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Pension goals and institutional arrangements

Reforms DC2.0 for Latin America

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Pension Goals and Institutional Arrangements: Reforms DC 2.0 for Latin America

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ABSTRACT

The pioneering pension reforms that brought a market for individual defined-contribution (DC) pension accounts to some Latin American countries in the 1980s and 1990s have failed to gain widespread social legitimacy. Such systems do not cover everyone, and the market design and regulatory infrastructure are not geared towards achieving the objective of maximizing the value of pensions. This failure stems from a combination of flaws in the fundamental design of the investment regime, which is highly regulated and focused on short-term outcomes, and of misaligned incentives of the firms operating in a market that is not conventional due to consumer inertia and other forces that limit competition. The contribution of this paper is twofold: (i) first and foremost, to define a new paradigm for the investment regime, with long-term features to target pension goals; (ii) second, to discuss in parallel changes in the design of the market that are needed for implementing such goal-based investment approach. By delineating few principles for ensuring competition in lifelong investing, we identify research and policy questions that require further work for clarifying how to pursue needed reforms. Given the technical and political barriers to implementing all these DC 2.0 principles in different country contexts, the paper seeks at the very least to establish a framework for framing discussions about future pension reforms in the region.

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I. Introduction

In the context of aging populations and large deficits in public finances, the theme of pension reform has been at the top of the policy agenda of many countries for decades now. The pension reforms introducing capitalization and private management in defined-contribution (DC) individual accounts that took place in Latin America during the 80s and 90s were a truly revolutionary innovation in the administration of pensions at inception (and inspired similar reforms in other countries from Oceania to Eastern Europe). Yet, despite some benefits such as long-term reduced fiscal pressures and the development of capital markets (Corbo and Schmidt-Hebbel, 2003; Gill et al. 2004, Cerda 2008), challenges abound. After almost four decades of implementation, regulations and institutional arrangements continue failing to achieve the desired results. These systems have, therefore, been subject to constant questioning from diverse sectors of society, including ideological attacks, take-overs and even some reversals.[1]

A main challenge is the access to these systems in the first place.[2] They do not cover people in the informal sector and reforms have often led to fragmentation, with different segments of society having access to different systems or contributing to parallel systems that cohabit and sometimes cannibalize each other. But beyond coverage, Latin American fully-funded, defined-contribution (FF-DC) schemes show a series of pitfalls and may not deliver adequate pensions to the people contributing to them. Some are related to the fundamental investment principles of these schemes, which are constrained by existing regulations. Others have to do with operational and commercial practices of pension providers that seek to maximize market share and not necessarily the returns on retirement assets. This misalignment is reflected in the underperformance of these systems (Acemoglu, Kremer and Mian 2003).

The more prominent role that DC systems give to markets, competition and individual choice for getting an adequate pension at retirement thus raises questions about the *design of the investment regime* as well as about the *design of the market*. The former has to do with the design of the "product", which involves how to invest retirement assets optimally. The latter implies questions about the behavior of pension administrators, which is not always aligned with the objective of maximizing returns for the future pensions of individuals (Besley and Prat, 2003, 2005). Designs that lead to returns underperformance and low income-replacement rates in retirement affect people but should be a source of concern for pension funds themselves - as it credibly exposes the industry to risks of political intervention. Finding the right design is henceforth in the interest of all stakeholders.

This paper delineates a framework, that we call 'DC 2.0', that establishes principles for what could become the next generation of reforms for the evolution of the mandatory FF-DC pension schemes that dominate the 'second pillar' of retirement income systems in Latin America. The key contribution is to discuss in parallel two areas that are usually analyzed separately: investments and market design (i.e. industrial organization). We start by defining a new paradigm for the investment regime, one with long-term features to pursue certain pension goals or individual income targets for retirement. We then proceed to discuss which industrial organization and market practices are needed to ensure that the behavior of pension providers is aligned with such investment regime.

The need to think in terms of pensions goals is well captured in the statement by Nobel-prize winner Robert C. Merton that *"our approach to DC savings is all wrong: we need to think about monthly income, not net worth…Of course, you need a pot of money to buy a retirement income, but the pot is the means to an end, not the end itself. Confusing the two can lead to costly mistakes…*" (Merton, 2014). In Latin America, the balance in the individual

[1] An argument put forward by reform supporters was that it would help de-link pension financing from the political business cycle, which was welcomed in a region with weak institutions such as Latin America. Nevertheless, DC schemes are subject to inherent political risks. Reform processes are gradual and sequential but governments, politics and policies change over time; in the event of a shock, such as a financial crisis, there is always an expropriation risk. The Argentine government nationalized its FF-IDC scheme in 2008 and Bolivia did so in 2011. Mesa-Lago (2012) called these part of a "re-reform" process.
[2] See Bosch et al. (2013) for a discussion on coverage.

accounts is used as a surrogate to retirement income, but these two are not even close, with important implications for the allocation of assets and risk management processes (Merton, 2014; Martellini, 2016a). Different forms of long-term goal-based approaches have been discussed in the recent literature regarding investments (see Arnott et al. 2013; Fan et al. 2013). There is nevertheless a gap in understanding the link between such investment regime and the organization of the industry and competition in the market. The novelty of the paper is to discuss both issues *jointly*, which brings new perspectives to how to improve market practices in current Latin American systems because a systemic change in investment regime has not yet been part of ongoing policy discussions.[3]

The current lack of integration of the accumulation phase (when retirement savings are invested) and the decumulation phase (when pensions are paid) exposes the shortcomings of both the current design of the investment regime and the design of the market. Regarding the investment regime, pure DC model puts all the focus on asset accumulation (i.e., the value of the balance in the individual account) rather than on retirement income planning that targets a specific pension objective. Regarding industrial design, the pure DC model produces two industries: the accumulation and decumulation industries. These industries work under different rules and regulations (e.g., pension funds vs. insurance companies that offer annuities), and they perform under different market structures and industry dynamics. Such a design complicates financial lifelong individual planning as well as the generation of long-term indicators that would align competition and investments to the long-term objective of maximizing pensions (Randle and Rudolph, 2014).

We acknowledge that the principles unfold in the DC 2.0 framework would have to overcome several technical and political barriers, and details of implementation will always depend on idiosyncrasies of each country – there is no a one-size-fits-all strategy. Our main objective is to establish a roadmap that governments and stakeholders can use to frame discussions for future reforms. All the policy issues raised regarding both the investment regime and the design of the market emerge from normative frameworks that make use of life-cycle theory, models of incomplete markets and contracts, and information and behavioral economics.[4] We also rely on experiences from other countries outside Latin America such as the Netherlands, Sweden or United Kingdom to think about potential solutions to the policy issues in question. The paper still leaves many questions open, so we prefer to see it as an initial effort of an ongoing research agenda for fully articulating our DC 2.0 vision. The paper thus also identifies research and policy questions that need further work to define the details of how to pursue the needed reforms. Another clarification is that we are not attempting to survey the regulations that govern choice or investments in Latin America. They have obviously their twists in each country. Instead, we identify the common problems that regulatory efforts have tried to deal with over time and focus mainly on the type of solutions available.

The rest of the paper is structured as follows. Section II delineates a long-term (lifelong) investment regime whose allocation of assets is driven by a pension goal (i.e., a targeted replacement rate during retirement). Section III analyzes the changes in the organization of the industry and market practices that would be consistent with such a regime. Some of the reforms proposed are needed to adopt a goal-based investment regime whereas some others are the result of general unresolved issues that already exist in current systems and would also hamper a new investment regime. Both sections identify areas for future research. Section IV summarizes the main policy issues, and the research agenda needed to clarify details of potential reforms.

[3] Stewart (2014) formulated a target-pension model with benchmarks but it lacked a discussion about dynamic investments.

[4] Background references include Valdes (2002), Barr Diamond (2008) and Merton (2014). Relevant references in terms of "investments" include Campbell and Viceira (2002), Merton (2014), Estrada (2016), and Martellini (2016a); Impavido, Lasagabaster and Garcia-Huitron (2010); and the research by Valdes (1992, 1994, 1995, 1997, 2002, 2004, 2005, 2007, 2014a, 2014b) are important for "market design".

II. Investment regime for a goal-based pension system

The current approach to investments

The context from which we are departing is one of strong regulations regarding investments. There are two common denominators in mandatory DC systems in Latin America. First, the number and nature of investment options offered by a pension provider are strictly determined by law –Chile, Mexico or Peru have a "multi-fund" system in which each pension provider must offer a fixed number of funds with varying levels of risk exposure. Each fund follows a statutory portfolio limit to equity exposure and other ad-hoc quantitative limits by asset class, credit worthiness, location, etc. People are allowed to have only one of those funds at the time.[5] Second, default investments involve a very basic 'age-based' life cycle approach by which retirement savings are allocated into funds with more risk for younger people. There is also limited freedom to opt out into other funds.

The strong investment regulations are partly motivated by the fact that taking financial decisions is a difficult process for most people. There is a large literature in behavioral economics that discusses the challenges (e.g., Agnew et al. 2003; Benartzi and Thaler 2001, 2002, 2007; Choi et al. 2009; Mottola and Utkus 2008). Asset allocation decisions are often driven by rules of thumb.[6] Decisions are influenced by how investment options are framed, which may lead to wrong choices that can persist over time due to inertia. And many people take no decision at all, particularly if investment options are complex and they do not feel literate enough on financial matters (van Rooij 2007). Retirement savings are thus often invested in the default funds. Regulators try to limit the exposure to risk – and to guard against the agency and other inherent problems in private markets. The problem is that asset class restrictions in such multi-fund system focus on short-term volatility without considering the ultimate risk to pension fund members. Regularly favoring safer investments, as current regulations do, is not necessarily the 'safer' strategy. Systems are not working towards a longer-term pension income goal (Stewart 2014). The relationship between asset allocation and the investor's age (i.e., the glide path) in default funds is determined by inflexible age thresholds, and investment in equity and riskier assets are often not well optimized. Age groups are broad, and they do not cater risk preferences well.

Overview of the DC 2.0 approach to investments

Investments in a DC 2.0 approach seek to adapt investments according to the pension target. The goal is to achieve *real sustainable spending* at retirement and this way asset allocation and product strategies can focus on minimizing what can be called 'spending risks.' Pension systems would, therefore, seek to smooth consumption during a whole lifetime, instead of targeting wealth maximization at the point of retirement. Exposure to equity adjusts based on individuals' level of wealth relative to the value of their spending goal (Blanchett and Kaplan 2013; Fan et al. 2013).

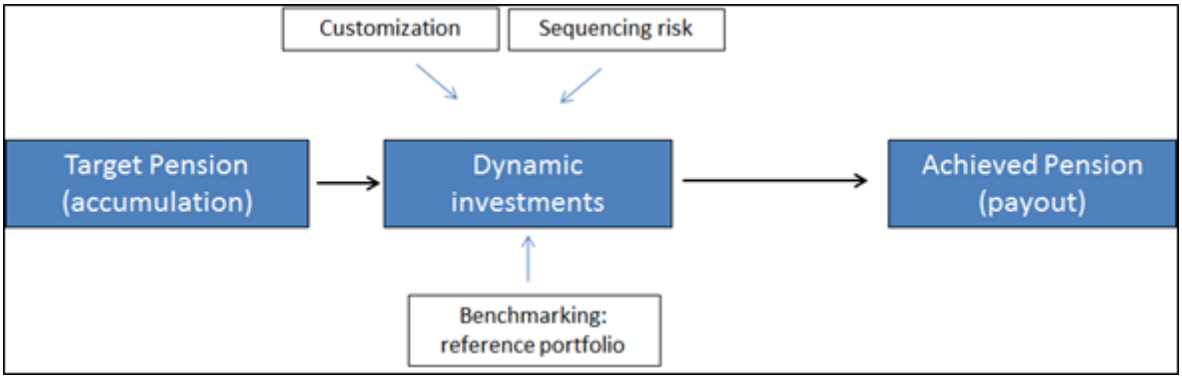
The first step in a DC 2.0 approach to pensions is to define a pension target. Several mechanisms then follow (see Figure 1). Investment strategies in many pension schemes have so far set as objective either minimizing risks or maximizing wealth at retirement. But this ignores the investment horizon after retirement. A new approach implies putting together retirement income targets, their horizon relative to the retirement date, and sequencing risk. By integrating the accumulation and payout phases, a natural pension target is the replacement rate (Berstein

[5] Historically people have not had enough choice – e.g. in Mexico people were not allowed to choose a fund more aggressive than the one that corresponds to their age although this is being relaxed.

[6] People are subject to mental accounting (e.g. following a "1/n strategy" by dividing contributions evenly across the different investment options. Benartzi et al. (2011) explain the behavioral traits that may limit the process of decision making regarding annuities.

et al. 2013).[7] The second step is to introduce a dynamic investment strategy that adapts to economic shocks and rebalance assets to keep track of the target. Benchmarks or reference portfolios can be used to determine if investments are on track (see Stewart 2014).[8]

Figure 1. The Target-based Approach



In the context of this model, pension risk refers to the possibility that a certain person might not reach the targeted pension or replacement rate. Pension risk is driven by diverse background risks: labor market risk (i.e., the risk of not being able to contribute); investment risk; or the risk of annuitization or reinvestment when the final balance of the member's account is transformed at retirement into a pension amount. The introduction of pension goals means that a kind of liability would be incorporated into the portfolio-optimization process, which makes possible to build portfolios that better hedge the risks faced by a retiree (Blanchett and Kaplan 2013).

The following two sections describe in more detail the different elements of the target-based approach represented in Figure 1.

Lifelong planning: integrating the accumulation and payout phases

Since a target-based approach to investments is of a long-term nature, the first element is to integrate the accumulation and payout phases. A current challenge of most DC systems is that investment strategies, including in default funds that reallocate assets based on age, focus on the accumulation phase and offer little guidance on how to decumulate wealth during retirement. A DC 2.0 approach requires that risk management during accumulation is integrated with the goals for the decumulation (payout) phase. DC plans have typically failed in these respects so far as investment strategies are often divorced from the spending 'liabilities' they will need to fund.

Inducing people approaching retirement to invest their current retirement portfolio conservatively, as many systems currently do, is not necessarily the best approach. People may still live another, say, 25 or 30 years. When people find themselves in the '*retirement risk zone*,' i.e., the few years before and after retirement, the greatest

[7] The target can also be specified in terms of a desired level of annuitized wealth at retirement (Rudolph and Sabat, 2016).
[8] See also Noriega (2015) for a proposal developed by the Mexican AFP sector under a commissioned contract to Towers Watson.

amount of retirement wealth is in play, which creates a portfolio-size effects where wealth losses could become substantial if investments are not adequate.

While it is becoming clear that a long-term investment regime must also incorporate variables linked to the 'retirement' phase, such as life expectancy, it is not yet clear how to design an optimal investment strategy across the whole lifecycle (e.g., an optimal deterministic glide path). Academic work on the question of integrating the accumulation phase and the payout phase is still recent. One of the first recommendations emerging from it was a U-shaped glidepath with an increasing equity glide path during retirement (Pfau and Kitces 2014). But there is so far not a consensus. Another proposal suggests the opposite: individuals (or default funds) should implement an inverted U-shaped glidepath by gradually increasing their exposure to stocks while saving for retirement, have maximum exposure to stocks at the time of retirement, and then gradually decrease their exposure to stocks during retirement (Estrada 2016).

Policy/Research question(s) that need clarification:

- How is the process of asset allocation likely to change when integrating the accumulation and payout phases?
- How to evaluate the main sources of risk across a complete lifecycle that jeopardize pension goals?

Dynamic Investments and Customization

The lack of consensus regarding a deterministic glide path reinforces the argument in favor of dynamic investments, which adjust equity exposure based on market outcomes from year to year, over deterministic rules. The lack of consensus about optimal deterministic rules already existed in discussions about the glide path for the specific case of the accumulation phase. Integrating the accumulation and payout phases just makes these old discussions more complex. Some leading economists had initially argued that the proportion of stocks, bonds, and other assets in an investor's portfolio should be the same along the life cycle (see Merton 1969, 2014).[9] The most generalized view is that there are valid reasons for decreasing exposure to risky assets as investors approach retirement. But not few specialists suggest that contributors would be better off following a "contrarian" strategy by increasing exposure to equity and riskier assets as people age.[10] These contradictory views reveal that all depends on the economic context: the state of the general economy and also the personal situation of the investor.

Dynamic strategies can generate larger wealth than deterministic rules (see Basu et al. 2011) – and in the process solve the problem of having to come up with optimal portfolio rules.[11] Larger wealth can be achieved by reducing risk, namely by overcoming *sequencing risks* (Basu et al. 2012). People can easily end up in different paths of capital accumulation if bad market outcomes accumulate. People can get the "right" returns but in the "wrong" order; disappointing final wealth outcomes can still arrive if the order of those returns arrives in bad moments. Even if deterministic products were optimal 'ex-ante' investment vehicles, they do not adapt to 'ex-post' shocks that affect wealth accumulation. Valuation-based dynamic allocation can help smooth negative impacts.

[9] Asset allocation theory shows that both fixed and pre-determined glide path asset allocation strategies are optimal under certain conditions. In Samuelson (1969) and Merton (1969, 2014), the optimal investment strategy is independent of wealth and constant over time.

[10] See Arnott et al. [2013]. Estrada (2014a) explains that contrarian tend to deliver a higher terminal wealth in bad scenarios than lifecycle strategies do: "the higher uncertainty of contrarian strategies is basically uncertainty about how much better, not how much worse, investors are expected to fare with them than with lifecycle strategies."

[11] See the evidence presented by Basu, Byrne and Drew (2011).

There are already some dynamic financial products in retail markets, which, by definition, must have a target-based vision. Some of the products available target a level of return (instead of targeting a future pension amount) which means that they are responsive to past performance of the portfolio relative to an investor's target return in determining the mix of assets in future periods.[12] Also by their nature, these products must have metrics to track how far targets are being met and to guide strategic asset allocation (see Shiller 2000; FINSIA 2015).[13]

An optimal investment strategy would depend on individual characteristics, such as the degree of risk aversion, human capital, work history, family composition and other sources of wealth (see Blake et al. 2014). People may prefer different types of investments based on their employment history, even if such people have similar age or educational level. The level of investor's risk aversion matters because people may have an appetite for risk that is above or below the one implied by the fund. Retirees with high levels of risk aversion could be advised to invest conservatively and purchase annuities or deferred annuities to offset longevity risk.

The problem is that customization is costly.[14] Offering fully tailored plans involves information collection costs and database creation and maintenance costs. Individual characteristics such as risk aversion and tastes are difficult to measure. In addition to information costs, there are also individual account management costs that may make continuous trading not feasible. Transaction costs have shrunk significantly during the last 30 years but remain material, precluding instantaneous rebalancing to optimize the return/risk equation in a customized way.

Technology can help in making it easier for people to take decisions. Financial advice is one way to address both the lack of financial literacy and inadequate planning. But given the challenges of increasing the take up of holistic financial advice, technologies such as 'robo-advisors' can increasingly assist with key parts of the financial planning process. Since 2005 the pension supervisor in Chile has included personalized information in the pension statements which affiliates receive, known as the Personalized Pension Projection (PPP). These statements contain a forecast of the affiliates' pension under various assumptions. In 2012 PPP also started including information on 'pension risk' via a pension simulator model that helps plan members learn what actions to take to increase their expected pension outcome. Pension risk is given by the marginal effect on the expected replacement rate of carrying out a particular investment strategy, taking into account all relevant sources of risk faced by members of the pension system. The online application feeds in individual's characteristics such as age, gender, level and density of contributions, retirement age, and investment strategy.

Policy/Research question(s) that need clarification:

- What types of factors determine sequencing risk and the subsequent impact on target performance?
- How to incorporate individual measures of risk aversion into dynamic investments?

The goal-based investment paradigm in context

The sections above provide a vision for a new investment paradigm where Latin American countries could be heading. The motivation of proposing such a model is that Latin American countries may need to leapfrog the current financial products used in some countries and directly introduce innovations regarding investments. Life-

[12] Switching to conservative assets takes place only if the investor has accumulated wealth in excess of a target accumulation at the point of switch. After switching to conservative assets, if accumulated wealth falls below the target in any period, the direction of the switch is reversed by moving away from bonds and cash towards stocks.

[13] E.g. wealth ratios; adaptive macro indexes, among others. See Shiller (2000) and FINSIA (2015) for more details.

[14] Even if individual characteristics are perfectly known, it then follows that optimal hedges, for a given household, involve the constitution and dynamic management of large portfolios. Accounting for diversity across households appears to render fully individualized solutions prohibitively costly to manufacture (see World Bank 2010, Hinz et al. Editors, page 265).

cycle funds and target-date funds, for instance, implied a step in the right direction in the United States. They often outperform other investment strategies.[15] But their static (and thus deterministic) nature is raising concerns about how well they cater the needs of different types of people, and it is thus not clear whether they should be used as a model.

Conventional lifecycle funds typically reallocate assets over time within the fund by becoming increasingly conservative as the pension member approaches retirement. Some evidence does suggest that as people approach retirement, they are less willing to bear risks (Estrada 2014). In the years immediately before and after the retirement date (i.e., the retirement "risk zone"),[16] people are particularly subject to shocks that can deplete wealth. These funds provide investors with a one-stop shopping alternative, broad diversification, and automatic periodic rebalancing without their active intervention, all of which are beneficial (Estrada 2013). But they have serious drawbacks. First, they expose people to stocks more in the early years, when the accumulated capital is not large. This likely hurt the prospects of capital accumulation. Second, investment rules (i.e., the glide path) depend exclusively on age (or the number of years to retirement), despite the fact that people face very different economic realities.[17] The rules thus ignore things like investors' preferences, risk tolerance or labor market risks. Third, investment rules are deterministic, despite the fact that what is safe and what is risky change over the lifetime.

The DC 2.0 paradigm presents some promising ways for improving current systems in Latin America in a more systematic way. There are already some examples out there. One example to look at is the 'layered' approach envisaged by FINSIA in Australia, which puts together retirement income targets, their horizon relative to the retirement date (the transition-to-retirement phase), and sequencing risk through a valuation-sensitive investment approach. The use of benchmarks is not new either. Lithuania introduced a life-cycle benchmark for pension fund managers based on a *target replacement rate*, and parameters relating to volatility, risk-free and market rates, correlations, etc.[18]

All these experiences can offer piece-meal lessons for building a comprehensive goal-based approach. Yet, as usual, "the devil is in the details." The different elements of the goal-based approach uncovered above must first be discussed in more detail in the region to evaluate feasibility. Much depends on how the market is organized and on whether the incentives of all the relevant players are aligned to achieve the objectives of pensions DC 2.0

III. Market design for a goal-based pension system

A pension system with goal-based investments can operate with several pension providers that compete to attract clients. Nevertheless, several changes would be needed in current systems to ensure that those providers compete solely by employing the best investment strategies. There are several unresolved challenges in the current systems, including questionable commercial practices by pension providers. Moreover, re-inventing the investment regime using pension goals would demand additional reconfigurations of the market to accommodate

[15] See Viceira (2010) for evidence.

[16] We borrow the concept of 'retirement risk zone' from FINSIA (2015).

[17] As noted by Bodie and Treussard (2007), TDFs are inappropriate for most individuals, in particular for those who face considerable exposure to human capital risk, have a high degree of risk aversion, or both. They stress that the equity proportion for such investors is too high. They also show that substantial welfare gains could be achieved if an age-dependent safe-target fund is offered in the form of a suitably designed inflation-protected bond with horizon-matching maturity date.

[18] This example is discussed in Stewart (2014). See also: http://www.ipe.com/countries/cee/lithuanian-regulator-to-limit-risk-options-in-second-pillar-pensions/10012297.fullarticle

features like dynamic investments and the integration of two industries that were "separated at birth" such as the retirement funds industry (for the accumulation phase) and the one for annuities (for the payout phase).

Goal-based investments may also require some degree of freedom of choice, but there is an increasing sentiment among specialists that the combination of choice and competition is often the wrong model for pensions. Barr and Diamond state such tension in their book *Reforming Pensions: Principles and Policy Choices,* where they argue that "systems in which workers have to choose from competing private pension providers face information and behavioral problems and have high administrative costs" (Barr and Diamond, 2008). These criticisms seem to have become the norm in the FF-DC systems in Latin America, where consumers cannot impose market discipline given the mandatory nature (thus creating a quasi-market in which demand is inelastic to prices), and firms engage in excessive marketing and switching costs due to the inertia of participants.

The challenges of a market for pensions have long been known to regulators, policymakers, and experts in the region but there is frustration regarding how to move forward.[19] Actually, these challenges featured prominently in discussions in Chile in the context of the Marcel Commission (Presidential Advisory Council, 2006) and then continued to be discussed 10 years later in the Bravo Commission (Presidential Advisory Council on the Pension System, 2015); they were also discussed in the Commission formed at the interior of the Peruvian Congress to review the Private Pension System in 2011. Regulators in Latin America have already deployed a plethora of ad-hoc focalized interventions over almost four decades to control commercial expenses, ignite price competition, improve the quality of information and increase the sensitivity of people to price and return differences among providers. Such interventions have ranged from the simplification of fee structures and the prohibition of fee discrimination to restrictions to moving from one provider to the other and proposals to introduce government-managed AFPs.[20] However, the ad-hoc nature of these interventions implies marked trade-offs among multiple and conflicting policy objectives (Impavido, Lasagabaster, and Garcia-Huitrón, 2010) and they have normally only targeted the consequences rather than the key cause of market imperfections.

Policy interventions could become more effective when implemented as part of an overall strategy for the whole system, with clear objectives of the desired outcomes. An integrated goal-based paradigm for the investments of retirement assets would give such clear objectives for coordinating reforms. Indeed, the lack of integration of the accumulation and decumulation phases inherited from the pure DC systems, and the lack of lifelong investment planning that this involves, has been a drag in finding better governance solutions.

In the rest of this section, we discuss some of the challenges and changes needed in the pensions market, particularly for re-designing the market in a way that is compatible with a goal-based pension system. Five elements guide the discussion:

(i) Unbundle AFPs and reap the benefits of economies of scale;

(ii) Take market design into its next evolution;

(iii) Protect the interests of the individual participants;

(iv) Transform AFPs into fully-fledged pension providers;

(v) Enable the existence of non-for-profit AFPs.

[19] See for instance Abuhabda (1994), Valdes (1992, 1994, 1995, 1997, 2002, 2004, 2005, 2007), Chisari, Dal Bó, Quesada, Rossi, and Valdés (1998), Bateman and Valdes (1999), Mastrángelo (1999), Galarza and Olivera (2001), Berstein and Micco (2002), García-Huitrón, M., and T. Rodríguez. (2002), Ferro (2003), Greco (2005, 2006), Apella and Maceira (2004, 2005, 2006), Melendez (2004), Impavido and Rocha (2006), Kay and Sinha (2007), Reyes and Castro (2008), Masías and Sánchez (2007), Auguste, and Urbiztondo (2008).

[20] See Chile Presidential Advisory Council on the Pension System (2015), Hastings, Hortaçsu, and Syverson (2013) and Valdes (2014b).

These five elements are consistent with previous policy recommendations in Impavido, Lasagabaster, and Garcia-Huitrón (2010) and De La Torre and Rudolph (2015). We go beyond these authors by analyzing these five elements in the context of the goal-based DC 2.0 framework presented in the previous section. An important warning is that we do not aim to provide a general recipe applicable to all countries all the time.[21] That may not be realistic as countries differ regarding culture, history and institutional infrastructure, even when focusing the analysis on the relatively homogeneous setting observed across Latin American mandatory defined-contribution pension systems. Henceforth, important public policy aspects such as whether all these elements are to be implemented simultaneously or must follow a sequence and whether all or only a subset of them are feasible in a specific country must be assessed by policymakers in their specific context.

Unbundle AFPs and reap the benefits of economies of scale

A lifelong, goal-based investment approach requires that pension providers reconfigure their asset management practices (having pension goals as the main objective) and that the investment function becomes the centerpiece of their business. Yet, pension providers often have other functions with competing interests, a situation that makes their operations costlier and thus increasing, in general, the cost of the whole pension system. Therefore, in their current state, pension providers would not be the ideal vehicles for investing retirement assets.

The specific legal entity called "AFP" is by design an amalgam of functions. In addition to asset management, the typical services include the collection of contributions, record keeping, provision of information, commercial activities and marketing and treasury operations.[22] These functions have different economic objectives, and costs structures and bundling can raise market concentration levels and, therefore, average prices. For instance, asset management has lower economies of scale than customer services or collection of social security contributions, which are characterized by large sunk and fixed costs. When the two are bundled, the overall market concentration equilibrium is equal to the largest among the equilibria that would occur in customer services and asset management separately (in this specific case, customer services). Consequently, barriers to entry are artificially extended while market power and overall prices increase (Impavido, Lasagabaster and Garcia-Huitrón 2010). Also, requiring pension firms to offer pension services in a single package spares consumers the search costs associated with choosing in several quasi-markets (one for each pension service).

A way to mitigate these outcomes is to **unbundle** pension services: make the investment function the priority and then establish institutions for centralized production and procurement of services with high economies of scale such as customer services or collection of contributions (Impavido, Lasagabaster, and Garcia-Huitrón 2010; De la Torre and Rudolph 2015).[23] The depth and breadth of unbundling and centralization is sensitive to each country institutional arrangements. Several activities could be considered for centralization, such as contribution collection, record keeping, and benefit payments. These can be administered by a public entity or a regulated private entity or a mix, depending on idiosyncratic institutional capabilities and social attitudes towards such public-private ventures.

Some countries have gone even further and have centralized the client service and communications function. Such a design entails a so-called "client-blind" approach by which the centralized entity keeps the individual information anonymous and act as an intermediary between individual clients and investment managers. In theory, the client-

[21] Barr and Diamond (2008) have forcefully argued that in pension design there is no one size that fits all. Therefore, any search for an optimal pension system is deemed to be a futile exercise, a maxim that we adhere to.

[22] AFPs are legally separated from the balances in the individual accounts. This legal separation aims to reduce potential conflicts of interest, to ensure the security of the operation of the system, and to better control the investment of pension funds.

[23] Several lines of argument suggest that a design that centralizes contribution collection and auctions the right to manage contributions to competitive fund managers is superior to a quasi-market (Diamond 2000, 2011; Greco 2005, 2006; Valdes 2007; Apella and Maceira 2004, 2005; Impavido, Lasagabaster and Garcia-Huitrón 2010; De la Torre and Rudolph 2015).

blind approach is capable of eliminating commercial and marketing activities. However, blinding accounts is subject to implementation obstacles, particularly for a system that does not start from scratch. As an example, we next consider the most well-known example, that of the Premium Pensions (PPM), which is the FF-IDC component of the first pillar in Sweden.

The PPM scheme has achieved low costs by separating activities with high fixed costs and economies of scale, such as the administrative, operative, and collection functions, from the investment management function (Diamond, 2011). The former functions are centralized and managed by the regulator (called the "Swedish Pensions Agency") –which in turn relies on the Swedish tax administration authority to collect contributions – while the investment function is open to private competition. The only responsibility of AFPs in Sweden is to invest the funds during the accumulation phase. Henceforth, they do not incur commercial or marketing expenses - indeed, the Swedish Pensions Agency is their only client. However, there is evidence that over time implementation problems with the blind-account scheme had emerged. More specifically, a parallel industry of financial advisors has emerged that in exchange for a commission advises individuals regarding portfolio decisions. There are nowadays more than 700,000 people registered with PPM consultants and these services are more commonly used by people with low levels of education and income (Weaver and Willen 2013).[24] We will have more to say about this in a subsequent section in the context of how to protect the interests of participants in pension markets.

Another important point to make regarding centralization is that much can be done in sequence, and in practice, most countries require a wider bundling of services than that observed in Sweden. For instance, bundling asset management with customer service and record keeping helps explain why, in New Zealand, a small set of default providers were appointed for seven years. Also, there is a lot that the emergence of new technologies could do regarding generating cost savings that could be transferred to participants in the road towards a more unbundled scheme, and regulators should be on top of these type of initiatives already.

Policy/Research question(s) that need clarification:

- Which functions should be centralized by a public entity? What would be the reduction in operating costs for the whole industry?
- What changes in the governance of AFP would be needed to focus on asset management?
- What factors would make a client-blind approach feasible for Latin American FF-DC systems?

Take market design into its next evolution

The centralization of functions showing economies of scale is likely to create savings for the whole pensions system. Take the example of Sweden again. The costs charged to the individual affiliates by the Swedish Pensions Agency have decreased from around 25 basis points to 6 basis points of the assets under management and are expected to decrease further.[25] Yet, centralization by itself does not ensure that these gains are translated into benefits for the final customer. The gains in Sweden are the result of the institutional capabilities and of the heavy regulatory hand of the Swedish Pensions Agency, which sets price ceilings and negotiates fee discounts on behalf of the affiliated participants.

[24] At the time of writing this article, a new advisory commission set up by the Swedish government has been tasked with proposing solutions to tackle these and other design issues of the PPM.
[25] The total charge, considering also the average 23 basis point charged by investment managers, is 29 basis points.

Following a heavy regulatory hand approach as in Sweden is certainly one option for Latin American regulators. Some countries like Mexico certainly use price controls. However, depending on the starting point and the legal and institutional constraints in each country it is not the only nor necessarily the best approach.[26] An alternative regulatory strategy is one where competition is triggered by a package of market-based incentives. Some Latin American countries already implement market-based interventions by allocating clients to pension providers based on their levels of fees and returns. Countries like Chile, México, and Perú, introduced hybrid industrial organization structures that separate clients into two segments: a procured segment for inert clients and a quasi-market segment for less inert clients. There are differences in implementation. Chile and Peru use an auction of the *new* participants into the system, so-called "flow design" (Impavido, Lasagabater, and García-Huitrón, 2010) while the Mexican design involves a less formal mechanism: a so-called "allocation" of participants since 2001. The Mexican allocation policy makes use of an additional design element besides the "flow" approach observed in Chile and Peru: in addition to an annual allocation of the flow of undecided participants, a bi-annual allocation of the "stock" of participants previously allocated is being implemented since 2012. Despite some promising results in lowering fees, however, these mechanisms have not altered the dynamics of the industry in such a way that it is conducive to a competitive environment that further reduces fees and **quality-proofs the investments function**.

We interpret these measures as an evolutionary development in the regulatory approach taken by these countries. In a sequel paper, we seek to analyze in more depth the pros and cons of the "stock vs. flow" and the "auction vs. allocation" dilemmas and use mechanism design theory to explore alternative solutions for making pension providers compete in terms of investment returns. A potential next step could be to craft a more nuanced competitive mechanism (such as a dynamic tournament scheme) to tackle the pitfalls of the above 'first generation' incentive-based interventions.[27] It is also important to clarify how market-based interventions are superior to heavy-hand direct regulations in the first place. Although the latter might entail more salient tradeoffs, they may be considered as second-best options by countries where the implementation of market solutions is not feasible, either operationally, legally or politically.[28]

Policy/Research question(s) that need clarification:

- Under which conditions would incentive-based markets interventions be superior to direct regulatory interventions to induce competition and lower costs in Latin American systems?
- What factors would determine whether the allocation of clients should be determined by the performance of pension providers (e.g., regarding long-term returns) or be subject to auctions?
- Under which conditions should allocations apply to new 'flows' of clients or the whole 'stock' of existing clients? Do these two approaches supplement each other or are they substitutes?

[26] For instance, the Mexican pension regulator, CONSAR, had tried to curb commercial expenses at different moments in time by increasing the operational costs associated to transfers, for instance, by adding an additional requirement such as a digital signature or the like. Because measures like these tackled the symptoms and not the causes of increased commercial competition, their effects were only short term (Garcia-Huitron and Seira 2015). It took only some months for the commercial forces to "technologically absorb" the operational cost increase and then the war surged again thus creating a vicious circle of ever incremental costs for the system. Chisari, Dal Bó, Quesada, Rossi, and Valdés (1998) review similar episodes in Argentina in the 1990s.

[27] Auctions of centralized clients might not be able to change the dynamics of the market in significant ways. It is possible that the incumbent that adjudicated the last auction may be using its previously gained profits to practice some form of short-term business strategy in exchange for a more dominant position in the future or else in preparation for a future merger or acquisition. Commercial wars are possible in the context of repeated auctions or other regular allocation mechanisms. Therefore, implementation details such as whether to target the "flow" of new participants into the market or groups of existing clients is an important element in current debates.

[28] Examples of such interventions are the following: (i) price control mechanisms to ensure savings are transferred to affiliates; (ii) the introduction of a public AFP to impose market discipline, set standards and target unserved niches such, like the case of NEST in the UK; (iii) setting a limit on market shares to avoid concentration; among others.

- Under which conditions it is possible to devise an "incentive mechanism" capable of inducing virtuous competitive dynamics in the pensions industry?

Protect the interest of individual participants

Making pension providers focus on the investment function and compete by long-term investment performance constitutes the key element for operating a goal-based approach. Practices that complement such paradigm such as centralizing clients and allocating them to pension providers based on mechanisms that promote competition require that old challenges are tackled to protect the interests of people. Achieving this will restore trust in the system and therefore its social legitimacy.

The underperformance of Latin American pension quasi-markets regarding fee competition and wasteful commercial expenses stems from the interplay of demand and supply factors. On the demand side, informational asymmetries between individuals and AFPs are very large. Therefore, individual consumers are easily manipulated by sales forces and pension firms use advertising to turn inexperienced investors' attention away from fees and towards brand name (Hastings, Hortaçsu and Syverson 2013). Manipulation is more likely to happen in lower-income segments of the population, where investors have less education and lower financial literacy rates. Similar challenges would be faced in a goal-based approach if the attention of clients is turned away from the performance of their long-term investments.

Ensuring the right behavior of sales forces would benefit everyone. Ideally, there should be a component of commercial activity that is socially productive (Valdes, 1992, 1995; Chisari, Dal Bó, Quesada, Rossi, and Valdés, 1998). For instance, sales forces should advise and educate individuals about financial planning in the interest of their clients. What we observe, instead, is that sales forces have regularly been involved in controversial practices in all pension markets in Latin America. Examples are abundant, from the recurrent practices of attracting clients with "gifts" since the 1980s in Chile (Valdes, 1992, 1995) to the recent experience also in Chile amid the emergence of a shadow market for "timing" transfers across multi-funds within AFPs (Superintendencia de Pensiones, 2013).[29] Also recently, COFECE, the Mexican anti-trust commission, punished four Mexican AFP (Afore, as they are called in Mexico) for collusive agreements among its sales forces.[30]

The behavior of sales forces and the excessive commercial expenses by AFPs are also in part driven by supply-side factors and by how prices and fees are structured in pension quasi-markets (Impavido, Lasagabaster, and Garcia-Huitrón, 2010). How to redesign fees structures would also become a relevant question when discussing how to introduce a goal-based investment regime and the relevant market. For now, regulations lead to more commercial expenses. AFPs across all jurisdictions in Latin America are precluded by a distinctive regulation to price discriminate in their current systems, but this is not efficient in the context of pension quasi-markets and has fundamental consequences for market dynamics.[31] A "*rate uniformity regulation*" requires each AFP to apply a single fee schedule to all its customers for the whole package of services it produces - while the efficient fee policy should be one that charges specialized prices that reflect the cost structure of each service as well as their

[29] Participants follow the advice of when to move from one fund to another in exchange of a generous fee. The term "shadow pension advisor" comes from the fact that these advisory companies are not under the regulatory oversight of the Superintendence of Pensions. The Chilean regulator released evidence that the advice led to pro-cyclical behavior among participants, i.e. a 'selling cheap' and 'buying high' behavior for workers that do not follow the default option and therefore to financial losses (Superintendencia de Pensiones, 2013).

[30] COFECE issued a "Statement of Probable Responsibility after considering the existence of elements suggesting that Economic Agents have participated in absolute monopolistic practices in the AFORE´s market" in April 2014 and sanctioned it in April 2017. Pursuant to the Federal Economic Competition Law (FECL), absolute monopolistic practices consist of contracts, agreements, arrangements or combinations amongst competing Economic Agents, which have as their purpose or effect to fix prices, restrict supply, allocate markets, rig bids and exchange information with one of these purposes or effects. See COFECE (2015b).

[31] See Impavido, Lasagabaster and Garcia-Huitrón (2010), Box 3.2, page 70, for an explanation.

contingent nature.[32] Therefore, an implicit redistributive scheme is in place in which high-base participants pay more than low-base participants, which could have led to an increase in average prices as a consequence of excessive commercial expenditures (Impavido, Lasagabaster, and Garcia-Huitrón, 2010). As a consequence only high net worth clients are part of the organic growth plans of AFPs, leaving some vulnerable groups (low income; flat age-earnings profile groups, etc.) and other collectives such as the independent workers out of their scope.

Liberalizing fee structures so that efficient pricing is allowed would eliminate excessive commercial expenses incentives.[33] In particular, a flat component in the price structure[34] (e.g., inspired by New Zealand's Kiwisaver scheme) would go a long way in eliminating cream-skimming commercial incentives (e.g., marketing and sales people seeking to attract high earners or high net worth individuals) and should be associated with lower barriers to entry. However, the observed tendency in Latin America is to phase out flat fees, showcasing the strong preference by regulators of redistributive over efficiency grounds.[35] Hence, it is expected that episodes of excessive commercial expenditures will still be prevalent.

A Swedish-style "client-blind" model as discussed above would eliminate some of the challenges related to the behavior of sales forces and commercial expenses (De la Torre and Rudolph, 2015), although not without complications and further challenges, as mentioned before. Future work must explore intermediate options such as creating a regulated pensions advisory industry and define how best to regulate this industry to ensure incentives are aligned and fiduciary duties fulfilled. It is also important to come to terms with the potential impact that technological developments such as robo-advice may bring to pension quasi-markets. Robo-advisors are a promising route to meet the challenges of a cost-efficient access to meaningful mass-customized investment and communication solutions for individuals (Martellini, 2016b), if yet under development (Lam, 2016). Over time, robo-advisors could be introduced in pension quasi-markets for the component of advising that is informational and educative and that therefore has positive social value.

Policy/Research question(s) that need clarification:

- How would the commercial arm of AFPs be reconfigured if the investment function is given a more central role (e.g., in a goal-based approach)?
- What would be the implications of introducing a goal-based investment regime on fee and price structures?

Transform AFPs into fully-fledged pension providers

A goal-based investment regime requires the integration of the accumulation and decumulation phases: to transform AFPs from "pension savings administrators," limited to the accumulation stage, into fully fledged life-cycle "pension providers," also covering the decumulation stage. In the current Latin America context, individuals are mandated to save in a DC industry during the accumulation stage and at retirement are de facto required to transport these savings into another industry, to transform their savings into an annuity. AFPs are therefore mainly

[32] A uniform rate applies despite the fact that some of these services are contingent upon active demand from the customer (e.g. specific customer services) and that most of them have a high fixed cost component that does not vary over time – and therefore shows little if any relation with customer characteristics such as income, balance in the individual account, etc. Specialized prices could come either in the form of fixed monetary units or be variable; some services would only be triggered if there is an action from the customer.

[33] There are proposals to move out of this inefficient regulation. Valdes (2005b) and De Gregorio (1997) proposed liberalizing fees in Chile. Marthans and Stok (2013) also proposed a liberalization in Peru. Impavido, Lasagabaster and Garcia-Huitrón (2010) contains a generic proposal for FF-IDC schemes.

[34] This would be a specialized companion fee to the specialized variable fee that the investments function command in an efficient price setting in this market. See footnote 32 for more background on this. See also the recent analysis by the International Monetary Fund (IMF, 2017, pages 82-83).

[35] A more aggressive use of flat fees and subsidies and hybrid industrial organizations, in conjunction with unbundling of pension services, appears to provide fewer policy trade-offs and should be pursued by policy makers in mandatory FF-IDC systems according to Impavido, Lasagabaster and Garcia-Huitrón (2010).

geared towards operating only during the accumulation stage. They only perform some basic operations during the decumulation stage such as administering programmed withdrawals in some countries, should individuals choose that option at retirement.[36]

There are many jurisdictions where pension funds have 'enlarged' operations covering accumulation and the payout phases, including the Dutch hybrid (collective) schemes and some pension providers in certain markets - be Australian (QSuper), Canadian (New Brunswick) or Danish (ATP). In the Netherlands, most hybrid schemes[37] are essentially a composition of deferred annuities (active members) and paying annuities (retirees). Plan members build up annuities each year of labor service, where the value of the newly acquired annuities is defined by the value of the contributions. So, benefits are set to a certain (promised) level (like in DB systems), but the actual payment during retirement is conditional on the financial health of the scheme (like in DC systems, since pension rights can be cut is returns are poor). This design allows for intergenerational sharing of financial markets risks. Also, since pension payments come from the collective fund itself, the scheme pools longevity risk among participants (intra-generation risk sharing).

Latin American FF-DC systems are fundamentally different from the collective model since actuarially fair individual accounts preclude risk sharing altogether. The schemes in the region are designed to share risks in a system-wide manner, not within the specific FF-DC (second pillar) system. In a sequel paper, we will discuss the merits and demerits of adding risk-sharing components to the current design of second pillar schemes and potential ways to implement this in the Latin American individual accounts context. The relevant question is what types of risk are to be shared. Intra-generational risk sharing makes sense even in an actuarially fair setting such as individual accounts in Latin America. Inter-generational risk sharing is more controversial, as the recent debates in the Netherlands portrait (see Ponds and Steenbeek, 2017).

Another important question is whether AFPs could be enabled to provide annuities. The upshot is that this is feasible and may go a long way regarding integrating the accumulation and decumulation stages, but that it entails the setup of the appropriate regulation (i.e., Solvency II type of regulation) to ensure that AFPs can fulfill this new role and to protect individual consumers. In countries such as in Mexico this proposal would come as a handy solution to the structural problem of an annuity market where many companies have been operating in run-off mode for quite some time now (Impavido, 2007), just in time before the initial wave of retirees from the reformed second pillar scheme.

Are there alternatives to converting AFPs into fully-fledged pension providers? There are different ways of achieving this. The mandates (laws) of AFP and insurance providers could be transformed in a way that they are connected and get an integrated investment path that integrates the payout phase. Yet, there are some hurdles to be overcome. The capitalization scheme for AFP and Insurance firms is very different. Integration in such circumstances would be limited to reap some transaction cost but not a continuous investing. Insurances follow asset liability management (ALM), and any mismatch is penalized with additional capital. The law defines the liability side. On the other hand, under the current design AFPs have very limited liability, and thus they are only required a commensurate minimum capital. Nevertheless, our proposal of moving into an investment regime for a goal-based pension system is closer to setting up an ALM regime than it seems at first blush - the main differences being that it would be done at the individual level (thus i-ALM) and that the liability is defined by the pension goal only in probabilistic terms.

[36] We are aware that in some countries there are other options such as lump-sum withdrawals (as it was recently introduced in Peru) and the more structured Chilean combination of real life annuities, actuarially adjusted programmed withdrawals, combinations of these two and a combination using a short-term deferred annuity.

[37] Hybrid schemes come is two dominant forms: "hybrid DB plans with conditional indexation" and "Collective DC plans" (Ponds and Steenbeek, 2017). Hybrid DB plans with conditional indexation, benefits are calculated as in traditional DB plans except that indexation of pensions in payment and accrued benefits is conditional on the plan's funding status. Collective DC plans are equal to hybrid DB plans with one main exception: contribution rates are fixed for at least five years.

This discussion opens the door for other relevant questions. Given that we are proposing that AFPs provide annuities, does it also make sense for insurers to provide "retirement savings" products during the accumulation stage? In the context of a life-cycle product anchored in a pension goal, insurers could indeed be able to provide such a product and enter the FF-DC pension funds market (and such a business line will be regulated like any other pension fund). By contrast, allowing insurers to offer DC type retirement savings and then at retirement transport the accumulated savings into annuities would create the same problems as the current status quo and would conflict with the "sole-purpose" objective of AFPs envisaged above, centered on the maximization of investments.

Policy/Research question(s) that need clarification:

- What are the different ways in which the operations of AFPs can be enlarged to cover the full lifecycle? How would governance structures be affected?
- How could risk-sharing devices be introduced into Latin American DC systems and what would be the impact on current and future clients?

Enable the existence of non-for-profit AFPs

The pension market can also involve non-for-profit (NfP) pension providers that operate alongside other for-profit providers. If well designed, NfPs are well-suited to facilitate sound lifecycle planning on behalf of individuals, who are prone to behavioral bias and cognitive constraints in the face of very complex intertemporal financial decisions under uncertainty. NfP structures may also be the basis for which certain groups such as the self-employed could be voluntarily organized under rules provided by the government to facilitate their participation in their pension system, such as the case of the self-managed superannuation funds in Australia.[38] This element of the market design may facilitate the alignment of interests between clients and pension providers, as well as facilitate consumer protection in Latin American pension markets.

As with the other four elements of the market design, this one may need a proper "tropicalization" based on country historical and institutional settings. The status quo in Latin America is that AFPs are required by legislation to be registered as limited liability companies, which de-facto precludes a not-for-profit motive. This limitation is hard to justify. We should also acknowledge that just changing the law to allow NfP to enter the quasi-market may not work because NfP schemes have emerged mainly as a response to industrial or occupational pension schemes in countries such as Australia, Netherlands, Sweden, Switzerland, Denmark, among many others in the OECD. The Latin American context is very different, and therefore a different figure may be needed to enable or proxy NfPs. Recent proposals entail the creation of "client committees" with voice and voting capabilities across relevant dimensions within the structure of AFPs (Clapes UC, 2016).[39] Another idea to explore is to introduce NfP components at different points in the pensions value chain. An example would be the Swedish second pillar, where the governance of the pensions industry supports having co-opetition among for-profit and non-for-profit companies. In a sequel paper, we explore such a proposal as well as other alternatives.

[38] The concept of a "self-managed superannuation fund" (SMSF) was created to facilitate enrollment of the self-employed. These funds are directly regulated by the Australian Taxation Office, as opposed for instance to corporate or occupational plans that are regulated by the Australian Prudential Regulation Authority. SMSFs are the fastest-growing segment of the Australian superannuation industry accounting for almost one-third of total assets under management in the Australian superannuation industry assets, up from 9 per cent in 1995. A main lesson in the case of Australia is that the Internal Revenue Service authority must be involved in the process, otherwise the effort becomes superfluous at some point Garcia-Huitron and Ponds (2016).

[39] See also the set of papers presented at the Special Number of the "Gestion Y Tendencias" Magazine, available at <http://www.gestionytendencias.cl/index.php/GT/issue/view/7 >.

IV. Research agenda

This paper provides a framework that Latin American countries could follow to redesign their mandatory FF-DC pension system. In particular, the basics of a new paradigm are presented for reconfiguring both the design of the investment regime and the design of the market with the objective of optimizing lifelong investments of retirement assets, achieving certain pension goals and, in the process, gaining wider social legitimacy. In a goal-based approach to investments, optimal investments would respond to the events of a whole lifetime and, ideally, would be as customized as possible since people face very different economic realities. Part of customization would be achieved by dynamic asset allocation strategies that adapt to individual economic shocks.

The principles DC 2.0 outlined above could be combined in different ways depending on country contexts. One way in which the market could operate following our principles delineated above is one where AFPs are unbundled and focused on the investment function, whereas collection and the system's database are centralized. It cannot be emphasized enough that whether regulators should introduce market mechanisms to allocate clients or choose instead the more radical solution of rendering AFPs client-blind depends on the institutional framework of each country and further country-level research is required.

The discussion in the sections above identified some policy/research questions that need clarification to build a roadmap for future reforms in the region. All these questions emerged from the principles that we articulated for the investment regime and the design of the market.

Regarding the (goal-based) investment regime:

- How is the process of asset allocation likely to change when integrating the accumulation and payout phases?
- How to evaluate the main sources of risk across a complete lifecycle that jeopardize pension goals?
- What types of factors determine sequencing risk and the subsequent impact on target performance?
- How to incorporate individual measures of risk aversion into dynamic investments?

Regarding the design of the market:

- Which functions should be centralized by a public entity? What would be the reduction in operating costs for the whole industry?
- What changes in the governance of AFP would be needed to focus on asset management?
- Under which conditions would incentive-based markets interventions be superior to direct regulatory interventions to induce competition and lower costs in Latin American systems?
- What factors would determine whether the allocation of clients should be determined by the performance of pension providers (e.g., regarding long-term returns) or be subject to auctions?
- Under which conditions should allocations apply to new 'flows' of clients or the whole 'stock' of existing clients? Do these two approaches supplement each other or are they substitutes?
- Under which conditions it is possible to devise an "incentive mechanism" capable of inducing virtuous competitive dynamics in the pensions industry?
- What factors would make a client-blind approach feasible for Latin American FF-DC systems?

- How would the commercial arm of AFPs be reconfigured if the investment function is given a more central role (e.g., in a goal-based approach)?
- What would be the implications of introducing a goal-based investment regime on fee and price structures?
- What are the different ways in which the operations of AFPs can be enlarged to cover the full lifecycle? How would governance structures be affected?
- How could risk-sharing devices be introduced into Latin American DC systems and what would be the impact on current and future clients?

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