Investment Choice in Defined-Contribu­tion Pension Schemes: International Experience and Policy Issues

Eduardo RODRIGUEZ-MONTEMAYOR
2014/60/EPS
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Eduardo Rodriguez-Montemayor*

* Senior Research Fellow at INSEAD, Boulevard de Constance 77305 Fontainebleau Cedex, France. Email: Eduardo.rodriguezmontemayor@insead.edu

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Abstract

Populations around the world are becoming older and countries are increasingly adopting defined contribution (DC) pension schemes to ensure adequate and sustainable retirement incomes for people. Such schemes typically give people the ability to exert choice in a series of key decisions in the administration of their own retirement wealth. One of such decisions is how to allocate retirement assets across different investment options. This paper reviews how investment choice in DC pension schemes is regulated across different countries and also reviews actual country experiences in terms of individual active choice. The discussion of policy implications is supported by the current knowledge in the literature on behavioral economics and finance. How much freedom workers should have over the choice of a pension provider and the choice of investment portfolio is a key economic and policy question because academic literature shows that people’s behavior is often characterized by naïve decisions, inertia and switching and searching costs. What the evidence tells us, in general, is that the proportion of people that actively choose how to invest their pension contributions is low. People’s money is often invested in default investment funds. Therefore, policy intervention is usually desirable, particularly in the design of an optimal default policy. Our discussion suggests that an optimal regulation approach would move the basis of competition from short-term returns to long-term returns. One strategy is to set performance objectives for pension funds for outperforming a long-term benchmark fund (or funds) regulated by the government. Such funds could operate with life-cycle principles.

Keywords: Defined-contribution pension systems, investment choice, pensions regulation
1 Introduction

In the context of aging populations, pension systems have been evolving around the world so that they remain financially sustainable. Pension systems are usually formed by a combination of state-managed arrangements (public pensions) and others run by the private sector. Although public pensions still represent a key component of retirement income systems (usually via contributory PAYGO schemes), many countries have increasingly promoted the development of private pension systems, particularly fully-funded, defined-contribution (DC) schemes.

In some countries DC schemes are mandatory and have become the mainstay of retirement income systems. For instance, until the late 1980s, national pension systems in Latin American countries were administrated similarly to those existing in many parts of the world: employees paid mandatory contributions into a system that was administered by the government in a PAYG basis. In 1981, Chile pioneered a new pension model that was soon adopted by many other countries: employees are still mandated to make contributions, but now the system is fully funded, with future pension benefits being determined by the return on accumulated retirement savings in pension funds. Such pension funds are often administrated by private companies.

In other countries, DC schemes are often voluntary and organized at the workplace. The United States and the United Kingdom, for instance, have had a long history of occupational pension provision (this is sometimes called the Anglo-Saxon tradition because countries such as Canada and Ireland also show similar features). Benefits in such schemes had mainly been based on DB principles (just like in traditional public pensions) but they have also experienced a shift from DB to DC principles and the market is booming. Employers remain extensively involved in sponsoring the increasingly pervasive DC plans and assuming fiduciary responsibility (e.g. 401k plans in the US), often through trust-based approaches that involve the appointment of trustees or supporting multi-employer plans. Yet, there has been a strong recent move towards contract-based arrangements where the employer’s role is simply to facilitate individual employee contracts with commercial providers (e.g. IRA accounts in the US).

Other countries have designed mixed approaches. Australia and Norway have mandated DC schemes on top of public schemes (with the public component usually only generating a minimum basic pension). In Denmark and Sweden, there are private pension schemes that are “quasi-mandatory”, because industrial-relations agreements ensure coverage of 80% or more of the workforce. New Zealand has introduced a system of automatic enrolment into a national retirement savings system that has achieved high coverage levels.

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2 In traditional PAYGO systems the amount of the pension is based on defined-benefit principles (determined by length of service and past earnings) and pensions are financed with contributions of current workers.

3 In the United States private pensions’ assets in DC schemes have grown by 297% between 1990 and 2010 (Brady et al. 2010). Many factors explain this shift in countries of the Anglo-Saxon tradition (Ashcroft 2009): e.g. changes in regulation, accounting standards and tax rules; volatility in capital markets; increasing longevity; etc.
The expansion of DC schemes implies that people are more involved in the administration of retirement savings because such schemes typically give people the ability to exert choice in a series of key decisions. People make decisions across several dimensions: choice of pension provider; choice of investment fund among those offered by the provider; rebalancing assets across investment funds over time. Choice is relevant for both new members joining a pension scheme (they choose provider and then may choose among the investment funds offered by such provider)⁴ and for current members, who can decide how to allocate new contributions and how to rebalance existing assets in the pension fund.

How much freedom workers should have over the choice of a pension provider and the choice of investment portfolio is a key economic and policy question. While choice of funds with different degrees of return and risk seems in principle a worthy goal from the point of view of individual welfare, the abundance of investment options does not necessarily mean that people are in a better position to accumulate more retirement assets. What the evidence tells us, in general, is that the proportion of people that actively choose where to invest their contributions is low and decisions are often influenced by inertia, rules of thumb and mental accounting. Yet, the global financial crisis increased (albeit temporarily) active choice and people seemed to take the right decisions by reducing their exposure to risky investments. Since individuals bear the investment risk of the accumulation of pension assets, many governments regulate the market.

The objective of this paper is twofold. The first is to offer a description of how investment choice in DC pension schemes is regulated across different countries and to review actual country experiences in terms of individual active choice. We look particularly at the differences between mandatory DC systems and the experience of countries from the Anglo-Saxon tradition.⁵ We present more details for the cases of United States and Latin America, particularly after the global financial crisis. The second objective is to identify issues that have to be tackled by policy makers and academia into the future. The discussion of policy implications for investment choice and default funds is supported by the current knowledge in the literature on behavioral economics and finance.

The rest of the paper proceeds as follows. Section 2 describes how DC schemes are organized across different countries. Section 3 discusses investment choice in the context of economic theory. Section 4 presents the experience of the private pension market in the United States during the financial crisis and that of mandatory systems in Latin America. Section 5 discusses policy issues, including future trends for DC pension schemes.

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⁴ In some countries people must first choose pension provider and only then they choose a specific investment fund, while in others they choose directly a mutual fund.

⁵ We offer a picture of how different systems were organized by the time of the financial crisis. Some countries have further reformed their systems in the last couple of years. For instance, some countries in Eastern Europe downsized their DC schemes and Hungary even overturned its mandatory national DC system (see Whitehouse 2012).
2 Investment regulations in pension schemes

Defined-contribution schemes often require individual choice in four dimensions: whether to participate (in the case that the system is voluntary); how much to contribute; what to invest in; and how to receive the pension at retirement. Investment decisions are particularly subject to financial risks and DC pension schemes are often regulated in some key dimensions:

- the range of investment options available to pension plans’ members;
- quantitative limits on investments by asset class;
- the design of default investment funds (for people that do not choose a fund);

Restrictions that limit investment choice may be imposed either through pension plan statutes, decisions made by the plan sponsors or governing bodies, or through laws and regulations.

Therefore, the availability and diversity of different investment funds does not necessarily reflect the extent of investment choice and investment diversification. Regulations as quantitative limits by asset class restrict the freedom of choice. There are often restrictions regarding the exposure to equity. Some countries also limit the exposure to foreign assets (this is common in Latin America). In Latin America and Eastern Europe freedom of choice is further restricted by the fact that people are allowed to have only one fund at the time. This implies that people cannot benefit from diversification between funds with different levels of risk.\(^6\) Such regulations vary across countries but there are similarities across certain groups of countries (Table A.1 in the Appendix summarizes key features of different systems).

In countries of the Anglo-Saxon tradition, DC pension schemes are usually less regulated and offer more investment choice. For instance, in the United States the average number of funds offered by 401k plans has been found to be between 16 and 18 (people usually choose mutual funds rather than individual asset classes).\(^7\) In the UK, both trust- and contract-based schemes also offer several investment options, particularly the latter.\(^8\) Other countries of the Anglo-Saxon tradition show similar characteristics.\(^9\) The ‘prudent person’ principle underpins the regulatory frameworks of these countries (Aschcroft 2009). They rely on the fiduciary role and propriety of

\(^6\) Other countries with mandatory DC systems such as Australia and Sweden do allow diversification; Sweden, for instance, allows splitting the money into up to five investment funds.

\(^7\) Based on results from the Annual 401(k) Benchmarking Survey (2008 Edition) and Council of America’s 2008 Survey of Profit Sharing and 401(k) Plans. In the case of IRA accounts, the average number of funds offered by big providers is large: Fidelity and Vanguard, for example, managed 180 and 144 mutual funds, respectively, in 2010.

\(^8\) Mercer’s 2009 global DC survey finds that the median number of funds in trust-based schemes is 9, while the number is 46 in contract-based plans. Stakeholder pension providers offer, on average, 35 funds (DWP, 2010)

\(^9\) In Canada, 40% of pension providers have between 10 and 13 investment options. In New Zealand, the average number of funds by provider is 5 but some few providers offer something between 11 and 17 funds.
the pensions trust or the plan governance (the few restrictions in place cover aspects such as investing in the sponsoring employer or in the period before retirement). Although the system in Australia is mandatory, it maintains some similarities to the Anglo-Saxon tradition regarding the regulatory approach and the degree of investment choice (Table A.2 in the Appendix describes in more detail the components of retirement income systems in these countries).10

_In countries with mandatory defined-contribution national systems (e.g. in Latin America and in Eastern Europe), the number of investment funds offered by a pension provider is often determined by law and investment choice more regulated._ In Chile, for instance, each pension provider must offer five investment funds (called multi-fondos), which differ in their level of risk. Each of these funds has similar characteristics to their counterparts offered by other providers (i.e. they have similar restrictions regarding investments in equity and other assets). Providers in Mexico currently must offer four funds (they used to have five funds until 2012). In Peru the mandated number of funds is fixed to three by provider. The mandated funds in each of these countries have specific names (no matter the provider of such funds) that allow people identify them based on their level or risk. Countries in Eastern Europe such as Estonia, Latvia and Slovak Republic used to have similar systems with a total of three funds (often called conservative, balanced and aggressive based on their level of risk and equity exposure). After the financial crisis of 2008 some of these countries temporarily adjusted their DC systems (Hungary even eliminated the system) but the approach remains similar.

![Figure 1. Equity maximum limits by type of fund in a selection of mandatory DC systems](image)

<table>
<thead>
<tr>
<th>Number of funds by provider</th>
<th>more aggressive</th>
<th>more conservative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fund A</td>
<td>Fund B</td>
</tr>
<tr>
<td>Chile</td>
<td>5</td>
<td>80%</td>
</tr>
<tr>
<td>Mexico</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>Peru</td>
<td>3</td>
<td>80%</td>
</tr>
</tbody>
</table>

Note: Table updated with information extracted from OECD (2014)

_Exposure to equity is usually regulated with quantitative limits._ Figure 1 presents the legal maximum limits on equity of the funds offered by pension providers (from the most aggressive to the more conservative) in three countries with mandatory DC systems.11 The exposure to

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10 There is considerable variation in the number of funds offered by each of the three types of Superannuation funds. Industry funds and corporate funds offer considerably fewer options than retail/personal funds.

11 To facilitate the comparison across countries, we refer to the funds by a letter, A to E, as is the case in Chile, although other countries use a different name to refer to the various fund options.
equity in Mexico is not as high as in Chile or Peru. Such equity limits have been adjusted slightly over the years. A few countries have also imposed quantitative performance requirements on pension funds, such as minimum or guaranteed investment returns (e.g. in Chile and Slovak Republic the minimum return has been set to be determined relative to past performance of funds), or set limits on quantitative investment risk (as in Mexico, where investments are subject to risk ceilings based on a VAR methodology).

*Pension providers in mandatory systems usually must also by law specify one fund as a default investment option* (i.e. for the cases where individuals are not willing or not able to take a decision). The features of the default fund vary across countries. In countries such as Estonia, Latvia and Slovak Republic pension providers must by law assign individuals to the more conservative fund they have. Some others countries establish certain funds (with varying levels of equity exposure) to be used as default and often the assignation to a fund depends on the age of the person (Figure 2 shows the age groups used in three countries). This means that quantitative limits are sometimes complemented by age restrictions.

**Figure 2. Equity limits on default funds corresponding to different age groups**

<table>
<thead>
<tr>
<th></th>
<th>Quantitative Limit on Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0%</td>
</tr>
<tr>
<td>Chile</td>
<td></td>
</tr>
<tr>
<td>&lt;36</td>
<td>60%</td>
</tr>
<tr>
<td>36-55</td>
<td></td>
</tr>
<tr>
<td>&gt;55</td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td></td>
</tr>
<tr>
<td>&lt;36</td>
<td></td>
</tr>
<tr>
<td>37-45</td>
<td></td>
</tr>
<tr>
<td>46-59</td>
<td></td>
</tr>
<tr>
<td>&gt;60</td>
<td>5%</td>
</tr>
<tr>
<td>Peru</td>
<td></td>
</tr>
<tr>
<td>&lt;60</td>
<td></td>
</tr>
<tr>
<td>&gt;60</td>
<td>10%</td>
</tr>
</tbody>
</table>

Note: In Chile, the age ranges for women are different than for men: <36; 36-50 and >50

12 There are, however, no restrictions on investment choice: people can opt out of the default and choose balanced and aggressive funds.
The default policy in Chile, Mexico and Peru involves an ‘age-based’ approach, in which retirement savings are allocated into funds with lower ceilings on equity as people reach retirement. Chile uses three of its five funds to allocate people according to their age group; Peru uses two of the three; Mexico uses all its four funds. In such age-based default policy people may choose to move to another fund with a higher or lower limit on equity (funds themselves do not change their asset allocation). Although the approach in these three countries is similar, a big difference between Chile and Mexico, for instance, is that people in Mexico are not allowed to choose a fund more aggressive than the one that corresponds to their age,\textsuperscript{13} whereas in Chile people can opt to change freely across the five funds (the only limitation is for people who are within 10 years of the legal retirement age, who cannot choose the most aggressive fund).\textsuperscript{14}

Some countries with mixed pension systems have also followed an age-based approach for the DC component. The premium pension is the funded part of the earnings-related old-age pension in Sweden and it is compulsory. The money is deposited in individual investment accounts with individual choice. Employees can choose up to five funds out of more than 700 mutual funds offered by independent fund managers. In addition, the government set up a special investment fund for individuals who do not want to make their own investment decisions; their contributions are automatically invested in the Premium Savings Fund, which is managed by the Seventh National Swedish Pension Fund (AP7). The AP7 Såfa fund, established in 2010, has two cornerstone funds: all investment capital is held in the AP7 Equity Fund until age 55; thereafter, around 3% of the assets are transferred into the AP7 Fixed Income Fund every year until age 75 (by which time roughly 67% of assets will be held in the AP7 Fixed Income Fund).

Countries of the Anglo-Saxon regulatory tradition implement fewer regulations regarding default investments. Australia is the only of such countries with a mandatory national DC system. But unlike other countries with mandatory systems, there are no regulations regarding default investments. Therefore, the proportion of assets invested in equity is generally higher than in other countries with mandatory systems. In Canada, Ireland, United Kingdom and the United States defaults funds are, in general, neither mandatory nor highly-regulated. Yet, in countries such as United Kingdom and the United States providers are regularly choosing to offer default funds, which are mainly based on life-cycle and target-date funds (see Box 1 in the Appendix for definitions of investment funds with ‘life-cycle’ features). In the United States, providers of

\textsuperscript{13} People aged 36 or younger are automatically allocated into the most aggressive fund. Therefore, only these people have access to all the four funds; the only choice they can make is to move to more conservative funds (which correspond to people with older age).

\textsuperscript{14} Therefore, they can choose among 4 funds whereas people of the same age in Mexico have no choice and are allocated by default to the most conservative option.
401(k) plans can, since 2007, assign undecided workers to one of three possible default options (target date funds, balanced funds, and managed accounts).\textsuperscript{15}

Most regulations in countries of the Anglo-Saxon tradition apply to products that are used as a default ‘scheme’. Whereas default investment funds are designed for people that are enrolled to a pension provider but are unable to choose the allocation of money across the investment funds offered by such provider, people sometimes do not choose pension provider (i.e. a pension scheme) in the first place. Default schemes (typically contract-based products) often involve situations where employers wish to auto-enroll employees but have no other form of pension plan.\textsuperscript{16} In New Zealand, for instance, employees are assigned to the KiwiSaver provider chosen by the employer when they do not specify a choice. If the employer does not have a chosen scheme, the regulator allocates workers to one of six government-appointed default providers (and contributions are invested in the scheme’s conservative investment fund option). Regulations are usually stricter. The ‘default’ scheme in the UK, the stakeholder plan,\textsuperscript{17} is required to meet a series of conditions set out in legislation (e.g. low minimum contributions, flexibility in when to contribute, etc.), including having a default investment fund based on lifecycle principles. In Ireland, the legislation mandates a default investment strategy for PRSAs, which is the default scheme.\textsuperscript{18} Such scheme must invest only in “pooled” funds. The default scheme in the United States is the ‘safe harbor’ 401(k) plan, which is the only plan that, by law, must offer a default investment fund (such funds are usually organized as target-date funds).

3 Choice and Behavioral Economics

Defined-contribution pension funds usually give people the capability to choose among several investment options. The range of options varies across countries. The United States is an example of variety. Big pension providers in the US usually offer more than 20 investment funds in their DC plans. However, although the number of investment options has been increasing over time, the number of funds actually used by an average individual is low and it has remained relatively constant (at least in large pension providers such as Vanguard or Fidelity).

The current literature suggests that people’s behavior is often characterized by naïve decisions, inertia and switching and searching costs. Since the seminal research work by Shlomo Benartzi from UCLA and Richard Thaler from the University of Chicago in the late 90s, different

\textsuperscript{15} According to a survey by Mercer, in both US and UK at least 80 percent of pension providers offer life-cycle funds. In the same sample at least 70 percent offers life-cycle funds as default investments.
\textsuperscript{16} One must note the difference between a default scheme and a default investment fund. Default schemes may have multiple investment funds and one of them may serve as default investment option.
\textsuperscript{17} There is no entity recognized in law that acts solely on behalf of members of contract-based schemes (only trust-based schemes are regulated by the UK pension regulator); they are overseen by the Financial Services Authority.
\textsuperscript{18} The Pensions Board (regulatory body) and the tax authority give the approval of PRSA products.
scientific papers show that people’s investment decisions are often driven by rules of thumb or mental accounting (see Benartzi and Thaler 2001, Benartzi and Thaler 2007, Choi et al. 2009). For example, many individuals will follow a "1/n strategy" by dividing their contributions evenly across the different funds offered in the pensions plan. Sometimes asset allocations can be extreme (either 100 percent or zero percent in equities) and there is inertia in asset allocations (Agnew et al. 2003).

Is having more investment options something good?

How much freedom workers should have over the choice of provider and investment portfolio is a key economic and policy question. In theory, individuals demand investment funds in the ‘pensions’ market with the objective of maximizing returns on retirement savings (while maintaining risks at lower levels as possible). While choice of funds with different degrees of return and risk should be a worthy goal from the point of view of economic theory, this market is different from the conventional textbook model.

Academic literature has confirmed that pension system design matters. Several papers examine how the menu of investment options made available to workers in defined contribution plans influences portfolio active choice (Brown et al. 2007) and preference for equity exposure (Iyengar and Kamenica 2010). The literature on private pensions in the US has recently shown a negative effect of the number of investment options on plan participation, mainly due to information overloading. People may be overwhelmed by the amount of choice and prefer not to take any decision, in which case savings are allocated into default investment options (Madrian and Shea, 2001; Agnew et al., 2003; Agnew and Szykman 2005), or simply opt out of the system altogether if the system is voluntary.

Studies in behavioral finance have also shown a significant tendency for people to treat risk in different ways depending on how options are “framed”, which may lead to misinterpretations and wrong choices (Benartzi and Thaler, 2002, and Mottola and Utkus, 2008). The design of the menu of investment options made available to workers has been found to influence portfolio choice (Tang et al. 2010). Having more investment options in a particular asset class (e.g., more equity funds) has been found to have a significant effect on how much resources people allocate to such asset class (Benartzi and Thaler, 2001, Brown et al. 2007).

Since a larger set of options may induce a stronger preference for simple, easy-to-understand and less risky options (Iyengar and Kamenica 2010), limiting options to a manageable number may simplify decisions by individuals and provide incentives to save more for retirement, apart

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19 Although Papke (2003) had previously shown evidence that people with access to investment choice were 36% more likely to make annual contributions (and also invest more in stocks), more recent studies such as Iyengar et al. (2004) report that an addition of ten funds to the existing range of choices in 401(k) plans decreases participation by 2% and the portfolio share of equities by 8%, while increasing the share of ‘safe’ investments by 5.4%.

20 Investing heavily in equity, therefore, might be the result of a higher availability of those funds in the first place.
from lowering administrative costs. People many times construct inefficient portfolios, even when portfolio menus seem adequate, thus reducing their potential retirement wealth (Tang et al. 2010). With a simplified system people may also start favoring a greater allocation to equity funds, which may give higher long-run returns levels, instead of money market and bond funds.

Perhaps the biggest challenge in DC schemes is that the evidence usually describes people as “reluctant investors” who will opt for not making any decision at all (and retirement savings are thus invested in default funds). Different surveys on pension attitudes show that people often consider themselves financially unsophisticated and are reluctant to take control of retirement savings investment, even when offered the possibility to improve their financial education (van Rooij 2007). People often do not have well-defined preferences and would opt for portfolios chosen by other people instead of making an independent decision (Benartzi and Thaler 2002).

**Quasi-markets and captive investors**

People’s freedom of choice can also be limited by the characteristics of the market and corresponding incentives of people and providers. Countries where DC pensions are mandatory often experience a “quasi-market” because the system replaces the sole State provider with competitive independent ones (Impavido et al. 2010). But it is also “quasi” because it differs from conventional markets in various ways. On the demand side, consumers cannot withdraw from the quasi-market and this limits their capacity to impose market discipline (so demand is more inelastic to prices). On the supply side, although there is competition among firms (as in conventional markets), they do not necessarily maximize profits but market shares or some form of participants’ welfare. The indeterminacy of firms’ objectives (profits, market share, participants’ welfare, etc.) 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 supply of multiple investment options) and are encouraged to create switching costs for participants to defend their investments with ambiguous impact on overall costs (and facing a pool of captive consumers, providers are encouraged to charge fees above average costs).

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21 Authors in the UK (Byrne et al. 2007) and the European Fund and Assets Management Association (2008) have discussed an approach that involves offering three to five multi-asset strategies with different risk–return profiles, with some form of life-cycle overlay to manage risk over time.

22 Iyengar and Kamenica (2010) show that the presence of more funds in an individual's 401(k) plan is associated with a greater allocation to money market and bond funds at the expense of equity funds.

23 People purchasing power is not expressed by money, as in markets, but by budget earmarked to the purchase of specific pension services. In the case of mandatory schemes, this is financed by mandatory contributions from the beneficiary himself (often subsidized by earmarked state budget or tax exemptions).

24 The governance structure of pension providers varies considerably, including for-profit firms, mutual associations, and state owned enterprises.
4 International Experience on Active Choice

What the evidence tells us in general is that the proportion of people that actively choose where to invest their contributions is low. This applies for both new and active members. Since indicators of active choice of new members are scarce, the percentage of people whose money is invested in default funds is generally taken as evidence that individuals are either incapable of making, or unwilling to make, decisions concerning the investment of their pensions (this is called default option bias). In the US, for instance, Choi et al. (2001) suggested that over 65% of 401k plans members are enrolled in default funds. In the UK, a survey of Watson Wyatt reports that over half of FTSE 100 DC pension schemes had more than 80% of their membership in the default investment fund in 2009. In Australia, Clare (2006) found, using survey data, that only 23% of individuals actually chose their super fund.

Although active choice is, in general, low for current members, the default bias declines with tenure. In other words, the proportion of people making active choice is usually greater for members with some tenure in the system than for new members. The reason is that people who initially do not select a fund may change their mind later on, particularly once they accumulate more assets. In Australia, for instance, only 45.5% of total assets are invested in default funds, even though roughly 80% of new members are estimated to end up in such funds in the beginning. This suggests that people with longer tenure and higher income move their assets to other investment options. Choi et al. (2001) estimate that at six months of tenure up to 73% of participants in 401(k) plans in US would have their assets invested in the default fund. However, the default bias decline over time and at 24 months of tenure the proportion of people enrolled in the default falls to 40–51%, with further declines for longer periods of tenure.

Despite the generalized low degree of people involvement in the administration of retirement savings, the global financial crisis was a period with a relatively high degree of active choice. Such temporary boost in active choice was observed in different countries. The crisis exploded in 2008 (being nurtured already in late 2007) and the level of activity of asset reallocation in pension funds changed temporarily. Below we briefly discuss the experiences of the United States and Latin America (Chile, in particular). Something similar occurred in other countries. Legorano (2009) reported international evidence of portfolio rebalancing at the fund level for the second half of 2008 and into 2009. Specifically, this involved a reduction in equity in favor of

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25 The use of the default bias as an indicator of (the lack of) active choice may be misleading given the difficulty of distinguishing between people automatically allocated into a default fund and people that chose the default fund.
26 This is consistent with a report from the National Association of Pensions Funds (NAPF, 2008) that states that on average 82% of members have left their money in the default fund.
27 This phenomenon is not widespread, though. According to results from (EFRP, 2010), in the United Kingdom the majority of plan members remain in default funds (80% roughly) and the activity in the pensions market is low in terms of portfolio movements. In Australia, according to a survey by AFSA (2010), only 15.2% of respondents have altered the investment option of their super fund over the past 12 months, while the remaining 84.8% have maintained their existing investment strategy. The great majority of switches of fund come as a result of members changing employers or employers changing fund providers.
new “non-traditional” asset classes (such as real estate and commodities). Rebalancing assets allows people, at least in theory, both to avoid the risks of financial crises and to take advantage of riskier investment options when returns are higher in the business cycle.

The US Case

Although the United States is one of the countries where pension providers offer a larger range of investment options, active individual choice is not large. Agnew et al. (2003) suggested that, in a typical year, 87% of 401(k) plan members made no investment re-allocations (and only seven percent made more than one change). This is consistent with more recent evidence presented by Holden et al. (2009) using the EBRI/ICI 401(k) database. There is also evidence that even over a period as long as a decade, 75% of members makes no re-allocations (Ameriks and Zeldes, 2004).

Yet, the level of activity seemed to peak during the crisis of 2008 and decline after that (Figure 3). In 2008, the percentage of people re-allocating assets (i.e. changing asset allocation in account balances) was 14.4%; the percentage of people making changes in asset allocation of contributions was 12.4%. By 2010, people were much less likely to reallocate assets.

Figure 3. DC Plan participants actions (% of participants)

![Bar chart showing percentage of participants reallocating assets over years](chart.png)

Source: ICI (2013); ICI Survey of DC Plan Recordkeepers

Note: All DC schemes (incl. 401k plans and IRA accounts).

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28 In Australia, examination of self-managed superannuation funds (Australian Taxation Office, 2009) identified a reduced exposure to equities between June 2006 and March 2009. Yet, according to a survey commissioned by the Australian Institute of Superannuation Trustees (see Gerrans, 2009), which involved six of the country’s largest funds, the number of people switching investment options was still low (less than 7% of fund members).

29 Although the such database does not have information on participant trading activity, it is possible to compare snapshots of year-end asset allocations among participants present in multiple years in the database.
As the percentage of people rebalancing assets increased so did the percentage of total assets that were rebalanced each month (i.e. more people were rebalancing and with more frequency each of them). The Hewitt Associates’ Monthly 401(k) Index measures net transfer activity in relation to total 401(k) balances. Net transfer activity is, on average, low - about 0.06% per day (see the trend in Figure 4). Monthly activity had decreased after 2003 (coincidentally or not, it was the time when the use of life-cycle funds started to increase rapidly). But then it bounced back with the start of the financial crisis in 2008.

When stock prices declined, the net transfer activity peaked after years of inactivity. In fact, after 2002 there is a negative correlation between the percentage of assets being rebalanced and the S&P 500 index of stock prices. Such correlation is not surprising as the bulk of 401(k) assets continue to be invested in equity (58% by 2010).³⁰

![Figure 4. Behavior of the Hewitt Index: % of total 401(k) assets rebalanced (average daily activity by month)](image)

Source: Own calculation applying moving average to the monthly indicator of activity of Hewitt 401(k) Index

The increase in asset reallocation implied that investment in equity declined in the period of the crisis. Figure 5 shows how assets were rebalanced across asset types. Money market funds started increasing sharply at the end of 2007, which coincides with the first signs of weakness in equity investments. Such investments occur via equity funds, the equity portion of balanced funds, and company stock (Holden et al., 2008, report that the typical 401(k) plan has approximately 65% of assets invested in equities).

³⁰Such investments occur via equity funds, the equity portion of balanced funds, and company stock (Holden et al., 2008, report that the typical 401(k) plan has approximately 65% of assets invested in equities).
the financial markets in the US. Such reallocation of assets may have allowed some people avoid investment losses from equity investment. One question that has not been explored is whether these people that made active choices fared better in terms of returns than people investing in funds that do not require active management, such as life-cycle funds.

Figure 5. Rebalancing behavior in 401(k) plans by type of asset
(12-month cumulative flows in US$ bn)

The Latin American Case
People in Latin America, as in other regions, are not very active in the administration of pension funds. In Mexico, more than 70% of new members in 2006 were automatically assigned to a pension provider (AFORE) by the supervisor. The figure for Chile was 70% in April 2007. There is lack of knowledge about the system even in countries with mature systems such as Chile. For instance, data from the 2010 EPS survey in Chile shows that the majority of people did not choose their current pension provider (Figure 6, panel a) and then people remain with the same provider either because of inertia or because they lacked knowledge (Figure 6, panel b).31

31 The survey Encuesta de Proteccion Social (EPS), is a longitudinal household survey, representative of Chile, whose first wave was released in 2002. Three additional waves followed for 2004, 2006 and 2009
The financial crisis affected returns to pension investments in Latin America. Whereas the most aggressive funds (those with higher levels of investment in equity) had greater returns in 2007, they were by far the most affected after the global financial crisis in Chile, Mexico and Peru (Figure 7). The great loss in Peruvian funds is explained by the large degree of exposure to equity and the peak in inflation, which reached 7% in 2008.
Although the level of activity in Latin America was still low during the crisis, people did seem to make the right decisions. At least this was the case in Chile. In 2008, with the start of the global financial crisis, the most aggressive fund (Fondo A) started ceding accounts rapidly whereas the more conservative fund (Fondo E) gained accounts (Figure 8). In 2009, the trend was reversed and back again to the status quo.

The patterns of investment choice and change of funds by individuals was unusual for Chile. From 2004 to 2007 Fondo A was receiving much more accounts that the number of accounts it was ceding, whereas the number of accounts in Fondo E remained similar (the number of accounts received was in fact slightly lower that the accounts ceded, which implies that the number of net swifts was slightly negative). Fondos B, C and D were ceding more accounts than what they were receiving, which is to be expected given that they are used as default funds. What is interesting is that it was Fondo B that was losing great part of the accounts that were then transferred to the more aggressive Fondo A. This suggests that there was a demand for more aggressive funds. Yet, active choice is low: the number of individuals who had elected a fund (including the most and least aggressive funds, Funds A and E, respectively) represented only 34% of total participants.

Figure 8. Net swifts (accounts received minus accounts ceded) by type of fund, Chile

Source: Own calculations using data from SAFP

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32 In Chile, and the other Latin American countries with similar schemes, people move completely from one fund to the other; diversification is not possible.
5 Policy issues

The expansion of defined contribution pension systems, either implemented as mandatory national systems or promoted by employers as occupational pensions, implies that people increasingly have a say in the administration and investment of retirement savings. Yet, people often do not take the right decisions or, most importantly, prefer not to take any decision at all. Academic literature has confirmed that pension system design matters, particularly due to individual behavioral responses.

What governments should do to improve the performance of defined-contribution systems is not straightforward. By not defining guidelines for long-term investment strategies, governments leave participants subject to day-to-day uncertainty, which may diminish the overall performance of pension funds and may end up affecting the long-term viability of funded pension systems. By defining rules that are too tight, governments may induce a portfolio structure that is not optimal. The maximum exposure to equity fixed in some Latin American and Eastern European countries, for instance, has not been derived from any optimization model and therefore cannot guide the decision of participants about the level of equity exposure that they should seek. Also, limiting investment in foreign assets reduces the scope for geographical diversification (as national equity markets are subject to country risk).

Since people are expected to make financial decisions, financial education is a basic pillar of defined-contribution systems. There is evidence that financial education increases participation in and contributions to private pension schemes (OECD 2005; Lewis and Messy 2012). In the United States, for instance, more financially literate workers in 401(k) plans are more likely to join the plan - or less likely to opt out of a scheme with automatic enrolment plans (Agnew et al. 2007). Financial education often takes place in employment-based information campaigns.

Nevertheless, financial education is a necessary but not sufficient condition for improving performance in defined-contribution schemes. Individual financial decisions may still be subject to rules of thumb and mental accounting, and be influenced by how pension plans’ investment options are framed. Even with good financial education, people may still be reluctant to take decisions (or at least be subject to inertia and procrastination). To overcome these challenges, several mechanisms have been proposed: (i) the adoption of automatic enrollment; (ii) the adoption of default investments strategies that provide automatic rebalancing (usually age-based) across funds with different risk exposure and; (iii) the proliferation of life-cycle funds (particularly, target-date funds), which reallocate assets of the whole pension fund (not only the default option) over time by becoming increasingly conservative as the pension member approaches retirement.

The age-based investment allocations of the default rules have been decided in an arbitrary manner and may not necessarily be optimal from the perspective of the typical plan member. Also, there seems to be other more relevant measures for preventing poor diversification such as limits on investments in specific issuers or sectors.
Default investments with age-based risk exposure were introduced relatively recently in Latin American countries with mandatory defined-contribution systems (Chile was the pioneer; Peru followed in 2005; Mexico in 2008) and there is not, therefore, a sufficiently long time frame for evaluating performance. It is unclear what benchmarks should be used for measuring performance, given that the current design lacks any connection with the payout phase.\textsuperscript{34} Impavido et al. (2010) suggest that in Latin America countries there is scope for improving expected rates of return over the life-cycle by simply improving at the margin on current designs: (i) more gradual gliding paths (i.e. re-balancing rules) for default options, (ii) making equity funds a default option for young investors and (iii) 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.\textsuperscript{35}

Life-cycle funds, where optimal investment allocations adjust depending on the age of the person, are proliferating in countries like US and UK and they could be increasingly adopted in pension schemes in other countries (see definitions of different life-cycle products in the appendix). Lifecycle funds have several benefits. For individuals with low levels of financial literacy, lifecycle funds, particularly if adopted as the default fund, allow a greater allocation of resources to equity and potentially higher returns.\textsuperscript{36} Viceira (2010) shows that life-cycle funds often outperform other investment alternatives (such as government bonds, full investment in domestic equity, full investment in global equity, etc.) in terms of the expected asset accumulation at retirement. Also, the switch to low-risk assets prior to retirement can reduce the risk of confronting the most extreme negative outcomes. The reduced volatility of wealth outcomes makes them desirable to investors who seek a reliable estimate of final pension payments a few years before retirement.

Yet, these benefits come at a cost to the investor by giving up significant upside potential of wealth accumulation offered by more aggressive strategies (Booth and Yakoubov, 2000; Byrne et al., 2007). In other words, for rational investors (i.e. those taking into account all the information available in order to make the best decisions), these funds may not be as attractive because such investors may prefer to adjust asset allocations themselves based on their own risk preferences and information (Lusardi and Mitchell, 2007; Mitchell et al. 2008). A second concern discussed by Shiller (2005) is that lifecycle strategies give up higher returns by substituting stocks with low return assets just when people’s incomes and the accumulated assets in their pension funds are both at their highest (i.e. when people approach retirement). A third concern has to do with ‘mixed’ investors, i.e. people investing in both lifecycle funds and also in

\textsuperscript{34} Impavido et al. (2010) argue that the key weaknesses of the system of multi-funds could be largely addressed by requiring fund managers to offer investment products that explicitly link the accumulation with the de-accumulation phase in the spirit of surplus optimization and/or liability driven investment strategies.

\textsuperscript{35} 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.

\textsuperscript{36} These funds reshape the age distribution of equity exposure, eliminating extreme zero- or all-equity positions.
other individual funds available in their plans. The problem is that these people may inadvertently replicate their investments, thus becoming less diversified unintentionally (Choi et al. 2009).

The suitability of target-date funds depends on the investor’s risk aversion and human capital risk (Bodie and Treussard 2007). Deterministic target date funds – as commonly implemented, where switching rules are fixed - are optimal for some investors, but not for others. Strategies that dynamically alter the allocation between growth and conservative assets based on cumulative portfolio performance (i.e. achieved investment returns) are expected to be superior (Basu et al. 2009). Recent innovations in DC schemes include diversified growth funds (which incorporate alternative asset classes that have low correlations with equities and bonds) and portfolio insurance-type products that attempt to manage risk in a more dynamic fashion than traditional lifecycle products.

The World Bank (2010) suggests the creation of a model set of life-cycle pension funds determined by life-cycle optimization rules, which can serve as benchmarks against which the performance of pension fund managers can be measured. The superiority of life-cycle default investment options is based on two key considerations: (i) it is optimal to invest in risky assets; and (ii) it is less so over time. In the absence of more relevant long-term measures of performance, the existing emphasis on short-term returns creates incentives for pension fund managers to focus their efforts on maximizing short-term returns (Campbell and Viceira 2002). However, the funds with better short-term performance are not necessarily those best aligned with the long-run performance of a pension system.

An optimal regulation approach would move the basis of competition from short-term returns to trying to beat a long-term benchmark fund regulated by the government. The asset allocation would depend not only on age, but also on other parameters, including contribution rates, density of contributions, benefits from other social insurance programs, patterns of lifetime earnings, risk preferences, and correlations among these factors and asset returns. Human capital shocks (skill obsolescence, health shock, disability shock, etc.) and employment shocks (reduction of working

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37 In a study by Vanguard (2010), about 54% of participants holding target-date funds in their retirement plan accounts also own other plan investments (this is consistent with the national figure; Towers Watson’s 2010 Global Pension Assets Study suggests that less than half of individuals investing in lifecycle products in the US held 100% of their assets in that fund).

38 The correlation between investments is also relevant for currencies when investing in foreign assets. The conventional practice is fully hedging currency exposures. However, currencies in emerging economies tend to be negatively correlated with the dollar and tend to appreciate when global stock markets fall. Therefore, contrary to conventional practice, pension funds in most emerging economies should keep unhedged positions in their equity exposure (Viceira 2010).

39 The literature on strategic asset allocation provides numerous examples of cases in which short-term asset allocation conflicts with longer-term objectives, including selection of the risk-free asset, international portfolio diversification, and currency hedging strategies.

40 Participants with low risk tolerance experience welfare losses if they are forced to adopt life-cycle funds with the average high-equity allocations that are optimal for medium risk tolerance participants.
hours, retrenchment, and retirement) may have an important effect on portfolio allocation because they generate heterogeneity in the pattern of financial wealth accumulation over time (Mitchell and Turner 2010). Consequently, there is a potentially wide diversity in what constitutes an optimal portfolio for each individual (even if they are of the same age).  

**Research agenda**

There is an increasing interest in research in the area of pensions, particularly regarding the adequacy of pension systems in the context of aging populations. Extensive research has been done regarding macroeconomic questions such as the financial sustainability of such systems and optimal reforms in terms of inter-generational redistribution of welfare.

The optimal design of defined-contribution pension systems (and related reforms) also involves questions related to the area of finance such as the optimal portfolio structure and diversification. Such research explores long-run investment products and strategies that maximize pension fund performance, i.e. that maximize expected asset accumulation at retirement. The literature cited in the previous section confirms the importance of this area of research for policy questions.

A third set of research questions involves microeconomic questions about individual decisions and behavior (e.g. regarding retirement, choice of annuity type, savings and investment decisions), particularly in the context of the incentives generated by the design of pensions.

Individual behavior is particularly crucial during the phase of accumulation of pension entitlements because it determines how people plan for retirement income, how much they contribute to pension schemes and the types of financial decisions they make (another phase involves deciding how to convert accumulated savings into a pension payment). There is a series of questions that deserve more research:

- Under which circumstances are people more likely to make active investment / saving choices? Do people make active choice only in times of crisis?
- How does the availability of information on returns (and costs) affect investment choice?
- How does the availability of other pensions and safety nets affect active choice and risk-taking?
- How are individual investment choices affected by work circumstances and environments?
- How does labor flexibility / mobility affect contributions to pension plans?

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41 If there is a positive correlation between equity returns and labor income then income risk results in reductions to the optimal allocation of equities at any age (Bagliano et al., 2010).
One specific hypothesis that has not been explored in countries with mandatory defined-contribution systems is if greater tenure in the system actually reduces inertia (and the default bias) and encourages active choice. Research on the questions above would allow shading light on how labor mobility and tenure in pension schemes impact the expected pension at retirement.
References


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OECD (2014), Annual Survey of Investment Regulation of Pension Funds, 2014. OECD.


Vanguard (2010), Mixed target-date investors in defined contribution plans, September 2010.


## APPENDIX

Table A.1. Regulations and Investment Options in a selection of DC Systems

<table>
<thead>
<tr>
<th>Country</th>
<th>Program</th>
<th>Type of Scheme</th>
<th>Number of Investment funds by plan/provider</th>
<th>Number of plans/providers</th>
<th>Can invest in more than 1 fund at the same time?</th>
<th>Default fund regulated by law</th>
<th>Type of default fund (mandated or most used)</th>
<th>limits by asset class</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mandatory National-wide Systems</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Chile</td>
<td>Main system</td>
<td>Mandatory</td>
<td>5, by law</td>
<td>7</td>
<td>No</td>
<td>Yes</td>
<td>Age-based equity exposure</td>
<td>Yes</td>
</tr>
<tr>
<td>Mexico</td>
<td>Main system</td>
<td>Mandatory</td>
<td>4, by law</td>
<td>11</td>
<td>No</td>
<td>Yes</td>
<td>Age-based equity exposure</td>
<td>Yes</td>
</tr>
<tr>
<td>Peru</td>
<td>Main system</td>
<td>Mandatory</td>
<td>3, by law</td>
<td>5</td>
<td>No</td>
<td>Yes</td>
<td>Age-based equity exposure</td>
<td>Yes</td>
</tr>
<tr>
<td>Estonia</td>
<td>Second pillar</td>
<td>Mandatory</td>
<td>3, by law</td>
<td>5</td>
<td>No</td>
<td>Yes</td>
<td>Most conservative</td>
<td>Yes</td>
</tr>
<tr>
<td>Latvia</td>
<td>Second pillar</td>
<td>Mandatory</td>
<td>3, by law</td>
<td>8</td>
<td>No</td>
<td>Yes</td>
<td>Most conservative</td>
<td>Yes</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Second pillar</td>
<td>Mandatory</td>
<td>3 (in total)</td>
<td>6</td>
<td>No</td>
<td>Yes</td>
<td>Most conservative</td>
<td>Yes</td>
</tr>
<tr>
<td>Australia</td>
<td>Superannuation</td>
<td>Mandatory</td>
<td>&lt;10 in corporate and industry types, &gt; 100 in retail</td>
<td>More than 300</td>
<td>Yes</td>
<td>No</td>
<td>Balanced funds</td>
<td>No</td>
</tr>
<tr>
<td>Sweden</td>
<td>Premium System</td>
<td>Mandatory</td>
<td>n.a.</td>
<td>More than 700</td>
<td>Yes</td>
<td>Yes</td>
<td>Equity fund until age 55</td>
<td>No</td>
</tr>
<tr>
<td><strong>Voluntary Systems</strong></td>
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</tr>
<tr>
<td>United States</td>
<td>401(k)</td>
<td>Occupational / trust-based</td>
<td>17 (on average)</td>
<td>by employer (468,000 plans)</td>
<td>Yes</td>
<td>Yes</td>
<td>Life-cycle/Target Date</td>
<td>No</td>
</tr>
<tr>
<td>IRAs</td>
<td>Personal / contract-based</td>
<td>180 Fidelity; 144 Vanguard (in total)</td>
<td>Several</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Self-invested personal plan</td>
<td>Personal / contract-based</td>
<td>150 (on average)</td>
<td>Several</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Stakeholder Pensions</td>
<td>Workplace / contract-based</td>
<td>35 (on average)</td>
<td>44</td>
<td>Yes</td>
<td>Yes</td>
<td>Life-cycle</td>
<td>No</td>
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</tr>
<tr>
<td>DC trust-based schemes</td>
<td>Occupational / trust-based</td>
<td>6 - 10 (on average)</td>
<td>by employer (80,000 plans)</td>
<td>Yes</td>
<td>No</td>
<td>Life-cycle</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>New Zealand</td>
<td>KiwiSaver</td>
<td>Workplace / contract-based</td>
<td>5 (on average)</td>
<td>33</td>
<td>Yes</td>
<td>Yes</td>
<td>Most conservative</td>
<td>No</td>
</tr>
<tr>
<td>Ireland</td>
<td>PRSA</td>
<td>Workplace / contract-based</td>
<td>5 (on average)</td>
<td>10</td>
<td>Yes</td>
<td>Yes</td>
<td>Pooled funds</td>
<td>No</td>
</tr>
<tr>
<td>Trust-based Schemes</td>
<td>Occupational / trust-based</td>
<td>5 (on average)</td>
<td>by employer</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Canada</td>
<td>RRSP</td>
<td>Personal / contract-based</td>
<td>10-13 (on average)</td>
<td>Several</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>System</td>
<td>Description</td>
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<tr>
<td><strong>United States</strong></td>
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<tr>
<td>OASDI</td>
<td>Social security payments to the government-administrated Old-Age, Survivors and Disability Insurance program. There is also a means-tested old-age supplemental benefit.</td>
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<tr>
<td>Employer-sponsored DB pension plans</td>
<td>Employer-sponsored and can be classified as trust-based DC schemes. Plans employers incur in fiduciary responsibilities. The ‘safe-harbor’ 401(k) plan, introduced in 2007 as the ‘default’ pension plan for employers offering no other form of provision, is the only scheme available to employers wishing to auto-enroll without incurring fiduciary liability for investment performance. Employers can additionally choose to “match” part or all of the employee's contribution by depositing additional amounts. Plans contributions are deposited as “tax deferred” and then taxed at normal income bracket for distributions.</td>
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<tr>
<td>Individual Retirement Accounts (IRAs)</td>
<td>They are contract-based personal savings accounts (i.e. not tied to employers). Employers may offer IRAs to their staff but, unlike 401(k) plans, they assume no fiduciary responsibilities and do not make any ‘matching’ contributions. The primary source of funding of IRAs used to come from direct individual contributions, mainly from individuals whose employers did not sponsor a DC savings plan. However, the primary source of IRA funding has shifted to rollovers (i.e. transfers of assets from a former employer's DC or 401k savings plan into an IRA). Contributed money is at first post-tax money. However, contributions are tax deductible which reduce the tax basis for that tax year. Then, distributions are taxed at the normal income for distributions.</td>
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<tr>
<td><strong>United Kingdom</strong></td>
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<tr>
<td>Basic State Pension</td>
<td>Flat benefit payable to all people above age 65 that are eligible according to years of contributions</td>
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<tr>
<td>State Second Pension (S2P)</td>
<td>Earnings-related contributory scheme (which has become a flat rate from 2010). This is mandatory but individuals may contract out into a private pension plan.</td>
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<tr>
<td>Workplace pensions</td>
<td>Occupational private pension arrangement. It is voluntary and facilitated by the employer. Occupational pensions are still dominated by DB schemes (8.8 million members, according to UK Pensions Regulator, 2008) but DC schemes are growing fast. Defined-contribution workplace schemes can be divided in two types. Trust-based schemes, which are set up by, or administered on behalf of, an employer and are regulated by the UK Pensions Regulator, have nearly 6 thousand schemes and 2.4 million members. Contract-based schemes are administered instead by financial service companies. The stakeholder</td>
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</table>

42 An IRA trustee may be a bank, a credit union, a mutual fund, a life insurance company or a large brokerage firm. There are now many types of IRA plans (SEP IRA, Simple IRA, Roth IRA) but, as of 2009, 88% of assets are invested in the traditional IRA plan created with the Employee Retirement Income Security Act in 1974. Nowadays, IRAs have become the largest single vehicle of retirement assets (ICI, 2008).

43 According to Watson Wyatt, DC assets comprised in 2009 45% of total pension assets compared with 30% in 1998. In 2009 already 62% of employer-sponsored membership within the private sector was in DC schemes.

44 These schemes are subject to a different regulatory framework than DC trust-based schemes. The regulator works jointly with the Financial Services Authority (FSA) in the regulation of GPPs and GSHPs.
pension scheme, for instance, was introduced in 2001 and is the ‘default’ pension plan for employers offering no other form of provision and it is thus subject to most of the regulatory requirements. Group personal pensions (GPPs) and group stakeholder pensions (GSHPs) are workplace mechanisms facilitated by employers.

<table>
<thead>
<tr>
<th>Personal pensions</th>
<th>People can opt out of workplace pensions and choose their own personal contract-based pensions. They include self-invested personal pensions (SIPP). Contract-based schemes are replacing occupational trust-based schemes.</th>
</tr>
</thead>
</table>

**Canada**

<table>
<thead>
<tr>
<th>Old-age Security</th>
<th>Universal basic public pension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada Pension Plan</td>
<td>Contributory earnings-related social insurance program</td>
</tr>
</tbody>
</table>

**Private pensions**

These include *Registered Pension Plans (RPP)*, which are sponsored by employers as *trust-based occupational* schemes and are still dominated by DB plans, and *Registered Retirement Savings Plan (RRSP)*, which are tax-deferred individual savings managed in DC principles (i.e. taxes on earned income are deferred until the eventual withdrawals from the plan). The tax deferred is commonly called the contribution tax credit and accounts can be set up for individuals, in a sort of personal pension plan, or for a group of individuals working for the same employer (workplace scheme). In either case RRSPs classify as a *contract-based* private pension schemes.

**Australia**

**Australian mandatory DC pension system**

*Australia* introduced in 1992 private pension schemes with mandatory employer contributions. Employees must be enrolled into one of two types of plans: a *Superannuation plan* or a *Retirement Savings Account (RSA)*. The latter targets low earners and it provides a guaranteed minimum return (with returns usually much less than a superannuation fund). As RSAs are capital guaranteed there is no portfolio choice available. The Superannuation is the main system and plans are organized in three forms: (i) *industry funds* are set up by union bodies to provide superannuation benefits to employees in a particular industry; (ii) *corporate funds* are set up by some employers for their employees and accept compulsory superannuation guarantee contributions; (iii) *retail funds* are personal plans generally available through fund managers, financial advisers and banks where employees and employers can make contributions and workers can maintain the fund even if they change jobs. The number of superannuation entities (i.e. pension firms) has in the recent past been above 300. Nearly all *superannuation* plans have DC elements (by 2005, 66% of all plans were fully DC, according to Australian Prudential Regulation Authority APRA; only 2 % were DB plans and 32 % mixed DB and DC schemes). Superannuation fund members have two types of choice: (i) which fund to direct their mandatory superannuation contributions to (Superannuation Legislation Amendment Act 2004 - choice of Superannuation Funds); (ii) an investment strategy within the fund.

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45 Instead of setting up a super fund some employers use a master trust to provide superannuation to employees. A master trust is a super fund to which a number of employers can contribute.
Box 1. Definitions of funds with ‘life-cycle’ characteristics

Balanced funds are pooled accounts invested in both stocks and bonds (and sometimes money market investments). They are classified into two sub-categories: lifecycle funds and non-lifecycle balanced funds. Although non-lifecycle balanced funds, most of the time just called “balanced” funds, are in the “asset allocation” family, their portfolios do not materially change their asset mix. In contrast, life-cycle funds make changes in response to an investor's changing risk-return appetite or age (they are often called age-based funds because they rebalance to more conservative investment strategies as individuals get older). We have the following products:

Target risk or life style funds: they automatically rebalance their holdings towards a target asset mix that remains constant over time. They may include conservative, moderate and aggressive funds. For example, a fund might target a 60–40 percent mix of stocks and bonds; periodically the fund sells some of the holdings of the asset class that has outperformed over the period and uses the proceeds to invest in the asset class that has underperformed so as to keep the mix of stocks and bonds in the portfolio on target.

Life-cycle funds: they also rebalance automatically towards a target asset mix, but this mix changes over time. The target asset mix generally becomes increasingly conservative as the pension member approaches retirement. Life-cycle funds are called “Life-style” funds in the United Kingdom, which is different from the meaning this word has in the United States (see F.1 above).

Target Date funds: An approach to life-cycle that switches investments to less volatile assets (relative to how members are drawing their benefits) based on the switches being completed by a target date (often the retirement date). Whereas in traditional lifecycle funds the switches are carried out at member level, in target-date funds the switches are inherent within the fund. For example, someone expecting to retire in 2040 would buy the “2040 Fund”, which has an internal risk-based mechanism and starts switching into safer assets in, say, 2030.
Europe Campus
Boulevard de Constance
77305 Fontainebleau Cedex, France
Tel: +33 (0)1 60 72 40 00
Fax: +33 (0)1 60 74 55 00/01

Asia Campus
1 Ayer Rajah Avenue, Singapore 138676
Tel: +65 67 99 53 88
Fax: +65 67 99 53 99

Abu Dhabi Campus
Muroor Road - Street No 4
P.O. Box 48049
Abu Dhabi, United Arab Emirates
Tel: +971 2 651 5200
Fax: +971 2 443 9461

www.insead.edu