Battling Inertia: Evidence from a pro-competition reform in the Chilean Pension System

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November, 2023.
Preliminary and Incomplete.
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Abstract

This paper evaluates a pro-competition reform in the Chilean pension system that changed the enrollment process from individual choice to a default option based on competitive auctions every two years. This shift led to consistently lower prices and modest improvements in the rate at which participants switched to more cost-effective fund managers. Notably, only one of the six analyzed auctions significantly influenced participant behavior, slightly increasing both the switching rate and the likelihood of selecting cheaper managers. Despite minimal changes in overall fee awareness and broader systemic improvements, the reduced fees resulted in extra disposable income, which increased voluntary retirement savings among a subset of members. This suggests that savings from lower fees are partly reinvested into retirement savings. Additionally, the study highlights the response to fee increases post-auction. While most firms maintained stable pricing post-auction, one manager significantly raised fees by 182% after the mandatory two-year price freeze, leading to approximately 16% of active affiliates exiting their plans, a response that is significantly more sensible that the response when better prices are available. This action reflects a strategic exploitation of contributors inertia and underscores the challenges of ensuring long-term benefits from competitive mechanisms, highlighting potential for managerial exploitation in the absence of ongoing regulatory oversight.

Keywords: customer inertia; pensions plans; default enrollment; attention
JEL Codes: H55; H57; J26; L51.

First version: May 31, 2023. I am grateful to Pamela Giustinelli and Sarah Eichmeiyer for their invaluable mentorship and guidance throughout the duration of this project. I am also thankful for the assistance of Massimo Anelli, Jan David Bakker, Stefano Fiorin, and others who generously shared their insightful comments and suggestions. I acknowledge the funding provided by ANID-Chile and the Subsecretaría de Previsión Social for the availability of the Social Protection Survey (SPS). The usual disclaimer applies.
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1 Introduction

Consumer inertia and optimization failures are prevalent across diverse markets, including TV subscriptions, home energy contracts, mobile plans, and pension schemes, often resulting in significant welfare losses. Although switching costs—from psychological barriers to financial penalties—are known to hinder optimal decision-making, their detailed impacts remain poorly understood (Luco (2019); Gabaix (2019)). These challenges are particularly acute in high-stakes areas like health insurance and retirement planning, underscoring the need for targeted regulatory interventions (Beshears et al. (2018)).

The relevance of addressing inertia in retirement savings has increased as many nations transition from pay-as-you-go (PAYG) to defined contribution (DC) systems due to demographic shifts, thus placing greater responsibility on individuals to make informed choices (Hastings and Mitchell (2020); Lusardi and Mitchell (2011)).

Current research on effectively regulating DC retirement schemes amid widespread consumer mis-optimization is limited, offering scant guidance for policymakers. This paper addresses this gap by analyzing Chile's 2009 pension reform, which aimed to enhance price sensitivity and reduce inertia among pension plan participants without sacrificing fund performance.

Under the former system, new participants selected their fund managers from a variety of standardized, often expensive, non-competitive plans. The reform changed this approach, mandating that new enrollees be automatically assigned to the lowest-fee fund manager, determined via a competitive sealed-bid auction. [1] This default assignment was fixed for 24 months without the option to opt-out. Both pre and post-reform, managers set non-discriminatory prices, and consumers could change managers freely without substantial costs.

The reform sought to increase competition in a highly concentrated market, with a size of about US$1 billion per year, characterized by stagnant fees and minimal product differentiation because of stringent regulations. The competitive pressure comes from the fact that winning manager's prices can benefit both former affiliates and those who decide to switch from another manager in search of the new, better conditions. The process of switching is simple, and can be done online with no pecuniary cost involved. Initial evaluations indicate that the bid-based enrollment mechanism introduced by the reform has successfully lowered average fees and facilitated market entry for two new managers, thereby reducing overall market concentration (Harrison et al. (2019)).

In this paper I study the effectiveness of this pro-competition reform addressing three specific research questions by examining various price variations induced by the bidding-based enrollment

[1] Auctions are recognized as a powerful mechanism to enhance competitiveness across various markets (Bulow and Klemperer, 1996). Appendix D describes the economics of auctions in this context. In the case of regulated pension markets, auctions have been used extensively in countries such as New Zealand, Sweden, Peru, Chile, India, Kosovo, among others, and has been proposed in the USA (Harrison et al., 2023; Kurach et al., 2019). In the specific context of Chile, the utilization of auctions appeared to hold greater promise in the pension market following the successful experiences. For example, Chilean lawmakers defined auctions to increase competition and optimally allocate the mandatory disability and survival insurance operator as well as the mandatory unemployment insurance manager (Reyes, 2010).

mechanism.

First, I examine whether the introduction of the bid-based enrollment mechanism leads to increased and more convenient switching among members who are free to choose in the months immediately following the implementation. As new, lower prices from auction results take effect, previously enrolled members are presented with stronger incentives to switch if they are not already with the cheapest fund manager. However, I find that anticipatory effects, where members might switch in expectation of new prices, are absent. Among the six auctions analyzed, a significant increase in switching activity is observed in only one, suggesting a deep-rooted inertia within the system. This single auction resulted in a modest improvement in the switching rate of 0.26 percentage points (0.08 SD), with an average monthly switching rate of 0.7% among contributing affiliates.In addition, a secular trend is observed in the quarterly fixed effect only for switching rates, suggesting a learning process over time or competitive responses from other fund managers. The policy implication of this finding is that even though the reform led to significantly more convenient alternatives, this alone did not overcome the inertia characteristic of the market. What works well to improve member welfare is the default allocation to the cheapest alternative.

After observing the minimal impact of fee reductions on switching behavior among members already enrolled before the reform, I further explored how the most substantial fee reduction—equivalent to 2.4 percentage points of monthly disposable income—affects individual outcomes. This investigation specifically targeted members assigned to the winning fund manager by default. The analysis sought to determine whether participants perceived the fee reduction as beneficial by examining shifts in cost awareness and variations in consumption and saving behaviors. Employing a difference-in-differences methodology, I discovered a statistically significant increase in total voluntary savings, with balances rising on average from about US$550 to US$120, alongside an 18 percentage point decrease in the likelihood of receiving quarterly financial statements—a key measure of service quality. The analysis of heterogeneous effects revealed that higher-income individuals with consistent contribution histories showed improved fee awareness, suggesting that fee changes are not prominently recognized across all demographics. Interestingly, the decline in service quality was predominantly observed among low-income members, aligning with a strategic 'invest-and-then-harvest' approach by the manager. These findings align with existing literature on the limited salience of fees in financial decision-making and suggest that while fee reductions can enhance savings among specific groups, they do not universally translate into broader financial awareness or improved service perceptions.

Finally, I study a relevant event observed after the reform, where a fund manager decided to raise management fees by 180%. In response to this increase, the affected affiliates showed a switching rate of the order of 15% of the total affiliates at the time in the six months following the increase. This response is several orders of magnitude larger than the observed response of affiliates to a more favorable event, such as a lower price following an auction, consistent with individuals being loss averse. I establish that this reaction does not significantly differ based on the

method through which the affiliate joined the manager, whether via the default rule or voluntarily. To better understand the switching behavior, I include a number of predictors. Predictors like system knowledge, experience, salary, and mental health play key roles in explaining patterns for both groups. Inertia predictors involve attention-demanding responsibilities and high satisfaction, while proactive predictors relate to experience, financial sophistication, income, and portfolio choice. Factors like age, education, and gender, that have been documented as determinant in the literature, lose significance in explaining responses to rising costs once comprehensive predictors are considered.

This paper makes contributions to three areas of literature. First, it assesses a significant reform aimed at enhancing the design of DC schemes, adding to the body of knowledge on optimal pension scheme design. It addresses the issue of perceived high administrative fees in countries that have transitioned to DC schemes (Tuesta, 2014). The study examines the impact of a reform intended to reduce these fees and explores the factors that may explain why it fails to overcome inertia. In doing so, it complements existing research conducted in Chile (Luco, 2019; Krasnokutskaya et al., 2018; Illanes, 2016), Peru (Bernal and Olivera, 2020), Mexico (Hastings et al., 2017; Duarte and Hastings, 2012), as well as other relevant countries. It also complements with some work pointing to informational frictions as the reasons behind the inertia, either by exploiting institutional reforms (Kronlund et al., 2021) that make the price variable more salient or through randomized information letters (Kinnerud and Lorentzon, 2022). The main contribution of the present paper is to provide evidence that the intervention of the market through new mechanisms that reshape the available price menus, introducing cheaper alternatives, is not enough by itself to overcome inertia, and that the introduction of default mechanisms is necessary to improve the position of affiliates. This paper also complements recent work by Harrison et al. (2023). They focus on the aggregate impact of the reform on price sensitivity, quality of service, and return on investment, and concludes improvements in design, while the present work focuses in the individual consequences of the reform. The present work extends the analysis to members of the system enrolled before the reform and exploits events to understand possible reasons for inertia.

Second, this study contributes to the broader literature on the origins of customer inertia in regulated markets and their susceptibility to profit-seeking strategies employed by firms (Heidhues and Kőszegi, 2018). Specifically, it presents a case study focusing on the regulated pension market, complementing previous research conducted in the realm of mandatory health insurance (Ericson, 2014; Ho et al., 2017). This paper shows that the introduction of auctions may lead some firms to exploit the mechanism to their advantage, profiting from the inertia exerted by individuals. What sets this work apart is the analysis of personalized information, enabling the examination of factors previously unexplored, including past experiences, purchasing complexities, mental health, and other attention-diverting factors, thus allowing for heterogeneity analyses. Furthermore, the observation of the highest response rate to the price increase, achieved through a switch from a manager capitalizing on inertia, offers evidence that switching costs could be lower than previously estimated. This highlights the increased significance of other factors, such as attention, which might

be adversely impacted by variables like mental health or caregiving responsibilities.

Finally, this study addresses the literature on the salience of taxes, highlighting how the presence of hidden attributes, such as the administrative fee deducted from gross wages, can contribute to inertia (Chetty et al., 2009; Gabaix, 2019; Bordalo et al., 2022). The paper's contribution lies in providing suggestive evidence of the role of learning, as individuals gradually reveal their salience over time and exhibit behaviors that are more responsive to changing environments compared to their less experienced counterparts, particularly when managers change. The opacity of attributes can be managed to the advantage of individuals using institutional features. Kronlund et al. (2021) find that an increased salience of fund fees in 401(k) plans — in which the employer plays an important role in manager selection — leads to a reduction in the plan's share of more expensive funds, despite the common perception that savers are largely passive in their investments. In turn, Kinnerud and Lorentzon (2022) show how information frictions can be overcome using simple information treatments. This paper shows that the new prices generated after the auctions do not seem to change either the salience of the price attributes or the information that individuals manage about them. On the other hand, it is observed that a relevant fraction of individuals respond actively to strategies aimed at exploiting their inertia, a fact consistent with loss-averse individuals.

The rest of the paper is organized as follows. Section 2 provides the necessary background and a description of the policy reform. Section 3 describes the data used and the different empirical strategies, section 4 provides the results and a discussion about possible channels. Finally, section 5 concludes.

2 Background

2.1 The fully funded DC Chilean Pension System

In 1981, during a period of dictatorship, Chile implemented a major pension reform in response to the risk of fiscal unsustainability. The old PAYG scheme was changed for the fully funded DC system. The reform implied that all new members would be automatically enrolled in the new system from January 1983, while old members could choose to switch. The majority of Chileans chose to switch, as the discount system in the new system was more advantageous.[2]

The new system has three pillars.[3] The first pillar includes a transfer financed by general taxes designed to provide a level that prevents poverty among the elderly and that is not linked

[2]The new system requires a monthly contribution of 10%, which has remained unchanged since then, compared to the contribution of over 20% of wages in the old system. In addition, all the contributions made under the old system were recognized by the introduction of a *Bono de Reconocimiento*, which is a document expressed in monetary values, representing the contributions registered under the old pension system, adjusted by the CPI and capitalized by a real return of 4% per year.

[3]This is the usual description proposed by International Organizations such as World Bank or the OECD. As in many countries, the armed forces in Chile have their own and separate social protection system.

to the contribution history.[4] The second pillar is the core of the Chilean system. It is based on a mandatory monthly contribution of 10% of the wage for formal workers,[5] which is saved on individual pension balances invested by private, single-purpose administrators (PFA).[6] PFAs compete on different margins, and participants can switch at any time at little (direct and indirect) cost and with no penalty fees. When members retire, they receive a pension based on the level of their individual account. All retirees are free to choose between three types of benefit repayments: scheduled withdrawals (whose monthly level quotas are defined according to actuarial rules); life annuities; and temporary income with deferred life annuities.[7]. Withdrawal of any money from the individual's balance is prohibited in the active stage, [8] the employer does not play any role in defining the plan or the investment strategy, and the state provides a guarantee to the funds similar to what it does with bank deposits.[9] Finally, the third pillar consists of voluntary savings that are generously rewarded by the Treasury. [10] This is relevant, as it generates incentives, via rewards, for both high and low income people to have extra savings for old age.

After more than 40 years functioning, the system has 11.6 million enrollees over a population of 13.5 of working age. [11] About 6.5 million enrollees make monthly contributions. The total balances administrated by the PFA accounts for 191,000 million dollars equivalent to the 60% of the Chilean GDP.[12]

2.2 PFA competition setting

Chile's second pillar offers its members a range of choices in making decisions about their future retirement [13]. However, freedom of choice poses challenges due to complexity of the system, information frictions, or financial illiteracy, among others.

Since its inception, Chilean policymakers have been actively advocating for the inclusion of design elements that promote competition. To this end, they have prioritized a straightforward

[4]The generosity and base of this pillar changed with the other arm of the important reform in 2009 that is described later.

[5]This include public servants but exclude military forces and polices that have their own segregated system. Self-employment are not mandate to contribute and they rarely do so voluntary.

[6]The contribution rate is set by law and has remained the same since 1981. It is deducted directly from wages (as a percentage), but retained by the employer, who transfers the corresponding amount to the PFAs.

[7]The annuities are administered exclusively by insurance companies, while the scheduled installments are administered by PFAs. Fees are charged for both products.

[8]This aspect changed in 2020 when Congress decided to allow extraordinary withdrawals during the pandemic to cover the loss of income caused by the pandemic. After that, 50,000 million dollars were withdrawn by individuals. This policy will be discussed later.

[9]In fact, during the 1982-83 crisis, several PFAs went bankrupt, and workers' savings were not affected.

[10]This is the component that looks more like the typical 401(K) plans in the US, in which the employer plays a crucial role.

[11]The informal sector in Chile is estimated at 27% (i.e. employed workers without social security contributions). This percentage is much lower than in the Latin American region, but still far from that of developed countries.

[12]There is an important literature highlighting the role of the pension system improving financial markets and boosting economic growth. See Cerda (2008) for a discussion.

[13]The range of possibilities is considerably more restricted than in schemes such as the U.S. 401(K). The margin of choice during the active phase is limited to selecting the fund manager and determining the risk level of the funds. Meanwhile, in the passive stage, the focus is on choosing the type of benefit to allocate the pension savings into.

cost structure based on a percentage of monthly salary, unlike models that involve a mix of fixed and variable costs or rely on fund performance, as seen in the case of Mexico, where inertia and profit accumulation by fund managers can occur (Hastings et al., 2017). Furthermore, transparent reporting requirements have been implemented, and significant efforts have been made to streamline and expedite the affiliation switching process.

In its early stages, the pension industry witnessed a notable surge in the number of firms. As of December 1981, there were 12 active fund management companies, owned by entrepreneurial groups, workers' associations, and trade unions. Throughout the 1990s, the industry continued to grow, reaching its peak with 22 operating firms in different years. However, over time, the industry experienced a gradual decline in the number of firms due to exits and mergers. The evolution of the Herfindahl–Hirschman Index for balances and affiliates is illustrated in Figure A11[14]. Currently, there are 7 PFAs competing in the market.

An individual can only have one contract with each PFA at a time. Prior to the 2009 reform, initial affiliation with a PFA occurred when individuals received their first payment in the formal labor market. This initial choice was often random or influenced by the employer or members of the individual's network, as young and inexperienced workers may have lacked the knowledge to make an informed decision. Throughout their active period, individuals had the flexibility to change PFAs at any time, following a simple process. PFAs compete to attract new participants based on three key factors: fees, financial performance and quality. However, there is substantial evidence that there is a high degree of inertia within this mandatory market (Luco, 2019; Illanes, 2016).

In this highly regulated environment, fees should be the primary driver of choice for the majority of participants. Appendix B explains why administrative costs are important when balances are not large enough to outweigh the additional costs by better performance. Fees are set independently by each PFA and can range from 0.45% to 2.5% of the monthly wage.[15] The second component of relevance is the financial performance of investments. Each PFA is allowed to define investment strategies that are structured among five risk profiles defined by the regulator. This strong regulation imposed by the regulator leads to a high degree of homogenization in the financial strategies observed, so that there is not much dispersion in the differences in fund performance among PFAs (Villatoro et al., 2022; Luco, 2019; Raddatz and Schmukler, 2013).[16] Finally, the quality dimension includes factors such as the quality of service[17], the availability of branches, and also the prices of secondary financial products such as voluntary pension savings or the cost of

[14]HHI is a measure of the size of firms in relation to the industry. An HHI between 1,500 to 2,500 indicates moderate concentration, while above 2,500 indicates high concentration.

[15]Figure A1 shows the evolution of fees. It is not easy to make a comparison with other countries because this fee structure is based on the income stream and not on the size of the balance. Han and Stańko (2020) attempts to estimate equivalence by comparing costs as a percentage of total assets under management. In this comparison, Chile is below the median for its cluster.

[16]The regulator publishes the investment portfolio followed by each PFA for each month, with a delay of three months. This facilitates herding, in particular focusing on those PFA that invest heavily in their finance departments.

[17]**?** notes that the evidence suggests that this is not a margin on which PFAs compete.

programmed withdrawals after retirement. [18]

2.3 Enhancing Competition: The 2009 Reform and new bid-based enrollment mechanism

The prevailing consensus in Chile was that the lack of competitiveness and the high degree of inertia in the pension system had a negative impact on individual welfare. This justified an intervention in the form of a major reform, embodied in Law 20,255 of 2008, which enjoyed broad political support. [19]

The reform had two main objectives: (1) enhancing equity through significant reforms in the first pillar, and (2) improving PFA competitiveness in the second pillar. [20]

This paper focuses on a reform that introduced an innovative auction mechanism designed to enhance competition. Under this system, the regulator allows the flow of new affiliates to be bid on for a period of 24 months. At the end of this period, individuals have the option to either remain with their current pension fund administrator (PFA) or switch to another. Both existing and new PFAs are eligible to bid for this influx of new contributors by proposing the lowest commission fee. The winning PFA not only secures the new contributors but is also required to apply the new, lower fee to all existing members, including those from other PFAs who opt to switch. [21]

This mechanism facilitates the entry of new manager participants into the system by providing operational certainty for a span of two years. Around 200,000 fresh affiliates become part of the system annually. Granting the manager exclusive rights over the influx of new affiliates ensures a substantial volume that guarantees a minimal efficient scale. At the same time, the cost of entry is not so high, since the flow of new contributors does not have high savings [22] and ensures that it is welfare-improving, since for this type of individuals the fee factor is undoubtedly the most relevant.[23] Figure A3 shows the results for each process, which PFA competed, and how the system's cheapest fee varied.

[18] For example, Planvital, a major player, justified its fee increase in 2018 by claiming that it had the lowest fees for voluntary savings and that it was the only PFA that did not charge for managing programmed withdrawals after retirement.

[19] During the period 1991-1997, the system reached a high level of competitiveness, with up to 50% of affiliates changing their PFA in a given year. This level of sensitivity was achieved only with high investment in sales staff and the use of decoys, which were detrimental to the overall welfare of the system (Berstein et al., 2005).

[20] In the history of the legislative discussion of this reform, one can read: "The challenge of the proposals put forward in this initiative is to create mechanisms that will increase price awareness among member companies, allow for greater competition and, ultimately, allow new players to enter the market".

[21] Additionally, the reform included two significant changes. First, it disentangled the disability insurance premium from the administrative fee, a distinction that was not previously clear. This separation allowed for a clearer differentiation between the fees for PFA services and those related to disability insurance, which vary according to the risk profile of each PFA's member pool. This adjustment was put into place in July 2009. Second, starting from July 2008, the fee structure was simplified by eliminating the fixed fee component.

[22] The law requires that administrators invest the equivalent of 1% of the amounts under management in the same financial instruments as their affiliates, in order to align incentives. It is called "encaje".

[23] Facing a lower monthly fee when young or having low balances more than outweighs the possible benefits of being in a better performing PFA.

The assessment of the reform is generally positive, as evidenced by a decrease in the weighted commission fees within the system. Additionally, the reform has fostered market inclusion by introducing two new administrators, resulting in a notable reduction in market concentration. [24] In addition, three PFAs voluntarily reduced their fees as a response to the reform.[25] Harrison et al. (2019) provides a summary of the main aggregate effects of the reform. However, despite this evidence, there has been no systematic review focusing on the individual level, with a focus in the effect of this reform on former enrollees' sensitivity to price and the factors that may affect aggregate response.[26]

2.4 The interesting case of Planvital

Since this new reform, the only PFA that has decided to increase its commissions is Planvital. Its business strategy could be described as what the literature calls *invest-then-harvest* (Farrell and Klemperer, 2007).[27]

Planvital is one of the PFAs that has been in the system since its inception in 1981 and has never achieved a leading position in market share. In the years prior to the reform, Planvital had a number of members that were close to the estimates of efficient scale. In order to increase its customer base, Planvital participated in every tender since 2009 and only won in 2014. After winning, it significantly lowered its commission from 2.36% to 0.46%, which immediately benefited its 384,778 affiliates (4.6% of the total market). In 2016, it won the bid again with a commission of 0.41%. This means that during 2014-2018 it was the cheapest PFA with a more or less stable commission. Figure A1 describes the evolution of fees during the period.

In 2018, the bidding process was declared abandoned due to a lack of bidders. As a result, the responsibility for the stock of new affiliates fell to the lowest-cost PFA, Planvital. However, Planvital unilaterally, in a meeting board just after knowing that no offers were made, decided to increase their management fees, despite concerns that this could lead to a substantial loss of members[28]. Consequently, management fees surged from 0.41% to 1.16%, representing a significant

[24] Modelo was the first entry had been observed in this market since the early 90's and in 2019 UNO has entered so. From the PFA's point of view, this reform is also useful. Instead of facing a high risk of entering a market in which it is expensive to attract new members, they are insured by a stream of customers that is large enough to achieve economies of scale, and because low balances by new members this implies low financial fixed costs to maintain the "encaje".

[25] Habitat reduced its fees from 1.36% to 1.27% in May 2012. Provida reduced its fees from 1.54% to 1.45% in May 2017. Finally, Cuprum reduced its fees from 1.48% to 1.44% in July 2018. The only PFA that has not changed its fees is Capital. This low intensity response suggests that the other non-winning AFPs do not see the threat to respond by competing on price.

[26] Peru undertook a similar reform in 2012 (Law 29,903) when the same problem of low sensitivity to fees and low competition became apparent. Bolivia did something similar, but in a slightly different system.

[27] This strategy of expanding the consumer base by discounting fees and then raising them by exploiting consumer inertia has been documented in other mandate markets. For example, Ericson (2014) discusses the case of Humana, a health plan participating in Medicaid Part D, which has followed this practice. Pejoratively, it is known as "bargains-then-ripoffs" pricing.

[28] As a way of explaining this change they informed their users that they made the decision to increase commissions, but that in compensation would aim to have the lowest commission on voluntary products and that they would be

180% increase. This fee adjustment affected Planvital's 1.8 million members, comprising 16.9% of the market at that time.[29] In the eight months following the fee increase, 125,538 individuals, accounting for around 14% of its contributors, chose to leave Planvital.

Planvital's financial statements summarized in Figure A2 reveal a notable pattern consistent with the *invest-then-harvest* strategy, which helps shed light on the board's decision-making process. Following its successful bid in 2014, Planvital experienced a significant decline in its return on equity (ROE), which fell from an average of 21.4% to just 1.43% during its tenure as the winning bidder. These results made the manager's operations unsustainable in the long run. Despite having valuable information to make accurate estimates, they took an aggressive stance during the bidding process to rapidly expand their affiliate base and gain market share. [30] The revelation that the auction had been invalidated had an immediate impact: Planvital would continue to secure the influx of new affiliates as long as it maintained the lowest commission in the market. However, this entailed an unacceptable level of financial risk. As a result, the Board decided to adjust the commission rate to the median of the distribution. As a result of this strategic shift, Planvital's financial statements showed a remarkable improvement, with an average ROE of 40.3% in the post-bid period, even in the face of some affiliate attrition.

3 Data and Empirical Strategy

3.1 Data

The main data source for this paper is the Survey of Social Protection (SPS). This is a nationally representative Chilean panel created to inform the major pension reform of 2009. It covers 7 waves from 2002 to 2020[31]. The dataset consists of information on around 16,000 individuals. It includes modules on individual and household characterization, work and medical histories, and other relevant factors. Special modules were also incorporated in specific years to capture non-cognitive skills, psychological traits and moods, valuation and opinions, and financial literacy.

The SPS dataset can be merged thanks to an agreement with the regulatory authorities. For each individual ever interviewed in the SPS waves, the complete administrative record of pension contributions is available in the data set called Affiliates' Historic Pension (HPA) records. It contains monthly information on contributions, PFA's, employer and wages and covers about 28,500

the only PFA that would not charge for administering payment schemes during retirement.

[29] It is true that another way to rationalize Planvital's behavior would be to use the overlapping generations switching cost model in Farrell and Shapiro (1988), in which one firm specializes in new customers and sets a low price, and the other specializes in old customers and sets a high price. Over time, the firms reverse roles, with the previously cheap firm raising its price to extract rents from its captive customers, and the previously expensive firm lowering its price to rebuild its customer base depleted by consumers leaving the market. But this model does not anticipate a price increase as rapid as Planvital's, which looks more like a profit-taking advantage to reap profits.

[30] Further evidence of the aggressive nature of Planvital's bids in the process is the absence of any subsequent bids lower than the one they had submitted for that specific period, and the non-existence of processes declared deserted.

[31] The wave released in 2012 was published with a cautionary note stating that the fieldwork was poorly conducted. As a result, authorities strongly advise against using this wave to draw conclusions or evaluate public policies.

individuals with information since May 1981[32].

3.2 Some Stylized facts

This section provides a series of stylized facts associated with the context of the reform, based on the information available in the SPS and contrasted with what has been developed in the literature (with a particular focus to the Chilean case).

Savings and voluntary products. One way to gauge the sophistication of individuals may be to observe whether they have voluntary savings for retirement. The Chilean legal framework provides generous tax incentives for individuals who make this type of savings[33] This benefits imply that these voluntary schemes are convenient not only for the high-income population. There are two kinds of voluntary savings: Cuenta 2 and Voluntary Savings Accounts (APV). Cuenta 2 is an account that mimics the mandatory one, managed by the same PFA but with different fees, and it is designed to complement the mandatory savings account during retirement (so all tax benefits are extinguished in the event of withdrawals). The APV is a broader set of instruments that can be managed for institutions other than the PFA, such as banks, investment banks, insurance companies, etc., and it is also designed to serve as a savings instrument for contingencies. In terms of penetration, 15.1% of affiliates have a Cuenta 2 and 7.7% have an APV account managed by PFAs.

Raw switching behavior. Since the last major reform in 2009, inertia has been the pattern among affiliates[34]. The total number of transfers does not exceed 4% of the total number of members per year. Only 18% of members have ever switched [35], and of those, 43% have done so only once. Some factors that have been important in defining the probability of switching are the re-entry into the labor market after a period of unemployment (Luco, 2019) or the holding of financial instruments that signal sophistication, such as voluntary savings or higher density of contributions (Quezada et al., 2019). Figure A4 shows a time series of how the probability of switching varies in the panel. Appendix C explores the predictors that determine switching behavior prior to 2009 using a random forest method.

[32]Information on which PFA the individuals were affiliated with is only available since 2007.

[33]About 85% of formal workers are exempt from income tax. For this reason, two reward schemes are considered: scheme A, where savings are rewarded with fiscal transfers, and scheme B, for workers with higher wages, where tax deductions are made. There is also scheme C, which is collective and benefits the company, but it is not very widespread.

[34]Refer to Berstein et al. (2005) for a complete description of the three stages prior to this reform. One that is worth mentioning is the period of significant price sensitivity and fierce competence that led to higher prices and a huge expenditure in sales forces moving the attention to practices apart from improving the performance of retirement balances.

[35]The process for making a PFA change is relatively simple and at no direct cost. It involves filling out an Irrevocable Transfer Order, which can be done online or in person, with or without the help of a salesperson. As part of the procedure, since 2006, an information sheet detailing the administration fees of all PFAs must also be signed. If everything is in order, the transfer is completed within 30 days (although its applicability depends on the fortnight in which the application is made). Luco (2019) estimates that the cost of switching is about US$35.

Information Setting. Information frictions may be an important factor explaining inertia in the Chilean context (Berstein and Ruiz, 2005), with women, young people and low-income members being the most affected. Affiliates show low knowledge of important parameters of the system. According to the 2015 SPS, only 43.5% of contributors know what percentage of their taxable income is deducted monthly for their pension balances, about 20% of members do not know what the legal retirement age is, 56% of members do not know the account balance, only 7% claim to know how much they are charged in administrative fees by their PFA, and 25% of members think that these fees are paid by the employer and not by themselves as a deduction from their gross income. This is despite the fact that each PFA is required to send a quarterly statement detailing costs, balances and other related information, and that 56% of affiliates reported receiving this statement in the past year. Fajnzylber and Reyes (2015) estimate that the introduction of a personalized projection in the annual statement each affiliate receives leads to an increase in voluntary savings, particularly among older affiliates closer to retirement and among women. Fuentes et al. (2022) show that receiving randomized and personalized advice to improve savings, leads to an improvement in voluntary savings concentrated among individuals who had previously overestimated their expected pension.

Financial Literacy. It may be the case that even holding information, individuals do not translate that into actions because lack of abilities. Financial illiteracy has been proposed by a relevant factor explaining poor financial performance (Lusardi and Mitchell, 2014). The information in the SPS suggest that the financial literacy in Chile is low. Only a small share of the population is able to answer correctly simple questions about compounding interest, about risk pooling or about value of money through time. Hastings and Mitchell (2020) document that only 17% of the Chilean population is able to answer correctly 4 or more of the 6 questions of their battery to asses financial knowledge, and that the financial literacy increases with wage. But there is no study for Chile on how the difference in these skills translates into better plan choices.

Myopia and preset bias. These factors may be associated with exhibiting inertia (Ya'akov et al., 2019). According to the SPS, 20.8% of the affiliates stated to have not yet though about how to plan their retirement and only 4% state to have ever performed an estimation of their expected pension. On the other hand, 66% of them state to have a method to track their monthly expenses, while the majority 77% of the individuals state that if they perform expenses plans, they just do so considering the following months ahead and not longer periods.

Expectations about retirement. Another reason for inertia in plan choice would be that not all individuals expect to cover living expenses in retirement with their PFA account balance, so they pursue alternative avenues to ensure future coverage of those expenses. Only a 43% of affiliates state that they think they will not rely on the balances managed by the PFA. A relevant proportion of 28% state that they plan to continue working after the mandatory age for retirement, and that

27% of the actual retired individuals state that they would have loved to work longer to increase their pensions. The expected pension by individuals has a mean value of $235,032 (US$ 300) that in the majority of the cases is not well matched with historic contribution records.

Sales Forces. PFA can induce transfers by increasing the resources devoted to sales forces. Berstein and Ruiz (2005) document that there was a period of fierce competence that led to a sub-optimal equilibrium in which PFA devoted excessive resources to sales forces, increasing prices and decreasing quality. This sub-optimal equilibrium was one of the motivations for introducing the auctions to the default option. Hastings et al. (2017) show that the interaction between enrollees and pension fund sales forces is associated with enrollees shifting their attention from fees to non-fee fund attributes. On average, PFA spend US$10.25 per participant per year on sales forces, with Modelo spending the least and Capital spending the most. According to the SPS 2015 report, 67.5% of the affiliates who reported switching stated that they had done so with the assistance of a salesman.

Trust and popularity. Individuals in a context of compulsory membership by law could perceive the system as unfair or lack confidence in it, which would be reflected in indifference and distance from it.[36] Only 29.7% of affiliated individuals claim to be satisfied or very satisfied with their PFA, while in the whole sample only 9.5% of individuals have a good evaluation of the PFA and 6.9% have a positive evaluation of the pension system as a whole.

3.3 Research design

The purpose of this paper is to examine whether this pro-competitive reform, which changed the enrollment rule and affected the entire price menu in repeated periods, increased affiliates price sensibility. To do so, I address three key questions: 1) Does the new pricing scheme introduced after each auction, with a more convenient alternative, induce non-automatically enrolled members to switch? 2) How does the reduction in fees (and the increase in disposable income) affect individuals' consumption and saving behavior? 3) What are the key individual characteristics that correlate with the observed switching behavior after a fee increase? To answer these questions, each strategy is examined and discussed independently in the following sections of this study.

3.3.1 Individual Panel Estimation

The information from the HPA allows me to follow 25,309 individuals who can be observed from January 2009 (the year of the major pension reform) until December 2021. This provides 14,083

[36] There is a social movement called "No more AFP" that managed to mobilize a large number of people and place the issue of a pension reform to end the PFAs as a central issue in the 2018 presidential campaign. Over time it has lost popularity and today the reform that was discussed to the system is seen that it does not have the support to move forward.

switching events over the period, while 19,064 individuals are never movers. The panel is gender balanced (51.44 % are male) and can be matched with information on total balances, asset allocation, and voluntary savings holdings. The majority of individuals (78.5%) were members before the default option was introduced. After excluding members with no contributions in the period (i.e., retirees and deceased individuals) and those lost in the merger process, I obtain a total of 19,827 individuals.

To estimate the immediate effect of each of the six auctions and its announcements (to address anticipation issues) detailed in A3, I run the following panel estimation with individual within-individual variation that accounts for all unobserved heterogeneity:

$$S_{it} = \delta_i + \sum_{n=1}^{6} \beta_n \cdot Ann_{nt} + \sum_{j=1}^{6} \gamma_j \cdot Auc_{jt} + \rho \cdot Covid_t + \sum_{w=1}^{3} \eta_w \cdot W_{wt} + \zeta \cdot \mathbf{X}_{it}^{'} + \tau_t + PFA_i + \epsilon_{it} \qquad (1)$$

Where S_{it} is an indicator that takes the value of 1 if the individual i switches at time t (or if she switches to the cheapest PFA at time t), Ann_{nt} is an indicator variable for each of the six reform announcements that takes the value of 1 for all months up to the third month after the announcement, Auc_{jt} is the same, but with the three months after each new fee is enforced, $Covid_t$ is an indicator that takes the value of 1 for the period in which there was a lock down, W_{wt} denotes an indicator that takes the value of 1 for each of the three months in which a legal withdrawal was allowed, $\mathbf{X}_{it}^{'}$ is a vector of time-varying individual characteristics, τ_t is a quarterly period fixed effect, δ_i is the individual fixed effect, and PFA_i is a PFA of origin fixed effect. ϵ_{it} is the error term with the usual characteristics. The coefficient of interest corresponds to γ_j for one of the each auctions short-run impacts on switching and on switching quality.

The coefficients of interest are γ_j for each of the auctions considered. The assumption in this exercise is that each of the bids induces more desirable alternatives that would induce a change. Since the change takes up to three months to register administratively, the causal effect associated with this new alternative is estimated only if a change is observed in this window. It is further assumed that each individual's fixed effect can be observed for unobservable characteristics that could invariably affect the decision over time, and that the winning PFA is orthogonal to the average observable characteristics of its observables (i.e., that the main driver of participation is to increase the size of the market, not to segment it).

After, this specification will be slightly modified to estimate the impact of each of the bids autonomously, using an event study in a time window considering 18 months before and 12 months after implementation, controlling for individual characteristics that change over time[37]. This allows me to identify month-by-month effects, separating according to how much more convenient it is to charge the winning PFA, as well as showing whether there are anticipatory effects (considering

[37]Specifically, the controls considered are: whether the affiliate returns from a period of unemployment, years to retirement (which is differentiated by sex), standardized salary, active choice of funds, standardized mandatory balance, contribution density, length of the last period of unemployment.

that the winner is announced six months before the new price takes action).

3.3.2 Difference-in-Differences after the fee reduction

This empirical sections focuses on the fee reduction observed in 2014 for Planvital's former affiliates (Figure A1). This set of enrollees automatically began to benefit from reduced administrative costs after this PFA won the bid, and rules out some self-selection concerns. As its competing PFAs do not alter their prices during this period, we can assume that the patterns seen in its affiliates would have developed similarly to what is observed in the PFA that reduces the fee without the intervention. This arrangement creates a natural control group.

Exploring how individuals react in terms of cost awareness or alterations in their consumption and savings behaviors is crucial. Such an analysis illuminates the significance individuals attribute to changes in their disposable income resulting from the most favorable contracts generated by the auctions.

To take advantage of the panel nature of my dataset I exploit a first-difference approach where the dependent variable is the variation from the baseline in the outcome of interest, regressed to a set of individual controls at baseline that may affect the trajectories on the outcomes and a dummy variable indicating if the individual was a former affiliate of the affected PFA. I restrict the sample just to those individuals that do not switch to other PFA in the time window. The baseline consists of information observed in the SPS 2009, while the results are contrasted with observations in the SPS 2015. [38]

The selected sample consists of 2,769 individuals who remain in their PFA in the time window with contributions before and after the fee reduction (balanced), of which 4.6% are PFA members who reduced their administrative costs (consistent with the aggregate market share data). Table A1 contains the summary statistics.

Specifically the model is described by the following equation:

$$\Delta Y_i = \alpha + \theta_1 \cdot Treated_i + \theta_2 \cdot \mathbf{X}'_{i,baseline} + \varepsilon_{it} \tag{2}$$

where ΔY_i is the individual variation in the outcome of interest (i.e., changes in voluntary savings, awareness of fee size, or PFA rating, among others) in the time window, $Treated_i$ is an indicator that takes the value 1 if the individual was in the treated PFA, and $\mathbf{X}'_{i,baseline}$ are the individual baseline controls, which attempt to capture a complete set of factors other than the unobserved factors included in the first-difference.

It is not possible to provide a parallel trend test for each outcome variable, as this would require matching the bases with SPS from previous rounds in which the question is also repeated, with a high attrition cost that reduces statistical power. However, Figure A6 uses the panel information

[38] The 2009 SPS fieldwork was conducted during the months of April 2008 to April 2009, while the 2015 SPS fieldwork was conducted between April 2016 and July 2016.

to provide evidence of parallel pre-trends in wages and contribution density, factors that should not be affected by the auctions in the absence of strategic sorting[39].

3.3.3 Determinants explaining outflows after an increase in charges

As a final step, this paper examines how individuals' response to an unexpected increase in fees in 2018 (Figure A1) varies according to a number of observable factors. This event allows me to disentangle into subgroups: those who were enrolled in the treated PFA before the introduction of the auction mechanisms, and those who were enrolled there by the default option. The difference in this group is relevant because survivorship may introduce bias in the former group due to a greater concentration of passive affiliates, while the default group provides a cleaner set of individuals thanks to the default allocation.

I can observe this event over a set of 1,319 individuals, of which 971 were assigned by the auction mechanism. Table A2 provides a description of the summary statistics.

The idea of this exercise is to assess whether the factors driving the switching-out behavior differ by sub-group. The empirical strategy consist in a cross-sectional regression, in which the dependent variable is a dummy taking a value 1 if the individual switched out in the period after the increasing of about 150% in the administrative cost. The estimand proposes is the following:

$$SwitcherOut_i = \phi + \varphi_1 \cdot \mathbf{X}_i^{'} + \epsilon_i \tag{3}$$

where $SwitcherOut_i =$ is an indicator with value 1 if the individual reacted switching-out from the PFA that decided to unilaterally increase fees, and $\mathbf{X}_i^{'}$ is a vector of observed characteristics in the SPS 2015.[40]

4 Results

4.1 Are induced large economic incentives enough to drive switching into more convenient managers?

Estimations for equation 1 are in table A3 for the effect of auctions on the probability of switching and in table A4 for the effect on the probability of switching to the cheapest. The coefficients are estimated in percentage points, and the preferred specifications are those in columns (5) and (6), which include PFA fixed effects and quarter fixed effects (or their interaction). In general, we observe economically small effects, that individuals do not respond to the announcement of a new available cheaper cost, and that only in some cases, they respond switching in response

[39] Furthermore, this graphical evidence serves to eliminate the potential that the fee fluctuations are being influenced by the firms themselves. Such a scenario is highly unlikely, given that each company has employees affiliated with various AFPs in its workforce, identifying those who would gain from the more favorable payment scheme would incur significant costs, not to mention the legal implications involved.

[40] Please refer to Appendix E to a discussion about the justification to consider mental health issues as a possible driver of poor decision-making.

to the new fees. Also, as expected given the structure of the charge relative to monthly income, the probability of switching is positively related to the wage. In addition, the lock-down period due to the pandemic reduces the probability of switching and switching into the cheapest, while the withdrawals do not positively affect both probabilities, although it significantly increases the salience of retirement balance accounts.

In turn, Figures 1 provides a plot of the estimated coefficients when running an event study on the probability of switching over the cheapest alternative (and Figure A8 plots the event study over the probability of switching).[41]

Combining both evidence, the first finding is in the period right after the enforcement of a new administration cost due to the auction, there is little evidence of greater switching or greater probability to move into the cheapest administrator. This is regardless of the level of variation in the new fee with respect to the system average cost. A prior could have been that the effect on the changes would be more pronounced when the decrease is of greater relevance with respect to the average, that is, in the third auction when the new price of the winning PFA induces a decrease of 21% in the system average.

A significant improvement is only observed in the probability of moving to the cheapest fund manager after the 5th auction, a fact compatible with the idea that individuals are more sensitive to losses than to possible gains, which are left on the table. As explored in the following sections, this effect in Figure 1 for auction five is mainly explained by affiliates actively responding to the price increase in 2018 switching-out from that PFA. In terms of the raw switching behavior, it can be observed that events like the change in the fee structure in 2009 where the regulator decided to separate the charge of the disability insurance modifying the listing prices[42], and the pandemic in 2020 produce a variation in the switching (Figure A4). But none of these changes are directly attributable to the effect of an auction. They are more likely to be explained by exogenous changes in individual's attention, with a major reform in 2009 being something that increases it, while the pandemic, being an event that crowds-out it. The entry of new players do not seem to play a role either, new manager available since August 2018 and October 2019 do not seem to produce greater switching behavior nor better switching. This is in opposition to the assumption that the novelty of new players could help improve inertia in the market.

In addition, the evolution of the estimated year-quarter fixed effects in Figure A7 shows that the trend in changes is increasing and statistically significant from the first auction onward, with an improvement of 2% observed over the entire period. However, this result is not observed when estimating year-quarter fixed effects on the probability of switching to the cheapest manager. While the entire impact on mobility cannot be attributed to the new enrollment mechanism, this suggests that there is a long term effect and that individuals do not react immediately after the new price

[41] An alternative to presenting an event study for each auction would have been to overlap them as if they were one event with homogeneous effect and thus increase statistical power. However, given the heterogeneity both in the intensity of price variation and in the entry or not of new suppliers, I have preferred to present them separately.

[42] Please refer to footnote 21 for an explanation of the change.

is enforced, possibly indicating a role of learning and getting used to the possibility of switching. All in all, this effect is far from being economically relevant and is not associated with a welfare improvement outcome.

In line with Luco (2019), the estimations in tables A3 suggest that those who leave a period of unemployment and re-enter formal work show a higher probability of switching and better switching. Upon reentering the labor market, each worker must inform his new employer of the PFA in which he is enrolled so that he can make payments to the appropriate PFA. This fact probably increases the attention on the PFA and its attributes, giving rise to a higher conditional probability of switching. Although the law mandates that anyone who signs a transfer form must also sign an information document indicating the administration costs of all PFAs[43], it is not observed that those who return to the formal market significantly increase their probability of switching to a cheaper or the cheapest PFA as seen in Table A4. This suggest that the information treatment provided by the policy do not play an important role at that stage where the decision was already taken.

Another aspect worth discussing is the significant decrease in plan changes that became apparent after the lockdown imposed in March 2020 due to the pandemic. This trend aligns with a diversion of attention toward other concerns, resulting in heightened inertia. Nevertheless, the unprecedented initial withdrawals—requested by over 6.5 million users within the first 10 days of August 2020—markedly heightened the prominence of pension funds. This could potentially lead to behavior aimed at optimizing fund management. However, this hypothesis is not supported by the data in the time series (Figure A4), likely indicating that these withdrawals were primarily viewed as a means to increase liquidity during a complex period and were not associated with a reassessment of the choice of pension manager.

Overall, the data suggest that the majority of affiliates have inertia, and that while the auctions have increased price sensitivity, they do so by a narrow margin that is far from being economically relevant. All this is compatible with a conceptualization of commissions as "shrouded attributes" that make people not internalize (Chetty et al., 2009) and then exert inertia.

It is important to note, since these effects are not considered in this paper, that the new mechanisms did not have a negative impact on either the fund performance of the winning fund managers or on service quality indicators (Harrison et al., 2023).

Finally, with the goal of gaining insights from an individual perspective, and since the section E notes that depression problems are associated with inertia for a certain subset of the population, I test whether two exogenous events related to mental health in the panel produce variations in switching behavior. The first event is the death of a household member (i.e., the unexpected loss may trigger episodes of mental illness (Keyes et al., 2014)) and the second is the transition to daylight saving time due to a DST policy (i.e., the variation in sunshine hours may affect sleep

[43]Since 2006, the Circular N1408 establishes that during the filling of the form of transfer, the affiliates must be exposed to the information on the administrative costs of all the managers.

patterns and thus trigger depressive problems (Johnson and Malow, 2022)[44] But as can be seen in the Figure A9, no significant effects are found for death, with very precise estimates, and while for the month after the DST there is a negative point estimate for the second month after, this is not statistically significant (while the observed disappearing effect over time supports the hypothesis).

4.2 Effects of the fee reductions on individual's outcomes

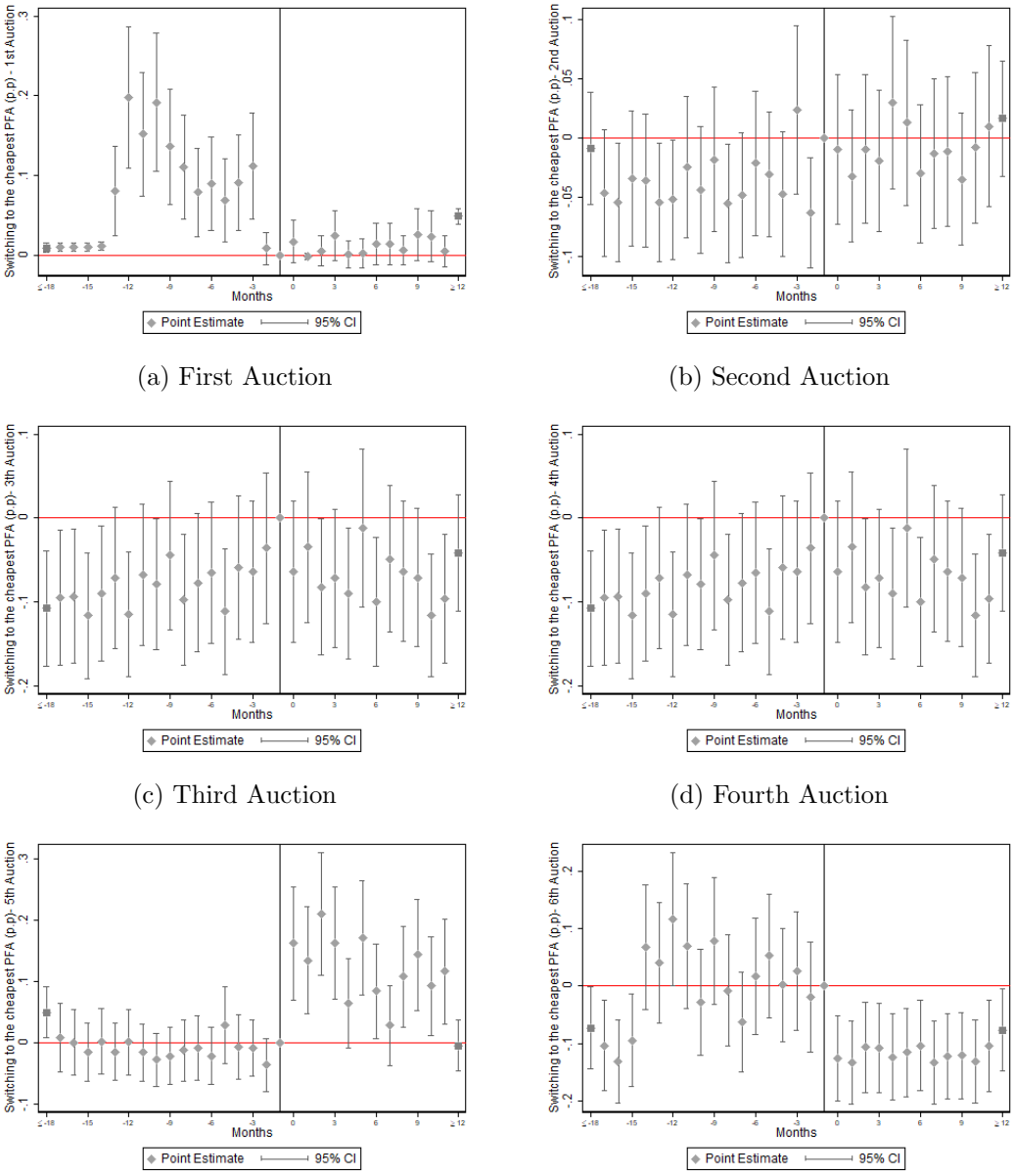
As the fee reductions produces an exogenous and unexpected increasing in disposable incomes of those non-defaulted affiliates that were clients of Planvital before the adoption of the new fee, observing the impact on different individuals' outcome may be relevant to gain insights into the underlying causes of this inertia. In particular, those related to the level of knowledge they have about the fee size and who pays it, or the level of substitution towards voluntary retirement savings or other types of short-term consumption that could signal the level of priority individuals place on improving their future payouts.

Figure 2 gives a summary of the estimated coefficient of interest according to equation 2. There are only a statistically significant impact on the probability of reporting having received the periodic statement in the last year and on the total amount saved as a voluntary instrument and a small improvement in the intensive margin of voluntary savings, but not in other outcomes. This suggests that the reduction in administrative costs had a negative impact on service quality, a fact that is consistent with the *invest-then-harvest* business strategy (Farrell and Klemperer, 2007). On the other hand, the improvement in voluntary savings is consistent with the evidence showing that these products are sensitive in the intensive margin to different changes in disposable income or information treatments that make retirement more salient (Fuentes et al., 2022). [45]

[44] In the time window, I can identify 775 individuals facing near-death and 11 months in which DST reduces sleeping hours, with the date of change varying from year to year. Note that the number of lags and leads is shorter in the DST exercise. This is to avoid overlapping effects between treatments.

[45] This could be relevant for policy makers. Estimates for the reasonable performance of the funds suggest that if the entire rebate had been allocated to voluntary savings during the entire active period, the savings that this would generate would be equivalent to what would be produced by delaying the retirement age by three years.

Figure 1: Event Study Estimations for the different auctions over the probability of switching into the Cheapest PFA



(a) First Auction

(b) Second Auction

(c) Third Auction

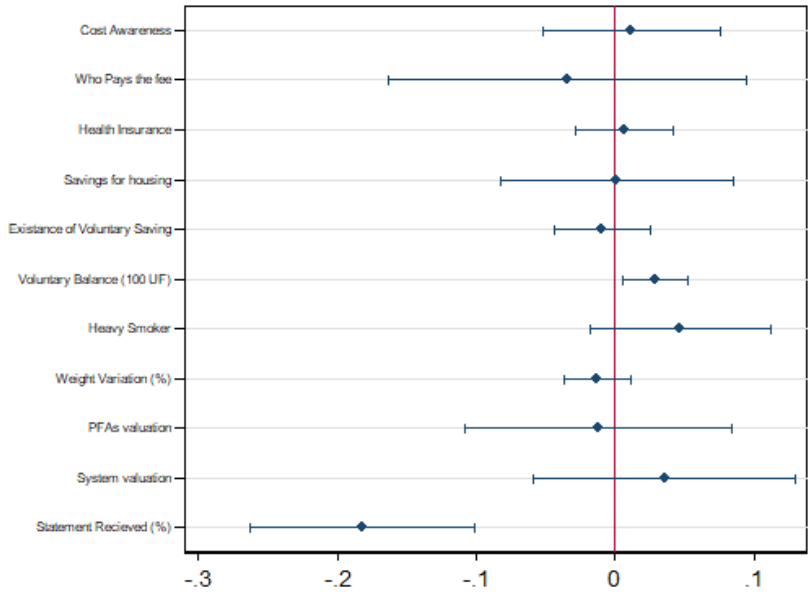
(d) Fourth Auction

(e) Fifth Auction

(f) Sixth Auction

Note: These six panels present the estimates of an Event Study for each of the auctions studied for the probability of switching to the cheapest PFA. The reference point for each is the month prior to the activation of the new maintenance charge. Months -18 and +12 include the estimate for the other periods not considered. The announcement of the winning PFA is made six months prior to the effective date of the new charge. The first panel shows an important effect of changes associated with June 2009, the date on which the reform that changes the pricing structure and dissociates the disability and survival insurance charge from the monthly charge comes into effect. Point estimates are displayed along with their 95% confidence intervals.

Figure 2: Summary of the estimated coefficients for being in the treated PFA over a serie of relevant outcomes.

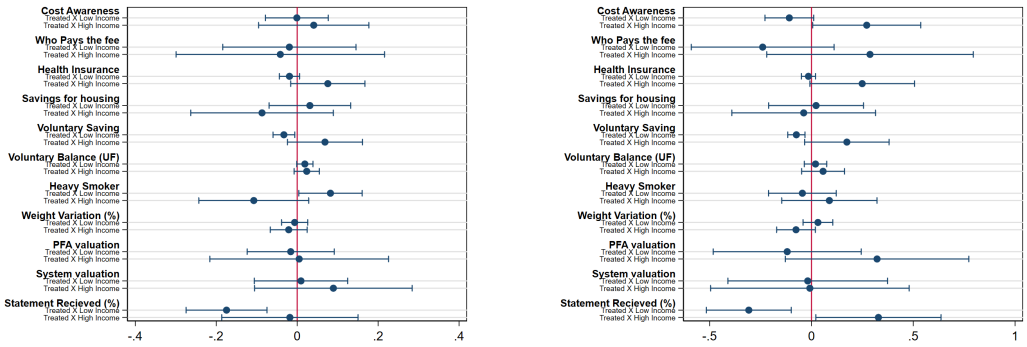


Note: This figure plots the estimated coefficients for θ_1 in equation 2 for various outcomes of interest. These coefficients represent the estimated impact of remaining in the PFA that reduces administrative costs relative to those individuals who remain in their untreated PFA, comparing the baseline in the 2009 SPS with the information observed in the 2015 SPS. The fee reduction took place in August 2014. Outcomes PFA valuation and System Valuation are only observed in SPS 2012. Point estimates are displayed along with their 95% confidence intervals. The regression considers 2,769 observations which 128 are in the treated group.

It is interesting to examine whether there are heterogeneous effects by income level, since the ex-ante effects are ambiguous. On the one hand, since the administrative fee is a fixed percentage of wages, a change in it is more likely to be noticed more easily by a worker who receives his monthly paycheck than by a worker whose nominal amount is lower but relatively the same. On the other hand, however, lower-income workers are the ones with the active budget constraint, for whom a financial relief would be more beneficial and therefore more noticeable.

The results of these heterogeneity analyses are presented in Figure 3 by separating individuals in high-income (above the mean) and distinguishing for the density in their contributions (intense being those with contributions in all months).

Figure 3: Summary of the estimated coefficients for being in the treated PFA over a serie of relevant outcomes by level of income (left) and only on those receiving the intense treatment (right).



(a) By Level of Income

(b) By Contribution Density

Note: This figure plots the estimated coefficients for θ_3 in the modified equation 2: $\Delta Y_i = \alpha + \theta_1 \cdot Treated_i + \theta_2 \cdot HighIncome_i + \theta_3 \cdot Treated_i \times HighIncome_i + \theta_4 \cdot \mathbf{X}'_{i,baseline} + \varepsilon_{it}$ for various outcomes of interest. The left panel includes the estimation for the whole sample, while the right one restricting only to those who were affected by a intense number of contribution in the period. The estimated coefficient represent the estimated impact of remaining in the PFA that reduces administrative costs by income level relative to those individuals who remain in their untreated PFA, comparing the baseline in the 2009 SPS with the information observed in the 2015 SPS. The fee reduction took place in August 2014. Outcomes PFA valuation and System Valuation are only observed in SPS 2012. Point estimates are displayed along with their 95% confidence intervals. Within the treated group, there are 43 individuals classified as high earners, while the subgroup of intensively treated individuals consists of 31 individuals.

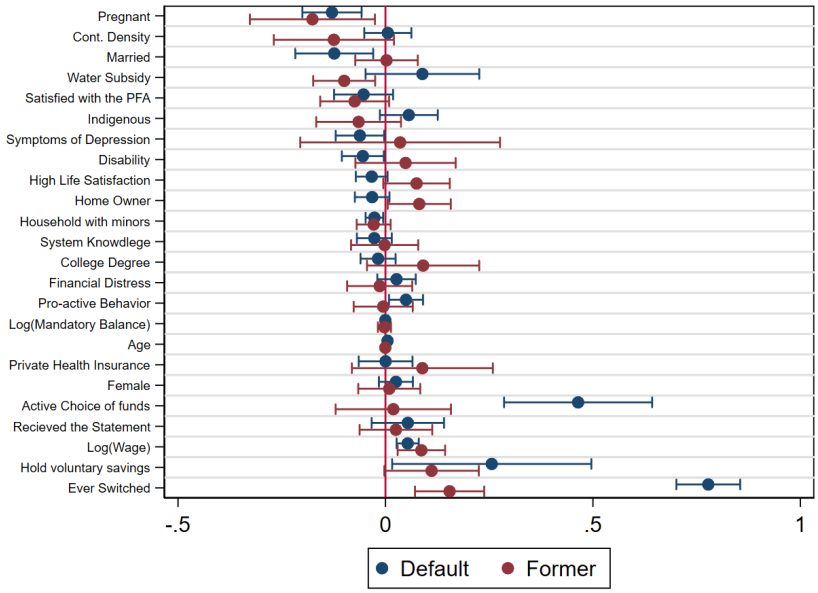
Results show differences by income level, which become more noticeable as the sample is restricted to those individuals with 100% contribution density. For example, the difference in the likelihood of having reported receiving the balance statement suggests that the treated PFA focuses its services on those affiliates that can generate higher revenues for it, neglecting the others and providing them with lower quality services. It is also interesting to note that, although not significant at the 5% level, the point estimate for awareness of the amount charged for fees increases for high-income members with intensive treatment. This suggests that there is a subgroup of affiliates who notice and internalize a relevant discount, probably through the information they receive from their employer on a monthly basis in the pay stub, which details the legal discounts, including the commission. A nominally higher amount, might attract the attention of higher income members. Similarly, the point estimate for the value of the system is positive for those with high incomes in the intensive treatment, although not statistically significant. This may be relevant for policymakers interested in increasing the trust in the system and its social legitimacy. Finally, its worth to mention that there are not relevant heterogeneities by gender.

As a recap, the evidence in this section suggests that the increase in disposable income resulting from the reduction in administrative fees, while substantial, do not improve the awareness in the fee size nor the knowledge of who pays the cost. Additionally, I find evidence of poorer quality of service in that period, consistent with a strategy in which the winning PFA reduced fees beyond what was reasonable, presumably with the goal of increasing its contributor base.

4.3 Switching-out and Loss-aversion

Finally, I study reactions to the sole increase in administrative costs observed after the introduction of auction mechanisms. Under a loss aversion hypothesis, this event should induce greater sensitivity in individuals. Figure 4 plots the different estimated coefficients from equation (3), separating the estimated coefficients by type of affiliation; either newly enrolled to the default affiliation or former affiliates who voluntarily chose the manager.

Figure 4: Estimated coefficients by type of enrollment to explain switching-out behavior in 2018



Note: This figure plots the estimated coefficients for different confounders considered in equation 3 by type of individual. The Outcome variable is a dummy with value 1 if the individual switched-out from the PFA that increased the fees. Default refers to individuals who were automatically enrolled in the winning PFA, while Former refers to individuals who were enrolled in the PFA before 2010. This estimate includes only those individuals with contributions before and after the August 2018 fee increase by the PFA of interest. The set of confounders are those observed in the 2015 SPS, whose fieldwork was conducted between April and July 2016. The x-axis estimates the impact of in terms of the probability of actively responding to the increase in charges by leaving the PFA. Point estimates are displayed along with their 95% confidence intervals.

The first lesson of this exercise is that the switching out rates do not differ importantly by groups (A2, first row). While the rate of switching-out in the former group is 15.9% that share is 15.6% in the default group. And one possible explanation to this is that in the first group there are 50.43% of individuals who have ever changed. As individuals perform switches they disclose their type. Indeed, while 27.5% of the old group members who have ever switched PFA in the past respond by leaving to the fee increase, only 3.5% of the non-sophisticated individuals in the former group. And, on the other hand, default enrolled individuals, that are younger, and as can be seen in Table A2 are less familiarized with the System and therefore score less in the question regarding knowing the system. Taken together, this suggests that there is learning-by-doing and that as time goes on, individuals reveal their type so that in the older affiliate stock it is possible to distinguish more accurately who is likely to respond and who is not.

The second lesson comes from comparing the switching rate in response to this increase with the switching response induced by other better alternatives due to auctions. The response rate is significantly higher by many orders of magnitude, potentially suggesting a context involving loss-averse individuals. While a smaller fraction of affiliates responds to new, more advantageous positions, in this case a fraction of 15%, orders of magnitude larger, responds by leaving. This is interesting given that there are switching cost estimates for the very same market on the order of $35 estimated from structural models that leverage on observed behavior (Luco, 2019), suggesting that these estimates may be biased upward. While this may be consistent with individuals having loss aversion, it may also be consistent with the fact that in this case the decision to exit is easier to compute; there is no need to compare other dimensions on which PFAs differ other than price, nor are specific skills required to do so. It is simply noted that the promise made is no longer in effect, and this may be reason enough to motivate paying the cost of switching.

The third lesson from this exercise is that the estimated predictors seem to behave consistent across enrollment-type groups. While at the top, predicting inertia, there are factors that may crowd-out attention such as taking care of a toddler [46], or suffer for depression. On the bottom, those factors predicting switching out are those associated with past-experience, holding voluntary savings for retirement, higher income and to have been active in the definition of the investment portfolio. All these factors suggest the existence of a more sophisticated type of individual, which would be more responsive. It is worth noting that, regardless of the group, factors usually identified as relevant to explain more reactive individuals, such as age, sex, educational level or knowledge of the system (Berstein and Ruiz, 2005; Quezada et al., 2019), are irrelevant in predicting switching-out behavior.

Finally, it cannot be denied that we may be facing an event of a particular nature, not comparable to the opportunities that induce better price alternatives after the auctions. It is possible that the high switching rates can be explained as a measure of dissatisfaction or protest once the price increase is verified, or as a way of showing rejection of feeling used after an *invest-then-harvest* strategy.

5 Conclusion

This study examines the consequences of a reform aimed at increasing price sensitivity and promoting competition within pension plans in Chile, which are among the most important financial assets for households. The reform introduced an innovative enrollment mechanism in which new affiliates into the system are automatically enrolled for 24 months with the lowest-cost manager identified through a sealed-bid auction. Importantly, individuals are not allowed to opt out during this period. Additionally, as each subsequent auction occurred to define who will hold the monopoly right over the incoming flow of affiliates, the reduced prices established were extended to all other

[46] An alternative interpretation, based on Baranov et al. (2020), would be that the fact of being pregnant in 2016 leads to a higher risk of postpartum depression.

system members, leading to a transformation of the pricing structure that has one cheapest alternative. This modification was crafted to offer a more cost-effective and convenient choice, thereby motivating individuals to actively exercise their option to switch plans.

The significance of these findings is underscored by the growing reliance on defined contribution (DC) systems, which depend on individuals' ability to effectively manage their complexities. Although DC systems are instrumental for fiscal sustainability and intergenerational equity, they often present challenges for individuals in terms of understanding and managing their options effectively.

The research highlights three key insights for optimally regulating the market for retirement savings plans. First, it demonstrates that the competitive bidding process alone, without automatic enrollment into the most economical plan, does not improve consumer outcomes. This is primarily because a significant majority of consumers do not switch to less expensive managers, even when it would be financially beneficial. This observation emphasizes the strong impact of consumer inertia and supports the notion found in the literature that competitive pressure alone is insufficient to motivate consumers to choose better alternatives (Gabaix, 2019).

Secondly, aligning with this interpretation, the research reveals that a rule mandating automatic default enrollment into the most cost-effective manager holds substantial promise in significantly reducing fees borne by consumers. This is in line with other default implementations (Cronqvist et al., 2018), and also with other funding in the Chilean pension system, where it has become evident that too much freedom of choice can lead to poorer outcomes for individuals, and even affect the performance of financial markets (Da et al., 2018).

The third policy lesson pertains to regulation designed to safeguard against possible exploitation by plan providers. While the combination of competitive bidding and default enrollment has the potential to consistently deliver efficient outcomes for consumers, there is a risk identified in my findings. This risk pertains to the possibility that this bid-based enrollment mechanism could be manipulated to expand the customer base. Providers might bid aggressively in such scenarios, capitalizing on customer inertia subsequently. To address this, one viable policy could involve implementing a prohibition on cost increases beyond a defined threshold to prevent such practices after the period of the auction expires. However, such measures must be carefully calibrated to avoid disincentivizing participation in future auctions, both for current and newly managers.

Building on this, another policy implication suggests expanding the scope of the default enrollment rule. Currently defined for new members over a 24-month period, this rule could be extended to all members whose balances do not justify remaining with a more expensive fund manager. This extension could be combined with a provision for individuals to opt out - an alternative not currently available - potentially enhancing the legitimacy of its implementation. In addition, certain degrees of price differentiation could be evaluated, which would make it possible to reward permanence at the expense of a commitment in terms of membership time. However, this should be done with care to avoid skimming practices that end up affecting lower-income members who are less attractive to managers.

From an empirical point of view, there are also some lessons to be learned, in particular about the different behavior observed when members are faced with a price increase even though the stakes are equivalent to the potential gains from switching to cheaper alternatives. This could shed light on the role of switching costs in explaining inertia, and also highlight aspects of attention. It is also interesting to note that when controlling for a rich set of factors that have not yet been considered, those that have been syndicated in the literature as determinants of more active members, such as education level, knowledge of the system, or gender, turn out not to be those that correlate most strongly with the observed behavior. Rather, they are associated with factors associated with learning-by-doing over time, such as past experience, active choice of multifunds, and holding voluntary savings instruments.

These lessons about the consequences of a strategy of default enrollment mechanisms combined with auctions to reduce prices to combat inertia are not limited to the pension market. They can easily be extended to health insurance, mortgage insurance, accident insurance, subsidized loans, and other instruments where the government creates a high-volume quasi-market in which the beneficiaries are ex ante uninformed and unable to navigate the complexities.

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A Appendix Tables and Figures

Appendix Table A1: Comparison at Baseline between treated and not treated PFA by fee reductions

	All		Treated		Non Treated		diff
	mean	sd	mean	sd	mean	sd	diff.
Indigenous	0.077	0.267	0.062	0.243	0.078	0.268	0.016
Age (years)	42.362	9.380	43.219	8.428	42.320	9.423	-0.898
Male	0.600	0.490	0.625	0.486	0.599	0.490	-0.026
College Degree	0.091	0.288	0.039	0.195	0.094	0.291	0.054***
Risk Aversion	1.902	0.638	1.891	0.667	1.902	0.636	0.012
Knowledge of spreadsheets	0.260	0.439	0.117	0.323	0.267	0.442	0.149***
Myopic	0.577	0.494	0.508	0.502	0.580	0.494	0.072
Financial Literacy	1.373	1.106	1.203	1.132	1.381	1.104	0.178*
System Knowdlege	2.074	1.265	1.625	1.230	2.095	1.263	0.470***
Wages (100K CLP)	3.087	2.288	2.260	1.444	3.128	2.314	0.868***
Balance (100 UF)	350.551	480.997	187.622	196.246	358.448	489.258	170.826***
Voluntary Balance (100 UF)	0.016	0.154	0.001	0.004	0.017	0.157	0.017***
Voluntary Dummy	0.290	0.494	0.148	0.357	0.297	0.499	0.149***
Home Owner	0.713	0.453	0.672	0.471	0.715	0.452	0.043
Private Health Insurance	0.101	0.301	0.000	0.000	0.106	0.307	0.106***
Contri. Density	0.832	0.268	0.771	0.271	0.835	0.268	0.064**
Disability	0.034	0.180	0.023	0.152	0.034	0.181	0.011
Potable	0.088	0.283	0.078	0.269	0.088	0.284	0.010
Free Public Insurance	0.118	0.323	0.250	0.435	0.112	0.316	-0.138***
Statement	0.715	0.451	0.617	0.488	0.720	0.449	0.103**
Voluntary Flu Vax	0.189	0.391	0.086	0.281	0.193	0.395	0.108***
Heavy Smoker	0.718	0.450	0.773	0.420	0.715	0.452	-0.059
Treat. Depression	0.036	0.187	0.031	0.175	0.036	0.187	0.005
Observations	2769		128		2641		2769

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Source: Author's own elaboration based on SPS 2009-2015

B Convenience of switching: trade-off between salary and total balances

Given that the PFAs differ in the commissions charged and in profitability, this has a different impact on contributors depending on their taxable income and their accumulated balance in the individual capitalization account. The assumption of this paper is that for the majority of individuals in the sample, the fee variable is the most determinant factor of choice. This assumption is based on the fact that this is a highly regulated market in which the possible portfolio investment alternatives are limited and therefore the differentiation along this dimension is low.

Harrison et al. (2019) analyze representative individuals based on specific wages and balances in a static framework.[47] The main takeaway is that for low balances the fee factors dominates, and

[47]The advantage of using these representative agents is that they allow us to simply characterize the trade-offs involved without having to consider the complexities of the collection system, which, being based on a percentage of

Appendix Table A2: Control comparison by type of Enrollment

	All		Default		Former		diff
	mean	sd	mean	sd	mean	sd	diff.
Switcher	0.157	0.364	0.155	0.362	0.161	0.368	0.006
Symptoms of Depression	0.037	0.189	0.044	0.206	0.017	0.130	-0.027***
Enrolled by default	0.736	0.441	1.000	0.000	0.000	0.000	-1.000
Female	0.505	0.500	0.538	0.499	0.411	0.493	-0.127***
Age (years)	30.196	11.007	25.387	4.769	43.629	12.293	18.242***
Ever Switched	0.169	0.375	0.049	0.217	0.506	0.501	0.456***
Hold voluntary savings	0.063	0.243	0.015	0.123	0.195	0.397	0.180***
Log(Mandatory Balance)	13.484	3.343	12.859	3.208	15.232	3.085	2.374***
Log(Wage)	12.883	0.688	12.844	0.677	12.990	0.706	0.146***
Satisfied with the PFA	0.136	0.342	0.084	0.278	0.279	0.449	0.194***
Recieved the Statement	0.161	0.368	0.073	0.260	0.408	0.492	0.335***
Active Choice of funds	0.058	0.233	0.032	0.176	0.129	0.336	0.097***
Household with minors	0.575	0.835	0.556	0.828	0.629	0.851	0.074
System Knowdlege	0.514	0.608	0.330	0.518	1.029	0.541	0.698***
Pro-active Behavior	0.474	0.500	0.440	0.497	0.569	0.496	0.129***
Pregnant	0.006	0.078	0.005	0.072	0.009	0.093	0.003
Water Subsidy	0.041	0.198	0.029	0.167	0.075	0.263	0.046***
Disability	0.005	0.073	0.005	0.072	0.006	0.076	0.001
Cont. Density	0.648	0.335	0.609	0.342	0.758	0.290	0.149***
Private Health Insurance	0.120	0.326	0.127	0.333	0.103	0.305	-0.023
Home Owner	0.660	0.474	0.660	0.474	0.658	0.475	-0.002
Financial Distress	0.786	0.411	0.807	0.395	0.727	0.446	-0.080***
High Life Satisfaction	0.367	0.482	0.371	0.483	0.353	0.479	-0.018
Indigenous	0.102	0.302	0.105	0.307	0.092	0.289	-0.013
College Degree	0.332	0.471	0.387	0.487	0.178	0.383	-0.209***
Married	0.100	0.300	0.021	0.142	0.322	0.468	0.301***
Observations	1320		972		348		1320

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Source: Author's own elaboration based on SPS 2009-2015

Appendix Table A3: Individuals Within-Regression over Probability of Switching

	(1)	(2)	(3)	(4)	(5)	(6)
	switch	switch	switch	switch	switch	switch
1st Release	-0.131***	-0.092	-0.079	-0.006	-0.006	-0.016
	(0.028)	(0.051)	(0.051)	(0.085)	(0.085)	(0.085)
2nd Release	-0.139***	-0.203***	-0.204***	0.005	0.005	0.005
	(0.028)	(0.046)	(0.047)	(0.078)	(0.078)	(0.078)
3th Release	-0.000	-0.048	-0.059	-0.115	-0.116	-0.118
	(0.034)	(0.056)	(0.056)	(0.099)	(0.099)	(0.099)
4th Release	0.077*	-0.004	-0.014	-0.105	-0.102	-0.102
	(0.038)	(0.062)	(0.062)	(0.103)	(0.103)	(0.103)
5th Release	0.088*	-0.047	-0.036	-0.235*	-0.230*	-0.228*
	(0.039)	(0.062)	(0.062)	(0.111)	(0.111)	(0.111)
6th Release	0.191***	0.093	0.115	0.238*	0.238*	0.239*
	(0.044)	(0.069)	(0.069)	(0.102)	(0.102)	(0.103)
7th Release	-0.200***	-0.092	-0.106*	-0.081	-0.078	-0.077
	(0.027)	(0.053)	(0.053)	(0.087)	(0.087)	(0.087)
1st Auction	-0.147***	-0.114**	-0.107**	-0.031	-0.030	-0.030
	(0.022)	(0.040)	(0.040)	(0.057)	(0.057)	(0.057)
2nd Auction	0.013	0.051	0.048	0.085	0.086	0.087
	(0.029)	(0.048)	(0.048)	(0.066)	(0.066)	(0.066)
3th Auction	0.007	-0.040	-0.052	-0.067	-0.067	-0.068
	(0.028)	(0.046)	(0.046)	(0.070)	(0.070)	(0.070)
4th Auction	0.300***	0.363***	0.349***	0.262**	0.261**	0.260**
	(0.037)	(0.061)	(0.061)	(0.083)	(0.083)	(0.083)
5th Auction	0.153***	0.056	0.072	0.149*	0.149*	0.149*
	(0.035)	(0.056)	(0.056)	(0.072)	(0.071)	(0.071)
6th Auction	-0.035	-0.303***	-0.287***	1.864	1.900	23.767
	(0.028)	(0.046)	(0.046)	(1.038)	(1.038)	(22.555)
7th Auction	-0.251***	-0.560***	-0.593***	1.905	1.895	3.053
	(0.021)	(0.040)	(0.040)	(1.229)	(1.229)	(1.733)
Labor reactivation		1.453***	1.453***	1.450***	1.450***	1.444***
		(0.058)	(0.058)	(0.058)	(0.058)	(0.058)
Years to retire		-0.043***	-0.053***	0.169	0.162	0.162
		(0.003)	(0.004)	(0.097)	(0.097)	(0.096)
Std. Monthly Wage		0.526***	0.531***	0.526***	0.531***	0.533***
		(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Active in multifund		0.109	0.103	0.106	0.099	0.111
		(0.065)	(0.065)	(0.065)	(0.065)	(0.065)
Std. Voluntary Balance		-0.026*	-0.026*	-0.026*	-0.026*	-0.026*
		(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Std. Mandatory Balance		-0.710***	-0.682***	-0.707***	-0.680***	-0.675***
		(0.070)	(0.068)	(0.069)	(0.068)	(0.068)
Contribution Density		-0.194***	-0.187***	-0.204***	-0.198***	-0.188***
		(0.049)	(0.049)	(0.049)	(0.049)	(0.049)
1st legal withdrawal		-0.457***	-0.470***	-0.081	-0.082	-0.082
		(0.034)	(0.034)	(0.061)	(0.061)	(0.061)
2nd legal withdrawal		-0.121**	-0.114**	-0.264***	-0.258***	-0.263***
		(0.044)	(0.044)	(0.056)	(0.056)	(0.055)
3th legal withdrawal		-0.045	-0.066	0.037	0.035	0.033
		(0.045)	(0.045)	(0.059)	(0.059)	(0.059)
Lockdown period		-0.524***	-0.516***	-0.171*	-0.171*	-0.172*
		(0.038)	(0.038)	(0.070)	(0.070)	(0.070)
Constant	0.419***	1.982***	2.412***	-3.569	-3.211	-3.235
	(0.002)	(0.090)	(0.112)	(2.583)	(2.584)	(2.582)
PFAxQuarter FE	No	No	No	No	No	Yes
PFA FE	No	No	Yes	No	Yes	No
Quarter FE	No	No	No	Yes	Yes	No
Inds.	19,827	18,400	18,400	18,400	18,400	18,400
Obs.	2,851,487	1,685,440	1,685,440	1,685,440	1,685,440	1,685,440

Clustered Robust Standard Errors at Individual Level. Coefficients represent percentage points.

Source: Author's own elaboration based on PHA

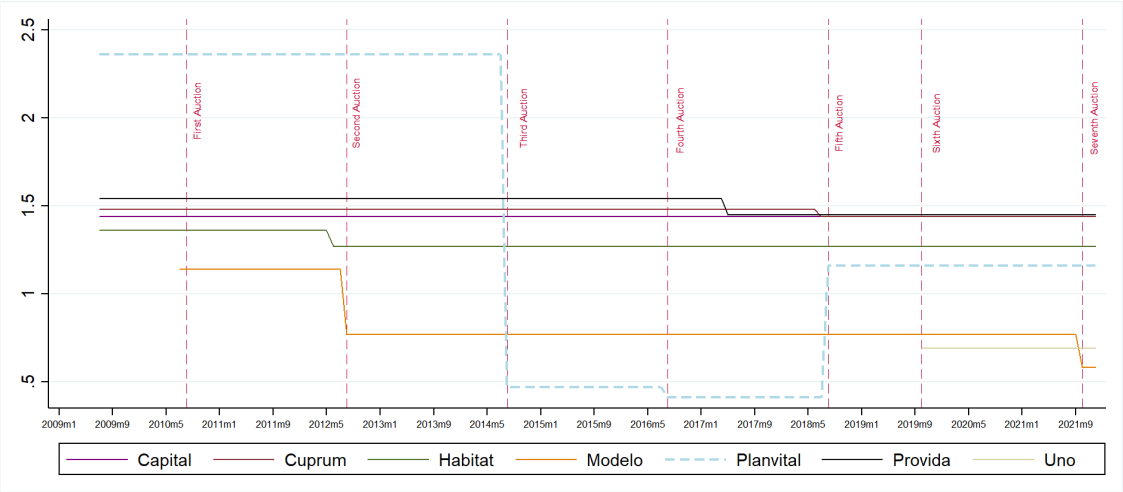
Appendix Table A4: Individuals Within Regression over Probability of switching into the cheapest alternative

	(1)	(2)	(3)	(4)	(5)	(6)
	cheapest	cheapest	cheapest	cheapest	cheapest	cheapest
1st Release	0.013	0.037	0.045*	0.005	0.004	0.004
	(0.011)	(0.021)	(0.021)	(0.035)	(0.035)	(0.035)
2nd Release	-0.012	-0.017	-0.019	0.022	0.021	0.020
	(0.008)	(0.014)	(0.014)	(0.019)	(0.019)	(0.019)
3th Release	-0.007	-0.011	-0.020	-0.021	-0.021	-0.021
	(0.009)	(0.015)	(0.015)	(0.029)	(0.029)	(0.029)
4th Release	-0.009	-0.025	-0.034*	0.002	0.003	0.003
	(0.009)	(0.014)	(0.014)	(0.024)	(0.024)	(0.025)
5th Release	-0.012	-0.033*	-0.025	0.013	0.015	0.014
	(0.009)	(0.014)	(0.014)	(0.021)	(0.021)	(0.021)
6th Release	0.069***	0.089**	0.100***	0.033	0.032	0.034
	(0.017)	(0.028)	(0.028)	(0.045)	(0.045)	(0.045)
7th Release	-0.012	-0.002	0.004	0.042*	0.043*	0.044*
	(0.010)	(0.018)	(0.018)	(0.021)	(0.020)	(0.020)
1st Auction	-0.026***	-0.036***	-0.031***	0.003	0.003	0.003
	(0.004)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)
2nd Auction	-0.009	-0.010	-0.014	-0.018	-0.018	-0.018
	(0.007)	(0.012)	(0.012)	(0.019)	(0.019)	(0.019)
3th Auction	0.007	0.009	-0.001	-0.020	-0.020	-0.020
	(0.009)	(0.015)	(0.015)	(0.023)	(0.023)	(0.023)
4th Auction	0.068***	0.102***	0.095***	0.046	0.045	0.044
	(0.014)	(0.022)	(0.022)	(0.031)	(0.031)	(0.031)
5th Auction	0.096***	0.140***	0.150***	0.125***	0.125***	0.125***
	(0.016)	(0.026)	(0.026)	(0.033)	(0.033)	(0.033)
6th Auction	-0.031***	-0.071***	-0.061***	-0.028	-0.026	-1.580***
	(0.005)	(0.010)	(0.009)	(0.316)	(0.315)	(0.427)
7th Auction	-0.036***	-0.083***	-0.081***	-0.037	-0.040	-1.291*
	(0.004)	(0.010)	(0.009)	(0.375)	(0.374)	(0.571)
Labor reactivation		0.144***	0.143***	0.144***	0.143***	0.143***
		(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Years to retire		-0.003***	-0.008***	-0.002	-0.007	-0.009
		(0.001)	(0.001)	(0.030)	(0.029)	(0.029)
Std. Monthly Wage		0.038***	0.040***	0.038***	0.040***	0.041***
		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Active in multifund		0.052**	0.086***	0.053**	0.087***	0.084***
		(0.018)	(0.019)	(0.018)	(0.019)	(0.019)
Std. Voluntary Balance		-0.001	-0.002	-0.002	-0.002	-0.002
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Std. Mandatory Balance		-0.074***	-0.072***	-0.074***	-0.073***	-0.076***
		(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Contribution Density		-0.077***	-0.062***	-0.078***	-0.063***	-0.062***
		(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
1st legal withdrawal		-0.009	-0.002	-0.016	-0.016	-0.016
		(0.012)	(0.012)	(0.011)	(0.011)	(0.011)
2nd legal withdrawal		0.016	0.014	-0.156***	-0.158***	-0.159***
		(0.020)	(0.020)	(0.036)	(0.036)	(0.036)
3th legal withdrawal		-0.061***	-0.057***	-0.011	-0.009	-0.009
		(0.013)	(0.013)	(0.017)	(0.017)	(0.017)
Lockdown period		-0.068***	-0.058***	-0.016	-0.016	-0.016
		(0.009)	(0.009)	(0.014)	(0.014)	(0.014)
Constant	0.038***	0.213***	0.408***	0.162	0.360	0.384
	(0.001)	(0.024)	(0.031)	(0.789)	(0.786)	(0.784)
PFAxQuarter FE	No	No	No	No	No	Yes
PFA FE	No	No	Yes	No	Yes	No
Quarter FE	No	No	No	Yes	Yes	No
Inds.	19,827	18,400	18,400	18,400	18,400	18,400
Obs.	2,851,487	1,685,440	1,685,440	1,685,440	1,685,440	1,685,440

Clustered Robust Standard Errors at Individual Level. Coefficients represent percentage points.

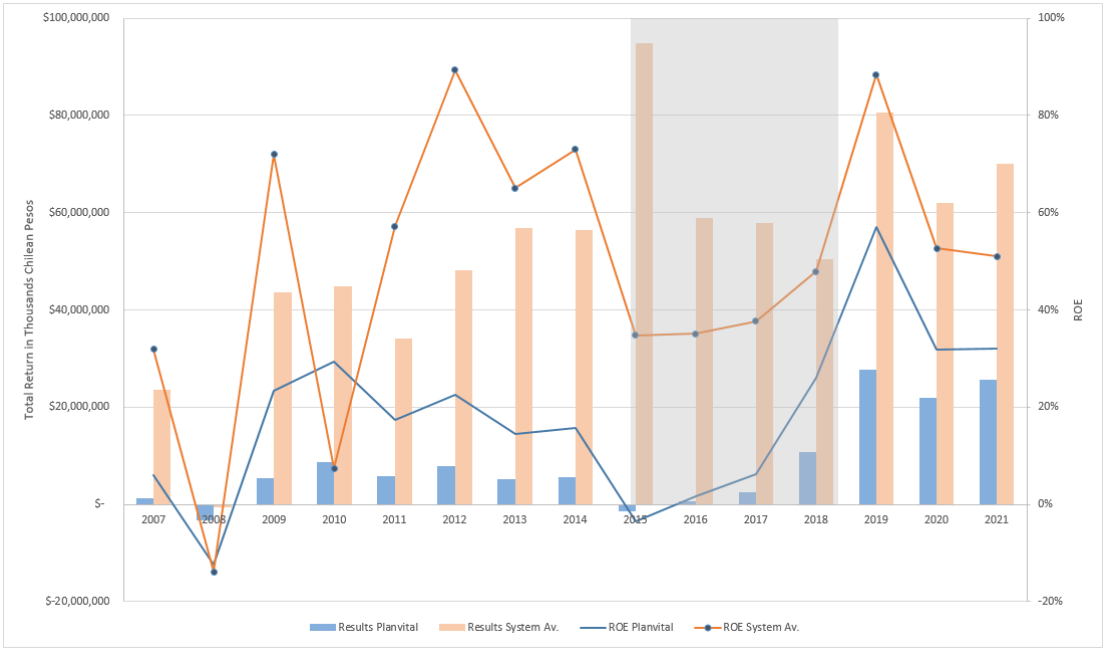
Source: Author's own elaboration based on PHA

Appendix Figure A1: Variation in PFA administrative charges.



Note: This chart shows the variation in administrative fees since January 2009. Auctions were implemented in August 2010, August 2012, August 2014, August 2016, August 2018, October 2019, and October 2021. The y-axis shows the percentage of monthly wages that each PFA charges active workers with contributions in a given month. Planvital PFA is dashed.

Appendix Figure A2: Financial Performance Trends: Planvital versus System Average (2007-2021)



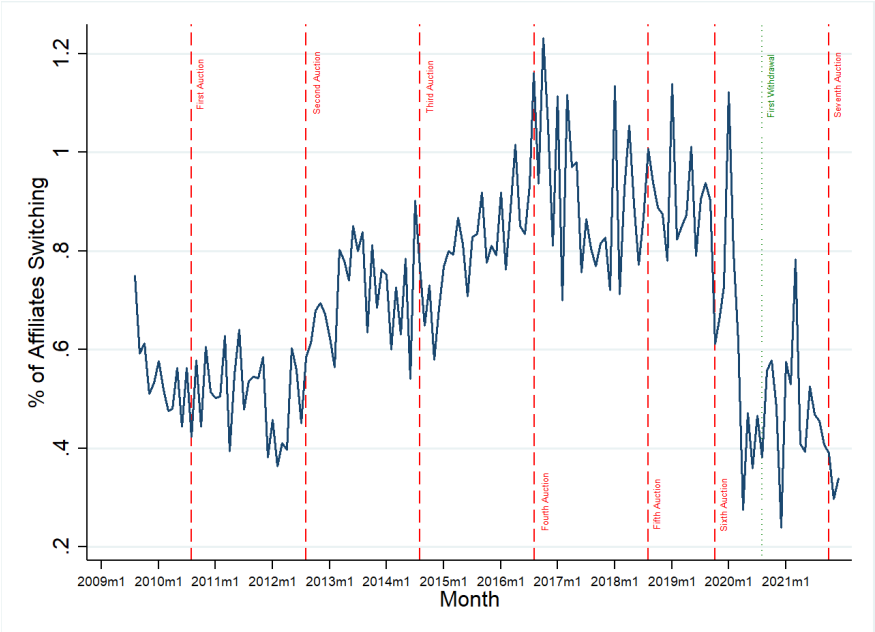
Note: This graph details the financial performance of Planvital and the system average over the period 2007-2021 by December 31 of each year. The bars for each year map to the left y-axis in units of thousands of pesos, while the lines map to the right y-axis detailing the ROE (Return On Equity) percentage for each of the years. The gray area shows the period in which AFP Planvital was the winner of the bidding processes (Aug 2014-Aug2018).

Appendix Figure A3: Details of each auction, competitors and collection proposals made.

Process	Adjudication Date	Auctioned Period	Bidders	Bid
Auction 1	Jan-2010	Aug-2010/Jul-2012	Cuprum	1.32%
			Habitat	1.21%
			Modelo	**1.14%**
			Planvital	1.19%
Auction 2	Jan-2012	Aug-2012/Jul-2014	**Modelo**	**0.77%**
			Planvital	0.85%
			Regional	1.04%
Auction 3	Jan-2014	Aug-2014/Jul-2016	Modelo	0.72%
			Planvital	**0.47%**
Auction 4	Jan-2016	Aug-2016/Jul-2018	**Planvital**	**0.41%**
Auction 5	Jan-2018	Aug-2018/Jul-2020	Deserted	No Bids
Auction 6	Mar-2019	Oct-2019/Sept-2021	**Uno**	**0.69%**
Auction 7	Mar-2021	Oct-2021/Sept-2023	**Modelo**	**0.58%**
			Uno	0.62%
Auction 8	Mar-2023	Oct-2023/Sept-2025	Modelo	0.57%
			Uno	**0.49%**

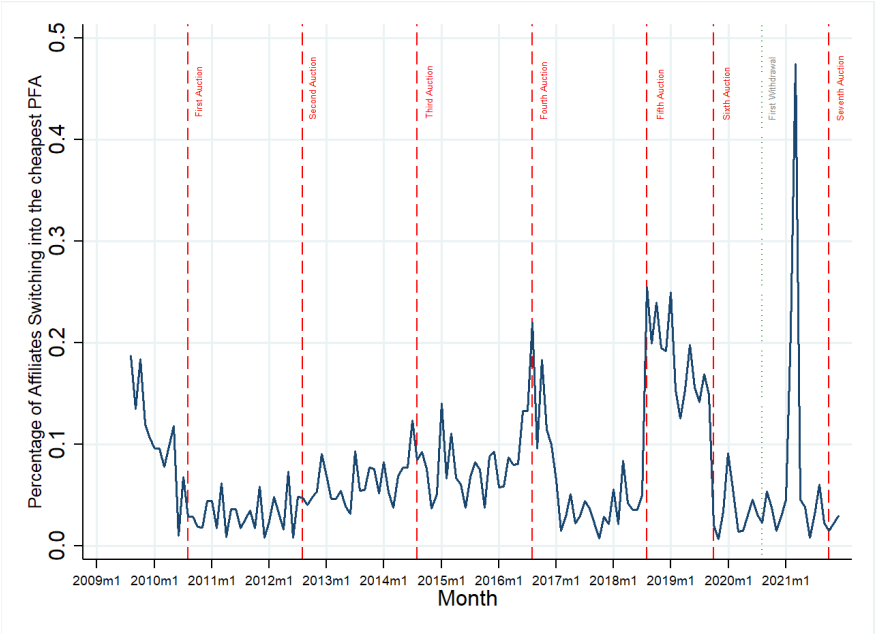
Note: This figure details each of the auctions, describing the number of bidders, the bid each made and the winning bid (in bold). The bid is based on the administration fee that will be charged as a percentage of salary for active workers with contributions in a given month.

Appendix Figure A4: Time series of percentage of affiliates switching in a given month.



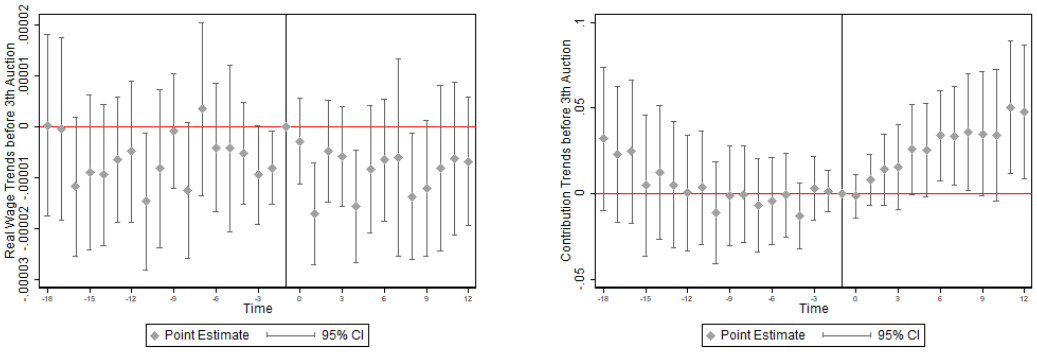
Note: This figure shows the time series of movements observed in a month. The y-axis represents the percentage of affiliates that made a change in a given month. The red dotted lines show the dates on which each of the auctions examined went into effect. In addition, the red dotted line shows the date of the first and exceptional withdrawal of funds allowed due to the COVID crisis.

Appendix Figure A5: Time series of percentage of affiliates switching into the cheapest PFA in a given month.



Note: This figure shows the time series of movements observed in a month into the cheapest PFA. The y-axis represents the percentage of affiliates that made a change into the cheapest PFA in a given month. The red dotted lines show the dates on which each of the auctions examined went into effect. In addition, the red dotted line shows the date of the first and exceptional withdrawal of funds allowed due to the COVID crisis.

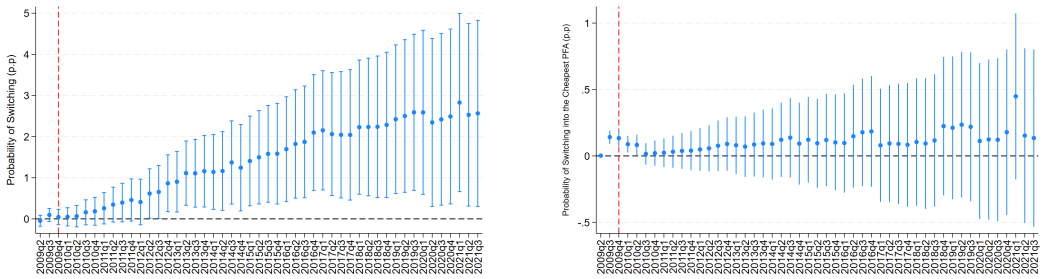
Appendix Figure A6: Parallel Trends on wages and in contribution densities: treated vs non-treated before the third auction.



(a) Effect on Observed Gross Income (b) Effect on Contribution Density

Note: This figure provides graphical evidence of parallel trends for the treated and untreated groups before the introduction of the significant fee reduction by a former PFA. The treated group are those old members with pre- and post-treatment contributions who do not switch PFA and benefit from the fee reduction, while the control group are those former members who are not in the treated PFA and remain in it in both periods, with pre- and post-treatment contributions. The left panel shows no effect on reported monthly wage, while the right panel shows evidence of no effect on contribution density prior to the third auction. Point estimates are displayed along with their 95% confidence intervals

Appendix Figure A7: Quarterly Trends estimated as quarter fixed effects since the adoption of the first auction (red dashed line).



(a) Quarter Fixed-Effects on Switching (b) Quarter Fixed-Effects into the Cheapest

Note: This figure plots the estimates for the coefficients associated with the fixed effects of each quarter in terms of the probability of observing a change in a given month. The left panel shows the impact over the probability of switching, while the right one over the probability to switch into the cheapest. The y-axis describes the percentage points of that probability. The red dashed line marks the quarter in which the first bid took action. Point estimates are displayed along with their 95% confidence intervals.

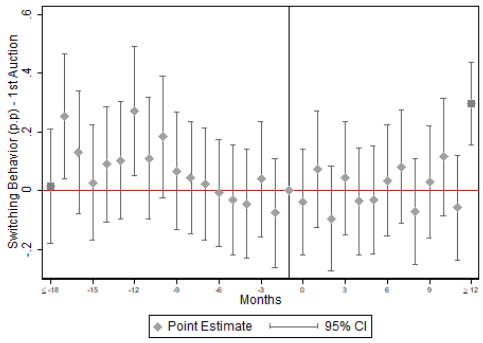
that for increasing balances, the lower the salary, the earlier this alternative became dominated, while for the taxable maximum, given the cost of the commission, the balance has to be higher compared to lower salaries, so that the effective gain is higher. For the minimum wage, the threshold in the balance is about 170 UF, while for an average wage the threshold is about 380 UF and for the maximum taxable income the threshold is 850 UF.

In turn, Reyes Hartley and Castro (2008) simulate the IRR that hypothetical new affiliates would have obtained for each of the periods between 1984 and 2004 versus another hypothetical new affiliate that would have joined the most profitable one. The cheapest alternative always dominates. When studying the same exercise, but considering the distribution of real members, it is observed that if they had joined the cheapest institution, 77.3% of the members would have seen their net IRR improve (an improvement of 11.5%), while only 10,5% of the people would have worsened their IRR, with an average worsening of 4%.[48] Finally, the authors estimate an equivalence; a sharp drop in profitability of two percentage points, for example from 5% to 3%, is equivalent, in terms of IRR, to a drop in commissions from 2.3% to 2.07% (i.e. 0.23 percentage points).

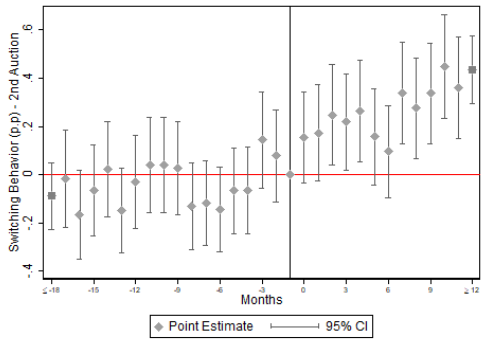
salary, abstracts from the amount of the balance and its yield, and in turn, generates cross-subsidies between high and low income and those who contribute and those who do not.

[48]The authors note that the big difference between choosing according to price and choosing according to profitability is that the price is observable at the time of the choice and in fact the person can switch to the cheapest PFA if the PFA he/she is in raises its prices. However, which PFA will be the most profitable in the following 24-month period is not observable at the time of making the decision, so the comparison of the results of the previous exercise is even stricter and more favorable to the option of choosing according to price.

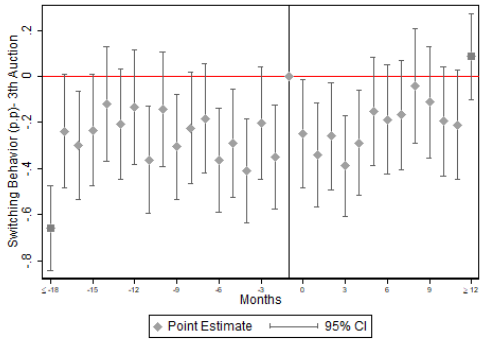
Appendix Figure A8: Event Study Estimations for the different auctions over the probability of switching



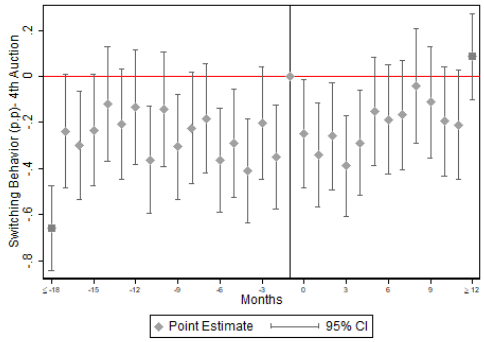
(a) First Auction



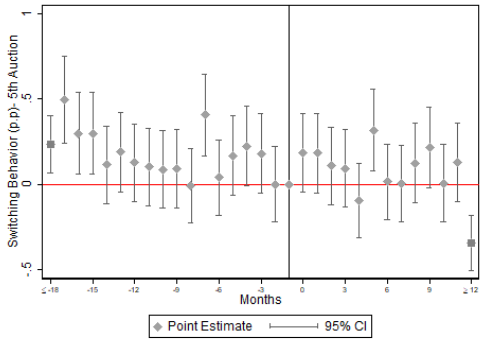
(b) Second Auction



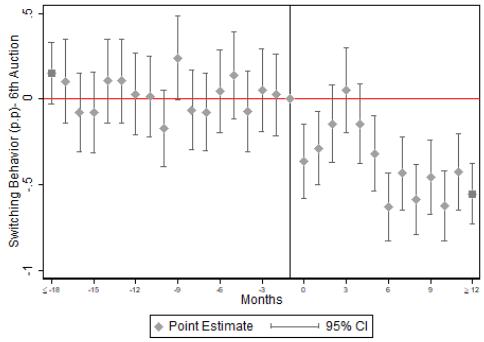
(c) Third Auction



(d) Fourth Auction



(e) Fifth Auction



(f) Sixth Auction

Note: These six panels present the estimates of an Event Study for each of the auctions studied for the probability of switching. The reference point for each is the month prior to the activation of the new maintenance charge. Months -18 and +12 include the estimate for the other periods not considered. The announcement of the winning PFA is made six months prior to the effective date of the new charge. Point estimates are displayed along with their 95% confidence intervals.

C Who is switching?

The goal of this section is to characterize the individuals that switched. First, I will provide a set of descriptive statistics about the observable differences among types. Then, I will proceed to estimate by random forest algorithms the types, by separating the time, using as a train set the period before the first auction, and then using that information to predict who will switch (in an even stronger incentive setting).

Table A5 provides a raw comparison between groups for the period 2007 to 2010. This is the period before the introduction of auctions. There is no information on membership status prior to 2007. Switchers are characterized as individuals who switched at least once during this period. Their characteristics are taken from the 2006 wave of the SPS. Switchers account for 10.6% of the sample, which is slightly lower than that observed during the auction periods, suggesting that the bidding processes encouraged switching at the extensive margin.

It can be seen that there are important and significant differences in many dimensions, such as the existence of voluntary products, university degree, credit card, etc., which signal differences in income and human capital (these are relevant in terms of their financial competences). There are no differences in terms of gender, history of depression, the characteristic of being longsighted in planning and the characteristic of making budgets and following them.

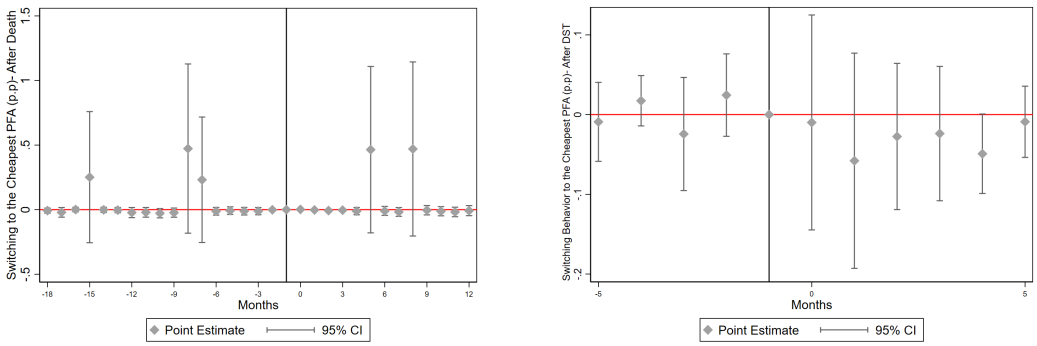
Figure A10 shows the relative importance when fitting a classification model based on the observed behavior using Random Forest and considering a set of 59 controls. It can be seen that the most important variables are age, BMI, gender, and having a voluntary savings account. While the least important variables are having a disability, being widowed, being a drinker and stating that one of the reasons for not switching is because its own PFA is cheap. This importance metric does not have any economic meaning, it simply illustrates the relative importance of that factor in explaining the classification when using the algorithm in the training model. A pending step is to test this model using the post-auction observations as test data.

D The economics of auctions in Pension Plans

Since the ancient Roman Empire, the role of auctions has been recognized as an efficient way to assign the provider of a particular contract of interest to the government. Today, auctions are used in various markets, from telecommunications to government bonds (Fabre and Straub, 2023).

As discussed above, competition in the PFA market has been a primary concern of policymakers. Through a process of mergers and acquisitions, PFAs became more concentrated in the period 1999-2009. The evolution of the HHI index for affiliates and total assets under management shows high levels of concentration for the period just before the implementation of the reform (Figure A11). Concerned about the lack of competition and its welfare consequences, policymakers decided to conduct these repeated auctions, granting monopoly rights over the flow of incoming formal

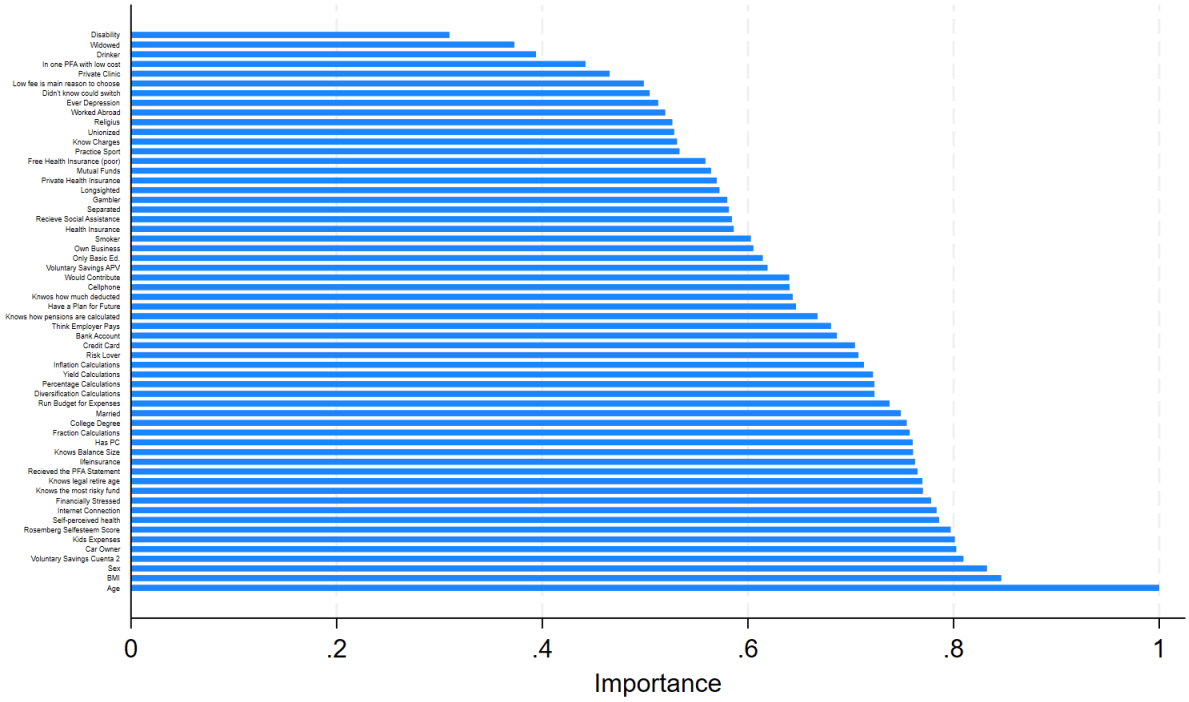
Appendix Figure A9: Event Study Estimations for the event of facing a death of a household member (left) and after the transition to daylight saving time (right)



(a) Death of Household Member (b) Daylight Saving Time

Note: These two panels show evidence associated with events that may negatively affect mental health on the likelihood of changing PFA. The right panel shows the Event Study associated with losing a household member in a specific month. While the right panel shows the Event Study estimate for the month of switching to daylight saving time (clock forward) in a Daylight Saving Time (DST) context. The right panel considers a narrower time window to avoid overlap with the previous year's event.Point estimates are displayed along with their 95% confidence intervals

Appendix Figure A10: Relative Importance of independent variables when running a classification model using Random Forest algorithms.



Note: This chart shows the relative importance of each factor considered as estimated by the package `rforest` in Stata. The factors are plotted from the least important at the top to to the most important in the bottom.

Appendix Table A5: Control comparison by type of Individual

	All		Switcher		No Switcher		diff
	mean	sd	mean	sd	mean	sd	diff.
Voluntary Savings Cuenta 2	0.191	0.393	0.266	0.442	0.182	0.386	-0.084***
Voluntary Savings APV	0.032	0.176	0.078	0.268	0.027	0.161	-0.051***
Sex	0.572	0.495	0.564	0.496	0.573	0.495	0.009
Married	0.442	0.497	0.395	0.489	0.447	0.497	0.052**
Age	39.283	10.589	34.512	8.633	39.848	10.657	5.336***
College Degree	0.170	0.376	0.351	0.478	0.149	0.356	-0.202***
Only Basic Ed.	0.283	0.450	0.114	0.318	0.303	0.459	0.189***
Car Owner	0.202	0.402	0.300	0.459	0.191	0.393	-0.109***
Internet Connection	0.170	0.375	0.303	0.460	0.154	0.361	-0.150***
Own Business	0.057	0.231	0.049	0.216	0.057	0.233	0.008
Bank Account	0.089	0.285	0.195	0.396	0.076	0.266	-0.119***
Credit Card	0.114	0.318	0.214	0.410	0.102	0.303	-0.111***
Financially Stressed	0.691	0.462	0.586	0.493	0.703	0.457	0.117***
Recieved the PFA Statement	0.599	0.490	0.649	0.478	0.593	0.491	-0.056***
Private Health Insurance	0.099	0.298	0.268	0.443	0.079	0.269	-0.189***
Risk Lover	0.196	0.397	0.219	0.414	0.193	0.395	-0.025
Gambler	0.084	0.277	0.066	0.249	0.086	0.280	0.020*
Unionized	0.037	0.188	0.053	0.223	0.035	0.184	-0.018*
Religius	0.064	0.244	0.053	0.223	0.065	0.246	0.012
Percentage Calculations	0.500	0.500	0.627	0.484	0.485	0.500	-0.142***
Fraction Calculations	0.431	0.495	0.508	0.500	0.422	0.494	-0.086***
Yield Calculations	0.499	0.500	0.608	0.489	0.486	0.500	-0.123***
Inflation Calculations	0.253	0.435	0.266	0.442	0.252	0.434	-0.014
Diversification Calculations	0.280	0.449	0.285	0.452	0.279	0.449	-0.006
Longsighted	0.081	0.273	0.083	0.276	0.081	0.272	-0.002
Run Budget for Expenses	0.349	0.477	0.369	0.483	0.347	0.476	-0.023
Smoker	0.885	0.319	0.846	0.361	0.890	0.313	0.044***
BMI	26.099	4.127	25.542	3.878	26.167	4.151	0.625***
Disability	0.029	0.167	0.008	0.092	0.031	0.173	0.022***
Ever Depression	0.075	0.263	0.063	0.243	0.076	0.265	0.013
Observations	5570		590		4980		5570

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Source: Author's own elaboration based on SPS 2009-2015

workers.[49] The rationale behind limiting the default option only to the flow of new formal workers is based on the fact that for these affiliates, the option with the lowest administrative cost dominates the difference in fund performance because these enrollees have little or no balance (Appendix B). In addition, policy makers were confident that structuring a tender under the expert consensus and experience of the regulator would help bridging the information gap.

Auctions in the context of the Chilean Pension System were supposed by experts to boost competition and price sensitivity (Barr et al. (2010); Reyes Hartley and Castro (2008); Fischer et al. (2006)). The reasoning behind this expectations is based on the theory (Laffont and Tirole (1993)) and the compelling evidence in favor of auctions in assigning monopoly rights (Fabre and Straub, 2023).

The market structure of PFA make suitable the use of auctions in this context. As any DC scheme, pensions plans are mandatory, the enjoyment of the benefits is distant, and there exist misinformation. Taken together, this creates little incentive for companies to compete for affiliates with high inertia. In the absence of a bidding process, the chances of a new entrant were close to zero. This is because a scale of around 300,000 individuals is required to operate[50], with enormous marketing costs.

In addition to being big enough, the defaulted group has on average less balances (which imply less financial cost due to the mandatory reserve), is a group that requires lighter infrastructure because their retirement age is later and therefore they require less face-to-face information and advisory services, and lastly, they are more familiar with technology, which lowers operational costs since communication channels are virtual rather than physical.

On the other hand, there is little incentive for the PFA to reduce its own charges. Lowering commissions sacrifices revenue from high-income members who are already committed to the PFA for the uncertain potential of new entrants. It is not known how many will respond or what level of income they will have (note that this is key, given that commission is a fixed percentage of monthly salary) and the size of their balance (note that PFA incur in a financial cost of 1% of the total balances managed due to financial regulation of reserves).

Moreover, the strong role of the regulator allows to ex-ante reject the typical drawbacks that these mechanisms have while implemented (i.e: corrupt environment, risk of collusion, etc.). Remarkably, in its more than 40 years of operation, there has been no major scandal related to collusive or corrupt behavior.

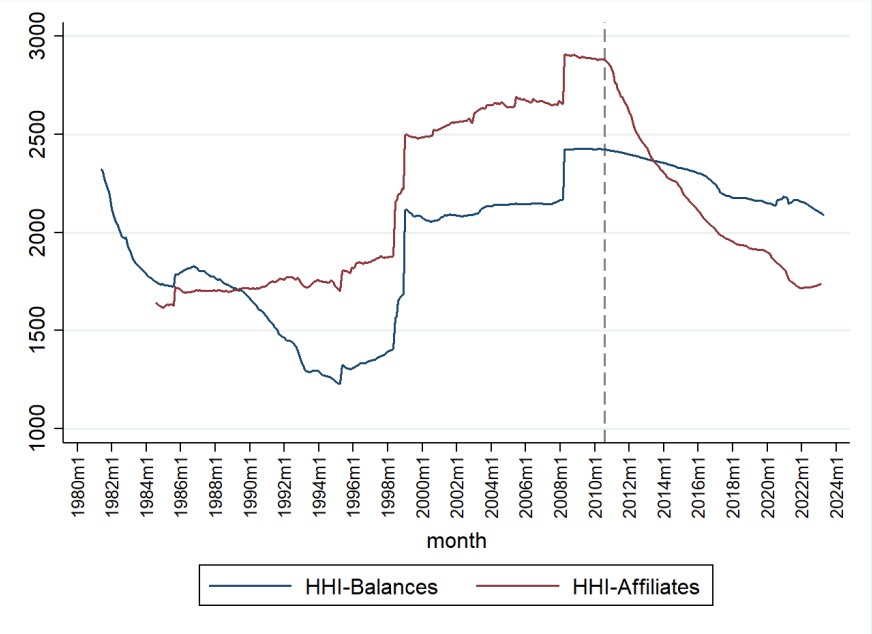
Finally, it is important to comment on the dynamics of the bidding process, as it is repeated every two years. Harrison et al. (2019) study which types of institutions are most likely to compete. It is concluded that the incentives are for relatively smaller PFAs to compete. They rationalize this using a Judo strategy for competition model.[51] They also point out that the current design

[49] A widely used alternative would be to set price ceilings, but this proved ineffective (Kurach et al., 2019).

[50] The typical services provided by pension firms in mandatory DC pension markets are summarized in the following list: collection of contributions, record keeping, asset management, benefit payment, insurance, treasury operation, provision of information. Agostini et al. (2014) proves that there are important economies of scale.

[51] Gelman and Salop (1983) coined the term judo economics to describe a strategy that would induce a large

Appendix Figure A11: HH-Index series for balances and for affiliates since the origin of the system



Note: This chart shows the evolution of the HH index series for balance sheets and affiliates. The HHI is a measure of industry concentration and is estimated using the following formula: $\sum s_i^2$ where s_i corresponds to the market share that each participant has in the market in percentages. HHI values between 1,500 and 2,000 indicate moderate concentration, while values above 2,000 indicate high concentration. The dashed line point to the date when the first auction took place.

discourages participation over time, since it will not always be possible to offer a fee below the lowest fee offered (even if there is technological innovation, because the incoming flow is limited). This would mean that some processes would be declared deserted due to lack of interest, as happened in the fifth bidding process.

E Depression and decision-making

The psychological literature suggests that depression affects decision making. The diagnostic guideline for depression in the Diagnostic and Statistical Manual of Mental Disorders (DSM-10) hints at a link with problems in decision making. [52]

Depression is one of the most common health conditions worldwide. It is estimated that between two and six percent of people in the world have experienced depression in the past year, with a significant negative impact on quality of life (Vos et al., 2016).

This common condition has been proposed as a possible mechanism to explain poverty traps (Sergeyev et al., 2023; Ridley et al., 2020; Haushofer and de Quidt, 2019), as a way to explain deviations from "rational models" (Ya'akov et al., 2019; Leykin et al., 2011), and as a condition that impairs executive function (Lawlor et al., 2020; Cáceda et al., 2014). Interestingly, there

incumbent always to accommodate the entry of a new and smaller player.

[52] Some of the key symptoms considered are: Impaired ability to think, concentrate, or make decisions; Decreased efficiency in completing routine tasks; Loss of interest in most activities.

is evidence that pharmacological treatment may be ineffective in treating impairments in higher order cognitive functions and information processing caused by the depressive condition (Shilyansky et al., 2016). On the other hand, some evidence suggests that psychotherapy interventions may be cost-effective while improving decision making in some specific contexts(Baranov et al., 2020).

Baranov et al. (2020) provide an interesting framework to explain why depression may be relevant when explaining poor investment choices in early human capital with long-lasting consequences. Based on a review of the psychological literature, they sum up three channels through which depression affects investment decisions: 1) via potential changes in preferences; 2) via potential changes in expectations and 3) through tightening constraints. This framework is extensible for rationalizing the context of pension plan choices.[53]

Specifically, regarding the relationship between financial decisions in retirement and depression, there are some contributions indicating that depressed people plan their finances over a shorter time horizon (Choung et al., 2022); that households whose members are affected by mental health problems reduce investment in risky instruments (Lindeboom and Melnychuk, 2015; Bogan and Fertig, 2013); that psychological distress is associated with a significant reduction in the likelihood of holding retirement accounts in DC pension schemes (Bogan and Fertig, 2018); and the negative impact of poor mental health on individuals' net worth (Balloch et al., 2022).

Finally, one way to understand the role of depression in decision making in the context of this paper (i.e., where the study is conducted on people who have functional depression, that is not associated with severe illness and who are able to continue working) is to see the condition as a sort of (lack of) technology that prevents the process of responding to new information from leading to action. When new information or stimuli from the environment arrives, even in the absence of switching costs, the individual is not able to transform that input into action.

Depression in my Sample. Mental health status, and particularly depression has been proposed as one source of consumer inertia.[54] The SPS allows the measurement of depression status in two ways; by using the PHQ-9 scale or by the respondent's self-report of being currently in treatment[55]. In the context of this research, we will limit the data to contributors to the social security system, so that when we observe depression, we observe what is called functional depression. This excludes relatively severe conditions that deprive them of daily activities. In the 2015 SPS, 4.7% of individuals report currently receiving treatment for depression, while 17.6% of individuals have moderate symptoms on the PHQ-9 and 6.4% have moderate or higher symptoms on the PHQ-9.

[53] Although the time spent by mothers teaching their children is not exactly the same as the decision to change PFA, nor is the subset of individuals affected, the complexities associated with internalizing the short- and medium-term effects associated with different management fees, different returns, associated product holdings, and the final pension outcome make this scheme applicable to the context of this paper.

[54] Please see Appendix E for a discussion of why mental health would be relevant in explaining inertia.

[55] There is a national program called Explicit Health Guarantees (GES) available since 2005 that guarantees access to depression treatment for the entire population over 15 years of age. This treatment consists of six sessions heavily subsidized by it mild scenario and a more complete set of treatments for those with more severe symptoms.