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Regulating private pension funds' structure, performance and investments: cross-country evidence

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Abstract

Because defined-contribution systems expose pensions to a number of risks, reforming governments have often strictly regulated the pension fund industry's structure, performance, and investments. This paper compares the rules in the new systems of Latin America and eastern Europe with richer OECD countries. The authors argue that the benefits of competing pension funds and individual choice can only be achieved if regulations are loosened in the medium term.

Zusammenfassung

Da private Pensionsfonds einer Reihe von Marktrisiken ausgesetzt sind, werden diese Fonds von vielen Regierungen im Hinblick auf ihr Investitionsverhalten reguliert. Der Aufsatz untersucht derartige Regulieren in Lateinamerika und Osteuropa sowie einigen OECD-Ländern. Als Ergebnis zeigt sich, dass es nötig ist, im Interesse von mehr Wettbewerb und individueller Wahlfreiheit, in vielen Ländern die Regulierungen zu lockern.

JEL-Classification: G 18, G 23, H 55

'Risk is risk. It cannot be legislated away. It can only be diversified away.'
George Russell, financier, quoted in de Ryck (1998)

A number of countries have implemented or proposed fundamental reforms of their pension systems, including eight in Latin America and five in Europe[1]. These reforms emphasise the role of individual, privately managed defined-contribution accounts, where the value of the pension benefit will

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1 Chile (1981), Peru (1993), Argentina (1994), Colombia (1994), Uruguay (1995), Bolivia (1997), Mexico (1998), El Salvador (1998), Czech Republic (1998), Hungary (1998), Poland (1999), Sweden (1999) and the United Kingdom (1988). Schwarz and Demirgu-Kunt (1999) provide a global survey of pension reforms of the last six years.

depend on accumulated contributions and investment returns. They are, by definition, fully funded. The new pension plans substitute for the old, public, defined benefit schemes where the pension depended on some measure of earnings and years of coverage. Public schemes are usually financed on a pay-as-you-go basis, where current workers' contributions pay for current pensioners' benefits.

The new defined contribution systems expose workers' future pension benefits to a number of different risks. To try to mitigate these risks, reforming governments have often strictly regulated the pension fund management industry's structure, performance, and asset allocation. Often, a new fund management industry has been established, consisting of multiple competing pension funds, separated from other financial institutions. In the majority there are restrictions on the type of investments that can be made and sometimes regulations specify the returns that the funds should earn.

These fundamental reforms of pension systems aim to:

- enhance individual choice and responsibility through the freedom to select a fund manager;
- ensure good service and performance through competition between fund managers and so deliver reasonable pension benefits; and
- limit risk through competition and investment restrictions.

However, in practice, 'Draconian' regulation of pension funds has prevented the achievement of many of these objectives. Regulations have generally focussed on three aspects: industry structure, asset allocation, and performance. Structural regulations force workers to choose only one manager and one fund. So, workers are unable to diversify investments across funds, exposing them to aberrant behaviour by fund managers, and preventing portfolio adjustments according to the individual's age, household characteristics, career profile and attitude to risk. Strict asset-allocation rules and relative performance criteria mean that pension funds often invest and perform almost identically, removing any substantive choice for workers over the allocation of their pension fund's assets and the portfolio's risk and returns.

This paper provides evidence for some of the effects of structural, investment and performance regulation of pension funds in emerging economies and compares them with evidence from more developed OECD countries. Concentration in the pension fund management industry is found to be higher in the new pension systems of Latin America and Eastern Europe than in most OECD countries. Concentration might be because the new pension markets are smaller than in countries with more established funded pension systems, but it could also be because of restrictions on industry

structure. In Latin America, asset allocation and performance is nearly identical across pension funds. So-called 'herding' behaviour is almost a defining characteristics of these pension regimes. Again, this reflects, at least in part, asset allocation restrictions and strict performance regulation. There is also evidence that pension funds have often under-performed simple portfolios composed of market indices of stocks and bonds.

All the rules imposed in the new systems of Latin American and Eastern Europe[2] seem to be more stringent than in the OECD, with one exception: portfolio limits. Some OECD countries have a tighter investment regime than countries such as Argentina, Chile, Colombia, Peru and Poland. But OECD countries tend to have fewer barriers to entry and impose fewer constraints on performance than Latin American and Eastern European countries.

The rest of the paper is structured as follows. Section 1 reviews investment supervision and regulation in practice. The subsequent section looks at risks in pension funds. Sections 3, 4, and 5 review the adverse effects of structural, performance and portfolio restrictions respectively. Section 6 concludes.

1. Pension funds, supervision and regulation

Pension funds have shown an impressive growth pattern. In Chile, which reformed its system in 1981, pension funds are the leading institutional investors, managing a total of $32 billion at the end of 1997, worth some 44 per cent of GDP. Only five countries have proportionally larger pension fund sectors – Ireland, the Netherlands, Switzerland, the United Kingdom and the United States – where funds average 75 per cent of GDP. In these five countries, the value of funds has been growing rapidly: by 56 per cent between 1987 and 1996 (OECD 1998, table V.1.). Intersec, a financial data firm, expects world pension fund assets, currently $11,000 billion, to grow by 40 per cent over the next five years.

In other Latin American countries and in Eastern Europe, reforms were more recent, and so funds are much smaller. The next largest system after Chile is Argentina, where assets are worth 3 per cent of GDP. But funds in other countries are forecast to grow rapidly. Goldman Sachs, an American investment bank, expects the value of Argentine funds to increase from $8.8bn in 1997 to $33bn in 2003, or 6.4 per cent of GDP.[3]

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[2] The countries in Europe considered are Poland, Hungary and the Czech Republic. These countries are actually part of the OECD, but for the purposes of the study they are discussed together with Latin American countries, because they have established very similar private pension industries.

[3] Mariscal (1998a).

Mexico has the largest number of workers covered by the new plans – about 14 million. Around 6 million workers each in Chile and Argentina, $2^1/_2$ million in Colombia, just over 1 million in Peru and fewer than half a million in Bolivia and Uruguay are covered.[4] In the United Kingdom, 5.7 million workers (28 per cent of total employees) are covered by the new personal pensions. A further 10 million are covered by longer-established employer-provided plans (of which more than 90 per cent are defined benefit). In Hungary, 800,000 workers have so far announced their intention to switch to the new funds.

In Hungary, Poland and most of the Latin American countries, a new agency was established to supervise the new pension funds. The exceptions are in Colombia and Uruguay, where this responsibility falls on the Central Bank.[5] These agencies ensure compliance with regulations on capital, disclosure and reporting, commissions, transfers between funds, rates of return and investment allocation. In other countries, such as Australia, Switzerland and the United Kingdom, existing financial regulators expanded to cover pension funds.

2. Risks in pension funds

Government intervention in markets can be justified by market failures. In financial systems, externalities, asymmetric information and monopoly are the three main types of market failure. Pension funds pose a different set of risks than other financial institutions, such as banks. Pensions are long-term contracts and they involve a sizeable proportion of the individual's wealth. However, the existence of assets in pension funds avoids the danger of the type of runs that can occur in banking crises (*i.e.*, externalities). Monopoly, too, is likely to be less of a problem in the pension fund industry, as barriers to entry are low compared with banking.[6]

Asymmetric information – the fact that it is costly for the buyer of financial services to obtain sufficient information to assess the quality of that service – is likely to be the most serious problem for pension funds. Lack of information means that the buyer is vulnerable to fraud, negligence, incompetence and unfair treatment by the provider. Clearly, the desire for providers

[4] However, only 54 per cent on average of these members actually contribute to the schemes, ranging from 44 per cent in Peru to 65 per cent in Mexico. See Queisser (1998b).

[5] The issue of supervision is covered in Demarco, Rofman and Whitehouse (1998).

[6] See, however, section 5.1 below for evidence of high concentration in pension fund management in Latin America. Also, Altman (1992) shows the monopoly problem that arises with employer-provided plans.

to maintain a good reputation offers a high degree of protection, but there remain three risks in pension funds:

- *Systematic (undiversifiable) market risk:* current generations cannot trade with unborn ones, so efficient intergenerational risk sharing cannot take place
- *Systemic risk:* Asymmetric information problems in banking systems can lead to bank runs, and make financial systems fragile
- *Agency risks:* in financial markets, trading often takes place between parties with different information, creating problems of moral hazard and adverse selection[7]

Table 1 gives a taxonomy of these investment risks as they affect funded, defined contribution pensions plans. It also shows the mechanisms to reduce risks that might be used and the new risks that might be created. We describe these risks in turn.

2.1 Systematic market risk

Once market-based ways of reducing systematic risks (such as diversification and risk pooling) are exhausted, investors are left with some rate-of-return uncertainty. This systematic market risk can only be reduced further through intergenerational risk sharing, pooling returns of investors across time. Example policies include issuing indexed bonds or offering government guarantees.[8] Some observers (such as Heller, 1998) have argued that the mandatory nature of the new pension systems means that governments retain a responsibility for ensuring adequate pensions beyond the guarantees specified by legislation, producing 'contingent' or 'conjectural' public-sector liabilities.

Government intervention in the form of guarantees may not necessarily be a panacea for risk. Guarantees create a moral-hazard problem: for example, a pension guarantee creates an incentive for informal sector workers to contribute to the system for the minimum number of years to qualify for the minimum pension. Investment managers may take excessive risks knowing that the member's pension is underwritten by the government. In general, guarantees reduce one type of risk but may increase others.

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[7] There is some overlap between the first and the other two forms of market failure risks. Whenever there are systemic and agency risks, systematic market risk for the investor is created.

[8] Defined-benefit pensions might also reduce this kind of risk, but exposes the worker to other forms of uncertainty over, for example, job tenure and earnings profiles (see Disney and Whitehouse, 1994 and 1996 and Bodie, Marcus and Merton, 1988).

Table 1

A taxonomy of investment risks in pension funds

Type of risk	*Example*	*Risk reduction*	*Example*	*New risk created*
Non-systematic market risk	Management inefficiency or inexperience (fund or industry specific)	Portfolio diversification	Diversification across countries or intermediaries	
Systematic market risk	Global asset price volatility	Government provides risk-reducing instruments	Inflation-indexed bonds	Policy risk
		Government guarantee	Minimum pension or real rate of return guarantee	Agency risk / moral hazard Policy risk
Systemic risk	Banking crisis	Prudential regulation	Capital adequacy	Policy risk
		Government guarantee	Deposit insurance	Agency risk / moral hazard Policy risk
Agency risk	Moral hazard: fraud, pension mis-selling, excessively risky investments Adverse selection: reasonably priced insurance not universally available	Prudential regulation	Diversification, limits on self-investment	Policy risk Agency risk / moral hazard
		Government guarantee	Compensation	

2.2 Systemic risks

Investment in capital markets depends crucially on the option to exit into the safe-haven of liquid money markets. If banks take excessive risks, impairing their solvency, the solidity of the whole financial system is put at risk by the potential for a run on the banks. Hence, a sound banking system and a secure pension system go hand in hand.

The regulatory framework should ensure that the moral hazard from deposit guarantees is mitigated. Latin American countries are still trying to make accounting and supervisory standards stringent enough to evaluate risks more effectively than in the past (Rojas-Suarez and Weisbrod, 1996).

2.3 Agency risks

Intervention to limit agency risks takes the form of prudential rules and guarantees applied to financial markets and intermediaries generally, not just to pension funds. This framework includes aims to

- avoid fraud through setting accounting and auditing standards, information disclosure and insider trading rules
- reduce overexposure to specific risks by requiring minimum levels of diversification by issuer and security
- mitigate conflicts of interest through limits on self-investment
- limit market power by restricting concentration of share ownership

Government might also choose to go further and guarantee individuals against these risks.

The contrast between the regulatory regime for pension funds and other financial intermediaries in many developing countries is startling. While pension funds are subject to strict prudential controls, such as capital, disclosure, fiduciary and diversification standards requirements, the regulatory and supervisory framework of other financial institutions is often weak. Valuation is also a widespread problem. The strengthening of prudential controls is a basic precondition for the successful development of financial markets and expanding the investment universe of pension funds.

3. Regulating industry structure

In Latin America and Eastern Europe, reforming countries restricted the industry structure in three ways

- investment was limited to one instrument, the specially created private pension accounts
- administration of funds was restricted to companies exclusively dedicated to pension fund management and managers were restricted to one fund each
- ownership of pension fund managers was not open to existing financial institutions in some countries (Bolivia, Chile, Mexico, Peru)

The structure of the industry in many reforming countries is limited to specially created pension fund managers, which must be independent of other financial institutions. Colombia is one exception: severance funds were allowed to manage pensions as long as this activity was kept separate from other businesses. But in other countries, too, there are strong economic ties between pension fund managers and other companies. For example, Maxima, the largest fund in Argentina, has Banco Quilmes, the Argentine subsidiaries of Deutsche Bank and HSBC (two of the world's largest banks) and New York Life as shareholders.

Pension fund managers are usually restricted to pensions-related activities, such as collecting contributions, asset management, reporting results, and benefit payments. Associated activities – such as custody of assets, provision of life and disability insurance, *etc.* – are often carried out by separate institutions for economic or prudential financial reasons. In Eastern Europe and Latin America, each manager may usually administer only one fund. In Poland, the regulations allow managers to offer two funds from 2005: one with a relatively liberal investment régime, the other restricted to fixed-income securities. In Mexico too, the regulations contemplate allowing more than one fund some time in the future.

In most OECD countries, in contrast, pension plans are offered by a variety of different providers. In some, employers play an important role. In Ireland, the United Kingdom and the United States, employer schemes are a mix of defined benefit and defined contribution. Larger schemes tend to be managed 'in-house', while smaller plans contract out fund management to specialist financial institutions. The investment of defined-benefit schemes is, of course, of less concern to members than defined-contribution. Other countries with predominantly defined-benefit coverage include Belgium, Finland, France and Germany.

In the United States, around half of employer-provided pension coverage is now defined-contribution. So-called 401(k) schemes (named after the relevant clause of the income tax legislation) cover 37 million workers. They now account for 39 per cent of the total of pension fund members, 29 per cent of assets and 53 per cent of new contributions (VanDerhei 1999). Typically, the employer selects the range of investment options in 401(k)s, but they are generally broad, including equity, bond and money-market funds.

In Denmark and the Netherlands, the pension system is based on industry-wide schemes. There are 35 funds in Denmark, and the number of single-employer schemes has now declined to around 100. There are 65 compulsory industry-wide funds in the Netherlands, of which 95 per cent are defined-benefit. In contrast, pensions in Denmark are defined-contribution. Dutch companies are free to opt out of these plans if they offer their own scheme with equivalent benefits. There are around 1,000 of these single-employer plans.

Australia's new superannuation system is based around compulsory employer-provided defined-contribution schemes.[9] Initially, the employer decided where contributions were invested. However, the government is proposing that employers be required to offer a minimum of five different funds. Already, 15 of the 24 largest funds offer a menu of investment strategies.

[9] See Flanagan (1999) and Edey and Simon (1996).

The market for individual pension accounts in OECD countries usually involves a wide range of financial intermediaries. In the United Kingdom, for example, there are around 90 providers of personal pensions, including most life insurers and banks. They offer an average of around 8 funds each, and individuals are free to divide their assets between different funds (Dilnot *et al.* 1994).

3.1 Rationale

The restrictions in the Latin American and Eastern European regimes are designed to keep the regulation and supervision of the industry simple, avoiding the complexity of multiple instruments and funds. The poor performance of some existing financial intermediaries led to the decision to establish a new industry. But this poor performance could only result either from poor market or economic performance, or from inadequate regulation. In the first case, there is no *a priori* reason to expect the new pension funds to perform any better. The second case justifies improvements in the existing regulatory framework, not necessarily the creation of another. Moreover, if the previous regulatory failure resulted from some systematic, cultural failure of governance, there is no reason to expect the new regime to be any better.

In addition to being simpler to regulate, restrictions on the structure of the pension market makes the system easier for participants to understand. This is probably an advantage initially, as the new régime offers people new choices. However, as people become accustomed to the new system, this simplicity is less important.

Limiting managers to one fund avoids the moral-hazard risk generated by minimum pension guarantees. If a manager were able to 'stream' low-income workers into one fund, they could then take 'wild bets' in high risk / high return assets knowing that the government insures the worker.

Excluding existing financial intermediaries, such as mutual funds and banking conglomerates, from the new pensions industry is common in countries with weak banking systems or poor past mutual-fund performance. The aim of the restrictions was to protect retirement savings from deficiencies in existing financial institutions, often in the form of agency risks that were not checked by the existing regulatory and supervisory system. In some countries, these restrictions were also designed to reduce the market power of these intermediaries. The mandatory nature of pension contributions in many countries increases the government's responsibility for the safety of pension assets.

Some OECD countries which also have mandatory private pension pillars also impose a single instrument requirement. In France, Switzerland, Finland and Australia employers are obliged to set-up pension plans for their employees. There is, however, more flexibility, because asset management may be carried by a variety of financial institutions. In the reforming countries, only licensed pension fund administrators are allowed to manage the funds.

3.2 Adverse effects of structural regulations

The most important adverse effect of structural regulation is that it prevents diversification. Workers are unable to spread retirement savings across different financial intermediaries and different financial products. Hence, non-systematic market risk (the risk of aberrant behaviour by a specific fund manager or investment instrument) is not pooled away. Such risk could be easily diversified away if workers were able to invest in various funds at the same time, though this may raise administrative costs significantly. Also, to the extent that governments impose relative performance rules, and guarantee such performance, these constraints may not be worrying. Some countries, however, do not have performance rules, and in some cases require investors to remain with a specific fund for up to six months before they can transfer to a new one. In these cases, governments will probably be forced to bear the responsibility for funds which consistently underperform the industry.

Another adverse effect arises because excluding existing financial intermediaries precludes the use of existing infrastructure and the potential benefits of economies of scale, raising administrative costs. Instead, investors have to finance the set-up costs of the new industry through fees and commissions (Shah, 1997).

The restriction of one fund per administrator also has significant costs. Workers cannot choose the optimal portfolio that best suits their age, career earnings path, and risk aversion. For example, younger workers have few assets other than their human capital (*i.e.* their future earnings). It is optimal for them to hold assets with a low correlation with their projected wages.[10] It may also be better for younger workers to weight their portfolio towards equities, which have a higher long-run return but also a higher short-term risk, whereas older workers prefer a less risky, bond-weighted

[10] See Jagannathan and Kocherlakota (1996). This is a key attraction of defined-contribution plans over defined-benefit which also tie the worker's pension to future earnings. See Disney and Whitehouse (1994, 1996) and Bodie, Marcus and Merton (1988).

portfolio.[11] Furthermore, workers of a given age will also vary in a range of characteristics, such as occupation and industry and family type, which affect their attitudes to risk. They will also differ in the types of other assets that they hold: housing, durable goods and liquid assets, such as equities, bonds or deposits. The 'one-size-fits-all' portfolio that results from these restrictions means workers are unable to reap the benefits of diversification.

Finally, the structural constraints can behave as barriers to entry in the pension fund industry, limiting competition, and raising administrative costs. This, however, is a very controversial effect, since industry competition and administrative costs is affected by many factors, like the size of the industry, the stage of development of capital markets, and the ability of workers to switch between funds.

3.3 Issues in member choice of investments

The structural constraint that has received most attention is the limit of one fund per administrator. In order to ensure an adequate degree of matching between investor preferences and the portfolio chosen by the funds, the solution would be to liberalise the investment market to give employees choice over how their pension fund is invested.

The main counter-argument is one of cost and complexity. Dividing individual pension contributions between different funds (even when they are offered by the same manager) and transferring investments between funds on members' request adds significantly to the administrative burden. Providing information on different investment options and educating workers about investment choice would also be expensive.

There is also the risk that workers make the 'wrong' choices. Many studies of member-directed investment in 401(k) plans in the United States have found evidence for 'reckless conservatism', with people investing the majority of their fund in low-risk, low-return instruments.[12]

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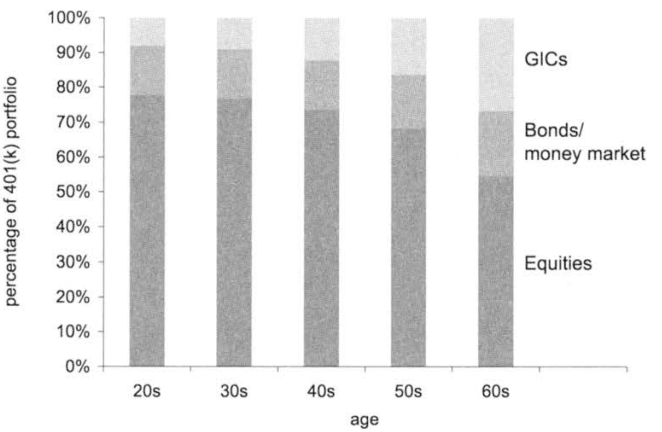
11 Constantinides, Donaldson and Mehra (1998) suggest that liquidity constraints prevent younger workers from investing as much as they should in equities. This behaviour in turn may help explain the 'equity premium' or the excess risk-adjusted return observed on equities compared with short-term government bonds. A defined-contribution pension could alleviate this problem, if workers have some control over their portfolio. See also Blanchard (1993), Jagannathan and Kocherlakota. (1996) and Mehra and Prescott (1985).

12 Regulations protect plans and sponsoring employers from fiduciary responsibilities if members are allowed a sufficiently broad choice of investments with different risk and return characteristics. The vast majority of plans intend to comply with these regulations, allowing members to choose investments (94 per cent of schemes covering 92 per cent of members according to survey data: KPMG Peat Marwick, 1998).

Figure 1 (and Table A.1 in the Appendix) shows the allocation of 401(k) investments from a large survey covering 18 per cent of 401(k) members.[13] Overall, nearly 70 per cent of funds are invested in equities, with 15 per cent in bond or money-market funds and 15 per cent in guaranteed investment contracts. The pattern with age seems prudent. Older workers tend to reduce the proportion in equities and increase the allocation to bond and money-market funds and guaranteed investment contracts. These contracts, provided by insurance companies, provide for a 'holding period' during which a fixed rate of return is paid, guaranteed for the life of the contract. Withdrawals can be made at book value to provide benefits.

There are, however, some important divergences from prudent investment. First, the large allocation to the stock of the employer: 28 per cent of the total invested in equities or 19 per cent of the total fund. A more diverse portfolio would be more sensible. Indeed, given individuals' future employment and wages are already dependent on the performance of their employer, any investment in the employer's stock seems imprudent.



Note: investment in balanced funds is allocated 60 per cent to equities and 40 per cent to bonds, in line with the Investment Company Institute's data for the average balanced mutual fund.

Source: VanDerhei *et al.* (1999).

Figure 1: Asset allocation in member-directed 401(k) pension plans

[13] VanDerhei *et al.* (1999). Earlier studies used much smaller data sets. These include Yaboboski and VanDerhei (1996), who looked at 180,000 members with three large employers. Goodfellow and Schieber (1997) analysed 36,000 participants in 24 schemes. Other papers have investigated investment choices in the Thrift Savings Plan (a defined-contribution scheme for federal employees) – Hinz, McCarthy and Turner (1997) – and in TIAA-CREF (a plan for teachers and college professors) – Ameriks, King and Warshawsky (1997).

There is also evidence that a substantial minority are very conservative. Fifteen per cent of people have no equity investments at all, even though balanced funds or their own employer's stock. Although this may be a rational strategy for people in their 60s (25 per cent of whom have no equity investments), it certainly is not for people in their 20s (of whom 15 per cent avoid equity investments).

In all, however, it is likely that workers would benefit from some degree of choice, like the two funds of the Polish system, where one fund is invested in a 'balanced' manner, and the other is more conservative. The need for at least two portfolios becomes more apparent when one looks into the future. As the new pension systems mature, older workers that are close to their retirement have a high preference for a conservative portfolio.

3.4 Empirical evidence of concentration in fund management

Figure 2 shows the degree of concentration in the pension fund industry in Latin America and, for comparison, in the liberalised fund management market of the United Kingdom. The curves show the cumulative percentage of funds under management moving downwards from the largest fund. (Appendix Table A.2 gives detailed data.)

The pattern in Latin America is remarkably similar, particularly between Chile and Argentina. The largest firm in Argentina, Chile and Mexico accounts for around 20 – 25 per cent of total assets, with the top three holding over half of funds, and the top five, around three-quarters. The situation is similar in Colombia, Peru and Uruguay (not shown in the Figure), where the largest three firms cover 60 – 75 per cent of total members.[14] Bolivia has licensed only two funds.

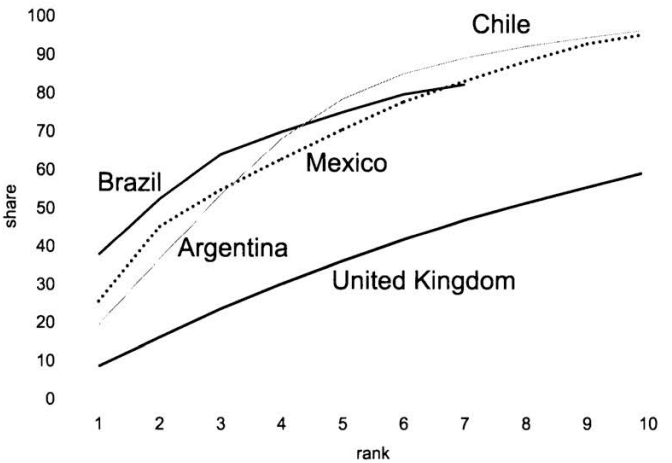
The situation is very similar in Hungary, although 45 funds were licensed initially. The three-firm concentration ratio for mandatory funds is 57 per cent, and the five-firm ratio, 71 per cent. The voluntary pension sector is a little less concentrated. The three-firm ratio is 46 per cent and the five-firm ratio, 66 per cent. These ratios are exactly the same for voluntary funds in the Czech Republic.

The fund management industry in the United Kingdom is significantly less concentrated than in Latin America. Prudential takes just 8 per cent of the market, with under a quarter of funds for the top three and a little over a third for the top five. Even the top 15 only accounts only for around three-quarters of funds. These funds include both individual's personal pensions and externally managed accounts for employer-provided pension plans. The

14 See Queisser (1998), chapter 4.

largest employer fund managing its own assets – Hermes, which runs the pension schemes for the Post Office and British Telecommunications – would rank 15 – 20th.

Other sectors of the pension market in the United Kingdom are more concentrated. Employer-provided plans where funds are managed externally rely mainly on just five fund managers. A recent *Pensions and Investments* survey in the United States found a five-firm concentration ratio of 20 per cent and a 20-firm ratio of 40 per cent, significantly below even the United Kingdom figures of 36 and 72 per cent respectively.



Source: Pension fund regulators in Latin America, HSBC James Capel for United Kingdom.

Figure 2. Concentration curves for fund managers in Latin America and the United Kingdom

In both Chile and Argentina, there has been substantial recent consolidation in the pension funds industry. In 1994, there were 26 funds in Argentina, falling to 18 at the beginning of 1998 and 15 after three recent mergers (see the notes to the Appendix Table). In Chile, there were 21 funds in 1994, 13 at the beginning of 1998 and 10 now. Mexico has also experienced substantial consolidation, despite the relative infancy of its private pension fund industry. The number of fund managers has fallen from 17 in 1997 to 13 at present and some more mergers are expected soon. In other Latin American countries, reforms were more recent and there were fewer funds initially (*e.g.*, nine in Colombia, five in Peru, six in Uruguay, and two in Bolivia). Hence, it is not surprising that there has been little consolidation in these counties. Consolidation has already begun in Hungary, where the

majority of the 45 funds are very small. Hungary has already absorbed five of the smallest funds. Poland expects to have 10 – 12 funds after two years, although regulators expect to license more funds initially.

An important policy question is to whether the concentration in reforming countries is due to entry restrictions and structural regulations or is a natural consequence of the size of the market, the efficiency of capital markets, and the ability of workers to switch between fund managers. In addition, the impact of concentration on industry competition, administrative costs, quality of service and capital markets should be explored.

4. Regulating performance

Some countries – Chile, Argentina, Peru, Uruguay, and Colombia – require pension funds to achieve rates of return above a prescribed minimum, typically related to the industry average (Table 2). Argentina and Chile define their profitability band in relative terms: the minimum of 2 percentage points and 50 per cent (Chile) or 70 per cent (Argentina) above or below the average annual return of the industry[15]. The supervisory agency monitors compliance with the minimum on a monthly basis. All fund managers have to establish a reserve fund with their own capital (invested in the same way as the pension fund). If the reserve is insufficient to top up the fund's return to the minimum, the government guarantees the minimum.

In Peru the minimum return is calculated in the same way as Argentina and Chile, but is not guaranteed by the government. There is no maximum return: the ceiling was eliminated in November 1996. There are also plans to move to a rate-of-return rule based on performance over five years. In Uruguay, the guarantee is expressed in both absolute and relative terms. The state-managed fund guarantees a minimum real return of 2 per cent a year, while private pension managers have to create a guarantee fund (similar to the reserve fund in Argentina and Chile). This fund is drawn down if the return falls below the average of the industry by more than 2 percentage points. There is also a limit on the maximum return that funds can earn. Because the state managed fund – República – dominates the market average (56 per cent of total assets in May 1998), other pension funds are also forced to reach the 2 per cent real return. In Colombia, the minimum return is calculated as the arithmetic average of the return of the pension fund industry over three years and the return over three years of a market portfolio[16]. No

15 Chile is considering changing the application of the rule to a 36-month rolling basis.

16 From 1 July 1995, the composition of the market portfolio is (percentage of total pension industry assets invested in shares × 90 per cent of the average rate of return

ceiling is placed on the returns. The regulator checks compliance with the stipulated minimum return on a three-month basis.

Table 2

Pension fund performance regulations and government guarantees in Latin America

	Minimum rate of return	*Maximum rate of return*	*Government guarantee*
Argentina	relative to average	relative to average	yes
Bolivia	–	–	no
Chile	relative to average	relative to average	yes
Colombia	relative to markets	–	yes
El Salvador	relative to average	relative to average	yes
Mexico	–	–	no
Peru	(relative to average) 2 per cent for República	–	no
Uruguay	relative to average	relative to average	yes

Note: Maximum removed in Peru in November 1996. Minimum legislated but regulations not yet issued.

Source: Pension fund regulators.

Poland will place a lower limit of 50 per cent of the pension funds' average returns or four percentage points below the average. There will not be an upper limit. Hungary regulates the pension funds' performance relative to benchmark indices.[17]

Unlike asset restrictions, performance regulation is rare outside the privatised Latin American pension systems. In Brazil, non-occupational private pensions must deliver a minimum real return of 6 per cent. In Singapore and Switzerland, minimum nominal returns of 4 and $2^1/_2$ per cent respectively are imposed. But these are all absolute not relative limits, and are likely to be *more* damaging, since they encourage fixed-income investments, particularly when the guarantee applies to a short period.

4.1 Rationale

Performance regulation is normally encountered in non-competitive industries, such as utilities. Asset management, in contrast, is a competitive

of the three stock exchanges in the country) + (percentage of total industry assets not invested in shares × 95 per cent of rate of return of a fixed-income index). As of June 1998, only 5 per cent of industry assets were invested in equities, so the market portfolio is mainly a fixed-income index.

[17] Chlon, Gora and Rutkowski (1998) and Palacios and Rocha (1998).

business and barriers to entry are fairly low. Investors are typically able to diversify away fund manager risk by investing in various funds. In the pension systems of Latin America, however, affiliates may only invest in a single fund managed by a specific fund manager. Since investment in pension funds is mandatory, individuals can neither avoid nor diversify away fund manager risk. In some countries, workers may not even transfer between funds within a specified period, which can be as long as six months. Performance rules ensure that the worker does not suffer from the exposure to this diversifiable, non-systematic risk.

4.2 Adverse effects of performance regulation

The main adverse effect of performance regulation is to exacerbate 'herding' behaviour (Vittas, 1998*b* and Queisser, 1998*a*). Smaller fund managers behave like Stackelberg followers (Tirole, 1988), choosing portfolios similar to the larger funds, which have a greater weight in the industry average return. Free from intense rate-of-return competition, the larger funds have an incentive to opt for lower risk-return assets, such as deposits and bonds.

Return ceilings (as in Argentina, Chile, El Salvador and Uruguay) generate moral hazard in fund managers. At a given level of risk, there is no incentive to achieve a return above the ceiling and so the optimal point in the portfolio efficiency frontier might not be reached. Since returns no longer serve as a benchmark for comparing schemes, funds compete through advertising and marketing campaigns. The costs are passed on to consumers in the form of higher commissions.

Portfolio homogeneity can be explained by other factors. First, the limit of one fund per manager forces them all to have a similarly balanced portfolio. Secondly, illiquidity of markets also encourages concentration of asset choice, as funds cannot easily take advantage of buying or selling opportunities. Thirdly, 'yardstick' competition, where managers measure their performance relative to their competitors, is entrenched even in countries with liberal regimes. Fourthly, an institution's trading decisions have informational content, which can be observed by its competitors and inferences drawn. Fifthly, fund managers tend to react in the same way to market news (*e.g.,* the issue of macroeconomic data). Finally, the prudent-person legislation seems to be worded in a way that encourages herding. The United States rules say managers must invest "with the care, skill, prudence and diligence under the circumstances then prevailing that a prudent person, acting in a like capacity and familiar with such mattes would use in the conduct of an enterprise of a like character and with like aims". The Employee Retirement Income Security Act of 1974 goes further than common law. It is

not sufficient to be a careful amateur: managers must act as a prudent professional, experienced and educated in financial matters.

Trustees of employer-provided pension plans surveyed in the United Kingdom reported that they took four main factors into account when determining investment policy: historic returns of different assets, the financial position of the scheme (the relationship between assets and defined-benefit liabilities), the scheme's maturity. Finally, and most important for our purposes, trustees said they took into account the asset allocation of other schemes. Indeed, the majority said they remained close to the average portfolios measured by WM (World Markets) or Combined Actuarial Performance Services (CAPS).[18]

However, compared with countries with prudent-person regulations, the degree of similarity in Latin American portfolios is much greater. Workers end up with practically identical portfolios, whichever their choice of manager.

4.3 Empirical evidence of herding

Herding has become almost a defining characteristic of the pension fund industry in Latin America. Table 3 shows the mean and standard deviations of portfolio weightings of different assets in Chile. In equities, for example, the mean share of the portfolio is 29.4 per cent and the standard deviation is just 1.6.

Table 3

The herding effect in Chile
(per cent of assets of pension funds)

Asset	*Average weighting*	*Standard deviation*
Government bonds	39.4	4.3
Equities	29.4	1.6
Mortgage credit bills	16.8	3.9
Bank instruments	5.3	2.9
Corporate bonds	5.1	1.7

Source: Queisser (1998).

The principal effect of herding is to generate very similar returns between different funds. Table 4 summarises the correlation in returns across pension funds in Argentina, Chile and Peru from the inception of their systems until May 1998. The average correlation between pairs of funds is exceptionally high: 0.98 in Chile, 0.93 in Peru and 0.87 in Argentina. Since these

[18] Pratten and Satchell (1998). See also Bunt, Winterbotham and Williams (1998).

countries have the most flexible regimes, the figures for the other countries are unlikely to be very different.

Table 4
Correlation of pension fund returns

Country	*Mean*	*Range*
Argentina	0.94	0.72 – 0.94
Chile	0.98	0.97 – 0.99
Peru	0.93	0.88 – 0.96

Note: Based on annualised monthly returns. Includes only companies operating throughout the period.

Source: Authors' calculations based on data from Superintendencias de Administradoras de Fondos de Pensiones.

Studies of other countries include Lakonishok *et al.* (1991) on the United States and Blake, Lehman and Timmerman (1997) on the United Kingdom. Pension funds in the United States invest mainly in the equities of large companies: they own 25 per cent of the stockmarket as a whole, but 55 per cent of the largest 100 companies.[19]

4.4 Performance regulation and herding

The link between performance regulation and herding is controversial. Ramirez Tomic (1997) found that herding by Chilean pension funds had (perversely) decreased slightly after the fluctuation band around the minimum rate of return was narrowed. Vs-Prieto and Ramirez (1999) revised Ramirez Tomic's figures, showing that the width of the band caused a statistically significant but very small increase in the degree of herding among Chilean pension funds.

To investigate the impact of return ceiling on herding, we take a closer look at the case of Peru, which eliminated its upper band in November 1996. Until then, the constraint on the return was 50 per cent above or below the industry average. The removal of the upper limit might be expected to lead to greater dispersion of investment across asset classes, as a wider range of risks can now be taken. However, Table 5 shows that the opposite occurred. After the regulation changed, the squared deviations from the industry averages for the largest asset classes, such as equities and government bonds, fell. This suggests that removing upper limits on performance does not provide adequate incentive for taking greater risks than the indus-

[19] Monks (1992) and Brancato (1994).

try average. A more definitive analysis will be possible when data from countries without portfolio limits, such as Bolivia and Mexico, becomes available.

Table 5

Peru: Average pension fund portfolio and standard deviation, 1995 – 98

	Industry Average		*Standard deviation*	
	1995 – 96	*1997 – 98*	*1995 – 96*	*1997 – 98*
Government bonds	27.5	3.8	2.5	1.1
Corporate bonds	6.2	14.8	1.7	1.7
Bank securities	21.9	16.5	1.8	1.3
Time deposits	27.5	27.1	1.4	1.4
Shares	16.1	37.3	1.5	0.7
Mortgage-backed	0.9	0.5	0.6	0.2
Average			1.2	0.8

Note: Data are squared deviation from quarterly industry average, averaged over the periods (March 1995-March 1996) and March 1997-March 1998) and square-rooted.

Source: Authors' calculations based on data from Superintendencia de Administrados de Fondos de Pensiones.

It is possible that other regulations (such as the limit of one fund per manager) and the structure of capital markets (for example, the supply of liquid investments) are more important than performance regulation in explaining herding and the lack of portfolio diversity. What is certain is that performance regulations have reduced – and indeed almost eliminated – the risk of below industry-average performance by specific fund managers to the point where all workers obtain a similar return, irrespective of their choice of pension fund. The result is that there is no real choice between different asset managers, and no performance reason for transferring between managers.

Despite this, transfers in many reforming countries have been running at very high rates. In Chile, for example, 29 per cent of members transferred in 1997. In Argentina, regulations designed to reduce transfers have been introduced, which cut the annualised transfer rate from 18 per cent in December 1997 to 5 per cent in January 1998. Since then, however, the rate has increased again, but only to $7^1/_2$ per cent. Chile is currently looking at reducing transfers by allowing funds to cut charges for long stayers. Poland has adopted such a policy as a way of limiting transfers. With little difference in portfolios between funds, this transfer process is, at least in part, wasteful. And the marketing costs of wooing and keeping new members, including, in Chile, now-banned practices such as gifts and promotions, an indication of the degree of waste. Sweden is to adopt a 'clearing-house' system to try and limit direct marketing. Contributions will be collected centrally and allo-

cated to chosen fund managers, but the managers will not know the identity of their members. This will not, however, preclude indirect marketing and promotional expenditure.

5. Regulating asset allocation

Pension fund investments in all countries in Latin America are tightly controlled. Almost all countries' regulations include five types of limits

- by asset class (a ceiling on the proportion of specific assets classes in a fund's portfolio);
- by concentration of ownership (a ceiling on the proportion of the issue of a company that a given fund can hold);
- by issuer (a ceiling on the proportion of assets in a fund's portfolio issued by the same institution);
- by security (a ceiling on the proportion of individual securities in a fund's portfolio);
- by risk (a minimum acceptable risk rating of securities).

The last four types of controls are a form of prudential regulation, similar to those of other institutional investors, like mutual funds. All countries impose restrictions on concentration by ownership, by issuer and by security.[20] In addition, most reforming countries have restricted the securities eligible for investment to those that have been risk rated. In Chile, the minimum acceptable risk category for fixed-income securities is BBB or equivalent. The law requires *all* investments – not just fixed-income securities – to be rated. This rating system for stocks has meant that only 30, mainly blue chip companies, out of a total of approximately 300 listed were eligible for pension fund investment until 1997. The new capital market reform bill, approved in 1997, extended coverage to more than 200 companies with smaller capitalisation and to other financial instruments, such as project financing, securitised bonds and venture capital.

Concentration of ownership is limited in Chile through ceilings on the proportion of a firm's bond or share issue that any fund can hold, currently 20 and 7 per cent respectively. Minimum diversification requirements are also imposed, limiting funds to 7 per cent of fixed-income securities and 5 per cent of shares from the same issuer. To avoid conflicts of interest, the

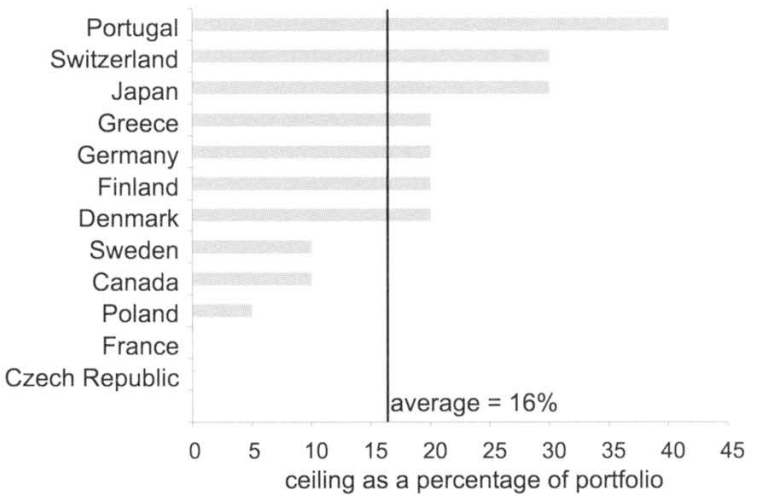
[20] Exceptions include the large balances invested by 401(k) participants in the United States in their employer's stock. Reserve funding systems, such as those in Germany, Japan and Luxembourg are equivalent to investing all of the fund in the sponsoring employer's equity.

limits are set lower for issuers that have financial interests in the pension fund managing companies. There are similar prudential rules elsewhere.

In addition to these prudential rules, some countries also impose direct constraints on asset allocation. Countries tend to take two approaches to regulation of asset allocation, which Vittas (1996) describes as 'Draconian' and 'relaxed'. The latter refers to countries that apply the 'prudent-person' principle as described in section 4.2. (Countries with few or no restrictions on investments are listed at the top of Appendix Table A.3.)[21]

Secondly, countries which impose limits, usually either a minimum investment in public bonds (between 15 and 50 per cent of total assets) or a maximum in equities (between 20 and 30 per cent of total assets), including Denmark, France, Germany, Japan, Norway, Portugal and Switzerland.

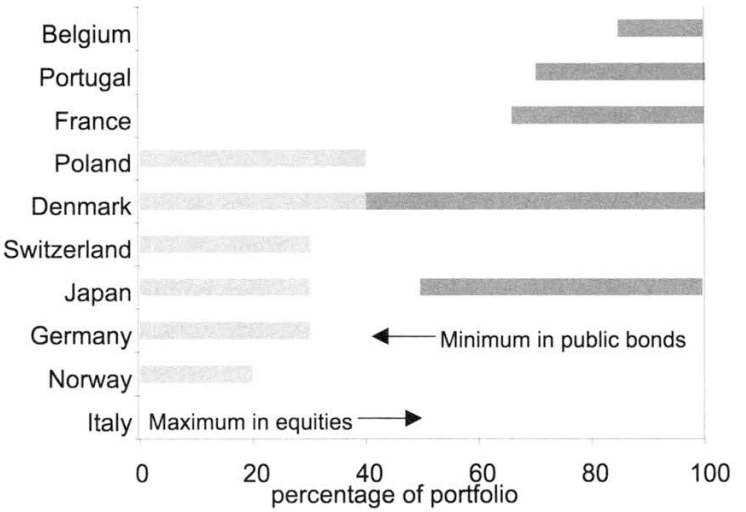
Other countries have quantitative limits on investments in particular assets or asset classes. (These are listed countries in the lower panel of Appendix Table A.3.) For example, around half of OECD countries have limits on foreign investments, averaging around 16 per cent of total funds (Figure 3). Belgium, Denmark, Portugal and France impose a minimum investment in bonds (Figure 4). Six countries limit equity holdings (Figure 4, again) and eight, investment in property.



Source: Laboul (1992), Davis (1998), EFRP (1996), Watson Wyatt (1997), Chlon, Gora and Rutkowski (1998).

Figure 3: Limits on foreign investments in OECD countries

21 See Blommenstein (1998), Davis (1995) and OECD (1998), chapter V.



Source: Laboul (1992), Davis (1998), EFRP (1996), Watson Wyatt (1997).

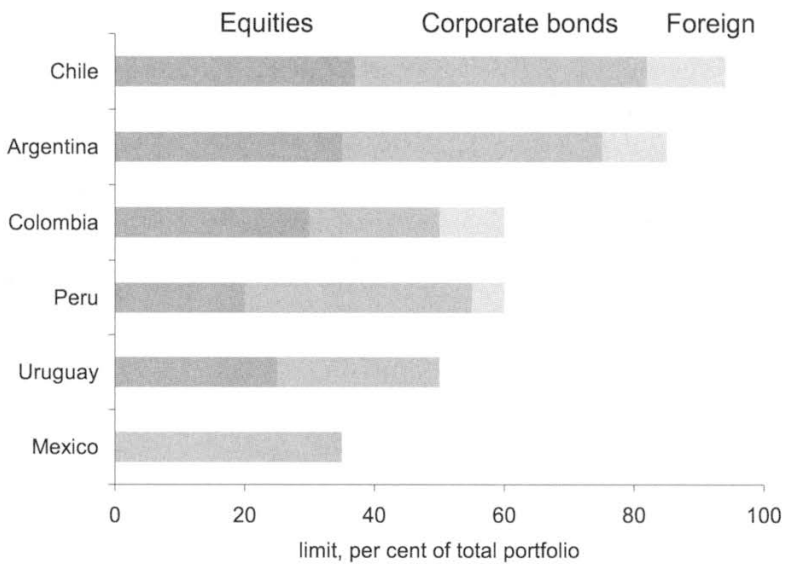
Figure 4: Limits on domestic investments in OECD countries

The portfolio restrictions imposed by regulators in May 1998 in seven Latin American countries are summarised in Figure 5 and shown in detail in Appendix Table A.4. In some countries, although legislation allows a more liberal investment regime, regulators have imposed tighter restrictions. In Chile and Bolivia, the law establishes a band for the ceiling by asset class. The regulator must then fix the ceiling within the value of the band. In Argentina, the law only sets out portfolio maxima. For example, the ceiling on equities is 50 per cent by law, but the regulator permits only 35 per cent of the fund to be invested in this asset class.

All countries have tight portfolio limits, but the most flexible systems currently are Chile, Argentina, Colombia, and Peru (probably in that order). They are the only countries that permit equity and foreign investment (the highest limit on shares is Peru's of 40 per cent, and on foreign assets, Chile's of 12 per cent). In Bolivia, although the legislated limits on shares and foreign assets have been set at relatively high levels (50 – 90 and 10 – 50 per cent, respectively), funds have to invest a minimum amount in government bonds. In the first few months of the system, this was set at $180m per annum, only just below the actual flow of funds into the funds. In general, the limits encourage government debt holdings at the expense of equity and foreign assets.

Uruguay and Mexico have the most restrictive regimes, although, as in Bolivia, they are supposed to be only temporary. In Uruguay, pension funds

are subject to both minimum and maximum limits on investments in government securities. The band is expressed as a percentage of the portfolio, and there is a phased program in which the band is to fall from 80 – 100 per cent in 1996 to 40 – 60 per cent in 2000. The laws allow the amount above the band to be invested in any security, but only time deposits have so far been approved. In Mexico, the regulator has so far only approved fixed-income instruments (largely government securities).[22]



Source: Pension fund regulators.

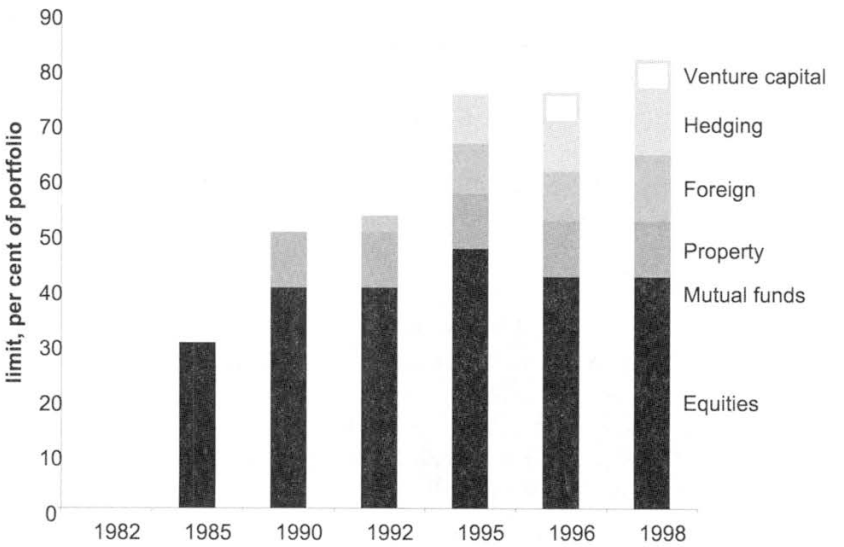
Figure 5: Pension fund portfolio limits, 1998

Investment guidelines for pension funds have tended to become more liberal over time, permitting and extending investments in equities, foreign assets and less liquid assets, such as real estate and venture capital. The development of the regime in Chile, which has the longest experience, is shown in Figure 6. (Details are in Appendix Table A.5.)

In general, the domestic investment regime currently in place in Chile, Argentina, Peru, Colombia and the new regime to be implemented in Poland is more liberal than in most of the OECD countries with statutory portfolio limits. On the other hand, these same OECD countries allow a higher share

[22] The Mexican pensions law also requires that funds must invest in securities that encourage national productive activity, create infrastructure, generate employment, housing investment, and regional development (article 43).

of the portfolio to be invested in foreign securities, and some also permit direct investment in property and lending to affiliates (at least employer pension plans).



Source: Superintendencia de Administradoras de Fondos de Pensiones.

Figure 6: Evolution of portfolio limits in Chile, 1982 – 1998

5.1 Rationale of asset allocation regulations

Two common arguments for controls on international investment[23] are first, that they limit volatile capital flows and hence achieve monetary sovereignty and macro-economic stability (Fontaine, 1997) and secondly, that they reduce capital flight and deepen domestic financial markets (Reisen, 1997). These are problems that are particularly relevant for developing countries, which would explain why in general the ceiling on investment in foreign securities is lower in these countries than in the OECD area.

Five main arguments have been used to justify domestic portfolio limits

- lack of experience in fund management and, in particular, the absence of adequate risk assessment models mean pension funds take 'excessive' risks
- capital markets lack liquidity and transparency

[23] See Candia (1998) for a summary.

- fragile financial markets might jeopardise the sustainability of the pension reform
- limiting the fund's overall risk can alleviate the moral-hazard problem caused by government pension guarantees
- the transition cost to a funded pension system may be prohibitively high for countries with large explicit debt burdens and so can be eased by requiring investment in government bonds

As with restrictions on industry structure, asset-allocation limits are a way of isolating pension assets from agency and systemic risks in capital markets. The prudent-person rule may not be viable where capital-market infrastructure is underdeveloped and prudential controls are not properly in place.

Theoretical models, such as that of Corsetti and Schmidt-Hebbel (1996), support the government-debt argument to an extent. But they provide a case for *floors* on investment in government securities, not for ceilings. If the new pension funds were unwilling to hold the explicit debt burden created by the transition from pay-as-you-go to funded financing of pensions, interest rates would rise. This would, in turn, worsen government finances and crowd out private investment.[24]

All of these arguments apply only temporarily. Over time, the efficiency and effectiveness of fund managers should improve with experience and as prudential standards are adopted and the costs of the transition amortised. Regimes should therefore be relaxed over time and, eventually, move towards prudent-person rules.

5.2 Adverse effects of asset allocation regulations

Limits on asset classes have three main adverse effects:

- constraints on portfolio diversification create systematic market risk, meaning that higher returns can only be achieved at higher relative risk
- pension funds are more likely to control large shares of the markets in which they can invest, creating liquidity problems
- capital market development might be hindered

Modern portfolio theory provides the most critical perspective on portfolio limits. Shah (1997) uses a capital-asset-pricing model to show that asset restrictions hamper the ability of fund managers to earn the highest possible

[24] See also Holzmann (1998*b*) on the issue of debt financing of the transition to a funded system.

risk-adjusted return. Returns as high those in an unconstrained system can only be reached with greater risk. Or, for a given degree of risk, retirement income will be lower. This argument is particularly relevant for developing countries, because the range of investment products is typically very limited when the new pension system was set-up. Further restricting portfolios can therefore have adverse consequence on the degree of risk diversification that can be achieved.

Market power (the second adverse effect) has become more of a problem as systems develop. Figure 7 shows the percentage of the stockmarket owned by pension funds in a selection of OECD and Latin American countries. Chile comes top among Latin American countries, with 11 per cent of equities owned by pension funds. Pension funds account for a third of stocks in the United Kingdom, and a quarter in the United States. In the Netherlands, although pension funds are very large, only a quarter is invested in shares (compared with over three-quarters in the United Kingdom, for example). In contrast, Belgian funds' portfolio is the most heavily weighted in equities after Ireland and the United Kingdom, but the pension funds overall assets are relatively small. In other countries, both the funds' assets and their equity proportions are small.

The concentration of equity ownership in pension funds' hands raises a number of issues. First, liquidity problems. Coupled with the herding effect of performance regulation (see above), when shifts in asset allocation involve the majority of pension funds buying or selling at the same time, market prices can shift strongly (in an adverse direction). When the Chilean investment regime was partially liberalised in 1985, pension funds found it difficult to close their fixed-income positions without adversely affecting prices. Pension funds moved only gradually from fixed-income instruments into stocks.[25] As a result, asset allocations become ossified, and changed only slowly in response to liberalisation of the investment regime. Walker (1993*a*, 1993*b*) looks at differences in risk-adjusted returns between Chilean funds and finds that smaller funds' variable income portfolios perform better than those of larger ones. He attributes this to the 7-per-cent limit of each company's shares that funds can hold. In fixed-income portfolios, he finds no significant differences.

A second important issue arising from the concentration of ownership is corporate governance: whether pension funds make effective owners of stocks. This has been hotly debated in the United Kingdom and the United States, where strong movements for 'shareholder activism' have developed.

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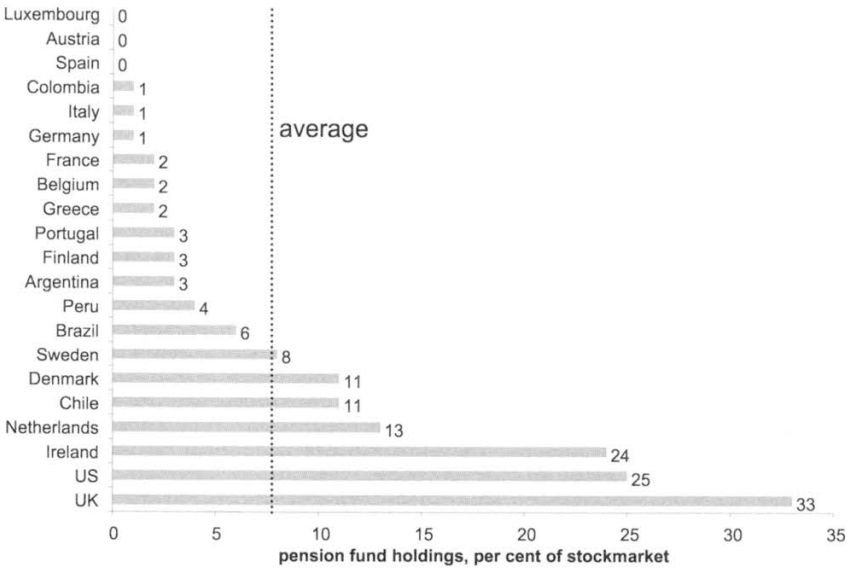
25 The jump in the share of the proportion allocated to equities between 1990 and 1991 (from 11 to 24 per cent) is largely due to an extraordinary stock market real return of nearly 90 per cent that year.



Source: De Ryck (1998); pension fund regulators.

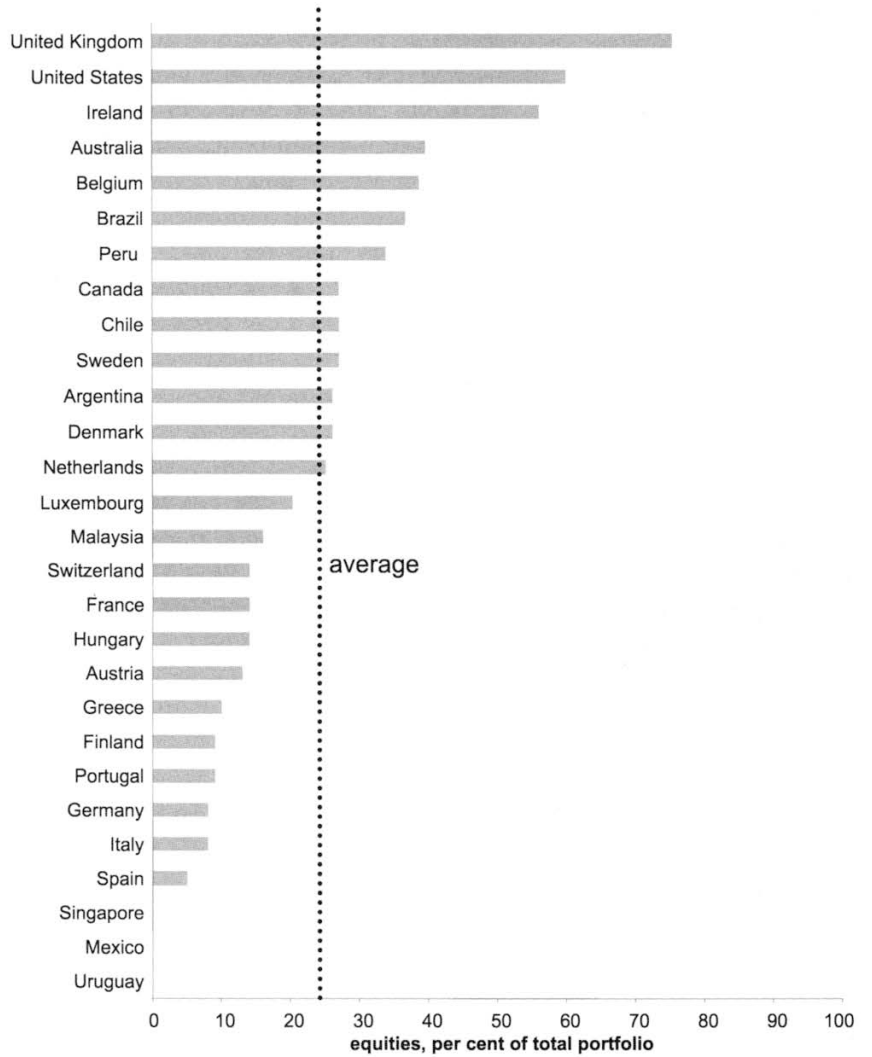
Figure 7: Pension funds' equity holdings as a percentage of total stockmarket capitalisation, 1997

5.3 Empirical evidence of portfolio limits and asset allocations

Asset allocation varies widely across countries. Appendix Table A.6 compares the portfolios of five Latin American countries with a range of OECD countries and two from Asia. Figure 8 focuses on the proportion invested in equities. With the exception of Mexico and Uruguay, the Latin American countries all invest above the average (24 per cent) proportion in equities. The highest proportion of funds are invested in equities in the English-speaking countries. In Australia, Ireland, the United Kingdom and the United States, the average equity holding is 60 per cent of the fund. At the other end of the scale are Mexico and Uruguay, which have only recently reformed their systems, Singapore, where the provident fund invests mainly in bonds, and a number of continental European countries. The first contributions have only just begun to flow into Hungarian pension funds, so most of the assets are currently invested in short-term deposits.

5.3.1 Latin American countries

Table 6 shows the structure of portfolios in Argentina, Chile and Peru in June 1997 along with the legal maxima by type of instrument. For some



Source: De Ryck (1998), Mariscal (1998*a,b,c,d*), Asher (1998).

Figure 8: Equity investments as a percentage of total pension-fund portfolios

instruments, restrictions have been binding.[26] Table 7 shows how the relaxation of portfolio restrictions in Chile over time has led to changes in

[26] Information refers to aggregate portfolios. Restrictions do not necessarily require the aggregated amount to coincide with the legal upper limit. Also, individual funds usually establish lower-than-legal upper limits of their own, to avoid incurring the costs of asset liquidation when changes in the portfolio are required. Another

portfolio composition. Pension funds have taken advantage of the elimination of the ban on investment in equities. By 1997, they had invested nearly one quarter of their portfolio in stocks. The lowering of the limit on mortgage investments (from 70 per cent of the portfolio in 1981 to 50 per cent in 1990) had the opposite effect. However, the dramatic reduction in their portfolio share (from 51 per cent in 1983 to 17 per cent in 1997) is largely a consequence of a supply constraint. In 1997, pension funds owned over one half of all mortgages.

The Table does not indicate the full extent of the impact of regulations on portfolio allocation. Other regulatory controls, such as limits on the concentration of ownership, can create a discrepancy between the effective limit to which the funds are subject and the one stipulated in legislation. In Chile, for example, the 7-per-cent limit of a company's shares that a pension fund can own becomes binding for larger funds long before the overall equities limit of 37 per cent (Walker, 1993b). Iglesias (1990) calculated that, because of the 7-per-cent constraint, the effective limit on equities for the largest Chilean funds was around 14.8 per cent, compared with the overall maximum of 30 per cent at that time.

Pension funds in Latin America have so far only dipped their toes in the water of international markets. Foreign investment has been permitted in Chile since 1992, but only 1 per cent of the portfolio is now invested overseas, mainly via mutual funds.

Table 6

Pension-fund portfolios and limits in Argentina, Chile and Peru

Assets	*Argentina*		*Chile*		*Peru*	
(% fund)	*Actual*	*Maximum*	*Actual*	*Maximum*	*Actual*	*Maximum*
Public-sector bonds	49	50	38	35/50	12	40
Private-sector bonds	5	28	4	30/50	16	35
Certificate of deposit	18	28	8	30/50	34	50
Equities	22	35	29	35/50	35	30
Mortgages	0	28	17	35/50	1	40
Others	6	–	4	–	3	–
Total	100		100		100	

Note: Data relate to June 1997.
Source: Pension fund regulators.

reason for lower-than-legal limits in Argentina is that the supervisor values the funds, and, in exceptional cases, this may result in differences between official prices and those assumed by the pension-fund managers.

Table 7

Asset allocation of funds in Chile, 1981 – 97

per cent of funds	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*
Government bonds	28	26	45	42	42	47	41	35	42	44	38	41	39	40	39	42	40
Mortgages	9	47	51	43	35	26	21	21	18	16	13	14	13	14	16	18	17
Deposits	62	27	3	13	21	23	29	30	22	18	13	11	8	6	7	7	14
Shares						4	6	8	10	11	24	24	32	32	30	25	23
Funds														1	3	3	3
Foreign													1	1		1	1
Corporate bonds	1	1	2	2	1	1	3	6	9	11	11	10	7	6	5	5	3

Source: Superintendencia de Administrados de Fondos de Pensiones.

5.3.2 OECD countries

Table 8 shows portfolios relative to limits for eight OECD countries with quantitative investment restrictions. In most cases, the limits again do not seem to be binding, with the exception of the (soon to be abolished) equity limit in Japan and the (informal) equity limit in the Netherlands. In effect, fund managers in, for example, Germany and Switzerland have been far more conservative than the regulations would allow.

This is also the case in international investment. Even countries with no restrictions invest very few assets abroad. In Belgium, Ireland and the United Kingdom this proportion exceeds 30 per cent. In the United States, the proportion is just 10 per cent. This effect is termed home bias, and there are a number of likely explanations.[27]

First, overseas investments imply additional exchange-rate, settlement and liquidity risks. While it is possible to hedge such risks, this can be costly and, as recent experience has shown, can be difficult in periods of extreme volatility, lack of liquidity or where historic relationships between markets break down. Secondly, pension funds' liabilities are almost wholly domestic, so it seems prudent to match them mainly with domestic assets. Thirdly, the type of benchmark or yardstick orientation of fund managers outlined in section 5.1 may play a role. Fourthly, the world market portfolio, as suggested for pension-fund investment by Kotlikoff (1994), may not be optimal if markets are inefficient.[28] Moreover, there is also evidence that adverse, downward movements in world markets are more correlated than upward (Solnik, Boucle and Le Fur 1996). Finally, some have argued that increased integration of global capital markets mean that the benefits of diversification are decreasing.[29] The correlation of returns between a broad United States equity index (the Standard and Poors 500) and returns in emerging markets was 0.41 in the period 1990–95, compared with 0.27 in 1975–95 (Source: ICFA). A similar effect can be observed between the United States and Latin American markets: the correlations were 0.38 in 1990–95 and 0.24 in 1975–95. Investment returns among the major industrial economies are stronger: between Germany, the United Kingdom and the United States, the correlations are between 0.54 and 0.62. One exception is Japan: the correlation with return s in the United Kingdom and the United States is around 0.05 (Holzmann 1998a, Table A.2).

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27 See Adler and Jorion (1992), French and Poterba (1991), Solnik (1991), Nowakowskic and Ralli (1987) and Candia (1998).

28 Beltratti (1998) and Huel and Cozzini (1990).

29 Kessler (1996), Blommenstien (1998) and OECD (1998).

Table 8

Portfolios relative to regulations in eight OECD countries

	Equities	*Bonds / loans*	*Property*	*Deposits*	*Foreign*
Belgium		+32	−33	0	
Canada					−11
Denmark	−18	+5			−13
Germany	−25		−14		−14
Japan	−3	+11	−18		−23
Netherlands	−7		−4		
Portugal	−15		−47		−11
Switzerland	−17		−35		−21

Source: EFRP (1996).

5.4 Empirical evidence of pension fund returns

In section 4.2 above we established that individual pension funds in Latin America perform very close to the industry average. We now assess performance of pension funds relative to alternative investments.

Funded pension systems of the type introduced in Latin America impose considerable fiduciary duties on governments. First, because government mandates contributions. Secondly, because governments set investment allocation limits, and empirical evidence suggests that 90 per cent of individual funds' returns in Latin America can be explained by the investment regime, with only 10 per cent attributable to investment managers' performance.

In this section, we compare pension fund investment performance with various market benchmark indices. While market benchmark comparison is common in the pension fund industry in developed countries (especially in defined-benefit schemes), they are as yet rare in Latin America. Absolute returns are often quoted to demonstrate the 'success' of the new systems but returns can only be judged against alternatives. The Colombian supervisory agency has established its own market index that makes up half of the stipulated pension fund return. In Bolivia, the contract between the government and the pension funds requires a benchmark to be established, and permits funds would to raise commissions by 10 per cent if they reach the benchmark. But the government has not so far decided what the benchmark should be.

5.4.1 Latin American countries

Table 9 evaluates performance in Chile, Argentina, and Peru against domestic market indices (to May 1998). The IFC index of equity returns

comprises 60 per cent of the balanced portfolio, with 40 per cent from an index of bond returns. The Table gives the average annual real returns before fees and the standard deviation of returns, a simple measure of volatility.

Pension funds only appear to have performed better than the benchmark in Argentina. However, it is important to note that around 25 per cent of the assets of Argentine pension funds are in an 'investment account'. This account, created after the Mexican peso devaluation in 1994, allows funds to avoid marking to market fixed income securities that lost significant value during the crisis. Hence, 'return' figures for the Argentine pension fund industry should be interpreted with caution, since they are likely to be significantly overstated.

Pension fund returns in Peru were only half the return of the balanced portfolio and three-quarters in Chile. However, the volatility of pension fund returns was much less than the variance in the balanced portfolio in all three countries. It must be remembered, however, that these three are the countries with the most liberal investment regimes. In countries with more stringent regimes pension funds can be expected to have performed relatively worse[30].

Table 9

Returns on pension funds and balanced portfolios: Latin America

(%)	*Period*	*Actual return*	*Balanced portfolio*	*Bond index*	*Equity index*
Argentina	1994 – 97	11.9 (5.0)	11.5 (15.2)	8.9 (13.1)	12.8 (18.7)
Chile	1981 – 97	11.2 (9.0)	15.4 (25.7)	7.6 (1.2)	17.9 (43.3)
Peru	1993 – 97	7.7 (3.8)	14.6 (18.9)	n / a	14.6 (18.9)

Note: Balanced domestic portfolio is 40 per cent bonds, 60 per cent equities. Standard deviation in parentheses.
Source: Pension Fund Regulators, National Securities Commission, Central Banks, IFC.

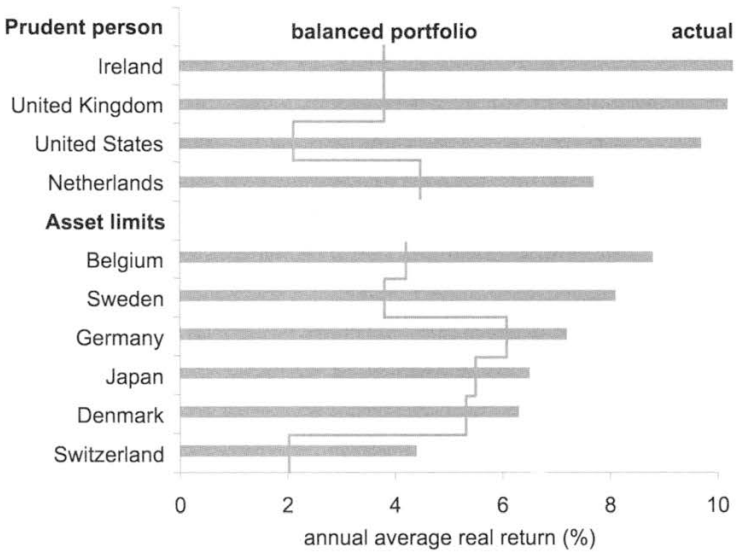
5.4.2 OECD countries: cross-national comparisons

Earlier in this section, we showed that OECD countries' policies can broadly be divided between those with prudent-person rules and those with asset limits. Comparing pension fund performance between the two groups of countries can provide some useful evidence on the effect of investment regulations.

Figure 9 gives data for ten countries. Four – Australia, Ireland, the Netherlands, the United Kingdom and the United States – have systems best

30 An adequate evaluation of performance in countries like Bolivia, Uruguay, and Mexico cannot be carried out, however, because the time period is too short.

described as prudent person. The other six have some form of portfolio regulation (although the degree, of course, varies). The bars show actual returns for pension funds, the lines, the returns on a balanced portfolio (50 per cent bonds, 50 per cent equities). Table A.7 in the Appendix gives more details, and some data for another five countries.



Source: OECD (1998), Tables V.2 and V.3, based on EFRP (1996), Pragma Consulting, Davis (1998).

Figure 9: Returns on pension funds and balanced portfolios: OECD countries

On the surface, the prudent-person countries perform significantly better, earning $9^1/_2$ per cent a year, compared with $6^1/_2 - 7$ per cent a year in the countries with asset limits. But this analysis is rather superficial for a number of reasons. First, it ignores risk. Funds in prudent-person countries have larger equity portfolios. Davis (1998) constructs a synthetic rate of return for pension funds over the period 1967 – 90. He couples data on the portfolio structure of funds in different countries with aggregate indices of the return on different asset classes to estimate pension funds returns. (Actual returns of pension funds will differ from this synthetic return.) Over this period, the standard deviation of returns in prudent-person countries was 11.1, compared with 8.1 in asset-limits countries. Thus, some of the higher return is bought at the price of higher volatility. Secondly, there may be many other correlated factors that explain the difference in returns between the two groups of countries, including other types of regulations, macroeconomic

policies, taxation, structural factors *etc.* But the lines on the Figure, however, show that market returns on a balanced portfolio were somewhat lower in prudent-person countries. Thus, it was pension-fund rather than market performance that differs between the two sets of countries.

5.4.3 United Kingdom and United States

Section 5.3.1 showed the rate of return to pension funds in Latin America relative to market returns. A comparable analysis for the United Kingdom and the United States, both of which have prudent-person rules rather than asset limits, is instructive. Lakonishok, Shleifer and Vishny (1992) investigated the performance of defined-benefit pension funds relative to the Standard & Poors 500 over the period 1983–89. Weighting each funds return equally, the average return fell 1.3 percentage points below the index return of 19 per cent. Weighting funds by value, the under-performance was 2.6 percentage points. Over the same period, other institutional investors, such as mutual funds, outperformed the market. Since there are no asset limits, this under-performance should arise from some other structural factors such as market failure.

A similar analysis for the United Kingdom shows marginal underperformance of pension funds' investments in domestic equities of around 0.3 percentage points over the period 1981–91.[31] Government bond investments also performed at about the market average. The only significant underperformance was in investments in overseas equities, which were three percentage points below market indices, reflecting a conservative strategy with foreign investments.

The lesson of these analyses is that it is too simplistic to attribute the whole of underperformance to investment regulations. Even in countries with prudent-person rules, there is some evidence that pension funds do not achieve market levels of returns.

6. Conclusions and policy implications

Along with housing, pensions will be the largest asset most workers (at least in developing economies) own. Governments that have mandated pension contributions have a fiduciary responsibility and a financial interest (through implicit and explicit guarantees) in ensuring that this important component of workers' savings provides the best possible returns. Govern-

[31] Dilnot *et al.* (1994), section 5.4 and Figure 5.4, based on data from Combined Actuarial Performance Services (1993).

ments have used this responsibility to justify Draconian regulations of pension funds' structure, performance, and investment allocation.

The result of these regulations is that pension funds' portfolios are very similar and their returns practically indistinguishable. Such regulations provide little incentive for improved efficiencies in investment management. They also fail to offer workers significant portfolio choice. Although workers have their individual accounts, they have no real choice over how their contributions are invested. They have little real responsibility for determining their own financial future. A policy implication of the evidence presented in the paper is that investment regimes should be liberalised to allow diversification. Funds should be able to compete in offering different risk-return strategies, to allow workers with different degrees of risk aversion and at different points in their lifecycle to choose different portfolios.

Restrictions when a reform is first introduced are probably necessary to bolster confidence in the system. Much of the risk at this point comes not from market volatility, but from systemic risk that could lead to the collapse of one or more of the private funds, or indeed, of the whole system. If new financial intermediaries and the restriction of a single fund manager per investor are deemed desirable, then performance regulations may also be required to ensure that investors in mandatory systems are not exposed to fund manager risk that they cannot diversify away. The key policy question then becomes how quickly should the system be liberalised? In Chile, which pioneered this type of reform, the answer was probably fairly slowly. In countries that have reformed more recently, the success of other countries' models should allow for far more rapid relaxation of investment restrictions. A medium-term goal should be to allow managers to offer different types of funds. The long-term goal should be to move towards a 'prudent-person' rule. This kind of regulation also has its faults, but is still preferable to a long-term policy of quantitative investment restrictions.

Governments have a responsibility to ensure that mandatory pension funds are managed well. It is therefore not unnatural that developing countries with a history of poor performance of financial institutions act on the side of caution. Draconian regulations are designed to protect pension funds from fragile and underdeveloped financial systems, both in Latin America and in the transition economies of Eastern Europe and Central Asia. These regulations are not cost free, however, and it is critical that governments evaluate carefully the impact of the regulations they impose, since they can undermine many of the objectives of pension reform.

Appendix. Detailed data tables

Table A.1

Asset allocation in member-directed 401(k) pension plans

	Equity	*of which, own employer's stock*	*Bond / money funds*	*Guaranteed investment contracts*
20	77	*22*	14	8
30	76	*26*	14	9
40	72	*29*	14	12
50	67	*29*	15	16
60	53	*28*	18	26
Total	**68**	***28***	**15**	**15**

Note: investment in balanced funds is allocated 60 per cent to equities and 40 per cent to bonds, in line with the Investment Company Institute's data for the average balanced mutual fund.

Source: VanDerhei *et al.* (1999).

Table A.2

Concentration of fund managers in Latin America and the United Kingdom

United Kingdom		*Chile*		*Mexico*		*Argentina*	
Prudential	8.2	Provida / Union	23.2	Bancomer	25.1	Consolidar / Fecunda	18.9
Mercury	15.8	Habitat	42.5	Banamex	44.8	Origines / Claridad	36.3
Schroder	23.2	Cuprum	59.8	Inbursa	54.4	Maxima	53.1
Commercial Union	29.8	Santamaria	72.3	Bital	62.5	Siembra	67.8
Morgan Grenfell	35.9	Summa / Bansander	84.7	Profuturo	70.2	Previnta	78.0
Fleming	41.4	Proteccion	94.3	Garante	77.3	Nacion	84.7
PDFM	46.6	Planvital	96.9	Santander	82.7	Generar	88.8
Standard Life	51.0	Magister / Qualitas	98.7	XXI	87.9	Arauca Bil	91.8
INVSECO	55.2	Aporta	99.5	Banorte	92.4	Previsol	94.0
Norwich Union	59.3	Fomenta	100.0	Bancrecer / Dresdner	95.1	Prorenta / San Jose	96.1
Legal & General	62.8			Previnter	96.7	Future	98.0
BZW	66.3			Atlantico-Promex	97.7	Ethika	98.7
Threadneedle	69.2			Confia-Principal	98.4	Unidos	99.3
Hill Samuel	72.1			Tepeyac	98.8	Profesion + Auge	99.7

Note: Columns show the cumulative percentage of total funds under management. Figures for Argentina includes three recently announced mergers (Consolidar / Fecunda, Origines / Claridad, Prorenta / San Jose), as does Chile (Provida / Union, Summa / Bansander, Magister / Qualitas).

Source: Pension fund regulators in Latin America, HSBC James Capel for United Kingdom.

Table A.3

Pension asset regulations in OECD countries

	Domestic	*International*
Prudent person		
Austria	–	no limits
Australia	no limits	no limits
Iceland	–	no foreign investments by public-sector funds (*e.g.* civil servants and fishermen)
Ireland	no limits	no limits
Netherlands	no limits (informal 30 % limit on equities)	no limits
New Zealand	no limits	no limits
Spain	–	no limits in other OECD countries
United Kingdom	no limits	no limits
United States	no limits	no limits
Asset limits		
Belgium	Minimum 15 % in public bonds, maximum 40 % in property, 10 % in deposits	no foreign investments
Canada	7 % maximum on property	tax on foreign assets over 10 %
Czech Republic	–	no foreign investments
Denmark	Minimum 60 % in domestic debt; property, equities and mutual funds maximum 40 %	20 % limit
Finland	–	20 % limit in other EU states (lower limit on property, higher on government bonds)
France	minimum 50 % in EU public bonds (AGIRC / ARRCO) minimum 34 % in public bonds, 40 % limit on property and 15 % Treasury deposits (insured funds)	no foreign assets (insured funds)
Germany	guidelines: 30 % limit on EU equities, 25 % EU property	20 % limit on foreign assets overall; 6 % limit on non-EU equities, 6 % on non-EU bonds
Greece	–	20 % limit on domestically based mutual funds, which can invest abroad
Italy	limited to public bonds, deposits, property, mortgages, investment funds (insured funds)	no limits
Japan	guidelines (being phased out): 30 % limit on equities, 20 % property; minimum 50 % bonds	30 % limit on foreign assets; 10 % limit in any one country
Norway	20 % limit on equities, 30 % on private bonds or loans	no limits
Portugal	minimum 30 % in public bonds, 50 % limit on property	40 % limit

Continued Table A.3

	Domestic	*International*
Asset limits		
Poland	20 % limit on bank deposits or securities, 40 % in listed equities, 15 % in open-ended investment funds, 5 % in closed-end funds, 15 % in publicly traded municipal bonds, 5 % in untraded bonds; property, commodity and derivatives investments prohibited	5 % limit on foreign assets
Sweden	majority of investments in listed bonds and loans	5 – 10 % limit, depending on type of fund
Switzerland	30 % limit on equities, 55 % on property	30 % total limit, 30 % in foreign bonds, 25 % in foreign equities, property 5 %

Source: Laboul (1992), Davis (1998), EFRP (1996), Watson Wyatt (1997), Chlon, Gora and Rutkowski (1998).

Note: – indicates data are unavailable.

Table A.4

Pension fund portfolio limits, 1998

Asset	*Argentina*	*Chile*	*Colombia*	*Mexico*	*Peru*	*Uruguay*
Government securities (total)	65	50	50	100	30	75 – 85
Federal	50					
Provincial and municipal						
Central bank	15				30	
Corporate bonds (total)	40	45	20	35	35	25
Long term	28					
Short term	14			10		
Convertibles	28	10				
Privatised firms	14					
Bank bonds			50	10	25	25
Mortgage-backed securities	28	50	30			30
Letters of credit		50				
Fixed-term deposits	28	50			30	30
Short-term margin loans					10	
Repurchase agreements			15			
Shares, public companies	35	37	30	0	20	25
Shares, workers' shares					20	
Preference shares				10		
Shares, privatised companies	14					
Stock index instruments			5			
Securitised instruments			20			
Primary issues, new ventures				10		
Mutual funds	14	5	5		10	0
Real estate funds		10				
Venture capital funds		5				
Securitised credit funds		5				
Direct investment funds	10					
Foreign securities (total)	10	12	10	0	5	
Government securities	10					
Corporate bonds / shares	7					0
Fixed income		12	10			
Variable income		6				
Hedging instruments	2	9			10	

Note: Argentina: The Nacion pension fund must invest between 20 and 50 per cent (or $300m) in provincial and municipal bonds to finance regional projects. *Colombia:* a limit of 15 per cent is imposed on investment securitised instruments backed by non-admitted assets, real estate and infrastructure.

Source: Pension fund regulators.

Table A.5

Evolution of portfolio limits in Chile, 1981 – 1998

Asset	*1981*	*1982*	*1985*	*1990*	*1992*	*1995*	*1996*	*1997*	*1998*
Government securities	100	100	50	45	45	50	50	50	50
Corporate bonds	60	60	40	40	40	40	45	45	45
Convertible			10	10	10	10	10	10	10
Mortgage-backed securities	70	40	40	50	50	50	50	50	50
Letters of credit	70	40	40	50	50	50	50	50	50
Fixed term deposits	70	40	40	50	50	50	50	50	50
Shares, public companies			30	30	30	37	37	37	37
Mutual funds				10	10	10	5	5	5
Real estate funds				10	10	10	10	10	10
Venture capital funds							5	5	5
Securitised credit funds							5	5	5
Foreign securities					3	9	9	12	12
Fixed income						9	9	12	12
Variable income						$4^1/_2$	$4^1/_2$	6	6
Hedging instruments						9	9	9	12

Source: Superintendencia de Administradoras de Fondos de Pensiones.

Table A.6

Pension fund portfolios, selected countries

(% of portfolio)	*Equities*	*Fixed interest*	*(% of portfolio)*	*Equities*	*Fixed interest*
United Kingdom	78	14	Luxembourg	21	61
United States	62	27	Malaysia	16	55
Ireland	58	30	Switzerland	14	69
Australia	41	15	France	14	38
Belgium	40	46	Hungary	14	19
Brazil	38	38	Austria	13	71
Peru	35	60	Greece	10	53
Canada	28	48	Finland	9	61
Chile	28	68	Portugal	9	27
Sweden	28	62	Germany	8	74
Argentina	27	70	Italy	8	63
Denmark	27	63	Spain	5	76
Netherlands	26	63	Singapore	0	70
			Mexico	0	96
Average	**24**	**56**	Uruguay	0	100

Source: De Ryck (1998), Mariscal (1998a,b,c,d), Asher (1998).

Table A.7

Returns on pension funds and balanced portfolios: OECD countries

Annual average, real, %	*Actual returns*		*Balanced domestic portfolio*
	1984–96	*1984–93*	
Prudent person	**9.5**	**9.5**	**3.4**
Australia			2.7
Ireland	11.0	10.3	3.8
Netherlands	8.0	7.7	4.5
United Kingdom	10.0	10.2	3.8
United States	9.0	9.7	2.1
Asset limits	**6.5**	**6.9**	**4.0**
Belgium	9.0	8.8	4.2
Canada			2.2
Denmark	6.0	6.3	5.3
France			5.2
Germany	7.0	7.2	6.1
Italy			1.9
Japan		6.5	5.5
Spain		7.0	
Sweden		8.1	3.8
Switzerland	4.0	4.4	2.0

Note: Balanced domestic portfolio is 50 per cent bonds, 50 per cent equities.

Source: OECD (1998), Tables V.2 and V.3, based on EFRP (1996), Pragma Consulting, Davis (1998).

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