Record: 1

Title: Pension Funds in Infrastructure Project Finance: Regulations and Instrument Design.

Authors: Vives, Antonio

Source: Journal of Project Finance. Summer99, Vol. 5 Issue 2, p37. 16p. 9 Charts.

Document Type: Article

Subject Terms: *Pension trust management
*Investment management
*Infrastructure (Economics)
Developing countries

NAICS/Industry Codes: 523999 Miscellaneous Financial Investment Activities
523930 Investment Advice
526112 Non-trusteed pension funds
525110 Pension Funds
523920 Portfolio Management
524292 Third Party Administration of Insurance and Pension Funds
526111 Trusteed pension funds

Abstract: Deals with the symbiotic relationship of pension fund management and infrastructure investment in developing countries. Move of the countries in Latin America to adopt private pension fund management and private participation in infrastructure projects; How the private sector participation has affected the capital market; Investment needs of private pension plans.

Full Text Word Count: 8554

ISSN: 1082-3220

Accession Number: 2294976

Database: Business Source Complete

PENSION FUNDS IN INFRASTRUCTURE PROJECT FINANCE: REGULATIONS AND INSTRUMENT DESIGN

In the nineties, Latin American countries undertook two reforms rather intensively: they allowed private participation in both pension fund management and infrastructure investment. Many countries in other parts of the world have undertaken one or the other, but not both at the same time (with the exception of the United Kingdom, which closely resembles the case of many countries in Latin America and pioneered private participation in infrastructure). These dual reforms have created a sizable, mostly domestic source of long-term funds, while at the same creating a sizable need for domestic investment funds. Never-theless, in spite of the potential benefits of a happy marriage, a relationship has not yet been developed.

The liberalization of many emerging market economies and the attendant realization of the many benefits of private participation in infrastructure have resulted in a considerable need for private capital. This liberalization, occurring in the context of relatively underdeveloped financial markets, has meant reliance on foreign capital to finance growing needs, with the concomitant risk for the economies of unexpected devaluations and/or sudden reversals of those flows. Even though foreign capital flows into infrastructure projects are more resilient than portfolio investment, recent crises have reduced the willingness of investors to provide capital for emerging markets. As a result, projects have been subjected to severe foreign exchange risks.

This situation underscores the importance of developing domestic sources of long-term capital. The major, and sometimes only sources of domestic long-term capital are local pension fund resources, which, in addition, can contribute to the development of local financial markets. It is imperative that these resources be tapped by infrastructure projects. If they are to tap local pension-fund resources successfully, project developers and the international project finance industry must be aware of the special needs of these funds. Even though the discussion is concentrated on Latin America it has implications for most countries with privately managed pension funds and private infrastructure.

The purpose of this article is to promote this symbiotic relationship, outlining the conditions under which sources and uses of long-term resources can meet and focusing the attention of both sides on the benefits of a properly structured relationship. There are benefits for both parties that can be exploited through a better mutual under-standing of the needs of the other party. We do not propose that special subsidies, guarantees or tax benefits be granted to infrastructure works to make them attractive to private pension fund managers. Nor do we propose that public pension fund resources be directed or forced into infrastructure investments on account of their positive externalities or social benefits. Private infrastructure investment instruments must be structured so that they fit into the investment strategies of private pension funds. At the same time, appropriate changes in the pension fund regulatory frame-work should be encouraged. We propose a strictly voluntary private to private relationship, albeit with the participation of the public sector as grantor and regulator of private activities. The public sector has the important role of facilitator; it controls most of the rules of the game and its actions in either sector can make or break the relationship.

Before embarking on the purpose of this article, which is to discuss the structure of infrastructure financial instruments needed to capture pension fund investments and the consequent policy and regulatory reforms needed in most developing countries, we briefly review the potential sources and needs for investment, the characteristics of the funds and of the projects, the current limitations on the relationship, and the benefits for both parties. The article concludes with a discussion of the implications this can have for developed countries such as the U.S. and most of Europe, where private participation is lacking in both areas: mandatory pensions and infrastructure.

PRIVATE PENSION FUND INVESTMENTS IN LATIN AMERICA

Since the pioneering effort of Chile, which took place in 1981, many Latin American countries have undertaken pension fund reform, including the introduction of private management of mandatory pension savings along with, or as a replacement for, the public pension system.

These pension funds have accumulated a significant amount of resources.[sup1] Exhibit 1 shows that Chile has the largest pension funds relative to the size of its economy. At the end of 1998, accumulated assets exceeded US$31 billion, representing 40% of GDE Other regulated systems (mandatory and voluntary) are relatively recent, and more are added every year (the most recent one being that of El Salvador, which was established in 1998; a private pension fund system is slated to start in Venezuela in late 1999). While most systems are relatively new, they are growing rapidly, both as a result of the profitability of investments and the number of new entrants. Chile's private pension fund system has been in operation for almost twenty years, and in that period resources have grown at an annualized rate of 29.4% (in local currency). Most recent systems have posted very high growth rates. For example, in Argentina, pensions increased at a rate of 29% a year over three years; in Colombia the rate of increase was 39% over two and a half years; in Mexico it reached 168% over two years; and in Peru, 22% over three years. Nevertheless, they are still small when compared with their potential and relative to the size of the respective economies. If the countries that have started private pension funds were to reach the levels attained in Chile, Latin America would have over

US$560 billion. This is a significant amount that the underdeveloped and thin capital markets would not be able to absorb, forcing investments in government paper or bank instruments. (Exhibit 7 gives an indication of capital market depth.) There is a need to develop those markets and to introduce new instruments, which the pension funds are in a position to support.

INVESTMENT REGULATIONS

In order to protect the interests of the affiliates, all the countries of Latin America in which private pension funds operate regulate the composition of portfolios. As these portfolios are expected to provide or supplement the pensions that were previously provided by the state, they tend to place strict limits on allowable investments and the performance of the portfolio.

These regulations[sup2] tend to favor stability and uniformity of investment portfolio performance, which tends (however unwittingly) to exclude worthwhile, and economically and socially desirable investments like the provision of new infrastructure. A few regulations that further exacerbate this difficulty must be overcome if infrastructure investments are to be a part of pension fund portfolios.

The regulations cover the range of allowable investments, their liquidity, valuation, risk characteristics, and other regulations on the portfolios themselves, such as minimum return. They also govern the management, allowing freedom to switch administrators, the number of portfolios per affiliate, portfolios per administrator, and allowable managers. Still other regulations set limits on the liquidity and valuation of investments and limit investments to rated instruments. Some of these regulations make it almost impossible to invest in infrastructure assets or at least tend to discourage such investments. Appendix B presents a summary of the most relevant regulations in the countries listed in Exhibit 1.

Regulations That Hinder

Ratings. In order to account for the risk of the allowable assets and the rules set by regulators, pension fund administrators tend to require that non-government paper be rated by an independent agency and have a local investment-grade rating. Those pension schemes that allow investments in foreign assets require an investment-grade rating for such assets, rated by internationally recognized credit rating companies. Even equity investments are sometimes limited to rated firms.

Liquidity. To minimize problems with the valuation of security assets, most regulations prohibit, or in the best of cases, limit the holding of assets that are not traded or do not have a high degree of liquidity in major organized exchanges. For the purpose of identifying the level of liquidity, some regulations use liquidity indexes.

Valuation Rules. Most regulations require mark-to-market valuation, which by itself tends to favor investments whose prices are frequently quoted. This, again, would make investments in new infrastructure less likely to occur, because the instruments backing those assets would tend to be traded infrequently.

Regulations That Discourage

Allowable Investments. As of 1999, the most restrictive private pension fund regulation is that of Mexico, where the only allowable instruments are debt securities issued or guaranteed by the federal government or the central bank. The only exception is the investment of up to 35% of the assets of the fund in debt securities issued or guaranteed by private companies and financial institutions with high credit rankings. Also, at least 65% of the portfolio should be invested in paper with maturities and/or review of interest rates not more than 183 days, some of which must be invested in securities issued by the government or central bank with maturities of less than ninety days. At the end of 1998, the portfolio composition of all pension fund administrators in Mexico included 97% government or central bank paper. In addition to being conservative, these rules, which are expected to be temporary, aim to ensure financing for the government liability created by the transition from the old pay-as-you-go (PAYG) public pension system to the private system. The most liberal and oldest of the pension fund regulations are those of Chile, which allow investments in stocks, foreign securities, real estate, infrastructure, and most negotiable instruments with an investment grade rating. These regulations have been progressively liberalized, as capital markets became more developed and confidence in the operation of the system increased.

These investment regulations discourage investment managers from investing in infrastructure assets, as most (with the exception of Chile's) make the rules of liquidity, valuation and ratings applicable to all investments. This, in effect, limits direct investment in projects and, in only a few cases, allows indirect investments through the purchase of stocks of well-established infrastructure corporations or mutual funds. Furthermore, investments in non-recourse or limited recourse greenfield projects (i.e., investments that depend on the cash flows of newly constructed or under-construction projects) are even more restricted. These projects do not have an established track record, are rather risky, illiquid, and in most cases lack a rating (let alone an investment grade rating).

Performance Regulations. In order to protect the value of the affiliate's pensions against over-aggressive behavior by the administrators and to minimize the need for supplementary public pensions, most countries regulate the performance of portfolios. In many cases, they are required to earn minimum returns, measured in either absolute (nominal or real) terms or relative to the performance of other pension funds. In the case of Chile, administrators are required to earn a minimum, which is the lesser of 200 basis points below the average system return or half the average return. Those that do not meet this criterion are required to compensate the portfolio with resources from a fluctuation reserve, established with prior earnings exceeding the minimum, and/or the administrator's own capital. In the case of Argentina, minimum returns are measured as 30% below the system average.

In order to avoid underperformance at a given point in time, pension fund managers tend to avoid volatility (inherent in infrastructure) and to invest in similar portfolios, reducing incentives for taking greater risks, while diversifying their portfolios within the limits allowed by local financial markets, thereby precluding larger returns. Quantitative evidence from the Chilean system presented by Shah [1997] shows that there are minimal variations in portfolio composition.

This herding behavior is not exclusive of regulated funds. It also can be found in the management of private corporate pension funds, where managers often compare their performance with the industry average or with a standard benchmark and, in an attempt not to report under-performance relative to the average, tend to imitate each other's portfolio. This tendency is obviously not as prevalent as that forced by regulation.

Switching. Most regulations allow affiliates to switch accounts between pension fund administrators once or more in a given year. This option, combined with restrictions on portfolio composition and minimum performance requirements, has an impact on marketing expenses. Such an option also tends to reinforce herding behavior because administrators do not want to lose customers on account of reporting volatility arising from infrastructure investments.

One Portfolio Per Affiliate. All Latin American countries require that all pension assets of the affiliates be invested in the same portfolio, although several are considering a change. This precludes the existence of portfolios with different risk-return characteristics, that could adapt to the affiliate's risk tolerance and life-cycle. Again, this restriction conspires against the incorporation of illiquid assets. The model of individual retirement accounts sponsored by private U.S. corporations is a good one. In this case, affiliates can opt to divide investments among several portfolios offered by the fund manager in order to tailor the combined portfolio based on age or risk tolerance, or to take account of other investments they may have. Obviously in this case there is no bailout of pensioners by the government, as is the case in some Latin American countries, which guarantee a minimum pension. Moreover, the level of development of the capital markets and the investment sophistication of the affiliates in Latin America make it more difficult to allow this freedom. A better solution would be to allow flexibility in the choice of portfolio within a given pension administrator, after the pensioner has a part of his/her savings in one that guarantees a minimum pension.

One Portfolio Per Administrator. Pension fund managers can only offer one portfolio to their clients. Combined with the restrictions described earlier, this one also reinforces the convergence to the mean portfolio and precludes the incorporation of riskier assets. In Mexico, for example, the law establishes that pension fund administrators could manage several pension fund companies with different portfolio composition and risk levels, although the current, very strict investment and minimum-return rules restrict the viability of this option.

Monopoly of Pension Asset Management. Almost all Latin American countries currently restrict the management of pension assets to institutions exclusively devoted to this end, often regulated by a special regulator. In Colombia, for example, the Bank Superintendency regulates pension fund administrators. Competition from banks, insurers, and other financial institutions is not permitted. While this allows for easier oversight of the industry, it also precludes the offering of alternative investment vehicles, which in general have had better returns than pension fund portfolios, albeit with greater risk. This choice, which should become available as the system matures, would allow for greater competition, portfolios that are more along the risk-return frontier, and a stronger interest in infrastructure assets, particularly as financial institutions gain experience in infrastructure finance. This is not to suggest that oversight be eliminated. As investment and pension management services become specialized, the industry will continue to need regulation to protect the interests of affiliates. But, as the system and financial markets mature, it will become more obvious that there are significant similarities between the pension fund and the banking and insurance industries, and that all can operate in the same markets with common regulations.

Portfolio Composition

Given the foregoing, the portfolio composition of pension funds tends to be rather conservative. The least conservative system is that of Chile because that country's system is more mature.

The case of Chile, with its longer history, illustrates the possible evolution as funds mature and tend toward riskier portfolios, even within the very conservative limits set by regulations. At the beginning, most assets were invested in essentially risk-free securities, as is the current case in Mexico (although in this case pension assets also are used to finance the deficit in the transition from the old to the new system). As time went by and capital markets developed, funds started to invest in mortgage bonds and corporate securities. By 1994, they were investing as much in these securities as they were in public securities. This changed in 1998, when the stock market was hit by uncertainties associated with the Asian crisis and funds moved into bank deposits and diversified internationally.

In 1990, pension funds were authorized to invest in foreign securities subject to a very low and slowly increasing limit (currently set at 12%). Foreign investments started in 1993, increasing by 38% in 1998 to reach US$1,785 million. Investments in venture capital and infrastructure funds were permitted in 1993; in 1995 the limit on equity holdings was raised to 37% (Vittas [1996]).

Given their relatively large size, Chile's pension funds also have contributed to the development of the market. They have been instrumental in developing credit rating agencies (clasificadoras de riesgo), giving depth to the markets, stabilizing prices (because they are long-term investors), developing new products to attract them, and opening the possibility of investment in infrastructure funds as we are exploring in this article.

As can be seen, when private pension funds mature and capital markets develop, the range of investments tends to widen and move away from concentration in government securities. The current, very restrictive regulations can be expected to be liberalized as the systems gain the confidence of regulators and self-regulation is developed. Eventually those systems will adopt the prudent person rule -- no restrictions, just common sense -- that governs the pension programs of private corporations or the most advanced systems in Europe, like the Netherlands and the United Kingdom. This trend needs to develop for the inclusion of infrastructure as an allowable investment.

Infrastructure Investments

The only Latin American countries that now explicitly allow investments in infrastructure (including greenfield projects) are Argentina, Colombia, and Chile. Pension fund managers in those countries are able to participate in infrastructure development pro-grams and public services only indirectly by purchasing paper issued by specialized infrastructure investment funds or titulos securitizados (securitization), which spread the risks involved. Obviously, those systems that allow investments in private securities allow, indirectly, investments in infrastructure assets, through the purchase of mutual funds or stocks and/or bonds of the corporations owning those assets. Nevertheless, some of these assets may not have the required rating and/or liquidity necessary to comply with other regulations, and, as such, may have to be exempted if project finance investments are desired. Furthermore, most managers would have to acquire the capabilities to perform due diligence on these investments.

The case of investment in established corporations that have a significant portion of their assets in infrastructure falls within the category of investments in stocks or bonds of traded corporations and is rather straightforward. As a result, we will not address it here. We are more concerned with investments in new infrastructure projects (project finance). Although no precise figures exist, in Chile the private pension system has invested in several road and airport concessions by investing in the concession partners. In all cases, this involved investment in already existing assets, not greenfield projects. In the case of Argentina as of the end of 1998, approximately 0.6% and 5.8% of total pension assets were invested in bonds and shares, respectively, of infrastructure-related projects or companies.

The newly created pension funds should hope to emulate U.S. corporate pension funds, which operate in a very well developed financial market. As of the end of 1998, the defined-benefit corporate pension funds among the top 1000 funds in the U.S. had an average of 5.1% of their assets in private equity and real estate (these assets are the most similar to infrastructure projects) and 11.8% in international equity.[sup3]

Investment Needs of Private Pension Funds

The regulations described earlier determine, in most cases rather narrowly, the potential investments of pension funds. If these regulations were relaxed, pension funds would probably invest in other instruments. In particular, they are likely to be interested in instruments that:

- Provide higher returns;
- Provide opportunities to reduce risk through diversification;
- Provide inflation protection;
- Do not enhance volatility of reported returns;
- Do not add undiversifiable risks (like foreign exchange exposure);
- Have liquidity; and
- Provide short-term and mid-term cash flows.

Unfortunately, most financial markets in the developing countries would not have the instruments needed, even if the regulations were relaxed. There-fore, instruments will have to be created as financial markets develop. If properly structured, infrastructure financial instruments can meet some of those needs and, as a result, should be attractive to pension funds. Nevertheless, infrastructure investment is an inherently risky activity which is, both because of its strategic inflexibility (it cannot be moved or used for other purposes) and the fact that it provides basic public services subject to political interference (which could be reduced as a consequence of private pension fund participation). In this regard, it is important to distinguish between investments in well-established firms that provide infrastructure services (which should be treated as regular investments) and investments in new projects, which require special consideration in terms of the regulatory environment and financial instrument design.

In terms of the latter, we propose that private pension funds invest between 1% and 5% in infrastructure project finance assets. Needless to say, this recommendation is not based on a comprehensive analysis of the risk return characteristics of infrastructure investments or the efficiency frontier of the allowable assets of pension fund portfolios. Nor does it incorporate the risk preferences of affiliates (the research required goes beyond the scope of this article). This is merely a rule of thumb, based on the preceding analysis, in particular by looking at the evolution of the Chilean case and the practices of pension funds administered under the "prudent man rule."

Potential Private Pension Fund Investment in Infrastructure

Based on the expected rates of growth in pension fund assets[sup4] and assuming that 3% of those assets are invested in infrastructure, Exhibit 4 gives an indication of the availability of resources in selected countries. The third column gives the stock of potential assets in the portfolio if the full 3% were invested. The fourth column gives the availability of resources for new investments during the year, assuming that investment of 3% of new assets flows into the pension funds portfolio.

The investment of pension funds assets in infrastructure provides important benefits to those projects in which:

- Foreign exchange risk exposure is reduced, as most projects generate local currency revenues, but have traditionally depended on foreign exchange financing to cover long-term needs.
- Financing (refinance) risk is reduced because pension funds are able to provide longer tenors than those currently available in the local financial markets.
- The cost of capital is potentially reduced because these resources tend to be less expensive on a risk-adjusted basis than most of the alternatives (imported capital or short-term local finance).
- There would be less interference in decision making because pension funds tend to be less involved in day-to-day management than the alternative sources (this must be compensated with a proper governance system to ensure that pension funds are not "taken for a ride").
- Political risk is reduced because the participation of resources representing the pensions of local workers should induce closer adherence and fairness in the application of infrastructure regulatory principles. Pension funds can be honest brokers as affiliates are affected both by the returns of the projects and the rates charged by the services provided.

These benefits are important enough for infrastructure projects to be very interested in pension fund resources and to take the necessary measures to capture them.

PRIVATE PARTICIPATION IN INFRASTRUCTURE

The current decade has seen a significant transformation in the way infrastructure services are provided concurrent with pension reform. There has been a major increase in private sector participation in the provision of infrastructure services. This is particularly the case in the countries that have undertaken pension reform and also have liberalized their economies, but it is not limited to them. In the case of Latin America, the main reasons for the increase in private participation has been the need to modernize and expand services the state can no longer finance and to redirect resources used to finance the deficits of public utilities to more pressing social needs. This has led most countries to privatize public utilities and to grant concessions for transportation services, leaving the financing of rehabilitation and expansion in the hands of the private sector. These investment needs, as will be seen later, are rather large and well beyond the current capacities of domestic financial and capital markets in terms of both volume and tenor. This forces the private sector to rely on international sources to finance investments that generate revenues mostly in domestic currencies.

Financing Needs

It has been estimated that for each 1% in GDP, investment in the traditional infrastructure sectors (telecommunications, energy, transportation and water and sewage) would need to increase by 1% of GDP (World Development Report [1995]). A reasonable goal for governments would be to make sure that infrastructure can support a long-term annual growth rate of 5%. Given the size of the Latin American economy, this would require investments of US$70 billion (in year 2000) per year. It is estimated that the telecommunications sector would require roughly $25 billion a year; energy, $28 billion; transportation, $10 billion; and water, $7 billion. Telecommunications can be considered a relatively safe and developed sector that should be part of the regular portfolio of investments of pension fund assets in publicly traded stocks and bonds. Hence, it should be excluded from the special "project finance" allocation we are suggesting. Also, a portion of the energy sector that includes well established utilities in countries with mature reforms could also be seen in this light. Nevertheless, as this is still a small segment of the overall Latin American marker (although it represents a large part in Chile and Argentina), we will assume that the energy sector is in need of risk capital and include the estimates in our proposal. As a result, total annual needs that could potentially be covered by the risky portion of pension funds assets could amount to almost $50 billion in the year 2000. These large needs continue to be met mostly by the public sector and the World Bank estimates that private sources only cover 15% (World Bank [1997a]).

Exhibit 6 shows the percentage of private investment covered assuming that the private sector finances around 15% of the infrastructure needs of those countries (15% of 5% of GDP). Obviously, every country would be different and the numbers shown attempt to provide only orders of magnitude to assess the overall feasibility of pension fund financing. They are more valid in the aggregate than on an individual country basis.

Even though the potential contribution by pension funds appears to be small compared with the needs, it is an important contribution in relation to scarce local currency financing. When considered in the context of the financing package of any project, these figures, even excluding the special case of Chile, represent a large contribution from a single source of financing and surely would be the largest of the local financing sources.

What Do Infrastructure Investments Offer?

Based on the discussion earlier, it should be clear that private infrastructure could and should tap into pension fund assets. Yet, this can happen only if those investments bring something of value to the pension funds. Indeed, infrastructure investments do have some valuable features:

- They rend to provide a higher return than currently earned by pension fund portfolios.
- Although infrastructure projects are riskier, they provide diversification benefits given that their returns are less than perfectly correlated with existing pension fund portfolios. For riskaverse investors, investments in infrastructure may move the overall return toward a more desirable risk-return combination.
- These investments could increase the volatility of returns, but given that the proportion would be very small, the impact should be negligible.

- Infrastructure investments contribute to overall economic growth, including the creation of new jobs, thereby generating even more resources for the pension funds and benefiting their stakeholders.

Nevertheless, these investments also have some undesirable features that must be overcome before pension funds undertake them:

- Higher expected returns are achieved over the long run. Even though pension funds can afford to wait for returns because their liabilities are long-term, current regulations lead them to prefer short-term, steady returns.
- Infrastructure investments may not comply with some of the regulations described earlier, in particular With respect to ratings, valuation and liquidity.
- Given that these investments carry a higher (although mostly diversifiable) risk, they bring the nondiversifiable risk of having to report a failure in an investment, with the potential for increased switching by affiliates to another pension fund administrator. This is an agency problem, because even though the investment may benefit the affiliate in the long run, it poses a short-term risk to the administrator.

By now the alert reader may have already devised ways to overcome these obstacles. We will discuss them later.

COMPATIBILITY BETWEEN INFRASTRUCTURE INVESTMENTS AND PENSION FUND PORTFOLIOS

In the previous two sections we analyzed the investment needs of the private pension fund portfolios. It is apparent that the incompatibilities outweigh the synergies. Nevertheless, it is important to emphasize that these incompatibilities are more the consequence of the lack of appropriate instruments and regulations, than of the fundamentals. We will now discuss the ideal regulatory environment to foster infrastructure investments and make some policy recommendations. We also discuss the design of financial instruments needed to take advantage of that pool of resources.

Changes in the Regulatory Environment

Based on the discussion earlier concerning pension fund regulation and the characteristics of infrastructure investment, it is no wonder that there has been so little participation. The regulations on ratings, liquidity, switching, minimum return, one portfolio per affiliate, one portfolio per administrator, monopoly by pension fund administrators, and valuation rules make these investments almost impossible. The ideal regulatory framework will use the "prudent person rule," whereby decisions on investments are left to administrators exercising their fiduciary responsibility, as is the case of corporate pension funds in the U.S. and pension funds in the Netherlands and the U.K. However, the government continues to have a financial interest because, in many cases, it guarantees the minimum pension. Furthermore, in developing countries, this relaxation must be accompanied by the corresponding enhancement of supervisory agencies' capabilities. Thus, regulations should allow affiliates to have several portfolios: a properly regulated one for the minimum pension, and several for supplementary pensions that are basically deregulated and operate under the "prudent person rule." Minimum pension portfolios would be regulated under current rules and gradually relaxed as the system matures.

This ideal regulatory framework cannot be achieved in the short run, but should become the benchmark as pension funds and financial markets mature. In the meantime, the regulations could be progressively relaxed and move from regulating investments to measures that regulate overall portfolio risk. The performance of supplementary pension portfolios would be assessed based on measures of risk-adjusted returns. Each administrator should be allowed to manage several portfolios with different risk-return characteristics (with the number being compatible with the development of the local capital markets). Each portfolio would advertise the risk tolerance and net-of-expenses performance benchmark and underperformance (say 20% below benchmark return) would be covered through reserves or the administrator's capital. Switching still would be allowed, but it would be less of an issue, because comparison would be relative to a net-of-expenses benchmark, not to other "competing" portfolios (not comparable, unless they are of the same risk and same expenses). Ideally, all financial institutions would be able to manage pension funds and all would fall under a consolidated regulatory body, with specialized units (banking, securities, insurance, and pensions).

Regulations on ratings, liquidity, and valuation should be handled through the proper design of infrastructure financial instruments. Nevertheless, it would help if these regulations were relaxed, not eliminated, for a small percentage of assets, say 5%. For instance, valuation and rating rules could be substituted by periodic independent assessments of the investment value.

Design of Financial Instruments

Based on the discussion earlier, it is clear that if these instruments are to be attractive to pension funds, without been forced, they need to be, to the extent possible:

- More liquid;
- Less risky (lower probability of failure); and
- Less volatile.

The instruments can have either direct or indirect claims on the cash flows. In the case of direct claims, the instruments can be securities (the need to be marketable is a sine qua non condition) like general project bonds, securitization of specific cash flows or shares of the special purpose vehicles. In any case, to comply with these conditions, the securities would need to have claims on special cash flows. For instance, they should have a senior claim on revenues, be based on projects with track records (operation stage) or have some form of enhancement through the participation of the government, multilateral agencies and/or political or credit insurance. The aforementioned conditions can be further enhanced if the securities are based on indirect claims on cash flows through some form of investment pools. This would allow investment in the securities of several projects, over several sectors, and even over several countries. The resulting securities already would constitute a well-diversified portfolio and, as such, would be more liquid, less risky, and less volatile, and might even be rated. In all cases, the underlying projects must be well structured and backed by solid sponsors. Even though this is the ideal, barely achievable in practice, it is the benchmark that those seeking pension fund financing should strive for.

In the U.S. and other developed capital markets, there are endless options for the private pension fund administrator to invest the portfolio assets, and to configure the desired risk-return profile. In the case of countries with lesser-developed markets the options are rather limited, sometimes limited to government paper and the negotiable certificates of deposit Or liquid deposits of financial institutions. The case of most countries of Latin America is paradoxical. The private pension fund industry generates long-term, domestic, investable resources, and it needs to enhance profitability and minimize risk. Unfortunately, it does not have a well-developed capital market capable of providing the necessary instruments, either because it is underdeveloped, or as in Chile, it is rather small when compared with the size of the funds. On the other hand, there are large unsatisfied needs of legitimate long-term domestic investments waiting to tap into the pool of those resources. There is a real gap between the potential of the funds, the needs of infrastructure and the develop-ment of the capital markets that must be closed through the development of the proper instruments, regulations, and institutions.

Pension Fund Investments in Infrastructure Assets

As discussed earlier, changes in the pension fund regulations are needed, but these alone will not be enough. Changes in the design of infrastructure finance instruments also are needed. These regulatory changes, if at all, will occur over prolonged periods of time. In the mean-time, for pension funds to invest in project finance infrastructure assets, the instruments will have to adapt to the existing regulations.

The ideal financial instrument would consist of securities in a fund, invested in many carefully selected projects, with some form of credit enhancement (e.g., multilateral participation, credit guarantees, political risk insurance), over several sectors (heavy on energy, light on water, with a mix of transportation subsectors). The fund would cover several countries, projects would be mostly in operational stages, and shares of the fund would be quoted on some exchange, preferably in a developed market.

This proposed financial instrument would require minimal changes in regulations -- in some countries none at all. The ideal instrument proposed is the most conservative that can be designed, short of one guaranteed by AAA-rated institutions or governments. It should have ample liquidity, very low risk (obviously with a correspondingly lower return) and would be properly valued. Even though it would capture funds for infrastructure, pension funds could do better in the risk-return tradeoff with more direct investments. As regulations were relaxed, the instruments would not have to be as complex as implied by the recommendation and some funds may be able to acquire simpler instruments, including direct investments or the purchase of negotiable debt instruments of specific projects.

The application of the prudent-person rule most likely would not imply a dramatic change in the port-folios of pension funds, evidenced by the portfolio composition of countries that use this rule. Administrators probably still would insist on liquidity, ratings, and valuation rules, but most likely, they would be willing to "exempt" a portion of the portfolio from these self-imposed rules and allow investment in illiquid, nonrated and subjectively valued assets. This would favor direct investment in relatively riskier (diversifiable), but return-enhancing infrastructure assets.

IMPLICATIONS FOR OTHER COUNTRIES AND OTHER INVESTMENTS

Even though we have been discussing mainly Latin America, the conclusions have implications for all countries, taking into account the differences in financial-market development. This is particularly the case because pension fund reforms in many developing countries are following the Chilean model (with needed variations). Also, many developed countries (particularly in Europe) are under pressure to reduce their fiscal deficits and, to do so, are considering the privatization of infrastructure services. Given that these countries already have corporate or private pension funds in place, the implications of our discussion are also valid for them. Obviously, as the discussion refers to a private-private relationship, it is valid if both infrastructure and pension funds are in private hands. The discussion can also be applied in the case of other private investments, different from infrastructure, that share some of the problems of inflexibility and size, as would be the case of housing.

In the U.S., there was a proposal in the early nineties to utilize the vast resources of private corporate pension funds to finance public infrastructure (see U.S. Department of Transportation [1993]). In this case, the proposal was to use resources under private management to finance public sector works. The proposal involved the creation of a public financial institution that would issue securities, insured by a separate insurance company and with the implicit guarantee of the U.S. Government and tax benefits for purchasers. These securities were to be purchased by institutional investors, including private pension funds, and the proceeds were to be used to finance public infrastructure, leveraging the capital paid in the corporation by the federal government. Even though the idea was well structured, the private sector was not enthusiastic about it, as it appeared to be a form of forced investment. The problem was that even though the corporation would have been managed along private criteria, the activities financed were public works without an underlying cash flow and the tax exempt pension funds were more interested in taxable securities (for a comprehensive analysis of the proposal, see U.S. General Accounting Office [1995]). Given that corporate pension funds in the United States have very few investment restrictions, the problem of insufficient infrastructure finance could be solved by privatizing some of the infrastructure and issuing securities along the lines proposed in this article.[sup6]

CONCLUSION

If regulations of private pension funds were to be relaxed to allow investments in private infrastructure projects and, in turn, these projects adapted their financial instruments to the needs of those pension funds, both parties could reap significant tangible and intangible benefits. Private pension funds could benefit from the opportunity to enhance the risk-return combination offered to the affiliates, hopefully enhancing the value of their savings and pensions. Private investments in infrastructure could benefit from the possibility of tapping long-term resources in local currency and reducing financing costs. In the process, there would be an opportunity to promote the development of the country in areas that can have a multiplier effect in terms of competitiveness and quality of living.

To achieve this relationship, pension fund regulations must be restructured so that the goal of safeguarding the value of pensions does not hinder investments in viable and profitable infrastructure projects. On the other hand, infrastructure needs to tailor the instruments to satisfy the needs of pension funds. The discussion presented shows how this can be achieved for the benefit of all parties. This relationship is a positive sum game.

ENDNOTES

The opinions expressed in this paper are the responsibility of the author and do not necessarily reflect those of the Inter-American Development Bank. Helpful comments have been received from Dimitri Vittas of the World Bank, and Paulina Beato and Kim Staking of the Inter-American Development Bank. Research support was provided by Daniel Lamaute of Lamaute Capital and more extensively by Leonor Demori. Production and editing support was provided by Gina Lizardi and Graciela Testa. Thanks to all, and as usual, any errors are the responsibility of the author.

[sup1]Even though Brazil's public system has not been reformed, the assets under administration under corporate pensions are so large that they are of considerable interest for financing infrastructure and as such are included in the discussion.

[sup2]This section benefits from the paper by Shah [1996], which criticizes the regulation for their effect on management expenses and sub-optimal portfolio choice, and Vittas [1998], which moderates the criticisms, for lesser developed countries, on account of under-developed financial markets and institutions.

[sup3]Even though private pension funds in Latin America are defined contribution, the management of the portfolios is in the hands of independent managers with a single portfolio and as such the resulting portfolio is more comparable to the U.S.-defined benefit case.

[sup4]Assumes the following rates of growth: Argentina and Brazil, 20%; Chile, 12%; and Colombia, Mexico, and Peru, 30%. These rates are not critical for the point we want to show and are merely indicative.

[sup5]If the telecommunications sector is excluded from these estimates, under the assumption that they represent traditional investments, then the figures could, as a rough estimate, be multiplied by 1.5, as telecommunications account for about 30% of the estimated financing needs.

[sup6]For a discussion of the issues of pension fund participation in the U.S., where there are almost no restrictions to pension fund investments, see the complementary article by Buehler, Murley, and Neal [1996].

EXHIBIT 1 Comparative size of Private Pension Funds

Legend for chart:

A1=Total Pension Fund System[supa] (millions of US$)
A2=GDP 1998 (millions of US$)
A3=Population Projected 1998 (millions)
A4=Pension/GDP (%)
A5=Pension assets per capita (US$)
B1=Argentina
B2=11,526
B3=337,615
B4=36.1
B5=3.4
B6=319
C1=Brazil
C2=75,068
C3=776,900
C4=165.5
C5=9.4
C6=454
D1=Chile
D2=31,146
D3=77,417
D4=14.8
D5=42.7
D6=2,101
E1=Colombia
E2=2,110
E3=87,474
E4=37.7
E5=2.4
E6=56
F1=Mexico
F2=5,801
F3=379,126
F4=95.8
F5=1.5
F6=61
G1=Peru
G2=1,739
G3=60,480
G4=24.8
G5=2.9
G6=70
H1=Germany
H2=294,379
H3=2,142,100
H4=82.0
H5=13.7
H6=3,591

I1=Netherlands
I2=457,807
I3=378,300
I4=15.6
I5=121.0
I6=29,259
J1=Spain
J2=31,831
J3=569,000
J4=39.3
J5=5.6
J6=810
K1=U.K.
K2=991,951
K3=1,362,300
K4=58.3
K5=72.8
K6=17.027
L1=U.S. (corporate)
L2=4,400,000
L3=8,508,900
L4=269.8
L5=51.7
L6=16,310

	A1	A2	A3	A4	A5
B1	B2	B3	B4	B5	B6
C1	C2	C3	C4	C5	C6
D1	D2	D3	D4	D5	D6
E1	E2	E3	E4	E5	E6
F1	F2	F3	F4	F5	F6
G1	G2	G3	G4	G5	G6
H1	H2	H3	H4	H5	H6
I1	I2	I3	I4	I5	I6
J1	J2	J3	J4	J5	J6
K1	K2	K3	K4	K5	K6
L1	L2	L3	L4	L5	L6

[supa]Pension Fund Data at December 1998, Except Germany, Netherlands, and the U.K. at December 1997.
Sources: GDP data: IMF [1999]. Latin America Pension data: FLAP, Boletin #5; Europe Pension data: Mercer. USA Pension data: Pensions and Investments [1999]. Top 1000 Corporate Pension Funds.

EXHIBIT 2 Portfolio Composition by Sector (%) -- End of 1998

	Bonds	Stocks	Real Estate	Foreign	Other	Total
Argentina	70.9	25.0	0.3	0.3	3.5	100.0
Brazil	47.0	36.5	14.5	0.0	2.0	100.0
Chile	76.4	16.1	1.7	5.7	0.1	100.0
Colombia	84.0	3.2	2.5	0.0	10.3	100.0

Mexico	100.0	0.0	0.0	0.0	0.0	100.0
Peru	65.8	33.5	0.0	0.0	0.7	100.0
Germany	71.0	6.0	13.0	7.0	3.0	100.0
Netherlands	47.0	15.0	7.0	29.0	2.0	100.0
Spain	62.4	13.7	0.0	16.7	7.2	100.0
U.K.	8.0	54.0	2.0	29.0	7.0	100.0
U.S.[supa]	28.9	51.9	3.0	10.5	5.7	100.0

[supa]top 1,000 Funds aggregate asset mix.
Source: Latin America: F/AP [1999]. U.S.: Pensions and Investments [1999]. Europe: Mercer.

EXHIBIT 3 Evolution of Chile's Pension Fund Investments

Type of asset (percentage of total assets)	1981	1985	1990	1994	1998
Government Securities	28	43	44	40	41
Bank Deposits	62	21	17	5	14
Mortgage Bonds	9	35	16	14	17
Corporate Bonds	1	1	11	6	5
Corporate Equities	0	0	11	32	15
Other	0	0	1	3	3
Foreign Securities	0	0	0	0	6
Total	100	100	100	100	100

Source: Vittas [1996], data for 1998 from Boletin #5, FLAP [1999].

EXHIBIT 4 Availability of Resources for Infrastructure in the Year 2000

Legend for chart:

A1=Pension Fund Assets
A2=Potential Investments in
A3=Potential New Yearly
S1=year end
S2=Infrastructure Projects
S3=Investments in Infrastructure
D1=Country
D2=(billion US$)
D3=Portfolio) (million US$)
D4=Projects (million US$)
F1=Argentina
F2=20
F3=600
F4=120
G1=Brazil
G2=117
G3=3,900
G4=780
H1=Chile
H2=49

H3=1,470
H4=180
J1=Colombia
J2=3
J3=90
J4=30
K1=Mexico
K2=20
K3=600
K4=180
L1=Peru
L2=3
L3=90
L4=30

	A1	A2	A3
	S1	S2	S3
	D1	D2	D3
F1	F2	F3	F4
G1	G2	G3	G4
H1	H2	H3	H4
J1	J2	J3	J4
K1	K2	K3	K4
L1	L2	L3	L4

EXHIBIT 5 Investment in Infrastructure Projects with Private Participation -- 1990-1997 -- Latin America and the Caribbean (million US$)

Legend for chart:

A1=Year
A2=Electricity
A3=Water
A4=Gas
A5=Telcom
A6=Transport
A7=Total
B1=1990
B2=645.70
B3=-
B4=-
B5=4,443.30
B6=5,311.00
B7=10,400.00
C1=1991
C2=-
C3=75.00
C4=-
C5=9,213.80
C6=395.50
C7=9,684.30
D1=1992

D2=2,130.06
D3=-
D4=2,930.00
D5=11,112.00
D6=2667.50
D7=18,839.56
E1=1993
E2=2,925.74
E3=4,153.00
E4=142.80
E5=5,804.40
E6=835.80
E7=13,861.74
F1=1994
F2=3,019.57
F3=434.00
F4=1,342.90
F5=9,109.90
F6=1,517.10
F7=15,423.47
G1=1995
G2=5,380.48
G3=1,178.80
G4=796.50
G5=6,910.30
G6=1,600.70
G7=15,866.78
H1=1996
H2=9,012.51
H3=153.90
H4=915.80
H5=9,710.40
H6=2,785.40
H7=22,578.01
I1=1997
I2=20,514.80
I3=1,625.20
I4=2,490.88
I5=11,273.40
I6=3,658.50
I7=39,562.78
J1=Total
J2=43,628.86
J3=7,619.90
J4=8,618.88
J5=67,577.50
J6=18.771.80
J7=146,216.94
A1 A2 A3 A4 A5 A6 A7

B1	B2	B3	B4	B5	B6	B7
C1	C2	C3	C4	C5	C6	C7
D1	D2	D3	D4	D5	D6	D7
E1	E2	E3	E4	E5	E6	E7
F1	F2	F3	F4	F5	F6	F7
G1	G2	G3	G4	G5	G6	G7
H1	H2	H3	H4	H5	H6	H7
I1	I2	I3	I4	I5	I6	I7
J1	J2	J3	J4	J5	J6	J7

Source: World Bank [1999].

EXHIBIT 6 Coverage of Infrastructure Needs in the Year 2000

Legend for chart:

A1=Private Financing of Needs (15%)
A1=Pension Fund Allocation to New Investments in Infrastructure Projects-per Year (million US$)
A3=Percent of Yearly Needs Satisfied[sup5]
B1=Argentina
B2=1,900
B3=120
B4=6.3
C1=Brazil
C2=4,200
C3=780
C4=18.6
D1=Chile
D2=435
D3=180
D4=41.4
E1=Colombia
E2=525
E3=30
E4=5.7
F1=Mexico
F2=2,700
F3=180
F4=6.7
G1=Peru
G2=435
G3=30
G4=6.9

A1	A2	A3	A4
B1	B2	B3	B4
C1	C2	C3	C4
D1	D2	D3	D4
E1	E2	E3	E4

F1	F2	F3	F4
G1	G2	G3	G4

EXHIBIT 7 Indicators of Capital Depth

Legend for chart:

A1=1996 Market Capitalization
A2=Domestic Credit[supa]
A3=1996 Turnover
A4=1998 Fund Size
B1=Argentina
B2=18
B3=26
B4=50
B5=3.4
C1=Brazil
C2=32
C3=37
C4=86
C5=9.4
D1=Chile
D2=93
D3=60
D4=10
D5=42.7
E1=Colombia
E2=25
E3=46
E4=10
E5=2.4
F1=Peru
F2=27
F3=12
F4=26
F5=1.5
G1=USA
G2=105
G3=138
G4=93
G5=51.7

	A1	A2	A3	A4
B1	B2	B3	B4	B5
C1	C2	C3	C4	C5
D1	D2	D3	D4	D5
E1	E2	E3	E4	E5
F1	F2	F3	F4	F5
G1	G2	G3	G4	G5

Percent of GDP, except turnover.

Sources: IMF, Financial Statistics [March 1999]; Word Bank, World Development Indicators [1998]; [supa]Provided by banking sector in 1996.

APPENDIX A Characteristics of Latin American Private Pension Funds

Legend for chart:

A1=Chile
A2=Peru
A3=Colombia
A4=Argentina
A5=Mexico
A6=Bolivia
A7=Brazil
B1=Start of operations
B2=1981
B3=1993
B4=1994
B5=1994
B6=1997
B7=1997
B8=1977
C1=Public PAYGO system
C2=closed
C3=remains
C4=remains
C5=remains
C6=closed
C7=closed
C8=remains
D1=Privately-funded system Affiliation of new workers
D2=mandatory
D3=voluntary
D4=voluntary
D5=voluntary
D6=mandatory
D7=mandatory
D8=corporate
E1=Fund management companies[supa]
E2=AFP
E3=AFP
E4=AFP
E5=AFJP
E6=AFORES
E7=AFP
E8=EFPP
F1=Contribution rate for savings (% of wage)
F2=10
F3=8 (d)
F4=10

```
F5=7.5
F6=6.5 + subsidy
F7=10
F8=variable
G1=Commissions + insurance (% of wage)
G2=2.94
G3=3.72
G4=3.49
G5=3.45
G6=4.42
G7=3.00
G8=variable
H1=Contribution collection
H2=decentralized
H3=decentralized
H4=decentralized
H5=centralized
H6=decentralized
H7=decentralized
H8=corporate
I1=Past contributions[supb]
I2=RB
I3=RB
I4=RB
I5=CP
I6=life-time switch
I7=CP
I8=N/A
J1=Disability/survivors insurance
J2=private
J3=private
J4=private
J5=Private
J6=public
J7=private
J8=N/A
K1=Supervision
K2=specialized
K3=specialized
K4=integrated
K5=specialized
K6=specialized
K7=integrated
K8=integrated
L1=Account transfers[supc]
L2=2 x p.a.
L3=2 x p.a.
L4=2 x p.a.
L5=2 x p.a.
```

L6=1 x p.a.
L7=1 x p.a.
L8=N/A
M1=Minimum rate of return
M2=relative
M3=unregulated
M4=relative
M5=relative
M6=no
M7=no (e)
M8=N/A
N1=Minimum pension
N2=yes
N3=no
N4=yes
N5=yes
N6=yes
N7=no
N8=N/A

	A1	A2	A3	A4	A5	A6	A7
B1	B2	B3	B4	B5	B6	B7	B8
C1	C2	C3	C4	C5	C6	C7	C8
D1	D2	D3	D4	D5	D6	D7	D8
E1	E2	E3	E4	E5	E6	E7	E8
F1	F2	F3	F4	F5	F6	F7	F8
G1	G2	G3	G4	G5	G6	G7	G8
H1	H2	H3	H4	H5	H6	H7	H8
I1	I2	I3	I4	I5	I6	I7	I8
J1	J2	J3	J4	J5	J6	J7	J8
K1	K2	K3	K4	K5	K6	K7	K8
L1	L2	L3	L4	L5	L6	L7	L8
M1	M2	M3	M4	M5	M6	M7	M8
N1	N2	N3	N4	N5	N6	N7	N8

[supa]AFP = Administradoras de Fondos de Pensiones; AFJP = Administradoras de Fondos de Jubilaciones y Pensiones; AFORE = Administradoras de Fondos de Ahorro para el Retiro; EFPP = Entidades Fechadas de Previdencia Privada.
[supb]RB = Recognition Bond; CP = Compensatory Pension.
[supc]Due to administrative delays, transfer may be more limited.
[supd]Contribution rate will be increased gradually to 10%.
[supe]Guarantees are required from the fund management companies. Source: Queisser [1998] and own data.

APPENDIX B Comparison of Investment Regulations -- Percentages of the Total Assets of the Pension Fund

Legend for chart:

AA1=Securities Issued of Guaranteed by Government
and/or Central Banks
AA2=Debt Securities (Non-Government)
AA3=Stocks
AA4=Mutual Funds
AA5=Foreign Investment
AA6=Others
BB1=Argentina
BB2=Max. 65%
BB3=Max. 100%
BB4=Max. 35%
BB5=Max. 14%
BB6=Max. 17%
BB7=Max. 2%
A1=. In any case no more than 7% in securities issued or
guaranteed by the same entity
A2=. Max. 1% of the fund in a mutual fund and/or 10% of the
capital of the mutual fund. If mutual fund invests in the real
estate sector, max. 5% of capital of the fund per real estate
mutual fund or 20% of the issue
A3=. Max. 5% of the fund in the capital of a company or
max. 20% of its capital
A4=. Max. 10% of the fund in a company and/or group and max. 20%
of the fund in a financial institution and/or group
BA2=Max. 50%
BA3=Max. 100%
BA4=Max. 37%
BA5=Max. 15%
BA6=Max. 16%
BA7=Max. 10%
A6=. Max 7% of the fund in one entity or max. 15% of the
fund in a group
A7=. Max. 5% per diversification factor on mutual funds that
invest in real state, development of enterprises and
securitization; and/or 20% of its capital
A8=. Max. 3% in debt of new companies (could include public
infrastructure by private companies); and/or 20% of
the issue
A9=. Max 5% in real estate companies (could include
investments in public concession projects); and/or 20% of the
capital of the company
BA1=Colombia
B1=. Max. 5% of the fund per issuer, including group. If the
issuer is supervised by the bank superintendency, the
limit is 10%
B2=. Max. 10% of the capital of a company and max. 20% of an
issue, including securitization, except government

or central bank paper.
B3=. Max. 10% issued or guaranteed by an entity,
and max. 15 for a group
F1=Max. 40%
F2=Max. 100%
F3=Max. 35%
F4=Max. 15%
F5=Max. 10%
F6=Max. 10%
B4=. In any case no more than 15% in one company or 25%
in an economic group
D1=Max 30%
D2=Max. 20%
D3=Max. 25; Real Estate
B5=. Equities: E.U, equities, including Germany:
max 30%; Non E.U. equities: max. 6%
AB1=Netherlands
B6=. Min. 90% invested in listed assets, real estate and
bank deposits; Bank Deposits: max. 15%.
B7=. Max. 5% (max. 10%) in securities issued or guaranteed by
one entity (group). This limit doesn't apply to foreign
estates/international organization

	AA1	AA2	AA3	AA4	AA5	AA6
BB1	BB2	BB3	BB4	BB5	BB6	BB7
	A1					
	A2					
Brazil	Max. 100%	Max. 80%	Max. 50%	Max. 15%	-	Max. 35%
	A3					
	A4					
	. Max. 20 of the capital of a rela state mutual fund					
Chile	BA2	BA3	BA4	BA5	BA6	BA7
	A6					
	A7					
	A8					
	A9					
	. Max. 1% of the fund per foreign investment fund					
BA1	Max. 50%	Max. 100%	Max. 30%	-	Max. 10%	-
	B1					
	B2					
Mexico	Max. 100%	Max. 35%	-	-	-	-
	B3					
	. Max. 15% for a series or same issue					
Peru	F1	F2	F3	F4	F5	F6
	B4					
Germany			D1		D2	D3
	B5					
AB1	. Prudent person rule					
	. Self Investment: max. 5%					
Spain	B6					

```
        B7
United
Kingdom . Prudent person rule
U.S.    . Prudent person rule

Source: Web sites of Associations of Pension Fund
Administrators, law, and regulations.
```

REFERENCES

"Bonos de Infraestructura." Ministerio de Obras Publicas, Ministerio de Hacienda. Santiago, Chile, 1997.

Buehler, J.E., T.S. Murley, and B.E. Neal. "The Growing Project Finance Market: An Attractive Investment Opportunity for Pension Funds." Journal of Project Finance, Spring 1996, pp. 3S-40.

Bustamante, J. Quince Anos Despues: Una Mirada al Sistema Privado de Pensiones. Santiago, Chile, 1997.

"Facilitating Private Involvement in Infrastructure: An Action Program." World Bank, Washington D.C., 1997.

Federacion Internacional de Administradoras de Fondos de Pensiones. Semi-annual Bulletins for 1996, 1997, and 1998, Santiago, Chile.

"Financing the Future, Report of the Commission to Promote Investment in Infrastructure." U.S. Department of Transportation, Washington D.C., February 1993.

"Growing Older: Latin America's Pension Funds Come of Age." Latin Trade, December 1998.

"Infrastructure for Development, World Development Report 1994." World Bank, Washington D.C., 1994.

"International Financial Statistics." International Monetary Fund, Washington D.C., March 1999.

"Investment and Pensions Europe." Mercer European Pension Fund Managers Guide, W.H. Mercer Companies, Inc., 1998.

Kilby, P. "The Rising Tide of Local Capital Markets." Latin Finance, No. 92, October 1997.

"Mobilizing Domestic Capital Markets for Infrastructure Financing." World Bank Discussion Paper No. 377, World Bank, Washington D.C., 1997.

"Pension and Investments: The International Newspaper of Money Management." Crain Communications Inc., January 25, 1999.

"Pension Fund Investment." Financial Times, May 14, 1998.

"Private Pension Plans: Efforts to Encourage Infrastructure Investment." U.S. General Accounting Orifice, Washington D.C., September 1995.

"Private Sector Development Department, Private Participation in Infrastructure Database." World Bank, Washington D.C., April 1999.

Queisser, M. "The Second-Generation Pension Reform in Latin America." Organization for Economic Cooperation and Development, Paris, 1998.

Riesen, H. "Liberalising Foreign Investments by Pension Funds: Positive and Normative Aspects." Technical paper No.120, Organization for Economic Cooperation and Development, Paris, January 1997.

Shah, H. "Toward Better Regulation of Private Pension Funds." Policy Research working paper No. 1791, World Bank, Washington D.C., March 1998.

Vittas, D. "Pension Funds and Capital Markets." Public Policy for the Private Sector Note No. 71, World Bank, Washington D.C., February 1996.

--------. "Regulatory Controversies of Pension Funds." Working paper No. 1893, World Bank, Washington D.C., March 1998.

"World Development Indicators."' World Bank, Washington D.C., 1998.

~~~~~~~~

By .-Antonio Vives

Antonio Vives is deputy manager of infrastructure, financial markets, and private enterprise of the Sustainable Development Department and vice-chairman of the pension fund investment committee at the Inter-American Development Bank in Washington, D.C.
~~~~~~~~