Competition And Asset Allocation Challenges For Mandatory DC Pensions: New Policy Directions

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This report is the result of a policy research project designed and coordinated by Gregorio Impavido and finalized together with Esperanza Lasagabaster and Manuel García-Huitrón. The material contained here draws on four background papers especially procured for this report. Dayoub and Lasagabaster (2008) survey trends in competition policy and investment regulation in Latin American countries and constitute the guiding framework and provide important material for Chapter II of this report. Valdés-Prieto (2007) develops a conceptual framework for assessing the policy tradeoffs in the use of specialized regulation or alternative industrial organization structures to reduce the price distortions stemming from the inertia of individuals; this work is summarized in and constitute the guiding framework of Chapter III. Raddatz and Schmukler (2008) analyze the asset allocation patterns and investment strategies of Chilean pension fund managers. Blake et al. (2008) survey the literature on strategic asset allocation and develop a proposal for linking the accumulation and pay out phases through the use of target annuitization funds. The material from these last two works is used in Chapter IV.

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REFERENCES


Chapter I

Introduction

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I THE INTRODUCTION OF MANDATORY DEFINED CONTRIBUTION PENSIONS

Recent parametric and systemic pension reforms\(^1\) have generally had in common three key objectives. First, they aimed at improving the actuarial features of the pension system.\(^2\) Second, they typically aimed at reducing the defined benefit and increasing the defined contribution component in the system. Third, they aimed at increasing the level of funding in the system.\(^3\)

In many reforming countries, the three aforementioned objectives were achieved with the introduction of a “second pillar”: i.e., occupational or personal plans, fully funded, targeting formal sector workers, with mandatory participation and with financial assets as the funding or collateral of the pension promise (Holzmann \textit{et al.} (2005)). These second pillars are present in a large number of countries with coverage easily exceeding 100 million participants.\(^4\) In Latin America, countries include Argentina,\(^5\) Chile, Colombia, Mexico and Peru.\(^6\) In Europe, countries include Bulgaria, Denmark, Hungary, Poland, Sweden, Switzerland and the United Kingdom.\(^7\) In Asia and Oceania, countries include Australia, Hong Kong and New Zealand.

The Chilean reform of 1981 was used as a model by a large number of these countries. This reform was influential in determining a radical paradigm shift in the way it is today believed pension income should be financed. The new paradigm is based on a larger role of markets and on individual savings complementing intergenerational risk sharing. The paradigm shift was historically motivated as it coincided with increased macroeconomic stability in reforming countries. In addition, it was considered essential to reduce the fiscal pressure created by generous mandatory defined benefit plans and

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\(^2\) The literature here distinguishes between actuarial balance and actuarial fairness. The former feature, more macroeconomic, relates to the long-run financial stability (viability) of the pension systems (Diamond (2002)). The latter feature, more microeconomic, relates to the link between benefits and contributions (Fenge (1995), Kotlikoff (1996) and (1998)).  
\(^3\) In many countries (Italy, Latvia, Poland and Sweden) with very mature systems actuarial fairness and balance were improved by introducing notional defined contribution systems that combine partial funding with individual accounts.  
\(^4\) The International Organization of Latin American Pension Supervisors (AIOS) reports around 73 million participants for Latin America only. These figures exclude participants from Switzerland, Sweden (PPM), New Zealand, The Netherlands, Hungary, Hong Kong, Denmark, Bulgaria, Slovakia, Australia (some 40 million).  
\(^5\) In October 2008, the Argentine government presented Parliament a legislative proposal aimed at nationalizing the pension industry.  
\(^6\) Effective years of implementation of initial reform in Latin America are: Chile (1981), Peru (1993), Argentina and Colombia (1994), Uruguay (1996), Bolivia and Mexico (1997), El Salvador (1998), Costa Rica (2001), Nicaragua (2002), and Dominican Republic (2003). Two more countries have passed a reform but have either not yet implemented it or are in the early stages of implementation: Ecuador (2001) and Panama (1999 and 2006).  
\(^7\) Effective years of implementation of initial reform in Eastern Europe are: Hungary (1998), Kazakhstan and Poland (1998), Latvia (2001), Bulgaria, Estonia, Croatia, Kosovo and Lithuania (voluntary also for new entrants) (2002), Slovakia (2005), and Macedonia (2006/2007).
worsening demographic situations. This, notwithstanding the fundamental point that the way pension benefits are financed cannot by itself resolve the problems caused by demographic pressures and that only policies aimed at increasing labor productivity and future per-capita GDP can achieve that.

As a result, the paradigm shift created strong expectations to achieve many important objectives, including reducing fiscal imbalances caused by generous defined benefit plans, promoting portability and generally reducing labor market distortions, improving intergenerational equity and increasing national savings and economic growth. For instance, by improving the actuarial features of the system, the introduction of second pillars created expectations of reduced labor market distortions that would be translated in higher participation and coverage rates. In addition, by increasing the importance of the defined contribution component, the introduction of second pillars altered the risk sharing properties of pension systems by shifting risks from future generations to current generations, thus improving intergenerational equity. Finally, by pre-funding liabilities, the introduction of second pillars created expectations related to capital accumulation, such as financial and/or capital market development and increases in national savings and therefore, economic growth.

Since many countries have reformed their systems only recently, it is too early to assess whether these expectations have materialized or not. For instance, there is a debate whether the reforms constitute real changes in fundamental features of fiscal policy (Kotlikoff (2008)). There is also ambiguous theoretical evidence that the mere shift to individual accounts has improved labor market incentives (Orszag et al. 1999). Roffman and Lucchetti (2006) argue that low coverage, with inequities by income level, economic sector, and area of residence, persist in almost all Latin American countries, irrespectively of their pension system design. In addition, it is unclear whether pension funds development is associated with capital market development. Some authors maintain that that pension reforms (notably in Chile) have caused capital market development. Other authors maintain that pension funds do not contribute, as expected, to the development of capital markets. Finally, there is limited empirical evidence linking pre-funding with economic growth since a positive relationship between the two is conditional on increased national savings or, for given level of national savings, on improved allocation at the margin of these savings. In particular, an eventual positive relationship between pre-funding and national savings depends (among others) on the liquidity of pension savings, financial constraints faced by contributors, imperfect substitutability between pension savings and private savings, and fiscal discipline, which

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8 For instance, Iglesias (1998) and Lefort and Walker (2002) conclude that there is a causal relationship between pension reform and capital market development in Chile. Davis (1995) argues that increases in the holdings of pension funds improve the depth of capital markets since they invest in long-term and riskier assets. Similarly, Impavido et al. (2003) find that the institutionalization of savings increases the depth of stock and bond markets and in some cases improves stock market liquidity. Additionally, Impavido and Musalem (2000) argue that pension funds also increase innovation, competition, and efficiency of capital markets. Finally, Catalán et al. (2000) find that pension funds development Granger causes increases in stock market capitalization but it is not so unambiguously associated with higher turnover.

does not offset eventual increases in private savings with public dissaving. Due to these necessary conditions, it is often difficult to assess whether national savings have increased as a consequence of the introduction of second pillars.

This report seeks to analyze key policy challenges faced by policymakers in attempting to improve the efficiency with which mandatory defined contribution pension markets function. It does not comprise an assessment of past reforms or the ongoing debate on the desirability (or not) of mandatory defined contribution pension funds as a component of pension systems. An increasingly large body of literature will, in principle, improve our understanding on these fundamental issues.

This report is relevant to a large audience including: 1) policymakers in countries with an important defined contribution component or large volume of assets under management; 2) policymakers in countries with uncompetitive provision of financial services and/or unsophisticated capital markets; 3) policy advisors working in the areas of pension regulation and supervision, competition policy for financial services, capital market development and financial stability; and 4) academics who are interested in identifying under researched pension policy issues.

The report is naturally relevant to policymakers in countries where pension systems either have in absolute terms a large defined benefit component or have substantial assets under management. Some of these countries are reported in Figure 1 and Figure 2. The report is also relevant to policymakers in countries where the defined contribution component or assets under management are important only in relative terms. These would be countries where the industrial organization of financial services or the unsophistication of local capital markets make competition policy issues and long-term asset allocation and investment risk management issues relevant for purpose of financial stability. Again, some of these countries are reported in Figure 1 and Figure 2. The report is relevant to policy advisors who want to develop detailed understanding of the strength and limitations of policies adopted by many jurisdictions to lower administrative fees and to improve expected long-term performance. Finally, the report is relevant to academics as it identifies numerous policy issues that so far have not received adequate theoretical and/or empirical attention and that represent promising areas of future research.

Figure 1: Assets in DB and DC private plans (OECD and Latin America)

![Bar chart showing the distribution of assets in DB and DC plans across various countries.]

Source: OECD and AIOS.

Figure 2: Role of financial assets in overall income retirement financing

![Bar chart showing the percentage of total retirement funding from different sources across various countries.]

II NEW POLICY CHALLENGES IN MANDATORY DEFINED CONTRIBUTION PENSIONS

While preliminary evidence suggests that on average the performance of mandatory defined contribution pension funds has been adequate, there is substantial scope for improving their efficiency in order to achieve higher benefits at retirement. Addressing the inefficiencies to which these markets are exposed has become an increasing concern of policymakers. This report focuses on the two most important challenges that policymakers are trying to address in this regard, which are closely interrelated.

First, markets are characterized by high barriers to entry and the demand for pension services is highly inelastic to prices. This creates market power leading pension fund managers to treat their clients as captive and to choose prices above average production costs. This, in turn, finances excessive marketing expenses and/or supernormal profits. One limit to prices is given by the desire to minimize entry, which can be costly for incumbents because of the ensuing marketing wars. The other limit to prices is given by fears of government intervention stemming from the public reaction to welfare losses for participants. In either case, equilibrium prices are significantly above average production costs. There is a general consensus that the demand and supply inefficiencies, together with the related redistributive concerns, typical of these markets, justify policy intervention aimed at reducing administrative fees.

Second, participants fully bear the investment risk which they are likely to be badly equipped to assess, monitor and mitigate. The regulation of investment choice and the design of associated default options, the lack of a long-term target for fund managers and, more generally, the disconnection between the accumulation and the decumulation phase, appear to leave excessive degrees of freedom to asset managers in implementing the strategic asset allocation through tactical decisions which may not be consistent with participants’ preferences. In addition, participants may be lacking the necessary skills to monitor portfolio management and, therefore, they tend to make uneducated selection of portfolios during their life cycle. Similar to the case of administrative fees, there is a general consensus that price inertia of participants and excessive degrees of freedom of fund managers justify policy intervention to design investment products and default options in line with the preferences of long-term investors.

Challenges are interrelated as they both stem (in part) from participants price inertia and they both increase the cost of intermediation for contributors measured by lower risk adjusted expected net rates of return. Disappointing ex post net rates of return imply, ceteris paribus, disappointing ex post replacement rates. The latter, in turn, may imply higher than expected levels of poverty among old age individuals and raise concerns about the advantages of individual accounts for pension policy.

After an overview in Chapter II of the characteristics of mandatory defined contribution pensions, their industrial organization, the trends in competition policy, asset allocation and investment regulation, the following two chapters analyze the policy responses that have been used to address the aforementioned challenges.
Chapter III provides a conceptual framework for analyzing the tradeoffs policymakers face in introducing specialized policies to offset the negative impact that participants’ inertia has on administrative fees. These policies include various experimentations with narrowly focused regulations aimed at increasing demand elasticity, exploiting economies of scale in select pension services, lowering barriers to entry, rendering markets more contestable and capping prices charged by pension firms. Two key messages stem from the analysis conducted. On the one hand, the policy interventions so far adopted have been narrowly devised so that, while partially addressing a problem, they often create new challenges. On the other hand, more fundamental and market based policies, with which few countries have only recently started experimenting, should be pursued. In general, specific policies with negligible tradeoffs could be pursued including the use of flat fees, flat subsidies, unbundling of pension services, hybrid industrial organization models that combine public procurement techniques for inert participants and choice for participants with higher elasticity of demand.

Chapter IV discusses policies aimed at increasing gross risk adjusted expected rates of return. Namely, the chapter supports the progressive liberalization of the regulatory framework for investments and the adoption of life cycle funds that has been observed in Latin American and Eastern European countries in recent years, so as to promote financial innovation and offset participants’ inertia. The chapter suggests that even within a rule-based framework, welfare gains could be achieved by reviewing investment rules, mandating the use of deferred annuities and long-term duration bonds towards retirement and increasing the number of default investment options. However, substantial additional welfare gains for participants could only be achieved within a risk-based framework by reconnecting the accumulation phase with the decumulation phase through the use of target retirement date annuitization funds without introducing liabilities for private providers.

Chapter V concludes and summarizes the lessons that can be drawn from the conceptual frameworks discussed in the previous chapters, as well as indicating important areas for future research.

III REFERENCES


Competition And Asset Allocation Challenges For Mandatory DC Pensions


Chapter II

Industrial Organization Issues And Their Consequences

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IV  INTRODUCTION

This chapter analyzes the nature of the markets for mandatory defined contribution pensions. It describes key market characteristics and explains their causes by discussing the properties of the underlying supply and demand for pension services.

First, the markets for mandatory defined contribution pensions display high barriers to entry and concentration that result from a series of demand and supply characteristics. On the supply side, sunk costs and natural economies of scale characterize the provision of important pension services. The regulatory framework does set various entry criteria inter alia minimum capital requirements, fit and proper test and experience, but these do not constitute a major entry barrier explaining the high concentration levels. On the demand side, consumers’ participation is characterized by inertia and switching and search costs.

In addition, the combination of these demand and supply characteristics creates market power for firms which, in turn, yields important distortions on both the demand and supply side. For instance, providers invest excessively in marketing to attract inert consumers. These expenditures may provide some financial education to consumers but they do not appear to be directed to improving the quality of asset management. Alternatively, price distortions and rent redistribution are probably the most obvious consequences of market power. Facing a pool of captive consumers, providers are encouraged to charge fees substantially above average costs.

Finally, demand and supply distortions reinforce market power. For instance, marketing expenditures are essentially a fixed cost for firms that is set endogenously and that increases barriers to entry and therefore, market power. Alternatively, price distortions including the use of loyalty bonuses or discounts create endogenous switching costs aimed at increasing price inertia and therefore, market power.

This Chapter draws from Dayoub and Lasagabaster (2008), especially commissioned for this report, and it is organized as follows. Section II defines the “quasi-market” nature of mandatory defined contribution pensions. Section III discusses key characteristics of these quasi-markets. Section IV and Section V discuss the characteristics of the supply and demand of pension services. Conclusions follow in Section VI.

V  THE QUASI-MARKET NATURE OF MANDATORY DEFINED CONTRIBUTION PENSIONS

The systemic pension reforms of the last decades that introduced mandatory second pillars have all shared the following characteristic: individual workers are still mandated to participate but the State essentially stopped being both the funding agent and the provider of pension services, as far as second pillars are concerned. In addition, provision of pension services is now shared with private sector providers. Finally, the role of the State is limited to co-funding pension services whilst participants are mandated to purchasing services from a variety of private or public sector providers, all operating in competition with one another.
In other words, the reforms created a “quasi-market” for pension services. The term was introduced and used by Le Grand (1991), Le Grand and Bartlett (1993) and Glennerster (1991) to describe and assess the welfare impact of the education reforms of the Thatcher government in 1998. A quasi-market is a “market” because it replaces the monopolistic state provider with competitive independent ones. It is also “quasi” because it differs from conventional markets in various ways. On the supply side, there is competition among firms as with conventional markets. These however, may not necessarily maximize profits but often maximize market shares or some form of participants’ welfare. In addition, the governance structure of pension providers varies considerably, including for-profit firms, mutual associations, and state owned enterprises.

On the demand side, consumer purchasing power is not expressed by money, as in markets, but by budget or vouchers earmarked to the purchase of specific pension services. In the case of mandatory defined contribution pensions, the voucher is financed by mandatory contributions from the beneficiary himself and is often subsidized by earmarked state budget or a combination that includes a subsidy and labor tax exemptions. In addition, consumers cannot withdraw from the quasi-market and this limits their capacity to impose market discipline. Indeed, the demand for services in quasi-markets is highly inelastic to prices and, even if in theory consumers can change provider, they hardly do it voluntarily.

Due to the different nature of the demand and supply, the welfare analysis for consumers participating in quasi-markets is far from obvious. The classic concerns relate to the ability of quasi-markets to produce X-efficiencies and improve allocation efficiency. With X-efficiencies, the indeterminacy of firms’ objectives (profits, market share, participants’ welfare, et cetera) creates ex ante uncertainty on how firms react to market incentives. For instance, due to the inertia of participants, providers engage in excessive marketing and are encouraged to create switching costs for participants to defend their investments with ambiguous impact on overall costs. With allocation efficiency, quasi-markets are expected to increase consumer choice and improve quality of service with respect to monopolistic state providers. Whilst it is a priori unclear why this should be the case, it is clear that more choice is not necessarily Pareto improving for the case of financial services. Indeed, consumers of financial services are not always rational and are often disinterested. Even when rational, they frequently lack the financial education to process the relevant information and the will power to consistently implement their decisions. In the specific case of pension services, it is safe to question whether individual consumers are best equipped to solve the relevant intertemporal strategic asset allocation problem to maximize their expected replacement rates. Maybe, the solution to this problem would be best left to professionals as suggested in Chapter IV.

11 The quasi-market idea was actually put in practice well before the Thatcher government by the replacement of concessionary fares with transport vouchers in the UK almost two decades earlier and it can be traced back to the education vouchers originally proposed by Milton Friedman.
12 A quasi-market may also emerge in the absence of formal compulsion if incentives for participation lead to the creation of a de facto captive clientele. These incentives can be financial (like tax deductions, subsidies and exemptions) or non-financial (like mandatory participation cum opt-out clauses, stigma or addiction).
For simplicity of exposition in what follows, we will use the terms “market” and “quasi-market” interchangeably when referring to mandatory defined contribution pensions, unless otherwise noted.

**VI** **KEY CHARACTERISTICS OF MANDATORY DEFINED CONTRIBUTION PENSIONS**

The supply of pension services in mandatory defined contribution quasi-markets is organized in various ways around the world but it exhibits few general characteristics. First, most jurisdictions allow only specialized entities to provide pension services. Second, markets are fairly concentrated and firms exhibit high indices of market power. Finally, price performance is heterogeneous both across and within countries but it is generally believed to compare unfavorably relatively to voluntary markets for similar asset management products.

**VI.A Sole purpose vehicles**

Most jurisdictions allow only specialized, sole purpose pension firms in the market while few allow a wider range of financial institutions to manage defined contribution plans. The widespread use of sole purpose providers has its origins in the introduction of mandatory privately managed individual accounts in Chile back in 1980. The reform created the need for a new legal and regulatory framework as well as for the definition of entities that could manage pension funds. At the time of the reform, experience with pension fund management was limited, which raised strong concerns about principal-agent problems in the pension industry, and a high premium was given to ease of supervision. Therefore, the Chilean pension law (Decree No. 3,500/1980) determined the creation of new financial entities with the exclusive purpose of managing pension funds (the pension plan administrators or pension firms). Certain types of institutions, in particular banks, were prohibited from participating directly in the ownership of pension firms. It was considered that a specialized pension fund manager (pension firm) would be easier to supervise and that potential conflicts of interest and risks would be more adequately controlled for, resulting in enhanced consumer protection. Similar models requiring specialized pension firms have been adopted in other countries in Latin America and Eastern Europe. Licensing criteria typically require *inter alia* a minimum capital, a fit and proper test, and a business plan. The minimum capital usually ranges from about US$150,000 to US$1,000,000. In Chile’s case, for example, the minimum capital required for a license is close to US$150,000 and the minimum increases with the number of members but does not exceed US$0.5 million. Other jurisdictions with more mature financial markets, such as Australia, Sweden, and the UK, have permitted a wider range of financial institutions to manage mandatory defined contribution plans (Bateman (2000) and Palmer (2004, 2006)).

The governance structure of pension firm varies somewhat among countries, including private providers often sponsored by large financial holding companies (in Latin America) or insurance companies (Poland), public providers and open mutual associations. Argentina, Costa Rica, Uruguay and Mexico have also allowed the

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13 EU regulation however, pushes this minimum requirement to EUR2.5 million.
operation of public pension firms. In Hungary, while the governance structure is designed to grant decision powers to fund members, this outcome does not materialize in many plans. The open mutual association nature and the absence of capital requirements imply that, in most cases, the local mandatory pension funds needed a sponsor to meet start-up costs. As a result, the Hungarian mandatory defined contribution pension industry is divided in three groups of pension fund managers: 1) those sponsored by financial institutions; 2) those sponsored by large employers, and 3) the independent plans (i.e., without a sponsor) (Impavido and Rocha (2006)). In Poland, the pension fund industry has ownership links with the insurance sector and is largely operated by foreign companies. For example, the seven largest managers are controlled by insurance companies, three managers are controlled by banks and there are also two managers, the controlling companies of which, are not linked to active financial sector holding groups.

Broadly speaking, the licensing criteria have not constituted a major entry barrier for pension fund administrators in Latin America and Eastern Europe. Some jurisdictions, however, require a minimum level of reserves to support a minimum relative return guarantee, which involves bands around the average industry and the obligation for pension fund administrators to bring any return to the minimum with its own compulsory reserves. In Chile, for example, compulsory reserves are equivalent to one percent of assets under management so that the whole industry holds a reserve equivalent to 0.75 percent of GDP. Even in jurisdictions without such reserve requirements, concentration is high as highlighted below. This suggests that non-regulatory barriers to entry are far more important in explaining concentration. These include high exogenous economies of scale resulting from the bundling of pension services and other endogenous economies of scale resulting from high marketing expenditures motivated by inert consumers and switching costs. We discuss these barriers in the next sections.

VI.B Concentration
The market for mandatory defined contribution pension funds is typically fairly concentrated and, for the most part, concentration has increased over time through mergers and acquisitions as displayed in Table 1. Industry concentration is particularly high in small countries, such as Bolivia and El Salvador, where two managers cover the entire market. In Bolivia, the government initially granted operating licenses for two pension firms, with an exclusivity period of five years, through an international bidding process. In El Salvador, five pension fund managers were initially set up in 1998. Two years later, three managers merged and the license of a fourth manager was revoked for operating without sufficient capital.

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14 In particular, the Mexican government has always had a participation in a private pension firm (AFORE XXI), aimed at private sector employees, and created a government agency pension firm (PENSIONISSSTE) following the reform of the federal civil servants’ pension plan of 2007, aimed at federal civil servants and other public sector employees.
Table 1: Concentration Indicators – Select Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Dec '98</th>
<th>Dec '03</th>
<th>Dec '05</th>
<th>Dec '06</th>
<th>Dec '07</th>
<th>C2 (percent) /1</th>
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<tbody>
<tr>
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<td>12</td>
<td>11</td>
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<tr>
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<tr>
<td>El Salvador</td>
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<tr>
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<tr>
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Notes: /1 C2 refers to the share of assets managed by the largest 2 administrators.


Concentration is high and increasing also in more mature economies. In 2007, the two largest Chilean pension firms managed about 55 percent of pension funds assets, which were equivalent to around 40 percent of GDP. This high concentration can be related to an intensive industry consolidation in the late-1990s.15 Argentina and Mexico, with a larger market, show greater diversification. Concentration in the latter country, as well as in Peru, declined in recent years due to regulatory changes that facilitated entry of newcomers, but started to increase following the regulatory amendments that came into effect in March 2008.16 High concentration is also prevalent in jurisdictions with mandatory defined contribution pensions outside the Latin American region.17 In Hungary, the number of local mandatory provident funds declined from 38 in 1998, year after the pension reform, to 18 in 2004 while assets under management in the 6 largest funds averaged 83 percent over the same period (Impavido and Rocha (2006)). In Poland, the three largest pension firms accounted for about 64 percent of the assets under management in the system in 2005, while this share was about 76 percent for Slovakia in 2006 (Rocha and Rudolph (2007)). In general, trends towards higher concentration are typical of the asset management industry. For instance, industry concentration measured by the assets under management of the world’s largest 500 fund managers, has grown in recent years and the share of the largest 20 of these fund managers increased from 29 percent in 1996 to 36 percent in 2004 (IFSL (2006)).

The only jurisdiction in Table 1 that shows both an increasing number of pension firms and decreasing asset concentration ratio over time is Mexico, especially between 2003 and 2006. This is the result of a series of reforms introduced starting with 2002.

15 In the early 1990s, a large number of small and mostly inefficient operators entered the market which unleashed an aggressive competition war and resulted in higher costs and inefficiencies. At the peak point in 1995, there were as many as 21 operators. The lack of viability of the small operators and changes in regulations led to a wave of mergers and acquisitions and, as of July 2007, six managers operate in Chile.
16 Concentration in Mexico declined from 2003 through 2007. During the second half of 2007, the Law was amended in Mexico to change *inter alia* the rule for assigning unallocated affiliates from the lowest fee to the highest net rate of return. The new measures came into effect in March 2008. The number of AFOREs declined to 18 following the approval of the 2007 legal amendments.
17 While trends towards more concentration are the norm, more mature countries like Australia, the United Kingdom, and Sweden have a more diversified industry.
which resulted in a much more contestable market\textsuperscript{18} but at the cost, in the view of some observers (Valdés-Prieto (2007)), of introducing distortionary subsidies in favor of potentially low asset management quality funds, without sufficient incentives to improve asset management quality.\textsuperscript{19}

VI.C Market power

A highly concentrated market can lead to excessive market power and produces important distortions on both the demand and supply side. On the demand side, market power implies: 1) price distortions; 2) losses in social welfare; and 3) rent redistribution from consumers to firms. Price distortions arise when a relative mark-up is imposed and therefore consumption takes place at higher prices relative to the competitive equilibrium. The magnitude of price distortions can be measured by the Lerner index and it is monotonically decreasing with the elasticity of demand to prices as explained in Box 1.

Box 1: Relationship Between Market Power and Demand Elasticity

The inverse relationship between market power, measured by the Lerner index, and the elasticity of demand is easily shown in the case of a profit-maximizing Cournot oligopoly of \( n \) different firms producing a single homogeneous good.

Let \( p(Q) \) the inverse demand function with \( Q = \sum_{i=1}^{n} q_i \) being the total output produced by the \( n \) firms.

Let \( C_i(q_i) \) be the supply function of the \( i \)-th firm: i.e., the cost (different for each firm) incurred by \( i \)-th the firm to produce \( q_i \) units of the good. Assume that both the demand and the supply functions are differentiable with \( p \varepsilon < 0 \) and \( C_i \varepsilon > 0 \). Firm \( i \) maximizes its profits by taking the quantities produced by the other firms as given. Therefore, the problem for the \( i \)-th firm implies choosing the quantity \( q_i \) such that:

\[
\max_{q_i} P_i(Q) = [p(Q) q_i - C_i(q_i)]
\]

This is found by solving the system of reaction functions \( q_i^* (Q^*, i) = q_i \) jointly with the other \( n-1 \) firms. This yields the Nash equilibrium \( q_i^* (Q^*, i) = q_i \), \( i = 1,L,n \) sold at the equilibrium price \( p^* = p(Q^*) \).

Notice in particular that the Lerner index for firm \( i \) is derived directly from the first order condition

\[
\frac{\partial p}{\partial q_i} q_i + p - \frac{\partial C_i}{\partial q_i} = 0.
\]

In other words:

\[
L I_i = \frac{p - C_i}{p} = \frac{p q_i}{p} = \frac{1}{e_i}
\]

where the left hand side of the last equation is the relative “mark-up”, also known as Lerner index, charged by firm \( i \) and \( e_i \) is the elasticity of the residual demand faced by firm \( i \).

In equilibrium, the market power if firm \( i \) is inversely proportional to the elasticity of its residual demand. For given \( q_i^* \), firm \( i \) will have a low market power if its residual demand is very elastic. It will have a high market power if its residual demand is very inelastic.

A social welfare loss arises when the combined surplus of producers and consumers decreases; in other words, when the surplus of the consumer decreases by more than the

\textsuperscript{18} Reform were then reversed in 2008.

\textsuperscript{19} Chapter III analyzes in greater detail the impact of regulations aimed at promoting competition.
increase in the surplus of the producer. The social welfare loss is also a function of the
demand elasticity but, contrary to the case of price distortions, the welfare loss is not
necessarily monotonically decreasing with it; this will depend on the interaction between
demand and supply. Finally, in the case of mandatory defined contribution pensions,
concerns arise also with the distribution of rents. With a highly inelastic demand, price
changes do not affect quantities consumed very much but elicit large monetary transfers
from consumers to firms. This is not a particularly desirable outcome for neither policy
makers, who mandate consumption, nor for pension providers, since rent redistributions
that are deemed socially unacceptable elicit strong political responses which can easily
jeopardize profit margins.

Market power can also have perverse effects on the supply side. These more subtle
distortions take the form of: 1) X-inefficiencies (Leibenstein (1966)); and 2) rent seeking
behavior. In general, we know that unless shareholders can perfectly monitor the
activities of the firm’s employees (executives and workers) and credibly threaten to
sanction deviations, firms are likely to engage in X-inefficiencies. The corporate
governance literature (Becht et al. (2003)) tells us that a whole series of mechanisms
(including board of directors, compensation packages and more generally, yardstick
competition\textsuperscript{20}) can be useful at mitigating the problem of separation between ownership
and control. However, most of these mechanisms are not available for pension funds. In
addition, market power and concentration reduce the scope and effectiveness of yardstick
competition in ensuring alignment of incentives between owners and managers. In other
words, market power makes it easier for the manager to slack and increase production
costs. These extra costs would add to the welfare loss that arises in the presence of price
distortions.

The other supply distortions relate to rent-seeking behavior. Firms in a non-
competitive market will incur strategic and/or administrative expenses to increase and
maintain their market power. R&D, lobbying, patent fees, legal fees for defense against
charges of antitrust violations and marketing expenditures that raise barriers to entry by
increasing endogenous switching costs\textsuperscript{21} are all examples of such expenses. For instance,
marketing expenses (salespeople, agency networks and advertising) create market power
by intensifying economies of scale (Comanor and Wilson (1967)), and these have been
particularly high in mandatory DC pensions. However, whether these expenses amount
to socially wasteful dissipation or not, depends on the circumstances. In the case of
financial services, sales agents typically play both a “positive” and a “negative” role. On
the one hand, they help consumers make educated choices in the purchase of financial
services. On the other hand, they can create noise and engage in persuasion and high-
pressure sales tactics, not necessarily for the benefit of consumers. We will discuss the
role of pension funds’ agents for the case of Mexico later on, but it is clear that whether
rents are socially wasted to produce noise or used to educate consumers is a matter for
further empirical estimation.

The following tables show the correlation between concentration and market power
for countries for which data at the individual pension firm level is publicly available.

\textsuperscript{20} Takeovers, debt as a monitoring device, institutional investors, \textit{et cetera}.

\textsuperscript{21} See APPENDIX A for a review of the literature on switching costs.
Concentration is measured in terms of the number of contributors and assets under management by the means of shares of the largest two, four and six firms and Herfindahl indices. Market power is measured by the means of Lerner indices, here approximated with average administrative income fee (net of disability insurance premiums, where needed) and average administrative expenses. The key message provided by these tables is that there exists a high correlation among the number of funds, concentration and market power. As a matter of fact, the latter two differ only by a factor which is function of the price elasticity of market demand as shown in Box 2.

**Box 2: Relationship Between Concentration and Market Power**

The Herfindahl-Hirschman index is defined as the sum of the market shares squared:

$$HHI = \sum_{i=1}^{n} (s_i)^2$$

where simply $s_i = q_i/Q$ is the market share of the $i$-th firm.

From Box 1 we learned that in the case of the profit-maximizing Cournot oligopoly of $n$ different firms producing a single homogeneous good, the Lerner index for firm $i$ can be expressed as the inverse of the price elasticity of its residual demand. We can further manipulate this to express the firm’s Lerner index as the inverse of the elasticity of the market demand weighted by the firm’s market share:

$$LI_i = \frac{1}{e_i} = \frac{p\bar{q}_i}{\bar{p}Q} = \frac{s_i}{\bar{e}_Q}$$

where $\bar{e}_Q$ is the elasticity of the market demand.

The market Lerner index is defined as the average of the firm Lerner indices weighted by their market shares:

$$LI = \frac{\sum_{i=1}^{n} s_iLI_i}{\sum_{i=1}^{n} s_i^2} = \frac{HHI}{\bar{e}_Q}$$

which gives us the relationship between market concentration and market power.

Market power is directly related to market concentration and the strength of this relationship is inversely proportional to the demand elasticity. If market demand is very elastic, changes in concentration will not have very large effects on pricing and hence, market power. If demand is very inelastic, changes in concentration can have large effects on pricing and therefore, produce important distortion on both the demand and supply side as mentioned in the text.

Table 2 presents the trends in concentration and market power for the four countries that have publicly available data on individual pension firms. Concentration is correlated to market size, although it is also affected by regulatory changes that facilitate the entry of new firms or encourage mergers/acquisitions and the exit of firms. While market power as measured by the Lerner index tends to be more volatile than market concentration as measured by the Herfindahl index, general correlations can be observed between the two indexes. The correlations tend to be lower at points in time when there is a firm entry or exit (or threat of entry due to a regulatory change) but tend to resume thereafter. The correlation between concentration and market power are not as strong in the case of Argentina due to the severe crisis of the early 2000s and the negative impact
that it had on the performance pension funds and the profits of pension funds for several years.

**Table 2: Trends in Concentration and Market Power**

<table>
<thead>
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<td>8</td>
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<td>37</td>
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<td>31</td>
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</tr>
<tr>
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</tr>
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<td>Firms /1</td>
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<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5/1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>HHI /2</td>
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<td>2661</td>
<td>2653</td>
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<td>52</td>
<td>55</td>
<td>25</td>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>

**Note:**
1/ Number of pension firms; 2/ Herfindahl index calculated on the basis of assets and scaled by 10,000; 3/ Lerner index weighted by assets.

**Source:** own calculations on data from respective supervisory authorities.

In Mexico, the largest six companies represent more than 70 percent of the market in terms of registered individuals served or assets under management. Two distinct periods can be identified: a period of increasing concentration and average market power until 2003 and a period of decreasing concentration and market power afterwards due to a series of reforms aimed at increasing contestability and generally competition in the market.\(^{22}\) Notice that at the peak of 2003, firms were on average charging a relative mark-up of around 50 percent of fee income, as indicated by the Lerner indices.

Argentina showed increasing levels of concentration. Compared to Mexico, Argentina displayed higher concentration especially towards the end of the sample. Nevertheless, average relative mark-ups are much lower\(^{23}\) than in Mexico, especially during the period 2002–05 when the economic crisis severely hit the profitability of AFJPs (Rofman (2007)).

In Chile, three phases can be identified. An initial phase, between 1981–90, characterized by high fees, high costs for pension firms, very little churning of firms, and rapidly rising profit levels towards the end of the phase. An intermediate competitive phase, between 1991–97, characterized by the entry of new companies, mergers and takeovers, decreasing level of profits and rising commissions in real terms. A final steady-state phase, from 1998 until present, characterized by little movement of companies, high yield levels and greater concentration. Table 2 covers the last two

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\(^{22}\) Prior to the 1999, the correlation between market power and concentration is low or negative due to the high expenditures incurred by pension administrators in the early years of operation of the system.

\(^{23}\) The Lerner index was calculated here by subtracting from both income fee and total costs the premium for disability and survivorship insurance. The presence of the public pension fund operation in Argentina may have explained why the mark ups in Argentina were generally lower than in Mexico even though concentration tended to be higher.
Competition And Asset Allocation Challenges For Mandatory DC Pensions

phases. Notice that since 1998/2000, the average mark-up charged by Chilean pension firms has gradually increased reflecting the upward trend in the earnings related fee base.

Finally, the number of firms in Peru is much smaller than in countries like Argentina and Mexico, but a similar pattern of increasing market power can be observed. Again, pension firms charged on average a 50 percent relative mark-up until 2004 and, on average, charged more than in Argentina. However, a sudden drop in profit margins took place after 2005 when PRIMA AFP entered the market as direct competitor of PROFUTURO AFP and UNIÓN VIDA AFP. This sparked a marketing war aimed at defending market shares by the incumbents. The drop in relative mark-ups in 2006 could be explained by the huge loss of PRIMA AFP that in that year had reached already 27 percent of the market and, at the same time, by the fact that marketing expenses doubled in the same year reducing a lot profit margins for all firms. The marketing war seemed to have stopped in 2007 following the merger of UNIÓN VIDA AFP and PRIMA AFP during the second half of 2006.

VI.D Price performance

The other characteristic of mandatory defined contribution pensions is that fees are set substantially above average costs. Very few studies have attempted to compare price performance across countries in a systematic manner because cross-country comparisons are hampered by several factors. Ideally, fees should be compared relatively to the cost structure of pension firms since this is likely to differ across and within countries, due to the heterogeneous industrial organization of pension services. Unfortunately, a systemic cross-country analysis of cost structures has not been conducted, due to the unavailability of accounting data disaggregated by cost functions. In addition, differences in key parameters such as retirement age, density of contribution, contribution rates, salary bases and assets under management further render international comparisons problematic.

Despite these caveats, several key policy issues emerge from cross-countries comparisons: 1) most countries require “uniform rates” to fees which may discourage investment in asset management quality; 2) measures of equivalent fees are highly variable within and across countries; and 3) fees charged by pension firms do not always compare positively with similar service providers resulting in excessive returns on equities.

Most countries require the application of uniform fee rates to fee bases that grow with earnings (say, contributions, assets or both) creating a redistributive scheme from high- to low-base participants which relieves the latter from the burden of paying fees.

All pension funds in Latin American countries charged principally fees as a percentage of the locally relevant earnings base (on the “flow”) and, in some countries, other types of fees were also charged. This is reported in Table 3, which compares average first floor fees charged by pension firms in Latin America in early 2006. In Chile, firms could only charge first floor fees on the flow but de facto charged second floor fees on assets under management (on the “stock”) as well, since participants’

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24 First floor fees include all fees charged by pension firms to participants for services provided directly by them. Second floor fees include fees that are charged by service providers to pension firms which, in turn, pass them onto participants.
accounts are credited only with the net rate of return from the management of foreign assets.\textsuperscript{25} In addition, pension firms in Chile and Uruguay charged flat fees on every flow, irrespective of its size. Pension firms in Mexico and Bolivia charged additional fees on assets under management, and those in Costa Rica included additional charges on nominal returns. The Dominican Republic is the only country where pension firms had additional charges on excess benchmark returns. Finally, discounts were offered in a number of jurisdictions according to the number of years a consumer has either participated in the system and/or has been client of a pension fund.

Table 3: Average First Floor Fees Charged in Latin American Countries (2006)

<table>
<thead>
<tr>
<th>Country</th>
<th>Proportional charge on flows (percent of salary)</th>
<th>Fixed charge on flows (US$)</th>
<th>Charge on assets under management</th>
<th>Charge on nominal returns</th>
<th>Charge on excess returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>1.27%</td>
<td>--</td>
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<td>--</td>
</tr>
<tr>
<td>Bolivia</td>
<td>0.50%</td>
<td>0.2285% /1</td>
<td>--</td>
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</tr>
<tr>
<td>Chile</td>
<td>1.60%</td>
<td>$0.90</td>
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</tr>
<tr>
<td>Colombia</td>
<td>1.57%</td>
<td>--</td>
<td>--</td>
<td>7.50%</td>
<td>--</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>0.14%</td>
<td>--</td>
<td>--</td>
<td>28.57% /2</td>
<td>--</td>
</tr>
<tr>
<td>El Salvador</td>
<td>1.40%</td>
<td>--</td>
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</tr>
<tr>
<td>Mexico</td>
<td>1.20%</td>
<td>0.34%</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Peru</td>
<td>1.81%</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Dominican Rep.</td>
<td>0.50%</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>28.57% /2</td>
</tr>
<tr>
<td>Uruguay</td>
<td>2.07%</td>
<td>$0.26</td>
<td>--</td>
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<td>--</td>
</tr>
</tbody>
</table>

Notes: /1 Different charges apply depending on the fund size; /2 The fee applies to the excess return paid over the interest rate of commercial banking cash deposits.

Source: Corvera et al. (2006).

The other characteristic of prices in mandatory defined contribution pensions is that they tend to be highly heterogeneous across and within countries. Corvera et al. (2006) develop a methodology to facilitate the comparison of different fee structures across countries by estimating “equivalent fees” on assets or on the flow. The equivalent asset fee is calculated as the annualized charge over assets that would have generated the same final asset accumulation as the actual combination of charges on the flow, assets and returns applied to the individual retirement account of a representative consumer\textsuperscript{26} during a given period of time (say, 25 and 40 years as reported in the following tables).

They calculate the equivalent asset based fee for 67 pension managers in Latin America and find that dispersion for pension management fees is large, both across and within countries. Cross-country dispersion in fees can be partially explained by differences in the services that pension managers are forced to provide as well as the degree to which the pension system’s architecture in each country takes advantage of economies of scale. However, they found that intra-country fee dispersion seems to be related to inadequate competition and the presence of state-owned managers, which tend to charge lower fees.

\textsuperscript{25} Following the 2008 reform, Chilean pension firms can only charge fees on asset management.

\textsuperscript{26} In order to make the calculations as comparable as possible across countries the authors need to assume same accumulation periods, rates of return, contribution density but allow for country specific average wages and contribution rates. The uniform assumptions provide a reasonable tradeoff between comparability and actual charges in each country.
Table 4: Latin America 25-Year AUM Equivalent Fees (percent)

<table>
<thead>
<tr>
<th>Country</th>
<th>Min</th>
<th>Max</th>
<th>Weighted average</th>
<th>Standard deviation</th>
<th>Coeff. Of variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>1.20</td>
<td>1.45</td>
<td>1.35</td>
<td>0.09</td>
<td>6.89</td>
</tr>
<tr>
<td>Bolivia</td>
<td>0.53</td>
<td>0.53</td>
<td>0.53</td>
<td>0.00</td>
<td>0.20</td>
</tr>
<tr>
<td>Chile</td>
<td>0.98</td>
<td>1.21</td>
<td>1.07</td>
<td>0.08</td>
<td>7.31</td>
</tr>
<tr>
<td>Colombia</td>
<td>0.81</td>
<td>1.01</td>
<td>0.92</td>
<td>0.08</td>
<td>8.44</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>0.75</td>
<td>1.10</td>
<td>1.02</td>
<td>0.16</td>
<td>15.26</td>
</tr>
<tr>
<td>El Salvador</td>
<td>0.86</td>
<td>0.86</td>
<td>0.86</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>México</td>
<td>0.67</td>
<td>1.51</td>
<td>0.89</td>
<td>0.20</td>
<td>22.48</td>
</tr>
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<td>Peru</td>
<td>0.94</td>
<td>1.22</td>
<td>1.10</td>
<td>0.13</td>
<td>11.64</td>
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<tr>
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<td>1.01</td>
<td>1.01</td>
<td>0.09</td>
<td>8.95</td>
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<td>0.74</td>
<td>1.14</td>
<td>0.90</td>
<td>0.19</td>
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The fees of the most expensive firms are about two to three times higher than the least expensive one. Corvera et al. (2006) find that Argentina, Mexico and Peru have the most expensive firms calculated with a 25-year horizon (Table 4 and Figure 1). Argentina, the Dominican Republic and the Costa Rica have the most expensive firms calculated with a 40-year horizon (Table 5 and Figure 2). Bolivia, Colombia, and El Salvador have the least expensive plans and present low price dispersion across firms. Corvera et al. (2006) also find that fees have largely stagnated over the years and are unlikely to decline in the medium term due to insufficient competition, especially in El Salvador and Bolivia where there is a duopoly market structure.

Table 5: Latin America 40-Year AUM Equivalent Fees (percent)

<table>
<thead>
<tr>
<th>Country</th>
<th>Min</th>
<th>Max</th>
<th>Weighted average</th>
<th>Standard deviation</th>
<th>Coeff. Of variation</th>
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<td>0.77</td>
<td>0.05</td>
<td>6.87</td>
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<td>0.39</td>
<td>0.39</td>
<td>0.00</td>
<td>0.27</td>
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<td>Chile</td>
<td>0.56</td>
<td>0.69</td>
<td>0.61</td>
<td>0.04</td>
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<tr>
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<td>0.53</td>
<td>0.04</td>
<td>8.42</td>
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<td>0.92</td>
<td>0.13</td>
<td>14.01</td>
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<td>México</td>
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<td>0.07</td>
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<td>0.84</td>
<td>0.09</td>
<td>10.80</td>
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<td>0.42</td>
<td>0.65</td>
<td>0.51</td>
<td>0.11</td>
<td>20.89</td>
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</table>


27 See Table 4, Table 5, Figure 1 and Figure 2.
28 In these three countries, either the regulator or the law stipulates price ceilings. Price ceilings are also used in the Dominican Republic, Hungary and Poland. In the first two countries, they have not resulted in the low fees observed in other countries (see Figure 1, Figure 2 and Table 6). Furthermore, as discussed in Chapter III, caps affect incentives to improve asset management quality.
Figure 1: Latin America 25-Year AUM Equivalent Fees (dispersion)


Figure 2: Latin America 40-Year AUM Equivalent Fees (dispersion)

Table 6: Eastern Europe 25 and 40-Year AUM Equivalent Fees (percent)

<table>
<thead>
<tr>
<th>Country</th>
<th>Min</th>
<th>Max</th>
<th>Weighted average</th>
<th>Standard deviation</th>
<th>Coeff. Of variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary</td>
<td>0.39</td>
<td>1.44</td>
<td>1.15</td>
<td>0.34</td>
<td>29.56</td>
</tr>
<tr>
<td>Poland</td>
<td>0.39</td>
<td>0.41</td>
<td>0.40</td>
<td>0.01</td>
<td>2.51</td>
</tr>
<tr>
<td>Slovakia /1</td>
<td>0.90</td>
<td>1.00</td>
<td>0.95</td>
<td>0.04</td>
<td>4.21</td>
</tr>
</tbody>
</table>

25-year equivalent fee

<table>
<thead>
<tr>
<th>Country</th>
<th>Min</th>
<th>Max</th>
<th>Weighted average</th>
<th>Standard deviation</th>
<th>Coeff. Of variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary</td>
<td>0.24</td>
<td>1.29</td>
<td>1.00</td>
<td>0.34</td>
<td>34.02</td>
</tr>
<tr>
<td>Poland</td>
<td>0.23</td>
<td>0.26</td>
<td>0.24</td>
<td>0.01</td>
<td>4.17</td>
</tr>
<tr>
<td>Slovakia /1</td>
<td>0.85</td>
<td>0.96</td>
<td>0.91</td>
<td>0.05</td>
<td>5.49</td>
</tr>
</tbody>
</table>

40-year equivalent fee

Notes: /1 Unweighted.
Source: Own calculations on Corvera et al. (2006).

Some mandatory pension plans in Eastern Europe with similar structures to the ones in Latin America also display high fees. The methodology developed by Corvera et al. (2006) was also applied to countries like Poland, Slovakia and Hungary. The calculations made on Hungary apply to the system before it introduced caps on fees in 2007 and they report 20 and 40-year assets under management equivalent fees much higher than for other countries in Eastern Europe and Latin America. Equivalent fees for Poland show a decline to 40 and 25 basis points by 2030 and 2045, respectively, and compare to the least cost Latin American firms operating in Bolivia. Equivalent fees for Slovakia are comparable to the ones obtained for Latin American countries.

Figure 3: Eastern Europe 25-Year AUM Equivalent Fees (dispersion)

Source: Corvera et al. (2006).

29 The information for these countries is less recent: Poland, December 2006; Hungary, December 2005; and Slovakia, February 2007.
Finally, the charges applied by pension firms in both Latin America and Eastern Europe (see Chapter III for relevant data) do not positively compare to the 50 and 100 basis points that large US occupational funds and mutual funds charge, respectively, or the Swedish mandatory DC plan. For instance, the average fee for stock funds, bond

Table 7: Mutual Fund Fees and Expenses in the US, 2000-05 (basis points)

<table>
<thead>
<tr>
<th>Fees and expenses</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stock Funds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load fees (annualized)</td>
<td>30</td>
<td>25</td>
<td>24</td>
<td>23</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Expense ratio</td>
<td>98</td>
<td>99</td>
<td>100</td>
<td>99</td>
<td>95</td>
<td>91</td>
</tr>
<tr>
<td>Total fees and expenses</td>
<td>128</td>
<td>124</td>
<td>124</td>
<td>122</td>
<td>117</td>
<td>113</td>
</tr>
<tr>
<td><strong>Bond Funds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load fees (annualized)</td>
<td>27</td>
<td>22</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Expense ratio</td>
<td>76</td>
<td>74</td>
<td>73</td>
<td>74</td>
<td>72</td>
<td>70</td>
</tr>
<tr>
<td>Total fees and expenses</td>
<td>103</td>
<td>97</td>
<td>93</td>
<td>94</td>
<td>92</td>
<td>90</td>
</tr>
<tr>
<td><strong>Money Market Funds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load fees (annualized)</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Expense ratio</td>
<td>49</td>
<td>47</td>
<td>45</td>
<td>43</td>
<td>42</td>
<td>41</td>
</tr>
<tr>
<td>Total fees and expenses</td>
<td>49</td>
<td>47</td>
<td>45</td>
<td>43</td>
<td>42</td>
<td>41</td>
</tr>
</tbody>
</table>

Notes: Fees measured as asset weighted averages. The expense ratio is the amount of expenses that a fund charges its shareholders every year. n.a. means not available.


Comparing the fees of pension funds in Latin America and Eastern Europe to those of mutual funds in the same countries would not be very relevant for a variety of reasons, most importantly the former benefit from a very large captive market while the mutual fund industry targets a voluntary market and assets under management are relatively smaller. Thus, the US mutual fund industry with larger funds is a more relevant indicator, albeit far from perfect.
funds, and money market funds (more relevant comparators given the portfolio structure of pension firms) are around 30-70 basis points (Table 7). The Swedish mandatory defined contribution plan, in operation since 2000, charges fees close to 77 basis points and authorities expect these fees to decline to less than 30 basis points by 2025 (Rocha and Rudolph (2007)).

VI.E Supernatural profits
As a consequence of the aforementioned price distortions, pension firms in many Latin American countries have registered exceptionally high rates of return on equity. In Chile, for example, operating costs fell significantly after 1997 due to reduced expenditures in marketing services. However, the corresponding decrease in fees was substantially smaller leading to a remarkable increase in firms’ returns on equity, which reached 51 percent in 2000. Returns started to fall thereafter partly to absorb an increase in insurance premiums. In El Salvador, a small country with a duopoly market, the returns on equity in 2005 were as high as 39 percent. By contrast, returns on equity have decreased in Mexico since 2002 when competition started to rise as a result of regulations that facilitated the entry of low cost operators and switches across pension firms. Similarly, the returns on equity have been declining in Peru since 2004, mostly due to regulatory changes and the entry of new operators (Figure 5).

In Eastern Europe, pension firms have also been able to recover their start-up costs within relatively few years and to generate high returns on equity in recent years. For example, in 2004, the returns of Hungarian pension firms were about 16 percent. In Poland, they were 22 percent in 2004 and 24 percent in 2005 (Rocha and Rudolph (2007)). More interestingly, average returns on equity of pension firms have been higher than average returns on equity of banks (except for Mexico), which are subject to stricter capital requirements, manage a more complex business, and bear much higher risks (Figure 6).

31 Since pension funds in Latin America and Eastern Europe tend to be passive investors, fees would need to be smaller than the average fees charged by mutual funds of the same size in the US. Also, the fees of US mutual funds reflect large distribution fees associated with the provision of financial advice and other services such as individual retirement planning, education and tax returns.
An alternative measure of profitability is given by return on assets, but this is more difficult to measure since the net returns should be divided by assets at replacement costs.
which requires special data adjustments.\footnote{The first adjustment is to exclude assets not required by the business, such as financial investments, investments in other firms and investments in buildings that can be rented. The second adjustment is to add the replacement cost of intangible assets, which by convention depreciate more quickly than what their actual economic life would suggest. The third adjustment is to add the expected cost of contingencies such as the penalty for violating the floor to relative returns and the expected cost caused by unusual regulations such as excessive capital requirements and excessive stabilization reserve, after optimization.} Using this methodology, Valdés-Prieto and Marinovic (2005) estimate a 50 percent annual return on assets for Chilean pension firms during the period between 1999–2003.

The next two sections provide a rationale for the relatively poor price performance of mandatory defined contribution pensions by analyzing the characteristics of the supply and the demand of pension services, respectively.

\section*{VII \ THE SUPPLY OF PENSION SERVICES}

The supply of pension services is generally characterized by economies of scale that promote concentration and reduce the contestability of the market. The typical services provided by pension firms include:

1) Record-keeping. This includes, for instance, maintaining the registry of flows into (mainly contributions) and out of (personal loans, sometimes) each individual account, determining the end of period value (or share) of the account, managing the transfer of accounts from one pension fund to the other and providing the necessary treasury services related to these operations.

2) Benefits payment. This includes the determination of benefits and their payments. Often, it also includes advising consumers on retirement options. Frequently, these functions are shared with other institution within the financial group.

3) Marketing. This often includes maintaining a sale force or subcontracting this function to a specialized agency, designing and launching public information campaigns through mass media, and allowing for crossed sales to exploit distribution channels of companies providing complementary goods that exploit economies of scope.

4) Collection of contributions. This involves both enforcing the physical collection but also reconciling the information linked to contributions with the amount of contributions collected. This function is therefore, strictly related to record keeping. Many countries like Argentina, Colombia, Poland, Bulgaria, Mexico, Sweden, and more recently Hungary have centralized this service (either through the tax authority or the local social security scheme).

5) Insurance. In most jurisdictions, pension funds are also involved in the provision of insurance benefits. These primarily include disability and survivorship benefits but can include pure life and annuity. Sometimes, pension funds simply negotiate contracts with insurance companies on behalf of consumers. More often, they act as insurers; typically, in the case of disability and buy reinsurance from insurance companies. More rarely, Mexico for instance, disability insurance is managed by...
separate entities and the role of pension funds in this is simply limited to record-keeping.

6) Asset management. This function is often conducted in house but can be subcontracted.

A number of studies estimate the cost function of pension firms, especially in Latin America. Barrientos and Boussofiane (2001) and Marinovic and Valdés-Prieto (2004) for Chile, Apella and Maceira (2004) for Argentina, and Meléndez (2004) for Mexico found that there are significant economies of scale in the industry. The estimates of Marinovic and Valdés-Prieto (2004) also show that marketing costs contribute to raising economies of scale as suggested in the literature (Comanor and Wilson (1967)). Without marketing costs, the minimal efficiency scale declines substantially from about one million contributors (or 2 million registered individuals) to about 150,000 contributors (or 300,000 registered individuals). 

Apella and Maceira (2004) found that economies of scale in the Argentinean pension industry declined after 1997 in response to a regulatory change regarding the transfers of members across administrators, but remained significant. For Mexico, Meléndez (2004) found that the minimum efficiency scale is close to 1.15 (1.05) million members for pension fund managers that belong (do not belong) to a financial conglomerate. Nevertheless, Aguilera et al. (2006) suggest that previous studies used wrongly specified cost curves. By using instead a semi-parametric cost function, they found that economies of scale are low in Mexico (about 800,000 members or 2 percent of the market share) and that the industry has dramatically reduced its costs since 2002 when the authorities started introducing regulatory changes aimed at promoting competition in fees.

The discrepancy in results in the aforementioned studies has three main sources: 1) lack of reliable data to analyze cost determinants (in particular, disaggregated accounting cost data, when available, may suffer from arbitrary allocations and inconsistencies across countries); 2) methodological difficulties inherent in the definition of output produced by a pension firm; and 3) possible misspecification in some studies (namely, omitted variables) due to data inconsistencies across countries. Nevertheless, while there is some uncertainty on the magnitude, the literature is unambiguous in showing that these economies of scale exist, especially in functions such as collection of contributions, account administration, record-keeping and in passive (but not active) asset management.

The decrease in average administrative costs of pension funds over time provides further evidence of economies of scale. Overall, there has been a dramatic decline in the operational costs of the pension fund industry (Table 8), accompanied by increasing returns on equity to fund managers. International comparison of operational expenses as a share of assets or per member should not be directly interpreted as a measure of relative efficiency as the ratios are highly influenced by coverage and volume of assets. Nevertheless, it is striking that in 2006, operational expenses in Argentina were about 4 –
5 times higher than in Bolivia notwithstanding the fact that assets under management in
the former country were about 13 times higher than in the latter country.

Table 8: Operational Expenses in Latin America, 2000 and 2006

<table>
<thead>
<tr>
<th>Country</th>
<th>Per member (US$)</th>
<th>Over assets (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>75.80</td>
<td>26.95</td>
</tr>
<tr>
<td>Bolivia</td>
<td>18.16</td>
<td>5.48</td>
</tr>
<tr>
<td>Chile</td>
<td>34.52</td>
<td>38.37</td>
</tr>
<tr>
<td>Colombia</td>
<td>n.a.</td>
<td>39.56</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>n.a.</td>
<td>16.72</td>
</tr>
<tr>
<td>El Salvador</td>
<td>76.43</td>
<td>17.34</td>
</tr>
<tr>
<td>Mexico</td>
<td>42.22</td>
<td>25.55</td>
</tr>
<tr>
<td>Peru</td>
<td>31.32</td>
<td>39.54</td>
</tr>
<tr>
<td>Dominican Rep.</td>
<td>n.a.</td>
<td>8.35</td>
</tr>
<tr>
<td>Uruguay</td>
<td>53.14</td>
<td>20.69</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>48.34</td>
<td>28.18</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>47.37</td>
<td>23.85</td>
</tr>
<tr>
<td><strong>Std. deviation</strong></td>
<td>22.32</td>
<td>12.46</td>
</tr>
</tbody>
</table>

Note: n.a. means not available.
Source: AIOS.

Expenditures were particularly high in the early years of the reform due to both small
asset and member bases. In addition, pension firms incurred important inception-related
costs, such as marketing costs to attract new members (Table 9). Marketing costs
remained high in many countries and, in 2006, they accounted for about 26 and
11 percent of total operating expenses of pension fund managers in Mexico and
Argentina, respectively, but have declined substantially in Chile to 4 percent (AIOS
(2006)). In Hungary, operating expenses of pension funds as a share of total
contributions decreased from 6.8 percent in 2001 to 6.5 percent in 2004 and, in contrast
with most systems in Latin America, marketing-related costs as a share of total operating
costs have been very small (about 2.1 percent of the total operating costs in 2004).36

Table 9: Number of Sales Agents in Select Countries, 2000–05

<table>
<thead>
<tr>
<th>Country</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>11,683</td>
<td>11,381</td>
<td>9,118</td>
<td>9,227</td>
<td>9,120</td>
<td>8,161</td>
</tr>
<tr>
<td>Bolivia</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>70</td>
<td>66</td>
<td>67</td>
</tr>
<tr>
<td>Chile</td>
<td>4,382</td>
<td>3,868</td>
<td>3,944</td>
<td>3,812</td>
<td>2,281</td>
<td>2,348</td>
</tr>
<tr>
<td>Colombia</td>
<td>4,933</td>
<td>3,853</td>
<td>3,341</td>
<td>2,941</td>
<td>2,554</td>
<td>2,622</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>n.a.</td>
<td>1,463</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>El Salvador</td>
<td>856</td>
<td>573</td>
<td>413</td>
<td>399</td>
<td>376</td>
<td>n.a.</td>
</tr>
<tr>
<td>Mexico</td>
<td>13,482</td>
<td>10,781</td>
<td>12,116</td>
<td>17,870</td>
<td>22,121</td>
<td>36,734</td>
</tr>
<tr>
<td>Peru</td>
<td>1,042</td>
<td>880</td>
<td>861</td>
<td>894</td>
<td>1,115</td>
<td>3,168</td>
</tr>
<tr>
<td>Uruguay</td>
<td>342</td>
<td>197</td>
<td>193</td>
<td>123</td>
<td>129</td>
<td>123</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>36,720</td>
<td>32,996</td>
<td>29,986</td>
<td>35,336</td>
<td>37,762</td>
<td>53,223</td>
</tr>
</tbody>
</table>

Note: n.a. means not available.
Source: FIAP.

36 It is possible that some marketing activities are performed by other companies in the same financial
group and the associated costs are hidden in the asset management fee (Impavido and Rocha (2006) and
Valdés-Prieto (2008)).
Despite the decrease in average costs, the industrial organization of mandatory pension services has not favored the exploitation of economies of scale. This is mostly due to the fact that policy interventions aimed at reducing barriers to entry and stimulating competition face a policy dilemma. For example, barriers to entry can be reduced by unbundling functions characterized by heavy sunk costs (such as contribution collection and disability insurance) from services with low economies of scale (such as active asset management). Many countries have already centralized collection of contributions but unbundling of other services has lagged behind since it has been argued that a single service package limits the consequences of participants’ inertia and economizes on search and administrative costs. Chapter III analyzes in detail the trade-offs faced by policymakers in implementing these and other regulations aimed at creating more competitive and efficient markets for pension services.

**VIII THE DEMAND OF PENSION SERVICES**

As Section III showed, market concentration leads to distortions only if it generates market power: i.e., if the demand is inelastic to prices. A well functioning market for mandatory defined contribution pensions requires consumers to react to relevant price parameters, such as administrative fees and gross rates of returns. Switches are probably the most important way with which the “market” disciplines asset managers: when consumers are dissatisfied with the performance or the quality of services in one pension fund, they can switch to another pension fund. In order for such discipline to be exerted, consumers need to be well informed as well as take rational decisions on the basis of such information. In short, the demand for pension services needs to be highly elastic to prices.

However, preliminary evidence presented below suggests that consumers are inert in the sense that they do not act on the information at their disposal. If they do act, they often act upon the wrong information or in a non-rational way. In general, consumers are inadequately appraised about their pension system. In some countries, the inertia problem is compounded by regulations restricting the number of switches between providers.

**VIII.A Inertia and elasticity of demand**

Inertia is pervasive among consumers of mandatory defined contribution pension. In Argentina, for example, around 80 percent of new members were assigned to pension firms by the pension supervisory agency in 2006. In Mexico, more than 70 percent of

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37 For example, the defined contribution pillar in the Swedish model unbundles asset management, which is subject to competition, from collection and record-keeping functions, which are centralized. This model has allowed managers to operate with modest fees (see Box 3).
38 This type of regulation has been used in Latin America as a tool to control what was perceived as “too much switching,” caused by marketing wars between pension fund providers (Chile in various episodes), and in some other cases others to prevent these marketing wars, like in Mexico from 1997 to 2003. New versions of this regulation recognize that null switching is also detrimental to competition. For instance, Mexico introduced a rule in 2008 whereby a switch to an AFORE that offers a higher net rate of return is allowed at any time, otherwise the consumer can only move to a different AFORE after 12 months. More about this can be found in section V.B.
39 The analysis of switching costs is addressed in APPENDIX A.
Competition And Asset Allocation Challenges For Mandatory DC Pensions

new members in 2006 were automatically assigned to an AFORE by the supervisor. Similarly, in Chile, the regulator had automatically assigned around 70 percent of the 8.63 million registered individuals by April 2007. In general, very few individuals transfer voluntarily, with exceptions of select countries (Mexico after 2003, for instance). Despite ample evidence of inertia, Table 10 shows an increasing trend of consumer activism when measured as a share of active contributors.

Table 10: Number of Transfers Across Pension Firms, 2000–07 (thousand)

<table>
<thead>
<tr>
<th>Country</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>Jun-07 /1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>401</td>
<td>413</td>
<td>331</td>
<td>364</td>
<td>711</td>
<td>243</td>
<td>432</td>
<td>460</td>
</tr>
<tr>
<td>Bolivia</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Chile</td>
<td>256</td>
<td>235</td>
<td>229</td>
<td>275</td>
<td>212</td>
<td>235</td>
<td>235</td>
<td>270</td>
</tr>
<tr>
<td>Colombia</td>
<td>n.a.</td>
<td>n.a.</td>
<td>170</td>
<td>123</td>
<td>80</td>
<td>73</td>
<td>67</td>
<td>64</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>--</td>
<td>6</td>
<td>--</td>
<td>75</td>
<td>74</td>
<td>97</td>
<td>99</td>
<td>140</td>
</tr>
<tr>
<td>El Salvador</td>
<td>135</td>
<td>78</td>
<td>41</td>
<td>53</td>
<td>37</td>
<td>68</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Mexico</td>
<td>99</td>
<td>117</td>
<td>133</td>
<td>431</td>
<td>1,205</td>
<td>2,438</td>
<td>3,849</td>
<td>3,869</td>
</tr>
<tr>
<td>Peru</td>
<td>7</td>
<td>5</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>129</td>
<td>643</td>
<td>640</td>
</tr>
<tr>
<td>Dominican R.</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Uruguay</td>
<td>n.a.</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

| Total transfers | 898  | 853  | 913  | 1,333| 2,332| 3,288| 5,339| 5,454     |
| Total contributors /3 | 18,618| 20,075| 24,070| 25,719| 26,885| 28,724| 30,490| 31,996 |
| Turnover /4      | 4.82 | 4.25 | 3.79 | 5.18 | 8.67 | 11.45| 17.51| 17.04     |

Note: /1 period June 2006 – June 2007; /2 switches were allowed only starting with 2004; /3 country specific definition for the month preceding the reference month with the exception of Mexico where the data refers to the two months preceding the reference month; /4 Number of switches measured as a percentage of contributors

Source: Own calculations on AIOS data.

Several studies on demand elasticity for select countries have been conducted, using a variety of methodologies. Results are mixed but they generally point to low demand elasticity with respect to prices, with elasticity increasing when firms invest in marketing.

For Chile, a series of papers investigated the impact of regulation limiting the role played by sales agents. Berstein and Micco (2002) estimate demand elasticity for the periods covering 1995–97 and 1998–2002, before and after a regulatory reform. In the first period, featured by aggressive competitive strategies through sales agents, net transfers were found to be positively (negatively) correlated with differentials in rates of return (fees). The number of sales agents increased (decreased) the elasticity of demand to rates of return (fees). In the second period, after new regulations come into effect reducing both the number of salesmen and transfers across funds, parameters related to fees were not found to be significantly related to the elasticity of demand. These findings suggest that net switches among pension funds are mainly determined by the number of sales agents and that the presence of sales agents increases the elasticity of demand with respect to fees and returns. Berstein and Ruiz (2004) confirm that the large number of salesmen during 1995–97 helped to increase elasticity with respect to price variables, in particular rates of return. They also confirm widespread misinformation about the market for mandatory defined contribution pensions. Misinformation is more acute among women, young individuals and individuals with low income and/or education. Cerda (2006) shows that the rate of churning of contributors is positively correlated with the

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40 The total number of workers in the system increased by 2.1 million in 2006, 1.6 million of which were assigned by CONSAR.
market share of the pension fund and its ranking in terms of asset management performance. Finally, Berstein and Cabrita (2007) reconfirm, using individual data, that despite relatively low demand elasticity with respect to prices (fees and returns), elasticity increases considerably when associated to a sales agent involvement.

In Peru, Masías and Sanchez (2006) find positive and significant correlations between transfers to a pension fund administrator and the number of sales agents. However, they also find that transfers are positively and negatively correlated to real rates of return and commissions, respectively, which would suggest a positive demand elasticity to relevant price variables.41

Finally in Mexico, consumers seem to be particularly sensitive to marketing strategies of pension funds. García-Huitrón and Rodríguez (2002) estimate the demand elasticity function for Mexico and found that the only significant parameters were those related to marketing, especially the number of sales agents, while parameters related to fees and rates of return were neither significant nor significantly different from zero. Meléndez (2004) estimates AFORE demand functions and finds that neither fees nor returns explain affiliation. In addition, members’ decisions to transfer their accounts across Mexican pension firms are highly associated with the sales efforts of the pension firm and less associated with fees and rates of return. However, the importance of these last two factors has significantly increased over time. Armenta (2007) analyzes the determinants of switches from one AFORE to the other and finds that the number of switches is statistically correlated with the changes in the fee charged on contributions but less affected by fees charged on the asset base. In sum, findings generally reveal that the probability of switching is positively correlated to the activity of sales agents.

VIII.B Heuristic behavior

As discussed earlier, from 2003 to 2007, pension firms in Mexico saw a decline in market power and high turnover of contributors by comparison to other countries in Latin America. These trends were largely the result of regulatory reforms issued around 2002–03 that facilitated switches among pension funds, automatically allocated undecided individuals to the funds with the lowest equivalent fees, and abolished time restrictions to switches when such switches occurred from higher to lower fee funds.42 These reforms lowered barriers to entry, by securing a pool of accounts to low fee pension firms, and increased the productivity of sales forces, by facilitating individuals to switch from one fund to the other, which led to higher demand elasticity.43

The increased number of transfers in the system, however, does not imply higher expected net rates of return until retirement as individuals consistently make mistakes choosing their pension funds. The standard economic theories of lifetime saving are

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42 The new regulatory measures included: 1) eliminating the requirement for the ceding fund to intervene in transfers; 2) reducing the transfer period from 3 months to 13 days; 3) simplifying documentation requirements for transfers; 4) centralizing the transfer validation in a single agency (PROCESAR); 5) allowing individuals to initiate transfers over the internet; and 6) improving the quality of information disclosure at the level of individual consumers and on the website of CONSAR.
43 Some of these policies were reverted with the April 2008 reform and it is too early to assess the impact of such policy change.
based on several implicit rationality assumptions: 1) savers accumulate and decumulate assets to maximize some form of lifecycle utility function that may include bequests; 2) savers have the financial education to solve the necessary optimization problem; and 3) savers have sufficient will power to implement the strategy that stems from the solution to the intertemporal optimization problem. But, all these assumptions are highly suspect.

Individuals not only do they act in an irrational way and make mistakes, but they also do so in a very inconsistent and unpredictable way. Individuals tend, in practice, to adopt simple rules of thumb to solve the relevant optimization problem and subsequently implement their choices, leading to systematic biases.

For instance, the literature on “behavioral economics” identifies several key patterns (or anomalies) on investment retirement behavior. For instance, when presented with a choice of investment strategies, pension plan members appear to have relatively weak preferences for the asset portfolio they choose (Benartzi and Thaler (2002)); i.e., individuals lack firm preferences. In addition, investment decisions are affected by framing effects so that the response of individuals changes depending on how the same information is presented to them (Benartzi and Thaler (1999), (2001), (2002)). Alternatively, investment decision-making is affected by anchoring effects, i.e., the initial conditions used to justify a decision remain important over time even when the decision is irrational (Mitchell and Utkus (2004)). Anchoring is also consistent with the significant inertia and procrastination in investment decision-making by pension plan members documented by Madrian and Shea (2001) and Choi et al. (2002). Another anomaly is that asset allocations in defined contribution pension plans tend to be driven by past performance rather than by expected future returns and risks. (Benartzi (2001)).

Additionally, there is some reason to suspect that individuals do not maximize expected utility in practice. According to prospect theory developed by Kahneman and Tversky (1979), individuals maximize some form of non-linear value function that differs from expected utility maximization in two key ways: 1) individuals judge how their decisions affect incremental gains and losses to their wealth, rather than how they affect their total wealth as required by standard utility theory and 2) individuals treat gains and losses asymmetrically. Individuals have the tendency to be overconfident about the future and to make excessively optimistic forecasts (Barber and Odean (2000), De Bondt (1998) and Goetzmann and Kumar (2001)). Investors are reluctant to “cut their losses” and keep loss-making positions in the hope that they will recover their original investment as reported by Odean (1998), Benartzi and Thaler (1995), Gneezy and Potters (1997) and Rabin and Thaler (2001).

Finally, overconfidence and loss-aversion are exacerbated by narrow framing effects, also known as mental accounting that individuals seem to use to keep track of financial transactions and evaluate them (Kahneman and Tversky (1984, 2000), Thaler (1985, 1999), Barberis and Huang (2001) and Barberis et al. (2006)).
The experience of Mexico exemplifies the heuristic behavior of contributors in choosing their pension firms and it highlights the critical role played by information and the way it is provided. Calderón et al. (2008) analyze the choice of pension funds providers by Mexican contributors and the role played by the sales force of each fund in this selection process. Like many other studies, this paper finds that the number of switches is affected by the number of sales agents hired in the receiving pension fund manager. In addition, it notices a high increase in switches among pension firms between 2003–06 coupled with a substantial increase in marketing expenditures, especially after 2003. Finally (Figure 7), nearly 40 percent of switches were made to pension funds with lower historical returns and higher fees.

The Mexican authorities were naturally concerned with the exponential trend in turnover, the parallel increase in marketing expenses that did not directly benefit consumers, and the surprisingly high number of switches towards firms with lower net rates of return. As a result, the Mexican authorities decided in 2007 to curtail (albeit not halt) switches to essentially once a year and to base the automatic assignation rule on net rate of returns. However, it is unclear that the Mexican policy response (adopted for similar reasons in other countries) is optimal. Among others, historical returns are not representative of future returns, which suggest that the alleged wrong choice today may turn out to be the right choice tomorrow. Notwithstanding this, retirement investment behavior is characterized by all the aforementioned anomalies, suggesting that consumers had likely made mistakes.

44 The number of switches over contributors rose from a mere 0.5 percent in 2000 to around 18 percent in 2006.
In summary, the heuristic behavior of individuals points to a strong rationale for policy intervention in the design of pension plans’ options. Consumer behavior can be altered by merely changing the options available, especially the default option, and the way pension services are organized. For instance, in the US, employers’ decisions on automatic enrollment, automatic saving, and default investment funds of 401 K plans have been critical in shaping retirement savings. Thaler and Sunstein (2003) argue that the solution to permanently modify consumer behavior is a strategy of paternalistic libertarianism, in which individuals can have some choice, but the choices are predetermined by a paternalistic plan designer.

VIII.C The role of agents and importance of information

In addition to heuristic behavior, the aforementioned literature and Mexican case highlight the fact that consumers are not informed about their options. Consumers need to be educated and the quality of information provided and the way it is provided become of utmost importance.

Consumers are often uninformed about the system they participate in. For instance, twenty-five years after the reform, consumers in Chile remain unapprised of critical factors in the system. The 2004 Social Protection Survey indicated that only 50 percent of respondents claimed to know their pension account balances and less than 2 percent knew about their fund fixed and/or variable fees (Arenas de Mesa et al. (2006)). Surveys of members of US corporate pension plans show low financial literacy, too. Such comprehensive surveys are not yet available throughout Latin America, but one can presume that other countries in region face similar challenges.

While some authors question that financial education improves the rationality of investment decision-making, there is a general consensus that some benefits can be derived from financial education if education programs are tailored and carefully delivered. For instance, Caskey (2006) argues that personal financial management education cannot be considered an effective mechanism for helping lower-income households accumulate financial assets and/or improve their credit histories. Also, Bell and Lerman (2005) argue that the success of financial education programs may be due to simple self selection. By contrast, Hilgert and Hogarth (2003) presents suggestive evidence on the value of financial literacy by demonstrating that individuals with greater measured levels of financial knowledge are more likely to behave in ways consistent with recommended financial behavior. Moreover, Bernheim et al. (2001), find that households exposed to financial literacy education in the United States increased asset accumulation, while Bernheim and Garret (2003) find that employer-provided financial education stimulates savings. Finally, in his review of the literature Martin (2007) concludes that: 1) whilst some households make mistakes with personal finance decisions, mistakes are more common for low income and less educated households; 2) there is a connection between knowledge and behavior, with increases in knowledge having a positive impact on personal finance behaviors (i.e., the causality runs from knowledge to behavior); 3) because low-income and less educated households tend to make more mistakes, they also benefit the most from financial education; 4) other groups that appear to benefit disproportionately include minorities, single parents, and women; 5) the benefits of financial education appear to span a number of areas including
retirement planning, savings, homeownership, and credit use; 6) financial education programs are most effective when they are tailored to the needs of the recipient and include face-to-face time, either with a counselor or in a classroom setting; 7) financial education programs that cover specific topics and teach skills are better than those covering more general subjects; and 8) the outcomes of financial education efforts are often described as “better” results for households, though increased financial knowledge may also result in seemingly worse outcomes, such as the increased use of mortgage default in certain circumstances.

As far as delivery is concerned, salespeople can play a role as providers of financial education, especially in contexts where participant choice is required (Papke (2004)). However, the use of high-pressure sales tactics and even fraud have often been problematic. This provides a rationale for policy interventions in the design and delivery of tailored financial education to consumers of mandatory defined contribution plans.

This report recognizes the importance of financial literacy and acknowledges that both the content and the form of delivery of information are critical. Notwithstanding, this is a complex policy issue that merits separate research. To advance this agenda, the World Bank has initiated a program that seeks to develop standard methodologies for the assessment of financial literacy and skills; formulate guidelines for the design, delivery and evaluation of financial literacy improvement programs; pilot these in several emerging markets; and disseminate the results.45

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45 The program started in January 2090 and will run through December 2012. Parts of the program will be conducted in conjunction with the OECD.
Box 3: Knowledge About One’s Pension Plan

Workers rely on accurate knowledge regarding their likely retirement benefits and consumption needs in order to arrive at the optimal saving decisions (Skog (2006)). However, the lack of key financial information can cause individuals to prepare inadequately for retirement (Lusardi and Mitchell (2006)). Little is known about individuals’ reasons for acquiring financial knowledge. Older people may know more simply because they are closer to retirement, healthier people may know more because they expect to live longer in retirement, and wealthier or more educated individuals may know that they will need to rely more on their pensions in retirement than the poor.

Studies in the US show that financial misinformation or lack of information is the norm (Gustman and Steinmeier (2001b)). However, men tend to know more about their retirement benefits than women; the older, wealthier and/or healthier the individual the more financially literate (Mitchell (1988), Gustman and Steinmeier (2001a), and Chan and Stevens (2004)). Individuals that are the most likely to rely on social security are the least informed, while those who are most likely to rely on their pensions are the best informed (Luchak and Gunderson (2000)).

Studies of OECD countries generally find that financial understanding is correlated with education and income levels. In Australia, the lowest levels of financial literacy are associated with low levels of education (year 10 or less), unemployment or low skilled work, low incomes, low levels of savings, being single, and being at either end of the age profile (18 to 24 year olds and those aged 70 years or older). In the UK, individuals in the lower social grades and the lowest income band, as well as young people aged 18 to 24, are likely to be the least receptive consumers. By contrast, the higher social grades, those with higher income, young couples and older respondents with no family are more likely to be sophisticated financial consumers, knowing how to get the information they need and understanding the advice they receive. In Korea, scores broken down by demographic characteristics indicated that students from families with less educated parents and/or students who have low professional expectations score the lowest (OECD (2005)).

Relatively few analysts have examined the question of pension knowledge outside the US. Arenas de Mesa et al. (2006) used Chilean data from the Social Protection Survey of 2004 to examine trends of financial literacy variables across social groups. In addition, Skog (2006) shows that the older, healthier, more educated, married male workers know more about the system. Union members, those with higher incomes, and employees of larger companies are also more financially informed. Finally, he finds that knowledge varies by subject area; accordingly, it is important to ascertain what literacy shortfalls must be targeted before determining what education efforts might be useful. Individuals become more pension literate as that knowledge becomes more useful.

IX  CONCLUSIONS

Mandatory defined contribution pension markets can be characterized as “quasi-markets” differing from standard markets in important ways. From the demand side, consumption is mandatory and purchasing power is expressed by vouchers often subsidized by earmarked state budgets. From the supply side, providers do not necessarily maximize profits and their governance structure includes both private and public sector firms, as well as for-profit and mutual associations.

Pension services are typically provided by specialized firms in most of Latin America and Eastern Europe, but licensing criteria do not appear onerous enough to represent high entry barriers and justify the prevalent high rates of market concentration. Instead, non-regulatory barriers such as economies of scale (endogenous and exogenous) combined with participant inertia appear to explain the observed market structure. Certain pension functions like collection of contributions, record-keeping and passive asset management are characterized by important economies of scale. However, the industrial organization of pension services in many countries does not promote full exploitation of
such economies of scale limiting the scope for lowering administrative fees. Mandatory defined contribution pension quasi-markets, especially in emerging economies, are concentrated and concentration has increased over time through mergers. All these factors have contributed to high barriers to entry and low market contestability.

The elasticity of demand with respect to prices is very low which, together with lack of market contestability, implies that pension firms have strong market power. Market power can yield important distortions on the demand side such as price distortions, losses of social welfare and rent redistribution towards providers. On the supply side, it can yield X-inefficiencies and rent seeking behavior. The most obvious distortions in mandatory defined contribution markets are price distortions with firms charging fees way above average costs that are highly variable both within and across countries.

Individuals are unable by themselves to exercise the necessary market discipline to reduce such price distortions due to misinformation about pension products and, in general, heuristic behavior in making fundamental savings decisions. This provides a strong rationale for policy interventions in at least three areas: 1) the overall industrial organization of pension services; 2) financial literacy of individual consumers; and 3) the design of investment options, especially the default option.

This Chapter endorses the broad consensus on the usefulness of financial literacy and it acknowledges the importance of identifying the most relevant content and delivery mechanisms to influence behavior; topics that merit further research. However, it is more concerned with institutional design issues in the areas of industrial organizations and default investment options. More precisely, in ways to exploit the systematic biases of the decision-making process of individuals so as to promote permanent changes in behavior that can result in improved expected replacement rates. These themes are addressed in more details in Chapters III and IV which analyze alternative industrial organizational forms and options for improving investment allocations, respectively.

X REFERENCES


APPENDIX A: WHAT WE KNOW ABOUT MARKETS WITH SWITCHING COSTS

This appendix presents a brief literature survey on switching costs that draws heavily on Farrell and Klemperer (2006).

Switching costs are defined as the real or perceived costs that are incurred when changing supplier but which are not incurred when remaining with the current supplier. This means that a customer who has previously bought a product from one firm may incur extra costs in purchasing an otherwise identical product from a new firm, even if that product is sold at the same unit price. The existence of such costs leads to economies of scale in repeated purchasing (Farrell and Klemperer (2006)).

The literature identifies a series of switching costs including: transaction costs, compatibility costs, learning costs, contractual switching costs, uncertainty costs, and psychological costs. Some of these appear to be more relevant to the pension fund industry and are described in what follows:

Transaction costs: For some products, there are transaction costs in changing supplier, which are not incurred when staying with the existing supplier. For example, changing pension funds can involve significant costs in terms of time and direct financial costs.

Contractual switching costs: As switching costs can increase a firm’s market power, firms can sometimes artificially create switching costs to discourage customers from changing supplier. These switching costs include frequent flyer programs, loyalty cards, loyalty discounts, joining fees for gyms, and exit fees in mutual funds or pension funds. These switching costs are also known as endogenous switching costs since firms create them to differentiate their products.

Uncertainty costs: If the product is an experience good (i.e., a good for which its quality/suitability for the consumer can only be known after consumption), consumers may be reluctant to switch to untested brands as they are uncertain whether the product will suit them. Typically, changing a pension fund involves changing the asset manager for your individual accounts. This can create uncertainty costs, in addition to the fact that future rates of returns can be predicted only with a margin of error.

Firms and individual behavior in the presence of switching costs

Klemperer (1995) contains the basic reference model in the literature to describe firm and individual behavior in the presence of switching costs. With switching costs, firms face two types of consumers: old types, who face switching costs, and new types (new entrants) who do not face switching costs. The model assumes firms cannot price discriminate among customers, which is a good assumption for the pension fund industry.

One period set-up

In a one period set-up, old/committed customers face a cost $s$ to switch from provider A to provider B. Both firms face constant marginal costs $c$ and, for the sake of simplicity, there are no new entrants. If firm A wants to attract customers from firm B, it needs to
price its product at least \((c - s)\). This strategy is only possible if there are economies of scale; in this case, the profits foregone by cutting its price to its existing customers (the firm cannot price discriminate) does not exceed the profits gained by stealing firm B’s customers. Typically, pension funds attract new customers by “compensating” them for the transaction costs through gifts of various sorts. If switching costs are sufficiently high, each firm acts as a monopolist to its customer base and needs to compensate them for not switching. In Klemperer (1995) this would involve each firm giving up more profit on their own customer base than they would gain by stealing their rivals’ customers. Hence, no switching takes place in equilibrium.

The no switching outcome is model assumption dependent as typically switching costs are heterogeneous. Assume a single period market where one or more firms already has a customer base. If the switching cost is heterogeneous such that the cost is higher for some consumers than for others, then some switching may occur in equilibrium. In this scenario, prices and profits will still be higher than without switching costs.

**Two periods set-up and time inconsistency**

In a two period set-up, firms have an incentive to “harvest” their customer base. This situation is useful to model cases where the market can be divided into a “start-up” phase, where there is intense competition for new customers, and a “mature” phase where most customers are already committed to a particular supplier (Klemperer (1987a, 1987b and 1995) and Padilla (1992)).

As in the single period example, we assume that firm A and firm B have identical constant marginal costs, \(c\), must charge a single price to all customers, and again for simplicity there are no new entrants. In the second period, both firms can price up to their switching cost above their competitor’s price without losing any customers to the rival. Farrell and Shapiro (1988) find that, in the second period, firms with higher market shares price higher than rivals with low market shares. This is because the more locked-in customers a firm has, the greater the benefits to it of increasing prices to reap the rewards from these customers, rather than reducing prices to compete for uncommitted customers.

Given that second period profits are valuable, this induces both firms to compete aggressively in the first period. It may even be rational for the firms to price below cost in the first period, as they are able to price above marginal cost in the second period. In other words, as market share is valuable, then there is competition for it. Firms “invest” in markets at an early stage in their development to be able to “reap” in later stages when consumers are locked-in to the supplier they previously patronized. Prices are lower in period 1 and higher in period 2 than if there were no switching costs.

This pattern of pricing is known as “bargain then rip-off”, in which low prices for new customers are followed by high prices for locked-in customers. Firms competed with a sequence of one period contracts, and the model contained the implicit assumption that firms were unable to commit to future prices. Under this assumption (i.e. when long-term contracting is unfeasible), firms face a “time inconsistency” problem. In the first period, in order to gain market share, firms would like to commit to low prices in the future; however, once they have a locked-in customer base, the firm’s incentives change.
in that they want to exploit their locked-in customers by raising prices (or lowering quality).

In an ideal world, it would be possible for firms and customers to contract for the whole lifecycle of a product and specify future prices and qualities. Under such circumstances, the existence of switching costs would not lead to inefficiencies. Consumers would buy their whole lifetime’s requirements from the lowest cost supplier. Whilst there would be no switching during the product life, firms would have no market power and the outcome would be as economically efficient as in a market without switching costs. That is, if it were possible to contract for the whole life of the product, then switching costs would cause no detriment to consumers or overall economic welfare. However, in the vast majority of real life circumstances, it will not be possible for buyers and sellers to contract for the complete lifecycle of a product (Hart (1995)).

**Introducing new entrants**

The existence of new customers creates a tradeoff for the firms in the market (Klemperer (1995)). In the second period, firms can either set a high price to exploit their locked-in existing customers (“harvesting”) or firms can set a low price to attract new customers (“investing”). The direction of this tradeoff critically depends on a firm’s market share. For a firm with a large market share, the profits gained by charging a high price to its locked-in customers are likely to be sufficiently higher than the gains made by setting a low price to attract new customers. However, firms with fewer old customers are likely to price more aggressively. As a result, firms with higher market shares tend to charge higher prices than firms with lower market shares.

**Switching costs and prices**

Assuming that firms cannot price discriminate between locked-in and uncommitted customers, in a market where both types of consumer co-exist, it is in principle possible that prices could be either higher or lower than in an otherwise identical market in the absence of switching costs. On the one hand, the existence of a locked-in customer base that firms could exploit induces firms to charge higher prices. On the other hand, firms may have an incentive to price low so as to build a customer base and thus ensure their profitability in the future.

It is difficult, a priori, to determine which of the two effects will prevail in equilibrium. However, there are at least three reasons why one would expect the level of prices to be higher when switching costs are present: 1) discounting; 2) aggressiveness of competitors; and 3) elasticity of demand.

**Discounting.** Positive discount rates imply that agents prefer the present to the future. This creates a bias for firms towards “harvesting” rather than “investing”, that is, an incentive to reap the rents associated with a large customer base rather than to invest in future market shares. The more firms discount the future, the less importance they attach to their future market shares relative to exploiting customers today.

**Aggressiveness of competitors.** The pricing decision a firm makes today influences how aggressive its competitors will be in the future. In particular, increasing the number of locked-in customers each firm has reduces how aggressively that firm competes. If
firms take this into account when setting prices, this gives each firm an incentive to raise its price today so that its competitors will gain share today and so be less aggressive tomorrow.

**Demand elasticity.** The existence of switching costs makes it rational for customers to take expectations of future prices into account when making today’s purchase decision. If a firm sets prices low today, customers may expect the firm to increase its price in the future. This makes customers less price-sensitive and firm’s elasticity of demand is correspondingly reduced.

**Switching costs and market shares**

Perhaps contrary to conventional wisdom, the presence of switching costs need not lead to stable market shares (Beggs and Klemperer (1992), Klemperer (1987a and 1987b)). Market shares exhibit certain inertia because consumers are reluctant to switch suppliers. However, the literature consistently finds that the firms with larger customer bases price much higher than their smaller counterparts. Consequently, the smaller firms succeed in attracting the business of consumers with low or no switching costs. Smaller firms see their shares grow as a result, whereas large firms see their shares eroding over time. Leadership is therefore only temporary. In a multi-period market with switching costs, both prices and market shares tend to fluctuate over time. Stability is the exception rather than the norm.

**Introducing search costs**

Search costs arise when a customer has to invest effort in finding a new supplier. Whilst search costs can be considered a form of “transaction switching cost”, they differ from switching costs in that switching costs arise only after one has purchased a product from a supplier (i.e., switching costs make previously homogenous products differentiated) whilst search costs arise even before one has purchased from a supplier. Whereas some types of switching costs exist even if all products and suppliers are identical and known to the buyer, search costs can exist even when products and/or suppliers are differentiated and the buyer has imperfect information about which one is a better or worse alternative. Search costs can also arise with homogenous products when effort has to be invested in finding the best price. Moreover, whilst switching costs are paid only if a customer actually switches, search costs are incurred whether or not a customer finally decides to remain with their current supplier.

Search costs and switching costs often arise together. For example, a customer switching its account from fund A to fund B may incur transaction costs (i.e., filling in forms and transferring direct debits). In addition, it can incur search costs if he/she has to do research on the many alternative suppliers to identify which one offers the most suitable product.

In some cases, search costs act as substitutes for switching costs. For example, with experience or credence goods, switching costs arise from imperfect information about products or suppliers’ characteristics. A consumer may spend time reading restaurant reviews in specialized guides and magazines (so incurring a search cost) or otherwise could just take the risk, go to a new restaurant, eat there and experience the quality of food and service. Reading a restaurant’s review in a magazine is costly for the consumer
(it is time consuming and the customer has to purchase the magazine) but reduces the uncertainty cost incurred when changing to an unknown restaurant.

In other cases, search costs and switching costs combine to further increase the cost of changing supplier. For example, in the pension fund industry, the customer typically has to first incur search costs in order to find out which alternative supplier offered the most appropriate product, before incurring the actual transaction cost of switching supplier. When search and switching costs are both present, each reinforces the effect of the other on equilibrium switching and prices.

Switching costs and market contestability

As Farrell and Klemperer (2006) noted, perhaps the most significant impact of switching costs is their effect on entry. Whilst it may appear at first sight that the existence of lock-in costs would deter entry, and it indeed does so in many cases, the presence of switching costs can be conducive to entry in some cases. This depends upon: 1) the size of switching costs; 2) the scale of entry; 3) market dynamics; and 4) the existence of economies of scale.

Size of switching costs. While it is obvious that very high switching costs will deter entry, a moderate level of switching costs may actually encourage entry for two reasons: 1) post-entry profits are expected to be higher in a market with switching costs, so attracting entry; and 2) incumbents may price less aggressively in response to entry. Models showing this can be found in Klemperer (1987c), Beggs and Klemperer (1992), and Farrell and Shapiro (1988).

Scale of entry. In general, the existence of switching costs has the effect of encouraging small scale entry while discouraging large scale entry. The reason for this is related to the fact that incumbents have an incentive to “harvest” their customer base and, therefore, new entrants have an incentive to design their strategies in attracting mainly new customers. This should also reduce the likelihood of price retaliation by the incumbent. Models showing this can be found in Gelman and Salop (1983), and Yoffie and Kwak (2001).

Market dynamics. Market growth can have an important impact on the likelihood of entry in a market with switching costs as they affect the pricing decisions of incumbent firms. In general, a growing market encourages new entry as the existence of new customers in each time period means that new entrants are not reliant on winning incumbent’s locked-in customers. The presence of switching costs in a fast growing market promotes contestability. The incumbent is worse-off than in the absence of switching costs as the value of its customer base (and, therefore, of its “harvesting” strategy) is reduced.

In the presence of switching costs, entry may be accompanied by price wars. Klemperer (1989) defines a price war as a period when prices fall and then subsequently rise in the absence of cost changes. Klemperer notes that this can happen both when switching costs are low and when switching costs are high. If switching costs are low, the incumbent has to reduce price in response to entry. However, once the entrant has acquired a customer base, its prices will rise, which also permits a price rise from the incumbent. As the entrant’s price will always rise once it has acquired a customer base,
Klemperer notes that the same pattern would also be expected in a market with high switching costs.

**Economies of scale.** Moderate switching costs are generally conducive to at least small-scale entry, but this is not the case when strong economies of scale are present in the market. Economies of scale may mean that the incumbent’s cost advantage is so great that it is able to both price substantially above its own cost and lower than a new entrant’s cost. This is likely to deter entry. If per capita economies of scale are greater than the per capita switching costs, then the incumbent can succeed in keeping the entrant out of the market, despite the entrant’s willingness to price below its cost. These strong economies of scale combined with switching costs give rise to what is known as “network effects” (Farrell and Klemperer (2006)).

The interaction of economies of scale and switching/search costs in the pension fund industry has strong implications for the competitive behavior of firms.

**Product differentiation and endogenous switching costs**

In addition to affecting pricing behavior, the presence of switching costs can have implications on which products a firm chooses to produce.

Economic theory finds that product differentiation tends to reduce price competition as firms compete on aspects other than price. In the presence of switching costs, however, product differentiation can actually increase price competition if consumers value variety. With identical products there is no reason for a customer to pay the switching cost, but with differentiated products, the desire for product variety gives the customer a reason for paying it. If a customer is already purchasing from more than one firm, then that customer may become relatively more sensitive to price competition. Consequently, product differentiation can increase price competition in markets with switching costs, and firms may choose to compete “head-to-head” rather than to differentiate their products.

Finally, the literature also finds that firms can face incentives to create switching costs to increase oligopoly power.46 These incentives are likely to be greater in markets with homogenous products, given that product differentiation mitigates some of the lock-in effects of the switching cost. These artificial switching costs are likely to be particularly harmful to overall economic welfare, since they usually lead to higher prices and firms waste productive resources when creating them.

In sum, the presence of switching costs can explain many commonly observed business practices, such as why businesses appear so concerned with their market share and why firms give generous introductory offers to new customers. Switching costs also impact the structure of prices.

There are three reasons why policy-makers should be concerned with switching costs: Switching costs can (i) affect the mechanics of competition; (ii) raise the average price level; and (iii) distort the pricing structure. They are of particular importance only in abuse of dominance cases. Particular caution needs to be exercised when investigating pricing abuses, and a dynamic perspective is necessary. Pricing below cost may not be

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46 See, for example, Klemperer (1995), and Farrell and Klemperer (2006).
predatory once follow-on sales have been taken into account and seemingly high prices to
locked-in customers may no longer appear excessive once intense competition before the
customers were committed is taken into account. A dominant firm may also create
switching costs that have the effect of foreclosing competitors from the market, through
so-called loyalty rebates or exclusionary contracts. In these cases, the onus should be on
the dominant firm to show that any pro-competitive benefits outweigh the potential
exclusionary effects.
Chapter III

Narrowly Focused Policies Or Alternative Industrial Models?

Version 20 March 2009
XI INTRODUCTION

Inaction is not an option for policymakers faced with weak price performance in their pension quasi-markets. Therefore, in the attempt to address the consequences of consumers’ inertia, different countries have introduced different specialized regulations and/or specific institutional arrangements. These include “soft” interventions (such as the prohibition of price segmentation, the simplification of fee structures, and bundling of pension services), more draconian interventions (like caps on fees, bans on switches and informal acceptance of oligopoly collusion) and specific institutional arrangements (like centralized agencies for the collection of contributions, record-keeping, annuity provision, auctions for given pension services and automatic assignment rules of undecided consumers).

Governments do not apply special regulations to voluntary, non-subsidized markets, even when performance is deplorable as these forms of specialized regulations and interventions have been often accused of discrimination across markets. However, the justification for stronger regulations in mandatory defined contribution pension quasi-markets is that inadequate performance can jeopardize the achievement of the policy goals that led the government to mandate purchase of pension services in the first place. When governments mandate participants to buy services in a quasi-market, they also grant legal support and implicit political support to the provider’s activity. This form of “sponsorship” also implies that politicians have an obligation to the electorate to demand higher performance from a quasi-market than from a conventional market. From another perspective, an industry that enjoys special privileges such as demand that is mandatory, auto-enrolled or heavily subsidized, cannot claim equal treatment with other industries that do not have such privileges.47

This chapter is based on Valdés-Prieto (2007b), especially commissioned for this report, and it is organized as follows. Section XII discusses the tradeoffs faced by policymakers in implementing ad-hoc regulations like restrictions to the ability of participants to switch pension firm, the use of uniform fee rates, the simplification of fee base, the bundling requirements for pension services and the use of price controls, all aimed at reducing price distortions and ensuring adequate redistribution of rents between pension firms and participants. Section III recognizes that price controls are a necessary (albeit non desirable) tool when the demand is highly inelastic and it discusses ways to improve price regulation by linking it to the cost structure of pension firms. Section XIV discusses the tradeoffs faced by policymakers in using pure procurement as one form of industrial organization to address the consequences of consumer inertia. Section XV presents policy considerations involved in the design of hybrid industrial organization models involving pure procurement and quasi-markets simultaneously. Policy conclusions follow in Section XVI.

47 In other words, the performance of the industry is a matter of public interest. The traditional “merit good” argument for compulsory social insurance is behind the paternalistic mandatory nature of demand. See Barr (1992) for a more detailed explanation.
XII  FROM LIGHT TO HEAVY HANDED REGULATION

The continuum of specific regulations and policy interventions in mandatory defined contribution pension quasi-markets is large. The examples discussed in this section are commonly used in most jurisdictions. They are all justified by the paternalistic view that in a quasi-market with mandatory participation, the State has the obligation to reduce demand or supply distortions (efficiency objective) and to ensure adequate redistribution of rents from pension firms to participants (equity objective). The ad-hoc nature and specificity of these interventions implies that when the issue of concern is addressed, other distortions are created. Typically, measures that aim at increasing equity reduce efficiency (and vice versa) and the magnitude of such trade-offs is usually proportional to the inertia of consumers. In what follows, we focus on increasingly heavy-handed specialized interventions: 1) uniform rate regulation and heterogeneous fee bases; 2) simplification of fee structures and bundling of pension services; 3) repression of transfers; and 4) price regulations.

XII.A  Uniform rate regulation and heterogeneous fee bases

All jurisdictions prohibit price segmentation of customers and require pension firms to charge the same price to participants irrespectively of the services that they receive. Uniform prices, typically expressed in the form of a uniform rate on an earning and/or asset related fee base, are considered more transparent and equitable. Nevertheless, they reduce efficiency in supply and encourage firms to invest excessively in marketing. In other words, a trade-off exists between efficiency and transparency, and between efficiency and equity.

The trade-off between efficiency and transparency is better appreciated when it is realized that efficiency in supply requires that the marginal cost of each service be covered by a specialized fee. In addition, some fees need to be either permanent or contingent, depending on the nature of the service. For instance, some services are permanently provided to participants once they are covered, regardless of whether individuals transit to and from the formal labor market. These include account updating and processing, distribution of quarterly or annual account statements and passive asset management. In this first case, efficiency in supply requires a specialized fee levied on a permanent basis to cover its marginal cost. Other services are either contingent to formal labor force participation or they are requested on a voluntary basis, but still exhibit strong economies of scale. The typical example of the former type of service is collection of contributions, which may justify the use of a fee on earnings. Examples of the latter type of service are advice on choosing portfolio (investment profile), advice on retirement decisions, et cetera. In this second case, efficiency in supply requires that specialized fee be levied only when the service is provided. It is clear that price discrimination would be more efficient but increased efficiency would come at the cost of transparency: participants would now need to compare a large menu of different prices across pension firms.

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48 Additional considerations related to the independent choice of earnings and asset related bases are made in Box 4.
49 In a number of countries an important additional voluntary service is the process of disability and survivorship claims.
Box 4: Additional rationale for the use of earnings and asset related fee bases

In addition to the equity and transparency rationale, earnings and asset related fee bases are traditionally thought to have (independently) other advantages.

For instance, an earnings related base is thought of spurring pension firms to help raising the density of contributions and reducing underreporting of taxable earnings. The rationale is that a pension firm may invest in improving collection of contributions and detecting underreporting if this allows it to earn higher revenues. In addition, positive externalities may arise from a contribution or earning base as more wage tax is collected and allocation of labor from informal to formal market may improve. Unfortunately, there is no empirical evidence in favor of both claims. Regarding the first, this is likely because the marginal cost of raising compliance is simply too large for administrators to profitably invest in it.

In the case of countries where pension firms provide also disability and survivorship insurance, there is an additional reason to use an earnings related base. Insurance benefits and premia are typically proportional to covered earnings and an earning related fee would help achieving a more efficient resource allocation (if not, cross-subsidies would be large, and the incentive to capture those subsidies would induce pension firms to engage in actions that raise total costs, such as selection efforts).

Finally, an asset related fee base has allegedly superior price information properties at the margin compared to an earnings related base. That is, it facilitates comparison of fees across pension funds. For instance, fees on assets can be directly subtracted from gross returns by consumers to compare pension firms across the single metric of net rates of returns. This argument underpins the competition policy reform of 2007 in Mexico that aims at promoting competition among pension firms on the basis of net rates of return. Again, there is no empirical evidence supporting this argument, notwithstanding its conceptual appeal.

The tradeoff between efficiency and equity is better understood when it is observed that uniform rates are applied to heterogeneous fee bases. With heterogeneous bases, high-base participants provide higher revenues to pension firms but receive the same quality of service. It is exactly this redistributive objective in favor of low-base participants that has promoted the adoption of uniform rate regulation applied to heterogeneous bases, irrespectively of the obvious inefficiency of this pricing scheme.

However, this pricing scheme has not had the desired impact of redistributing in favor of low base participants. Most likely, it has redistributed against the totality of participants and in favor of pension firms by promoting an increase in average fees as a consequence of marketing. Uniform rates applied to heterogeneous fee bases imply that different participants represent a different rent for pension firms. It is therefore economically attractive to invest in marketing whenever the marginal rent is larger than the marginal search/contact investment needed to attract that customer. Notice that such a distortion, which stems exclusively from the pricing scheme adopted, is not eliminated when all customers are highly price-sensitive. In this case, higher elasticity reduces the productivity of the sales force and minimizes rents, but there is still a justification for some (albeit smaller) marketing effort. If all firms charge the same fee rate, but the average earning base differs across firms, then the pension firms with the highest base earn the largest rent (ceteris paribus), irrespective of demand elasticity.

Finally, it is worth considering the aforementioned distortions in a dynamic context. Both assets and earnings bases exhibit strong trends, while pension fund cost functions

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50 Uniform rates applied to heterogeneous bases encourage firms to excessively invest in marketing and provide an explanation for the occurrence of marketing wars.

51 Relatively more participants would surpass in this case the hurdle of search and contact costs to warrant substantial investment in marketing.
exhibit a strong fixed component. This means that fee revenues can rise significantly over time above average costs causing a strong redistribution against participants. When the main fee is asset-based, the critical vulnerability stems from trends in absolute returns.\textsuperscript{52} When the main fee is contribution-based, the critical vulnerability stems instead from trends in taxable earnings and contribution rates.\textsuperscript{53} The trends in fee bases have prompted many jurisdictions to introduce price regulation in the forms of arbitrary caps on fees, later discussed in this section.

In summary, a pricing scheme based on uniform rates applied to heterogeneous fee bases is allegedly more transparent and more equitable: it aims at redistributing in favor of low-base participants but it is not efficient. Hence, price distortions persist and in addition, they are reinforced by the incentive to investment in marketing. Additionally, earnings and asset related fee bases exhibit strong trends while pension funds costs are mainly fixed or proportional to the number of participants served. This means that the aforementioned distortions are likely to become more severe over time. These distortions would be greatly reduced if participants were not inert: i.e., if the elasticity of demand to prices were high. Unfortunately, this is not the case, which implies that pension firms capture excessive rents at the expense of participants. These considerations prompted many jurisdictions to improve transparency as a way to increase the elasticity of demand of participants and to introduce price regulation to compensate for the excessive market power of pension firms. We discuss these issues in subsections XII.B and XII.C, respectively.

**XII.B Simplification of fee structures and bundling of pension services**

The quest for transparency has prompted many jurisdictions to adopt policies to simplify the choice that participants need to make. Two examples are the move towards single fee bases and the requirement for pension firms to offer all mandatory pension services as a single package.

The tradition among regulators is that the use of single fee bases simplifies price information and it facilitates comparison and learning by participants: i.e., it contributes to increasing demand elasticity. Chile moved to fees on earnings only in the late eighties and then to fees on assets only with the 2008 reform. Mexico too abandoned the use of a composite fee structure and moved to fees proportional to assets under management only in 2007. However, if the fee bases currently used are \textit{per se} inefficient (as previously argued), the change from composite to single fee bases (motivated by the desire to simplify the fee structure) further increases the discrepancy between prices and marginal

\textsuperscript{52} This logic implies that the regulatory decision taken in Mexico in 2007, which prohibited flow-based fees and forced pension firms to rely on asset-based fees alone, is vulnerable to trends that increase assets under management.

\textsuperscript{53} Salaries, contribution rates and matching rules are all variables subject to policy intervention for the most disparate reasons and this can unexpectedly create (or destroy) revenues for pension firms. For example, when New Zealand announced unexpectedly in May 2007 that it would mandate employers to match the contribution rate chosen by their employees, pension firms were unwittingly granted the opportunity to choose combinations of taking more revenue and cutting their commission rate. Another example occurred when Chile experienced fast growth in real salaries over 1986-1997: the pension firms were given the opportunity to combine taking more revenue and cutting rates. Most firms did both, and as total revenue increased substantially, a marketing war ensued in the mid 1990’s.
costs. In addition, changes in bases create their own distortions. In general, a shift from (to) an earning related base to (from) an asset related base creates an intergenerational redistribution in favor of the younger (older) generation. Older generations of participants, who already paid earning-based fees in the past will be forced to pay a higher pro-rata share of total costs, now that their assets have grown, than if earning-based fees had continued. In contrast, younger generations of participants will finance a smaller pro-rata share of total costs in the coming years, while their assets remain relatively low, than if flow-based fees had continued. The shift from an earning related base to an asset related base may also constitute a non-trivial windfall gain for the industry of pension firms depending on the level of the new fee rate, the prospects for increase in coverage and projected trends in the asset base relative to the earnings base.

Similar tradeoffs exist in the case of bundling. The rationale supporting bundling of pension services is that, in order to economize on search costs and limit the consequences of participant inertia, the organization of the supply of each pension service should minimize reliance on participant choice of provider. If participants were required to choose in several quasi-markets, one for each pension service, price-cost margins would drastically increase. One way to prevent this is to require pension firms to present mandatory services to participants into a single package, so that they face a single quasi-market.

However, this implies bundling of services with large sunk and fixed costs with other services that do not exhibit large sunk and fixed costs. For instance, requiring bundling of asset management with customer service and recordkeeping has the advantage of cutting marketing costs. However, it raises the overall concentration equilibrium to equal the largest among the equilibria that would occur in customer service/agency networks and in asset management, separately. Consequently, if policymakers fail to establish institutions for centralized production and procurement services with high economies of scale (like customer services or collection of contributions), barriers to entry are artificially extended.\textsuperscript{54}

In summary, in the case of fee base simplification, a trade-off exists among transparency, equity and efficiency. The alleged desirability (alleged welfare gains) of increased price information and comparability needs to be carefully weighed against the redistributive impacts of a shift towards, and the inefficiency of, a single fee base. Also in the case of bundling, a trade-off exists among transparency, equity and efficiency. The alleged welfare gains associated with simplified choice through bundling (transparency objective) need to be carefully weighed against the price impact stemming from forcing joint production of services with different cost functions (equity objective) and from the reduction in market contestability associated with higher barriers to entry (efficiency objective).

\textsuperscript{54} In the specific example just mentioned, the higher concentration equilibrium in customer services (justified by the higher economies of scale in these services) is extended to asset management, creating artificial concentration and barriers to entry.
XII.C Switching regulations

Many governments have enforced regulations aimed at reducing the mobility of participants across pension firms. Such regulations have been mainly used to curb socially unproductive marketing efforts and more recently. They have also been used as a complementary intervention to address information problems in mandatory defined contribution quasi-markets.\footnote{Due to informational problems, consumers make systematic mistakes when choosing pension firms. Hence, countries have been using switching regulation as a paternalistic effort to minimize the number of welfare-reducing switches from the consumer point of view. For instance, Mexico encouraged switches between 2003 and 2008. However, in 2008, switches were again made more difficult in response to increasing marketing efforts by firms, increasing transfer rate and ambiguous evidence that individuals were not choosing pension firms optimally (see Chapter II for a more detailed discussion).} Examples include: 1) prohibitions to switch to a different firm if some criterion is not met, traditionally a minimum contribution period;\footnote{For instance, the Mexican pension quasi-market started operations in 1997 with a switching ban, trying to avoid the marketing wars observed in Chile in the past. The ban prohibited participants from switching before a year of residence in the previous firm. This regulation was in place from 1997 to 2003.} 2) the existence of financial penalties on participants that switch, like in some Latin American and European countries;\footnote{Poland allows firms to levy a flat exit fee equal 160 zloty on switchers that have not completed 12 months of residence in the firm, paid out-of-pocket in cash. The exit fee falls to 80 zloty for switchers with residence between 13 and 24 months, and to zero thereafter. These exit fees are equivalent to 12.3% and 6.1% of average net monthly earnings.} and 3) restrictions on the availability of salespeople to pension firms that want to expand, like in Chile, Poland or Argentina\footnote{In Chile, independent brokers were banned in 1983, forcing pension firms to rely on direct agents. This made entry costlier and slower. In Poland, each salesperson is prohibited from selling on behalf of a different pension firm for 6 months counted from deregistration from the current firm. Therefore, an entrant cannot hire an expert salesperson with an advance notice of less than 6 months.} at different points in time.

Regulations aimed at controlling marketing expenses have been generally ineffective because (as we discuss further in this Section) they do not address the fundamental cause that justifies marketing effort: allowed pricing schemes imply rent heterogeneity for firms depending on which type of customer they serve. In the specific case of restrictions on switches, the impact on marketing is ambiguous due to the opposite impact on marketing costs and fees.

The analytical framework needed to understand the impact of restrictions on switches is provided for by the literature on switching costs.\footnote{See Appendix A, Chapter II for more details. This framework also draws from Boal and Ransom (1997) and Valdés-Prieto (2002).} An unambiguous impact on marketing expenditures exists only if regulations ban switches completely. In such a case, a firm with a captive clientele has no incentives to invest in marketing, as it cannot attract new customers. However, a complete ban on switches encourages pension firms to increase prices that a captive clientele cannot escape.

In the case of limited switches, pension firms will find it profitable to invest in marketing whenever the marginal profit from advertising is positive. Regulation aimed at reducing the ability of participants to switch pension firm has two effects: it reduces the effective elasticity of demand perceived by the firm and it increases marginal marketing costs. On the one hand, the reduction in the effective elasticity of demand encourages firms to charge higher prices. This, in turn, increases the marginal rent that can be
extracted from new customers and, *ceteris paribus*, it increases marginal profits from advertising.\(^{60}\) On the other hand, the increase in the marginal cost of advertising reduces, *ceteris paribus*, marginal profits. Hence, the combined impact is *per se* ambiguous unless firms agree to collude in repressing the marketing effort.

In addition to providing an ambiguous impact on the problem they attempt to solve, restrictions on transfers may affect asset management quality. The profit motive for investment in asset management quality is that a higher return attracts more participants and this increases the value of the firm.\(^{61}\) However, under a ban on transfers, a given increase in asset management quality results in much smaller net transfers. A similar effect to what was discussed before is now at work: incentives to invest in asset management are reduced as the lower switching rate raises the expected net present discounted value of the profits generated by the captive clientele.

The policy tradeoffs associated with a restriction on switches are obvious. Restrictions on switches are introduced when observed marketing expenditures are excessive, in the sense that a large share of it is considered socially unproductive. However, low mobility is also costly for the industry as it impairs competition, and pressure mounts to relax regulations. In some countries, the tradeoff has been reduced by pension firms independently colluding to reduce marketing expenditures. In other countries, and against all warnings from economic theory, the government facilitated deals between firms to control marketing expenses. These forms of agreement are politically unstable and facilitate the possible capture of the regulator by the industry.\(^{62}\)

The lesson from the history of mandatory defined contribution pension quasi-markets is that restrictions on transfers do not address the cause but only the symptoms of the problem of socially costly marketing expenditures. In addition, equilibria based on repression of transfers and/or monopsony collusion are likely to be welfare reducing, compared with the second best of socially costly marketing expenditure.

**XII.D Price regulation**

Price controls have been a substantially more draconian policy intervention aimed at curbing the price distortions stemming from excessive market power of pension firms. Many countries have adopted caps on administrative fees, especially in Eastern Europe, as a means to redistribute rents from pension firms to participants. Table 11 provides a summary of the key elements of price regulations introduced in select countries.

\(^{60}\) The intuition is as follows. A reduction in the effective elasticity of demand raises the equilibrium price charged at the margin and this increases revenues for the pension firms from the stock of customers. Clearly, higher prices will reduce, *ceteris paribus*, the stock of customers in the future as individuals will switch to cheaper funds. However, the future loss of profits caused by higher prices is further delayed the stronger is the restriction on transfers. At the limit, with no transfers, there is no negative impact on profits from an increase in prices.

\(^{61}\) The literature on mutual fund flows initiated by Ippolito (1992) has demonstrated that high returns in the past do attract significant volumes of new funds (see Chevalier and Ellison, (1997)). At the same time, a large body of evidence shows that high current performance (measured on past returns) has only modest persistence over time (for a recent work, see Ibbotson and Patel (2002)). The profit motive operates even if performance persistence is modest because new participants are attracted and pay more fees.

\(^{62}\) Valdés-Prieto (2007b) explores in detail these collusive agreements and the role of the government in the cases of Chile, Hungary and Uruguay.
Table 11: Price Regulation in Select Countries (2008)

<table>
<thead>
<tr>
<th>Country</th>
<th>Percent of contributions /1</th>
<th>Percent of assets</th>
<th>Percent of excess return over benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolivia</td>
<td>5</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>Bulgaria UPF, PPF</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bulgaria VPF</td>
<td>7</td>
<td>10 /2</td>
<td></td>
</tr>
<tr>
<td>Colombia</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costa Rica</td>
<td>4</td>
<td>8 /2</td>
<td></td>
</tr>
<tr>
<td>Dominican Rep.</td>
<td>6</td>
<td>30 /3</td>
<td></td>
</tr>
<tr>
<td>El Salvador</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macedonia</td>
<td>6</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>0.54</td>
<td>0.05 /2</td>
<td></td>
</tr>
<tr>
<td>Slovakia</td>
<td>1</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>5</td>
<td>0.8</td>
<td></td>
</tr>
</tbody>
</table>

Notes: /1 In many Latin America countries caps are expressed as a percentage of earnings. In this table we divided those caps by the contribution rate to express them as a function of the levels of contributions; /2 In Bulgaria, Costa Rica and Poland the benchmark is zero so that the performance fee becomes a fee on nominal returns; /3 In Dominican Republic, the benchmark is close to the return on bank deposits making the performance fee an asset management fee in disguise.

Source: Own calculations based on countries’ regulations.

From an economic perspective, the standard justification for price regulation is that it limits the price distortions generated by low demand elasticity and high barriers to entry. Low demand elasticity renders the clientele of pension firms captive: i.e., unable to “vote with its feet” and to leave costly pension firms for more affordable pension firms. High barriers to entry also limit the extent to which new entrants can impose price discipline on incumbents. Hence, in mandatory defined contribution quasi-markets, firms’ ability to charge above average costs is largely bounded by the credible threat of political interference (through the introduction of price caps) when mark-ups become intolerably high.

That said, price caps also lead to distortions, so their economic case is indeed mixed. Possible drawbacks discussed below include: 1) low asset management quality; 2) discrimination among pension firms; 3) regulatory capture (or risk); and 4) de facto ineffectiveness to redistribute rents in favor of participants.

Price caps may discourage investment in asset management quality, which is a major issue for long-term savings schemes. For instance, annual underperformance of only 1 percent over the lifecycle can reduce final cash balances by around 20 percent. The reason why caps may affect asset management quality is easy to understand: when caps are binding they simply starve the asset management function of needed income. When caps are not binding, the impact on asset management quality takes place through a less obvious channel. Non-binding price caps may mislead potential reformers into believing that current fees are acceptable just because they are capped. Hence, they discourage the adoption of policies that promote competition, healthy switching among pension firms and/or they legitimize charges at the level of the cap irrespectively of service quality.63

63 In some countries, price caps are extremely high and very difficult to lower. Colombia, for instance has a cap of 30 percent of contributions and the regulator is unable to force reductions of the ceiling onto the
Good examples of these problems are the Swedish and the Polish second pillars and the Thrift Savings Plan in the US. In Poland, caps on fees are set at around 50 basis points of assets and are scheduled to decrease to 30 basis points in the long run. As a consequence, the average pension fund in Poland employs only three investment officers with the most sophisticated fund hiring nine. As in Sweden, participants are required to choose among more than 700 mutual funds so that price controls are in principle evaded through second floor fees. The Thrift Savings Plan in the US, which charges only between 4 and 6 basis points on assets, offers only passive indexing portfolios with low yields. For instance, between September 2003 and July 2008, the G-Fund, designed to replicate the performance of CDs, yielded an annualized nominal 4 percent. The F-fund, designed to track the Lehman Brothers US Aggregate (LBA) index, yielded an annualized nominal 4 percent. The C-Fund, designed to perform the same as the S&P 500 index, yielded an annualized nominal 6 percent; the S-Fund, designed to replicate the Wiltshire 4500 index, yielded an annualized nominal 9 percent. Finally, the I-Fund, designed to replicate the MSCI EAFE index, yielded an annualized nominal 13 percent due to the strong depreciation of the dollar against major currencies over the period.

Price caps may discriminate against pension funds with a less valuable customer base because caps are applied to uniform rates and not to prices per unit of physical service. That is, a given cap provides less revenue per customer to pension firms with a lower average fee base. Consequently, price caps may encourage transactions with related parties with the objective of subsidizing capped revenues. An example of this takes place in Hungary where all pension firms outsource asset management and caps apply to both contributions and asset management fees. Pension firms outsourcing to asset managers within the same financial group have an incentive to artificially inflate the asset management fee to offset foregone revenues due to caps on fees. This form of cross-subsidization (through transfer pricing) is not available to pension firms outside the financial group, which outsource asset management at lower market prices.

Caps can expose regulators and supervisors to potential capture and firms to high regulatory risk. Caps can expose regulators and supervisors to potential capture and firms to high regulatory risk. In the absence of a formal process to set caps that reflects industry. It is fair to ask whether in such cases price controls effectively create a sense of appeasement simply because fees are capped.

64 Yet, Polish pension funds have reported good investment returns, at least in the period 2000-2005.
65 In Sweden, this problem is mitigated by the PPM negotiating a set of caps and rebates with the funds among which individuals can choose (see Palmer (2008) for a list of rebates).
66 The Thrift Savings Plan in the US is not subject to price caps. The low fees charged are the result of the monopsony power it has on service providers (see Section XIV for considerations on the detrimental impact of monopsony power on financial innovation).
67 The empirical literature surveyed in Chapter IV shows that while market timing yields a negative average value added to passive investment, stock picking can indeed yield additional percentage points. In general, it is purely an empirical question whether hybrid investment policies (not purely active policies) yield higher average long-term returns than purely passive indexing policies.
68 Consequently, fees charged by asset managers to their pension funds within the financial group are on average 60 basis points higher than those charged on other pension funds. Some market players report that few small funds outside financial groups even collude with outsourced asset managers to pay a higher than market asset management fee and receive back income from the asset manager to subsidize its operational costs.
the actual production costs of firms, pension firms rely on lobbying and related practices to make their point of view known when caps are set. In this case, regulatory capture by well connected market players becomes a likely possibility. At the same time, pension firms are exposed to excessive regulatory risk if a populist administration decides to arbitrarily lower the caps.

Participants may not benefit from the introduction of caps after all since caps can be easily evaded through second floor fees. This is probably one of two major critiques of price caps. Second floor fees do not yield additional revenues to pension firms but they reduce net yields for participants. In Chile, for instance, the extensive use of mutual funds for foreign investment with an average fee of 100 basis points, costs on average an extra 30 basis points on total assets to participants. In other words, the use of third party investment vehicles makes caps ineffective as a policy instrument to redistribute rents from firms to participants and instead redistribute rents from pension firms to third parties.

Probably, the second most important critique of current price regulations is that caps are not linked to the actual cost structure of firms and can easily become obsolete since factor prices, technology and demand change over time. For instance, when dispersion in the average fee base increases, caps becomes more discriminatory across firms; and when caps are decreased they take away more revenue per customer in firms with high fee bases than in other firms, affecting incentives differently across pension firms. In other words, due to possible changes in fee bases, price caps are a less effective policy instrument to redistribute rents from firms to participants. Clearly, this could be obviated by a schedule of caps revisions, as some countries have done. However, each new revision of caps is exposed to the drawbacks discussed earlier, in particular regulatory and political risks. Unfortunately, no government has yet adopted formal procedures for defining price caps that smoothly incorporate changes in factor prices, technology and demand.

In summary, price regulation in the form of price caps is a substantially stronger form of policy intervention that aims at addressing the consequences of price distortion and redistributing rents in favor of participants. However, by not addressing the causes of price distortions, it suffers from many drawbacks discussed above. Most importantly, price caps could in practice redistribute in favor of pension firms’ suppliers instead of participants through related parties transactions and could quickly become obsolete unless frequently changed. Irrespectively of the aforementioned drawbacks, price regulation generally appears to be a necessary (albeit non desirable) means to improve rent distribution between participants and pension firms. As such, it is becoming very popular among supervisors. The next section discusses ways to mitigate the aforementioned drawbacks, in particular by linking caps to the cost structure of pension firms.

XIII IMPROVING PRICING SCHEMES AND PRICE REGULATION

The distortions created by uniform rate regulations applied to heterogeneous bases could be greatly reduced by the use of flat fees and flat subsidies. However, these may not

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The second is discussed in the following paragraph.
obviate the need to introduce price regulations in response to participants’ inertia unless other alternative industrial organizational forms, discussed in Section 0, are adopted. We discuss why flat fees and flat subsidies may be jointly more efficient and more equitable than current pricing schemes in subsection XIII.A and how the design of price regulations can be improved by linking it to the cost structure of pension firms in subsection XIII.B.

XIII.A Improving current pricing schemes

The switch to the right combination of flat fees\textsuperscript{70} would increase efficiency by reducing the discrepancy between prices (fees) and marginal production costs of pension firms. This would occur because the average cost of the vast majority of pension services provided by pension firms is not proportional to the earnings or asset related bases on which fees are typically levied (as discussed earlier)\textsuperscript{71}.

However, flat fees are not equitable \textit{per se} unless used in conjunction with a subsidy. In the absence of a redistributive scheme, net returns can easily be negative for low-income earners and for new participants in the presence of flat fees. Hence, the equity objective to relieve low-base participants from the mandate to pay fees can be met by a flat subsidy. For instance, an explicit tax on all covered earnings at a constant rate can be created and the revenue from this tax can be used to pay each pension firm a flat subsidy per participant served per period, even if there was no contribution in that period (the subsidy can also be paid to the participant’s account). This tax-\textit{cum}-subsidy scheme is more equitable and more efficient than prohibiting flat fees, because redistribution takes place over the whole covered population and not within each segment covered by any one pension firm.

<table>
<thead>
<tr>
<th>Table 12: Fees Charged by Kiwisaver Default Providers (2007)</th>
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<tbody>
<tr>
<td>Provider</td>
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<tr>
<td>Tower</td>
</tr>
<tr>
<td>Average total fee in NZ$/year/account</td>
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<tr>
<td>Fee subsidy in NZ$/year/account</td>
</tr>
<tr>
<td>Average fee in US dollars/year/account</td>
</tr>
</tbody>
</table>

\textbf{Notes:} /1 Excludes mandatory employer fees announced in May 2007, after the auction; /2 Excludes second floor fees; /3 See Valdés-Prieto (2007b) for an explanation of the calculations performed and the assumptions used; /4 The exchange rate of May 2007 was 1 NZ$ = 0.7325 US$.


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\textsuperscript{70} Whilst flat, fees would still be contingent or permanent depending on the service provided as discussed in subsection XII.A.

\textsuperscript{71} Hastings and Tejeda-Ashton (2008) found experimental evidence that by presenting fees in pesos instead of annual percentage rates, less financially literate workers would be more inclined to consider fees when choosing among investment funds. I.e., they would be more likely to select funds with lower average fees.
New Zealand already implemented this fee subsidy in the Kiwisaver program in 2007. Flat fees do not burden low earners in New Zealand because the government also pays a flat subsidy to participants, advertised as support for paying fees and financed with redistributive general tax revenue. In New Zealand, the level of this subsidy was set slightly above the flat fee charged by firms and was advertised as a justification for firms to charge flat fees, thus encouraging their use (see Table 12). Moreover, the fee subsidy is paid even when the participant does not contribute, making it easier for firms to adopt flat fees.

Since 1997, Mexico has a similar flat subsidy (called “cuota social”) equivalent to more than 90 percent of required contributions for very low income earners close to the minimum wage. The Mexican “cuota social” is advertised as the taxpayers’ effort to raise the pensions of the poor, i.e. as a non-contributory subsidy to the elderly poor, comparable to minimum pension subsidies and universal flat non-contributory pensions. Mexico, however, does not allow pension firms to charge flat fees.

In summary, flat fees are more efficient than uniform rates applied to heterogeneous bases in both a high and low demand elasticity environment as they limit the discrepancy between prices and marginal production costs. In addition, when used in conjunction with a flat subsidy, they create a more efficient redistributive mechanism than one based on uniform rates.

However, two important drawbacks need to be highlighted: 1) subsidies financed by the budget can be fiscally expensive; and 2) greater efficiency in supply is attained by flat fees but the problem of price distortions generated by an inert customer base remains. The fiscal concern may imply that flat subsidies may not be a practical tool after all, but this is an empirical issue that is likely to differ from country to country. The problem associated with the inert customer base suggests that the likelihood of political intervention on prices remains high. Therefore, unless alternative industrial organization structures are adopted as discussed in Section 0, alternative and improved price regulation mechanisms are needed to reduce price distortions. The rest of this section analyzes the merits of an alternative price regulation design based on pension firms’ cost structure.

**XIII.B Improving the design of price controls**

As noted in subsection II.D, most of the distortion associated with the current design of price caps relates to the fact that these are not linked to the level and structure of costs of pension firms; the use of cost-based tariffs would reduce most of these distortions. Clearly, a full dichotomy between price caps, not linked to costs, and cost based tariffs, linked to costs, is impractical; some link to costs (even if implicit) is bound to exist even for price caps. For instance, the Kiwisaver’s program in New Zealand is an example where pension fees have been set through a process that reflects (albeit indirectly) the production costs of pension firms. An auction for default providers of undecided participants was used to make the market reveal the cost structure (and associated competitive mark up) of allowable pension services. On the basis of these revealed costs, all pension funds were allowed to charge a flat fee per person per month. This implicit link to costs means that, at least initially, most price caps are likely not to deviate much
One possible way to establish cost-based tariffs is through the use of a “model firm”, as commonly done in the infrastructure sector like water and electricity distribution. The basic idea is that evidence on audited production costs would be used to estimate the cost function of a representative firm. Each real firm would then be allowed to receive income capped by the tariff to finance the costs of the model firm and could retain all savings from cutting costs below those of the model firm, putting pressure on laggard firms to invest in cost savings. These tariffs are typically set for five years and allow for tariff indexation to inflation. The tariff formula often includes a parameter which is intended to estimate possible increases in total factor productivity resulting from technology changes.

An alternative regulatory approach used in the utility sector is the rate-of-return approach which limits prices so that the regulated firm earns only a “fair” rate-of-return on its capital investment. Contrary to the cost-based tariff based on a model firm, rate of return regulation creates no incentives for reducing costs and increasing efficiency, and can result in the regulated firm overinvesting in its capital stock (Guasch and Spiller (1999)).

For mandatory defined contribution quasi-markets, the objective of the tariff setting process would be to finance the long-term marginal production costs for each service that participants are mandated to consume and to raise sufficient revenues to finance non-production costs. Only “permissible” costs are considered in a model firm: i.e., costs that must be incurred to produce the set of services expected from the model firm. Mandatory services typically include collection of contribution, record-keeping, handling of transfers, benefits assessment, benefit payment and passive asset management. Ideally, active asset management, which displays high and rapidly increasing marginal costs, would not be remunerated by the same tariff established for all other low marginal cost functions but through a performance fee mechanism. Non-production costs typically include marketing and financial education.

The permissible costs should be periodically re-defined as they depend on the industrial organization and the degree of subcontracting (vertical disintegration). For instance, some pension firms may subcontract record-keeping so that a decision needs to be taken whether record-keeping costs should be included. Alternatively, if the collection of contributions is centrally provided by the government, it should not be considered as an allowable cost. Finally, the degree of common ownership between pension service providers and their suppliers also affects which costs should be considered. In short, the

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72 See Guasch and Spiller (1999) for a review of regulatory practices and challenges in the infrastructure sector in Latin America including lessons from OECD countries. See also Andres et al. (2008) and World Bank (1997).

73 This approach has been common in Canada, Japan and the United States (US), although some states in the US have moved over the years towards price caps based on cost-based tariffs through the use of a model firm. This rate-of-return approach has usually three components: the rate base, the rate level and the rate structure. The rate base refers to the investments that are allowed to earn a rate of return, the rate level refers to the relation of overall revenues to costs, and the rate structure defines how individual prices are set for different services or customers (Guasch and Spiller (1999)).
definition of permissible costs is a highly technical matter (subject to change) that cannot be determined in the law since it requires periodical revisions.

A key non-production cost that merits discussion is marketing cost. Marketing is critical in mandatory defined contribution pensions as it complements financial education programs. It is particularly important because the literature on financial literacy reviewed in the previous chapter argues that the most effective way to deliver information is through a one-to-one relationship, as the one that can be provided by salespeople. However, many jurisdictions have faced serious problems with the use of high-pressure sales tactics and even fraud. Including marketing costs in the determination of the costs of the model firm is an effective means to ensure a sufficient level of financial education, while controlling the risk of marketing wars. Indeed, the marketing budget to be financed could include specific educational actions (such as production and dissemination of information about returns achieved by different pension firms and different funds).

In computing the costs of the “model” firm on the basis of information on real firms, attention needs to be paid to the costs recorded by firms belonging to large corporate groups. Price transfers can be used to artificially inflate costs within a group. Alternatively, inputs can be subsidized within a corporate group structure (again, record keeping, marketing, brokerage services, etcetera) and the input price in transactions with related parties may be deliberately inflated to increase the final tariff of the model firm.

Once the costs of the model firm are estimated, there is the question of how to raise revenues for pension firms. We discussed earlier that a system of flat fees with flat subsidies would be more efficient and equitable than current rates applied to heterogeneous fee bases, but it can be fiscally expensive. An alternative redistributive scheme could be engineered by leaving current fee structures unchanged and by setting fee rates so as to generate an average income from all pension firms equal to what is needed to finance the model firm. Overall revenues from this tariff would then be distributed among pension firms in the form of a lump sum per month to cover fixed production costs plus a flat amount per participant to finance information and financial education (non-production costs).

This alternative scheme would achieve the same level of efficiency and equity of a system of flat fees and subsidies but without raising fiscal concerns. The equity objective for low-base participants is achieved since participants continue to pay what amounts to a uniform rate on earnings or assets, but flat revenues for pension firms are totally financed by rates on participants’ bases mitigating the fiscal risk. Moreover, since marketing expenditure is proportional to the churning rate, as discussed in the previous chapter, the tariff model would make it possible to raise sufficient revenues to target only a socially desirable churning rate. Finally, since firms cannot discriminate among participants on the basis of rents (their income is essentially flat), they are also discouraged to engage in cream skimming.

The obvious challenge in the use of the “model firm” to establish tariffs is that costs need to be estimated very accurately, which requires a regulatory authority with very strong technical capacity and resources and the necessary independence to avoid capture

\footnote{Indeed, this pricing scheme would provide the government with additional degrees of freedom to use the budget, should increased redistribution (to encourage participation, say) be deemed necessary.}
Competition And Asset Allocation Challenges For Mandatory DC Pensions: New Policy Directions

by politicians, consumers or the firms. Estimating the “model firm” has proven costly and challenging for utility regulators (Guasch and Spiller 1999), especially in emerging markets where regulatory authorities have often less capacity and they have frequently invited international experts to help them define the cost model. Allowing pension regulatory authorities to define price ceilings introduces a new regulatory risk, which if mishandled or handled in a discretionary or unpredictable manner could adversely affect the development of the sector, as the experiences in the infrastructure area illustrates. To handle disputes on price regulation, it is common in the infrastructure sector to define an arbitration mechanism or a specialized court for appeals given the complexity and technical nature of such a regulation.

While improving on the design of price controls appears to be a possible proposition to achieve a more equitable redistribution of rents between participants and pension firms, it introduces a new regulatory risk. More market based solutions could be envisaged which involve adopting alternative industrial organization structures. To date, few jurisdictions have attempted to directly address the cause of price distortions (low demand elasticity) by adopting alternative industrial organization structures, such as using a centralized public board to choose private pension providers on behalf of inert participants. In the infrastructure sector, auctions are also used as a mechanism to induce potential providers to reveal their price and induce competition for the market—when competition in the market is not possible. Furthermore, regulation in the utility sectors continues to evolve and there is a clear trend toward liberalization. Whenever technological innovations make it feasible, regulation is being replaced by competition in the market or segments of the market inter alia in the telecommunications and electricity sectors. Unbundling the sector by activities (e.g., generation, transmission and distribution in electricity) permits the introduction of competition in certain segments of the sector resulting in efficiency and welfare gains. Similarly, unbundling services related to pension fund administration according to their characteristics (e.g., high versus low economies of scale) can also be a way of increasing the overall efficiency of the sector. These alternative industrial organization structures are further analyzed in the next section.

XIV PURE PROCUREMENT

Alternative industrial models are based on procurement. In its purest form, each pension firm is assigned, at least temporarily, a monopoly over a set of consumers. Participants are assigned by an exogenous rule devised by a board, usually a contest based on prices, yields or other variables that are related to efficiency. The essence of pure procurement is that consumers are not given the opportunity to choose the board, otherwise a quasi-market is recreated and consumer inertia regains significance. Examples of countries that have adopted this framework are Singapore, Bolivia, and the United States for the Thrift Savings Plan. Other countries like Mexico, Bulgaria, Hungary, Argentina, Chile, New Zealand (Kiwisaver), et cetera, have adopted a mix between this system and a quasi-market (hybrid forms). This section focuses on pure procurement while hybrids are discussed in Section 0.

The merits of pure procurement arise directly from its primary objective, which is to deal in a radical manner with consumer inertia. When one demand block is granted to
each of the firms that win the contest, the incentive of providers to spend in marketing to attract clients is removed. In addition, by establishing competition for the market rather than in the market, barriers to entry and rent extraction activities are eliminated.

Nevertheless, pure procurement carries its own challenges for regulators and, although superior in most aspects to price ceilings, it is not clear that it is a Pareto improvement vis-à-vis quasi-markets in all cases. In particular, some form of supervision and monitoring needs to be imposed, especially on asset management quality.

In comparison to quasi-markets, there are two areas of concern with pure procurement boards. First, a procurement board is a centralized entity and by definition it has monopsony power over pension firms. This may lead to underinvestment in the adoption of innovations improving asset management quality. In addition, it is very difficult to monitor and evaluate the overall performance of the board. Being the only entity to asses, there is no valid performance benchmark that can be used. Second, procurement boards are usually public offices, in the sense that board members are designated by politicians, unions, employer associations or large employers. Henceforth, there is a risk that political interference may reduce the ability of the board to maximize participants’ welfare.

Subsection XIV.A provides analytical support for the concern that pure procurement models can lead to underinvestment in asset quality, whilst subsection XIV.B discusses the concerns related to political interference.

**XIV.A Underinvestment in financial management innovation**

Innovation of financial management techniques is an expensive sunk investment for pension providers. This is true for leading countries that innovate as well as for follower countries that adapt. In both sets of countries where a centralized board procures financial management technology from suppliers and where private domestic demand for financial products similar to those purchased by the procurement board is not well-developed, underinvestment in financial technology may take place for at least three reasons: monopsony power of the board, lack of competition in procurement and the public good component of innovation.

Consider the effects of monopsony power. According to Williamson (1971) underinvestment in adaptations that are specific to a customer (in our case the public board) emerges in any two-stage game situation where the adapter invests in period 1 and expects to sell his adaptation in period 2. In period 2, when the investments of the supplier are already sunk, the procurement board exercises its monopsony power to cut

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75 In some cases, boards are designated by firms chosen by the participant in another quasi-market for joint purchase of disability insurance.

76 The reason why adaptation is characterized by sunk costs, similarly to innovation, is less obvious. The following reasons are few among those suggesting that sunk costs in adaptations are not negligible: (i) international adaptation in follower countries is more expensive and riskier than subnational adaptation in leading countries; and (ii) the value of those innovations in follower countries depend on careful customization to the local financial infrastructure, part of which may be weak or inexistent.

77 Grout (1984) and Tirole (1986) proved the underinvestment result for the case of a single supplier that negotiates price with a single purchaser in period 2. Dasgupta (1990) extended this result for multiple suppliers, who participate in a sealed-bid auction organized by the single purchaser in period 2.
the marginal payment for quality. Looking ahead from period 1, the potential supplier realizes that the powerful purchaser will bargain away a portion of the sunk cost of producing quality; i.e., part of the cost of quality is not expected to be fully remunerated. Thus, the supplier underinvests in period one.

Consider next the effect of lack of competition. Arrow (1962) developed a critical result for comparing public procurement boards with quasi-markets: the more purchasers compete in period 2, the smaller is underinvestment in period 1. His model implies that a small pension firm that has zero profits in the output market (the quasi-market for defined contribution pensions) has a higher willingness to pay for an increase in quality than a monopoly purchaser does for the same innovation. The rationale is straightforward: the small pension firm that purchases an innovation can gain by displacing its rivals while a procurement board does not displace anybody else by improving quality because its market share is already 100 percent.

Consider finally the public nature component of innovations. No pension firm would finance research for financial innovations that cannot be kept proprietary, preferring to free ride on public goods produced by others. This implies that investment in innovation will be undersupplied in both pure procurement and quasi-markets, but there are at least two reasons to believe that underinvestment incentives are larger under pure procurement. First, research contracts by public procurement boards are more prone to favoritism, capture and collusion. Second, even if a public board engages in research contracts, it is subject to higher transparency constraints than a private pension firm, which will likely lead to faster imitation. A private pension firm that hires an innovator can reap temporarily the benefits of that investment by using secrecy to slow down imitation by rivals.

XIV.B Undue political interference
In addition to providing weak incentives for pension firms to invest in financial management innovation or adaptation, procurement by centralized public boards can result in low asset management quality because of undue political interference. Procurement board members may respond to the needs of the politicians that designate them in ways that do not necessarily contribute to the welfare of participants. In contrast, the members of the board of a private pension firm that competes in quasi-markets represent the owners of the firm and follow a profit motive. This creates two situations of potentially increasing negative impact on performance. On the one hand, political principals face a technical difficulty in determining whether the public board is

78 In defined contribution pensions, these principals are somewhat interested in good pensions since this can attract votes or may further other objectives, and therefore, are somewhat interested in achieving high-quality asset management.

79 Managers have compensation linked to pension firms’ profits or to increases in brand value. These links can be explicit (profit-sharing) or can be provided by the labor market for directors (board members), where reputation of success boosts future expected compensation. Thus, the boards of private pension firms are willing to risk more when designing contracts for asset management, because they share in the upside to a much larger extent. Private pension firms have better incentives to adopt not fully-tried innovations if the expected payoff is large. Even though these risks turn out badly sometimes, this managerial risk is diversified away over a participant’s lifetime, while the gain from well-motivated boards survives.
performing well in high quality asset management, which can lead public boards to adopt “safety-first strategies”. On the other hand, board members are vulnerable to political demands to direct investments in a non-commercial way. In what follows, we discuss in turn “safety-first” and socially responsible investment strategies.

In the absence of valid benchmarks, board members gain little on the upside, when returns are large, but if asset management becomes obviously deficient they suffer the burden of a loss of prestige.\textsuperscript{80} Board members become overly risk-averse and adopt safety-first strategies, most of the time at the expense of the participants’ expected returns.

We have in mind three types of “safety-first” strategies with an increasing level of severity. The first type of strategy is to delay the adoption of new asset management techniques until they are considered mainstream. The most extreme form of this kind of herd behavior is to fully index all portfolios offered to participants. Indexing implies low fees that can be used to address the principal’s political demands but often lead to lower gross yields. The Thrift Savings Plan in the US represents a good example of this. The second type is to discharge asset management responsibilities on participants, despite the evidence of participants’ inertia and inability to invest in a rational way as discussed in Chapter II. The Swedish PPM system does precisely this. The third type is to leave quality control of asset management services to external parties. This strategy is more likely to be adopted when the public procurement board itself evaluates return performance. A public board may hire consultants to select the worst defensible benchmarks that show the largest excess returns and the lowest tracking errors. When political principals and public opinion are tamed by performance statistics biased by self-selection, the public board can shirk on efforts to find the best asset managers.

In addition to safety first strategies, public boards are vulnerable to various forms of interference in asset management. We have in mind two types of interferences with increasing negative impact on performance: what the literature refers to as “socially responsible investments” (SRI); and outright undue political interference in asset management to direct investments to development projects. While SRIs have proved to be somewhat compatible with participants’ interests when canvassed in professionally and transparently designed strategic asset allocations, undue political interference can be substantially detrimental.

\textsuperscript{80} The situation is different from the one of Central Banks, whose boards are also public. First, currency is a natural monopoly from the demand side, because of externalities in the choice of a medium of exchange. In contrast, asset management is an activity where innovation and product variety are desirable for participants. Second, the degree of participant inertia, which is the ultimate reason for centralized purchase, varies significantly and some groups do not need it. Third, the world has at least a century of experience in measuring inflation, GDP and unemployment by independent statistical agencies. This makes performance evaluation of Central Bank boards by political principals and public opinion much easier than of defined contribution pension boards.
Box 5: Political Influence in Asset Management

**Investing following the principal's agendas.** This involves instructions to buy and hold bonds and equities issued by state-controlled enterprises, government bonds with weak covenants and vulnerable to inflation, and bonds issued by foundations controlled by the dominant political parties. The experience of emerging countries with this type of social investing is long and disastrous (Mesa-Lago (1991)). Alternatively, the board may instruct procured asset managers, either implicitly or explicitly, to sell blacklisted private securities, even if this sacrifices returns or security (Entine (2005)).

**Investing following the personal agenda of board members.** Some board members may push their own social agendas, with the support of aggressive publicity campaigns organized by outside activists, even against other board members and at a cost in terms of participants’ welfare. Surveys to participants may be an efficient response to such pressures.81

**Politicization of proxy voting.** Pension funds can influence proxy voting in creditors’ meetings for failing companies or in bondholders’ meetings. Since some politicians may want to cater to electorates in districts where layoffs are concentrated, they may ask board members to lobby asset managers to favor less than efficient debt restructuring agreements. Alternatively, pension funds can also influence proxy voting in the shareholders’ meetings of companies whose shares are publicly traded. These meetings have to vote on sales of essential assets, selection of board members and other issues important for politicians. Positions in the boards of large companies also allow influence over political donations for the next campaigns.

**Political pressure that may affect activities that are crucial to achieve liquidity.** The liquidity of the investments of large pension funds depends on selling and buying in mergers, takeover battles and public offerings of shares. However, control over these proxy votes are also attractive for a politician seeking to promote a national champion, or to protect political allies, or to win an election. Thus, a public board is vulnerable to political pressures in activities that are critical to achieve liquidity.

In general, political interference may lead a public procurement board to engage in a number of costly activities (see Box 5) that trade off participants’ returns for political objectives. For instance, TIAA-CREF (2007) finds that over a six-year period a socially responsible balanced portfolio did worse than its benchmark by 78 basis points per year. If this difference lasts the whole working life, the pension would be about 15 percent smaller. Instead, in countries where the “social” portfolio involves purchasing equity in state-owned companies that focus on maximizing employment (say), the loss can be much larger. Alternatively, Woidtke (2002) finds that pension funds that engage in politically influenced social investing in the United States pay lower returns to participants, since they destroy value in the firms where they vote. Both participants of the pension fund and other company shareholders lose due to the destroyed value. Moreover, political interference weakens transparency and conflict of interest rules for the securities markets, while professionalism in asset management loses ground. However, some of these empirical studies face data limitations, especially about the timing of the interference.

Obviously, the size of the costs of political interference in a public procurement board depends on the quality of governance in the country in general, and of the governance of the procurement board in particular. For example, if general institutions ensure that asset management quality achieved by the board can be easily observed by political rivals, the national auditing office and by press, board behavior is likely to

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improve. However, in countries with weak governance frameworks, political influence in asset management can have serious negative consequences for participants.  

In summary, the benefits of pure procurement in escaping participant inertia may be offset by a series of drawbacks. These include economic disincentives for asset management quality caused by the monopsony power of public boards over private suppliers of innovations and adaptations. In addition, the performance of centralized public procurement boards is difficult to assess due to the lack of valid benchmarks. This may encourage boards to adopt highly risk averse strategies that may not benefit participants. Finally, centralized public procurement boards are vulnerable to political interference, which may lead to seriously low asset management quality in countries with weak governance. Clearly, the relative importance of these drawbacks depends on the specifics of each country.

XV HYBRID SYSTEMS

A hybrid industrial organizational model separates demand in two segments: procurement and quasi-market. In one segment, the pension fund administrators are selected by a public board, as in pure procurement, while in the other, participants choose their own provider, as in quasi-markets. In the most interesting types of hybrids, each participant is free to choose segment; i.e., there exists competition between organizational forms. Hybrids also differ in their treatment of the “undecided”. It is natural to consider hybrids where the default for most of the undecided is the procured segment.

An example of a hybrid system is Kiwisaver, the New Zealand’s earnings-related system that began operations in July 1, 2007 following a procurement contest to determine “default providers” in 2006. The Swedish PPM system is also hybrid, but it differs from Kiwisaver because there is a state-owned monopoly provider in the “procured” segment and the quasi-market firms are subject to very tight price ceilings. Mexico’s rule to allocate undecided participants to the highest quartile of providers that operate in the quasi-market segment in terms of net returns is also a hybrid. Similar rules are used in Chile, Bulgaria and Hungary. The pension reform approved by the Chilean Congress in 2008 also establishes a hybrid system with an explicit procurement system.

XV.A Policy considerations in designing a hybrid

The hybrid form has potential economic advantages over pure procurement or a pure quasi-market but to realize them its design must consider a number of issues. The two potential economic advantages of the hybrid form over pure procurement relate to the

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82 The literature on governance of public pension fund management is large and good surveys as well as examples of good practices can be found in Musalem and Palacios (2004); Impavido (2002 and 2008); Vittas et al. (2008) and the papers referenced therein.

83 By the time this book was being written, the Mexican Congress passed a reform on the Pension Law that changed the design of the Mexican hybrid (December 2008). The two main highlights for this chapter are that Mexico is moving from a flow to a stock hybrid and that CONSAR is strengthening its implicit price control capabilities. Additional references are provided as needed as this section develops.
creation of a performance benchmark for the board and the creation of outside options for board’s suppliers.\footnote{This would mitigate the negative impact on asset management caused by the monopsony power of the public board and the lack of competition in procurement discussed in subsection XIV.A.}

Pension firms in the quasi-market segment are the only adequate benchmark for evaluating the public procurement board. This benchmark is subject to the same portfolio limits, catters to equally long-term investors, and suffers from home-bias to the same degree. The mandate to enroll creates the same biases in the sensitivity of participants to price differences. Such a well-tuned benchmark allows the political authorities and public opinion to make a better assessment of the performance of the public procurement board. By contrast, as mentioned in subsection XIV.A, the absence of adequate peers for benchmarking in a pure procurement model impairs the ability of the public board to evaluate the quality of asset management.

The existence of a pension quasi-market with multiple providers improves the outside options for suppliers to the public procurement board. Underinvestment by suppliers in financial innovation and adaptation is reduced because the degree of monopsony power of the public board is lower than in the pure procurement model. This helps the procured segment attain returns as high as in the quasi-market.

A hybrid can also be superior to a pure quasi-market for other reasons. For instance, by replacing the choices of the undecided with a technically qualified public board that compares prices while controlling asset management quality, the welfare of the undecided increases. In addition, if the allocation to the procured segment is reasonably targeted to inert participants, the share of active participants in the quasi-market segment increases. This raises the demand elasticity faced by firms in the quasi-market segment, which could result in lower prices and less marketing expenditures in that market. Finally, the public notoriety, or “signaling effect”, of establishing a procured segment may further increase public awareness about price differences among participants further raising price elasticity. For example, in Mexico, the allocation of the undecided led the press to intensify information on prices every time a new group of participants was assigned, which happened quarterly until December 2008.\footnote{With the December 2008 reform, the assignation will occur on an annual basis instead of a quarterly basis.}

However, the design of a well functioning hybrid model needs to take into account several policy considerations among which the following five appear critical.

First, a participant should not be allocated to a segment that does not maximize his/her expected future wealth net of fees. The government should allocate participants to the procured segment only when it is arguably in their best interest. Given the volatility of equity returns and the direct impact of returns on pensions in a defined contribution system, a government may face suits from individuals that find \textit{ex post} that the government allocation materially reduced her pensions, even though this could not be predicted \textit{ex ante}. Thus, the allocation to the procured segment needs to be transparent and well reasoned, and individuals should be free to leave the procured choice if they consider it worse than the choices available in the quasi-market.
Second, the targeting of the default allocation to inert participants should be made with objective rules. Involving the government in the business of finding the most convenient segment for an individual participant may lead to excessive interference, micro-management and legal liabilities. Possible objective rules include the simple requirement that the participant be undecided, in the sense that he or she does not choose a pension fund administrator. Alternatively (or in addition), rules could be based on observable attributes of undecided participants (such as individuals with low assets) to be within a range that ensures that it is highly unlikely that they can do materially worse in the default segment, if they choose to remain there.

Third, participants that recently chose a pension firm should be exempted from a default allocation. To be efficient, a hybrid model must limit duplication of search costs and switching costs, and consequently, it would be desirable to exclude from the procured segment individuals that chose a provider relatively recently.

Fourth, heterogeneity in fee bases can set the maximum welfare for participants at one of the extreme organizational forms (pure procurement or quasi-market) and the hybrid would not be viable. If the average base in the undecided segment is lower than in the non-default segment, providers to that segment need a higher fee rate to collect the same fee income per period as providers to the other segment. If the ratio between the average fee base (assets) of participants in the procured segment and the average base of participants in the quasi-market segment is low enough, then the fee rate obtained in the auction can be above the fee rate observed in the quasi-market segment, despite the fact that the latter must finance marketing costs and above-normal profits and that the former needs not. In that case, the best allocation rule for all undecided participants is the quasi-market (continuation in the last firm chosen, despite being undecided) and the procured segment is eliminated. In practice, differences in fee rates would be driven by inequality in fee bases as well as cost differences. Nonetheless, the above suggests that, if inequalities in fee bases between the two segments are large enough, the potential welfare gains of a hybrid over the extreme organizational form can be lost and the former can be wiped out. This can happen both with asset-based or contribution-based fees.

By contrast, when flat fees are dominant as in New Zealand, there is no inequality in fee bases since the base is one unit of service per person per period. In other words, encouraging flat fees reduces the risk of an artificial elimination of the hybrid model and should be an additional aspect to consider when selecting fee bases.

Fifth, suppliers to the procured segment need to be protected from cream-skimming during the service period. Heterogeneity in fee bases and fee restrictions create sets of

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86 The evidence from Mexico indicates that in the allocated segment the average density of contribution starts at 40 percent and falls to 20 percent within 12 months, much smaller than the average density in the open quasi-market segment, which is about 60 percent. In addition, the average contribution amount in the allocated segment is about 60 percent of the average amount in the open quasi-market. If only contribution-based commissions were allowed, the commission rate in the allocated segment would have to be 3.3 times larger to collect the same revenue over the first year. However, Mexico has switched in 2008 to asset-based only revenues which increases inequality between segments, since the average balance per participant in the assigned segment is US$30 compared to ten times that in the quasi-market. The allocated segment does not need revenue to pay for marketing costs, but the point is that the impact of inequality in commission bases can be substantial.
procured participants with large rents. As cream-skimming can be expected, bidders in the auction factor into their bid some amount to cover this loss of rents, leading them to offer higher fee rates. If these rates surpass those in the quasi-market segment, cream-skimming unravels the procured segment and eliminates the hybrid organization form. Cream-skimming is smaller when the share of flat fees in total revenues grows.

Cream-skimming of the procured clientele could be prevented by the use of additional policies such as: 1) prohibiting procured participants to leave the procured segment, even if they become active and decide to search; 2) allowing exit fees, set \textit{ex ante}; and 3) allow \textit{ex post} adjustment fees. However, these also present their problems.

A major problem with imposing prohibitions is that they cannot last more than a few months. Otherwise, it would impair the freedom to choose provider that is essential for efficiency in an environment where prices are changing in response to changes in cost and demand. However, a limited duration simply delays cream-skimming.\footnote{In 2002-06, Mexico prohibited procured participants from leaving the procured (assigned) supplier during the first 12 months, unless the destination firm charged a lower fee. This rule was subsequently changed to account also for rates of return.}

A second alternative is to allow exit fees to be paid by the receiving firm to the pension firm that was originally serving the customer. The exit fee would be the expected present value of rents until the end of the service period, so it would decline in size as the end of the service period comes closer. The allowed exit fee would be subject to a ceiling to prevent the creation of a captive clientele. The destination firm, however, would also take into account the possibility of losing this new customer to a third pension fund administrator. Fearing this second round of cream-skimming, some pension firms would be unwilling to pay the exit fee in the first round.

A third alternative is an \textit{ex post} adjustment fee. Each participant allocated to a procured pension fund administrator, but subsequently leaves to join the quasi-market segment, would originate a periodic payment to that procured pension firm, from the pension firm that served him during the previous month or quarter. The \textit{ex post} nature of the adjustment fee implies that the first destination firm stops paying when the customer moves to another firm in the quasi-market. The adjustment fee is paid until the end of the procured service period. The adjustment fee would be paid on a flow basis and would be based on actual density and fee bases in the previous month or quarter.\footnote{See Valdes-Prieto (2007b) for details.} The complexity of such adjustment fee raises concerns regarding its implementation.

In summary, a hybrid organizational form can lead to welfare gains for participants, but several constraints must be addressed for a hybrid to be viable and efficient. Among others, these constraints affect the choice of fee bases: heterogeneity in fee bases is likely to make the hybrid model non-viable further suggesting that increases in the flat component of current fees would be desirable.

\section{XV.B Types of hybrid design}

This section compares the advantages and costs of the major types of hybrid designs: the stock design and the flow design.
**XV.B.1 Stock design**

With the stock design, the full segment of participants (the inert customers) that would benefit from procurement is allowed to be served by providers in the procured segment. In addition, target participants can spend their whole working career in the procured segment as they will be served by a sequence of providers selected through periodic procurement auctions.

The most interesting example is the Kiwisaver scheme in New Zealand. The procured segment is made up of participants that when switching jobs or joining a covered job for the first time in their life, fail to decide between pension firms (are undecided), and the employer also fails to choose for them an “active choice provider” (a firm in a quasi-market) or to offer an occupational plan (employer superannuation). Starting on July 1, 2007, the procured segment will be served for a period of seven years by six “default providers” chosen in an auction.\(^89\) Individual defaults are allocated randomly to one of the default providers. The New Zealand auctioneer required bidders to comply with asset management experience criteria and the use of brands that are also sold in voluntary markets. Default providers share the same investment profile, which creates a homogenous asset class and induces more intensive rate-of-return comparison and rivalry.

As mentioned in the beginning of the chapter, the Kiwisaver scheme reduces fee base heterogeneity by establishing a flat fee subsidy to participants, paid in both the quasi-market and the procured segments. This is estimated to amount to nearly half the revenue of default providers and it encourages the use of flat fees. In addition, the use of flat fees is expected to reduce cream-skimming.\(^90\)

Kiwisavers default schemes charge on average 65 US dollars for each of the 812 thousand participants currently enrolled, which is much lower than the average fee charged by 401(k) plans in the US. However, it is difficult to compare fees charged in the Kiwisaver scheme with fees charged in other mandatory defined contribution pension quasi-markets. This is due to the fact that in New Zealand the quasi-market is characterized by ease of entry (as shown by the presence of 20 conservative active-choice funds offered by 20 different firms) and the small scale of each provider in the active-choice segment would all tend to make the New Zealand quasi-market more expensive than other quasi-markets. Additionally, the culling of undecided participants from the active-choice segment achieved by the default allocation is a factor that should increase the average sensitivity of demand to prices in the quasi-market segment and contribute to reductions in fees there relative to countries with a pure quasi-market. These differences prevent a simple extrapolation of the average price difference observed in New Zealand to other countries. In any case, as of September 2007, the median annual fee charged by 20 active-choice funds, with the same “conservative” investment direction as the default funds, was 23 percent above the median charge for the 6 default providers.\(^91\)

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\(^89\) Fees may only be increased at the end of years 3 and 5, and then only with a Minister’s approval.\(^90\) The asset base of the Kiwisaver scheme is still very modest and cream-skimming may become more problematic the future when assets grow.\(^91\) Source: Fee Comparator at [www.gmk.co.nz](http://www.gmk.co.nz). The comparison assumes an account balance of NZ$ 5,780 and is limited to the funds with Conservative investment direction.
In December 2008, Mexico moved to a stock design. Under the new regulation, if the undecided worker does not make an active choice to move to a different pension fund administrator in a two-year timeframe, the worker will enter automatically into a new auction. This process can be recurrent for the entire accumulation period unless the worker takes control over the decisions.

**XV.B.2 Flow design**

With the flow design, only a fraction of inert participants is served by providers in the procured segment. In addition, there are no periodic auctions for the same target participant; once a participant is allocated to the procured segment, he or she will never be allocated to it again.

Argentina and Mexico were the first countries to establish a flow design (with an ‘implicit’ procurement) in 2001 and 2002, respectively. They both established regulations that assigned the flow of new participants that fail to choose a pension plan (i.e., undecided) to the pension fund administrators that charge the lowest prices (rates) according to some rule. Hungary adopted the same rule recently, while Mexico has moved to an allocation rule based on net returns in 2008 and as mentioned above, abandoned the flow design in favor of a stock design in December 2008. By contrast, the hybrid system approved in Chile in late 2007 will have a formal procurement process. New participants to the defined contribution system (the default segment) will be assigned for a 24-month period to the pension fund administrator bidding the lowest fee.

**XV.B.3 Trade off of the stock and flow design**

There is currently a large debate on the relative superiority of the stock and flow designs. Some authors (Larrain et al. (2006)) consider the flow hybrid model more viable and less risky because the repeated auctions in the stock model imply that a large part of the clientele could be lost in the next auction. This could lead bidders to raise their bids significantly. This concern influenced the Chilean government in choosing a flow design in its 2008 reform. However, New Zealand’s successful auction suggests that other parameters can compensate for sunk costs such as the length of the service period. In addition, the flow design does not eliminate the risk of cream-skimming of participants from the procured segment. Hence, both designs need to ensure an appropriate length of service period for providers in the procured segment.

In addition, the flow design, by definition, does not target all inert participants, only new undecided participants, does not raise the average sensitivity to price and return differences in the quasi-market segment, thus exposing inert old participants to pay fees above production costs in the quasi-market segment. However, this issue is obviously more important in a mature quasi-market than in a younger system where the covered population is small.

Finally, the flow design facilitates the exploitation of inert participants after the initial service period expires because at that point the procured firm becomes free to raise

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92 The Mexican Pension Authority (CONSAR) will determine the maximum fee the services firms would be able to charge. Such a modification sets a limit for the fees, which arises by means of carrying out an auction.
fees. Only low base participants, who tend to be characterized by high inertia, will not be cream-skimmed by rivals after the service period ends. The unusually high inertia of the residual clientele means that fees charged on them could be high defeating the purpose of creating a procured segment.

In summary, the stock design presents attractive characteristics, like targeting all inert participants and protecting them from dynamic predatory pricing schedules. However, in the absence of cream-skimming, it may induce bidders to raise their prices if they fear that their clientele will be lost in a future auction. This is likely to be the case if a high degree of bundling is required from providers in the procured segment, as discussed in the next section.

XV.B.4 Stock and flow designs and the level of unbundling

A critical policy issue in the industrial organization design of the accumulation phase is to decide which services to bundle and to which services to apply a pure procurement, a quasi-market or a hybrid model. In principle, any service can face a quasi-market, pure procurement or a hybrid model. For instance, Mexican participants face a pure procurement for collection of contributions, provided by IMSS and PROCESAR, and for record-keeping related to switching, provided by PROCESAR, but they face a flow hybrid model for all other services. Similarly, Hungarian participants face a pure procurement for collection of contributions provided by the tax authority APEH, but a flow hybrid for all other services.

As mentioned earlier, requiring pension firms to provide bundled services increases sunk costs and barriers to entry. For the same reason, bundling raises the commercial risk faced by providers in the procured segment of a hybrid model of the stock design. However, when services are unbundled and only asset management is procured, the commercial risk decreases substantially. If the asset manager loses the contract in a future auction, it can move on to serve new customers at little loss of sunk costs (Valdés-Prieto (2005)), as confirmed by the experiences of the AP7 manager in Sweden, the Thrift Savings Plan in the US and suppliers to the Australian pension industry funds.

In practice, most countries that use the hybrid model require a wider bundling of services. Bundling asset management with customer service and recordkeeping helps explain why in New Zealand default providers were appointed for seven years. The experience with the Kiwisaver scheme demonstrates that a stock design is compatible with this particular bundling and low procured prices, if sunk assets are made small. Since Mexico exhibits the same degree of bundling as New Zealand, Mexico could use the stock design as well.

When the bundling of services also includes contributions collection and disability insurance such as in Chile, the viability of a stock hybrid model becomes more problematic. Each Chilean pension firm is responsible for collecting contributions on its own. In practice, incumbent pension firms have already come together to collect jointly a

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93 See subsection XII.B, where bundling and unbundling of services was discussed.
94 Another advantage of infrequent procurement is that collusion among bidders is less likely.
95 Contribution collection is provided by the Treasury (PAYE system) in New Zealand. Disability insurance is provided by other agencies in New Zealand and in Mexico.
majority of contributions through a subsidiary that owned in common (Previred Ltd.). Contributions from high-cost small employers, however, are still collected separately. Until the 2007 pension reform, each Chilean pension firm had to provide disability insurance to its own participants. This further increased entry costs because new firms did not know the rate of disability of their future clientele and had to pay large risk premia to reinsurers.

The 2007 Chilean pension reform advances in the direction of reducing the level of bundling: first, it separates disability insurance; and second, it permits the purchase of benefit determination services from third party providers. Separating the collection of contributions would have brought the Chilean degree of bundling in line with those observed in Mexico and New Zealand, but the authorities decided to create incentives for outsourcing collection of contributions rather than establishing a centralized portal for collection of contributions. Achieving costs as low as the AP7 in Sweden and the Thrift Savings Plan in the US would require one more unbundling step: separating customer service and recordkeeping from asset management.

The Swedish system is a good example of the effects of unbundling in lowering costs.\(^96\) Total charges were moderate in the initial years of operation and are expected to decline as the asset base expands – the total charge (the Premium Pension Authority—PPM—administration fee and the manager’s fees) was 60 basis points of in 2005 and is projected to decline to less than 30 basis points in 2025 (Rocha and Hinz (2007)). The PPM projects that its charge will fall to 10 and 4 basis points by 2015 and 2020, respectively. Initial costs were higher due to the small asset base and the fixed costs related to the development of information technology systems. The average fee for all funds (net of rebates) was 41 basis points in 2003 and it is projected to fall to about 24 basis points percent by 2020. The PPM designed a fee schedule for participating funds that is inversely related to the amount of assets held by fund managers, who can charge the fees they normally charge on similar products but pay a rebate, credited to the affiliates’ accounts, to the PPM if the fees exceed the PPM benchmarks. Marketing expenditures by fund managers are modest.

As mentioned before, Swedish authorities separated administrative and investment management functions, where the former is centralized and publicly managed and the latter is open to private competition. The PPM was set up to administer the FDC pillar, including the maintenance of individual accounts, collection and information on participating funds, transfers, and the provision of information services to workers. It relies on the Swedish tax administration authority to collect contributions, allowing for additional administrative savings. The sole responsibility of fund managers is to invest the funds during the accumulation phase, and they have no direct interaction with workers. In addition, the PPM will become the monopoly annuity provider during the decumulation phase.

\(^96\) Recall that in the 1990s, Sweden transformed its DB PAYG scheme into a combination of a notional defined contribution (NDC) PAYG and a financial defined contribution (FDC) scheme with a DB guarantee benefit level. Given the small size of the FDC pillar, authorities paid careful attention to its design and developed a structure in which funds could be efficiently managed at a low cost. They separated administrative and investment management functions, where the former is centralized and publicly managed and the latter is open to private competition.
The Swedish model is not easily replicable in countries with less developed institutional settings, particularly regarding financial markets. Furthermore, it has not resolved the fundamental problem of inertia of participants. The FDC scheme was designed with free entry for fund managers with a price ceiling and, as a result, the number of funds is large. There are no restrictions on fund choices and affiliates could place all their mandatory old-age savings in high-risk and poorly diversified portfolios. Critics thus have called for limitations regarding fund choices and lowering the permissible risk exposure. The large number of alternatives has created a passive attitude among affiliates instead of promoting choice because individuals have difficulty comparing investments to risk tolerance. This has resulted in: (a) the lack of diversification of investments (there is a risk for home bias in the country one lives in or sector one works in), and (b) a risk that investment strategies do not change over time, therefore not adapting to individuals changing risk preference during their lifecycles. Chapter IV deals with these issues in more detail.

XVI CONCLUSIONS

There exists a wide range of policy options that have been used to attempt to lower administrative fees in mandatory DC pension quasi-markets. Typically, options attempt to achieve multiple objectives like improving transparency, efficiency and equity which cannot be achieved simultaneously. Hence, most of these options entail marked trade-offs that policymakers should balance accordingly. The final resolution of such trade-offs is most likely country specific, as the final assessment depends on the current design of the pension market (status quo) and the degree of development of financial markets, among other idiosyncratic characteristics. This section concludes by reorganizing the policy interventions analyzed in this chapter according to the degree trade-offs they entail, emphasizing possible win-wins for policymakers.

XVI.A Policies with increasing embedded tradeoffs

Commonly used policies to contain administrative fees include: 1) the prohibition of fee discrimination and the use of uniform fee rates; 2) the simplification of fee structures; 3) bundling of pension services; 4) repression of transfers; and 5) price controls.

The desirable policy objective of subsidizing low income/asset participants has favored the use of uniform rate regulation applied to heterogeneous fee bases. This pricing scheme is allegedly more transparent and more equitable but less efficient, contributing to price distortions due to by participants’ inertia. In addition, it reinforces price distortions by encouraging excessive investment in marketing by pension firms. In addition, earnings and asset related fee bases exhibit strong trends while pension funds costs are mainly fixed or proportional to the number of participants served. Hence, the distortion between prices of pension firms and marginal costs is likely to become more severe over time.

97 Major reforms, including structural reforms of the financial market in the 1980s were important pre-requisites of the new Swedish pension system (See Palmer (2008)).
The simplification of fees and bundling of services are being used as means to improve participants’ inertia, but tradeoffs again exist among transparency, equity and efficiency. The alleged welfare gains of increased price information and comparability through simplified fee structures need to be carefully weighed against the redistributive impacts of a shift towards, and the inefficiency of, a single fee base. The alleged welfare gains associated with simplified choice through bundling need to be weighed against the price impact stemming from joint production of services with different cost functions and the reduction in market contestability associated with higher barriers to entry. In both cases, increased transparency, aimed at reducing inertia, is likely to be offset by higher inefficiency, further increasing price distortions.

Experience indicates that restricting transfers of participants across pension firms, with the purpose of reducing socially unproductive marketing expenses, is not an effective policy tool. Such restrictions do not affect the fundamental incentive for firms to invest in marketing; namely, the presence of rent heterogeneity across consumers due to uniform fees applied to heterogeneous bases such as assets or earnings. In addition, policies restricting transfers to protect participants from making systematic mistakes when choosing pension firms decrease the effective elasticity of demand and increase barriers to entry; i.e., they increase market power of incumbent pension firms. Finally, alternative policies based on monopsony agreements sponsored by regulators are politically unstable and facilitate the possibility of regulatory capture by the industry. Hence, equilibria based on repression of transfers and/or monopsony agreements are likely to be welfare decreasing when compared to the second best option with socially costly marketing expenditure.

Many jurisdictions also use price regulation, in the form of price caps, as a means to reduce the consequences of price distortion and redistribute rents in favor of participants. However, price caps suffer from a series of drawbacks including the fact that they are not linked to cost structures and, in practice, may not redistribute in favor of participants but in favor of pension firms’ third parties through related transactions. Additionally, in a dynamic context, they quickly become obsolete unless frequently changed. If price controls are to be kept, their design can be vastly improved by linking them to the cost structure of pension firms. Techniques used in utility industries to design cost-based tariffs can be adapted to mandatory defined contribution pension quasi-markets. We can expect cost-based tariffs to be vastly superior to current caps on fees given the existing discrepancy between prices and costs. Nevertheless, allowing pension regulatory authorities to define price ceilings introduces a new regulatory risk, which if mishandled or handled in a discretionary or unpredictable manner could adversely affect the development of the sector.

**XVI.B Win-win interventions**

A more aggressive use of flat fees and subsidies and hybrid industrial organizations in conjunction with unbundling of pension services appear to provide fewer policy tradeoffs and should be pursued by policymakers in mandatory DC pensions to improve efficiency, equity and reduce participants’ inertia.

The efficiency objective is best achieved with the use of flat price schemes. These greatly reduce price distortions as prices are based on one unit of service per person per
period. In addition, flat prices radically eliminate cream skimming marketing incentives and \textit{ceteris paribus}, should be associated with lower barriers to entry. The equity objective is best achieved by a separate subsidy. The subsidy may prove fiscally expensive but there are different ways to implement it to minimize the fiscal costs and achieve the socially desirable level of redistribution in the market.

However, flat fees do not address the problem of participants’ inertia. This is best addressed by alternative industrial organization models involving some elements of procurement by a centralized public board. A pure procurement model can deal in a radical manner with consumer inertia: demand is assigned to providers through auctions. By establishing competition for the market rather than in the market, barriers to entry and rent extraction activities are eliminated. However, procurement boards have a monopsony power over pension firms, which may lead them to underinvest in innovations to improve asset management quality. In addition, in the absence of a quasi-market, it is very difficult to benchmark the overall performance of the board. Finally, there is the risk that political interference may reduce the ability of the board to maximize participants’ welfare by encouraging it to adopt very conservative strategies or to support investments in a non-commercial way, especially if the country’s governance framework is weak. While pure procurement may not always be superior to quasi-markets, a hybrid model, with a combination of procurement and quasi-market, is likely to be.

Hybrids are organizational forms that separate participants in two segments: a procured segment for inert participants and a quasi-market segment for less inert participants. They can be superior to pure procurement as they provide a benchmark for board’s performance and provide an outside option for procurement boards’ suppliers. They can also be superior to a quasi-market since they replaces the choices of undecided individuals with a technically qualified public board and they increase demand elasticity in the quasi-market segment.

However, whether hybrids are indeed superior to either of the two extreme organizational forms of pure procurement or pure quasi-market, depends on several issues being addressed. These include accurate targeting of inert participants for the procurement segment and the protection of providers in the procured segment from cream skimming by providers in the quasi-market. Interestingly, if inequalities in fee bases between the two segments are large enough, the potential welfare gains of a hybrid over the two extreme organizational forms can be lost. Here is where the complementarities with the abovementioned options become evident: policies aimed at increasing efficiency by increasing the flat component in fees charged by pension firms would also promote the stability of hybrid industrial organizations and promote lower participants’ inertia.

Finally, there is an open debate on the relative superiority of the stock and the flow hybrid designs. The stock design presents attractive characteristics, like targeting all inert participants and protecting them from dynamic predatory pricing schedules. However, it may induce bidders to raise their prices if they fear that their clientele will be lost in a future auction. This concern could be mitigated by lowering barriers to entry through the unbundling of pension services.
XVII References


Chapter IV

Investment Choice And The Design Of Default Options

Version 20 March 2009
In the previous chapter we discussed the tradeoffs faced by policy makers with specialized regulation aimed at promoting a reduction of administrative fees in mandatory defined contribution pensions. In this chapter, we discuss policy issues related to the regulation of investment choice and the design of associated default options as a means to increase gross expected rates of returns.

The institutional design of mandatory defined contribution pensions shares the risks associated with investment among: 1) the regulator that defines the universe of allowable investments through investment regulation; 2) the asset manager that makes the choice of strategic and tactical asset allocations; and 3) the consumer that chooses among alternative funds within or across pension firms. However, while the regulator and the asset manager bear mainly a reputational risk, the individual fully bears the investment risk associated with his or her choices, as well as the consequences of the actions of the regulator and the asset manager.

The freedom to choose across pension firms and funds varies from country to country. Countries like Sweden and Australia allow for considerable choice on the part of individuals across funds. Countries like Hungary, Slovakia and Latvia in Eastern Europe or Chile, Mexico and Peru in Latin America and Hong Kong in Asia, allow for a much smaller choice of funds.

In addition, there is a clear trend towards providing more investment choices in order to account for heterogeneity across individual participants. For instance, at the end of 2007, 86 fund management companies with a total of 785 funds were registered with the Swedish premium pension system, up from 450 funds in 2000. Hungary allowed for limited investment choice in the voluntary pillar in 2007 and in the mandatory pillar starting in 2009. Mexico increased investment choices for participants in 2008 and Bulgaria and Colombia are expected to introduce investment choice in their third and second pillars, respectively, in 2008–09.

Still, we saw in the Chapter II that individuals may not have the knowledge to solve the relevant intertemporal asset allocation problem associated with long-term investment. Even if they do, they do not always possess the necessary will power to implement the investment strategy consistently overtime. Indeed, individual behavior does not follow the standard rationality assumptions of utility maximization used in the economic literature. In practice, individuals adopt simple rules of thumb to solve the investment problem and to subsequently implement their choices, leading to systematic biases. In addition, biases are compounded by the fact that the accumulation phase and the payout phase are not connected in a mandatory defined contribution system, in the sense that asset managers do not have a pension liability to meet. This implies that the investment incentives of asset managers and participants may not necessarily be aligned.

Hence, there appears to be a policy rationale for designing investment default options that exploit the systematic biases of individuals’ behavior and that attempt to align the incentives of participants and asset managers in the area of strategic asset allocation.
The rest of this chapter is organized as follows. Section XIX discusses the regulation of investment choices and default options in countries like Chile, Peru and Mexico that have pioneered the use of multi-funds or life-cycle funds in mandatory defined contribution pensions. Section XX is based on Blake et al. (2008), especially commissioned for this report, and it discusses the rationale for exposing younger participants to higher levels of equity risk. Section XXI identifies weaknesses in the current rules and designs of multi-funds and it presents evidence from Raddatz and Schmukler (2008), especially commissioned for this report, of gaps in pension fund manager behavior in the case of Chile. Section XXII, also based on Blake et al. (2008), presents a conceptual framework for reforming the investment default options, as they are typically used, in order to reconnect the accumulation with the payout phase without introducing liabilities for pension firms. Policy conclusions follow in Section XXIII.

**XIX INVESTMENT CHOICE AND DEFAULT OPTIONS**

**XIX.A Regulation and design**

The regulation of investment choice and the design of default options varies from country to country. Countries like Sweden and Australia give participants many degrees of freedom in selecting their portfolios and pay little attention to the investment portfolio to which undecided participants are assigned by default.

In the Swedish Premium Pension System, 86 fund managers had been licensed at the end of 2007. Managers can register up to 25 funds each among broad types of funds: 1) equity funds; 2) balanced funds; 3) fixed income funds; and 4) life-cycle funds. As a result, a total of 785 funds had been registered at the end of the same year, as shown in Table 13. Individual choice is restricted to up to 5 funds with unfettered switches (PPM (2007)) and undecided individuals are assigned to a default option designed to replicate the average asset allocation observed before individuals were allowed to select their own portfolios. The default portfolio has an 80 percent equity exposure reflecting the fact that the PPM represents a small component of the whole pension system, collecting only 2.5 percent of wages in contributions.

**Table 13: Investment Choices in the Swedish Premium Pension System**

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers</td>
<td>85</td>
<td>84</td>
<td>83</td>
<td>83</td>
<td>86</td>
</tr>
<tr>
<td>Funds</td>
<td>664</td>
<td>697</td>
<td>725</td>
<td>779</td>
<td>785</td>
</tr>
</tbody>
</table>


There is evidence that the large number of funds is discouraging rather than stimulating rational choices; since the first round of fund choices in 2000, very few individuals have since changed their asset allocation. In addition, the evidence suggests that individuals do not necessarily want to choose their own investment strategy and that choices are affected by a strong home bias (Palme et al. (2007)).
In Australia, participants in the superannuation system have potentially even more degrees of freedom. At the end of 2007 there were some 575 pension firms (superannuation entities) with at least 4 members and 63 percent of them offered on average 38 alternative funds (Table 1). Not all entities are required to offer a default investment option but when offered, this contains on average a very low percentage of equities, as displayed in Table 15.

**Table 14: Investment Choices in the Australian Superannuation System**

<table>
<thead>
<tr>
<th>Shares of entities offering investment choice /1</th>
<th>Corporate</th>
<th>Industry</th>
<th>Public sector</th>
<th>Retail</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2007</td>
<td>55%</td>
<td>85%</td>
<td>65%</td>
<td>66%</td>
<td>63%</td>
</tr>
<tr>
<td>June 2006</td>
<td>48%</td>
<td>85%</td>
<td>67%</td>
<td>66%</td>
<td>56%</td>
</tr>
</tbody>
</table>

**Average number of investment choices per entity /2**

<table>
<thead>
<tr>
<th>Shares of entities offering investment choice /1</th>
<th>Corporate</th>
<th>Industry</th>
<th>Public sector</th>
<th>Retail</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2007</td>
<td>6</td>
<td>10</td>
<td>8</td>
<td>97</td>
<td>38</td>
</tr>
<tr>
<td>June 2006</td>
<td>6</td>
<td>10</td>
<td>7</td>
<td>88</td>
<td>34</td>
</tr>
</tbody>
</table>

Notes: /1 Number of entities with at least 4 members; /2 Average calculated on the share of entities actually offering choice. 

Investment choice in Latin American and Eastern European countries is more limited and the default investment option for undecided individuals is often designed around the concept of life-cycle funds according to the age of the participant. The first country that introduced investment choice for participants was Chile in 2002.

**Table 15: Asset Allocation of Default Investment Options in the Australian Superannuation System**

<table>
<thead>
<tr>
<th>Instruments /1</th>
<th>Corporate Entities</th>
<th>Industry Entities</th>
<th>Public Sector Entities</th>
<th>Retail Entities</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian shares</td>
<td>40%</td>
<td>33%</td>
<td>29%</td>
<td>26%</td>
<td>31%</td>
</tr>
<tr>
<td>International shares</td>
<td>23%</td>
<td>26%</td>
<td>24%</td>
<td>20%</td>
<td>24%</td>
</tr>
<tr>
<td>Listed property</td>
<td>4%</td>
<td>2%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Unlisted property</td>
<td>3%</td>
<td>9%</td>
<td>7%</td>
<td>2%</td>
<td>6%</td>
</tr>
<tr>
<td>Australian fixed interest</td>
<td>12%</td>
<td>6%</td>
<td>10%</td>
<td>22%</td>
<td>11%</td>
</tr>
<tr>
<td>International fixed interest</td>
<td>6%</td>
<td>6%</td>
<td>9%</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>Cash</td>
<td>5%</td>
<td>4%</td>
<td>8%</td>
<td>15%</td>
<td>8%</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
<td>14%</td>
<td>8%</td>
<td>6%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Total 100% 100% 100% 100% 100%

Notes: /1 Not all superannuation entities are required to have a default investment strategy. Where there is no default strategy, the strategy of the largest option is reported or the fund strategy as a whole. 
Table 16: Key Maximum Investment Limits for Chilean Multi-funds

<table>
<thead>
<tr>
<th>Instruments /1</th>
<th>Fund A</th>
<th>Fund B</th>
<th>Fund C</th>
<th>Fund D</th>
<th>Fund E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LIMITS PER INSTRUMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government paper (a)</td>
<td>40</td>
<td>40</td>
<td>50</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>Time deposits, bonds, other Financial Institutions (b and c)</td>
<td>40</td>
<td>40</td>
<td>50</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>Letters of credit (d)</td>
<td>40</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>Bonds of Public and Private Companies (e and f)</td>
<td>30</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>- Bonds convertible to shares (f) (sub-limit)</td>
<td>No sub-limit</td>
<td>No sub-limit</td>
<td>10</td>
<td>5</td>
<td>Not eligible</td>
</tr>
<tr>
<td>Open plc shares and real estate plc shares (g and h)</td>
<td>60</td>
<td>50</td>
<td>30</td>
<td>15</td>
<td>Not eligible</td>
</tr>
<tr>
<td>Investment and Mutual Fund shares + Committed payments (2) (i)</td>
<td>40</td>
<td>30</td>
<td>20</td>
<td>10</td>
<td>Not eligible</td>
</tr>
<tr>
<td>- Mutual Funds shares (i) (sub-limit)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>Not eligible</td>
</tr>
<tr>
<td>Commercial paper (j)</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Foreign (k) (super limit across all funds)</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other authorized by the C.B.CH. (l)</td>
<td>1 - 5</td>
<td>1 - 5</td>
<td>1 - 5</td>
<td>1 - 5</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Risk hedging operations (m)</td>
<td>Investment of the Fund in instruments being hedged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign currency without exchange coverage</td>
<td>37</td>
<td>22</td>
<td>18</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Financial loan (n)</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>LIMITS PER GROUP OF INSTRUMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>a) Equities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equities (g, h, i, committed contributions and k and l capital)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>80</td>
<td>60</td>
<td>40</td>
<td>20</td>
<td>Not eligible</td>
</tr>
<tr>
<td>Minimum</td>
<td>40</td>
<td>25</td>
<td>15</td>
<td>5</td>
<td>Not eligible</td>
</tr>
<tr>
<td>Freely available equities (g and i)</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>Not eligible</td>
</tr>
<tr>
<td>Low liquidity shares (g)</td>
<td>10</td>
<td>8</td>
<td>5</td>
<td>2</td>
<td>Not eligible</td>
</tr>
<tr>
<td>Freely available foreign shares traded on the local stock exchange (k and l)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Not eligible</td>
</tr>
<tr>
<td><strong>b) Fixed Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BBB and N-3 (b, c, d, e, f, j and k and l: debt)</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>c) Fixed Income and Equities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equities (g, h, i, committed contributions and k and l equities) + Debt BBB and N-3 + Bonds that are exchangeable for shares (f)</td>
<td>No limit</td>
<td>No limit</td>
<td>45</td>
<td>22</td>
<td>-</td>
</tr>
<tr>
<td>Issuers with a history of less than three years (e, f, g, j y l)</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Restricted (g : low liquidity; g and i : freely available; k and l : freely available and traded on local stock exchange; l; issuers with a history of less than three years; debt BBB and N-3)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>-</td>
</tr>
</tbody>
</table>

**Notes:** /1 All limits are expressed as a percent of assets per fund unless otherwise noted. 
**Source:** SAFP.

Law 19.795 required Chilean pension firms to offer four funds (Fund B to Fund E) and allowed them to offer an additional more aggressive fund (Fund A), all with separate
quantitative limits in asset classes as reported in Table 16. All pension firms in Chile offer nowadays all five funds.

Participants younger than 50 years of age for women and 55 years of age for men can freely allocate their contributions to any of the five aforementioned funds. In addition, they can allocate their funds to two separate funds simultaneously. Participants older than the aforementioned ages are not allowed to elect Fund A.

As far as the default investment options are concerned, participants who do not choose a fund are automatically assigned to three funds according to their age as reported in Table 17. Participants younger than 35 years of age are assigned to Fund B. Participants between 36 and 50 years of age for women and 55 for men are assigned to Fund C. Participants older than 51 years of age for women and 56 for men are assigned to Fund D. Individuals can always switch to more or less volatile funds, if they so wish, with the exception of participants close to retirement who cannot elect the most aggressive Fund A. Finally, switching to other funds is made gradually with no more than 20 percent of account balances being transferred or assigned in any single year.

Table 17: Age Dependent Default Options in the Chilean Multi-funds

<table>
<thead>
<tr>
<th></th>
<th>≤ 35 Men ≤ 35 Women</th>
<th>35 &lt; Men ≤ 55 35 &lt; Women ≤ 50</th>
<th>Men &gt; 55 Women &gt; 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fund A</td>
<td>Not Allowed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fund B</td>
<td>Default</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fund C</td>
<td>Default</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fund D</td>
<td>Default</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fund E</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: SAFP.

Mexico introduced in 2004 a system of two multi-funds (SIEFOREs) called “SIEFORE básica” one (SB1) and two (SB2). Until recently, SB1 operated with fixed income instruments and SB2 operated with a combination of fixed income and equity securities. Since March 2008, investment choices were increased with the introduction of other three funds (SB3 – SB5).

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98 Mandatory retirement ages are 60 yeas of age for women and 65 for men.
At the same time, investment rules were amended to enable the introduction of three new asset classes: private capital, real estate and infrastructure; the new key maximum investment limits for each fund are reported in Table 18. Finally, recent amendments at the end of 2008 increased limits to AA and A rated fixed income instruments also as a countercyclical policy response to the global financial turmoil.

Notice that, similarly to Chile, the funds differ among them with respect to the exposure to equities and therefore, different allowable daily volatility as shown by the

---

**Notes:** /1 All limits are ceilings based on set assets of each SIEFORE with the exception of inflation protection which is a floor; /2 Ratings are local for domestic instruments and international for foreign instruments; /3 Real estate, infrastructure and bank trusts/leasing; /4 In cases where related party is a financial entity the limit is 0 percent.

**Source:** CONSAR [http://www.consar.gob.mx/limite_inversion/limite_inversion.shtml](http://www.consar.gob.mx/limite_inversion/limite_inversion.shtml)

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**Table 18: Key Maximum Investment Limits for Mexican Multi-funds**

<table>
<thead>
<tr>
<th>Instruments /1</th>
<th>SIEFORE</th>
<th>SB1</th>
<th>SB2</th>
<th>SB3</th>
<th>SB4</th>
<th>SB5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical VaR (1-alpha=95%, daily)</td>
<td></td>
<td>0.6%</td>
<td>1.0%</td>
<td>1.3%</td>
<td>1.6%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Equities (only through indices)</td>
<td></td>
<td>0.0%</td>
<td>15.0%</td>
<td>20.0%</td>
<td>25.0%</td>
<td>30.0%</td>
</tr>
<tr>
<td>Foreign investments</td>
<td></td>
<td>30.0%</td>
<td>30.0%</td>
<td>30.0%</td>
<td>30.0%</td>
<td>30.0%</td>
</tr>
<tr>
<td>Derivatives</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>Fixed income AAA /2 and Government</td>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Fixed income AA-</td>
<td></td>
<td>50.0%</td>
<td>50.0%</td>
<td>50.0%</td>
<td>50.0%</td>
<td>50.0%</td>
</tr>
<tr>
<td>Fixed income A-</td>
<td></td>
<td>20.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>MEX instruments AAA in single issuer or counterpart</td>
<td></td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>MEX instruments AA- in single issuer or counterpart</td>
<td></td>
<td>3.0%</td>
<td>3.0%</td>
<td>3.0%</td>
<td>3.0%</td>
<td>3.0%</td>
</tr>
<tr>
<td>MEX instruments A in single issuer or counterpart</td>
<td></td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>MEX FX instruments BBB+ in single issuer or counterpart</td>
<td></td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>MEX FX instruments BBB- in single issuer or counterpart</td>
<td></td>
<td>3.0%</td>
<td>3.0%</td>
<td>3.0%</td>
<td>3.0%</td>
<td>3.0%</td>
</tr>
<tr>
<td>In any single issue</td>
<td></td>
<td>20.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Foreign instruments A- in single issuer or counterpart</td>
<td></td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Foreign instruments (minimum A- for fixed income)</td>
<td></td>
<td>20.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Securitized instruments</td>
<td></td>
<td>10.0%</td>
<td>15.0%</td>
<td>20.0%</td>
<td>30.0%</td>
<td>40.0%</td>
</tr>
<tr>
<td>Structured notes</td>
<td></td>
<td>0.0%</td>
<td>1.0%</td>
<td>5.0%</td>
<td>7.5%</td>
<td>10.0%</td>
</tr>
<tr>
<td>REITs /3</td>
<td></td>
<td>0.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>10.0%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Inflation protection</td>
<td>YES (min 51%)</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>Related parties investments</td>
<td></td>
<td>15.0%</td>
<td>15.0%</td>
<td>15.0%</td>
<td>15.0%</td>
<td>15.0%</td>
</tr>
<tr>
<td>Related parties with participation in AFORE's capital /4</td>
<td></td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

---

**Notes:** /1 All limits are ceilings based on set assets of each SIEFORE with the exception of inflation protection which is a floor; /2 Ratings are local for domestic instruments and international for foreign instruments; /3 Real estate, infrastructure and bank trusts/leasing; /4 In cases where related party is a financial entity the limit is 0 percent.

**Source:** CONSAR [http://www.consar.gob.mx/limite_inversion/limite_inversion.shtml](http://www.consar.gob.mx/limite_inversion/limite_inversion.shtml)

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**Notes:** /1 All limits are ceilings based on set assets of each SIEFORE with the exception of inflation protection which is a floor; /2 Ratings are local for domestic instruments and international for foreign instruments; /3 Real estate, infrastructure and bank trusts/leasing; /4 In cases where related party is a financial entity the limit is 0 percent.

**Source:** CONSAR [http://www.consar.gob.mx/limite_inversion/limite_inversion.shtml](http://www.consar.gob.mx/limite_inversion/limite_inversion.shtml)

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**Notes:** /1 All limits are ceilings based on set assets of each SIEFORE with the exception of inflation protection which is a floor; /2 Ratings are local for domestic instruments and international for foreign instruments; /3 Real estate, infrastructure and bank trusts/leasing; /4 In cases where related party is a financial entity the limit is 0 percent.

**Source:** CONSAR [http://www.consar.gob.mx/limite_inversion/limite_inversion.shtml](http://www.consar.gob.mx/limite_inversion/limite_inversion.shtml)

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**Notes:** /1 All limits are ceilings based on set assets of each SIEFORE with the exception of inflation protection which is a floor; /2 Ratings are local for domestic instruments and international for foreign instruments; /3 Real estate, infrastructure and bank trusts/leasing; /4 In cases where related party is a financial entity the limit is 0 percent.

**Source:** CONSAR [http://www.consar.gob.mx/limite_inversion/limite_inversion.shtml](http://www.consar.gob.mx/limite_inversion/limite_inversion.shtml)
increasing daily VaR limits. In addition, more aggressive funds differ by having higher ceilings in securitized instruments, structured notes and REITs. Notwithstanding this market risk differentiation across funds, all funds have the same limits for credit and concentration risk.

Table 19: Age Dependent Default Options in the Mexican Multi-funds

<table>
<thead>
<tr>
<th></th>
<th>X ≤ 26</th>
<th>26 &lt; X ≤ 37</th>
<th>37 &lt; X ≤ 45</th>
<th>45 &lt; X ≤ 55</th>
<th>55 &lt; X</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB5</td>
<td>Default</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>SB4</td>
<td></td>
<td>Default</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>SB3</td>
<td></td>
<td></td>
<td>Default</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>SB2</td>
<td></td>
<td></td>
<td></td>
<td>Default</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>SB1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Default</td>
</tr>
</tbody>
</table>

Source: CONSAR.

As far as the default investment options are concerned, participants who do not choose a fund are automatically assigned by default to the five funds according to their age as reported in Table 19. Participants younger than 26 years of age are assigned to SB5 while participants between 26 and 37 years of age are assigned to SB4. Participants between 37 and 45 years of age are assigned to SB3 while participants between 45 and 55 years of age are assigned to SB2. Finally, participants older than 55 years of age are assigned to SB1. Individuals can always switch to other funds, but contrary to Chile, they cannot allocate balances to more than one fund and can only switch to more conservative funds. Again, switching to funds are made gradually over a period of several months.

Finally, Peru introduced investment choice with the Law N° 27988 of April 2003 and the decrees N° 182-2003-EF and N° 054-97-EF finally modified in March 2005. Pension firms are required to offer at least the two more conservative funds among the three allowed funds: Fund 1 is a capital preservation fund with low volatility, Fund 2 is a balanced fund with average volatility and Fund 3 is a capital appreciation fund with higher volatility. The key investment limits applied to the three funds are reported in Table 20. Again, the more aggressive funds have higher equity exposure and are allowed to invest more in derivatives and less in fixed income and cash management instruments. A foreign investment ceiling of 20 percent applies to all assets managed by each pension firm with no specific limit at the fund level.

Table 20: Key Maximum Investment Limits for Peruvian Multi-funds

<table>
<thead>
<tr>
<th></th>
<th>Fund 1</th>
<th>Fund 2</th>
<th>Fund 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Income</td>
<td>10%</td>
<td>45%</td>
<td>80%</td>
</tr>
<tr>
<td>Fixed Income</td>
<td>100%</td>
<td>75%</td>
<td>80%</td>
</tr>
<tr>
<td>Derivatives (hedging only)</td>
<td>10%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Cash</td>
<td>40%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Foreign Investments /1</td>
<td></td>
<td></td>
<td>20%</td>
</tr>
</tbody>
</table>

Notes: /1 Applied to total net assets in the three funds with no specific limit per fund.

Source: SBS.

Pension firms implemented the new system of multi-funds in July 2005 and participants had six months to elect a fund. Undecided participants were automatically
assigned to Fund 2, with the exception of participants older than 60 years of age who were assigned to Fund 1.

Table 21: Age Dependent Default Options in the Peruvian Multi-funds

<table>
<thead>
<tr>
<th>Fund 3</th>
<th>$X \leq 60$</th>
<th>$60 &lt; X$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Allowed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fund 2</th>
<th>$X \leq 60$</th>
<th>$60 &lt; X$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Not Allowed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fund 1</th>
<th>$X \leq 60$</th>
<th>$60 &lt; X$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: SBS.

Default investment options have not been modified since and are very simple. Participants younger than 60 years of age are assigned to Fund 2 while participants older than 60 years of age are assigned to Fund 1. Only individuals younger than 60 years of age can switch to other funds and they can allocate monies to several funds and pension firms (Table 21). Again, switching and assignation to funds are made gradually.

Other countries in the Latin America and Eastern Europe have implemented, or are in the process of implementing, small variations of the Chilean, Mexican and Peruvian models for regulating investment choice and designing default options. Hungary adopted a three multi-fund model in 2007 on a voluntary basis which will become mandatory in 2009. Estonia adopted a similar model in 2002 with pension firms required to offer one fund that is limited to investment in fixed income instruments, that is, a conservative fund. In addition, pension firms can manage a balanced fund in vesting in equity up to 25 percent of total portfolio or an aggressive fund investing in equity up to 50 percent of total portfolio. Bulgaria is expected to adopt a three multi-fund model in its third pillar between 2008 and 2009 and it plans to replicate the regulation in the second pillar in the following few years. Finally, Colombia is also expected to adopt a three multi-fund model in its second pillar in 2008.

XIX.B  Performance of age dependent default options

Assessing the performance of the current design of default options in mandatory defined contribution systems is difficult for various reasons. First, age dependent multi-funds have been introduced only very recently and not enough information has been accumulated on realized returns to assess the extent to which risk has reduced through intertemporal diversification. This is particularly the case for Peru and Mexico that introduced the current system in 2005 and 2008, respectively. Second, it is unclear what benchmarks should be used for measuring performance, given that the current design lacks any connection with the payout phase: i.e., the final objective for which savings are accumulated in the first place.\footnote{We will return to this point in Section XXII.} However, some conclusions can be drawn already by assessing the extend to which the multi-fund design has protected individuals close to retirement against the price volatility of the global financial turmoil of 2008.

Some evidence on performance exist in the case of Chile. Cheyre (2006) reports that the introduction of multi-funds was accompanied by an increase in the average performance of all funds by 244 basis points between September 2002 and December
2005.\textsuperscript{101} This exceptional performance, if continued over time, would increase average replacement rates by 80 percent. The performance over the period between September 2002 and December 2007 is consistent with the underlying theory: annualized real performance (averaged across pension firms) of Fund A was 15.8 percent, Fund B 11.3 percent, Fund C 10 percent, Fund D 6.1 percent and Fund E 5.6 percent (SAFP (2007)). The degree of volatility of the different funds has also been consistent with expectations, with Fund A and E being the most and least volatile, respectively (Conrads (2007)).

Still, the increased investment choice provided by the system of multi-funds was exploited by only a minority of participants, reflecting the inertia of individuals, as shown in Table 22. By August 2008, an average of 81 percent of participants in the default funds B to D had not exercised their choice and had been automatically assigned to the default funds according to their age. The number of individuals who had elected a fund (including the most and least aggressive funds A and E) represented only 34 percent of total participants.

<table>
<thead>
<tr>
<th>Table 22: Active Choice of Multi-Fund in Chile (2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fund A</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>Participants who elected a fund</td>
</tr>
<tr>
<td>Participants assigned by the system</td>
</tr>
<tr>
<td>Total Participants</td>
</tr>
</tbody>
</table>


While not enough data has been accumulated to assess the extent to which multi-funds have diversified risk intertemporally, there is strong evidence that the design of default options has successfully exploited the inertia of individuals and shielded individuals close to retirements against the price volatility caused by the global financial turmoil of 2008.

\textsuperscript{101} However, this may capture improved macroeconomic and financial conditions over the same period.
Figure 10 reports the asset allocation of multi-funds in Mexico, Chile and Peru at the end of September 2008. Investment in variable income instruments in these three countries amounted to 14, 48 and 56 percent of total assets respectively (first quadrant). In Mexico, the share of variable income instruments in the least and most aggressive funds were 0 and 20 percent of fund specific assets, respectively (second quadrant). In Chile, the share of variable income instruments in the least and most aggressive funds were 0 and 80 percent of fund specific assets, respectively (third quadrant). In Peru, the share of variable income instruments in the least and most aggressive funds were 28 and 79 percent of fund specific assets, respectively (fourth quadrant).

Given this distribution of variable income risk exposure across countries and funds, we would expect that the financial turmoil of 2008 had the lowest negative impact in Mexico and the highest negative impact in Peru. Additionally, we would expect the most aggressive funds in Chile (Fund A) and Peru (Fund 3) to have lost the most in the same year. Finally, we would expect the most conservative Peruvian funds to perform as badly as many of the aggressive funds in Chile and Mexico.
Table 23: 2008 Financial Crisis and Multi-funds in Latin America (% real)

<table>
<thead>
<tr>
<th>Country</th>
<th>Fund 1</th>
<th>Fund 2</th>
<th>Fund 3</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>Sep. 07 – Sep. 08</td>
<td>-0.5</td>
<td>-4.5</td>
<td>-5.8</td>
</tr>
<tr>
<td></td>
<td>Mar. 08 – Sep. 08</td>
<td>-2.4</td>
<td>-5.5</td>
<td>-6.8</td>
</tr>
<tr>
<td></td>
<td>Jul. 08 – Sep. 08</td>
<td>2.3</td>
<td>0.7</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Sep. 08</td>
<td>-0.6</td>
<td>-1.9</td>
<td>-2.5</td>
</tr>
<tr>
<td>Chile</td>
<td>Sep. 07 – Sep. 08</td>
<td>-26.7</td>
<td>-20.2</td>
<td>-13.2</td>
</tr>
<tr>
<td></td>
<td>Mar. 08 – Sep. 08</td>
<td>-17.2</td>
<td>-12.7</td>
<td>-8.0</td>
</tr>
<tr>
<td></td>
<td>Jul. 08 – Sep. 08</td>
<td>-19.9</td>
<td>-14.7</td>
<td>-9.6</td>
</tr>
<tr>
<td></td>
<td>Sep. 08</td>
<td>-11.8</td>
<td>-8.8</td>
<td>-5.6</td>
</tr>
<tr>
<td>Peru</td>
<td>Sep. 07 – Sep. 08</td>
<td>-7.2</td>
<td>-16.8</td>
<td>-23.3</td>
</tr>
<tr>
<td></td>
<td>Mar. 08 – Sep. 08</td>
<td>-6.4</td>
<td>-13.7</td>
<td>-18.3</td>
</tr>
<tr>
<td></td>
<td>Jul. 08 – Sep. 08</td>
<td>-6.6</td>
<td>-14.6</td>
<td>-20.9</td>
</tr>
<tr>
<td></td>
<td>Sep. 08</td>
<td>-2.0</td>
<td>-3.8</td>
<td>-5.2</td>
</tr>
</tbody>
</table>

Source: Respective supervisory authorities

Table 23 reports the impact of the 2008 financial turmoil on the value of multi-funds until the end of September 2008. The second pillar in Peru, with an overall equity exposure of more than 56 percent of total assets reported a negative real rate of return of 17.5 percent for the past year. Chile, with an equity exposure of 48 percent of total assets, reported a negative performance of 16.4 percent while Mexico, with only 14 percent of total assets invested in variable income instruments, reported a negative real annual return of only 5.6%.

The magnitude of the overall reduction in asset values was expected and in line with what experienced in OECD countries. What is nevertheless interesting in the data reported is how participants close to retirement have been effectively shielded against the volatility in asset prices during 2008; at least in countries like Chile and Mexico. Participants in Fund E in Chile and SB1 in Mexico reported an annual real performance of 0.5 and minus 0.5 percent, respectively while participants in Fund 1 in Peru, reported an annual real performance of minus 7.3 percent. The surprisingly negative performance of the conservative fund in Peru is probably due to the average variable income exposure of only less than 30 percent of total assets, in excess of the 10 percent regulatory limit (see Table 20).

In summary, there is only some extremely limited evidence that, at least for the case of Chile, the introduction of multi-funds and the consequent liberalization of the underlying investment regime translated in welfare gains for participants through increases in returns. In addition, it is not easy to disentangle the effect of the introduction of multi-funds from the liberalization of the investment rules and the improved macroeconomic and financial conditions of the country at that time. However, there is

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102 By October 2008, total assets of pension funds in OECD countries had declined by US$ 4 trillion, or more than 20 percent relative to December 2007. Including private pension assets, such as those held in Individual Retirement Accounts (IRAs) in the US and other countries, the loss increases to more than US$ 5 trillion.

103 This is not strictly speaking an issue of regulatory forbearance. Article 74 of the SPP Law in Peru allows the supervisor to agree on a time frame within which pension funds need to comply with the rules (FIAP (2007), pag 11).
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evidence that if equities are not included in defaults options close to retirements, individuals are likely to be shielded against major price shocks as the ones observed in 2008.

**XX RATIONALE AND ASSUMPTIONS FOR CURRENT RULES AND DESIGNS**

The validity of age dependent default investment options discussed in the previous section is based on two key considerations: 1) it is optimal to invest in risky assets; and 2) it is less so over time. The design of default investment options exploits the inertia of individuals and aims at generating higher expected rates of return over individuals’ life cycle by diversifying risk over time. Proper calibration of the parameters of the underlying strategic asset allocation depends on many factors. Of these, three appear critical: 1) adequately measuring the risk premium and the risk penalty (i.e., the attitude to risk) associated with the risky assets as well as how these evolve over time; 2) measuring the evolution of investment opportunities; and 3) adequately measuring the level and changes in human capital. We discuss these aspects, in turn, in the rest of this section.

**XX.A The role risk penalty and risk premium**

The risk penalty for an individual to invest in the risky asset is generally a function of the volatility of the return of risky assets and his risk aversion. In a mean-variance framework, volatility is measured by the variance of the return of the risky asset and more generally, participants’ attitude to risk is conventionally measured by the coefficient of relative risk aversion (Box 1). The higher the volatility and the lower the risk tolerance, the higher the risk penalty for investing in the risky asset. The risk premium is the extra return on risky asset (above the return on the risk free asset) that individuals need to receive to be compensated for absorbing risk. Clearly, we would expect that, ceteris paribus, the optimal holdings of risky assets be positive correlated with the risk premium and negative correlated with the risk penalty.

In particular, investors with different attitude to risk will have different holdings of risky assets. Investors who are more risk averse will tend to have lower holdings of risky assets than risk seeking investors. This relates to the fact that risky assets, such as equities, have higher returns in boom conditions than conservative assets, such as bonds, but lower returns in slump conditions. Therefore, risk averse investors are prepared to forego some of the upside potential of equities if the investment conditions turn out to be favorable, in order to avoid some of the downside losses on equities if investment conditions turn out to be unfavorable.

**Box 6: Individuals’ Attitude to Risk**

| Individuals’ attitude to risk is conventionally measured by the coefficient of relative risk aversion. This is defined as the wealth elasticity of the marginal utility of wealth: |

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104 We initially base our discussion on this framework and we discuss later why it may be more appropriate for countries in which participants have the vast majority of their financial assets in mandatory savings to define volatility in terms of maximum drawdowns.

105 Box 2 summarizes the key literature on the risk premium “puzzle” of US equities.
where the participant’s pension wealth is denoted by $W$, the utility of (or welfare derived from) pension wealth is denoted by $U(W)$, the marginal utility of pension wealth (i.e., the change in utility if pension wealth changes by $1$) is denoted by $U(W)$, and the degree of curvature of the utility function of pension wealth (which measures the rate at which marginal utility changes if pension wealth changes by $1$) is denoted by $U(W)$. For all investors, $U(W) > 0$, utility is increasing in wealth: more wealth means higher utility. For risk averse investors, $U(W) < 0$. This means that their utility functions are positive but concave functions of wealth, which implies that a $1$ increase in wealth increases utility by less in absolute terms than a $1$ reduction in wealth reduces utility. The greater the curvature of the utility function (or the more negative is $U(W)$), the greater the degree of risk aversion.

The relationship between holdings of risky assets, risk aversion and risk premium is best understood in the simplest case of a single period portfolio choice with one risky and one risk free asset. In such a set-up, Campbell and Viceira (2002, equations 2.46 and 2.25) show that the optimal weight of the portfolio in the risky asset is equal to the ratio of the risk premium of the risky to the risk penalty on the risky asset. In a multiperiod portfolio choice, Samuelson (1969), Merton (1969 and 1971) and Mossin (1968) show that if investors have a constant relative risk aversion and asset returns are unpredictable, results do not change. In other words, given the level of equity risk premium (if equity is the risky asset), the only parameter that is important to determine the plan member’s optimal portfolio allocation to equities is the risk penalty: i.e., the plan member’s degree of relative risk aversion to equities and the volatility of the returns on the risky asset. In a multi-asset framework, when the portfolio includes more than one risky asset, we obviously need to estimate the variance covariance matrix of the returns on the risky assets (or excess returns over the risk free asset).

The literature just quoted helps us understand why risk premium and attitude to risk are important elements in optimal portfolio choice but it does not help explain why risk aversion decreases with time. Actually, Samuelson (1969), Merton (1969 and 1971) and Mossin (1968) show that attitude to risk does not change with age and investors are better off by investing in a “myopic” way: i.e., by assuming that each period is the last period before retirement. In other words, age or time horizon are irrelevant in the portfolio choice of individuals.

One could think that the assumption of constant relative risk aversion is responsible for the result that age or time horizon are irrelevant in the portfolio choice of individuals. However, it can be shown that such result is due to the assumption of unpredictability of returns on the risky asset. In fact, this implies that absolute risk aversion is only proportional to wealth and therefore, consumption during retirement (Gollier (2005)). In other words, unpredictability of returns of the risky asset implies constant portfolio weights over time that are a function only of retirement wealth.

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106 This, in turn is proportional to the volatility of the returns on the risky asset and the degree of risk aversion.

107 Mossin (1968) shows that power utility functions are the only functions with such property.
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In summary, risk aversion, volatility of returns and risk premium are key elements justifying the optimality to invest in risky assets at any given point in time. However, it is unclear that risk aversion alone would justify time varying portfolio weights, decreasing over time for risky assets. Indeed, various arguments can be put forward for why risk aversion may not necessarily increase over time including the fact that human capital risk would tend to decrease over the life cycle of individual workers. In addition, it may be optimal to rebalance portfolios in the presence of transaction costs that create limited capital gains or losses. However, stronger arguments in support of time varying portfolio weights are the existence of time varying investment opportunities, mean reversion (i.e., predictability) in asset returns, and the presence of decreasing human capital.

Box 7: Equity Risk Premium in the US

The issue of what explains equity risk premium and the “puzzle” of why it seems so high, have been the subject of a large debate in the economic literature.

Mehra and Prescott (1985) suggest that the very high estimated equity premium in the US of 7.43 percent could only be explained if individuals had implausibly high coefficients of relative risk aversion. Kurz and Beltratti (1996) explain the size of the equity premium using a rational beliefs equilibrium model where price uncertainty is endogenously propagated and this is the predominant source of volatility in asset returns. Risk-averse investors need to be compensated for this and using the same parameters as in Mehra and Prescott (1985), they are able to generate the historically observed equity premium in the US. Constantinides et al. (2002) and Kogan et al. (2003) explain the size of the equity premium in terms of borrowing constraints. Constrained, young individuals cannot invest as they would like in the stock market and this reduces demand and raises the return on equities above the risk-free rate sufficiently to generate the observed equity premium. Rietz (1988) argued that the size of the equity premium could be explained by “low-probability disasters”, the possibility that the economy and hence the stock market could be subjected to an extreme negative shock even if this possibility had a very low probability. Barro (2005) also supports this view, and argues that a 1 percent annual probability of a 50 percent fall in GDP and the physical capital stock would be sufficient to produce the observed premium as well as the low long-run real return on risk-free government bonds. However, Juliard and Gosh (2008) argue that the rare event hypothesis is incompatible with the consumption-CAPM and, therefore, cannot by itself explain historical levels of equity premium. Brown et al. (1995) and Jorion and Goetzmann (1999) explain the size of the equity premium in terms of survivorship bias, with the observed equity premium being upward biased due to the long-term survival of the markets from which they are measured. Fauqère and Van Erlach (2006) argue that the US long-run equity premium is consistent with US GDP growth. Fama and French (2002) explain the high equity premium in the second half of the 20th century in terms of an unanticipated decline in discount rates. This led to a fall in the dividend-price ratio which, in turn, caused a substantial, but unanticipated, capital gain increase. The high observed equity premium is merely the realization of this gain.

In short, it is not clear whether there is a genuine equity premium puzzle or not. But most recent studies (Siegel (1999), Jagannathan et al. (2000), Fama and French (2002), and Poterba et al. (2006)) have used much lower estimates for the future US equity premium of around 3.5 percent compared with the historical average between 1951 and 2000 of 7.43 percent. The 3.5 percent figure lies roughly midway between 2.55 percent (Fama and French (2002)’s estimate of the equity risk premium on the basis of long-run dividend growth rates) and 4.32 percent (their estimate on the basis of long-run earnings growth rates).

XX.B The role of time varying investment opportunities

In the real world, the risk-free rate, the excess returns on risky assets, the variances of the returns on risky assets, and the covariances between the excess returns on risky assets are all time varying or stochastic (Campbell and Viceira (2002)). A stochastic investment opportunity set creates intertemporal hedging demands for specific assets that are capable of hedging against adverse movements in the investment portfolio (Merton (1973)). This
calls for time varying portfolio weights for the aforementioned specific assets, as opposed to the static weights of the myopic strategic asset allocation just discussed.

For instance, the presence of time-varying interest rates creates the demand for bonds, especially interest rate sensitive long-term bonds. When interest rates are expected to fall, this will reduce the income generated by the portfolio. Nonetheless, this is compensated by the bond price increase associated with the interest rate fall. In addition, long-term bonds provide a better intertemporal hedge than short-term fixed income instruments: the prices of short-term instruments change very little when interest rates change and due to they short maturities, they expose investors to refinancing risk. Alternatively, in the presence of substantial inflation risk, an inflation-indexed long-term bond is actually less risky than short-term instruments like cash and treasury bills and long-term nominal bonds.

There is substantial evidence that equity returns are also mean reverting and, therefore, predictable. If equity returns are mean reverting, then an unexpectedly high return today will be offset by lower expected returns in the future. It is therefore beneficial to invest in equities over long periods as this reduces total variance, a benefit known as time diversification (or the horizon effect). Time diversification is the equivalent of risk sharing with the future since it implies that risk compounds less than linearly with time as shown in Figure 1.

Figure 11: Mean Reversion and Variability of Returns in the US (1980–98)

Source: Campbell and Viceira (2002)
Above all, mean reversion implies that we would expect a hedging demand also for this asset class and that such hedging demand increases with time horizon. For instance, Barberis (2000) estimates significant mean-reversion in US stock returns \(^{108}\) and shows that the optimal hedging demand for equities is 40 percent of the portfolio without predictability and reaches 100 percent with predictability. \(^{109}\) Thus, in the presence of mean reversion younger investors should skew their portfolios towards riskier assets, even if they have a high level of risk aversion.

Notwithstanding the aforementioned considerations, the predictability of equity returns is not unequivocally supported by the theoretical literature. In fact, there is also large evidence that the volatility of returns \(^{110}\) is also time varying or stochastic. In other words, large negative returns tend to be associated with increased volatility in the long run (Ghysels et al. (1996)). Contrary to mean reversion, where bad news on instantaneous returns is also good news for the investment opportunity set in the future, stochastic volatility means that bad news today is associated with other bad news tomorrow. Chacko and Viceira (2005) show that with stochastic return volatility, younger investors should reduce (and not increase) their exposure to equities and select safer portfolios. Yet, they also find that stock return volatility does not appear to be variable and persistent enough to generate a large negative intertemporal hedging demand. In other words, in spite of the less than unequivocal support of the theoretical literature, a general consensus exists that younger investors should be exposed to equity risk in the initial phases of their working lives.

**XX.C The role of human capital**

Human capital \(^{111}\) can have a substantial impact on the magnitude of pension at retirement as this depends on the shape and the career salary profile of each individual. In particular, two parameters of the career salary trajectory have the largest impact on final pensions: the career average salary relative to final salary and the age at which the salary peaks. This is because the higher the average salary relative to final salary and the earlier the salary peaks, the longer is the time frame given to contributions to compound. Figure 12 and Figure 13 show that typically, low skill workers of both genders have the highest average salary relative to final salary and the salary of women tends to peak much earlier in their careers than the salary of men. This implies that low skilled workers (both men and women) and women in general, benefit the most from a defined contribution pension plan relative to a defined benefit plan.

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\(^{108}\) Similar conclusions are reached by Poterba and Summers (1988), Fama and French (1988) and Balvers et al. (2000).

\(^{109}\) For investors ten years horizon and a risk aversion of ten (i.e., extremely conservative).

\(^{110}\) I.e., also the second moment of the distribution of returns.

\(^{111}\) The present value of lifetime labor income.
Blake et al. (2007) show that, in the case of an equity only investment strategy, the largest median pension-to-final-salary difference between occupations is 34 percent for men and 38 percent for women, for the same contribution rate. The implication is that
there are major differences across both occupation and gender, and this suggests that key aspects of a defined contribution pension plan design should be occupation- and gender-specific.\footnote{In countries where wage trajectories for the majority of the population are flat (because of absolute poverty or insufficient heterogeneity across genders or occupations) the relevance of human capital risk for equity investments is obviously reduced.}

With human capital, total long-term assets now comprise financial (pension) assets and the human capital. Overall, the inclusion of human capital in long-term portfolio choice has the effect of increasing the portfolio weights of the risky financial assets.\footnote{Most literature favors the views that human capital is similar to bonds. Although generally true for employees, in some cases, this may not be the case; for example in the US the compensation is also linked to shares but more importantly labor reforms that increased temporary work and the increase in self-employment may result in equity linked profiles.} This is straightforward to understand when labor income is considered riskless. The introduction of a riskless investment in any portfolio causes the weights on risky investments to increase so as to rebalance the portfolio compatibly with the desired level of risk aversion. Naturally, however, labor income is not without risk and it is correlated with returns on financial assets. However, correlation is not perfect and, in addition, wage risk cannot be hedged directly as human capital is a non-tradable asset. Hence, investors can (and indeed, need to) hedge wage risk by adjusting equity holdings. The degree with which this should be done, clearly depends on the correlation between wages and equity returns.\footnote{Notice, that when the labor supply is endogenous, as opposed to a fixed labor supply assumed so far, individuals can decide how much labor supply as a consequence of wage shocks. A positive correlation between wage shocks and equity returns would lead to a reduction in equity holdings in the portfolio. The flexibility with which people decide how much to work before retirement is likely to be constrained by labor market regulation and therefore, pension participants are likely to be keen to hedge wage risk by adjusting equity holdings.} Finally, since younger individuals have a higher ratio of human capital to financial wealth, we would expect that the optimal hedging demand for equities would be higher for them than for older individuals.

Indeed, the empirical literature and calibration exercises confirm this. For instance, Gomes and Michaelides (2005) show that in the presence of labor income and with borrowing constraints, young individuals with even a high degree of risk aversion ($\gamma = 5$) and between the ages of 20 and 35 should invest 100 percent of their financial assets in equities. Equity weights should gradually decrease to around 40 percent at the age of 65 when the ratio between human and financial wealth decreases.

In summary, this section has shown that the regulation of investment choice and the design of associated default options known as “multi-funds” broadly follow the normative implications of the literature just briefly surveyed and as such, they should be welfare improving. This stems from the following considerations. First, equities have a place in the myopic investment strategy as they exhibit a risk premium. Second, the participant’s attitude to risk is a critical determinant of holdings in risky assets. Third, time varying returns create an intertemporal hedging demand for securities that do well when the investment set deteriorates. In other words, it is optimal to expose younger investors to higher levels of equity risk because the relationship between the returns on different assets varies over time. Fourth, equity returns are predictable in the long run as...
they are mean reverting. Therefore, investing in equities over long periods reduces total variance, a benefit known as time diversification. Finally, equities can be used to hedge wage risk and since human capital and human capital risk are proportionally higher at the beginning of the working career, younger individuals should invest more in equities than older individuals.

XXI SOME PROBLEMS WITH CURRENT RULES AND DESIGN

While exposing younger investors to higher levels of equity risk would achieve higher expected returns, other design gaps also need to be addressed. These include design limitations in the system of multi-funds currently adopted, the need to actively manage portfolios, the lack of explicit considerations of key background risks and the lack of an explicit long-term target for asset managers that is compatible with participant preferences. We believe that such problems either imply inadequate strategic asset allocations or confer asset managers excessive discretion in implementing strategic asset allocation through tactical decisions that may not be aligned with the long-term preferences of participants. This section discusses the nature and impact of these problems, and Section XXII follows with a discussion of how these problems can be partially mitigated.

XXI.A Minor design limitations

A first set of problems that may impact on the adequacy of investment default options is related to the underlying investment rules, the number of funds, the stepwise transition rules across default options and the rules governing the allocation of cash balances across funds.

Investment rules may excessively restrict the investment universe for pension funds or allow excessive tactical discretion to fund managers. Essentially, it is unclear that the underlying investment regulation allows pension funds to construct efficient portfolios. For instance, all the three Latin American countries surveyed severely limit investment in foreign assets and exposure to equity is severely limited in countries like Mexico, thus limiting the scope for geographical diversification in all countries surveyed and for intertemporal risk diversification in Mexico. The inadequacy of investment rules is also recorded in countries that have yet to implement multi-funds. For instance, Reveiz et al. (2008) argue that the investment rules in Colombia are likely to generate asset-liability mismatches at the level of individual participants. Either the risk profile of admissible assets cannot match the risk profile of individual liabilities or they do not allow portfolios to adequately reflect the heterogeneity in risk aversion of the covered population. Finally, even in Peru and Chile, where the most aggressive fund allows for equity investments between 40 percent and 80 percent of the total portfolio, it is unclear

\(^{115}\) See Campbell and Viceira (2002) for a more formal treatment of this topic.

\(^{116}\) It has to be noted that portfolio diversification in Mexico greatly improved between 2000 and 2007. In 2000, fixed income instruments represented 93 percent of overall assets while this share was only 67 percent in 2007. In addition, longer-term maturities (more than 10 years) represented around 22 percent of total assets.
whether such investment rules are consistent with the strong hedging demand reported in Barberis (2000).\textsuperscript{117}

Additionally, even if we assume that the underlying investment rules span the investment universe to effectively cater for different levels of risk aversion, countries like Mexico and Peru do not let individuals allocate their cash balances to more than one fund, preventing them from constructing portfolios that better match their own degree of risk aversion.

Finally, the rebalancing rules (also known as “gliding paths”) of default portfolios and the low number of funds imply that individuals remain in static (deterministic) default portfolios for long periods of time until they reach the trigger age to be switched to a more conservative default option. On this point, the literature (see Basu \textit{et al.} (2008), for instance) suggests that the dynamic (stochastic) strategies would generally perform better than static strategies.\textsuperscript{118} While we will explore policy options involving stochastic strategies later in this chapter, we also acknowledge that welfare gains could be achieved in most countries by simply increasing the number of funds offered over the life-cycle and therefore, making the rebalancing rules more continuous.

These observations suggest that there is scope for improving expected rates of return over the life-cycle in different ways in different countries by simply improving at the margin on current designs. In general, the measures that could be adopted include reviewing investment rules to enable fund managers to construct more efficient portfolios, requiring more gradual gliding paths for default options, making equity funds a default option for young investors and allowing for a richer combination of investment options by either increasing the number of funds or allowing cash balances to be allocated to more than one fund, or both.

\textbf{XXI.B \hspace{1em} The need to actively manage portfolios}

A second problem that affects the adequacy of multi-funds and other strategies aimed at diversifying risk intertemporally relates to the tactical behavior of asset managers. More precisely, to the consideration that assets should not be held passively. Intertemporal hedging demand for securities like equities implies that assets should be actively managed (i.e., investors should engage in market timing) in line with forecast changes in the mean-reverting state variables that drive excess returns. Indeed, investment rules allow for considerable discretion to asset managers to implement tactical asset allocations that can deviate substantially from the strategic asset allocation implied by the literature. For instance, the equity weight in the most aggressive Chilean fund can vary between 40 percent and 80 percent of total portfolio. This raises then the question of whether asset managers invest in the interests of long-term investors.

Even if incentives are aligned, we know from the empirical literature that active asset management does not add much value in general to the strategic asset allocation. In fact, although there is a very small number of star fund managers who are skilled at picking

\textsuperscript{117} In any case, the most aggressive Fund A in Chile is not a default fund for younger individuals.

\textsuperscript{118} More specifically, the stochastic allocation strategies exhibit clear second-degree stochastic dominance and almost first-degree stochastic dominance over strategies that switch assets unidirectionally without consideration of portfolio performance.
winning equities, the empirical evidence shows that the vast majority of professional fund managers produce negative returns from active fund management and, in particular, negative returns from market timing. For instance, as shown in Table 24, Blake et al. (1999, 2002) found that 99.47 percent of the total return generated by UK fund managers in the period 1986-94 could be explained by the return on a passive portfolio. Active management, constituted by stock picking and market timing, was less successful. The average pension fund was indeed successful in security selection, making a positive contribution to the total return of 2.68 percent. However, it was unsuccessful at market timing, generating a negative contribution to the total return of -1.64 percent. The overall contribution of active fund management was just over 1 percent of the average total return (about 12 basis points), which is less than the average fee charged for active management.

Table 24: Value Added of Passive and Active Asset Management in UK (86-94)

<table>
<thead>
<tr>
<th>Components</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myopic buy-and-hold</td>
<td>99.47</td>
</tr>
<tr>
<td>Stock picking</td>
<td>2.68</td>
</tr>
<tr>
<td>Market timing</td>
<td>-1.64</td>
</tr>
<tr>
<td>Other</td>
<td>-0.51</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Note: Using average observed portfolio weights observed in the period 1986-94.
Source: Blake et al. (1999, 2002).

Active investment performance is even worse in international markets, mainly due to unsuccessful market timing attempts (Timmermann and Blake (2005), Blake and Timmermann (2005)). These studies of UK pension funds show that not only do the funds underperform substantially relative to regional benchmarks, but this underperformance is much larger than what has been found in studies of performance in the domestic market. The average fund underperformed a passive global equity benchmark by 70 basis points per annum, which is substantially greater than UK pension funds’ underperformance in their domestic equity market (33 basis points per annum).

Finally, even those pension fund managers who do generate superior performance in certain periods find it very hard to maintain that performance over time. Very similar results on the inconsistency of out-performance have been found in the US (see Grinblatt and Titman (1992), Hendricks et al. (1993), Brown and Goetzmann (1995), and Carhart (1997)).

The fact that asset managers are not particularly good at actively managing portfolios and, in particular, at timing the market, suggests that there is a need to tie the hands of fund managers so as to align their incentives with the long-term incentives of...

119 See Kosowski et al. (2006).
120 See Lakonishok et al. (1992) for evidence of this is the US and Blake et al. (1999, 2002) for evidence of this is the UK. See Timmermann and Blake (2005), Blake and Timmermann (2005) for evidence of poor active management performance in international markets.
121 Using average observed portfolio weights observed in the period 1986-94.
122 In other words, systematic changes in the portfolio weights across international regions that ex post were found to be misjudged.
123 The FT/S&P indices for the four regions considered, namely Japan, North America, Europe (excluding the UK) and Asia-Pacific (excluding Japan).
participants. It is not clear that full alignment of incentives can be achieved in practice, especially since this implies defining the long-term objectives of contributors. However, in Section XXII we suggest that target annuitization funds could, at least partially, address the concerns about the adequacy of asset managers’ tactical behavior.

**XXI.C Inadequate consideration of key background risks**

Another problem that affects both the adequacy of the strategic asset allocation and the tactical decisions of asset managers is the lack of attention to key background risks (i.e., risks originating outside the management of pension financial assets) in the design of the investment rules and the associated default investment options. We will briefly refer here to the human capital risk, discussed in the previous section, and discuss in more detail the annuitization risk and other background risks.

**XXI.C.1 Human capital risk**

We saw in Section XX that the key consequence of explicitly considering labor income risk in the long-term strategic asset allocation is that the hedging demand for equities should be even stronger than what explained by mean reversion alone. That is, since human capital is risky and imperfectly correlated with other assets such equities, young investors should leverage their positions to invest more than 100 percent of the portfolio in equities.

This proposition of literally leveraging pension assets is unrealistic in most jurisdictions as incomplete financial markets do not allow individuals to borrow outside the pension system to leverage their pension financial asset positions. In addition to the argument of market incompleteness, tax rules in all jurisdictions prevent individuals from saving excessively in tax preferred accounts. Finally, the evidence reported in this chapter is based on UK life cycle data. In emerging economies, human capital income is low and constant through the cycle resulting in pension savings being the only financial asset for individuals. This may not necessarily mean that younger investors should not be exposed to riskier investments but that probably, equity exposure should decrease more rapidly than in countries where investors have also other financial assets outside pension savings.

Notwithstanding the aforementioned considerations, it is safe to argue that human capital is not explicitly considered in the design of default investment options adopted in the countries surveyed and, therefore, the question of whether the current design exposes young investors to equity risk in an optimal way by default remains an open question.

The answer to this question is likely to be country specific. We believe that higher income countries with adequate supply of human capital among asset managers and regulators and with sufficiently deep and liquid capital markets would find it easier to

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124 The conclusion that active asset management adds little to overall performance is mainly derived from empirical literature based on developed markets. It may be argued that in emerging markets, with shallower and more illiquid markets, the value of private information is higher than in more efficient markets. In other words, active asset management is likely to add more value, relatively to strategic asset allocation, in these markets than in more mature markets. The argument would support more activism but would not undermine the rationale for better aligning long-term incentives among policymakers, asset managers and pension plan participants.
design default options for younger participants with high levels of equity risk exposure. In addition, countries with a diversified source of financing of retirement benefits would find it optimal, \textit{ceteris paribus}, to expose young participants to higher levels of equity risk than countries where the provision of retirement income is concentrated in only defined contribution arrangements.

Finally, the financial turmoil of 2008 has raised the perception that there is a tradeoff between the need to hedge wage risk with equities on the one hand, and avoid short-term volatility of portfolios on the other hand. However, we believe that the tradeoff is only apparent. In fact, pension assets are illiquid investments for pension participants until retirement and their short term volatility does not necessarily impact on longer-term performance. Indeed, we believe that countries with a better financially educated work force will find it easier to communicate the short-term and cyclical nature of increased volatility in asset returns that will stem from larger holdings of risky assets. Therefore, investing in financial education is likely to remain a priority for most jurisdictions in the long-term.

In Section XXII we maintain that equities are an essential tool to hedge long-term wage risk; therefore, their optimal holdings as well as their evolution over time will depend on accurate modeling of human capital risk in target annuitization funds.

\textbf{XXI.C.2 \ Annuitization risk}

Annuitization risk is another important background risk that the current design of multi-funds and default options fail to consider. This implies a disconnection between the accumulation and the decumulation phase and therefore, poor consideration for monitoring the adequacy of tactical decisions of asset managers against a long-term financial target.

Annuitization risk is composed of two essential elements: 1) a “transformation” risk related to the timing of annuitization; and 2) a longevity risk related to the possibility of outliving one’s assets. The decision of when to transform accumulated assets into retirement income is important since the specific conditions of the capital market in which a given cohort retires determine the lifetime income of that cohort. The decision of how much to annuitize will greatly determine the probability of outliving one’s assets and/or leave bequests.\textsuperscript{125}

The optimal degree of annuitization is reduced if: 1) retirement income from other sources is high (Bernheim (1991)); 2) risk pooling within the family is efficient (Kotlikoff and Spivak (1981) and Brown and Poterba (2000b)); 3) risk aversion is low, since such individuals prefer equity investments (Milevsky and Young (2002, 2007a)); 4) the equity premium is sufficiently high (Horneff \textit{et al.} (2007)); 5) investment volatility is low (Milevsky and Young (2007b)); 6) availability of housing and other social welfare

\textsuperscript{125} In addition, longevity risk depends on the menu of products available to cater for consumption preferences during retirement, the eventual desire to leave bequests, the industrial organization of annuity providers that should be designed with the aim to maximize financial innovation and minimize administrative costs and the credit risk associated with possible default of annuity providers. However, these important policy issues are not related to the strategic asset allocation in the accumulation phase and therefore, beyond the scope of this report.
Competition And Asset Allocation Challenges For Mandatory DC Pensions

(health) is low (Milevsky and Young (2002)); and 7) the bequest motive is high (Bernheim (1991)).

Notwithstanding the aforementioned private incentives, the decision about the optimal level of annuitization is likely to be beyond the control of the vast majority of participants in mandatory defined contribution systems. Instead, it is likely to be driven by policy decision about the socially acceptable level of annuitization. For instance, many countries provide minimum pension guarantees in mandatory defined contribution pillars, and it is likely that minimum annuitization levels would also need to aim at reducing the fiscal cost of such guarantees.

In any case, the design of the strategic asset allocation and associated default options during the accumulation phase is likely to be impacted by the level of mandatory annuitization: the higher the floor, the higher the required contributions or the higher the equity exposure needed at young ages and the higher the variance with which the target is reached.

The decision about when to annuitize can be thought of as an option that depends on the annuity survival credit and the degree of risk aversion. Milevsky (1998) suggests that in the absence of a bequest motive and ignoring risk aversion, it is optimal to fully annuitize when the return on annuities (which equals the risk-free rate plus the survival credit) exceeds the return on equities (which equals the risk-free rate plus the equity risk premium). When risk aversion is considered, Milevsky and Young (2007a) show that higher levels of risk aversion lead to lower annuitization ages since individuals have a lower tolerance for investment risk.

Again, for many participants in mandatory defined contribution pensions, the decision of when to annuitize is taken by regulation and it is typically set at the mandatory retirement age. However, the design of default investment options during the accumulation phase need to take into consideration both the private incentives as well as the environment constraint affecting the optimal timing and level of annuitization.

The key message stemming from this brief review of the literature on annuitization risk is that the strategic asset allocation during the accumulation stage should play a greater role in hedging such risk. This would have two advantages: a critical interest rate risk for participants is hedged and a target useful at limiting excessive discretion of fund managers is identified. Section XXII will discuss how this could be achieved through the use of target annuitization funds.

XXI.C.3 Other background risks
There are clearly other background risks that might influence the investment strategy of the pension plan. The most important one is probably the housing risk. A house is an illiquid asset that can provide rental services in addition to being an investment asset the value of which, is often very highly correlated with inflation.

Cocco (2005) finds that younger and poorer investors prefer to invest in housing before investing in the stock market and this crowds out equity investment. Yao and Zhang (2005) find that home owners hold a lower average proportion of equities in their total net worth holdings (i.e., bonds, equities and housing) reflecting the substitution effect of housing wealth for risky equities identified by Cocco (2005). However,
similarly to when labor income is considered, home owners hold a higher equity weighting in their financial wealth portfolio (i.e., bonds and equities). This reflects a diversification benefit: home owners can use housing wealth to hedge equity and labor-income risks.\textsuperscript{126} Finally, Sun \textit{et al.} (2007) show that with reverse mortgages (or housing equity release plans), the optimal investment of financial wealth in equities increases. The intuition is that a reverse mortgage provides a long-term coupon to the retiree, very similar to an annuity. Therefore, less financial wealth needs annuitizing at any given point in time. In addition, the bond nature of a reverse mortgage will prompt a rebalancing of the financial wealth portfolio towards risky assets compatibly with any given level of risk aversion.

Irrespectively of the number of background risks that it is deemed necessary to include in the design of the long-term strategic asset allocation of participants, it is clear that these will affect that optimal holdings of risky financial assets in pension portfolios. For the vast majority of countries, we believe that the explicit consideration of human capital and annuitization risk is likely to generate the largest welfare gains. Countries with more sophisticated financial sectors may find it optimal to consider also other background risks like housing.

\textbf{XXI.D Evidence of gaps in asset manager behavior in Chile}

The empirical literature on the misalignment of incentives between asset managers and pension participants is extremely scarce while the theoretical literature focuses on hedging specific long-term risks (like inflation, for instance). The scarcity of empirical studies relates to the difficulty in defining the long-term preferences of pension participants that are generally postulated. For instance, Raddatz and Schmukler (2008) analyze the investment decision of Chilean pension firms during the period 1996-05 and reach a broad conclusion that pension fund asset management behavior may not have been consistent with long-term preferences of pension participants.

\textsuperscript{126} Essentially, the consideration of any non-financial assets, the return of which is only imperfectly correlated with equity returns, is likely to induce an increase in the weight of equities within financial wealth.
The system of multi-funds in Chile exhibits some well identifiable trends. Since the introduction of the multi-fund system in 2002, the Fund C has been the fund with the largest relative share of assets in the system. Nevertheless, Fund B and Fund A have also been gradually increasing, representing in 2005 around 20 percent of GDP (Figure 14).

Table 25: Chile Asset Allocation by Type of Fund (percent, December 2005)

<table>
<thead>
<tr>
<th>Fund A</th>
<th>Fund B</th>
<th>Fund C</th>
<th>Fund D</th>
<th>Fund E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Former Pension System Bonds</td>
<td>0.9</td>
<td>2.3</td>
<td>4.0</td>
<td>7.3</td>
</tr>
<tr>
<td>Corporate Bonds</td>
<td>1.8</td>
<td>4.5</td>
<td>8.4</td>
<td>8.9</td>
</tr>
<tr>
<td>Financial Institutions</td>
<td>12.9</td>
<td>20.4</td>
<td>24.9</td>
<td>26.8</td>
</tr>
<tr>
<td>Government Paper</td>
<td>3.0</td>
<td>7.7</td>
<td>13.5</td>
<td>24.8</td>
</tr>
<tr>
<td>Mutual Funds</td>
<td>1.6</td>
<td>3.6</td>
<td>3.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Equity</td>
<td>16.6</td>
<td>17.7</td>
<td>14.9</td>
<td>10.2</td>
</tr>
<tr>
<td>Mortgage Bonds</td>
<td>1.2</td>
<td>3.5</td>
<td>6.2</td>
<td>7.4</td>
</tr>
<tr>
<td>Foreign Assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Income</td>
<td>0.5</td>
<td>0.6</td>
<td>0.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Mutual Funds</td>
<td>58.5</td>
<td>37.6</td>
<td>22.4</td>
<td>10.1</td>
</tr>
<tr>
<td>Equity</td>
<td>-</td>
<td>0.7</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Raddatz and Schmukler (2008)
Overall asset allocation across types of fund has been generally consistent with investment regulations (Table 25). At the end of 2005, Fund A had around 70 percent of assets invested in equities,\textsuperscript{127} 7 percent in fixed income instruments and 13 percent in bank deposits. At the other extreme, Fund E had no investments in equities (by design),

\textsuperscript{127} Foreign mutual funds are considered equity mutual funds irrespectively of their asset composition. There is indeed large evidence that the vast majority of foreign mutual funds are indeed equity funds. In fact, Chilean pension funds achieve equity exposure through foreign mutual funds and fixed income exposure through the domestic market. This is partly explained by competition rules as fees charged by foreign mutual funds are not considered among the fees charged by pension firms to participants.
more than 80 percent in fixed income and around 17 percent of assets in bank deposits. Consistent with the rationale of multi-funds, the Chilean system appears to be moving individuals from equities to bonds over their careers until retirement and the specialization of each fund appears to be increasing (Figure 15).

Table 26: Chile Average Maturity Structure of Fixed Income Holdings (percentage, December 2005)

<table>
<thead>
<tr>
<th>Term maturity (in days)</th>
<th>Fund A</th>
<th>Fund B</th>
<th>Fund C</th>
<th>Fund D</th>
<th>Fund E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>7.5</td>
<td>5.1</td>
<td>3.6</td>
<td>3.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Under 90</td>
<td>18.8</td>
<td>13.7</td>
<td>11.3</td>
<td>6.6</td>
<td>4.7</td>
</tr>
<tr>
<td>Under 120</td>
<td>27.0</td>
<td>21.3</td>
<td>16.7</td>
<td>15.0</td>
<td>6.6</td>
</tr>
<tr>
<td>Under 360</td>
<td>59.3</td>
<td>47.6</td>
<td>38.8</td>
<td>33.5</td>
<td>16.8</td>
</tr>
<tr>
<td>Under 720</td>
<td>69.3</td>
<td>59.6</td>
<td>51.7</td>
<td>49.9</td>
<td>32.9</td>
</tr>
<tr>
<td>Under 1,080</td>
<td>75.5</td>
<td>68.6</td>
<td>61.6</td>
<td>65.9</td>
<td>50.4</td>
</tr>
</tbody>
</table>

Source: Raddatz and Schmukler (2008)

However, pension funds seem to be holding a disproportionate amount of liquid assets, particularly cash and fixed income securities. For instance all funds held on average 20 percent of assets in bank deposits at the end of 2005. Fund A had only 13 percent of assets in bank deposits, which is much higher than the 3.5 percent average weighting in “cash” of US equity mutual funds. In addition, fixed income holdings are skewed towards shorter term issues. On average, during the period 1996–2005, 45 percent (24 percent) of fixed income securities were held in instruments with less than 3 (1) years to maturity. The bias is even more severe for Fund A than for Fund E. For instance, at the end of 2005, Fund A held 76 percent (59 percent) of fixed income investments in securities with less than 3 (1) years to maturity. For Fund E, the same weights were 50 percent and 17 percent, respectively (Table 26).\(^{128}\)

The large holdings of liquid assets would suggest that pension firms are foregoing the illiquidity premium embedded in long-term illiquid assets in favor of holdings that allow for rapid changes in tactical asset allocation. In addition, the high concentration of bank deposits and short-term fixed income securities in Fund E suggests that Chilean retirees are exposed to high annuitization risk.

Besides the aforementioned the strategic asset allocation issues, the tactical asset allocation of Chilean pension funds appears not to be consistent with the long-term objectives of the system’s participants. In particular, Raddatz and Schmukler (2008) find evidence of contemporaneous herding, some evidence of dynamic herding, evidence that pension funds follow momentum investment strategies and no evidence of active asset management.

Contemporaneous herding takes place when all pension funds buy and sell similar assets at the same time while dynamic herding takes place when asset classes bought at any given point in time are also bought in subsequent periods. Evidence of contemporaneous herding is found for all funds in domestic corporate bonds and quotas of domestic and foreign mutual funds. For the other assets, herding seems to occur only among the largest pension funds. Evidence of dynamic herding is found for domestic equities and foreign mutual funds. On average, the economic magnitude of herding is

\(^{128}\) A similar pattern across multi-funds exists for the period 1996-05.
close to the evidence reported for mutual funds in developed countries but is still significantly higher in some asset classes. The high degree of herding can be explained by the fact that different pension funds arrive independently at the same conclusions regarding the optimal timing for trades that maximize long-term welfare of participants or that, most likely, they simply follow each others’ investment strategies.

In addition, Chilean pension funds are not active asset managers, generally buying and holding securities. Pension funds tend to change about only 10 percent of their portfolio every month but this varies substantially across type of funds: Fund A and Fund E display the highest degree of turnover, while Fund C and Fund B display the lowest degree of turnover. The findings are compatible with the fact that the highest degrees of turnover are observed for domestic government bonds (largely held by Fund E) and quotas of foreign mutual funds (largely held by Fund A). On average, however, pension funds buy fixed income instruments and hold them until maturity, not trading them on the secondary market.

Finally, Chilean pension funds follow momentum investment strategies. In particular, they tend to buy government bonds, former pension system bonds and quotas of foreign mutual funds when lagged returns are positive. Yet, they tend to buy domestic equity when lagged returns are negative; i.e., following a contrarian strategy for this asset class. Possibly this relates to some degree of mean reversion in domestic equities.

**XXII Reconnecting the Accumulation and Decumulation Phases**

We saw in Section XXI that the regulation of investment choice and the design of default investment options, implicit in the system of multi-funds, are likely to provide long-term welfare gains to participants compared to the earlier single-fund schemes. In addition, we argued that current arrangements could be further improved by addressing key weaknesses and proposed in the same section policies that are compatible with the rule-based framework in which multi-funds currently operate. In such a framework both products and rules of operations are defined by the policymaker. However, we also highlighted that major welfare gains can only be achieved if the design of default investment options hedged key background risks like human capital and annuitization risks. In this section, we argue that a major shift towards a risk-based framework is needed in order to achieve these additional welfare gains. In such a framework, market participants design investment products while the policymaker defines their minimum standards and focuses on monitoring their implementation.

The key weaknesses of the system of multi-funds discussed in Section XXI could be largely addressed by requiring fund managers to offer investment products (which we call here “target annuitization funds”) that explicitly link the accumulation with the decumulation phase in the spirit of surplus optimization and/or liability driven investment strategies commonly available in the retail sector for retirement wealth management. In the rest of this section we discuss the key characteristics of these products and possible difficulties related to their implementation. We also discuss alternative products and other short term policies that are likely to improve on current multi-funds designs.
XXII.A  Target annuitization funds

We use here the term “target annuitization funds” to indicate investment products with target maturity (say: the retirement date) and for which, the construction of the investment portfolio is liability driven. These investment products are very similar to the multi-fund products currently offered by pension firms in Latin American and Eastern European countries. This should reduce concerns related to their eventual implementation. However, they differ in three key aspects. First, they do not target a specific retirement age but they target, within a confidence interval, a consumption path level during retirement in the form of a socially accepted minimum wealth or replacement rate at the target retirement date. Second, the optimal (strategic) asset allocation of these funds is not deterministic but derived from stochastic programming techniques, i.e., by modeling key background risks faced by contributors during the accumulation phase. Finally, by having a probabilistic investment target, they allow for improved short term performance evaluation of pension fund managers through the tracking of individual funding positions. We discuss these key elements recursively in the rest of this section starting from the investment target.

XXII.A.1 Identifying the long-term investment target

A long-term investment target for fund managers is completely missing in the current multi-fund design of mandatory defined contribution pensions. This stems from the purely defined contribution nature of second pillars according to which contributions are defined *ex ante* and individuals are left to find out *ex post* whether their accumulated pension savings are sufficient to finance their desired consumption profile during retirement. In other words, contributions are exogenous and benefits are endogenous. This design feature is likely to be socially suboptimal in countries that rely primarily on capital markets to finance retirement benefits. In addition, it suits only individuals with a low intertemporal elasticity of substitution in consumption but not individuals who prefer higher and more stable consumption during retirement. Finally, the lack of a long-term benefit target is believed to be the key element causing the misalignment between the short-term investment objectives of fund managers and the long-term objectives of pension participants.

A target annuitization fund would target a long-term investment target that is deemed sufficient to finance the desired consumption profile during retirement. The target can be expressed as minimum cash balance, a replacement rate or an annuity level representing a socially accepted compromise between the desire of the government to minimize the costs of the typically provided minimum pension guarantees, the ability of contributors to pay for this and heterogeneity in intertemporal elasticity of substitution in consumption.\(^{129}\)

The different ways to express the target have different implications. For instance, a replacement rate target creates an explicit connection between the accumulation phase and the decumulation phase. In this sense, it would have the advantage, with respect to an absolute cash balances target to encourage managers to hedge annuitization risk

\(^{129}\) As discussed later on, the presence of a target implies volatility in contributions and some members might not welcome it since it implies a volatile pattern to consumption during the accumulation phase (although a less volatile pattern during retirement).
towards the retirement age. However, a cash balance target with specific investment rules aimed at smoothing interest risk associated with annuitization could probably be a valid alternative. This could in practice be implemented by requiring funds to invest in deferred annuities towards retirement and/or invest in long term bonds that match the duration of the annuity that individuals would be required to purchase after retirement.

Irrespective of how the target is expressed (which is likely to be country specific) its definition would involve estimating the value at retirement of the consumption path of individuals in the decumulation phase. Accordingly, a general precondition for the viability of a financial target that reconnects the accumulation phase with the decumulation phase is that countries develop accurate mortality tables.

The presence of a long term-investment target would create a confidence interval within which to monitor the long-term performance of pension fund managers.\(^{130}\) Finally, because of its probabilistic nature, it would not create a liability that fund managers need to meet and, therefore, be fully compatible with the defined contribution nature of second pillars in the country surveyed.

XXII.A.2 The construction of liability driven investment strategies

Once the individuals’ liabilities are measured and the target for asset managers identified, there is the issue of designing the strategic asset allocation of the default investment options during the accumulation phase.

With adequate investment rules, analytical methods, in the spirit of continuous-time dynamic programming models are useful to capture the key driving forces behind portfolio dynamics. However, by their nature, analytical solutions are often simplistic and detached from the reality of portfolio management. Instead, stochastic programming solutions allow for more comprehensive models and have been applied in numerous commercial applications.\(^{131}\) The key advantage of stochastic programming is that it allows for a full and realistic account of uncertainty facing agents in the context of asset-liability management. Important practical issues such as transaction costs, multiple state variables, market incompleteness due to uncertainty in liability streams that is not spanned by existing securities, taxes and trading limits, regulatory restrictions and corporate policy requirements can be handled within the stochastic programming framework. However, this comes at the cost of tractability; analytical solutions are not

\(^{130}\) Naturally, monitoring shorter-term performance would require alternative benchmarks, like a rate of return target consistent with the longer-term financial target or tracking of the “funded position” of individual accounts (we will discuss what we mean by “individual funded position” in sub-section XXII.A.3).

\(^{131}\) A second strand of the literature has therefore focused on developing more comprehensive models of uncertainty in an asset-liability management context. The stochastic programming approach to asset-liability management (Kallberg et al. (1982), Kusy and Ziemba (1986), or Mulvey and Vladimirou (1992)) is relatively close to industry practice, with one of the first successful commercial multistage stochastic programming applications appearing in the Russell-Yasuda Kasai Model (Cariño et al. (1998), Cariño and Ziemba (1998)). Other successful commercial applications include the Towers Perrin-Tillinghast asset-liability management system of Mulvey et al. (2000), the fixed-income portfolio management models of Zenios (1995) and Beltratti et al. (1999), the Wilshire model of Chang (2007) and the Innovest Austrian pension financial planning model InnoALM described in Geyer and Ziemba (2008). A good number of applications in asset-liability management are provided in Ziemba and Mulvey (1998) and Ziemba (2003).
possible, and stochastic programming models need to be solved via numerical optimization which in most, require that uncertainties be approximated by a scenario tree with a finite number of states of the world at each time. In other words, both analytical and stochastic programming solutions imply model risk.

An application of stochastic programming that addresses the weaknesses of the multi-fund design discussed before is given in Cairns et al. (2006). The authors show that a strategic asset allocation based on three funds would be sufficient to hedge intertemporal shifts in investment opportunities, interest rate (annuitization) risk and human capital risk. This requires three funds dominated by equities, bonds and cash, respectively, but each fund containing some of the other assets in order to hedge intertemporal shifts in investment opportunities, interest rate volatility and correlation with labor income. For example, the equity fund is an efficient portfolio of equities (mainly), bonds and cash, with the weights in the risky assets depending on the ratios of the assets’ risk premium to return variance in the standard fashion. Over time, weights are adjusted to account for variations in the correlation between asset returns and labor income.

The purpose of the equity fund is to hedge human capital risk and to benefit from the equity risk premium. As shown in Error! Not a valid bookmark self-reference., equity holdings in the strategic asset allocation are highly leveraged at the beginning, when the ratio of human capital to financial wealth is very high. Then, they gradually decrease to zero towards retirement when the aforementioned ratio becomes zero. The purpose of the bond fund is to hedge interest rate risk and the annuitization risk. Its weight is also very high at the beginning of the career as a consequence of the hedging demand caused by time varying interest rates. It decreases very rapidly but it increases again towards retirement to hedge the annuitization risk. The purpose of the cash fund is first to finance the initial very high leveraged positions in equities and bonds, so its weight is highly negative, and then to hedge the inflation risk in labor income, when its weight becomes positive.132

132 In addition to productivity improvements and career progression, labor income increases with inflation expectations. The return on cash adjusts to reflect inflation expectations.
Booth and Yakoubov (2000) and Howis and Davis (2002) had already suggested that the use of long-term bonds before retirement would be effective at hedging annuitization risk.133 This is straightforward and it stems from the observation that the price of annuities is inversely related to the interest rate. Horneff et al. (2008b) suggest that a more effective way to hedge the same risk is to annuitize gradually over time rather than at retirement; in this way bonds can be used to hedge other risks, such as the bequest risk. The optimality of gradual annuitization stems from the tradeoff between the illiquidity of annuities and the longevity risk insurance they provide. Although longevity insurance is valuable, the purchase of an annuity is irreversible making them a very illiquid asset. The option value from waiting is valuable at younger ages and this explains why gradual annuitization is preferable.134

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133 Ideally, the duration of the bond portfolio to be annuitized at any given point in time should be close to (if not the same of) the duration of the annuity being purchased. Neither the long term bonds nor the duration requirements are contained in the investment rules of default options close to retirement.

134 Clearly, the presence of transaction costs will reduce the extent with which gradual annuitization can be implemented. It may only be feasible to annuitize at few moments in time before retirement in the presence of sufficiently large transaction costs.
Another application of stochastic programming that explicitly considers bequest motives is given in Horneff *et al.* (2008a). Instead of switching from cash and equities into bonds over the accumulation stage (in order to hedge the annuitization risk), Horneff *et al.* (2008a) recommend a strategy that switches from equities to deferred annuities gradually over the entire life of the plan. The switch from equities is justified by the decline in human capital, while the switch into annuities is justified by the increase in the survival credit, i.e., the increase in value of the longevity risk insurance. The switch into bonds is justified by the opportunity to exploit time varying interest rates and to meet a bequest motive at the end of the life-cycle (Figure 17).

With no bequest motive, Horneff *et al.* (2008a) show that it is optimal to begin to annuitize from as early as age 20. The rising survival credit first crowds out bonds (at around age 50) and eventually equities (by age 79) as shown in Figure 17. With a bequest motive, bonds and equities are never crowded out by survival credits. Indeed equity and bond weights remain high to accumulate bequeathable assets. In fact, individuals start buying annuities only at age 60 and these are crowded out by bonds at age 80 as the bequest motive dominates the survival credits (Figure 18).
Finally, Reveiz and León (2008) and Reveiz et al. (2008) provide a third interesting application of stochastic programming for the case of Colombia. Their framework moves away from the mean-variance framework implicit in the previous examples and defines risk as the maximum shortfall that individuals are ready to withstand in any given period. This framework is an example of a practical way of targeting a replacement rate. For this to be possible, it is only necessary to: 1) allow for a wide set of instruments for all multi-funds; and 2) determine for each an investment horizon to maximize wealth given a maximum shortfall for a given period (say, 0, 2, 5, 10 and 20 percent per year for funds A, B, C, D and E respectively at a given confidence interval) that would be consistent with the target replacement rate. Asset limits could be used mainly for instruments with low credit, high complexity (CDOs, ABS...) or difficult to fairly price in the markets (joint ventures or infrastructure projects). Each fund then determines the appropriate combination of assets (benchmarks) that does not surpass these shortfall constraints and the regulator can verify that the resulting risk exposures of the fund are aligned with the objectives of each fund. These allocations are then determined as a benchmark and can be modified only 2 times every 3 years to avoid fund synchronization (macroeconomic volatility) and ensure stability. Active management, determined as a tracking error deviation, can be authorized as a deviation of these benchmarks for the managers to take opportunistic bets or decrease the overall risk of the portfolio if important changes on risk aversion are expected.

The three examples just presented calibrate optimal investment strategies via stochastic simulations that take into account a series of background risks like labor income and annuitization. They yield gliding paths for the optimal rebalancing of

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135 The authors justify this by arguing that in most emerging markets pension assets are likely to be the only financial asset for individuals and that therefore, asset management should have as an objective the minimization of shortfalls in individuals’ cash balances.

136 The composition of the portfolio is not relevant for the regulators who should focus only on the risk exposure; the strategic asset allocation is the responsibility of the manager.
portfolios over time that are far superior to the stepwise (deterministic) transition rules characteristics of multi-fund design today. However, these techniques are very complex and their full implications are still poorly understood. In addition, their stochastic nature makes them also very information-intensive, in the sense that they require constantly updated information about factors such as labor income, human capital and/or other background risks. They are therefore very difficult to implement and most countries would need to consider simpler (deterministic) strategies that are easier to implement.

Finally, in addition to issues related to construction of portfolios, considerations should be given to what techniques plan managers should be allowed to use to implement over time the strategic asset allocation. We limit here the discussion on this point to Box 8 and flag this as an issue worth further analysis in the future.

**Box 8: Liability Driven Investment Strategies: How Are They Implemented?**

Various definitions of liability driven investment strategies exist but they all essentially involve managing assets in a way to hedge the duration and convexity risk of assets and liabilities or the surplus stemming from the difference between assets and liabilities.

A traditional way to implement a liability driven investment strategy is through *surplus optimization*. Pure target maturity date asset allocation techniques produce an efficient frontier that maximizes expected return for given level of total expected risk and are unaware of liabilities. Instead, surplus optimization techniques produce and efficient frontier that maximizes expected surplus return for given level of expected surplus risk. Surplus return is defined as the difference between the liability return and the return on assets and the surplus risk is defined as the standard deviation of the surplus return. The target maturity date frontier and the surplus optimization frontier portfolios are very similar at the beginning of the working career of an individual. If anything, portfolios on the surplus frontier have larger exposure to equity, given the longer term horizon under consideration. However, they are very different towards retirement when portfolios on the surplus optimization frontier would include a larger proportion of inflation indexed long term.

A more recent way to implement a liability driven investment strategy involves separating assets between a *liability matching portfolio* and a *performance generation portfolio*. This approach can be thought of the combination of two separate strategies: 1) investing in immunization (for risk management); and 2) investing in standard asset management (for performance generation). When leverage is involved, the immunization portfolio would include the use of derivatives (typically, interest rate and/or inflation swaps) in the liability matching portfolio. This allows for more potential for performance generation. Under this general class of strategies, there can be found *constant proportion portfolio insurance (CPPI)* strategies, which are designed to prevent final terminal wealth from falling below a specific threshold, and *extended CPPI* strategies (or dynamic core-satellite strategies), which are designed to protect asset value from falling below a pre-specified fraction of the benchmark value, here given by the liability portfolio.

**XXII.A.3 Short term performance evaluation and variable contributions**

Liability driven portfolios (however they are constructed and implemented) implicitly assumes that the future states of the world are known *ex ante*, when the strategic asset allocation is designed. However, when new information arrives (as it does in reality), contingency plans need to be ready. For instance, if participants have a long-term target pension fund value (or a target annuity amount, or a maximum short-term drawdown) and the current value of the pension fund falls short of the level needed to reach that target, say as a result of poor equity returns, the only way to rectify this is to increase contributions into the plan. In essence, a shock creates “unfunded liabilities” in the
individual plan and reduce the probability of achieving the predetermined target.\(^{137}\) Therefore, the reconnection of the accumulation and decumulation phases through revised default investment options, should be accompanied by a review of individual funding/contribution policies and appropriate changes to investment strategy.

Two key objectives can be achieved by incorporating funding estimations into the liability driven approach similar to those employed by many defined benefit plans. On the one hand, the likelihood of individuals reaching their long-term retirement target is increased. On the other hand, a shorter-term benchmark for the plan investment strategy is introduced.

The extent to the likelihood of reaching the long term target can be increased depends on the individual intertemporal elasticity of substitution in consumptions. Individuals with a higher elasticity will prefer higher but more volatile consumption patterns over time and therefore more inclined to compensate for asset volatility with contributions while individuals with a lower elasticity will prefer more stable but lower consumption patterns.\(^{138}\)

The extent to which individual funded positions can be used as a short term performance evaluation benchmark depends on the adequacy with which assets and liabilities are evaluated. Given the model risk associated to such exercise, it is obvious that short-term performance evaluation would also need to rely on other short-term benchmarks like asset benchmarks, minimum return benchmarks or maximum drawdown benchmarks.

At this point, the policy compromise embedded in the use of target annuitization funds should be obvious. On the one hand, a purely defined contribution financing mechanism minimizes the volatility of consumption during the accumulation phase by fixing it and it considers only indirectly\(^ {139}\) the desired level of consumption during retirement. On the other hand, a purely defined benefit financing mechanism minimizes the volatility of consumption during retirement by fixing benefits\(^ {140}\) but it does not consider consumption during the accumulation phase. A probabilistic liability target defined at the individual level is a compromise between the two financing mechanisms: it may allow individuals to reach an optimal level and volatility of consumption during both the accumulation and the decumulation phase but only if individuals are ready to adjust the voluntary contribution rate into the plan to account for unexpected shocks.

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\(^{137}\) We use the inverted commas here to highlight the fact that the unfunded liabilities arise at the individual level and not at the pension plan level. I.e., pension plans remain pure DC plans with no liabilities. It is the individual that has a pension liability through his or her need to consume during retirement and he or she is mandating the pension firm to manage assets as a function of this liability.

\(^{138}\) These are individuals who prefer higher expected consumption in the future relatively to consumption today and therefore, they tradeoff stable consumption patterns over time with higher expected consumption in the future.

\(^{139}\) Through the definition of the level of contributions.

\(^{140}\) Both benefits in a defined benefit plan and the value of the fund in a defined contribution plan are non-tradable assets and their value is likely to be not optimal for most individuals.
XXIII CONCLUSIONS

The financial turmoil of 2008 highlighted the importance of default investment options in mandatory DC pensions. Their design can improve the scope for intertemporal risk diversification for individuals and increase the likelihood of achieving adequate replacement rates during retirement.

In general, the regulation of investment choice and the design of associated default options in mandatory defined contribution systems of countries like Chile, Mexico, Peru, Hungary and soon, Colombia and Bulgaria broadly follow the normative implications of the literature on strategic asset allocation: they attempt to achieve welfare gains by diversifying risk intertemporally. However, they are also subject to a series of criticisms which include secondary issues related to the design and adequacy of options provided, the need to actively manage portfolios, the lack of explicit considerations of key background risks and the lack of an explicit long-term target for asset managers compatible with the preferences of participants. Welfare gains are likely to be easily achieved by addressing some of these criticism through simple policies that can be implemented within the rule-based framework in which multi-funds operate. However, major welfare gains can be achieved only in a risk-based framework. They may be viable only in more sophisticated, deep and liquid markets and present more serious tradeoffs that would require careful assessment.

XXIII.A Policies for rule-based frameworks

A first set of policies could be readily implemented in countries that have adopted a system of multi-funds to improve the expected performance of default investment options. This would entail maintain the current rule-based framework where products and investment rules are defined in regulations and therefore, would present no implementation obstacles.

For instance, investment regulations could be reviewed in numerous countries to allow pension firms to construct more efficient portfolios and portfolios that are more adequately cater for the local risk aversion heterogeneity. In particular, annuitization risk could be effectively hedged in a rule-based framework by requiring default funds towards retirement to be invested in deferred annuities and/or long term (inflation indexed) bonds.

At the same time, the review of investment rules should be aimed at reducing the macro-financial stability impact of pension firms trading activities. These have accumulated a large amount of assets in many countries and their trading activities often exacerbate price pressures in the market for local securities and reduce liquidity artificially, to the detriment of local issuers and the capital market more generally.

Additionally, the number of default options that are currently offered in countries like Peru or Hungary could be revised to reflect the larger heterogeneity of risk tolerance in the covered population. Along the same line, two additional policies could be implemented by allowing individuals to allocate their cash balances in more than one fund and reducing the time during which individuals are allocated by default in any given fund. This would in practice entail maintaining the current deterministic gliding paths for rebalancing portfolios over time but making them more continuous by essentially increasing the number of default options along the life-cycle of individual workers.
XXIII.B Policies for risk-based frameworks

While welfare gains could be achieved by improving at the margin the rules of multi-funds and default investment options, major gains can only be achieved if pension firms were required to actively manage important risks. These second set of policies would entail progressively moving away from the current rule-based framework to a risk-based framework. In such a framework, market participants design investment products while the policymakers define their minimum standards and focus on monitoring their implementation.

Improving the intertemporal risk diversification characteristics of the system of default investment options in mandatory DC pensions implies a larger role for active asset management. In addition, there is the need give better consideration to important background risks such as human capital and annuitization risks. In particular, the poor attention given in current designs to the need for hedging annuitization risk creates a disconnection between the accumulation and the decumulation phases. This, in turns, leaves asset managers with excessive degrees of freedom in implementing the strategic asset allocation with tactical decisions that may be inconsistent with the long-term preferences of investors.

This chapter calls for reconnecting the accumulation and decumulation phases without reintroducing liabilities for pension firms as a way to address the key weaknesses of current multi-fund systems. Such reconnection could be achieved by requiring pension firms to offer target annuitization funds as commonly provided in the retirement wealth management retail industry.

Target annuitization funds are essentially target retirement date life-cycle funds with portfolios during the accumulation phase constructed by taking into considerations the liability structure of individual participants. They are liability driven investment products that do not differ substantially from the multi-fund design adopted in the countries surveyed so as to diffuse eventual implementation concerns. Nevertheless, they differ on three key points.

First, they are liability driven investment funds and as such, their implementation requires the estimation of the consumption needs of individuals during retirement. The investment target could be expressed as a consumption path or a wealth level or replacement rate at retirement compatible with the consumption path. The target would not represent a liability for the pension firm (in line with the defined contribution nature of second pillars) but simply a probabilistic benchmark to guide tactical decision and monitor long-term performance. Hence, the presence of a long-term investment target would provide a better means to align the incentives of asset managers with those of participants in mandatory defined contribution pensions than overly complicated investment rules.

Second, the optimal strategic asset allocation during the accumulation phase is constructed with the aid of stochastic programming techniques. Such techniques would define the stochastic gliding paths to rebalance default portfolios over time and consider key background risks including human capital risk, annuitization risk and bequest risk. The use of at least four efficient funds in the strategic asset allocation including a cash
fund, an equity fund, a bond fund and a deferred annuity fund, appear sufficient to formally consider and hedge such risks.

Finally, the presence of a long-term financial target would imply a funded position for individual participants, similar to the funded status of defined benefit plans. If an individual has a target investment and contributions are defined, an asset and/or liability shock would increase or reduce the probability of achieving the given target. Hence, contribution levels into the fund and/or future investment strategy would need to be adjusted accordingly.

Two critical observations stem from this third last point. First, the presence of an investment target may facilitate the short-term performance evaluation of pension firms by tracking the level of individual funded positions. Second, the presence of an investment target makes contributions partially endogenous but in a very different way from the endogeneity of contributions in defined benefit plans which is driven by solvency standards. The investment target is only probabilistic and pension firms are not required to follow solvency standards. In other words, individuals are left free to alter their contribution paths as a function of their intertemporal consumption preferences. The most practical way to achieve this flexibility in contribution is through the complementary use of voluntary individual accounts.

The viability of target annuitization funds is limited by general as well as product specific considerations. General considerations (which also apply to the current multi-fund design and moreover, to the overall viability of mandatory defined contribution pensions) relate to investment rules and the development of capital markets. Investment rules need to be flexible enough for pension firms to be able to create efficient portfolios while capital markets need to be sufficiently deep and liquid so as to reduce the macro-financial stability impact of large institutional investors.

Product specific considerations relate to the definition of the target, the stochastic techniques involved, the partial endogeneity of contributions and more generally, to the risk-based nature of the proposed default investment options. The consumption path during retirement needs to be carefully estimated which would require, inter alia, adequate mortality tables. Unfortunately, since many participants in mandatory defined contribution pensions around the world are yet to reach the retirement phase, accurate mortality tables have yet to be produced in most cases. Additionally, the stochastic investment strategies implicit in target annuitization funds may be too complex and information intensive to be easily and safely operationalized in the context of mandatory defined contribution pensions of most countries. Hence, the stochastic solution to the optimal strategic asset allocation may need to be substituted by a deterministic solution with linear (or quasi linear) gliding paths to rebalance portfolios over time. Finally, the extent to which contributions can be made endogenous will depend on how much contribution volatility is socially acceptable. For instance, some individuals might not welcome volatile contributions into the plan. This would imply a volatile pattern to consumption over time which individuals would like to avoid by sacrificing retirement benefits.

More generally, there is the concern related to model risk which supervisors need to monitor and evaluate. We agree that these risks are important and in order for financial
innovation to be safely adopted in mandatory defined contribution pensions quasi-markets, they need to be well understood. However, we would argue that pension jurisdictions that have or are adopting a risk-based supervision model would be equally ready to require pension firms to offer liability driven investment products.

XXIV REFERENCES


Chapter V

Conclusions

Version 20 March 2009
XXV CONCLUSIONS

This report focuses on two interrelated policy challenges confronting policymakers of mandatory defined contribution pensions. These policy challenges are: 1) how to promote low administrative fees; and 2) how to improve long-term asset management quality or gross performance.

The report endorses the broad consensus on the usefulness of financial literacy and acknowledges the importance of identifying the most relevant content and delivery mechanisms to influence behavior, which are topics that merit further research. However, it is more concerned with the institutional designs in the areas of industrial organizations and default investment options. In particular, it focuses on ways to exploit the systematic biases of the decision-making process of individuals to promote permanent changes in behavior that can result in improved expected replacement rates.

Improving expected net performance is a major issue for long-term savings schemes. For instance, annual underperformance of only 1 percent over the life-cycle can reduce final cash balances by around 20 percent. However, improving net performance becomes a particularly difficult policy objective to achieve, given the market power that firms have in the mandatory DEFINED CONTRIBUTION pension quasi-markets.

A quasi-market differs from conventional markets on both the supply and demand side, but it is on the latter where the differences are most striking. On the demand side, consumer purchasing power is not expressed by money, as in markets, but by contributions from the beneficiary and it is often subsidized by earmarked state budget or a combination that includes a subsidy and labor tax exemptions. In addition, consumption in pension quasi-markets is mandatory and hence, participants are limited in the way they impose market discipline on providers. They cannot withdraw from the quasi-market, but they can switch to alternative pension firms. However, there is ample evidence that the demand for pension services is highly inelastic to prices (fees and gross returns) and consumers rarely switch voluntarily. Finally, the provision of pension services is characterized by a large component of fixed costs, which increases barriers to entry and reduces market contestability.

Consumer inertia and barriers to entry are associated with market power that, in turn, reduces the effectiveness of policies aimed at lowering administrative fees. As explained in Chapter II, market power can yield important distortions on both the demand and supply side. On the demand side, it can yield important price distortions, losses of social welfare and redistributions of rents in favor of providers. On the supply side, it can yield X-inefficiencies and rent seeking behavior. The most obvious distortions in mandatory

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Keywords: Second pillars, mandatory pensions, competition policy, strategic asset allocation, investment choice, default options, life-cycle funds.

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DEFINED CONTRIBUTION pensions are price distortions: i.e., pension firms charging administrative fees substantially above average costs. However, X-inefficiencies in the form of low quality asset management can also be a problem. The main conclusion drawn from the discussion on market power is that policies aimed at addressing the issue of participants’ inertia are far more effective in reducing price distortions than policies aimed at decreasing barriers to entry and improving contestability.

Improving long-term performance is also hampered by market power and more specifically, by low demand elasticity with respect to fund managers’ investment performance. Mandatory DEFINED CONTRIBUTION pension participants are generally misinformed about the nature of the saving product they consume and, more specifically, they are unable to monitor the investment performance of fund managers. This raises concerns about whether the selection of portfolios over the life-cycle is compatible with long-term retirement objectives. In addition, these concerns are compounded by some evidence that fund managers have excessive freedom in implementing strategic asset allocation through tactical decisions that are incompatible with the long-term investment objectives of participants.

Our other conclusions are structured as follows: Sections XXV.A and XXV.B summarize the analysis made on policies linked to administrative fees, while Sections XXV.C and XXV.D summarize the analysis made on policies linked to investment choice and expected long-term performance.

XXV.A Policy tradeoffs in specialized interventions aimed at reducing administrative fees

Chapter III focuses on the tradeoffs related to policy interventions aimed at reducing administrative fees. These policies include: 1) the use of a uniform rate applied to heterogeneous fee bases; 2) the simplification of fee structures; 3) the bundling of pension services; 4) the repression of transfers; 5) price controls in the form of price caps; and 6) the use of pure procurement by public boards.

The interventions analyzed either attempt to achieve multiple policy objectives or target only the consequences (and not the causes) of participants’ inertia. Hence, they generate unsatisfactory compromises, inevitably reinforcing market power and therefore, price distortions. We briefly summarize here and in Table 11 the main conclusions drawn from the discussion on the use of such policies.

XXV.A.1 Uniform fee rates

All jurisdictions prohibit price discrimination and favor the use of uniform fee rates. These are intended to reduce inertia by increasing transparency and, at the same time, they attempt to achieve equity across contributors. However, they sacrifice efficiency and encourage high marketing expenditures and price wars. In other words, they represent a less than fully satisfactory compromise between efficiency, equity and transparency.

Uniform fee rates sacrifice efficiency in favor of transparency. Since different pension services have different production costs, uniform rates imply a divergence between prices and marginal costs across services. Efficiency in supply could be
increased to promote lower administrative fees, but this would require the use of different fees equal to the marginal cost of each pension service. However, multiple fees would come at a possible high cost in terms of transparency, as participants would be less able to compare prices across pension firms charging a large menu of different prices.

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Table 27: Specialized intervention with increasing tradeoffs

<table>
<thead>
<tr>
<th>Policy</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniform fee rates</td>
<td>They are more transparent and equitable.</td>
<td>They are inefficient as they imply a divergence between fees and marginal costs across pension services; they encourage excessive investment in marketing and cream-skimming; their redistributive power is limited as they redistribute only across the members of a single pension firm; and finally, price distortions increase over time as fees are vulnerable to trends in their bases and most pension services have large fixed costs in their production function.</td>
</tr>
<tr>
<td>Simplification of fee structures</td>
<td>It increases transparency and reduces participants’ inertia.</td>
<td>It further increases the discrepancy between fees (prices) and marginal costs. In addition, it produces intergenerational transfers in favor of younger or older cohorts.</td>
</tr>
<tr>
<td>Bundling of pension services</td>
<td>It increases transparency and reduces participants’ inertia.</td>
<td>It further increases the discrepancy between fees (prices) and marginal costs.</td>
</tr>
<tr>
<td>Repression of transfers</td>
<td>It discourages investment in marketing and cream-skimming by incumbent firms, thus allegedly reducing barriers to entry.</td>
<td>It does not address the causes of participants’ inertia. Additionally, it increases market power by decreasing demand elasticity. Finally, it increases barriers to entry by reducing the effectiveness of the marketing of new entrants.</td>
</tr>
<tr>
<td>Monopsony agreements</td>
<td>It discourages investment in marketing and cream-skimming by incumbent firms, thus allegedly reducing barriers to entry.</td>
<td>Barriers to entry are artificially raised as new entrants cannot attract existing customers. They are politically unstable and facilitate the possibility of regulatory capture by the industry.</td>
</tr>
<tr>
<td>Caps on fees</td>
<td>They are effective in reducing administrative fees.</td>
<td>They do not address the causes of demand inelasticity but only the consequences (high administrative fees); they are disconnected from the cost structure of pension services; they may lead to redistribution in favor of pension firms’ third parties; their establishment generates lobbying and exposes regulator to capture; and finally, they quickly become obsolete due to trends in the fee base.</td>
</tr>
</tbody>
</table>

Uniform fee rates also sacrifice efficiency in favor of equity. Efficiency is also sacrificed in favor of equity as uniform rates redistribute from high income/asset participants in favor of low income/assets participants. While redistribution is per se a desirable policy objective, uniform rates applied to heterogeneous bases imply that different participants represent different rents for pension firms. This encourages excessive investment in marketing and cream-skimming and it compounds the negative impact of participants’ inertia on price distortions by increasing barriers to entry.
Finally, price distortions are bound to increase over time. Fee rates are applied to trends in their bases and pension services have a large fixed cost component. Hence, individuals tend to pay more and more over time for the same quality of service while pension firm operational profits increase.

In summary, uniform fee rates applied to heterogeneous bases may be more transparent and equitable, but in the end, they reinforce market power (and more so over time) and therefore, price distortions.

**XXV.A.2 Simplification of fee structures and bundling of pension services**

Although other specialized policies, like the simplification of fee structures and bundling of pension services, are commonly used to increase transparency, they also sacrifice efficiency. In other words, the ultimate impact on price distortions of these policies depends on whether the alleged increased transparency really increases price elasticity sufficiently to offset the negative impact on prices due to the decrease in efficiency.

For instance, many countries (most recently Mexico in 2007) have required pension firms to charge participants on only one base. The tradition among regulators is that less complex fee structures simplify price information and facilitate comparison and learning by participants: i.e., they contribute to increasing demand elasticity. However, the simplification of fee bases further increases the discrepancy between prices and marginal costs. In addition, changes in fee bases create intergenerational transfers in favor of younger cohorts when there is a shift from an earnings to an asset related base. Conversely, the transfer is in favor of older cohorts when the shift is from an asset related base to an earnings related one.

A similar tradeoff exists with bundling of pension services. The rationale supporting bundling of pension services is that it minimizes reliance on participants’ choice and therefore, it limits the consequences of participants’ inertia. However, by bundling services with different cost structures, it is likely that the highest price equilibrium that would arise with separate services will be extended to all other services in the bundle. Consequently, if policymakers fail to establish institutions for the centralized provision and procurement of services with high economies of scale, barriers to entry are artificially extended. This, in turn, would increase market power and price distortions.

**XXV.A.3 Repression of transfers, monopsony agreements and caps on fees**

The ineffectiveness of these specialized regulations in increasing demand elasticity prompted many jurisdictions to adopt even more draconian policies. These include: 1) repression of transfers; 2) monopsony agreements between the regulator/supervisor and pension firms; and 3) price controls in the form of price caps.

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**Keywords:** Second pillars, mandatory pensions, competition policy, strategic asset allocation, investment choice, default options, life-cycle funds.

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The main conclusion drawn from the discussion on repression of transfers and monopsony agreements is that they do not affect the fundamental incentive for firms to invest in marketing; namely, the presence of rent heterogeneity across consumers. They generally decrease the effective elasticity of demand and increase barriers to entry; i.e., they increase the market power of incumbent pension firms. In particular, alternative policies based on monopsony agreements sponsored by regulators to repress transfers are politically unstable and facilitate the possibility of regulatory capture by the industry.

Finally, the main conclusion drawn from the discussion on the use of price controls is that they too do not directly address the causes of price distortions. Therefore, they suffer from a long list of drawbacks that, in great part, relate to the disconnection between price ceilings and cost structures. This disconnection could potentially discourage investment in asset management quality and result in the failure to redistribute in favor of participants; it also implies that caps could quickly become obsolete. Nevertheless, in the absence of more effective and market-based tools to increase demand elasticity and enable participants to recapture lost rents, price controls could be an effective (albeit non desirable) means by which providers’ market power can be curbed.

XXV.B  How to improve on existing policies

It is possible to mitigate the tradeoffs embedded in existing policies, as shown in Table 28.

Table 28: How to promote lower administrative fees with fewer policy tradeoffs

<table>
<thead>
<tr>
<th>Policies</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Win-win policies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat fees</td>
<td>They are more efficient and reduce price distortions. They eliminate excessive marketing and cream-skimming.</td>
<td>They do not allow redistribution and do not address the problem of participants’ inertia.</td>
</tr>
<tr>
<td>Flat subsidies</td>
<td>They redistribute more efficiently than uniform fee rates applied to heterogeneous bases.</td>
<td>They could be fiscally expensive if too generous.</td>
</tr>
<tr>
<td>Hybrid I/O models</td>
<td>They help address the problem of participants’ inertia.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flat fees and unbundling of pension services are needed to increase viability. Strong debate on the relative superiority of stock versus flow design.</td>
<td></td>
</tr>
<tr>
<td><strong>Improving on caps on fees</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pure procurement</td>
<td>They help address the problem of participants’ inertia.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It may lead to underinvestment in financial technology.</td>
<td></td>
</tr>
<tr>
<td>Cost based tariffs</td>
<td>Same as caps on fees.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Same as caps on fees but the connection with the cost structure of pension services reduces overall limitations. Cost structure needs estimating and audited accurately.</td>
<td></td>
</tr>
</tbody>
</table>
XXV.B.1 Flat fees and subsidies

A more aggressive use of flat fees would reduce price distortions. This relates to the fact that fixed costs are a large component of the cost structure of the majority of pension services. Furthermore, flat fees discourage marketing and cream-skimming as all participants provide the same rent to pension firms. However, flat fees are not equitable per se if not accompanied by a flat subsidy as done in New Zealand or Mexico (the latter country, however, does not allow flat fees to be charged). Within the fiscal space available to achieve a desired redistribution, a subsidy that redistributes across the whole population of contributors would represent a more efficient mechanism than the use of uniform fee rates that redistribute simply across the clients of any given pension firm. Finally, flat fees do not reduce per se price distortions caused by low demand elasticity.

XXV.B.2 Pure procurement

Alternative industrial organization models involving elements of procurement can be used to increase the elasticity of demand. For instance, some jurisdictions have been using procurement by a centralized public board. The merits of procurement arise directly from its primary objective, which is to deal in a radical manner with consumer inertia. When one demand block is granted to each of the firms that wins the contest, the incentive of providers to spend in marketing to attract clients is removed. In addition, by establishing competition for the market rather than in the market, barriers to entry and rent extraction activities are eliminated.

However, pure procurement may lead to underinvestment in financial technology for various reasons. For instance, a procurement board can exercise monopsony power and limit the compensation of financial innovators, since providers do not have outside options on where to market their innovations. Also, lack of competition in procurement may induce the board to reduce remuneration of investment in innovation as this does not affect its market share. In addition, public procurement boards are subject to strong transparency standards and, therefore, eventual innovators are likely to suffer more imitation than in the case of a private pension firm. Finally, there is no valid benchmark for measuring the performance of a single public procurement board and, additionally, boards may be subject to undue political influence.

XXV.B.3 Hybrid industrial organization models

Other jurisdictions have been using hybrid industrial organization models involving procurement and quasi-markets. These models share the merits of pure procurement while drawbacks are mitigated by the presence of a quasi-market.

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**Keywords:** Second pillars, mandatory pensions, competition policy, strategic asset allocation, investment choice, default options, life-cycle funds.

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In particular, the quasi-market component reduces the monopsony power of procurement boards. It represents a valid benchmark for measuring a board’s performance and an outside option for the board’s suppliers. Pension firms in the quasi-market segment are a well-tuned benchmark allowing the political authorities and public opinion to make a better assessment of the performance of the public procurement board. Finally, the existence of a pension quasi-market with multiple providers improves the outside options for suppliers to the public procurement board.

The main conclusion drawn from the discussion on hybrid industrial organization structures is that they represent a valid alternative to reduce pension firms’ market power. However, the design of a well functioning hybrid model needs to take into account several policy considerations discussed in detail in Chapter III. Here, it may be worth recalling that the winners of the auction for the procured segment are vulnerable to cream-skimming during the period of service and protection against cream-skimming cannot be guaranteed as long as fee bases are heterogeneous. Hence, hybrid structures are likely to be more viable when flat fees are used.

Within hybrid models, there is a debate on the relative superiority of two competing alternatives. These differ in the way they allocate participants to the procured segment: either from the stock of participants or from the flow of new entrants. With the stock design, the full set of participants (the whole set of inert customers) that would benefit from procurement is allowed to be served by providers in the procured segment. In addition, target participants can spend their whole working career in the procured segment as they will be served by a sequence of providers selected through periodic procurement auctions. With the flow design, only a fraction of the set of participants (typically the inert customers that recently joined the system) is allowed to be served by providers in the procured segment. In addition, there are no periodic auctions for the same target participants so that inert participants can spend their whole career served by the same provider.

The main conclusion that can be drawn from such debate is that the stock design presents attractive characteristics, like targeting all inert participants and protecting them from dynamic predatory pricing schedules. However, it may induce bidders to raise their prices if they fear that their clientele will be lost in a future auction. This drawback could be mitigated by reducing barriers to entry through further unbundling of pension services.

**XXV.B.4 Summary**

In summary, the use of flat fees, separate subsidies and hybrid industrial organization models appear to represent a superior package of policies to increase participants’ welfare. This is especially the case if hybrid models are reinforced by the use of flat fees and unbundling of pension services. However, many jurisdictions have adopted price controls and the political capital needed to implement alternative policies may be lacking. These jurisdictions could implement measures to increase the efficiency of price controls.

Most of the drawbacks of the design of current price caps could be mitigated if ceilings were linked to costs in the form of cost-based tariffs as commonly used in utilities industries. However, no country has yet tried to adapt tariff setting techniques to mandatory defined contribution pension quasi-markets. This report argues that the adoption of such techniques would, *inter alia*, greatly improve the transparency and due
process with which caps are established. It also acknowledges the difficulties related to the adequate estimation of model firm costs, the accurate audit of actual production costs, the need to revise tariffs periodically to reflect trends in the bases and the critical requirement of a regulatory authority with very strong technical capacity and the necessary independence to avoid capture.

XXV.C  Policies aimed at improving fund managers’ long-term performance

Chapter IV discusses the second policy challenge of this report: how to improve fund managers’ investment performance when participants are inert. There is a clear trend towards providing more investment choice in order to cater for heterogeneity in risk aversion across individuals in many jurisdictions. However, the extent to which individuals are allowed to choose across pension firms and funds differs from country to country. Countries like Australia and Sweden allow for considerable choice, while countries in Latin America and Eastern Europe allow for a much smaller choice of funds.

Notwithstanding the increased investment choice, individuals lack the necessary financial education to make rational investment choices and/or the will power to implement them consistently over time. Rather, there is empirical evidence suggesting that individuals follow heuristic methods to solve investment problems and implement investment strategies, leading to systematic biases. For instance, when individuals lack firm preferences, their decisions are affected by framing or anchoring effects, often being based on past performance and characterized by overconfidence and overly optimistic forecasts. This calls for policy interventions to reduce the degree of freedom that individuals have to make uneducated investment choices, and to design default investment options for undecided or inert individuals.

XXV.C.1 Default investment options in the form of multi-funds

Several countries have introduced, or are in the process of introducing, limited default investment choices for inert individuals. These attempt to exploit the aforementioned systematic biases in portfolio selection and are commonly known as multi-funds. The idea behind the design of these default options is to expose younger individuals to equity risk and gradually move them into bond or money market funds towards retirement. The basic rationale supporting the design of multi-funds is the generally accepted notion that equities exhibit a risk premium and their returns are mean reverting.

However, we argue that, while representing a step in the right direction, the multi-fund design suffers from key weaknesses. These include:

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Keywords: Second pillars, mandatory pensions, competition policy, strategic asset allocation, investment choice, default options, life-cycle funds.
• **The inadequacy of supporting investment rules.** For instance, it is unclear whether investment rules in most jurisdictions are sufficiently flexible to either: 1) construct efficient portfolios; or 2) allow for a good match between the risk profile of admissible assets and the risk profile of individual liabilities; or 3) allow portfolios to adequately reflect the heterogeneity in risk aversion of the covered population.

• **Static and discrete gliding paths.** The gliding paths for rebalancing portfolios over time are not continuous but exhibit three to five steps (depending on the jurisdictions). This could imply a severe welfare loss, especially for inert individuals, who remain in a given default fund for a long time.

• **The inability to allocate cash balances to more than one fund.** Very few countries allow participants to hold account balances in more than one fund. This suggests that in countries where choice is more limited, the allowed investment universe may not adequately cater for risk aversion heterogeneity.

• **Inadequate consideration of human capital and annuitization risks.** Important background risks, like human capital and annuitization risks, are not explicitly taken into consideration in the regulation of investment choices and the design of associated default options. For instance, the inclusion of human capital risk suggests that the hedging demand for equities should be much higher than what simple mean reversion would suggest. Therefore, the default fund at young ages (when human capital is high) should be more aggressive than that currently provided for in most jurisdictions. Similarly, the inclusion of annuitization risk would justify the introduction of long-term bonds and/or deferred annuities in the default portfolios towards retirement to hedge the interest rate risk associated with the conversion of savings into an annuity.

In addition to the design weaknesses of multi-funds, there is evidence (at least in Chile) that both strategic and tactical asset allocations of pension fund managers may not necessarily be compatible with the long-term objectives of participants. Hence, there is a need to tie the hands of fund managers.

It is likely that major welfare gains can be achieved for participants by addressing some of these criticisms through simple policies that can be implemented within the rule-based framework in which multi-funds operate. However, such gains can be achieved only in a risk-based framework. They may be viable only in more sophisticated, deep and liquid markets and may present more serious tradeoffs requiring careful assessment. We discuss these alternative policies in the next sections.

**XXV.D Improving default options**

**XXV.D.1 Within a rule-based framework**

A first set of policies could be readily implemented in countries that have adopted a system of multi-funds to improve the expected performance of default investment options (Table 29). This would entail maintaining the current rule-based framework where
products and investment rules are defined in regulations and therefore, would present no implementation obstacles.

For instance, investment regulations could be reviewed in numerous countries to allow pension firms to construct more efficient portfolios and portfolios that more adequately cater for local risk aversion heterogeneity. In particular, annuitization risk could be effectively hedged in a rule-based framework by requiring default funds towards retirement to be invested in deferred annuities and/or long-term (inflation indexed) bonds.

Table 29: Improving default investment options within a rule-based framework

<table>
<thead>
<tr>
<th>Policy</th>
<th>Criticism of current design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gradually liberalize the investment rules</td>
<td>Current investment rules are often too restrictive. They allow for inadequate geographical risk diversification, and likely limit the ability to construct efficient portfolios. The risk profile of admitted assets may not match the risk profile of participants’ liabilities.</td>
</tr>
<tr>
<td>Require the use of deferred annuities and long duration bonds towards retirement</td>
<td>Current default option design exposes individuals to annuitization risk. This allows the accumulation phase to be partially reconnected with the decumulation phase by providing a (regulatory) hedge for annuitization risk.</td>
</tr>
<tr>
<td>Increase the number of default options</td>
<td>Gliding paths are static and force individuals into a default fund for long periods.</td>
</tr>
<tr>
<td>Allow individuals to allocate cash balances to more than one fund</td>
<td>Current investment rules and the number of funds are often too restrictive. There is a concern whether current options adequately cater for the heterogeneity in risk appetite of participants.</td>
</tr>
</tbody>
</table>

At the same time, the review of investment rules should be aimed at reducing the macro-financial stability impact of pension firms’ trading activities. Pension firms have accumulated a large amount of assets in many countries and their trading activities often exacerbate price pressures in the market for local securities and reduce liquidity artificially, to the detriment of local issuers and the capital market more generally.

Additionally, the number of default options that are currently offered in countries like Peru or Hungary could be revised to reflect the larger heterogeneity of risk tolerance in the covered population. Along the same lines, two additional policies could be implemented by allowing individuals to allocate their cash balances to more than one fund and reducing the time during which individuals are allocated by default to any given fund. This would in practice entail maintaining the current deterministic gliding paths for

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rebalancing portfolios over time but making them more continuous by essentially increasing the number of default options along the life-cycle of individual workers.

**XXV.D.2 Within a risk-based framework**

While welfare gains could be achieved by improving at the margin the rules of multifunds and default investment options, major gains can only be achieved if pension firms are required to actively manage important risks. This second set of policies would entail progressively moving away from the current rule-based framework towards a risk-based framework. In such a framework, market participants design investment products while the policymakers define their minimum standards and focus on monitoring their implementation.

**Table 30: Improving default investment options within a risk-based framework**

<table>
<thead>
<tr>
<th>Policy</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
</table>
| Target date annuitization funds | - They improve expected long-term performance by diversifying risk intertemporally.  
- They reduce the investment risk borne by individuals.  
- They allow for full consideration of important background risks such as human capital, annuitization and bequest risks.  
- They do not create liabilities for asset managers during the accumulation phase.  
- They are compatible with the physical separation of providers in the accumulation and decumulation phases.  
- They provide an adequate benchmark for monitoring long-term performance.  
- They are liability driven instruments: i.e., they make the strategic asset allocation in the accumulation phase contingent on the structure of individuals’ liabilities in the decumulation phase. | - They increase model risk borne by individuals.  
- The stochastic strategic asset allocation is complex and information intensive.  
- They need supporting investment rules, sophisticated capital markets and general availability of risk management skills.  
- They need adequate estimation of liabilities including good mortality tables.  
- Overall contribution levels need to be endogenous.  
- Supervisors need to evaluate and monitor model risk. |

Chapter IV suggests that the weaknesses in the design of current investment choices and associated default options could be largely addressed by requiring providers to offer target date annuitization funds. Target date annuitization funds are essentially target retirement date life-cycle funds with portfolios being constructed during the accumulation phase by taking into consideration the liability structure of individual participants. They are liability driven investment products that effectively reconnect the accumulation and decumulation phases of the life-cycle of individuals, but without creating liabilities to fund managers during the accumulation phase.

The proposal for target date annuitization funds does not drastically deviate from current institutional arrangements, which should ease concerns related to their eventual implementation, but it improves on current design in regard to three key issues.
First, target date annuitization funds are liability driven investment funds and, as such, their implementation requires the estimation of the consumption needs of individuals during retirement. The investment target could be expressed as a consumption path or as a wealth level or replacement rate at retirement compatible with the consumption path. The target would not represent a liability for the pension firm (in line with the defined contribution nature of second pillars) but simply a probabilistic benchmark to guide tactical decisions and monitor long-term performance. Hence, the presence of a long-term investment target would provide a better means to align the incentives of asset managers with those of participants in mandatory defined contribution pensions than overly complicated investment rules.

Second, the strategic asset allocation during the accumulation phase would explicitly consider human capital and annuitization risks and be implemented with at least four basic asset classes: cash, equities, inflation indexed long-term bonds and deferred annuities. Each of these asset classes would serve a particular purpose.

- Cash could leverage the initial position in equities and hedge inflation risk in labor income.
- Equities could hedge human capital risk and benefit from the equity risk premium in particular.
- Long-term bonds could hedge interest rate risk in the initial stages of the accumulation phase and towards the end of the life-cycle to meet the bequest motive.
- Deferred annuities could hedge the annuitization risk.

In addition, the solution for the strategic asset allocation for the target annuitization funds would imply continuous (rather than discrete) rebalancing strategies, preventing individuals from remaining for too long in any given portfolio while the relative importance of the underlying background risks change.

Third, the use of an asset management target, even if only probabilistic, implies increased volatility in contributions. If participants have an investment target value for the retirement date and the current value of the pension fund falls short of the level needed to reach that target, say as a result of poor equity returns, the only way to rectify this is to increase contributions to the plan. The most practical way to achieve such flexibility in contributions is by using voluntary accounts. In other words, mandatory and voluntary accounts will need to be jointly considered in the overall regulation of investment choice and design of associated default options.

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Product specific considerations relate to the definition of the target, the stochastic techniques involved, the partial endogeneity of contributions and more generally, to the risk-based nature of the proposed default investment options. The consumption path during retirement needs to be carefully estimated which would require, *inter alia*, adequate mortality tables. Unfortunately, since many participants in mandatory defined contribution pensions around the world are yet to reach the retirement phase, accurate mortality tables have yet to be produced in most cases. Additionally, the stochastic investment strategies implicit in target annuitization funds may be too complex and information intensive to be easily and safely operationalized in the context of mandatory defined contribution pensions of most countries. Hence, the stochastic solution to the optimal strategic asset allocation may need to be substituted by a deterministic solution with linear (or quasi linear) gliding paths to rebalance portfolios over time. Finally, the extent to which contributions can be made endogenous will depend on how much contribution volatility is socially acceptable. For instance, some individuals might not welcome the fact that contributions into the plan will be volatile. This would imply a volatile pattern to consumption over time, which individuals would like to avoid by sacrificing retirement benefits.

More generally, there is the concern related to model risk which supervisors need to monitor and evaluate. We agree that these risks are important and in order for financial innovation to be safely adopted in mandatory defined contribution pension quasi-markets, they need to be well understood. However, we would argue that pension jurisdictions that have or are adopting a risk-based supervision model would be equally ready to require pension firms to offer liability driven investment products. If this were not the case, probably a review of the initial motivations and preconditions for implementing risk-based supervision would then be desirable.

**XXV.E Final considerations**

Policies aimed at reducing administrative fees or improving expected long-term performance are characterized by specific policy tradeoffs and general implementation constraints. However, additional tradeoffs exist between the short-term focus needed to promote lower administrative fees and the long-term focus needed to improve expected long-term performance. There is generally a poor understanding of the long-term nature of risks that participants, providers and governments face in mandatory DC pension products. Consequently, risk monitoring and management techniques are inadequate and often only focus on mitigating short-term risk. The definition, monitoring and mitigation of long-term risk, as well as financial education and literacy identified at the beginning of these conclusions, are important areas that warrant further research.