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Pension Reform in Small Developing Countries

Thomas Charles Glaessner
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For small countries the Chilean pension model should be modified to rely more on international trade in financial services — especially services that benefit from economies of scale and scope, such as collections, account processing, and benefit payments. The unbundling of pension services — such as the collection of contributions and the payment of benefits — is more advantageous in small than in large countries.

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Summary findings

Glaessner and Valdés-Prieto provide a framework in which small countries can assess the proper role for the state and the private sector in pension policy. Based on industrial organization theory and pension economics, this framework draws on experience in small countries.

The authors identify how optimal pension policies can change in small countries (those with fewer than 1 million active contributors to pension funds), explore optimal pension reform design for small countries, and incorporate other stylized assumptions about small countries into the discussion: the relatively greater international mobility of labor and capital, the greater scarcity of human capital specialized in financial supervision and tax administration, fewer independent interests, and higher political volatility and risk over long time horizons.

They conclude that:

- For small countries the Chilean model should be modified to include greater reliance on international trade in financial services — especially services that benefit from economies of scale and scope, such as collections, account processing, and benefit payments. Such an approach would require a greater harmonization of accounting and regulatory standards between small developing countries and the countries from which financial services are imported.
- The unbundling of pension services is more advantageous in small than in large countries.
- The collection of contributions and the payment of benefits (which are subject to substantial economies of scale for small countries) should be mandatorily unbundled from other pension services.
- Those services should be provided separately to ensure competition in the selection of trustees and competitive investment management services. This type of pension system design may be preferable to having a foreign firm provide all pension services.
- When other assumptions (such as susceptiblity to large gross migration flows) are combined with the assumption of a small-country base, mandatory pension systems or fiscal incentives are found to be less effective in small than in large countries. Large countries have broader contribution bases and much smaller gross migration flows, making them demographically more stable.
- The relatively greater international migration in small countries makes full funding of pension systems even more important in small than in large countries.

This paper is a product of the Latin America and the Caribbean Region. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Miguel Navarro, room I5-076, telephone 202-458-4722, fax 202-522-2106, Internet address mnavarromartin@worldbank.org. The authors may be contacted at thomas_glaessner@sfmny.com or svaldes@volcan.facea.puc.cl. September 1998. (55 pages)

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Pension Reform in Small Developing Countries

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ABSTRACT

This paper provides a framework within which small countries can assess the proper role of the private sector and the state in pension policy. This framework is based on industrial organization theory and pension economics and draws upon small country experiences. The paper identifies how optimal pension policies can change in small countries, defined as having one million or fewer active contributors to pension funds. After exploring optimal pension reform design given this one small country characteristic (e.g., one million or fewer active contributors), other stylized assumptions about small countries are incorporated into the discussion. These assumptions include: relatively greater international mobility of labor and capital, greater scarcity of human capital specialized in financial supervision and tax administration, fewer independent interests, and higher political volatility and risk over long time horizons. An important conclusion of the paper, which rests only on the assumption of a small contribution base, is that the "Chilean model" should be modified to include greater reliance on international trade in financial services. This applies especially to services subject to substantial economies of scope and scale, such as account processing, collections, and payment of benefits. Such an approach would require greater harmonization in accounting and regulatory standards between small developing countries and countries from which financial services are imported. Another important finding is that unbundling of pension services is more advantageous in small than in large countries. Collection of contributions and payment of benefits, which are subject to substantial economies of scale in the small country case, should be mandatorily unbundled from other pension services. These services should be provided separately to ensure competition in the selection of trustees and competitive investment management services. Moreover, it is shown that this type of pension system design may be preferable to the option of having a foreign firm provide all pension services. When other assumptions (e.g., susceptibility to relatively greater gross migration flows) are combined with the small contribution base, it is found that in small countries, mandatory pension systems or fiscal incentives are less effective than in large countries. Large countries have broader contribution bases and much smaller gross migration flows, making them demographically more stable. Finally, the relatively greater international migration in small countries makes full funding of pension systems even more important than in large countries.

EXECUTIVE SUMMARY

A. Background

1. Throughout the world, countries of all sizes face difficult decisions about how best to provide pensions that cover disability, survivors, and old age. Although a growing body of literature addresses generic issues in designing pension reforms (see World Bank, 1994; Valdés-Prieto, 1994), not much attention has been paid to special issues in designing pension reforms in small countries. This paper is devoted to the many small countries now in the process of reforming their social security systems that are confronting special pension policy problems related to their size. Pension policy in this report concerns intervention by a national government to improve the economic well being of its people through pensions. This definition leaves aside other social forces that affect economic well being in old age, such as the family, communal organizations, friendly associations, and private charity. It also leaves out retiree health benefits and other national subsidy programs for the old.

2. Several characteristics of small developing countries make optimal pension policies, at both the macroeconomic and microeconomic levels, different from those of larger countries. Perhaps the single most important and noncontroversial characteristic of small countries is the number of contributors to pension funds. For this purpose, small countries are defined as having one million or fewer workers employed in the formal sector; the relatively smaller number of workers covered by the pension system in a small country can result in a less than minimum efficient scale in provision of some pension services. In addition to the relatively smaller base of contributors in small countries, experience suggests there are a number of other characteristics in small relative to large countries relevant to pension policy design.[1] These include:

- relative scarcity of human capital specialized in the financial sector;
- greater international mobility of financial capital;
- greater gains from international portfolio diversification;
- proportionately greater gross migration of the labor force causing demographic instability;
- greater concentration of wealth and ownership in a small number of economic agents (i.e., families) and thus fewer independent interests; and
- a relatively less independent civil service, and therefore greater reliance on patronage.

3. When small countries have some or most of these characteristics, pension reforms that have been carried out in larger Latin American countries such as Chile and Argentina, which involve adoption of mandatory defined contribution schemes with minimum pension guarantees, may not be

1/ The characteristics noted below are indicative and can also apply in large countries. Moreover, some of these characteristics will not be prevalent in small countries; however, many small developing countries feature a large number of these stylized characteristics, aside from a small contribution base.

directly applicable. Similarly, government-operated pay-as-you-go defined benefit pension systems may be more difficult to adopt successfully in small countries, particularly those characterized by a high level of demographic instability and reliance on patronage. These factors can contribute to arbitrary redistribution of income, threaten the financial viability of the pension system, and undermine the confidence of contributors. Under these circumstances, policymakers in small countries are in need of a framework to assess options for pension reform, and are increasingly asking international institutions such as the World Bank to provide guidance in designing of such reforms.

B. Objective

4. The objective of this paper is to provide a framework to assess the proper role of the private sector and the state in providing pension services in small developing countries. The framework is based on pension economics and industrial organization theory. The paper provides a set of economic criteria, as well as a checklist of issues for officials of small developing countries and Bank staff, that need to be investigated to determine the advantages and disadvantages of specific pension reform options for such countries.

C. Conclusions and Recommendations

5. The specific structural characteristics present in small developing countries have important implications for pension policy and for the advantages of specific reform options. The preferred solutions are different than for large and medium-sized countries. The paper demonstrates that this result holds even if the only difference between small and large countries is the number of contributors to the pension system.

6. Perhaps the most robust overall policy implication of this paper is that in small countries the case for opening the economy to permit greater trade in financial services is much stronger than in large countries. This is so because:

(a) The infrastructure needed to support pension services can be radically reduced by importing key services, which will allow the small country to rely on the financial supervision, financial sector laws, and, in the extreme, even the civil law framework of larger, more developed trading partners (see discussion of institutional infrastructure to support pension services, below);

(b) The relatively greater tendency for lack of competition in the provision of key pension services in small countries, due to the small contribution base and lack of independent interests, can be mitigated through greater international trade in provision of these services (e.g., data processing, investment management, longevity insurance), combined with actions to mandate the unbundling of collection services from other pension services (see discussion of supply of pension services, below);

(c) In small countries this free trade in financial services must apply generally and should enable residents to contract for provision of investments in foreign currencies, implying the need for explicit convertibility guarantees over very long time horizons. This issue is shown to matter more for small than for large countries because

individuals demanding pension services will be able to obtain more diversification if they are allowed to operate internationally; and

(d) Finally, in many small countries securities markets are not liquid and are often characterized by a lack of independent interests. The paper suggests that it may even be necessary to *mandate* offshore investments *in addition to* permitting greater foreign competition in the provision of investment management services.

7. From the perspective of World Bank policy advice and actions, four key implications emerge from this study:

(a) The need to encourage small open economies with a small base of contributors to permit much greater international competition in pension services, which implies that establishment of a multi-pillar pension system (see James et al., 1994) may not always be advisable.

(b) The need to encourage much greater harmonization in certain key regulations and coordinated supervision across countries to facilitate greater cross-border provision of pension services.

(c) The need to evaluate how World Bank financial products such as convertibility guarantees might be used to permit development of more diversified pension products involving investments in multi-currency portfolios, for demanders of pension services. Such guarantees are needed given that authorities would need to commit to unrestricted convertibility of pension incomes into domestic currency without exchange or capital controls.

(d) The need to carefully analyze the links between the design of pension reforms and the form of prudential regulatory or other legal/regulatory reform being advocated. For example, minimum capital regulations for investment management companies may not create significant fixed costs to new entrants if collection of contributions is vertically disintegrated and processing services are subcontracted. This result holds, because such a pension reform design, involving vertical disintegration of collections, would imply the need for less initial capital by prospective entrants offering investment management services.

8. The more specific conclusions and recommendations of the paper can be summarized under four categories: institutional infrastructure to support pension services, supply of pension services, demand for pension services, and other considerations in pension policy and reform.

1. Institutional Infrastructure to Support Pension Services

9. *The preconditions for the institutional infrastructure needed in small countries to permit partial or total privatization of pension services are no greater and can even be less than those required in large countries.* Some important types of infrastructure can be imported by permitting freer trade in international financial services, including: custody services, offshore markets in which to invest in local or foreign currency-denominated securities, and account processing services. Some services, such as registries of contributors and pensioners, are far more difficult to import, but other

services, such as supervision, can be "imported" if investment management services are contracted to foreign firms.

10. *Institutional infrastructure and capacities needed within government agencies, e.g., domestic infrastructure to support a domestic securities market, and accounting, auditing, and actuarial or valuation services, are shown to be highly dependent on the exact type of pension reform proposed and not only upon permitting international competition.* For example, it may not be advisable, or may even be damaging in poor small countries, to have a "three pillar approach," as advocated in a recent World Bank study (1994), which can involve a-pay-as-you-go first pillar, a mandatory defined-contribution second pillar, and a voluntary occupational plan third pillar. This is especially true if the small country has no infrastructure to *enforce* a tax transfer system, cannot conduct effective financial supervision, and does not have proper registries of contributors or pensioners. By contrast, pension systems that do not entail any mandatory contributions and involve freedom to contract with offshore providers of pension services imply far fewer infrastructure needs.

2. Supply of Pension Services

11. A number of important policy recommendations relating specifically to the supply of pension services, including trustee services, involve establishment of a fiduciary obligation between contributors and pension plan trustees designated by the government. Among the most important findings in this area are:

(a) *There is a need to ensure a reduction of concentration in the trustee function by considering the mandated unbundling of some pension services such as collection and payment services, while permitting international competition in the provision of other services, e.g., investment management and insurance.* This recommendation results because permitting vertical integration back to the point of collections in small countries can increase overall costs in the pension industry and result in a much smaller number of trustees and investment management entities, thereby creating incentives for collusion, particularly in small countries that lack independent interests.

(b) *Small countries with a lack of independent interests need to give attention to the number of trustees; how they are selected; and the supervisory, regulatory, and governance environment in which they operate.* The limited number of independent interests in some small developing countries demands that the number of trustees be at least six and that coordination among trustees be prohibited unless foreign investments are very large. In addition, this report shows that in small countries where human capital is scarce it may be best to permit individual members of pension funds to choose the pension management trustee and board of directors, as opposed to having trustees selected by the government or by employers and unions. The latter alternatives are shown to be fraught with problems in small countries. Such a recommendation presumes that regulations and supervision systems are put in place to ensure that the pension fund trustees have incentives to carry out their fiduciary responsibilities on behalf of fund members.

(c) *Providers of pension services need the flexibility to subcontract domestically or internationally for many pension services.* This should include subcontracting for data gathering, to permit the small country to acquire pension services at lowest

labor costs and to benefit from the transfer of know-how. Such concerns are far more critical in small than large countries, because the economies of scale in such services and associated cost reduction will be difficult to achieve given the small universe of eligible labor. Permitting international subcontracting of pension account administration and processing is also critical for companies operating in small countries to realize efficiencies. A key issue regarding the latter is the cost of transferring the information to the international processing company, which in turn depends upon the degree of competition in the international telecommunications industry.

(d) *Regulations applied to portfolio management in small countries should permit or even mandate that some proportion of the pension funds be invested in appropriately rated offshore securities.* This requirement permits international diversification. It is also critical in small countries that do not have a sufficient set of independent interests, in order to minimize the possibilities for manipulation of local securities markets -- a problem that often arises in small countries as funds become large relative to the overall size of the domestic securities markets. This investment regulation should be coupled with actions to permit free entry to foreign portfolio management firms via direct provision of cross-border services without establishing a physical presence. Such policies, in combination, could make the investment management industry in the small countries more contestable.

(e) *Mandatory provision of insurance services bundled together with pensions (such as disability coverage or longevity insurance via the purchase of annuities) may not be advisable in small countries.* For example, in a small country the demands on scarce human capital needed to set up medical boards would be lessened if disability coverage were not made mandatory. Voluntary disability coverage may be offered to employer-established groups of employees by on and off-shore insurance companies or even by efficient public agencies (in other countries), which could compete to offer such coverage. Also in small countries, with fewer persons covered, the law of large numbers may not apply, and mortality tables may be less reliable because of the greater mobility of labor. Thus, cross-border provision and direct investment by foreign insurance carriers, including the purchase of reinsurance or annuities in the international markets, should be permitted subject to appropriate regulatory certification requirements by home and foreign supervisors.

(f) *The relatively small size of the market for pension services in small countries, in terms of both number of active contributors and level of wages, will limit the interest of foreign direct investors in providing such services.* The paper shows that in the case of markets with 200,000 to 400,000 active contributors and wage rates of about US$ 200 to 400 per month (e.g., Bolivia) the flow of commission income into the entire pension provision business will be between US$ 2 and US$ 10 million per year, depending on the commission rate. In this case the desire of major foreign companies to directly invest in setting up a branch or agency, and to form strategic alliances with domestic companies, will be limited. This implies an additional argument for mandating the unbundling of pension services -- i.e., the small size of these markets could be less of an impediment to entry if some services, such as investment management, were less subject to high fixed costs upon entry.

3. Demand for Pension Services

12. In the case of policy relating to the demand for pension services, differences between the small and large country case are not quite as dramatic as in the case of supply. Three substantive conclusions emerge:

(a) *It is important to avoid regulations that make demand for pension services insensitive to prices by prohibiting differential pricing of pension services. Such regulations discourage price as opposed to nonprice competition.* Although this type of problem arises irrespective of country size, it can be exacerbated in small countries where there is greater labor mobility. Liberalization of commission structures can help reduce the nonprice competition and high commercialization of selling costs often associated with private provision of pension services. Instead of needing to send salespeople to sway individuals to move from one pension provider to another, firms could then engage in greater price competition, which would reduce costs for all participants.

(b) *Relative to large countries, where some diversification can be obtained through domestic investments, in small countries the need for diversification, coupled with people's need to obtain a "real" pension, implies that authorities should commit to unrestricted convertibility of pension incomes into domestic currency, devoid of exchange or capital controls.* Multilateral institutions could provide transitory guarantees associated with convertibility risk to ensure that a pension product denominated in key international reserve currencies (e.g., U.S. dollars, German marks, and yen) can emerge. Capital controls can also impede the development of such pension products, but this risk is more difficult to insure.

(c) *The set of annuity products available to persons reaching retirement in small countries should concentrate to a much greater degree than in large countries on variable rate annuities.* Such annuities permit pensioners to take on some investment risk to partially diversify inflation risk, which is particularly important -- and difficult -- in small countries. This result obtains because actual domestic inflation in the small country can differ from inflation in the countries where some of the pension fund is invested, even if the same currency is used. This risk cannot be completely diversified, so that in small countries variable rate annuities at retirement may be much cheaper than constant real annuities (i.e., index-linked annuities defined in terms of the local price index).

4. Other Considerations for Pension Policy and Reform

13. When a small contribution base in small countries is combined with other characteristics such as relatively greater gross migration flows, more mobile capital, a lack of independent interests, and a shortage of human capital, a number of insights emerge for policymaking. These include:

(a) *Pension policies involving the use of fiscal incentives (e.g. 401K plans, IRA accounts, and tax incentives for personal occupational pension plans) are less attractive in*

small countries. Commonly used tax handles that are simple enough to avoid costly tax administration arrangements, such as value added taxes or import tariffs, are not effective in countering the improvidence of workers -- a key objective of pension policy. The relatively greater capital and labor mobility in small, open developing countries means that the tax base for imposing a given fiscal incentive will be less broad, so that such incentives will be less likely to stimulate saving and insurance for old age.

(b) *Mandating contributions in exchange for rights to benefits, as opposed to schemes involving fiscal incentives, carries potentially greater political risks than in large countries.* However, such schemes do address the problem of improvident workers, as well as failures in intertemporal insurance markets, more directly. To mitigate the greater political risks in small countries, mandated contributions should involve: (i) a defined contribution approach to risk sharing between the beneficiaries and the government; (ii) constitutional protection of property rights associated with individualized pension fund accounts; and (iii) professional or technical panels to provide oversight, under strict governance processes.

(c) *Apparent funding (i.e., the degree to which pension obligations are backed by various forms of securities, inclusive of government securities, is very important in small countries whereas ultimate funding (i.e., backing with outside assets such as physical or foreign assets) is less critical than in the large country case.* This finding results because in small countries overall economic growth is far more dependent on openness to international trade in goods, services, factors of production, and technology than on domestic accumulation of savings and new knowledge. Therefore, the increase in domestic savings that a pension reform may promote by insisting on ultimate funding is likely to be relatively less important in a small country with open borders. However, moving to a system with apparent funding is critical because the ability to back pension promises with securities (even if government securities), as opposed to legislated promises, as in a typical pay-as-you-go system, reduces political risks. In addition, a shift to apparent funding is a prerequisite for international portfolio diversification, which is valuable for smaller countries for the reasons explained above.

I. INTRODUCTION

1. Throughout the world, countries of all sizes face difficult decisions in the area of old-age security. This paper is focused upon the many small countries that are now in the process of reforming their social security systems and that confront special pension policy problems related to their size. At the same time, international institutions such as the World Bank are increasingly being asked to provide guidance in the design of such reforms.

2. The objective of this paper is to provide a framework for assessing the proper role of the private sector and the state in pension policy, which is based on pension economics and industrial organization theory, but emphasizes aspects of specific relevance to small countries. Thus, the paper provides guidance to officials in small developing countries and Bank staff in the design of policy frameworks for pension reform in small countries.

3. Small countries are characterized by smaller numbers of members in the pension system, which result in a less than minimum efficient scale in provision of some pension services. In this paper, small countries are defined to be those where employment in the formal sector is below one million. This assumption alone leads to a number of important policy implications; one of the most important being the need to subject small countries to greater"international competition" in provision of pension services. In addition, many small countries can also exhibit much greater international mobility of labor and capital; are subject to a greater scarcity of human capital specialized in financial supervision and tax administration; and have far fewer independent financial and political interests, relatively less independent civil services, and less political stability over the long time horizons involved in mandatory pension systems.

4. Perhaps the most robust overall policy implication of this paper is that in small countries, the case for opening the economy to permit greater trade in financial services is much stronger than in large countries. This is so because:

(a) The infrastructure needed to support pension services can be radically reduced by importing key services, which will allow the small country to rely on the financial supervision, financial sector laws, and, in the extreme, even the civil law framework of larger, more developed trading partners (see discussion of institutional infra-structure to support pension services, below);

(b) The relatively greater tendency for lack of competition in the provision of key pension services in small countries, due to the small contribution base and lack of independent interests, can be mitigated through greater international trade in provision of these services (e.g., data processing, investment management, longevity insurance), combined with actions to mandate the unbundling of collection services from other pension services (see discussion of supply of pension services, below);

(c) In small countries this free trade in financial services must apply generally and should enable residents to contract for provision of investments in foreign currencies, implying the need for explicit convertibility guarantees over very long time horizons. This issue is shown to matter more for small than for large countries because individuals demanding

pension services will be able to obtain more diversification if they are allowed to operate internationally; and

(d) Finally, in many small countries securities markets are not liquid and are often characterized by a lack of independent interests. The paper suggests that it may even be necessary to *mandate* offshore investments *in addition to* permitting greater foreign competition in the provision of investment management services.

5. This paper develops a detailed framework, based largely on industrial organization economics, to evaluate the need for special regulations of supply and demand for pension services in small countries. The paper is organized as follows: Section II describes the primary pension services and explains the links between the costs of pension services and development of certain types of infrastructure within the small country context. In addition, it shows how the design of pension reforms have implications for the type of infrastructure needed to support a mandated pension system. Section III covers the supply of trustee services, and the organization of supply of other pension services including investment portfolio management. Section IV discusses some of the special demand problems of a small country. Section V outlines a number of other issues that arise in designing pension policy in small countries that are characterized by not only a small contribution base, but also by greater international capital and labor mobility, less human capital, and a number of other stylized characteristics. Finally, Section VI offers some provisos and summarizes the recommendations.

II. PENSION SERVICES AND INSTITUTIONAL INFRASTRUCTURE

A. Primary Pension Services

6. Pension provision comprises the following services: (a) contribution collection, wherein employers acting as retention agents are contacted periodically by a collection agency that receives payment and raw data about each worker's contributions; (b) data processing of contribution information, with processing oriented to eliminating errors from the raw data; (c) accounting support to mark investments to market prices, to calculate net asset value for each fund on a daily or weekly basis, and to ensure that investment diversification guidelines and other regulations are met; (d) bringing together the information generated in the previous steps and processing individual accounts to obtain new balances; (e) client services provided to the contributors and pensioners (members), such as sending of account statements and answering inquiries; (f) portfolio management, including analysis of investment opportunities and financial risk management; (g) insurance and related benefit management, including benefit calculation and purchase of disability, survivorship, and longevity insurance (in the form of annuities); (h) pension payments and distribution of lump sum payments to permit purchase of annuities; and (i) processing transfers of individual account balances among authorized pension management trustees.

B. Institutional Infrastructure and Costs of Primary Pension Services

7. The costs of providing each of these primary pension services are not independent of the infrastructure present in a specific country (see Annex for details). For example, inadequately functioning registries, i.e., contributor and employer identification systems, can make imposition of a mandatory contribution system based on individualized accounts significantly more costly, if not impossible, to implement. In the case of Peru, the new pension system was forced to create its own identification numbers for members. A high cost could not be avoided even though procedures were coordinated by the Peruvian Superintendency of Pensions. These numbers are now being used by other services not related to pensions.

8. Cost-effective provision of pension services also requires the existence of a basic infrastructure in the areas of clearing and settlement of payments and custody of securities, which are often not well developed in small countries (see Annex). The financial information needed for efficient provision of insurance and fund management services requires actuarial, auditing, accounting, valuation, and securities rating services, some of which can be imported. Finally, there needs to an adequate supervisory and legal/regulatory framework, which may be more difficult to import.

9. Although the institutional infrastructure required to support a low-cost pension system may appear daunting, the minimum local requirements are well within the capability of small countries, particularly if reforms are implemented to permit free importation of a large number of the services noted (see Annex). Evidence from some Central American countries suggests that this is already occurring in the case of a number of services (see Box 1).

Box 1. Leasing Institutional Infrastructure from Abroad

Examples of institutional infrastructure that can be imported include, in the case of Costa Rica, subcontracting the processing of services to price and trade different kinds of securities (government or private) through Chile's electronic stock exchange. Given the small volume of transactions generated in the country, acquiring all the necessary infrastructure (hardware, software, etc.) and human capital to develop the securities market was very costly; therefore, subcontracting the services abroad allowed the Costa Ricans to trade in the securities market without the need to make these investments.

A minimum set of infrastructure however, must be developed domestically. This should include: (a) a system that identifies contributors, pensioners, and employers; (b) an adequate system of banking; and (c) pension supervision sufficient to enforce the pension regulatory framework. Of these three areas, the development of an adequate pension supervision system is the most difficult to implement given the shortage of specialized human capital in small developing countries (but see Box 2). Many other services (e.g., information services) can be imported or will develop effectively if the supervisory and regulatory framework creates incentives for self-regulatory associations to set high minimum standards for the services provided by their members.

10. In addition, even when some infrastructure services need to be provided locally, the human capital and overall costs for small countries may not be as great as anticipated. For example, Box 2 suggests that even in medium-sized countries such as Chile, the costs of developing pension supervision capacity are not prohibitive.

Box 2. Chilean Superintendency of AFP

Sometimes the amount of human capital required by a Superintendency is overstated. In Chile, the Superintendency of Pension Fund Management Companies had 79 employees with at least 4 years of university study in 1994. The composition was as follows:

Accountants/auditors	26	Statisticians	3
Economists	21	Industrial engineers	3
Computer engineers	9	Sociologists	1
Lawyers	8	Medical doctors	1
Social workers	6	Other	1

C. Pension Reform Design and Institutional Infrastructure

11. The extent of institutional infrastructure needed to support a pension system depends on the specific design adopted. For example, a mandatory occupational pension scheme like that in Switzerland, which places the burden of pension management on the employer, avoids the collection stage so the associated infrastructure is not needed. However, duplication of accounts and account transfer can be very costly in that setting, because there may be tens of thousands of pension managers. Similarly, a pension design wherein the government is the sole issuer of securities that can be bought by a fully funded scheme does not require much of the infrastructure associated with domestic securities markets, such as valuation and risk rating services or complex laws and regulations relating to conflicts of interest and corporate governance. Finally, to the extent that the management of a large portion of pension funds is contracted out to a single major international fund management firm, and domestic investment by the pension funds is limited, there is less need for extensive supervision and infrastructure of the domestic securities market.

12. Another type of pension reform option that can vastly reduce the infrastructure needed is one where the role of the government would only be to mandate contributions, create a collection system, set certain minimum standards for a pension contract, and license international companies to offer that contract to local contributors. In other words, leave it to Merrill Lynch. in this case the small developing country is de facto importing supervision services, and avoiding all of the infrastructure needed for domestic securities markets except for registries to identify contributors and pensioners. In a less extreme case, some proportion of the assets could be invested in domestic financial markets. Although this option can reduce the infrastructure needed, it introduces other risks and costs to pensioners. For example, under this setup each contributor could switch to a different international pension fund manager once a year. This would mean that each worker could have 47 different suppliers through retirement. The cumulative costs of administering each pension would increase with each change. In addition, legal recourse by pensioners under laws in the country where the foreign investment management firm is domiciled would need to be carefully analyzed.

13. The effectiveness of some types of institutional infrastructure is also a function of the specific forms of infrastructure that can be provided "together in one bundle." For example, if the pension supervisory body performs some operating functions, as it does in Peru, it loses some of the authority and incentives needed for effective supervision of that function. This is because the administrators of such a supervisory body are subject to a conflict of interest, since many of them may find it difficult to criticize their own performance. In addition, a supervisory authority in that role becomes hostage to its own personnel, since there is no alternate supplier of the operating functions it has centralized and nationalized. There is also a loss of information about the efficiency with which those functions could

be performed elsewhere, which may further hamper the cost-effectiveness of nationalizing the provision of certain infrastructure services.

III. THE SUPPLY OF PENSION SERVICES

14. In small countries, relatively more attention should be paid to designing pension systems that ensure adequate competition, or, more formally, contestability, in provision of pension services. Because small countries often experience greater labor mobility than large countries, their total mandatory contribution rates are subject to a lower ceiling, as discussed elsewhere in this report. In this setting, an increase in administrative charges cannot be absorbed by increasing the total contribution rate, as it could be in larger countries; rather, the net contribution rate and the final average replacement rate must be reduced. This means that the effectiveness of the tool of mandating contributions is damaged to a greater extent in a small country, because very low replacement rates do not help improvident workers enough.

A. Conceptual Framework

15. As Baumol et al. (1982) note, contestability is a characteristic of many markets. This is particularly true in the production of financial services (Braeutigam, 1989; Gorton, 1989). The industrial structure of a market will not be contestable -- entry will be blocked -- if it is characterized by both sunk costs and subadditive costs over the relevant range of output; that is, by a natural monopoly. If both sunk costs and subadditivity of costs are significant, they will permit initial industry participants that earn extra-normal profits to deter entry. However, if sunk costs are not significant, removal of entry controls, if present, may be sufficient to make provision of a good or service contestable even if the industry is a natural monopoly.

16. Sunk costs arise when there are capital costs associated with production of a good or service for a given client that cannot be recovered for the use of other clients. An example in the context of pension services is the information capital built up to manage collections at minimum cost, which involves detailed knowledge of particular employers present in a given area. Another example is the advertising costs of a pension fund management firm or insurance company.

17. If one particular pension service is not contestable, and that service is not subject to substitution in the total bundle of pension services, and all the other services in the bundle are offered in perfect competition, then, in theory, the monopoly supplier could extract similar monopoly rents, either by overpricing its monopoly service or by vertically integrating to offer the entire bundle of services and overpricing the bundle (Warren-Boulton, 1974; Tirole, 1988). In practice, the other services in the bundle are unlikely to be offered in perfect competition, especially trustee services, so in most cases a monopoly supplier gains by integrating and providing the entire bundle. Even if some diseconomies of vertical integration appear, the level of commission income will still increase due to vertical integration.

18. Such an analysis suggests that legislating the unbundling of the pension services in which there is a natural monopoly and sunk costs may facilitate entry into the other markets for pension services. A reduction in concentration associated with this mandatory disintegration is socially

valuable for a nonstandard reason: atomistic trustees have less political power. Concentration creates a special type of externality, since an increase in the market share of the largest trustees reduces the quality of service offered by other providers. This is because an increase in overall concentration of trustees increases the political risk of all pensions offered by a mandatory system. Because of this externality, interventions that limit concentration in the trustee market may be justified.

19. This argument should not be confused with the conventional one that concentration leads to an increase in charges and fees. Experience and theory show that prices may fall or increase with concentration, depending on market conditions. For example, a firm may be stronger (more efficient) in operations than its rivals or may have a lower profitability goal. If such a firm gains market share, average commissions may fall.

20. In addition, disintegration also facilitates regulation of the pension services in which there is a natural monopoly. More efficient regulation may generate an additional fall in charges. For such services, the alternatives are competitive bidding for the right to operate a franchise (Demsetz, 1968), price regulation, and self-regulation.

21. Lack of contestability is not always due to natural monopoly and sunk costs. Entry may also be blocked by legal barriers (legislation). One of the most common legal barriers found in small countries is the prohibition against cross-border provision of services. It follows that an effective strategy to prevent small market size from generating a monopoly is to allow the buyer to obtain the service from an offshore provider. In many cases, this strategy must not only eliminate prohibitions, but must also reduce special taxes on cross-border provision and dismantle nontariff barriers such as nonacceptance of foreign formats for the services involved.

22. International trade of pension services in small countries also depends critically on the availability and prices of enabling infrastructure, particularly in the areas of telecommunications and computers. Lack of competition in these services can greatly increase the cost of cross-border provision of pension services (see Annex).

B. Supply of Trustee Services

23. A key issue in small countries relates to the supply of trustee services and governance. A good way of analyzing the pension service industry is by distinguishing between services rendered to stocks and services rendered to flows. Services to flows include collection of contributions, processing of individual accounts, and payments of pensions. The services rendered to stocks include pension fund management, custody, and transaction execution. The distinction is useful because the consequences of a concentration of supply are different for each of these types of services.

24. Concentration and market power in processing accounts may result in large fees, but the fees are unlikely to be large enough to erode the pension funds significantly. However, concentration in pension fund management brings the prospect of fiduciary fraud, and more importantly, allows financial power to be concentrated in a few hands. This in turn may induce politicians to attempt to gain access to that financial power and exploit it for their own purposes.

25. Large administrative fees are unlikely to be sufficient to diminish the pension funds significantly, because in typical cases close to 70 percent of a pension is financed by past and future

interest earned, and only 30 percent is a recouping of contributions (with no interest). To understand the magnitudes involved, consider a case where administrative fees of 1 percent of wages are added to a contribution rate of 10 percent, which yields a gross pension equal to 70 percent of gross earnings. If 4 to 5 percent increase in interest earned requires that administrative fees be increased from 1 to 2 percent of wages, then the combination allows the total contribution rate to be reduced from 11 to 9.22 percent while keeping the same expected pension[2].

26. The extent of political risk is a critical issue. The possibility of political intervention to direct the use of the pension funds is an important source of financial risk over the long term. This risk tends to be greatest when the government designates the board(s) of trustees.

1. Functions of Pension Trustees

27. Efficient investment management distinguishes between portfolio managers, who are experts in financial investments, and pension trustees, who hold residual or prudential oversight powers. Trustees are critical in determining financial performance, since they have the power to fire and hire portfolio managers and set guidelines for their financial strategy. In addition, trustees are also empowered to select auditors that value illiquid assets, and to select custodians. When pension funds hold equity in corporations, trustees issue voting instructions at shareholders' meetings.

28. The suggestion that trustees be chosen by impersonal bidding, made by Arrau and Bitrán (1992), is not practical because such bidding would be extremely vulnerable to adverse selection. In this context, adverse selection means that some persons would be disproportionately attracted to offer low bids, such as criminals, persons willing to sell their decisions to rich business groups, and political administrators willing to use their power to obtain favors and contributions for their own parties. Although bidding coupled with adequate screening processes for checking the background and qualifications of trustees could be employed in theory, trustees have never been chosen by bidding in any country.

29. The critical question is who performs the function of trustee?[3] There are two aspects to the present question: (i) who designates the board of trustees; and (ii) what is the minimum number of "independent" boards of trustees needed in the pension system. This should not be confused with the issues of how many providers of pension services should be hired and how vertically integrated they should be, which are discussed in Section IIIC.

2. Independent Boards of Trustees

30. The number of trustees should be greater than five, because a smaller number would create a monopoly or oligopoly that could control the domestic financial system and the domestic corporations, if significant pension fund resources are to be invested domestically and if the portfolio movements of the pension funds are not to dominate the exchange rate. A mandatory pension system is expected to accumulate assets that are 200 percent of GNP, if coverage of workers is to be 100

2/ This calculation assumes a flat age-earning profile, 40 years of continuous contribution, and 20 years of retirement.

3/ The so-called "Master Trustee" is a vertically integrated pension services company that has a misleading name. It integrates all functions except that of sponsor or trustee, which has the final say about investment strategy and voting in shareholders' meetings. Given a board of trustees, that board can subcontract separately the portfolio managers, a custodian, a collection firm, and an account processing provider.

percent -- two to four times the assets of the banking system of most countries. Sooner or later, an oligopoly would use its power to attempt to control these assets. However, if the country is willing to require the pension system to permanently invest at least 95 percent of its funds in international capital markets, a single or very few trustees or board of directors could be considered.

31. Requiring the pension system to invest a large proportion of its assets internationally, however, could be detrimental for the development of the domestic economy, depending on the degree of international capital mobility. The option of requiring the pension system to invest in debt instruments alone eliminates the problems related to voting in shareholders' meetings ofnonfinancial companies, but it does not justify the existence of a single trustee. The Swedish experience with the two AP funds of the ATP system, which followed this option in 1959, shows that the trustees can still wield enormous financial power by refusing to buy corporate or bank bonds until required covenants are accepted (Pontusson, 1984).

32. The only case where a single or a few trustees are feasible is the one of a very small country that has a very open capital account and that enjoys such high degree of access to foreign capital markets that even small and medium-sized firms would not become dependent on the single trustee. These conditions are not met in most small developing countries; however, they are met by municipalities and even state governments in very large countries such as the United States. For all other cases, there should be at least six trustees or separate boards, and coordination among them should be prohibited, despite the not insignificant difficulties of enforcing such a provision.

33. Besides ensuring a certain number of trustees and limiting how they are related across separate pension funds, the issue of the independence of the trustees is multifaceted. First, they must be independent from affiliated investment managers to ensure that they are acting in the interests of pension fund contributors. Second, independence must also extend to their dealings with related parties within the financial group and with nonfinancial companies, if the pension fund can invest in equities. In small countries, finding independent trustees may require using foreign nationals of sufficient standing, and making them subject to adequate criminal and civil liability if they do not properly discharge their fiduciary obligations. In sum, ensuring a certain number of trustees or separate boards of directors is a necessary but not sufficient condition for small countries to obtain the benefits of private investment management in such areas as corporate governance of nonfinancial companies. In many of these countries, independent trustees, or outside directors, must be precisely defined in law and regulation and be subject to credible enforcement by supervisory agencies.

3. Trustee Selection and Political Risk

34. There are many ways to designate trustees. One is for the government to designate them at either the national or regional level. Another is for employers or unions to be assigned by law to designate the trustees; and the third is for individual workers to choose among available trustee services offered by pension management firms.

35. **Selection by individual members.** In the option where individual members choose among competitive and licensed pension management companies, as in Chile, the United Kingdom (since 1988), Colombia, Peru, and Argentina, that licensed company plays the role of trustee. The members of the board of the pension management company take on trustee responsibilities, as specified in fiduciary conventions and specific regulations. These include choosing accountants and custodians,

setting the overall investment strategy, directing the activities of the portfolio managers (both individuals and specialized companies with which it may subcontract); and directing their voting in shareholders' meetings. The individual members retain the rights to: (a) switch trustees, moving to another pension management company; and (b) bring suit against the board of directors for breach of fiduciary duties, either alone or in the context of a class action, where such recourse is permitted by law.[4] This is analogous to the delegation of rights in exchange for taking up fiduciary duties that occurs in the voluntary mutual.fund or unit trust industry.

36. To enable this option, the state's role is to provide a clear body of law that defines the attributes of the fiduciary relationship. Some of these attributes are (a) affirmative duties to disclose, (b) open-ended duties to act, and (c) a promise not to take implicit compensation unless openly disclosed (Clark, 1985). A second role for the state is solid enforcement by the courts. These two roles are more difficult to carry out in small than in large countries, because the specialized human capital needed to operate fiduciary law is more scarce, and the relative lack of independent interests makes the courts less reliable.

37. Still, the state can play a role by providing a specialized superintendency or regulator, which ensures that the boards of directors of the pension management companies discharge their fiduciary duties. In addition, actions can be taken through public disclosure and reports to the regulator to credibly enforce independence of the trustee or board member from related parties in the financial group, nonfinancial companies, or investment managers, as well as provide insulation from other conflicts.[5]

38. **The law assigns the duty to employers and unions.** Where the employer or the union is assigned by law to be the sponsor that designates the board of trustees, as in Australia and Switzerland, the danger exists that the members become vulnerable to manipulation by the sponsors. More formally, there are greater principal agent problems in these arrangements. The risk that some of the thousands of trustees created by such a law will fail to fulfill their imposed fiduciary role may be somewhat mitigated by a solid body of fiduciary law, provided it is well enforced by the courts, but the task is very demanding. For example, the Goode Report (1993, Section 4, para. 5.54) declares that "It is unrealistic to imagine that individual trustees will be able to leave behind entirely their other roles.... In the modern world, conflicts of interest cannot be avoided. They can, however, be managed." In practice, even though British trustees have the duty "to act impartially, fairly balancing the interests of different classes of beneficiary" (Goode Report, Section 4, para. 5.4), most base benefits on the last annual salary, a practice that redistributes wealth to those of higher income, as they normally have a steeper age-earnings profile. The most recent (1992) scandal of employer manipulation of pension funds is that involving Robert Maxwell in the United Kingdom.

39. Australia has attempted to mitigate problems associated with trustee selection by employers or unions by allowing members to elect half of the board of trustees. For the U.K., the Goode Report (Section 4, para. 5.40) proposes allowing members to elect a third or two-thirds of the board of trustees, depending upon whether the plan is defined benefit or defined contribution, and only for plans with more than 50 members. In fact, many of the elected trustees are union officials who can also manipulate the pension fund against some classes of members. This has indeed been the case in

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4/ In many Latin American countries the tradition of the Napoleonic code does not allow for bringing class action suits.

5/ Regulations may, for example, require records of trading by trustees or related parties, as well as by investment managers. Also, regulations can be designed to require certain minimum standards for internal compliance by the pension fund, e.g., internal control systems to prevent abuses by trustees or board members.

some union-sponsored multiemployer plans, both in the United States[6] and in developing countries. However, an abundant legal tradition regarding fiduciary rights and independent courts was still unable to deter fraud in pensions, although some reforms that were passed subsequently may have improved matters.

40. Small countries may have even more difficulty relying on court control, due to the lack of specialized human capital and the limited number of independent interests. Even in the U.K., the Goode Report concluded that creating a pensions regulator was essential, bringing the option of employer/union selection closer to the one with individual selection of trustees or boards. The analog in the case of member election of the board of trustees would be to entitle the members to elect part of the board of trustees, as shareholders do in public corporations. However, this remedy is in most cases less powerful than the right to switch trustees by moving to another pension fund management company.

41. **Assignment by the state.** A last option is where the government designates a single or a set of regional boards of trustees. In this case the state intervenes not as supervisor, but as sponsor of the board of trustees of the pension system, which oversees the adoption of prudential decisions. In this option there is no scope for a superintendency, since congressmen or politicians take up the role of supervising the board of trustees. This option may be marginally improved by applying fiduciary law to these congressmen and politicians. The practice of naming trustees for long overlapping periods, as in Supreme Courts or independent central banks, has been rejected by the Goode Report (Section 4, para. 5.49) because such trustees may impose additional liabilities on the sponsor.

42. When analyzing state ownership of natural monopolies, Willig (1994) has shown that a privately owned monopoly subject to price regulation has an important advantage over state ownership of the same monopoly, because the property rights of owners insulate the private firms from political influences. On the other hand, state ownership has the advantage of being able to respond to a social interest (different from an individual interest), even though the required response cannot be specified in advance through automatic rules and cannot be verified after the fact.

43. When applying these principles to the issue of designation of pension fund boards of trustees, we gain from insulating investment decisions from political influences, since the rate of return is by far the most important determinant of benefit levels. On the other hand, nationalization of trustee designation involves none of the gains mentioned by Willig (1994), because there is no need to respond to a social interest different from an individual interest, with the social interest narrowly defined as striving for secure and substantial pensions for the improvident. In addition, most trustee actions needed to achieve that purpose can be specified in advance or can be verified after the fact. Still, there exist other gains from nationalizing the designation of trustees. These gains are related to avoidance of costs that arise naturally with multiple providers of pension services under the non-nationalization option. Specifically, nationalization avoids (a) the marketing costs associated with individual selection among several pension management trustees, and (b) the potential for breach of trust by private trustees, whether they are designated by individuals, employers, or unions. However, nationalization often increases political risks to contributors because the trustees have little insulation from political manipulation.

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[6] See Res (1985), who cites the famous case of the Teamsters Pension Fund for the central states, southeast and southwest areas. This case is described in more detail in James and James (1965).

4. Comparing the Options

44. The optimal design for the number and selection method of trustees, and the related regulatory supervisory framework, turns on the relative size of these costs. The risk of fraud by employers and unions can increase the risk to pensions significantly, and this risk is higher in smaller countries due to the smaller number of independent financial interests. This risk depends in part on the quality of supervision, but creating an adequate supervisory framework similar to the ERISA law in the United States or the BVG law in Switzerland may be impossible for many small developing countries, which lack the specialized human capital needed to enforce such laws. In addition, to the extent that these laws create entities such as government guarantee funds (e.g., the Pension Guarantee Fund in case of ERISA), experience in small Latin American countries suggests that this is a very dangerous policy given the moral hazard problems engendered.[7] The high marketing costs observed in Chile, Argentina, and Peru are due in part to excessive government regulation of the fee structure. For example, the marketing costs, which run up to 30 percent of fee income in Chilean AFPs, are only 18 percent of fees in Chilean health insurance companies, which also collect mandatory contributions but have free pricing and therefore are free to offer group plans to each member (Valdés-Prieto, 1995). Fees could be even lower if other recommendations made in Section IIIC are followed, because entry would be easier. In any case, an 18 percent increase in administrative fees may be worth a reduction in the risk of pensions if the reduction is large enough.

45. The expected costs of political interference associated with government-designated boards of trustees depend on the degree of a country's political development. If the country can create government-designated boards and associated governance processes that are sufficiently insulated from politics and are able to perform their prudential role efficiently, this would be the best option. However, many small developing countries are not politically developed enough for this option. Consider, for example, the case of a military government that could replace the board of trustees with no opposition. If a single party has dominated the political spectrum for decades, as in certain Latin American, Asian, and Eastern European countries, boards of trustees in those countries could not be insulated from political pressures. What is more, a small country that depends on an imperialist power for more than 80 percent of its international trade may be forced to change its board of trustees due to pressures from that power.

46. There are many subtle ways to politically influence government-designated boards of trustees, which are more prevalent in small countries because of a smaller number of independent political interests. If political parties compete mostly on the basis of promises to their immediate followers (patronage), or on the basis of promising benefits for the majority of current voters (populism), or if the parties or elected representatives can be bribed easily by pressure groups, then government-designated boards of trustees have few chances to succeed in their duties over the long term. Once a regional or national board of trustees is captured by politicians, it can threaten the fund managers it hires with nonrenewal of their contracts unless they buy overpriced bonds from private firms that contribute to the campaigns of those politicians, or risky bonds issued by municipalities controlled by the dominating party, or bonds that yield below-market rates issued by the treasury or by state-owned enterprises (Tiglao, 1990); or if they do not buy overpriced mortgage bonds, as was required to support the official housing policy in Sweden (Pontusson, 1984).

7/ Even in large countries, the establishment of guarantee funds for occupational pension plans creates distorted incentives.

47. In countries that exhibit this type of political behavior, a pension system based on competitive selection of pension management companies by individual members can insulate trustees from many of these pressures. Since each pension management company must compete for clients, this competitive process punishes those companies that indulge in concessions to politicians. For example, if powerful politicians request that pension management companies buy a low-yielding debt from a state-owned enterprise, the company resists this pressure will exhibit higher returns and will be rewarded with more customers and higher profits, as seen in a recent Chilean episode (Godoy and Valdés-Prieto, 1994). It is important to note that these benefits will obtain with more certainty if the supervision agencies help to support the political independence of the members of the boards of trustees.

48. Therefore, in all cases where the political development of a small country has not reached a stage where vulnerability to such pressure can be confidently ruled out, and human capital is too scarce to supervise thousands of employer and union-run boards of trustees, the best option is individual selection of pension management companies. This proposition has received empirical support. A recent study by Mitchell and Hsin (1996) about the financial performance of 130 occupational pension plans for public employees at the state and county levels in the United States, where the sponsor is a political entity, finds that the presence of elected pensioner representatives, usually linked to unions, on the boards of trustees reduces the rate of return of the pension fund.

49. A recent study by the World Bank,[8] about the rate of return obtained by provident funds (single, government-managed pension funds) in 14 countries, found that all of them performed worse than privately managed pension fund management companies, and many had returns below negative ten percent per year for five years. A study by Mesa-Lago (1991) compares the financial returns of the funds invested by half-funded conventional social security systems in 8 Latin American countries and comes to similar conclusions.

50. In light of this experience, small developing countries may wish to choose a design with privately owned competing pension trustee companies, supervised by a specialized government agency -- a superintendency. (The exceptions, where other trustee arrangements might be better, would be countries that have enough human capital to supervise tens of thousands of employers and unions, and have a high degree of political development and stability.) However, the arrangement with privately owned competing pension trustee companies may be rendered suboptimal if this market turns out to be concentrated. This is because a tight oligopoly of pension trustee companies would have too much power in the domestic securities markets, where international capital mobility is not significant, thus increasing the risk that these firms would be misused by politicians. Section C below discusses the possibility that concentration in some types of financial services rendered to flows (e.g., collections, payments of benefits) may lead to concentration in the pension trustee market (i.e., services applied to stocks).

C. Competition in the Supply of Some Pension Services

51. The paragraphs that follow assess the degree to which each pension service is characterized by monopoly. In each case, specific options are described for the provision of that service.

8/ See James et al. (1994), Chapter 3, paras. 93-6 and Figure 3.7 and Chapter 6, Fig. 6.3.

1. Collection and Processing of Contributions

52. **Economies of scope.** The collection process is characterized by economies of scope, which come from three sources. First, each employer has to fill out a form for each provider of collection services, with each form indicating the employees within the company who have chosen pension management companies that in turn have hired a particular collections provider. There is a fixed cost involved in completing these forms. Therefore, a collection service serving pension companies that represent a larger share of the workers can spread that fixed cost over that larger number. The differential between the average cost of collection for large a versus small number of workers per form favors a particular organization of supply: a single provider of collection services per employer. This organization minimizes the number of forms per employer.

53. Second, the cost borne by the employer clearly falls as the number of collection agencies falls, because many assignment errors are avoided and the remaining mistakes can be corrected at a smaller cost. The cost of correcting mistakes when the employer distributes 60 employees among 6 forms is much larger than the cost when all 60 employees are on a single form. This means that employers also favor an organization of supply of pension services in which there is a single collection agent.

54. In a competitive environment, these two sources of economies of scope do not imply a natural monopoly in collection, because many collector firms can compete to act as the single collection agent for any given employer. However, in a regulatory setting in which employers are not allowed to express their preference for a single collector, and where collectors are not allowed to express the lower costs of collecting all the contributions paid by a given employer, these economies of scope cannot be expressed in prices. This is precisely what happens in Chile, where regulations prevent both types of response. Employers are not allowed to choose one collector because it is believed that the employer would obtain help to evade the obligation to contribute. This, in fact, seems to have happened as well in the Mexican retirement savings account system (SAR) set up in Mexico during 1992-1994.

55. This restriction does not yet imply a natural monopoly, however, because the other side of the market, namely collectors, would be willing to compete by offering discounts to groups of workers employed by a single employer. In the absence of price regulations, a small pension fund management company could start life with just a dozen contracts with ten or twenty medium-sized employee groups that pass on to their members the savings from acting in a group, and enjoy very small collection costs. No natural monopoly, therefore, would originate in scope economies.

56. The restriction in Chile is that collectors are banned by law from offering discounts. Since the cost savings remain but are not expressed in discounts, they benefit the collectors that come closer to acting as single collector for each employer. The pension management companies with a larger share in the worker market, assuming that those workers are evenly distributed across employers, enjoy a lower average collection cost per worker. This type of "economy from larger market share" is due largely to the regulations that prevent employers and collectors from expressing their savings in lower prices.

57. It is important to discuss whether allowing discounts for worker groups employed by a single employer is a good idea. It is possible to imagine that an employer would offer incentives to its

workers to choose a particular pension management company in order to save on administrative costs, and that the employer's influence could be tainted by a conflict of interest. This danger can be managed by imposing on employers an obligation not to influence their employees to favor a particular pension management company, but allowing them to encourage the selection of a single pension management company.

58. A third and final type of economy of scope may be realized through the consolidation of the forms used by employers to pay taxes, pension contributions, unemployment insurance, workers compensation, and mandatory health insurance into a single form, or at least into a unique collection process. However, diseconomies of scope may also exist in this approach because a mistake in processing one service may affect the others. In any case, this source of economies does not favor concentration of supply per se, but rather a larger scope of the service.

59. **Fixed and sunk costs**. Collection services also exhibit costs that are both fixed and sunk. This is because collection of contributions is a specialized activity quite different from, say, banking. The design of operations in countries where few employers use computers must deal with the fact that 5 to 10 percent of the raw data (incoming forms) contain errors, a much higher error rate than the one that banks can manage at low cost. The contribution processing system should detect and directly solve some of these errors and allow for consultation with employers to reconcile the rest. In this setting, specialization pays off handsomely.

60. A specialized processing system can take advantage of the fact that the error can be reconciled within a few months without major damage, which is not true of banking. In large Chilean pension management companies, a major part of the error reconciliation and correction occurs later on, in the massive processing stage. Further specialization gains can be made by building a network of contacts with the subset of employers that use computers, to connect to their accounting systems. There are large savings from moving collection offices out of expensive financial districts into areas with lower rentals, and from designing the tasks to be able to employ inexpensive personnel (avoiding the complex training needed by bank clerks, who must master a much larger variety of tasks). This know-how may reduce collection costs per form to less than one-third of the collection costs of a commercial bank.

61. Specialized collection technology exhibits two properties: First, most of the specialized know-how needed to reduce average costs is lost upon exit. This means that this is a sunk cost, the first condition for a natural monopoly. Second, there are economies of scale in developing the specialized know-how needed to reduce average costs. An investment in specialized error correction procedures is justified only when the system serves a large number of employers of similar size.

62. Given that the specialized technology has been developed in a particular country, its use in another region or country may occur at constant average cost. In other words, the economies of scale may be dynamic, not static, in the sense that they are present at the birth of the new technology, but disappear as more suppliers surpass the threshold of scale and invest in adapting the new technology. Once the specialized know-how becomes diffused, additional units of service can be rendered at constant average cost. Current experience in a variety of countries suggests that decreasing costs resulting from scale economies in collections continue up to 300,000 workers, or some 30,000 employers, but this may represent just the past of the pension industry, not the future. For a small country, there is a crucial difference between dynamic and static scale economies, because the former can be tapped by allowing competition among firms that have already made the investment in the

specialized technology through their association with international firms. In contrast, static scale economies are out of reach to small countries.

63. The available information does not allow us to discard the hypothesis that there also exist significant scale economies in collection over the number of contributors and employers observed in small countries. For example, the fact that all Chilean pension fund administrators (AFPs) with less than 100,000 members have decided not to integrate into collection (to avoid the fixed cost of the specialized technology) does not settle the issue of whether static or dynamic scale economies are present. This evidence may be representative of a past when Chile was the only country with competitive pension management companies, or it may show the importance of static scale economies. Evidence of these scale economies may be seen in the fact that SERVIPAG, a specialized Chilean collection company that services financial companies, utilities, and small pension fund management companies, has not been challenged by large-scale entry of other firms into this market. However, this same evidence may be seen as the result of restrictions on bank and AFP entry into this specialized business.

64. Economies of scale do obtain in a small country. In this case, both conditions for natural monopoly (sunk and fixed costs) would be present. If the relative size of these economies were substantial, competition among pension management companies that are vertically integrated into collections would favor the largest ones at the local level. In a small country, this process would lead to a concentrated market structure and higher charges, and to concentration of the trustee function. Given the negative impact of this latter outcome on the political risk affecting pensions, there may be a case for the government to intervene in collections.

65. The required intervention would be to prohibit vertical integration of collection and processing of contributions with the other functions. The gain from prohibiting vertical integration is that it prevents concentration of the trustee function. However, forced disintegration does impose costs. For example, looking in the membership archives held by the account manager allows a cheap solution to some types of errors, while avoiding contact with the employer. Some of these savings can also be obtained by a monopoly collector arranging to be in contact with the processing center of each pension management company. We now consider several options to organize the provision of collections services, given the mandated disintegration of this service.

66. **Policy options in collection and raw processing of contributions.** The first option is a nationalized monopoly. This appears attractive in small countries that have a well-functioning personal income tax collection system, because collections related to pensions can piggyback on that infrastructure. This has been tried in Argentina through DGI, a government-run entity, and could be attempted in small countries such as Costa Rica that have a fairly well-functioning personal income tax collection system. The costs of collections per form charged by DGI is US$ 4.0, and there is just one invoice (*planilla*) per employer. An important problem with this option is that a government collection agency may not have incentives to adopt the most cost efficient technologies for collections, but rather may wish to offer more employment to relatives and political supporters. For example, DGI uses a lot of manual labor and has yet to adapt the new technologies. A second important problem is that the nationalized monopoly may charge a large monopoly margin not subject to regulation, which acts as a hidden, unlegislated tax on labor. these factors may explain why the price for collections charged by DGI is four times that charged by Chilean banks, and at least 12 times the cost of large vertically integrated AFPs.

67. A second option is to periodically auction off the collection service to the one or several providers that offer the lowest charge per form. However, this is vulnerable to renegotiation because of the large sunk costs involved.

68. A third option is for a private monopoly subject to tariff regulation to provide collection services. Such an option presents substantial problems because regulation is very difficult to implement effectively when the costs of providing collection services are very sensitive to technical change. In addition, there is no stock of expertise about regulating these entities, contrary to what happens in electricity and telecommunications. It should be recalled that preventing high charges is more important in small than in large countries because high charges force a reduction in benefits.

69. A fourth option is for collection to be provided by a self-regulated open capital company, where the shareholders include the entities buying collection services, including the private pension management companies. The government's role would be reduced to imposing the obligation to allow entry on an equitable basis to new pension fund management companies, and the obligation of charging all pension fund management companies for collection services on the same basis. The government would also have to prevent this self-regulatory organization from serving as a cartel for its members by charging prices far in excess of its costs. On the positive side, the government could impose an obligation of confidentiality about contributors and pensioners, as well as corporate governance regulations that create incentives for efficient self-regulation of the collection company.

70. This last option appears to be the best for small countries that have no personal income tax collection infrastructure in place. Sometimes a mixed approach may be attractive. Some of the activities included in "collection and processing of contributions" may be run separately. For example, the Peruvian Superintendency of Pensions runs the processing functions related to error management. Although currently the private pension management companies in Peru collect forms, they could do so through a cooperative.

2. Payment of Benefits

71. If traditional banking technology is used, payment services are subject to total costs proportional to the number of beneficiaries, although the existence of infrastructure such as a network of automated teller machines (ATMs) can have a significant impact on these costs. significant scale economies seem to exist in benefit payments within the range observed in small countries, e.g., 100,000 pensioners in Bolivia. In addition, the gains from specialization in such services seem to be large, due to widespread geographic coverage, few service hours per month, and the fact that there is a relatively small number of pensioners. Again, specialized know-how gives rise to sunk costs, which, combined with scale economies, create a kind of natural monopoly in smaller countries. The options discussed above for data collection would also apply to the payments function.

3. Data Capture

72. Within the function of data processing of contribution information, there is a specific activity called "data capture," in which each individual line of a form is typed into a computer. It is generally considered a variable cost because it is proportional to the number of contributors being processed. This type of service can be provided by each pension fund management entity at similar cost

regardless of the scale of operations. However, the cost does depend substantially on unit labor costs, so it may be attractive to subcontract this function to the lowest cost provider, or even to an offshore provider. Contracting with firms abroad is now standard practice in the processing of credit card debits. Regulations should allow free subcontracting of this activity, particularly in small countries.

4. Account Administration and Processing

73. Account administration and processing includes investment accounting and recalculation of individual account balances. This function is subject to substantial economies of scale in relation to the number of accounts administered and processed. The main fixed costs are specialized computer programming personnel, software, and equipment. In large Chilean pension management companies, a major part of the error correction and checking processes occurs at this stage. Accounting cost evidence from the Chilean market suggests that average processing costs may fall to a third of initial costs when the number of members rises from 200,000 to 1 million. Further evidence of the economies of scale in processing is that small pension management companies in Argentina and Chile purchase processing services from a few major computer systems companies, such as IBM and SONDA, who do not experience much competition.

74. IBM and SONDA also provide a number of pension-related services in a single standardized package, so a relatively small trustee company can obtain access to attractive average costs with little effort. These packages comprise most of the services present in the "master trust" arrangements observed in the United States and Australia, with two exceptions: custody and selection, and control of portfolio managers.

75. The economies of scale in account administration and processing may seem problematic in small countries. For example, in Bolivia where perhaps no more than 200,000 members are served and at least six different trustees must compete to limit political risk, private providers of processing services would not be able to realize the scale economies noted above if each pension fund administrator undertook these services in-house. More importantly, even contracting out of account processing within Bolivia would not achieve these economies of scale.

76. In Bolivia, these problems in account administration and processing could be solved by allowing trustees to subcontract account administration and processing abroad. For international trade to be effective, it is important that regulations do not impose special requirements on the types of reports or other uses of the information, or define a specific processing method that creates fixed costs that will have to be shared throughout the country. In the Bolivian case, the key role for government is to harmonize standards to permit international firms to offer processing services on or offshore. This will allow account processing functions not only to be privately supplied, but to be competitive in terms of cost. International companies, specializing in information processing (EDS, IBM, SONDA) will compete to provide the service much more efficiently and at lower cost, passing along the economies of scale to Bolivian consumers.

5. New Technologies

77. The new electronic technologies, such as Electronic Data Interchange (EDI), promise small countries a substantial reduction in the administrative cost of pension systems by permitting a complete integration and dematerialization of many different pension services at once. Cost

reductions can result from decreasing documentation requirements and security checks needed to effect transfers of funds, transfers among pension fund investment management entities, collections, benefit payments, and reporting to members about the status of their accounts. Such a system can also reduce costs by dematerializing these functions, which can be performed through direct computer entries at every stage of pension service provision (see Box 3). Through EDI, many of the processing functions can be transferred abroad, where economies of scale may be available at very low cost.

78. However, this promise will materialize in a small country only if free trade in new computer technology is allowed and if a good telecommunications infrastructure is available. For many small countries, this expectation may be premature. However, an important policy implication is that multilateral and other donors actively seek to assist small developing countries in acquiring this infrastructure.

6. Client Services

79. The costs of providing client services depend on the quality of service, including aspects such as the variety and frequency of the services that must be provided. These costs generally do not exhibit scale economies. Quality of service varies with the frequency with which account statements must be sent to the client, the way in which returns must be calculated, and the degree to which the provider of the service is required to address individual consumer requests regarding his account. Achieving a specified quality of service does not require vertical integration of other functions. For example, SONDA offers an on-line connection to small Chilean AFPs so that its customers can obtain details about their accounts from SONDA's computers in real time.

80. The problem with client services is that regulators may require an excessive quality of service. To allow costs to remain low, supervisors should not require on-line answers to client questions regarding statements of account, especially in small countries where telecommunications are expensive or unreliable.

Box 3. EDI Chile (Electronic Data Interchange in Chile)

The electronic data interchange system was developed to transfer information between different entities and businesses through electronic means, and to use computers to send, read, select, store, and respond to messages and information requests. In the case of EDI Chile, common norms and standards set by the UN/EDIFACT (United Nations Electronic Data Interchange for Administrators, Commerce and Transport) are used, and a value added network (VAN-EDI) has been set up to facilitate the process, providing security and compatibility among users of the service. Four companies already offer VAN-EDI services in Chile (Easy Mail, Edibank, Inn, and Transaxion): through them, it is possible to exchange information; send, reply to, and modify invoices, payments, and purchase orders; transfer funds; etc. Edibank is owned by chambers of commerce, commercial banks, and AFPs.

For the Chilean pension system, EDI could prove advantageous in the following areas: (i) collections, (ii) management of funds, (iii) transfer of information and accounts among AFPs, (iv) consultations with and notifications to employers, (v) transfer of annuities and payments, and (vi) the return of invalid voluntary contributions. The use of EDI is expected to reduce time and administrative costs in all areas for AFPs and employers. Collections will be done through a single form (one from each employer) and funds will be transferred electronically to each AFP's bank account. The management of funds, the purchase or sale of securities, etc., will also be done on-line, thus saving time and money for AFPs and commercial and investment banks. EDI will also allow for the transfer of accounts among AFPs without the need to physically exchange files, therefore diminishing the possibility of losing information and time. Other benefits include electronically based reporting and the ability to provide additional information to the superintendency using preapproved formats, which will facilitate its supervisory capabilities. The expected total cost reductions are significant despite the reduced number of employers that will have the initial capability to use EDI. In Chile, only 2,000 of the 200,000 employers are expected to use EDI.

7. Regulatory Compliance and Reporting

81. The costs of reporting to the supervisory agency depend on the frequency, quantity, and complexity of the reports required with respect to benefits, the investment portfolio, and financial statements and accounts. Real time systems of control and off-sight supervision of investment portfolios are also expensive. Thus, part of the administrative work required of a pension management company will be fixed by the reporting standards. Since this is a fixed cost, it generates economies of scale. Given the implications of scale economies in small countries, supervisors in small countries should be particularly careful to determine whether each required report is justified.

82. In small countries, where imperfections in the domestic equity market are more likely, regulations relating to minimum capital are more likely to generate a fixed cost. The conventional justification for requiring minimum capital from trustee pension management companies is to ensure their commitment to the market. However, the minimum capital that is justified may be much smaller if collection is separate and processing is subcontracted than if pension services are vertically integrated. Thus, this aspect of prudential regulation design deserves special attention in the small country case and is not independent of other aspects of pension reform.

83. The scale economies of many types of costs also depend on the type of regulation to which the pension management companies are subject. In Chile, replacing the detailed regulation imposed by the superintendency with modern supervisory approaches, such as focusing on the quality of the internal control system rather than on each operation, is thought to have reduced personnel needs by more than 60 percent. Hence, the impact on scale economies is clear.

8. Portfolio Investment Management

84. Unlike many of the services discussed so far, portfolio investment management services are not characterized by large sunk costs, with the possible exception of advertising costs associated with market penetration. In addition, investment management does not involve large economies of scale. That is why the large market of portfolio investment management services that has emerged in the United States and Europe to serve occupational pension funds is supplied by small firms.

85. In small countries, it is useful to separate the discussion of domestic and international portfolio management. Regarding domestic portfolios, the lack of independent interests, if coupled with a small number of portfolio management firms, could create the potential for price manipulation or conflicts of interest in domestic asset markets. The lack of liquidity in small country securities markets can permit irregularities in the valuation of domestic securities portfolios and create incentives for manipulation among market participants. This can increase the risk of fraud and insolvency for contributors to these pension schemes. There are three ways to tackle these problems: (a) improve supervision of the domestic market, which is costly in terms of specialized human capital; (b) stimulate trading of domestic securities by domestic investors in foreign stock and bond markets, to take advantage of their supervision; and (c) require that perhaps as much as 40 to 50 percent of the investment portfolio be invested offshore in investment-grade securities.

86. Trustees based in small countries must hire foreign managers to take care of their international portfolios. Direct cross-border provision of these services must be permitted. To reduce the burden on domestic regulators that wish to ensure that these managers are trustworthy, arrangements for certification should be set up through cross-border agreements between supervision authorities, and regulatory accounting principles should be harmonized.

87. Another problem in countries that want to copy the Chilean regulation requiring the portfolio manager to post a performance bond of 1 percent of assets under management is that the performance bond requirement is difficult to pass on to foreign portfolio managers. This problem is not fundamental, but a result of a difference in format: if international managers do not perform, their contract is not renewed. Therefore, a simple way of facilitating the subcontracting of international managers is to redefine the performance bond to be more easily understandable, such as "30 percent of the income of the pension management company, net of collection, processing, insurance and administrative costs." An arrangement along these lines is needed in small countries because they rely heavily on subcontracted foreign portfolio managers.

88. A related problem appears when the regulations define a benchmark portfolio made up of domestic securities and then impose it on the international portfolio. To avoid delaying or blocking investment abroad, two options may be considered: (a) defining a different benchmark for each part of the total portfolio; and (b) defining a global benchmark that includes both domestic and international investments.

Box 4. Insurance in Bolivia

In Bolivia, 2 local insurance companies collect 50 percent of all premia, and only 7 of 18 companies were technically solvent as of 1992. This concentration was largely due to regulatory entry barriers as well as to impediments in the insurance law, which did not permit cross-border provision of insurance services. In other small countries (e.g., Costa Rica), the insurance industry is completely monopolized by the Government.

9. Insurance Provision

89. It is useful to distinguish two types of insurance: (a) short-term coverage, such as disability and survivorship or life coverage, which is usually purchased by the trustee pension management company on behalf of members; and (b) long-term coverage for longevity risk, provided through annuities at the time of retirement. The first type of short-term coverage is largely reinsured abroad in small countries due to worldwide economies of scale in reinsurance. the second, longer-term insurance service is sold to individuals and is not characterized by large scale or scope economies even in small countries.

90. In the provision of longevity insurance, advertising and information (relationship and reputation) can create important barriers to entry, which tend to increase concentration, political risk, and average charges (see Box 4). These problems are best solved in small countries by allowing cross-border provision of annuity insurance by certified insurance companies with a suitably supervised home office. Elimination of regulatory and legal barriers and harmonization of insurance regulations to allow the local use of at least a few foreign insurance providers of annuities is recommended for small countries.

91. In small countries the lack of specialized human capital may justify changesto some aspects of the pension system. First, mandatory disability insurance requires establishing specialized medical commissions to assess disability claims. An option is to make this form of coverage available on a voluntary basis only, via employer or individually. Second, technical information about mortality, expressed in life tables, will be less reliable in a small country due to relatively greater international labor mobility. This problem raises the risk that the mortality table is wrong, which will induce life insurance companies to increase the price of annuities. One way to keep these costs in check is to allow the use of the TIAA-CREF formula (see Section VC, below) for self-insured annuities, where this risk is borne by pensioners as a whole.

10. Entry, Market Size, and Level of Wages

92. In small countries, development of the privatization option in pension service provision cannot be viewed independently from the size of the market to be served (the number of individual accounts) or the level of wages of contributors. Market size can effect the desire of major foreign investors to compete through direct entry, especially when pension services are provided through a vertically integrated industrial structure. This kind of problem is best illustrated by the case of Bolivia. If it is assumed that not more than 200,000 active workers are contributing to individualize accounts and that the monthly wages are about US$200 per month, the flow of resources into

privately managed accounts would be US$50 million. If a typical company obtains 25 percent of this market, and commissions are 1.5 percent just for pension services (excluding insurance), the gross income before any costs would be US$2 million for a single company. The annual income for the whole industry would be US$10 million. Therefore, the fixed and variable costs of competing against vertically integrated entities will make direct entry by foreign AFPs unlikely, given high sunk costs and scale economies noted above.

93. Under these circumstances, inducing competition in a small economy will require that that pension services be unbundled (vertically disintegrated) so that entry can occur within each level of pension services or be provided through international subcontracting. What is clear is that the small size of the market will hinder foreign investment less in provision of some aspects of pension services (e.g., fund investment management services) than in others (e.g., collections, etc.).

IV. DEMAND FOR PENSION SERVICES

94. This section reviews the demand factors specific to small countries that can reduce competition among private firms providing pension services. There are a number of demand factors that reduce competition in large and small countries alike (see Valdés, Prieto, 1994) that are not discussed in detail in this section.

A. General Issues

95. Despite this paper's overall focus on small countries, it is useful to mention some generic issues, such as the fact that reputation may act as a barrier to entry. Demand for retail financial services sold to individuals is commonly influenced by the relative solvency and size of providers. There is a natural advantage for the pension trustee that is perceived as being the "largest" or having the strongest "capital backing." One approach to mitigating this problem is for local regulation to allow reporting of the assets managed by the parent companies of each local pension trustee company. A complementary approach is to avoid prohibitions against using the brand names of the parent companies, including existing banks.

96. Another factor reducing competition in service provision by private firms is that of many individual contributors are insensitive to price competition (for more detail, see Valdés-Prieto, 1995). One approach to managing this problem is to impose regulations that ensure that commissions are deducted from either salaries or pensions, not from the outstanding balance of the fund, so that they are perceived in the present. Another approach is to allow collective group plans, which allow consumers to overcome the fixed costs of the specialized knowledge required to compare the quality of the services offered by pension trustees. Although small firms cannot easily afford experts in financial matters to perform this service for their workers (e.g., such as personal investment advisors), one option is to facilitate the formation of associations of small employers for the purpose of performing the bargaining function for their members, as happens voluntarily in Switzerland (Zúñiga, 1993), and as undertaken by Australian Industry Funds (Bateman et al., 1995). A final approach to the price-insensitivity problem is to avoid regulations that prevent competitive trustees from offering discounts to consumers who switch less frequently, in proportion to the cost reduction allowed by their behavior.

B. Pension Product Design

97. An important factor to consider in the design of pension products is the denomination of pension benefits. In general, consumer demand is for "real" pensions, meaning pensions indexed to the local cost of living, that keep purchasing power constant. It is sometimes thought that private pension providers cannot produce real pensions, but this is incorrect. In several countries where companies and banks have been allowed to issue indexed long-term debt securities, and taxes have been redefined to take inflation into account, these debt markets have emerged and flourished as long as the government has not manipulated the local inflation index. The government can also contribute by issuing indexed long-term public debt. Once these instruments are available, insurance companies can produce CPI-indexed annuities, as they do in Chile and the U.K.

98. However, matters may be different in a small developing country. It may be difficult for a liquid market in long-term debt indexed to the domestic CPI to emerge if few local companies are large enough to issue safe long-term debt securities. Two issuers of long-term indexed securities can be counted upon: the local government and indexed mortgage loans, whose future incomes are responsive to the domestic price level. However, the amounts these issuers can supply is much smaller than what is required to invest the total pension wealth of pensioners, which may rise to 60 percent of GNP if the pension system has total coverage. Even if the supply of CPI-indexed securities is large enough for pensioners' needs, an additional large amount is needed to invest a significant portion of the portfolio of active workers. If this additional amount is not available, the pension accounts of active workers will compete for those securities. Mutual funds, commercial banks and other investors may also compete to hold such securities. This will not only reduce the yield on such securities, but will also attract less reliable companies to the issue of indexed debt, increasing the credit risk in such securities. The increase in credit risk will require extra payments to shareholders of life insurance companies, which can be achieved only by further reducing the rate of return on annuities. Overall, this implies that real annuities will be more expensive, i.e., will pay a lower amount per month in a small than in a large country.

99. Therefore, it is predictable that in small developing countries the demand for pensions will be a demand for pensions denominated in the main international reserve currencies, such as U.S. dollars, German marks, and yen. It will be shown below that this is desirable but that it imposes some requirements on the authorities. In particular, they should commit to unrestricted convertibility of pension incomes into domestic currency. If there is a risk that exchange controls will force pensioners to convert their foreign currency pension into domestic currency at an unfavorable exchange rate, the credibility of this product will be destroyed.

100. A pension denominated in the main international reserve currencies is riskier than a pension denominated in the domestic CPI. The purchasing power of a nominal pension is risky for three reasons: (a) actual international inflation in the reserve currency will differ from expected inflation; (b) actual domestic inflation in a small country differs from actual inflation abroad, even if the small country uses as its currency the international currency and has no separate currency; and (c) if the small country has a separate currency, there is exchange risk. None of these risks can be eliminated by diversification. Although a pension denominated in the domestic CPI index is safer, it is significantly lower in a small country, as explained above.

101. Given that cheap pension products will be risky in a small country in any case, it is sensible to allow pensioners to take on some investment risks, which may partially diversify those related to inflation and exchange rates. Two examples are variable rate annuities and the formulae used in the United States by TIAA-CREF since 1952 for the retirement of college teachers and professors (Greenough, 1990), both of which allow graduation of the size of investment risk by changing the portfolio of investments. The TIAA-CREF formula is important because it is the only one that allows pensioners to take the risk that the mortality table is wrong, and avoids paying a life insurance company a fee for guaranteeing this risk. The TIAA-CREF formula has the additional advantage for small countries of requiring less scarce human capital for regulation. Allowing the sale of annuities requires imposing strict solvency regulations on life insurance companies to avoid financial fraud, but the TIAA-CREF formula does not need to impose such restrictions because it operates like a mutual fund.

102. The authorities of a small country should allow these pension products to be produced by domestic life insurance companies as well as by international companies. This implies assuring domestic life insurance companies access to foreign exchange with the purpose of investing part of their assets abroad, in long-term fixed-income securities that allow matching of assets and liabilities (pension promises). In addition, workers should be shielded from conversion risk at pensioning age, i.e., the risk that the value of their account balance will fall in terms of reserve currency just before pensioning. This outcome can be insured by allowing the funds of active workers to be invested abroad as well. If capital controls prevent these investments, pensions will fall in quality.

103. A pension denominated in the main international reserve currencies that pays a flat amount over time should be modified to improve its quality. If a pension pays a fixed amount of international currency per period, it is bound to lose purchasing power over time because inflation in all reserve currencies is above zero. This problem will not be dealt with by competition. For example, if constant U.S. dollar annuities are allowed, it is predictable that the purchasing power of the annuity will be much larger at the date of issue than after 20 years. A constant annuity denominated in German marks might be expected to hold its purchasing power to a larger extent, because its expected inflation is lower. In that case, competition among providers will recognize this fact and force the dollar annuity to pay a higher nominal amount, which will be higher in real terms in the initial periods but lower in real terms later on.

104. However, an important feature of pension demand comes into play in designing a pension that maintains its "real value": improvident workers will prefer the U.S. dollar annuity because it pays a higher pension in the first years, and they don't care much about the far future. This outcome puts into doubt the effectiveness of the policy of mandating contributions. The problem can be solved by a further regulation, which is to require newly issued pensions to promise payment of an increasing amount of the international currency, with the minimum rate of increase equal to the current expectation of inflation for that currency in the long term, which may be calculated automatically from the prices of long-term nominal debt. This regulation is needed only in small countries, because big countries can restrict pensions to those denominated in the local CPI.

V. OTHER CONSIDERATIONS FOR PENSION POLICY

105. This section discusses how the elements of pension economics can be applied to a small country, and how some broader policy recommendations will differ from those for larger countries, if the small country is characterized not only by a small contribution base but many of a number of other characteristics. Among the most important of those are: greater international mobility capital than large countries; relatively greater scarcity of human capital specialized in the financial sector or in enforcement of tax policies, in many cases; proportionally greater gross migration of the labor force, causing demographic instability; and fewer independent interests.

A. Objectives of Pension Policy

106. There are three well-established objectives of national pension policy: (a) to alleviate the market failures that limit the efficiency and reliability of private capital markets for voluntary saving and insurance; (b) to help improvident individuals by ensuring that they save and insure prudently. An aspect of this objective is to prevent individuals who rely on support from family, community, or the state from exploiting that support by failing to save adequately; and (c) to help the elderly poor who could not save enough during their working lives for survival in old age (World Bank, 1994).

107. Other objectives, such as capital accumulation and redistribution of wealth between generations, can be achieved with tools other than pension policy, such as fiscal policy and national debt policy. Thus, pension policy should focus on the three objectives mentioned above, where it is indispensable. The use of pension policy for these other objectives is inefficient if this implies sacrificing the three proper objectives, because the proper use of other policy tools can have achieve both objectives together.

108. Objective (c), income redistribution towards the long-term poor, is not the focus of this paper, but merits discussion. The income distribution effects of a pension system can be classified between intended and unintended. Two examples of intended redistribution are a minimum pension and a benefit formula that includes a fixed amount of benefits plus some proportion of past wages. Unintended redistribution in favor of high-income workers occurs for many reasons. One is that high-income workers naturally take more advantage of fiscal incentives. Defined-benefit schemes are more prone to unintended redistribution because the benefit formula is not adjusted for the higher life expectancy of richer people. Similarly, defined benefit schemes that rely on the average earnings of the last few years of work do not adjust for the fact that high-income people have a steeper age-earnings profile.

109. Intended income redistribution through the pension system finds a tough competitor in tax and transfer systems. In most countries, the pension system covers just formal sector workers, which means middle and high-income workers. In this setting, redistribution among covered workers leaves out the really poor, who work in the informal sector or do not have employers to act as collection agents, as in the subsistence and communal sectors of developing countries. Granting pensions to the poor elderly requires, in most countries, the use of institutional vehicles different from formal social security, such as municipal networks to distribute transfers financed by the national government. Collecting revenue from independent workers is possible, as proposed for Latvia (Holzmann, 1994), but requires an administrative effort.

110. Income redistribution is more difficult to pursue in small countries, because they are subject to greater international labor mobility than large countries. This reduces the efficiency of all policies and institutions for redistribution, including the pension system. For example, citizens may have frequent and extended periods of work abroad, while many foreigners work in the domestic economy for years. This may imply that somebody who contributed for a few years can still obtain full support when returning to the country at age 65. Conversely, the elderly poor who arrived in the country to work at age 55 may be considered ineligible for support. Income distribution through pensions may imply undesired redistribution between alien residents and local emigrants who return, increasing the economic inefficiency and the political problems associated with these policies.

111. This paper focuses on the other two objectives of pension policy, namely helping improvident individuals, and alleviating the market failures of the capital markets that provide savings and insurance products.

B. Preconditions for Successful Pension Policy

112. The tools of pension policy are: (a) financial supervision that improves the reliability and efficiency of voluntary saving and insurance by attacking market failures; (b) mandates to contribute in exchange for rights to benefits (a simultaneous tax-transfer program); and (c) fiscal incentives to favored schemes (usually exemptions from the income tax for occupational and mandatory pension funds).

113. A pension policy cannot exist if these tools cannot be utilized in an efficient manner. There are many poor developing countries, especially in Africa, in which the government does not have the human capital or institutional infrastructure in place to use these tools. Thus, these countries should not have a national pension policy. If a developing country attempts to adopt a pension policy when the tools of pension policy cannot be developed or cannot be expected to be minimally effective, the social cost will be larger than the social benefit. In this case, it is better not to have a national pension policy.

114. This is an unfortunate outcome from the point of view of old-age security, but it is the best that can be done and it is certainly not detrimental to economic development. To understand this, it is useful to recall that the United States adopted its social security program as late as 1939, South Korea as late as 1988, and Australia as late as 1986-1992, after each had become developed countries. The United Kingdom did not mandate contributions for old-age pensions until 1908, well after the second industrial revolution. When the preconditions for a national pension policy are not met, a workable alternative is for the country to provide for old age through family support, community support, and occupational pension plans for some government employees (armed forces, police, judges). Such arrangements already exist in many small countries.

115. There is a second group of small countries where just a few of the tools of national pension policy can be made to operate efficiently, while the other tools cannot operate. In this case the menu of policy tools is more restricted, but it is still possible for a pension policy to exist. The conclusion, then, is that the identification of policy tools that can be used reliably in a given country is the critical input in support of a specific pension policy recommendation. There are a number of policy recommendations that may fail to pass this test, as discussed below. We now outline the preconditions for using each one of the tools of pension policy.

1. Supervision to Improve Voluntary Saving

116. **Legal framework and supervision.** This policy seeks to prevent fraud and abuse and minimize the risk of insolvency on the part of institutions providing voluntary savings and insurance products. This objective must be attained while creating adequate incentives for financial services to be provided efficiently. A first precondition for using the tool of financial supervision is that the government supply a reliable body of civil and commercial law to make enforcement effective. This must include a judicial system of reasonable quality to adjudicate conflicts between consumers and financial firms (see Section II for somewhat more detail).

117. A second precondition is for the government to supply specialized financial sector laws and effective ongoing supervision of financial intermediaries such as banks, insurance companies, and securities markets. Many small countries find it difficult to perform this function, since it requires a substantial amount of specialized human capital.

118. Since small countries may have difficulty meeting these two preconditions for effective supervision, an attractive option can be to allow international trade in these services, thereby relying on the financial supervision, financial sector laws, and even civil laws of larger countries. For example, financial contracts may be signed under the jurisdiction of another country, and financial firms may be required to be branches of licensed suppliers in well-supervised countries. In this way, the residents of small countries would still have access to efficient, voluntary saving and insurance. In the case of retail financial products where consumer protection is an issue, such as life insurance, the small country should require that the supplier be subject to consumer protection charges under a larger country's laws for its domestic sales.

119. **Voluntary saving and supervision.** In cases where small countries allow domestic financial intermediaries to develop new financial instruments for voluntary saving for old age, the government should devote substantial effort to supervising these instruments, because foreign supervision will not apply. This is the case with the Costa Rican voluntary individualized defined contribution plans offered by both onshore and offshore banks to residents of other Central American countries, and with the Paraguayan pension plans (see Box 5).

Box 5. Voluntary Saving and Cooperative Pension Schemes in Costa Rica and Paraguay

"Complementary" pension funds in Costa Rica came into existence in 1989, prior to being sanctioned by law. The industry continues to be largely self-regulated. As of 1993, about individual accounts were being offered by Costa Rican banks. These pension plans are voluntary defined-contribution schemes. The tax laws have been interpreted as allowing employers to make pre-tax contributions (taxable upon withdrawal at retirement), while employee contributions are post tax. Entities offering this pension service do so by establishing a trust (*fideicomiso*) and an associated trust agreement among the employees, employer, and the management company. In the case of BANEX, those that leave the fund must give 6 months notice, but the bank may pay before the 6 months expires if it wishes to. A maximum of 50% of the account balance can be withdrawn with the same 6 months notice, but not before 12 months after the previous withdrawal. Withdrawals in the first three years of the contract life are subject to substantial fees.

BANEX charges fees equal to 10 percent of the total nominal return on the funds invested. In general, this type of commission structure could create incentives for taking excessive investment risk, because the commission may be much larger if the return is high, which can usually be sustained only by taking larger risks. However, in this case the nominal return includes a hefty inflation component because inflation is 20% in Costa Rica, and the commission is in fact proportional to the assets under management. Moreover, any difference between high and low real returns translates into a much smaller difference between high and low nominal returns when inflation is high. Therefore, the incentive for excessive risktaking is muted. In practice, the complementary funds have been invested only in government securities under current self-regulatory standards, thereby ensuring safety but not permitting much diversification. The policy lesson is that the current commission structure may well create perverse incentives in the future when inflation falls. The industry should not be expected to swiftly adapt its self-regulatory standards to a drop in inflation, so supervision and regulation are needed for the survival of this valuable service in the long run.

The *Caja Mutual de Cooperativistas* (CMC) of Paraguay, founded in 1985, is an extraordinary institution. It offers voluntary entry to a collective defined-benefit program to the individual members of cooperatives that have joined the CMC. By the end of 1993, 10% of all cooperatives in the country, or 4,548 people, were contributing to the CMC. Monthly contributions are a function of the income declared by the member and his age, starting at 3.0% for age 20 and rising to 7.8% at age 49, subject to a floor equal to the minimum wage and to a ceiling equal to 10 times the floor. Once issued, the pension amount in guarantes (Paraguay's currency) is adjusted once a year according to the average of the indexing clauses reported by the active members. An annuity is issued at age 55 if membership in CMC started before age 40, provided that contributions were made for at least 16 years. There are even more generous clauses for the initial generation: the annuity is issued at age 60 if the number of years of contributions is at least 11 and membership started between ages 40 and 49. Furthermore, the CMC board may grant pensions to even older people, those who reach age 65, provided they entered between ages 50 and 60 and have contributed for at least 6 years. In August 1994 the pension fund had US$ 5.3 million in assets under management. Although almost all of the assets are invested in consumer loans to members, members are charged market rates and nonperforming loans are just 2.8% of the total.

Given the relative size of contribution rates and benefits, CMC is technically insolvent, but in the chain letter tradition it is increasing coverage and delaying the day of reckoning. The number of contributors has been growing at an average of 34.5% per year for the last 5 years, and most are young. There is no supervision of these contracts.

120. The case of voluntary saving and insurance benefits offered by employers raises important questions of consumer protection. In a setting with no fiscal incentives, occupational plans may be offered by employers to unsophisticated workers who do not realize the potential for fraud that such arrangements entail. For example, in defined-benefit plans the employer may fail to build a fund (either directly, by manipulation of the actuarial assumptions, or by failing to diversify investments away from the firm itself). The employer may also choose to reduce the rate of wage increase of those who are about to get a pension, and may dissolve the firm when the benefit expense becomes large. In defined-contribution occupational plans the employer selects the fund manager, an arrangement that raises the danger that the employer will hire a manager whose affiliate firms provide subsidized loans to the employer, at the cost of low performance of the workers' investment portfolio.

121. The solution to these problems is supervision and regulation of voluntary occupational plans. However, small countries with little specialized human capital may find it difficult to perform this

function. Again, one option may be to rely on foreign infrastructure, which outlaws voluntary occupational plans that fail to meet internationally recognized actuarial, disclosure, and regulatory standards. Although precedents are scarce, foreign supervisory bodies could be paid to supervise occupational pension plans within small countries. Alternatively, external supervisors could agree with an association of providers of voluntary saving and insurance mechanisms for old age that member firms put in place a self-regulatory framework (as in South Africa or New Zealand) where external supervisors examine the safeguards imposed by the association (see Annex and Glaessner, 1994).

2. Fiscal Incentives to Licensed Pension Schemes

122. This tool of pension policy tries to deal with improvidence by increasing the private rate of return of voluntary saving and insurance. Fiscal incentive schemes usually provide exemptions from income tax for licensed occupational pension plans and for licensed personal pension plans such as IRAs and 401(K) plans in the United States, and personal pension plans in the United Kingdom. Fiscal incentives can also consist of cash subsidies to licensed personal pension plans, as in the Czech Republic.

123. A significant problem with this tool is that it is regressive, because high-income workers receive more support for any given saving rate, and also because such workers already tend to have higher saving rates. A second problem is that fiscal incentives are expensive when successful. For example, in the U.K. the fiscal cost of tax preferences for occupational pension plans amounted to 2.4 percent of GNP in 1993 (Blake, 1996). This means that this policy should not be used in countries where the tax base is narrow and weak. A weak tax base is more likely in small countries because higher capital mobility makes fiscal incentives more inefficient at lower levels of subsidy than large countries.

124. **Credible implementation of fiscal incentives.** The first precondition for successful use of fiscal incentives is that commitments to provide promised fiscal incentives must be credible. One necessary element for credibility is a reliable body of civil law. The second precondition is that the fiscal incentives not be too expensive for the government. If these two conditions cannot be expected to hold for a long period -- measured in decades -- participants may not expect the fiscal incentive to materialize. In this case, fiscal incentives will be ineffective and substantial resources will be dissipated in attempts to escape taxation, provoked by suspicion that the incentives will be reversed. This precondition of credibility is more easily met in the Czech approach, where the incentive is granted up front (it is protected by property rights), but the fiscal burden is felt at the initiation of the policy.

125. **Fiscal incentives and administrative resources.** A second precondition for successful use of fiscal incentives is that they require few administrative resources. However, substantial administrative capacities are required because the aim of the fiscal incentive is to stimulate saving and insurance for old-age at the margin, and not merely to reshuffle transactions and assets, in which case old age security would not be improved. However, a tax system that is sophisticated enough to provide an effective incentive at the margin is more costly to administer, because it requires individual reporting and follow up of individual wealth and income. This requirement is especially burdensome in small countries, because human capital specialized in tax design and administration is more difficult to find. In fact, even the United States, with its sophisticated tax administration, has

found it difficult to turn IRA exemptions into effective tools in the sense of inducing individuals to save more (Gravelle, 1991). We would expect this problem to be greater in small countries, where there is greater international capital mobility and therefore tax administration more difficult because more wealth is held abroad.

126. In small countries that lack the sophistication of personal income taxation, occupational pension plans can still be granted a tax exemption at low administrative cost, so they may appear to be an attractive option. One of the drawbacks of occupational plans, however, is that employers may deceive workers about the actual value of their promises, as explained above. A second drawback is that occupational pension plans reduce labor mobility. This problem can be quite costly in small countries, which rely on international migration to a greater extent than large countries to keep balance in their labor markets without large fluctuations in unemployment and the real wage. In view of this problem, giving tax breaks to occupational plans is also not an attractive option for small countries.

3. Mandates to Contribute in Exchange for Rights to Benefits

127. This policy tool deals directly with improvidence by imposing a quota on savings. Mandating contributions is a more targeted tool than fiscal incentives because it helps to increase old age income only for workers who are improvident. Total savings of provident workers are not affected, because they simply reduce the voluntary saving rate as the mandatory saving rate is increased. Since many workers are credit constrained, especially the improvident ones, mandatory contributions are also more effective than fiscal incentives, because the incentives required to induce a credit-constrained worker to save voluntarily are quite large; that worker would rather borrow at the market interest rate. A third advantage is that a mandate to save is fiscally inexpensive. A fourth advantage is that mandating is less regressive than fiscal incentives, because improvident high-income workers do not receive fiscal support.

128. **Mandatory contributions and distortions in savings allocation.** Despite the advantages of mandating contributions, this tool leads to a distortion to personal savings that is avoided by fiscal incentives. Savings under mandatory contribution schemes cannot be recovered except as pension benefits, which eliminates their value as precautionary savings, and precludes their use in nonpublic, high-return investment opportunities. For this reason, mandated contributions as compared to voluntary savings are seen by individuals as partially taxed. The same problem affects savings through occupational pension plans.

129. **Mandatory contributions and political instability.** Another drawback of mandatory pensions is that they are vulnerable to political instability. Since funds cannot be withdrawn under any circumstances not specified in the law, the credibility of benefit promises depends on the perceived stability of the political and economic regime over the entire time horizon during which individuals belong to the pension system (i.e., 60 years). In contrast, this problem is lessened in the case of voluntary pension plans where members can react to greater anticipated political risk by withholding new savings and can often divert funds out of the country before they can be confiscated. Thus, a first precondition for the use of this policy tool is a political design that deals with this problem.

130. More concretely, the political regime must be stable enough to ensure workers that it will avoid future policy shifts, which are always an attractive option for populist politicians. For example, a shift away from full funding towards pay-as-you-go financing allows pension fund contributions to be diverted to nonpension uses in the "short" run -- a number of decades -- which is politically very attractive. The cost to contributors is a reduction in the backing of benefit promises, since their benefits become dependent on the willingness of the government to tax the population in the future. This decreases the credibility of future pension promises and increases the perceived tax component of mandatory contributions. Future generations are made unambiguously worse off because tax rates will be permanently higher in the long run after the first few decades such of such a policy shift.

131. Further, if the local political system is based on patronage and clientelism (i.e., if politicians base their appeal on the distribution of favors to supporters), this policy tool becomes more problematic, especially when a defined-benefit approach is adopted. This is because benefits must be defined in laws, but in many countries those laws distribute benefits less in relation to individual contributions and more to favor the politicians' supporters. As the link between individual contributions and benefits defined by patronage becomes negligible, the perceived tax component of mandatory contributions rises to 100 percent.

132. More generally, the political science literature shows that political instability emerges in response to the forces that shape of the state itself, such as international wars, the transition to a patronage-free civil service, and democratization of the electorate (Orloff, 1992). Since small countries are more vulnerable in international wars, and a patronage-free civil service is difficult to achieve in the closely knit societies of small countries, the type of impersonal political stability needed for mandatory pension systems to operate well is less credible in small countries, ceteris paribus. The implication is that the policy tool of mandating contributions in exchange for pension promises is less attractive in small countries.

133. Both contribution-based and benefit-based systems can be designed to reduce the degree of future exposure to political risk. Examples are constitutional rules granting the status of property rights to pension benefits, and use of professional panels whose advice cannot be overridden except by new legislation (Diamond, 1996). Still, the most powerful means of insulating pension rights from political risks is to require automatic adjustment of benefits to available revenue, which occurs naturally only in defined-contribution systems. Thus, the greater potential political risks of mandating contributions in small countries require at least: (a) a defined-contribution approach to risk-sharing between the beneficiaries of the pension system and the government, (b) constitutional protection of property rights associated with individual pension fund accounts, and (c) professional panels to provide oversight.

134. **Mandated contributions and costs of pension system administration.** Another precondition for the use of mandatory contributions is that the state must be willing to devote enough of its administrative resources to enforce the mandate. Enforcement is easier to impose on large firms, since small firms fade easily into the informal sector, while independent workers remain largely out of reach in most countries. Community workers, such as those in many African countries, lack an agent that can be charged with the task of collecting contributions.

135. Spending on enforcement is not an all-or-nothing decision. Many countries mandate contributions only for "dependent workers," i.e., those who have an employer, because the employer is easier to coerce. In the past, Bolivian employers with fewer than 30 workers were exempt from

supervision of their compliance with contribution requirements. At the other extreme, Sweden forces independent workers to contribute by including an explicit "contribution tax" within the personal income tax return.

136. The effect of a country's size on enforcement costs is ambiguous. The cases of Singapore and Switzerland show that small size may increase information about who is doing what, reducing enforcement costs. On the other hand, the examples of Bolivia and Honduras show that small size may imply a greater chance of lenient enforcement, because tax administration is impaired. For example, tax inspectors cannot be rotated over a large enough set of independent interests in these countries. The dilemma for a small country is that if it contents itself with a low degree of enforcement in order to save on enforcement costs, the number of contributors may be very small and it may not reach economies of scale in other areas of the mandatory pension system. This suggests that countries where small size reduces enforcement costs should strive for 100 percent coverage, while countries where small size increases enforcement costs should choose between not using the tool of a mandated pension system or accepting the high cost of using that tool.

137. **Labor mobility and the level of mandatory contribution rates.** The fact that mandatory contributions are perceived as a tax on (dependent) labor earnings has important implications for small countries, which experience greater international labor mobility. A type of arbitrage occurs when an improvident labor force is willing to work on either side of a border, because some industries choose to locate in the side with the lowest contribution rate. For this reason, small countries that adopt mandatory contribution systems should content themselves with lower mandatory contribution rates, accepting that improvident workers will achieve less coverage.

138. Finally, mandated contributions are less effective as coverage of the active work force falls, because fewer workers complete a full career of contributions due to continual rotation to uncovered sectors. This problem is more significant in smaller countries with higher international labor mobility per capita, assuming that workers do not contribute when abroad and that international treaties allowing for full portability of benefits are not effective. This means that improvident workers of small countries contribute for a shorter portion of their working life, so their improvidence will continue to hurt them in old age. An option for small countries is to devote more resources to signing and enforcing effective treaties with other countries, with the purpose of enforcing contribution payments to mandatory pension systems on a cross-border basis.

C. Funding Requirements

139. Pension reform is a process that attempts to either improve existing pension policy or establish new policies. Two critical areas in small countries are the degree of funding and international portfolio diversification. In each of these areas, initial conditions present in a specific country have a significant impact on the optimal design of pension reform.

1. Funding

140. Funding refers to the type of backing of pension promises. Two types of backing are: (a) "apparent funding," the degree to which pensions are backed by securities covered by the constitutional protection of property rights, as opposed to backing by legislated promises to pay

benefits, which usually give rise to pay-as-you-go financing; and (b) "ultimate funding," which is the degree to which pension promises are backed by outside physical and/or foreign assets. Ultimate funding excludes government debt, which is backed by future tax collections, and also excludes consumer debt to the extent that it is backed by future earnings. The national saving rate will increase in response to a pension reform only if it results in a greater degree of ultimate funding. An increase in apparent funding increases financial depth without an obvious impact on national savings. For example, if a pension system backed by legislated promises with pay-as-you-go financing is replaced by an apparently funded system where all funds are invested in newly issued government bonds, national savings would not increase.

141. A pension system where pension rights are covered by constitutional protection for property rights requires apparent funding. This occurs because, according to most constitutions, property rights can be established much more firmly over securities than over legislated promises to pay benefits in the future in some states of nature. One gain from this reform is that pension promises are made more secure because their backing obtains constitutional protection for property rights. Another gain is associated with international portfolio diversification, which is discussed separately below, given its significance for small countries.

142. If the initial condition in the country is no mandatory system for private sector workers, and mandated contributions will begin to be imposed on them, it is advisable to adopt both apparent and ultimate funding. If the initial condition is already apparent, the recommendation is to maintain it and avoid any move towards pay-as-you-go financing. If the country is in a stage of mature pay-as-you-go financing, then the recommendation is to shift to apparent funding. This entails replacing government promises to back the pension social security institutes' promises to individuals, with newly issued government bonds or with shares in state enterprises to be held by the social security institutes. The interest paid by those bonds and equities will provide the social security institutes the source of income they need to meet their promises to individuals. Finally, if the country is in a stage of immature pay-as-you-go financing, as most mandatory systems in the developing world are today, the recommendation is to shift immediately to apparent funding (see Valdés-Prieto, 1996 for more details).

2. International Portfolio Diversification

143. For a small country, this allows both a large increase in expected returns and a large reduction of risk. The higher expected return allows a substantial reduction in the contribution rate required to finance the same benefits, which translates into a substantial gain for workers. As explained above, reducing the contribution rate is especially valuable in a small country because of its higher international labor mobility. In a large country where asset markets are sufficiently developed, the gains from international portfolio diversification are smaller because the domestic portfolio is already quite diversified. The prerequisite for international portfolio diversification is apparent funding.

144. To achieve the gains of international portfolio diversification, the social security institutes must rebalance their portfolios away from government debt and purchase private sector assets instead, most of them foreign assets. A massive unloading of government debt could produce problems in the domestic debt market of a large country. However, in a small country there would be much less impact, because foreign investors are available to acquire the government debt without requiring large

increases in interest rates. Similarly, the potential balance of payments problems that can arise from a massive purchase of foreign assets by the social security institutes are much less significant in small countries because foreign portfolio capital will flow in to buy the government bonds, balancing the foreign exchange market.

145. The above argument is subject to two provisos: (a) that some small countries have adopted policies that interfere with international capital flows, and (b) that the international financial community tends to invest little in small countries about which there is little information. In these cases the process towards international portfolio diversification could bring the problems predicted for larger countries. Therefore, a precondition for successful pension reform in small countries in these circumstances is for them to abandon interference with international capital flows and to invest in promoting themselves to the international financial community. International organizations can play a valuable role by permitting initial access to international capital markets.

146. It is sometimes argued that a reform towards apparent funding is not enough because it fails to increase national saving rates, and therefore fails to reach a better endogenous growth path based on higher investment and its externalities. Some critics would prefer that a country move towards ultimate funding or backing by outside assets. However, in the case of a small country with an open capital account, the extra growth due to the effect of "ultimate funding" on savings accumulation is relatively less important than international portfolio diversification. This is because growth in a small country is more dependent upon openness to international trade of goods, services, and factors of production than domestic savings accumulation. Although an increase in ultimate funding increases national savings, it does so at the sacrifice of the living generations. If this sacrifice is mandatory, it entails higher tax rates or fewer public goods or both, which may be relatively harder to bear in small countries, where international factor mobility constrains the level of net tax rates relatively more. The conclusion is that in small countries the critical pension reform is towards apparent funding, while the net gains of moving towards ultimate funding are more debatable than in large countries.

147. A common worry about pension systems is that they are vulnerable to local population risks such as a drop in the local birth rate and an increase in domestic life expectancy. Apparent funding plus international portfolio diversification greatly reduces these risks in small countries. For example, consider the risk that the population growth rate falls for a decade in a small country. If the pension benefits were backed by legislated promises alone (pay-as-you-go), the diversification task would be transferred to the local political system. Even if the political system reacted optimally from an intergenerational risk-sharing perspective, which would mean increasing the level of contributions and reducing benefits as soon as the birth rate begins to fall, each generation would bear substantial population risk. In practice, most political systems do nothing until contribution revenue actually drops, which is too late. By then the risk of a fiscal crisis becomes large, and that risk is worse in a small country because it has little scope to increase tax rates in response to high international factor mobility. Contrast this with the outcome when the pension system is apparently funded and the portfolio is internationally diversified. In this case pension benefits are barely affected because the international capital market easily absorbs the population risks of any one small country, so contribution rates do not have to be altered. In sum, a shift to apparent funding significantly reduces the level of population uncertainty borne by each generation.

148. Overall, for small countries the case in favor of relying on the capital market instead of on legislated promises is much stronger than in large countries, provided the country keeps an open capital account. The precondition for this approach is a reform of the financing system towards apparent funding, meaning that pensions should be backed only by tradeable securities covered by

constitutional protection of property rights, as opposed to backing by legislated promises to pay benefits.

VI. PROVISOS AND RECOMMENDATIONS

A. Provisos

149. This paper takes a largely microeconomic perspective, so important issues relating to the fiscal implications of pension reform are not analyzed in detail. Neither does the paper focus on the many important improvements that can be made in pay-as-you-go social security systems, which are covered in Valdés-Prieto (1994) and James et al. (1994). Because of fiscal and political reasons, these improvements in existing pay-as-you-go schemes need to be undertaken simultaneously or prior to pursuing privatization and moving towards funding. Finally, the analysis mentions but does not focus in detail on the design and regulation of occupational pension plans, nor on the voluntary individualized defined contribution schemes often found in small countries.

150. The paper finds that pension reforms are complex to design. Implementation is not treated in detail but it is even more demanding, since consideration needs to be given to interaction with existing pension policies and with related reforms in the areas of health, labor markets, securities/capital markets, privatization of nonfinancial companies, and housing finance. Moreover, these reforms raise issues in such areas as political economy and legal and constitutional rights of contributors and existing pensioners. In implementing any of the recommendations of this paper, such issues would need to be carefully examined.

151. Some of the issues that deserve further investigation are the design of transitions at the fiscal, microeconomic, and political economy levels. In particular, all transitions in Latin America have resulted in the coexistence of new privately managed funded pension systems with the old pay-as-you-go financed and government-managed pension schemes. Countries such as Mexico are beginning to examine options that may not involve the coexistence of the two regimes. This coexistence has not been smooth in several instances. Thus, such types of reforms will be of special importance to analyze in the future.

B. Recommendations

152. The peculiarities of small countries have been shown by this paper to significantly influence the outline of optimal pension policy. These influences, which run from the broadest design to the narrowest political considerations, are particularly important at the microeconomic level. The conclusions and recommendations of the paper can be summarized under four categories: institutional infrastructure to support pension services, supply of pension services, demand for pension services, and other considerations in pension policy and reform.

1. Institutional Infrastructure to Support Pension Services

153. In small countries, it is often assumed that lack of institutional infrastructure in such areas as payment systems; lack of custody arrangements for securities; inadequate registries to identify contributors, employers, and pensioners; lack of a broad array of assets for investment; and inadequate financial information for the efficient provision of insurance or fund management services will preclude the option of privatizing pension services (see Britrán and Arrau, 1993).

154. The preconditions for the institutional infrastructure needed in small countries to permit partial or total privatization of pension services are no greater and can even be less than those required in large countries. Some important types of infrastructure can be imported by permitting freer trade in international financial services, including: custody services, offshore markets in which to invest in local or foreign currency-denominated securities, and account processing services. Some services, such as registries of contributors and pensioners, are far more difficult to import, but other services, such as supervision, can be "imported" if investment management services are contracted out to foreign firms.

155. Institutional infrastructure and capacities needed within government agencies, e.g., domestic infrastructure to support a domestic securities market, and accounting, auditing, and actuarial or valuation services, are shown to be highly dependent upon the exact type of pension reform proposed and not only upon permitting poor small countries to have a "three pillar approach," as advocated in a recent World Bank study (1994). That approach can involve a pay-as-you-go first pillar, a mandatory defined-contribution second pillar, and a voluntary occupational plan third pillar. This is especially true if the small country has no infrastructure to *enforce* a tax transfer system, cannot conduct effective financial supervision, and does not have proper registries of contributors or pensioners. By contrast, pension systems that do not entail any mandatory contributions and involve freedom to contract with offshore providers of pension services imply far fewer infrastructure needs.

2. Supply of Pension Services

156. A number of important policy recommendations relating specifically to the supply of pension services, including trustee services, involve establishment of a fiduciary obligation between contributors and pension plan trustees designated by the government. Among the most important findings in this area are:

(a) There is a need to ensure reduced concentration in the trustee function by considering the mandated unbundling of some pension services such as collection and payment services, while permitting international competition in the provision of other services, e.g., investment management and insurance. This recommendation results because permitting vertical integration back to the point of collections in small countries can increase overall costs in the pension industry and result in a much smaller number of trustees and investment management entities, thereby creating incentives for collusion, particularly in small countries that lack independent interests.

(b) Small countries with a lack of independent interests need to give attention to the number of trustees, how they are selected, and the supervisory, regulatory, and

corporate governance environment in which they operate. The limited number of independent interests in some small developing countries demands that there be at least six trustees and that coordination among trustees be prohibited unless foreign investments are very large. In addition, this report shows that in small countries where human capital is scarce, it may be best to permit individual members of pension funds to choose the pension management trustee and board of directors, as opposed to having trustees selected by the government or by employers and unions. The latter alternatives are shown to be fraught with problems in small countries. Such a recommendation presumes that regulations and supervision systems are put in place to ensure that the pension fund trustees have incentives to carry out their fiduciary responsibilities on behalf of fund members.

(c) Providers of pension services need the flexibility to subcontract domestically or internationally for many pension services. This should include subcontracting for data gathering, to permit the small country to acquire pension services at lowest labor costs and to benefit from know-how. Such concerns are far more critical in small than in large countries, because the economies of scale in such services and associated cost reduction will be difficult given the small universe of eligible labor. Permitting international subcontracting of pension account administration and processing is also critical for companies operating in small countries to realize efficiencies. A key issue regarding the latter is the cost of transferring the information to the international processing company, which in turn depends on the degree of competition in the international telecommunications industry.

(d) Regulations applied to portfolio management in small countries should permit or even mandate that some proportion of the pension funds be invested in appropriately rated offshore securities. This requirement permits international diversification. It is also critical in small countries that do not have a sufficient set of independent interests, in order to minimize the possibilities for manipulating local securities markets -- a problem that often arises in small countries as funds become large relative to the overall size of the domestic securities markets. This investment regulation should be coupled with actions to permit free entry to foreign portfolio management firms via direct provision of cross-border services without establishing a physical presence. Such policies, in combination, could make the investment management industry in the small countries more contestable.

(e) Mandatory provision of insurance services bundled together with pensions (such as disability coverage or longevity insurance via the purchase of annuities) may not be advisable in small countries. For example, in a small country the demands on scarce human capital needed to set up medical boards would be lessened if disability coverage were not made mandatory. Voluntary disability coverage may be offered to employer groups established by on and offshore insurance companies or even by efficient public agencies (in other countries); with fewer persons covered, the law of large numbers may not apply, and mortality tables may be less reliable because of the greater mobility of labor. Thus, cross-border provision and direct investment by foreign insurance carriers, including the purchase of reinsurance or annuities in the international markets, should be permitted subject to appropriate regulatory certification requirements by home and foreign supervisors.

(f) The relatively small size of the market for pension services in small countries, in terms of both number of active contributors and level of wages, will limit the interest of foreign direct investors in providing such services. The paper shows that in the case of markets with 200,000 to 400,000 active contributors and wage rates of about US$ 200 to 400 per month (e.g., Bolivia) the flow of commission income into the entire pension provision business will be between US$ 2 and US$ 10 million per year, depending on the commission rate. In this case the desire of major foreign companies to directly invest in setting up a branch or agency, and to form strategic alliances with domestic companies, will be limited. This implies an additional argument for mandating the unbundling of pension services -- i.e., the small size of these markets could be less of an impediment to entry if some services, such as investment management, were less subject to high fixed costs upon entry.

3. Demand for Pension Services

157. In the case of policy relating to the demand for pension services, differences between the small and large country case are not quite as dramatic as in the case of supply. Three substantive conclusions emerge:

(a) It is important to avoid regulations that make demand for pension services insensitive to prices by prohibiting differential pricing of pension services. Such regulations discourage price as opposed to nonprice competition. Although this type of problem arises irrespective of country size, it can be exacerbated in small countries where there is greater labor mobility. Liberalization of commission structures can help reduce the nonprice competition and high commercialization of selling costs often associated with private provision of pension services. Instead of needing to send sales people to sway individuals to move from one pension provider to another, firms could then engage in greater price competition, which would reduce costs for all participants.

(b) Relative to large countries, where some diversification can be obtained through domestic investments, in small countries the need for diversification, coupled with people's need to obtain a "real" pension, implies that authorities should commit to unrestricted convertibility of pension incomes into domestic currency, devoid of exchange or capital controls. Multilateral institutions could provide transitory guarantees associated with convertibility risk to ensure that a pension product denominated in key international reserve currencies can emerge (e.g., U.S. dollars, German marks, and yen). Capital controls can also impede the development of such pension products, but this risk is more difficult to insure.

(c) The set of annuity products available to persons reaching retirement in small countries should concentrate to a much greater degree than in large countries on variable rate annuities. Such annuities permit pensioners to take on some investment risk to partially diversify inflation risk, which is particularly important -- and difficult -- in small countries. This result obtains because actual domestic inflation in small countries can differ from inflation in the countries where some of the pension fund is invested, even if the same currency is used. Because this risk cannot be completely

diversified, in small countries variable rate annuities at retirement may be much cheaper than constant real annuities (i.e., index-linked annuities defined in terms of the local price index).

4. Other Considerations for Pension Policy

158. When a small contribution base in small countries is combined with other characteristics such as relatively greater gross migration flows, more mobile capital, a lack of independent interests, and a shortage of human capital, a number of insights emerge for policymaking. These include:

(a) Pension policies involving the use of fiscal incentives (e.g. 401K plans, IRA accounts, and tax incentives for personal occupational pension plans) are less attractive in small countries. Commonly used tax handles that are simple enough to avoid costly tax administration arrangements, such as value added taxes or import tariffs, are not effective in countering the improvidence of workers -- a key objective of pension policy. The relatively greater capital and labor mobility in small, open developing countries means that the tax base for imposing a given fiscal incentive will be less broad, so that such incentives will be less likely to stimulate saving and insurance for old age.

(b) Mandating contributions in exchange for rights to benefits, as opposed to schemes involving fiscal incentives, carries potentially greater political risks in large countries. However, such schemes do address the problem of improvident workers, as well as failures in intertemporal insurance markets, more directly. To mitigate the greater political risks in small countries, mandated contributions should involve: (i) a defined contribution approach to risk sharing between the beneficiaries and the government; (ii) constitutional protection of property rights associated with individualized pension fund accounts; and (ii) professional or technical panels to provide oversight, under strict governance processes.

(c) Apparent funding (i.e., the degree to which pension obligations are backed by various forms of securities, inclusive of government securities) is very important in small countries, whereas ultimate funding (i.e., backing with outside assets such as physical or foreign assets) is less critical than in the large country case. This finding results because in small countries overall economic growth is far more dependent on openness to international trade in goods, services, factors of production, and technology than on domestic accumulation of savings and new knowledge. Therefore, the increase in domestic savings that a pension reform may promote by insisting on ultimate funding is likely to be relatively less important in a small country with open borders. However, moving to a system with apparent funding is critical because the ability to back pension promises with securities (even if government securities), as opposed to legislated promises, as in a typical pay-as-you-go system, reduces political risks. In addition, a shift to apparent funding is a prerequisite for international portfolio diversification, which is valuable for smaller countries for reasons explained above.

159. From the perspective of World Bank policy advice and actions, four key implications emerge from this study:

- The need to encourage small open economies with a small base of contributors to permit much greater international competition in pension services, which implies that establishment of a multi-pillar pension system (see James et al., 1994) may not always be advisable.

- The need to carefully analyze the links between the design of pension reforms and the form of prudential regulatory or other legal/regulatory reform being advocated. For example, minimum capital regulations for investment management companies may not create significant fixed costs to new entrants if collection of contributions is vertically disintegrated and processing services are subcontracted. This result holds, because such design would imply the need for less initial capital by prospective entrants offering investment management services.

- The need to encourage much greater harmonization in certain key regulations and coordinated supervision across countries to facilitate greater cross-border provision of pension services.

- The need to evaluate how World Bank financial products such as convertibility guarantees might be used to permit development of more diversified pension products involving investments in multi-currency portfolios for demanders of pension services. Such guarantees are needed given that authorities would need to commit to unrestricted convertibility of pension incomes into domestic currency without exchange or capital controls.

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INSTITUTIONAL INFRASTRUCTURE AND PENSION SERVICES

1. The shortage of human capital in some small relative to large developing countries, and the associated lack of certain key types of institutional infrastructure, can undermine the effectiveness and overall credibility of pension reforms involving partial or complete privatization. However, the Chilean example is often cited to suggest that the implementation of "the privatization option" leads to the more efficient provision of an entire set of related infrastructure i.e., registries of different types, custody arrangements for securities, collection and clearing of payments, development of supervision capacity for providers of financial (e.g., securities and banking) and pension services, and even improvements in tax or other forms of collection systems. Development of this infrastructure is viewed as resulting in a form of positive externality associated with privatization of pension services.

2. The objective of this Annex is to identify the institutional infrastructure that will need to be present prior to implementation of different pension reform options in small countries. Section A provides a basic conceptual framework within which to evaluate different options for pension reform through the public or private provision of infrastructure services. Section B examines the appropriate role of the government in the provision of these services within the conceptual framework outlined in Section A. Finally, Section C identifies the most essential infrastructure services that will have to be present to ensure that pension reform options involving partial or complete privatization of pension services can be realized.

A. General Framework

3. Two basic questions need to be addressed when determining the institutional infrastructure required to support pension reform. First, what conceptual framework can be used to assess the degree to which these forms of infrastructure need to be wholly publicly or privately provided? Second, what types of institutional infrastructure are essential to support or complement the public or private provision of pension services?

4. **Public versus private provision of institutional infrastructure to support pension services.** Based on the theory of industrial organization as applied to physical infrastructure, it is possible to classify the types of institutional infrastructure needed to support pension services according to the degree to which they are public goods. The classification process involves assessing each type of institutional infrastructure from the perspective of consumers, in terms of the nature of the good and vis-à-vis the nature and conditions of production.

5. **Nature of the good or service.** This refers to the degree of subtractability or excludability in consumption of a specific good or service. Here *subtractibility,* or rivalry, refers to the impact that consumption by incremental or additional users has on consumption opportunities of all users. A purely private good can be consumed by only one person at a time (e.g., food or typical consumer goods). At the other extreme, a purely public good that is not extractable is clean air, since consumption by one individual does not lessen availability to

others the good or service is jointly consumed. Between these extremes are goods that may not become subtractable until the use reaches a certain level (e.g., highways and related congestion). *Excludability* refers to the feasibility of controlling access to the good. Some goods (e.g., air), or even different types of information produced by companies (e.g., ratings), may not be very excludable in consumption. Exclusion is more costly the more public the good is in consumption. Finally, some goods (e.g., a piped sewerage system) are characterized by exclusivity but are not subtractable. By contrast, common pool goods (e.g., water resources) are characterized by low excludability but are subtractable.

6. It is extremely important to note that the nature of a good or service is not static, technology can have extremely important implications for the degree to which a good can be characterized as public. For example, some highways are no longer considered public due to the invention of electronic road pricing, which has made it less costly to restrict access. Technology will tend to effect the marginal costs of consumption, the costs of exclusion, and the extent of congestion.

7. **The nature of production.** Production aspects, such as the degree of natural monopoly due to sunk costs or scale/scope economies or the degree of coordination in production, can each act to create situations where some government role may be needed. *Natural monopoly,* or more formally, subadditivity, of costs in production, occurs when there are substantial economies of scale or scope, so that average costs continue to decline for the entire range of output produced. Thus natural monopoly implies that the market will be best served by one supplier. However, if entry is free and the production of the good or service is not characterized by sunk costs, even a natural monopoly need not imply noncompetitive pricing if the market is contestable. A concept related to but distinct from natural monopoly is *coordination.* In some areas of infrastructure, networks require spatial coordination and some form of harmonized rules (e.g., electric power, vehicle traffic).

8. As in the case of consumption of the good or service, the degree to which production must involve a government role, through either direct provision or regulation, depends importantly on technological advances that can affect the entire cost function of the industry. Technological options can affect the degree of scale economies and the degree of sunk costs present in an industry.

9. **Externalities and social objectives.** Externalities occur when the costs (benefits) of producing or consuming the good affect third parties (persons not directly involved in the transaction). There can be either positive or negative externalities where these are a function of the good or service. Vehicle traffic leads to ill effects on air, water, etc. Water and sanitation services will positively affect health. Some goods (e.g., voice telecommunications) are characterized by what are called network externalities, where all users benefit when a new subscriber gains access to a network. Finally, certain minimum social or political objectives may be valued by the community, such as universal access to a certain level of service (e.g., water), or there may be social benefits beyond those accruing to individual users. These so-called *merit* goods have positive social externalities of consumption.

B. Application of the Framework to Pension Services Infrastructure

10. Table 1 classifies the different types of infrastructure often associated with pension services into two types -- Type 1 and Type 2. Type 1 goods and services are those which have some attributes associated with public goods, but need not be publicly provided. In contrast, Type 2 goods and services are generally thought to require public provision because they are nonsubtractable or excludable in consumption, or are needed due to information (or market) failures. For example, the judicial system/legal framework are examples of services the government may have to provide, because these services are not characterized by excludability in consumption. In the case of supervision, information failures in insurance markets related to adverse selection or moral hazard and the mandatory nature of contributions, suggest the need for supervision and regulation -- although this role must be carefully circumscribed.

Table 1. Institutional Infrastructure for Pension Services

ACTIVITIES	NATURE OF GOOD/SERVICE		PRODUCTION ASPECTS			EXTERNALITIES OR SOCIAL OBJECTIVES INVOLVED
	Degree of Subtractability	Degree of Excludability	Degree of Sunkness	Economies of Scale or Scope	Degree of Coordination	
Type 1						
1. Registries [a]	M-L	M-L	L	L	M[a]	H
2. Custody services	H	H	M[b]	M[b]	L-M	M
3. Payments services	M	M	M-H	M	L-M	M-H
4. Accounting	L	L	L	L	L	M
5. Auditing	M	M	L	L	L	M
6. Actuarial services	M	M	L	L	L	M
7. Collection services	M-H	M	M	M-H	L	M-H
8. Mortality tables	H	M	L	L	L	M
9. Financial analysis (valuation) and ratings of securities	M	M	M-L	L	L	M-L
10. Telecommunications	M	M-L	M-L	M-L	L	L
Type 2						
1. Supervision	L	L	L	M	H	H
2. Legal framework	L	L	L	L	H	H
3. Judicial system	L	L	L	L	H	H

Definitions: (H=high, M=moderate, L=low, NA=not applicable)

Subtractability (or rivalry) refers to the impact that consumption by incremental users has on consumption opportunities of all users. Low subtractability (nonrivalry) implies that consumption by one user does not impede availability to other users (such goods are jointly consumed). High subtractability implies that consumption by one user imposes identifiable costs on other users (privately consumed goods).

Excludability refers to the feasibility of controlling access to a good. High excludability implies that it is relatively easy (noncostly) to prevent users from consuming it.

Sunkness refers to the extent of sunk capital costs incurred in the event of exit from the activity. In activities with high contestability, entry and exit are relatively costless. This implies the absence of sunk costs.

Coordination refers to the need to control the rights to perform this function.

Externalities refers to cases where the good or service produced is nonexcludable in consumption, so that third parties are affected when the good is produced or consumed. Externalities can be positive or negative.

a/ In particular, unique identification numbers must be established for each contributor.

11. Table 1 highlights the fact that many forms of Type 1 goods or services, such as those affecting quality of information (1, 4, 5, 6, 9), custody and payment services (2, 3), and communications infrastructure (10) are characterized by certain externalities. Also, Type 1 goods and services have varying degrees of "publicness" in either consumption or production. For example, the nonexistence of accurate information in a registry to identify contributors results in a form of externality, since it increases transaction costs to all consumers of pension services through its impact on collection and by increasing account and information processing costs. In addition, the possibilities for fraud increase, with associated negative externalities to individual contributors who obey the statutes. Finally, although subtractability (rivalry) and excludability in consumption are not high for this service, production can involve some degree of sunk costs, so that scale economies may require some form of regulation but not necessarily outright public provision.

12. Custody and payment services are basic to the development of any form of privatization of investment management services. This is because securities must be warehoused in a way that ensures that when securities transactions are undertaken, counterparties have confidence that securities accounts will be properly credited and debited. Similarly, payment services must be timely and there must be rapid transfer of funds associated with securities trading. However, production of these services is characterized by some scale economies that can be important in the small country context, implying that care needs to be taken in the design of government regulation. Finally, communications infrastructure can be critical, particularly in small countries where access to offshore provision of some infrastructure services is central to the functioning of the pension system. Thus, it is important to ensure that phone lines exist and that there are no barriers to interfacing between data systems across countries.

13. A last Type 1 service of particular importance to pension reform, irrespective of the size of the country relates to collections (7). In this case, collections can be subject to significant economies of scale and scope. *Economies of scale* exist because fixed costs of a network of offices, and a labor force to collect contributions and enforce collections, can be large. Also, the need for each company that acts as a retention agent on behalf of workers to create many new forms *(planillas)* every time workers change employers can increase collection costs dramatically. Such costs can be reduced substantially if the number of collection agents and associated infrastructures are reduced. *Economies of scope* are present due to the joint nature of many government collection functions. For example, contributions for social security, unemployment insurance, personal income taxes, and health services, if provided by a separate public agency, are often collected separately using different forms, and even via separately created infrastructure in some countries. Assigning all of these collection functions (within one standardized form) to one collection system per employer has been shown to result in large cost savings.

14. This kind of analysis does not imply that Type 1 goods should be publicly provided. In many cases (e.g., registries, custody, and payments), the goods or services to be provided can be regulated via external regulation or self-regulatory standards set by associations (chambers of commerce in the case of registries, associations of accountants or actuaries, etc.), and by self- regulatory organizations (SROs) exchanges, and clearing houses. More often than not,

some combination of these two forms of oversight is applied to mitigate externalities (see Glaessner, 1994). It is important to note that enforcement of these regulations requires adequate supervisory capacity within the external regulatory authority to evaluate the adequacy of the oversight imposed through the self-regulatory association or organization. Finally, even in the case of collections, an assessment will have to be made of the existing infrastructure for collecting payments from the general public before the government is assumed to be the sole collection agent, as opposed to options involving the contracting out or concessioning (out-sourcing) of this service.

15. Experience in many developing countries, irrespective of size, suggests that substantial weaknesses exist in delivery of most Type 2 services that usually must be provided by the public sector. Although legal and regulatory reforms can be effected quickly, changes to improve judicial processes and supervision in areas needed to support a complete or partial privatization of pension services take time and can be quite extensive. For example, there often will be a need to vastly upgrade supervision of securities markets, banking, insurance, and all forms of pensions, whether mandatory or voluntary.

C. The Small Country Case: Selected Types of Institutional Infrastructure and Pension Services

16. In small countries, several factors make the related decisions regarding the nature of pension reform and the approach to development of institutional infrastructure highly complex. The Type 1 and Type 2 services indicated in Table 1 can be evaluated in the small country case by grouping the activities into six categories. These include: (a) registries to identify the contributors or verify the age of pensioners; (b) collection services, which are discussed in greater detail in Section III of the main text; (c) custody and payment services; (d) services relating to the quality of information available to the government or private agents to monitor or evaluate the performance of pension funds[1]; (e) capacity to supervise; and (f) important legal/regulatory issues associated with general governance or with conflicts of interest in providing investment advice and fund management services to third parties.

17. **Registries.** Accurate registries comprise one type of infrastructure that may be developed more rapidly in small than in large countries. The costs of verifying the identity of contributors and pensioners can be reduced given the much smaller contribution base and work force. At the same time, if some modern telecommunications technology is present, it may be possible to easily link up the civil registries (if physically separate) via computerization. If this service is publicly provided or contracted out to the private sector, it will be important to develop techniques for ensuring the accuracy of the basic information collected in the registry in association with different government agencies. This supervisory function will require deployment of human capital, which is scarcer in small than in larger developing countries.

1/ These include services such as registries, accounting, auditing, actuarial services, and valuation and ratings. See numbers 1, 4, 5, 6, and 9 in Table 1.

18. In addition to the civil and social security-related registries, other registries related to taxes, companies, real estate, land, movable goods, and securities are essential to the development of the capacity to supervise pension services if pension funds make investments in domestic currency-denominated securities. At the same time, such registries serve as the key source of information critical to the capacity of private market participants to monitor pension fund administrators, investment management companies, insurance companies, and other entities providing aspects of pension services. Many of these services can be provided by private vendors or associations (e.g., chambers of commerce), as is the case in Colombia. In addition, private credit bureaus or broad-based databases can be developed (e.g., DICON in Chile) to serve as invaluable sources of information to both supervisory agencies and private economic agents seeking to ascertain the creditworthiness of individuals or companies.

19. Despite these advantages in developing registries, small countries can face disadvantages related to labor migration. Specifically, such migration flows can make it difficult for government or the private sector to establish and maintain a registry of active contributors, which involves establishing national identity numbers. In essence, this requires coordination between the authorities responsible for immigration and those that must supervise and regulate whatever public or private pension systems are in place.

20. **Collection services.** Development of a collection infrastructure also presents difficult problems in small countries, particularly where personal income tax systems are not well developed and there is no publicly provided collection infrastructure. For example, Costa Rica is one of the few Central American countries that has a well functioning personal income tax collection regime. In most small countries more convenient tax handles have to be employed, such as export taxes or the value added tax (VAT). These tax systems, however, do not result in an infrastructure that can support collection of contributions to individual pension accounts out of wages. These countries may have collection infrastructure present at the individual level in the case of key services such as water and electricity; however, piggybacking on this infrastructure to collect contributions for workers is difficult, since the link between the employer and employee is severed. In most small countries collections must be effected by the employer through retentions and placed in accounts at commercial banks. Thus, a key issue involves standardizing the forms and process for collections in each company (e.g., establishing the *planilla*) and automating this process. An entire set of issues arises in small countries when collections are undertaken by different fund management companies that can vertically integrate (see Section III of main report).

21. **Custody, clearing, and settlement services and payment systems.** Custody functions (warehousing of securities), clearing functions (determining accountability for the exchange of money and securities between buyers and sellers of securities), and settlement functions (completing transactions by delivering or crediting securities and corresponding funds to appropriate accounts) can be organized in a decentralized or completely centralized manner. Similarly, payments in small countries can take the form of large value transfers or, more often, checks.

22. In small countries many of these services are characterized by some economies of scale in production over the relevant number of securities or payment transactions. Typically, economies can be realized if the number of securities transactions processed is more than ---- per day. Obtaining such economies and related cost reductions will only be present in small countries if each has no more than one entity (e.g., a clearing house, exchange, or custody corporation) providing such services as custody and clearing of securities or checks. In small countries such as Bolivia, Costa Rica, and El Salvador, a lack of independent interests, coupled with the need to reduce the number of providers of the service to capture scale economies, can lead to a situation where provision of these services by domestic market participants results in a form of self-regulated oligopoly or monopoly. Hence, experience suggests (see Glaessner, 1994) that care must be taken to permit objective entry to domestic exchanges or custody corporations and to carefully evaluate the option of importing these types of services from abroad.

23. Finally, it is essential that barriers to the links between international and domestic payment systems (often involving impediments to modern telecommunications technology by government-created local monopolies) be eliminated. In this case, payment system services involving international currencies, e.g., participation in SWIFT) can be more easily imported from abroad.

24. **Quality of information and valuation services.** The lack of independent interests in small countries and the related greater possibilities for collusion among pension service providers suggests that the quality of information and valuation takes on added importance. In particular, the need to import services will require that consumers have greater access to information about offshore providers of pension and insurance services. In addition, improving the quality of information will require a substantial investment in human capital. In many small countries, the actuarial, auditing, and accounting standards, as defined by self-regulatory associations, are very underdeveloped. Estimates suggest that there are very few trained actuaries, accountants, and auditors within the Central American countries, and in some of these countries they are almost nonexistent. The problem of the lack of human capital is compounded by a lack of independent interests, which greatly impedes the reliability of information provided about most financial and income statements. Relative to large countries there is a much higher probability that the opinions rendered by persons in these professions, and the applicable information provided, is not independent from the interests of the providing institutions.

25. **Supervision.** Given the greater shortage of human capital in small developing countries, it is important to find ways to minimize the investments small countries must make in this area. One method of minimizing these costs is to place far greater emphasis on information disclosure and on designing regulations that can create incentives for self-regulation by the financial institutions that provide pension-related services. This does not imply the complete absence of supervision; rather, it implies strengthened -- but far more focused -- supervision and adoption of a far more modern approach to financial services supervision. Alternatively, supervision services can be imported if pension reform involves the

complete contracting out of pension services to foreign entities that will be subject to supervision by the home country supervisor (see Section D below).

26. **Legal framework: corporate governance, conflicts of interest, and investment management.** Besides the immediate need to design specific aspects of the legal and regulatory framework for the supply and demand for pension services (see Section III of main paper), there will typically be the need to reform substantial parts of the legal regulatory framework in a complementary manner. In small countries there is often a relative lack of independent interests, and consequently, a greater concentration of ownership. This implies that regulatory and legal frameworks will need to be designed with special attention to governance and conflict of interest. Regulations employed to tackle these issues involve: (a) defining very clear investment objectives and policies; (b) examining the fiduciary liability of directors of investment management companies, trustees, pension plan sponsors, or those on special investment policy committees, if the country adopts a government-operated plan; and (c) establishing proper valuation and trading practice standards, many of which are difficult to enforce in domestic securities markets, which are not highly liquid. Finally, auditing, valuation, and disclosure standards can also be manipulated and compliance functions may not be well developed, making the risk of fraud, dumping of securities, and improper assignment of transactions frequent problems.

D. Options for Development of Institutional Infrastructure to Support Pension Reform

27. The above discussion might make it appear that small countries should not implement mandated pension schemes, if only because the infrastructure requirements appear more difficult to meet in a country with a small, very mobile contribution base. If such schemes are adopted, however, they need to meet minimum infrastructure requirements, as well as provide access to offshore services.

28. **Types of pension reform and minimum set of institutional infrastructure.** The types of institutional infrastructure that will be needed to support pension reform are not independent of the specific characteristics of the reform adopted. For example, if the reform involves the mandating of contributions, certain services will be essential to the government's ability to enforce its pension policy (e.g., tax authorities, perhaps military/police, some regulatory/supervisory body, and an adequate legal framework/judicial system). In addition, some forms of infrastructure will be needed to ensure that contributions are collected at fairly low cost and that benefits will be paid out in a timely fashion. For example, this would require the existence of adequate registries to identify both contributors and pensioners, as well as some form of privately or publicly provided infrastructure for collections.

29. If pension services are wholly or partially privatized, given investments in domestic markets, an entire set of infrastructure relating to the quality of information will be required, such as actuarial services, valuation and ratings of securities, accounting and auditing standards, and mortality tables with which to assess longevity risk. Complete or partial

privatization of pension services in such areas as investment management also gives rise to the need for reforms relating to payment systems and custody for securities, as well as legal or regulatory reforms to treat conflicts of interest and define the fiduciary responsibility of fund managers. Finally, privatization of pension services can require greater efforts to upgrade supervision so that different types of regulations and legislation can be enforced, to reduce the risks of insolvency and fraud on the part of private providers.

30. By contrast, if pension reforms are designed so that government would only mandate contributions, enforce and create a collection system (involving out-sourcing to commercial banks), set certain minimum standards for a pension contract, and license well-known international companies to offer that contract to local contributors, domestic institutional infrastructure requirements can be minimal. Maintaining the real purchasing power of such pensions can present interesting issues (see Section IV B.).

31. In sum, the design of pension reform in small countries can greatly affect how much institutional infrastructure will be required. In each country, difficult decisions will need to be made regarding priorities in this area.

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