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Why Should the Portfolios of Mandatory Private Pension Funds be Captive?
(the Foreign Investment Question)

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ABSTRACT

Should the portfolios of mandatory, private pension funds in developing countries be invested exclusively in the home country? Or should their managers be free to make prudent investments anywhere in the world? Traditional portfolio analysis gives a clear answer from the point of view of the beneficiaries of the funds: Lifting geographic restraints expands the risk-reward frontier, and unequivocally enhances their welfare. However, when the balance of payments is constrained, there is also a strong argument in favor of limiting capital outflows. The balance of payments constraint can be relaxed if autonomous capital outflows (such as pension fund investments abroad) generate compensating capital inflows (for instance, by raising international confidence). Chile, Argentina, Poland and Kazakhstan provide concrete examples of some of the issues discussed.

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During the last two decades of the twentieth century, a number of developing and transition countries with weak capital markets, aging populations, and demoralized pay-as-you-go social security systems adopted funded, defined contribution pension systems as a central feature of their development strategy. The distinguishing characteristics of the new retirement funds are that they are mandatory, individual, and privately managed. An important, additional, and still intensely debated question is: Should these funds also be captive? Should their investments be restricted to the home country?

Though a few voices argue strongly for lifting such restrictions,[1] others defend the restrictions as either necessary or desirable, at least in part, and for a time.[2] This paper will analyze the relevant considerations, and evaluate their implications for Europe and Latin America.

The paper begins, in section 1, with a review of the arguments in support of mandatory, individual, funded pension systems. Section 2 provides a rapid overview of the development of these systems during the last two decades. Section 3 analyzes the implications of the balance of payments constraint for the freedom for such pension funds to invest abroad. Section 4 comments on other considerations. Section 5 analyzes what the benefits and costs of lifting these restrictions would be in four specific cases: Chile, Argentina, Poland and Kazakhstan. Section 6 concludes.

1. The Case for Radical Pension Reform

1.1 The Principle Argument

Developing and transition countries with aging populations and demoralized social security systems face critical budgetary and social challenges. A demoralized system is one that has entered a vicious circle of rising tax rates, falling benefits, and increasing evasion.

As budgetary constraints cause benefits to decline, the incentive for tax evasion rises, and workers and firms increasingly migrate to the informal sector. When myopic authorities respond to the shrinkage of the tax base by raising tax rates, they further encourage additional evasion, and may find themselves approaching the downward sloping part of the Laffer curve. As a

[1] Kotlikoff (2000)
[2] Fontaine (1997) and Reisen and Williamson (1997)

consequence, a budgetary and social crisis may develop much sooner than would have been predicted on the basis of demographic factors alone.[3] Under such circumstances, scaling back or closing down the pay-as-you-go system, and introducing, in replacement, individual, funded retirement accounts, can break the vicious circle, if returns on the funds are high, and workers have confidence in the benefits that their contributions will generate.[4] [5] In this paper, I shall refer to such a shift from a pay-as-you-go to a private funded retirement system as "radical pension reform." The strategy was first implemented in Chile in 1981 (see below). World Bank (1994) and World Bank (1996) subsequently argued that the strategy could be an appropriate response to pension problems in a number of other developing and transition economies.[6]

There is clearly a substantial cash fiscal cost to a partial or total transition from a pay-as-you-go to a funded retirement system: pay-as-you-go receipts drop before benefits decline. In order to reduce the implied increase in its cash deficit, the government must raise taxes or cut benefits at the same time that it is requiring workers to make mandatory benefits to the new funds. If this cost is accepted, the country undertaking the reform experiences a temporary increase of fiscal burden, but avoids an otherwise incipient pension and fiscal crisis.

1.2 Why Mandatory?

The mandatory nature of the contributions in the standard model of radical pension system calls for commentary.

The presumption in favor of free choice on efficiency grounds has never been as clear for saving as it is for microeconomic consumption decisions. The classical arguments for presuming that individuals, left to their own devices, may save less than is socially optimal, focus importantly on myopia and moral hazard. In the context of developing countries with thin capital markets, both limited information flows, and the magnitude of the spreads between lending and borrowing rates, provide an additional rationale for public policy: By pooling savings and organizing competitive mechanisms for their efficient allocation, the State can reduce the margins which would otherwise be earned by middlemen with market power over the savers and the borrowers. Contributions have to be mandatory, in part, to counter the effects of myopia and moral hazard, but, in part also, because financial education is so limited in developing countries that few households would otherwise contribute. Below a certain minimum threshold, the infrastructure required to maintain the saving pool could not be sustained.

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[3] de Menil and Sheshinski (2001)

[4] In all of the countries experiencing systemic crisis, which have adopted the type of reform described here, contributions to the new pension funds replaced a portion or all of contributions to the pre-existing pay-as-you-go system. Whether the replacement was total or partial depended primarily on whether the funds were intended to completely replace the old system (Chile and Kazakhstan), or to coexist with a scaled-down version of the old system (most other examples), in a manner in which both systems would contribute separate portions of the average beneficiary's retirement income.

[5] Under either total or partial replacement, the maintenance or expansion of the contribution base – the number of employees making the mandatory contributions -- is crucial to reversal of the vicious circle.

[6] Reservations were subsequently expressed by Orszag and Stiglitz (2000)

When financial markets are thin, individuals may nonetheless save by making illiquid investments in their homes or in physical goods. But the transformation of these savings into annuity-like income streams, when the individuals are no longer capable of working, may be subject to substantial risk and inefficiency. Mandatory savings schemes, when they are efficient, open access to liquid investments, and can remove some of the uncertainty of old-age income streams.

1.3 Additional Arguments for Radical Pension Reform

In addition to averting a pension crisis, a partial or total transition to funded accounts, accompanied by sufficient budgetary savings, may also raise the national saving rate and encourage the development of national capital markets.

A mandatory saving scheme will increase the national saving rate, if the savings it collects are not off-set by compensating dis-saving by private agents, or by larger government deficits.

Promoting the development of national capital markets constitutes an additional argument for radical pension reform. This argument is independent of the savings and investment rate effect. Even if the pension reform leaves the total magnitude of national savings and investment unchanged, it can, by changing the channels through which the savings are directed, change the allocation of the investment. There is a growing literature on the effect of radical pension reforms on the development of national capital markets.[7] It is argued there that by increasing the demand for long-term financial securities by an order of magnitude, the reform also stimulates the supply of such long-run securities – corporate bonds and stocks, and mortgage-backed securities. It is also further argued that increased financial volumes create pressure for and justify a range of institutional developments whose consequence is to improve regulation and make financial markets more transparent and safer for all investors.

Such advocates consider these capital market developments to be an important benefit of the reform. It is important to emphasize, however, that radical reform is desirable whether or not it increases savings and promotes capital market development. These are secondary objectives of radical pension reform, not its primary purpose.

2. Overview of the Spread of Radical Pension Reform

The first example of a national system of mandatory, publicly regulated, privately managed, individual pension accounts is the system enacted in Chile in 1981. The Chilean pension funds replaced a fractured and demoralized patchwork of pay-as-you-go systems characterized by high taxes and low benefits. Their introduction was a central feature of a broad range of market reforms, including liberalization in the areas of trade, foreign

[7] Much of this work has been done at the World Bank, in the Financial Sector Development Department. See Vittas (1998), Vittas (2000), Impavido and Musalem (2000), Impavido, Musalem and Tressel (2001, 2003).

investment, and labor market, and banking and non-banking privatization. As of the end of 2001, the cumulated value of pension fund assets was 55% of GDP, the real rate of return of the average fund since inception was 10%, and 63% of wage and salary employees were covered and contributing.

Fifteen years after its launch in Chile (and five years after Chile's transition to a democracy) the model of mandatory, individual retirement accounts began to be implemented in a number of other Latin American countries. Table 1 describes the incidence of radical pension reform in the region, and summarizes the characteristics of the system in each country. By the end of 2001, the following eight countries in addition to Chile (in the order of their implementation of the reform) had adopted a mandatory, private account system: Peru, Argentina, Columbia, Uruguay, Mexico, Bolivia, and El Salvador. Nicaragua and the Dominican Republic had approved such a system, and were in the process of implementing it. The total population of the countries having implemented the reform was 244 million, almost as large as that of the United States. Individually, they ranged in size from 3.4 million (Uruguay) to 99.4 million (Mexico). Brazil, Venezuela, Guatemala, Cuba and Ecuador were among the larger countries of the region not to have adopted what we have termed radical pension reform.

Subsequently, the concept crossed the Atlantic, leapfrogged "Old Europe", and began to be implemented in the formerly Communist countries of Eastern Europe and the Soviet Union. Table 2 describes the incidence of radical pension reform in Eastern Europe and the Newly Independent States, and summarizes the characteristics of the system in each of those countries. By the end of 2001, mandatory individual retirement accounts were functioning in the following eight countries (in the order of implementation of the reform): Hungary, Poland, Kazakhstan, Macedonia, Latvia, Bulgaria, Croatia, and Russia. The total population of the countries affected was 225 million. Individually, they ranged in size from 2 million (Macedonia) to 144.8 million (Russia). In the CIS, many countries had not adopted this system, the largest being Ukraine and Uzbekistan.

Mandatory contributions to public pools of savings, in fact, were known in the developed and developing world before Chile's experiment. Historically, returns in such public funds have, by and large, been poor. In Bismarck's social system, funds were initially accumulated in a public fund. Several countries in Africa and Southeast Asia instituted mandatory national provident funds in the 1960s. In Bismarck's Germany, the State limited the growth of the funds by directing their investments to social purposes. In the years between the two World Wars, the remaining capital was destroyed by hyperinflation and depression. In Africa, public pools of retirement savings were so badly managed, that they had been dissolved by the early 1990s. Historical returns have been better in the Southeast Asian cases than in the African cases, but only in the case of Singapore have they been comparable to private returns.

Part of the novelty of the Chilean model was that the mandatory contributions were channeled to individual accounts, and that these were privately managed. The Chilean model gives each contributor ownership-like rights over the funds accumulated in her account, notably the right occasionally to change manager. The existence and the potential political strength of private owners provide some protection against state invasion or expropriation of the funds. The discipline of competition between private managers provides some protection against the

imprudent, politically motivated, or corrupt investment decisions which public officials might otherwise make.

3. Geographic investment restrictions.

We now turn to the central question of the paper: should the managers of mandatory, individual pension funds be free to invest outside the home country? The answer to this question depends critically on the nature of the balance of payments constraint which the country faces.

The opportunities and constraints associated with the balance of payments feature centrally in the growth strategy of any developing country. In the extreme, if a developing country does not face a balance of payments constraint, and if it offers attractive investment opportunities, it can borrow internationally and invest domestically as much as its institutional capacity permits it to absorb. Alternatively and preferably, if the country is a very attractive destination for foreign direct investment, it can allow international corporations directly to develop its investment opportunities.

Under either of these conditions of effectively limitless supply of long-term development capital, growth prospects are very positive. In such an optimistic situation, growth would not be limited by the national saving rate, and raising that saving rate would not be a national priority. Similarly, if the supply of international capital were unlimited, local capital markets would be of only secondary significance, and their development would also not be a national priority.

If, on the other hand, a developing country faces a strict balance of payments constraint, and international development capital is in short supply, then domestic savings are crucially important for growth. Far sighted authorities will want to increase both the quantity and quality of savings, by simultaneously raising the national saving rate and promoting the development of national capital markets. (Broadening and deepening national capital markets improves the efficiency with which the savings are allocated.)

Whatever their quantity and quality, the authorities will want to retain national savings in the home country, if the balance of payments is strictly constrained. This intention applies to all forms of savings, including, importantly, the savings held in mandatory, individual pension funds. It generates a conflict between the interests of the individual beneficiaries of these funds, on the one hand, and the collective interest of the country, on the other.

3.1. Pension fund portfolio allocation from the point of view of the beneficiaries

The arguments for the freedom to invest abroad are very strong from the point of view of the individual beneficiaries. Diversification through foreign investment can potentially enhance dramatically the risk-return possibilities available to them. Consider the interests of a representative individual beneficiary. Let the fund on the beneficiary's account be F. Let a

portion, α, of the fund be invested in foreign securities returning r_F, and the complement, (1-α), be invested in domestic securities, returning r_D.[8]

Let the means, variances, and covariances, of these returns be $\bar{r}_F$, $\bar{r}_D$, σ^2_F, σ^2_D, and σ_{FD}. The expected annual revenue of the representative beneficiary is

(1) $$\bar{R} = (\alpha\bar{r}_F + (1-\alpha)\bar{r}_D)F .$$

Its variance is

(2) $$\sigma^2_R = \left(\alpha^2\sigma^2_F + (1-\alpha)^2\sigma^2_D + 2\alpha(1-\alpha)\sigma_{FD}\right)F^2 .$$

If one assumes that the manager of the account seeks to maximize the expected utility of its beneficiary, one can easily derive the optimal value of α. This is done in Appendix 1. The result is a function of the returns, variances and covariances of the different securities, and of the individual's relative rate of risk aversion.

Under all but the most extreme circumstances, the individual benefits substantially from investing abroad. For example, unless the two securities are perfectly correlated, it is highly beneficial to invest abroad, even if the means and variances of r_F and r_D are the same. This is for the simple reason that the opportunity to average over two independent draws of the same random variable (r_F and r_D) reduces the variances of the outcome. In that simple case, in the optimal portfolio,

(3a) $$\alpha = \frac{1}{2}$$

If the variances are the same but the expected returns are different, α is greater or less than ½ depending on whether $r_F > r_D$.

(3b) $$\alpha = \frac{1}{2}\left[1 + \frac{(\bar{r}_F - \bar{r}_D)r_D}{\rho(\sigma^2_D - \sigma_{DF})}\right]$$

(ρ is the beneficiary's rate of relative risk aversion when the portfolio is entirely invested at home.)

If the expected returns are the same, but the variances are different, α< 1/2 or α 1/2 depending on whether $\sigma^2_D < \sigma^2_F$ or σ^2_D σ^2_F.

[8] If the exchange rate is fixed, this return on investment is a real return. If the exchange rate floats, it is a real return corrected for the rate of change of the exchange rate.

$$\alpha = \frac{\sigma_D^2 - \sigma_{DF}}{\sigma_F^2 + \sigma_D^2 - 2\sigma_{DF}}$$

(3c)
$$\geq \frac{1}{2} \text{ if } \sigma_D^2 \geq \sigma_F^2,$$
$$\leq \frac{1}{2} \text{ if } \sigma_D^2 \leq \sigma_F^2$$

The fact that the value of reference is ½ is a consequence of our artificial division of world securities into just two categories. If global investment is better described as offering *n* distinct, prudentially acceptable, categories of securities, where *n* is large, and domestic securities are just one of the categories, then the value of reference becomes

$$\frac{n-1}{n}$$

which is much larger. Clearly, in an efficient, global portfolio, the share of the portfolio invested in the securities of a small home country would be very small. (It is well known that, without explicit investment restrictions, investment portfolios in many countries and types of accounts suffer from a "home bias," and are substantially underinvested abroad. Our concern here is not to analyze psychological behavior, but optimal regulations.)

In a country which was not subject to balance of payments constraints, there would be no reason for the authorities to cap these portfolio allocations in any way. There would be no reason for alarm, even if 90% of all domestic pension fund portfolios were expatriated in this manner. As an example of unconstrained capital flows, consider, for instance, the states of the United States. When savers in Tennessee reduce their Tennessee bank accounts in order to purchase securities issued by a corporation in Oregon, neither the capital outflow from Tennessee nor the increased indebtedness of Oregon are a cause of concern to the authorities of either state. If the magnitude of the transfer is large, and, as a consequence, bank deposits and bank loans decline below their desired levels in Tennessee, a small increase in Tennessee deposit rates will suffice to attract compensating capital inflows. No public intervention is required or justified. The individuals and corporations of Tennessee and Oregon enjoy the financial freedom which comes with the absence of balance of payments constraints.

However, unlike the states of the United States, most developing countries in the world do not enjoy that freedom. When balance of payments constraints are tight, individual interests and collective interests clash. In the following section, we examine the collective interests of society in the portfolio decisions of domestic funds, when the balance of payments is constrained.

3.2. Pension fund portfolio allocation from the point of view of society

When a country's ability to borrow is limited, domestic savings, and the efficiency with which they are transformed into domestic investment, take on a unique strategic importance. The national savings rate, and the efficiency of national capital markets, become

important determinants of the country's long term growth potential. How, in such a situation, can one compare this national interest with the individual's investment interest? One way to compare the two is for the national authorities to put a price on the retention of domestic savings. A natural measure of their shortage is the interest rate that the authorities would have to pay to borrow equivalent sums on international markets. This price is the country's sovereign borrowing rate, r_S, which may include a large country risk premium. If one associates to the capital outflows, whose individual benefit we examined in the previous section, a social cost, at the rate r_S, it is straight forward to calculate the net benefit to the nation of a given amount of foreign investment. The uncertainty and volatility of the sovereign borrowing rate become an additional factor in the analysis.

Suppose, for the sake of argument, that the Central Bank makes up for any autonomous capital outflow by borrowing an equivalent amount from world markets, and pays r_S on the loan. Let the mean and variance of r_S be $\bar{r}_S$ and σ_S^2. If the manager of the representative beneficiary's portfolio invests αF abroad, in order to earn $\alpha r_F F$, the Central Bank will borrow αF and pay $\alpha r_S F$. Let us assume that the Bank, directly or indirectly, reinvests the proceeds of this loan in the domestic economy, where they earn a return of $\alpha r_D F$. Then the expected net income to society associated with the representative beneficiary's portfolio is

$$\bar{S} = \left(\alpha \bar{r}_F + (1-\alpha)\bar{r}_D\right)F - \alpha\left(\bar{r}_S - \bar{r}_D\right)F,$$

(4a)
$$\bar{S} = r_D F + \alpha\left(r_F - r_S\right)F$$

It is immediately apparent that, contrary to the individual, society does not stand to gain much from the allocation of a portion of pension portfolios to foreign investments.

Given the priority on domestic investment funds that the balance of payments constraint imposes, the national authorities match foreign investments with foreign borrowing. On a net basis, the nation cannot alter the geographic location of its investments. Any gain to society is restricted to come through the second term on the right side of (4a). The socially optimal share of foreign investment is a function of the difference $\bar{r}_F - \bar{r}_S$, the variance of that difference, the relative rate of risk aversion, and the covariances between the different yields. We show in Appendix 1 that the socially optimal share of foreign investment is

(5a)
$$\alpha = \frac{\left(\bar{r}_F - \bar{r}_S\right)\bar{r}_D}{\rho\left(\sigma_F^2 + \sigma_S^2 - 2\sigma_{FS}\right)} + \frac{\sigma_{DS} - \sigma_{DF}}{\sigma_F^2 + \sigma_S^2 - 2\sigma_{FS}}$$

If all covariances are zero, this simplifies to

(5b)
$$\alpha = \frac{\left(\bar{r}_F - \bar{r}_S\right)\bar{r}_D}{\rho\left(\sigma_F^2 + \sigma_S^2\right)}$$

The value of reference in this case is not ½ (or $\frac{n-1}{n}$), but 0.

The stark contrast between what is optimal for the individual and what is optimal for society is entirely a reflection of the balance of payments constraint.[9]

In fact, the situation may not be as stringent we have just described it. Advocates have argued that the foreign investments of mandatory pension funds increase international confidence in the institutions of the sending country, and consequently generate compensating capital inflows.[10] We shall examine the intermediate hypothesis that overseas investment generates partially compensating capital inflows. As we shall see, such linkage changes the results in obvious ways.

If foreign investment of αF generates $k\alpha F$ of return capital inflow, (0 ê 1), the necessary sovereign borrowing is reduced *pari passu*. The expected net income to society becomes

$$\bar{S} = (\alpha \bar{r}_F + (1-\alpha)\bar{r}_D)F - (1-k)\alpha(\bar{r}_S - \bar{r}_D)F$$

(4b) $$\bar{S} = (1-k\alpha)\bar{r}_D F + \alpha(\bar{r}_F - (1-k)\bar{r}_S)F$$

If compensation is complete, ê =1, and the social benefit (4b) coincides with the private benefit (1). If there is no compensation, we are back to the stringently constrained case, (4a), in which these is only a limited possibility for foreign investment to improve welfare. The obvious implication is that the level of the foreign investment share which is socially optimal varies critically with the importance of compensation capital inflows. (The appendix derives the expression for the α in the intermediate case.)

3.3. An Aside on the Design of Controls

When the balance of payments is constrained, and capital outflows are not fully and endogenously compensated, there is an argument for capital controls. The argument is not specific to pensions funds; it applies, mutiis mutandis, to all capital outflows. The controls should logically be separated from the pension supervision process. If foreign investment ceilings are called for, they should be set by the Central Bank or the Ministry of Finance, not by the authority charged with pension fund supervision. To the extent that the maturity of the

[9] We have treated the balance of payments constraint as an instantaneous constraint, which is operative at every moment in time. A more general approach would treat the balance of payments intertemporally, and replace the notion of a strict constraint with the notion of a loss function, whose arguments might be the mean and variance of the discounted value of all future balances. This would permit deficits and surpluses, appropriately discounted, to balance out over time, and would allow governments to contemplate a small probability of default.

[10] See Pinera (2000).

investment is a consideration, pension fund investments should be treated like other long-term capital outflows, such as foreign direct investment (see below).

In fact, quantitative ceilings are an awkward and inefficient form of capital controls. They do not allow for the possibility that different investors may have different knowledge of foreign opportunities, or different degrees of risk aversion. Penalties that require private investment managers to internalize social costs would be preferable from the point of view of economic and administrative efficiency. The analysis of the preceding section shows how such penalties might be structured. Let (1) represent the expected return of any private investor (whether she be a pension fund manager or any other investor). Suppose that this investor were required to pay a penalty of

$$(1-\boldsymbol{k})(r_S - r_D)$$

On every unit of domestic currency she decides to invest abroad. It is easy to see that the imposition of that requirement would make the private investor's objectives become the same as those of society. The imposition of the requirement would change (1) into (4b).[11]

As a result, private investors would, on average, set

$$\boldsymbol{a}$$

equal to the socially optimal level, a level much lower than would otherwise have been the case.[12] The central authority charged with controlling capital flows – let us say the Central Bank -- would still be expected to borrow $(1-\boldsymbol{k})F$ internationally, and reinvest the proceeds domestically.[13]

3.4 When foreign capital is ample but volatile

There is an alternative view of the balance of payments constraint of developing countries, which has different implications.

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[11] The Central Bank could separate foreign investments into a limited number of categories, and attribute to each category a different estimate of $\boldsymbol{k}$.

[12] It is natural to assume that $r_S > r_D$. Circumstances in which $r_S < r_D$ are circumstances in

which it would be in the interest of the country that the Central Bank use its good access to international markets in order to intermediate between these markets and domestic investment markets. In any realistic situation, this access is bound to be limited. (If it were unlimited, then the intermediation of the Central Bank could, in effect, lift the balance of payments constraint.) One way to interpret our analysis is to assume that these intermediation opportunities have been fully exhausted.

[13] It is in the national interest that the Bank compensate for the capital outflows from private investors, in this manner, even when these do not exceed the socially optimal level. The Bank might, for instance, lend the proceeds to one or more private development banks, exclusively charged with making long-term loans to domestic enterprises.

Some of the developing countries which have experienced balance of payments crises in the last decade seem not so much to have been limited by a rigid shortage of international capital, as to have suffered from the excessive speed with which it moved in and out.

When it is the rate of change rather than the level of foreign investments and foreign liabilities which creates difficulty, it may be desirable to put less emphasis on the promotion of national savings and national capital markets, and more on discouraging rapid changes in foreign exposure.

In such conditions, it may be desirable to regulate capital movements. But the nature of the regulations called for is different from what we have examined above. The object of the regulations should be more to act as circuit breakers, to block abrupt and costly inflows and outflows, and less to limit long-run levels of foreign assets and liabilities.

In the extreme, the Central Bank may have no view on the long-run level of the foreign investments of private investors. But it may want to ensure that movements of such assets in and out of the country do not occur too abruptly. Excessively rapid capital outflows might imperil the health of the institutions where the capital had been invested; and excessively rapid capital inflows might contribute to a speculative bubble in domestic assets.

The classic way of slowing down the flow of capital movements is to require that each major transaction receive prior, written authorization. A preferable, and less heavy handed approach is to grant automatic authorization, but to require advance notice and penalty deposits at the Central Bank.[14] Any implicit tax on capital movements of this sort generates substantial, microeconomic, efficiency and administrative costs. It may, nonetheless be justified, if very rapid capital movements are sufficiently disruptive.

The important question from the point of view of this paper is what the effect of such circuit-breaker regulations would be on the level of foreign investments in private pension funds. The answer is that such regulations are not incompatible with even very major levels of overseas pension fund investment. By their nature, pension fund investments are long-run investments. Pension fund managers may prefer to have complete freedom to move in and out of any investment at any time. But overseas investments are likely to remain attractive, even when regulations make them sticky. Moreover, any authorization scheme, and particularly the automatic authorization scheme with penalty deposits, need only regulate an investor's global foreign exposure, not its component parts. A pension fund manager who, unrestricted, would

[14] The Central Bank might, for instance, prohibit any movement within one month of the notice and require investors to deposit at the Central Bank, without interest, a sum equal to l times the anticipated capital movement.

l Would depend on the number of months due to elapse before the capital movement was scheduled to occur. It could be much greater than 1 for capital movements scheduled less than 6 months from the original notice, and less than 1 for capital movements requested more than a year in advance. Chile's controls on capital inflows were somewhat of this nature.

export a third of her portfolio, is not likely to be substantially deterred by the knowledge that she could not repatriate those funds rapidly, if she was assured of retaining the freedom to reallocate them to prudent securities anywhere in the world.

3.5. Additional considerations

There are two other considerations which should weigh on the design of an overall strategy for the foreign investments of private pension funds. They both relate, but in different ways, to the relative safety of foreign and domestic securities.

3.5.1 Monitoring regulatory compliance

It is natural for the pension supervisory authority of a developing country to be concerned that managers who can move assets out of the country may thereby be able to evade its regulations. Indeed, one can imagine investments in poorly regulated securities of off-shore jurisdictions covering up transactions tainted by egregious conflicts of interest. But, real though this risk is, it can be easily eliminated by simply restricting the class of permissible foreign investments. Investments in the bonds of G5 governments and in recognized stock index funds traded on the major exchanges of those countries would be impervious to manipulation, and would, nonetheless, provide rich opportunities for diversification. Fear of evasion should not be an obstacle to the judicious authorization of foreign investments.

3.5.2 Lowering the threshold of system feasibility

The other side of the coin is that foreign securities may be more transparent than domestic securities, in some developing countries. For private pension funds to be sufficiently reliable to mandate that workers' savings be deposited with them, certain minimum conditions have to be met. A growing literature analyzes these threshold conditions. Vittas (1998 and 2000) claims that critics of radical pension reform are wrong to insist that national capital markets must be well developed before private pension systems are mandated. He argues that the slow build up of these funds gives the reforming country time to implement the infrastructures of more efficient capital markets, and to encourage the development of an adequate supply of private securities. In his view, the three necessary conditions for the success of radical pension reform are conditions relating exclusively to the political will and technical capacity to guard and manage the accumulated assets: 1) a political commitment to macroeconomic price stability and sound fiscal policies,[15] 2) a political commitment to the effectiveness of an independent, regulatory and supervisory body, and 3) the existence of well capitalized banks and insurance companies. (In fact, Vittas implicitly treats the potential for the future development of stock and bond markets as a fourth necessary condition.)

[15] Vittas correctly considers that long-term financial contracts cannot survive protracted bouts of high inflation. Latin American experience teaches that when inflation is high and variable, indexation eventually breaks down.

The freedom for pension funds to invest abroad cuts through this debate. The freedom to invest prudently in international markets would eliminate any sense that the current or potential future development of domestic capital markets might be an obstacle to radical pension reform.[16]

International investment freedom is particularly important for small developing countries considering these reforms. Small countries can ill afford to be isolated from world markets in any dimension. Capital markets are no exception. In countries which are very small, the very limited potential for the future development of protected capital markets with captive savings is, in fact, an obstacle to radical pension reform In such countries, the freedom to invest abroad would substantially lower the threshold for radical pension reform.

In the extreme, in a city-state economy, the pursuit of autonomous financial development is not a viable option. In a city-state economy, the freedom to invest abroad, in the likely near future, is a necessary condition for radical pension reform

4.Overview of the general arguments and their implications

We have seen above that the benefits of diversification constitute a strong, prima facie case for permitting mandatory private pension funds to invest abroad, but that the presence of a balance of payments constraint qualifies the arguments in favor of investment freedom in a number of ways.

We have also seen, however, that foreign investments are not incompatible with a balance of payments constraint. In many circumstances, partial foreign investment freedom is both optimal and manageable, when the balance of payments is constrained, and even when capital controls are in effect.

Some writers seem to imply that countries opting for radical pension reform should also adopt currency boards. Whether or not currency boards are optimal for developing countries is a different topic, but neither they, nor unlimited capital mobility are a necessary condition for radical pension reform.

On the other had, when a developing country has the good fortune of being largely free of balance of payments constraints, there is no logical reason to limit the foreign investments of private pension funds (other than by subjecting them to reasonable prudential rules).

Some experts in Eastern European countries which are candidates for entry into the European Union have argued that the free capital mobility mandated by the Treaty of Rome pulls the rug out from under radical pension reform. To the extent that the purpose of the reform is to promote national savings and national capital markets, the argument goes, that purpose is undermined by the capital mobility the Treaty mandates.

[16] The political commitment to sound finance and forceful regulation emphasized by Vittas obviously remain as necessary conditions.

Surely, this argument is mistaken. The principal rationale for radical pension reform is the assurance of reasonable retirement income, which it provides workers. This argument will be as strong after entry into the European Union as it is before. One of the many benefits that membership provides is that it lifts the country's balance of payments constraint. One of the many enormous advantages that that entails is the freedom for all investors to invest anywhere in the world. At the stroke of a pen, the new members win access to all of the capital markets of Europe. They need no longer make heroic efforts to jump-start their own capital markets.

What this means for workers is that the threshold for viability of mandatory, private pension funds is lowered. Radical pension reform becomes more rather than less desirable.

5. Four Case Histories

In this section, we review the development of mandatory, private pension fund systems in two countries in Latin America, Chile and Argentina, and two formerly Communist countries in Europe, Poland and Kazakhstan. Chile and Poland are success stories. Argentina and Kazakhstan are cases where problems have arisen, which have had to be addressed. The principal feature of each country's pension fund system are presented, along with the highlights of each country's macroeconomic evolution, in Tables 3, 5, 6, and 7.

Chile

Chile's pension system remains without question the model of reference for radical pension reform.[17] It was the first system to be implemented. It is the system with the longest track record. And it is, on many accounts, the most successful example of mandatory private pension schemes.

The Chilean system was implemented when the country's capital markets were barely more developed than those of Poland at the beginning of the 1990s. Real returns on the invested funds have been high. Membership has been growing as a percentage of wage and salary employment. The funds accumulated have grown to the point that, at the end of 2001, they were 55 % of GDP (Table 3). This is still well below the percentage capitalizations of voluntary U.S. pension funds and U.K pension funds, but a qualitative leap for a middle income developing country. In 22 years, there have been no major instances of malfeasance, a private annuities market has emerged for the transformation of accumulated funds into pensions, and Chilean capital markets have developed and deepened. A corporate stock market has emerged; the stock market has developed; institutions have been created and laws passed to enhance transparency and accountability in all securities markets. During this time, the national savings rate increased. This macroeconomic result was as much the consequence of budgetary discipline and other tax measures as of pension reform, but the pension funds provided an effective vehicle for channeling part of the new savings towards investment.

These achievements were realized in a context in which foreign investments remained strictly limited throughout. Chile provides an example of the successful development of captive

[17] See Diamond and Valdes-Prieto (1994).

funds and protected capital markets. The example shows that the freedom to invest abroad is not a necessary condition for success, if other conditions are met.

But the effectiveness of the overseas restrictions of Chile's pension system, and the consequent protection of its domestic capital markets, may be reaching certain limits. As Table 3 shows, the country's stock market capitalization reached a plateau in the early 1990s, and has since fallen back. At the end of 2001, the capitalization of the stocks of Chilean corporations was 85% of GDP, well below the levels reached in the United States and the U.K. Part but not all of this difference reflects differences in the evolution of stock prices. [18]

During this time, the Chilean economy has continued to grow, and it is likely that its physical, private capital stock has increased relative to GDP. One hypothesis is that part of it has been acquired by multinational enterprises, and that part has lost its Chilean nationality. Under such circumstances, restrictions limiting the purchases of Chilean pension funds to Chilean equities would seem to have outlived their rationale. It is to be expected that free trade association signed by Chile and the United States June 6, 2003, will lead to the progressive lifting of these restrictions.

Argentina

Ten to fifteen years after Chile's experiment, the move towards more open, market-friendly policies, in previously protected and controlled economies, spread to other countries in Latin America. Radical pension reform was a prominent feature of the liberalization program in a number of cases. In 1993 and 1994, three countries, which were much larger than Chile, but which had levels of financial underdevelopment similar to that of Chile in 1981, adopted radical pension reform. These were (in order of implementation) Peru, Columbia, and Argentina.[19]

A significant feature of this development was that two of the three countries were democracies (Columbia and Argentina); their adoption of radical pension reform demonstrated that it could be implemented without the political constraints of dictatorship.

The broad outlines of the systems adopted in these three countries were similar to those of the Chilean system, with one central exception: all three were mixed, public and private systems. In all three cases, the public, pay-as-you-go system was maintained (sometimes reformed) alongside the new, mandatory, private system. The coexistence of the two systems was to become a recurrent feature of many subsequent radical pension reforms.

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[18] Data on the share of stocks in the total nonfinancial assets of pension funds, insurance companies and investment funds shows a similar pattern. In the United States, this share rises from 21% in 1986 to 45% in 1998, most of the increase occurring after 1991. In Chile, this share starts at 4% in 1986, when the mandatory pension funds were first permitted to hold stocks, and rises to 29% in 1994. It then falls back to 19% by 1998. Since bond prices are partly correlated with stock prices, these ratios are less affected by the stock market cycle than ratios to GDP. I grateful to Thierry Tressel for supplying the raw data underlying
Impavido, Musalem and Tressel (2001).

[19] Chile, with a ratio of M2/Y of 21% in 1980, was moderately more monetized than Columbia (16%), Peru (14%), and Argentina (16%) in 1993. Stock market capitalization was, however, higher in Argentina prior to its reform (19% in 1993), than in Chile, where it only reached 16% in 1986, after pension funds had been allowed to invest in stocks. (In 1993, stock market capitalization was 14% in Columbia, and 12% in Peru.)

A related, important difference is that initial contribution rates were much higher to the Chilean funds (14%), than to the other three (8% rising to 10%). (In the other three countries, workers continued to have to contribute to both systems.) In addition, a combination of higher real returns[20], apparently lower administrative costs and lower evasion[21] resulted in real accumulation that was twice as fast in Chile as in the other three countries. Seven years after their introduction, the assets of private pension funds were 15% of GDP in Chile, and only 6% to 7% in the three other countries (See Tables 1 and 3).

All three systems strictly restricted foreign investments, in fact, beyond the limits indicated in Table 1, because foreign securities had to be selected from an approved list, that the authorities were slow to establish.

From our point of view, the most interesting feature of the record of these three systems is the story of how the Argentine funds fared during the default and devaluation of 2001 and 2002. In the discussion that follows, we shall make three points:

- the funds did better than pay-as-you-go pensions, whose real value was cut substantially;
- political interference prohibited the funds from doing as well as they could have;
- the funds would have done much better if they had enjoyed an unfettered freedom to invest a larger share of their portfolios abroad.

The AFJPs before and during the Argentine default

The default and devaluation of 2001-2002, and the related bank runs, disrupted large segments of the economy, and caused real GDP to fall another %, on top of the % cumulative decline registered in the three years leading up to the crisis. In such a generalized crisis, it was inevitable that all categories of the population would suffer real losses. Pensioners receiving benefits from the traditional, pay-as-you-go system were no exception. In their efforts to hold to a zero deficit target in the Fall of 2001, one of the emergency spending cuts decreed by

[20] The average, annual real gross rate of return on invested funds was 25% in the first two and a half years, in Chile; 16.5% in Columbia; 7.1% in Peru; and 15.5% in Argentina. See Queisser (1997), pp. 19 and 34, and Tables 3 and 5. Real rates of return continued to be, on average, higher in Chile than in the other three countries.

[21] In 2001, the ratio of commissions (all of them essentially front-end-load) to contributions was 20% in Chile, 26% in Columbia and 32% in Peru (See Table 1). In Argentina, in 2000, before the debt crisis, this ratio was 23%. Though the commissions include survivor and disability insurance premia in the case of the latter three countries (and not in the case of Chile), it, nonetheless appears that the net cost to the beneficiary was higher in Peru and Columbia than in Chile. This impression concurs with the discussion of costs and fees in Diamond and Valdes-Prieto (1994). Quiesser (1997) discusses the degree to which, in Peru and Columbia, participation in the private system was lower and evasion higher, as a result of what she describes as "unfair competition" from the public system, particularly in the initial years.

President de la Rua and Minister Cavahlo was a substantial, across the board cut in the real value of public pensions.

The beneficiaries of the funds administered by the AFJPs do not appear to have suffered similar reductions. In a companion measure intended to inject demand at no budgetary cost, de la Rua and Cavalho reduced the rate of mandatory contributions to these funds from 10% to 5% in the Fall. The Supervisory Authority correctly pointed out, with alarm, that this reduction implied a roughly proportional cut in future benefits when the funds were to be converted into pensions. But, because these are defined contribution systems (in which what you get out is what you put in), contributors did not suffer a net financial loss on this account.

More importantly, in November 2001, the funds (along with other private, national holders) were pressured into agreeing to an exchange of their large holdings of marketable federal and provincial bonds, originally convertible into dollars, into non-marketable, guaranteed loans, paying a lower interest rate, and necessarily to be held to maturity. The exchange was clearly equivalent to a haircut for the funds, but one whose magnitude is difficult to estimate, since the replacement security has no market.

Then, in early December 2002, the funds were obligated to place money into new, guaranteed government time deposits. (They were forced to raise this money by selling other securities at the bottom of the market.)

The counterpart for the funds of accepting the exchange and the forced issue, was that they avoided the worse fate, which foreign holders of as-yet un-restructured bonds experienced, later in December 2001, when a resurgence of bank panic precipitated a full-scale default, devaluation and the termination of the currency board. Moreover, in the "pesification" act of January 2002, the government converted the bank loans and forced time deposits from old pesos into indexed, new pesos at a rate of 1.4:1, which was less than half of the then market rate, but, nonetheless better than 1:1, and better than a refusal to issue any new liabilities. The indexation insured that the face value of the loans and deposits was not further eroded by inflation.

How much, then, did the funds loose in the crisis? If one considers that the loans will be honored, and does not discount them for their illiquidity, the loss was not substantial, in real Argentine purchasing power. A rough measure of this loss can be obtained by using the rate of inflation from June 2001 to June 2002 to deflate the total value of assets in June 2002, back to June 2001 prices. After deflation, the June 2002 portfolio is seen to be 6.5% lower in real value than the June 2001 portfolio.

This modest loss, already made up in the subsequent year, is, of course, much less than the loss in the dollar value of the portfolio over that period. If one assumes that the June 2002 portfolio were marketable, and values it at the June 2002 free exchange rate,
one can estimate that the dollar value of the portfolio in that month was more than 50% below its dollar value in the same month of 2001.

In the end, it is the purchasing power of the funds in Argentina that will determine the purchasing power of the pensions that they can pay out. But the decline in their dollar value nonetheless represents a real loss of market potential.

This leads us to two observations which relate directly to the topic of this paper.

- Under the currency board, which had been in effect since 1991, and which implied that capital was completely free to move in and out of the country, there was no logical justification for the restriction (operative since their inception) limiting the foreign investments of AFJPs to 10% of their portfolio.
- Even the 10% ceiling was not used during 2001 by the AFJPs, despite the growing probability of devaluation. The same applies to the 15% ceiling on domestic equities.

A review of the individual portfolios of the fourteen funds in the system, from December 2000 through June 2002 (see appendix 2) reveals that between December 2000 and December 2001, not one of the funds took advantage of even the limited opportunity available to it of protecting its assets against a likely default and devaluation. There was not a single fund which increased its allocation during that time to either foreign securities or domestic equities, two potential hedges against those likely risks. In October 2001, the funds held on average 7.5% of their portfolio in domestic equities (the ceiling was 35%), and 1.6% in foreign securities (the ceiling was 10%).

Moreover, all of the funds increased substantially their allocations to government obligations during the year. The average portfolio share in Argentine government obligations went from 51% in October to 68% in December (and 78% in June 2002).
The standard deviation of exposure to government across funds fell during the year, as managers displayed increasingly homogeneous behavior.

One can not help but ask why there was not more diversity of investment behavior across funds, in this period of maximum disruption and uncertainty. One explanation relates the homogeneity to a peculiarity of the regulatory regime operating in Argentina (carried over, in fact, from Chile). This was a provision explicitly discouraging eccentric investment behavior. It required that any fund whose return fell below the average return by more than a given number of basis points be required to make up the difference from a reserve fund. Similarly any fund whose return was above the average by the same number of basis points was not allowed to let its participants benefit from its success, but had to contribute the excess to its reserve fund. This provision obviously drastically limits indiosyncratic risk taking.

Another explanation is simply that the government still had a substantial power to intervene in the affairs of the pension funds in Argentina. This was partly because of the weakness of the constitutional system, and partly because the simultaneous presence of a public, pay-go system may have given the government the opportunity to threaten private fund managers as a group with the passage of measures favorable to the public system and hostile to the private.

Whatever the political economy of these relations , it is clear that Argentine AFJPs could have come out of the country's crisis with less loss, and even some gain, if their managements

had been truly free to act in an independent fashion during the year which preceded it. It is also clear that a greater effective (as opposed to theoretical) freedom to invest abroad would have allowed the AFJPs to better protect themselves
against what turned out to be catastrophic country risk.

Poland

As in Latin America more than a decade before, the governments which came to power in Eastern Europe and the Former Soviet Union after 1990, were confronted with the challenge of opening up controlled economies to market forces. [22] Not unlike Chile, in its part of the world, Poland came to be the standard of reference for comprehensive and rapid reform in formerly Communist Europe.[23]

The radical pension reform which Poland implemented in 1999 was neither the first nor the most ambitious in the region.[24] Mandatory contributions to the pension funds were 7.3% of wages. The public system -- which was substantially rationalized at the same time the private system was introduced -- was clearly intended to remain the major source of retirement income. As a consequence, at the end of the third year of operation, the accumulated capital of the funds was 4.1% of GDP, half of what it was in Chile at a similar stage (8.6% at the end of 1984), but a little greater than in Argentina (3.2% at the end of 1998).

This being said, the design of the private pension system, the design of the reformed, companion public system, and the relatively well regulated nature of capital markets, make Poland's private pension system one of the more reliable ones in the region. At the end of its third year of operation, Poland's private pension fund system appeared to be running effectively, and already to be having an early positive effect on the country's capital markets. Thanks to a tighter control on fees by the regulatory commission (and, therefore, perhaps, lower profit margins) fees claimed a smaller share of contributions than was generally the case in Latin America. By the end of 2002, equities already accounted for 27.5% of portfolio assets. Observers of the Warsaw Stock Exchange, whose capitalization was then 15% of GDP, were commenting on the importance of the pension funds as contributors of liquidity to the market. At the same stage in their development, the Chilean pension funds had not yet been authorized to own any equities. Three years after investments in equities were permitted (1985), they still only constituted 8.1% of the total value of portfolios in Chile.

The pension funds contributed what they did to the development of Poland's security markets in a context in which there was a 5% ceiling on foreign investments. It is this ceiling and

[22]The Latin American reformers had to undo macroeconomic populism and import substitution. The reformers in Eastern Europe and the former Soviet Union had to replace the populist and protectionist policies implemented by reformed communists in the final years of the soviet regime, with sound finance and market liberalization. The European reformers had a greater institutional challenge, but they also had the advantage of proximity with the European Union, and, for some of them, the promise of membership.

[23] See Sachs (1992).

[24] The first mandatory, private system was Hungary's, implemented in 1998. The most ambitious was that of Kazakhstan (see below).

its relationship to Poland's 2004 entry into the European Unions, which makes the Polish case particularly interesting for the question addressed in this paper.

The foreign investment restriction is a subject of debate within Poland.[25] Some argue that one of the central objectives of the reform is that the mandatory savings it generates remain captive, and contribute to national saving and investment. Experts in favor of the restriction point both to the contribution that the pension funds have made to the stock market, and to the need of that kind of stimulus to encourage the growth of Poland's still underdeveloped market for corporate bonds. Experts opposed to the restriction point to the importance of diversification for the beneficiaries (as was discussed in Section 3.1), and argue that, as Poland enters the European Union, large Polish corporations will prefer to seek finance in the already established financial markets of existing EU countries.

In the end, the matter may be decided by the Treaty of Rome, which requires that, once Poland enters the EU, it must remove any restrictions on capital mobility between itself and other EU members. What this requirement means for geographic restrictions of the kind imposed by Poland's pension supervisory authority is not yet clear. It is likely, however, that these restrictions, particularly if they are as tight as they are in Poland, will be deemed to violate the Treaty. As I have argued earlier (Section 4), the freedom to abandon these restrictions should be viewed as one of the benefits of membership. It is interesting to note that Hungary has taken the path of dramatically raising the foreign investment ceiling. (It is scheduled to reach 30% in 2003.)

Kazakhstan

Given the prior weakness of its financial sector, this petroleum-rich country of 21 million people on the West bank of the Caspian Sea was an unlikely location for the creation of mandatory, private pension funds. In 1996, the ratio of M2 to GDP was 9%; there were no non-bank financial institutions; corruption was perceived to be less under control than in Belarus; and the rule of law equally poorly observed (See Table 7).

Nonetheless, in 1997, the Parliament and the President approved the most ambitious program of radical pension reform in the region. In consisted, as in Chile, of closing the public, pay-as-you-go system (which was in deep, systemic crisis), and replacing it completely with a funded, defined contribution system, to which mandatory payments of 10% of wages were to be directed.

During the five years that followed, the fate of Kazakhstan's new pension system occasionally seemed to hang in the balance.

When the system began operating in January, 1998, workers had the option of directing their contributions to either a publicly managed state fund, or one of 12 privately managed funds. A public guarantee covered the nominal value of all contributions to the state fund, but not to the private funds. Moreover, the state fund was the residual recipient of contributions from workers who had not made their fund designations within the time limit. Both conditions gave an

[25] See Kawalec and Kluza (2003).

advantage to the state fund, and, indeed, in the first year, it received 80% of all contributions. In turn, the state fund was restricted, by the reform law, from investing in anything other than bank deposits and government obligations. Concern that the Government would, therefore, exploit the state fund as a captive source of finance was heightened, when, in April 1999, the Government -- struggling to roll over its short-term debt -- convinced the state pension fund to exchange short-term bills for five-year USD bonds at a rate (6%) well below the country's international borrowing rate.[26]

Over time, the non-state funds, because they invested in higher yielding securities, posted higher returns; and, as a consequence, workers opted to transfer their new savings to them. By the end of 2002, a large majority of total pension assets were managed by non-state funds, and the dominance of the state pension fund became a thing of the past. However, the structure of the private funds has, in turn, also elicited concerns. Many pension funds are owned by banks, which are themselves part of financial-industrial groups. The concern has been that some of the dramatic increase in purchases of corporate bonds by private pension funds, particularly during 2002, may have been purchases from related parties.[27]

Enhanced enforcement of regulatory supervision, eventually centralized under the authority of the National Bank, has addressed these concerns.

As the private pension system has adapted and changed, it has also been subjected to substantial exogenous shocks. In the first months of the first year of operation of the system, the world oil market collapsed, and Russia defaulted and devalued. The combination of the two events (and of a draught in the summer of 1998) led to a drop in real GDP in 1998, and a loss of confidence in Kazakhstan's public debt. The crisis proved, however, to be relatively short lived. The Government injected fiscal stimulus at the end of 1998, and floated the Tenge in April, 1999. Most importantly, oil prices bounced back, and Kazakhstan enjoyed several years of high real growth. Interest rates on bank deposits and government bonds declined substantially.

By the end of the fifth year of operation (2002), the assets of all pension funds combined were 5.5% of GDP, and 27% of them were invested in domestic corporate securities – 20% in bonds and 7% in stocks.

In the context just described, in which a potentially fragile system has been buffeted by specific, external shocks, the question of the freedom to invest abroad has taken on particular significance. Throughout their first five years, Kazakhstan's private pension funds have been subjected to a 5% ceiling on foreign investments. When domestic investments are as limited and risky as they are in this country, the argument for expanding the risk-reward frontier, by adding to the range of options available, is strong. One hears it voiced in two different ways.

[26] The sweetener was that the trade was made at the exchange rate prevailing just before the 40% devaluation of the Tenge in April , 1999. The Tenge subsequently recovered over half of that nominal devaluation.

[27] "Many pension funds, together with their parent banks, are part of larger financial and financial-industrial groups. Especially when related companies are in difficulty, they may be tempted to seek financing from a related pension fund, for example through a bonds issue at conditions that would not be accepted by non-related investors." IMF (2002), p. 44.

The first is the version advocated by the managers of Kazakhstan's private funds. As default risk and inflation have receded, the resulting decline of nominal interest rates of government bonds has deprived them of a relatively safe source of high yields, safe to the degree that they could count on an unwritten government guarantee. Frustrated in their search for alternative high-yield investments, by Kazakhstan's degree of specialization in a petroleum extraction industry, which is not open to private domestic investment, they have increasingly advocated the right to invest abroad. Their notion of foreign investment consists of high yielding investments in Russian manufacturing industry across the border.

There is also another version of the argument, which should be at least as convincing for objective analysts of the national interest. This is that some exposure to government bonds, and corporate bonds with the highest ratings, in G5 countries can
Offer workers in Kazakhstan a kind of safety and accountability, which is difficult to find within the country.

In the broadest sense, the two versions are different aspects of the same argument, expressed in Section 3.1. Kazakhstan is an interesting case in which the counter-argument – the precedence of a balance of payments constraint – is likely to be attenuated by the presence of endogenous, compensating capital inflows. Commentators have noted that, after the difficulties of the first two years, the presence of the private pension fund system has been cited by rating agencies as a contributing, positive factor, in their upgrading of Kazakhstan credit. These positive evaluations were addressed to the pension system in its captive stage. If strengthening the assets of the system with safe, foreign investments further increases the rating, the overseas investments will, in and of themselves, have contributed to further loosening the balance of payments constraint.

6. Conclusion

This paper has addressed a growing debate about the regulation of mandatory, private pension fund systems in developing countries: Should the portfolios of these funds be limited to securities issued in the home country? Or should their managers be free to make prudent investments anywhere in the world? Initial sections of the paper address the question from the point of view of first principles. The last section analyzes the significance of foreign investment restrictions in the development of four specific mandatory, private pension fund systems – those of Chile, Argentina, Poland and Kazakhstan.

Traditional portfolio analysis gives a clear answer to the central question from the point of view of the beneficiaries of the funds: In today's heterogeneous world, lifting geographic restraints expands the risk-reward frontier, and unequivocally enhances their welfare. In a developing country with immature capital markets, the best foreign investments may, furthermore, be of such superior quality that they dominate domestic investments in all dimensions.

However, when the balance of payments is constrained – or when international capital is only available at a high and rising cost – there is also a strong argument in favor of limiting capital outflows. The paper models the optimal response to these conflicting imperatives under

highly simplified assumptions. On the one hand, the analysis suggests that, when there are no restrictions, the proportion of their portfolios which optimizing managers should invest abroad is approximately (n-1)/n , where n is the number of countries in which it is prudent to invest. An elevated share of foreign investment is optimal, even it does not bring an expected higher return. On the other hand, if the country is subject to a continuous and instantaneous balance of payments constraint, the interest of the society as a whole is that foreign investments be very limited. In one of the simple cases examined, the optimum for society is that there be no foreign investment, unless its return is greater than the country's cost of capital.

An extension of the simple model shows how a continuous balance of payments constraint can be relaxed if autonomous capital outflows (such as pension fund investments abroad) generate compensating capital inflows (for instance, by raising international confidence). The implication is that, in many situations, the optimum for society is neither the freedom to invest 100% of portfolios abroad, nor a complete restriction against any investment abroad. As a pension fund system matures, and passes a certain threshold of credibility, increasing the share of investments abroad may further raise the country's credit rating. It may be optimal, as that process develops, to allow increasing shares of foreign investment. The paper discusses the implementation of partial foreign investment freedom, and shows that it is not incompatible with the maintenance of capital controls.

The paper also discusses an alternative view of the balance of payments, which emphasizes its volatility. In this view, capital controls may be called for, not to limit long term foreign exposures, but to act as circuit breakers to slow down the speed of capital flows when international sentiment changes. Such capital controls are, again, not incompatible with large foreign holdings on the part of pension funds, because they are long-term investors.

Chile, Argentina, Poland and Kazakhstan provide concrete examples of some of the issues discussed.

1)Twenty two years after its launch, the Chilean case demonstrates that, under the right circumstances, a mandatory, private pension fund system can develop successfully with a very low ceiling on foreign investments. In Chile, infant industry protection of national capital markets provided a major stimulus to their development. After only four years of operation, the Polish system also appears to be stimulating Polish capital market development.

But this process may be reaching a plateau. Stock market capitalization as a percent of GDP appears to have peaked in Chile. As of the end of 2002, Poland's domestic bond market remained insignificantly small relative to GDP. What may be happening in both countries is that domestic capital markets may be in the process of being overtaken by the acceleration of integration into international capital markets.

2) Poland is a powerful example of the transforming character of capital mobility. When it and its fellow new members enter the EU, and a fortiori if they enter the EMU, their balance of payments constraints will effectively have been abolished. Poland's enterprises will enjoy access to the capital markets of existing EU members, that will be almost as open as that of their own enterprises. Once that happens, the argument for infant industry protection of the national

3)Argentina is an interesting case of a country which went from having radically open capital markets, before the crisis, to radically closed ones, during and after the crisis.[28] During the first phase, after the adoption of the currency board, capital mobility was, in principle, unlimited, and the restriction which existed on the foreign investments of the AFJPs had no logical justification. As the crisis unfolded, capital controls and restrictions on foreign investments became justified. However, the evidence we present of excessive intervention in portfolio allocations during the crisis, underlines the potential for misuse of capital controls, and suggests that they should be used with care, and preferably only for transitory periods.

4) Kazakhstan illustrates a different kind of argument for lifting foreign investment restrictions than the one suggested for Chile and Poland. In the latter two cases, the supply of domestic securities of quality is satisfactory and growing, but international organizations and markets in the business of supplying funds, appear to bidding them away from domestic pension funds. The pension funds, therefore, need to be able to look further afield for their investments. In Kazakhstan, it is because reliable domestic securities are very limited in supply, that additional investment opportunities abroad are needed.

Perhaps the most important lesson of recent developments comes from the European Union. When capital becomes completely mobile, as it must within the Union, there is no longer any rationale for requiring pension funds in member countries to limit their investments to home country securities.

[28] Perhaps the most important lesson of the Argentine experience is that, even under circumstances which were far from perfect, the mandatory, private pension system survived.

TABLE 1

THE INCIDENCE AND CHARACTER OF MANDATORY INDIVIDUAL RETIREMENT ACCOUNTS IN LATIN AMERICA

Country	Year of Introduction	M2/GDP (Year-End data)	Market Capitalization/ GDP[29]	GDP/ Capita (PPP)[30]	Population (millions)	Gross Contribution Rate (% of Wages)	Fee to Manager (% of Contri-bution)[31]	Fund Assets/ GDP	Regulatory Cap on Foreign Investments (% of Portfolio)
South America									
Argentina	1994	30.4	65.7	11,320	37.5	5.00	45.40[32]	7.4	17.0
Bolivia	1997	46.0	19.5*	2,300	8.5	12.21	18.10	11.0	50.0
Brazil	--	28.1	37.7	7,360	172.4	--	--	--	--
Chile	1981	45.5	84.9	9,190	15.4	12.44	19.61[33]	55.0	16.0
Colombia	1994	25.5	12.8	7,040	43.0	13.50	25.93[4]	6.0	10.0
Ecuador	--	24.9	5.8	3,280	12.9	--	--	--	--
Paraguay	--	33.3	(1999)5.5*	5,210	5.6	--	--	--	--
Peru	1993	31.9	19.9	4,570	26.3	11.73	31.80	6.6	10.0
Uruguay	1996	54.8	0.8*	8,400	3.4	15.00	18.26	6.1	0.0
Venezuela	--	17.1	6.2	5,670	24.6	--	--	--	--
Central America									
Belize	--	59.3	--	5,690	0.3	--	--	--	--
Costa Rica	2001	35.8	(1999)14.6*	9,460	3.9	(net) 4.50	n.a.	0.1	25.0
El Salvador	1998	(2000)46.0	11.1*	5,260	6.4	12.48	23.87	5.5	0.0
Guatemala	--	28.5	1.1*	4,400	11.7	--	--	--	--
Honduras	--	47.7	(1998)8.7*	2,830	6.6	--	--	--	--
Mexico	1997	21.0	11.2	8,430	99.4	15.26	29.68[34]	4.3	0.0
Nicaragua	Pending	(1998)60.3	--	(1998)2,450	5.2	10.50	n.a	n.a	30.0
Panama	--	88.6	25.6*	5,750	2.9	--	--	--	--

All data is for 2001, unless otherwise noted.

[29] Annual averages of month-end market capitalization data divided by year-end GDP data. Data indicated with an (*) indicate year-end market capitalization figures divided by year-end GDP figures.

[30] GDP/ capita converted into US$ using a purchasing power parity rate calculated for base year 1996.

[31] Fee to manager includes premium for disability and survivor's insurance.

[32] Some funds in Argentina also charge a fixed fee. The split between administrative fee, insurance and other fees is difficult to separate in Argentina and Colombia.

[33] Most Chilean funds also charge a small flat monthly fee. Anecdotal evidence suggests that some funds rebate this fee when workers switch funds, decreasing the net fee.

[34] In Mexico the government contributes 5.5% of the minimum wage, which is estimated to be 2.2% of the average wage, to each account. This is included in the figure above.

The Caribbean									
Cuba	--	--	--	--	11.2	--	--	--	--
Dominican Republic	Pending	33.4	(1999) 0.8*	7,020	8.5	5.00	30.00	n.a	n.a.
Jamaica	--	43.2	51.4	3,720	2.9	--	--	--	--
Trinidad & Tobago	--	44.5	54.2	9,100	1.3	--	--	--	--

SOURCES

Country	Year of Introduction	M2 to GDP/ GDP per capita/ Population	Market Cap/ GDP	Gross Contribution Rate/ Fee to Manager/ Fund Assets to GDP	Regulatory Cap on Foreign Investments
Argentina	Devesa-Carpio and Vidal-Melia (2002)	WDI	S&P *Emerg. Stock Mrkt. Review*	Mesa-Lago (2002)	Devesa-Carpio and Vidal-Melia (2002)
Bolivia	Devesa-Carpio and Vidal-Melia (2002)	WDI	WDI	Mesa-Lago (2002)	von Gersdoff (1997)
Brazil	--	WDI	S&P *Emerg. Stock Mrkt. Review*	--	--
Chile	Devesa-Carpio and Vidal-Melia (2002)	WDI	S&P *Emerg. Stock Mrkt. Review*	Mesa-Lago (2002)	Devesa-Carpio and Vidal-Melia (2002)
Colombia	Devesa-Carpio and Vidal-Melia (2002)	WDI	S&P *Emerg. Stock Mrkt. Review*	Mesa-Lago (2002)	Devesa-Carpio and Vidal-Melia (2002)
Ecuador	--	WDI	S&P *Emerg. Stock Mrkt. Review*	--	--
Paraguay	--	WDI	WDI	--	--
Peru	Devesa-Carpio and Vidal-Melia (2002)	WDI	S&P *Emerg. Stock Mrkt. Review*	Mesa-Lago (2002)	Devesa-Carpio and Vidal-Melia (2002)
Uruguay	Devesa-Carpio and Vidal-Melia (2002)	WDI	WDI	Mesa-Lago (2002)	OECD Pension Compendium (2002)
Venezuela	--	WDI	S&P *Emerg. Stock Mrkt. Review*	--	--
Belize	--	WDI	S&P *Emerg. Stock Mrkt. Review*	--	--
Costa Rica	IMF Country Report (2003)	WDI	WDI	Mesa-Lago (2002)	Costa Rica Legislation, WB Website (2000)
El Salvador	Devesa-Carpio and Vidal-Melia (2002)	WDI	WDI	Mesa-Lago (2002)	OECD Pension Compendium (2002)
Guatemala	--	WDI	WDI	--	--
Honduras	--	WDI	WDI	--	--
Mexico	Devesa-Carpio and Vidal-Melia (2002)	WDI	S&P *Emerg. Stock Mrkt. Review*	Mesa-Lago (2002)	OECD Pension Compendium (2002)
Nicaragua	--	WDI	S&P *Emerg. Stock Mrkt. Review*	Mueller (2001), Mesa-Lago (2002)	Nicaragua Legislation, WB Website (2000)
Panama	--	WDI	WDI	--	--
Cuba	--	WDI	S&P *Emerg. Stock Mrkt. Review*	--	--
Dominican Republic	--	WDI	WDI	Mesa-Lago (2002)	--
Jamaica	--	WDI	S&P *Emerg. Stock Mrkt. Review*	--	--
Trinidad & Tobago	--	WDI	S&P *Emerg. Stock Mrkt. Review*	--	--

TABLE 2

THE INCIDENCE AND CHARACTER OF MANDATORY INDIVIDUAL RETIREMENT ACCOUNTS IN EASTERN EUROPE & THE NIS[35]

Country	Year of Introduction	M2/GDP (Yr End)	Market Capitalization/ GDP (Yr Avg)[36]	GDP/ Capita (PPP)[37]	Population (millions)	Gross Contribution Rate (% of Wages)	Fee to Manager (% of Contri-bution)	Fund Assets/ GDP	Regulatory Cap on Foreign Investments (% of Portfolio)
Eastern Europe									
Bulgaria	2002	36.5	4.2	6,890	8.0	2.0-5.0[38]	2.5+[39]	0.2	5.0
Croatia	2002	52.8	14.4	9,170	4.4	5.0	15.0[40]	(2002)1.2	15.0
Czech Rep.	--	70.7	16.1	14,720	10.2	--	--	--	--
Hungary	1998	43.5	18.7	12,340	10.2	8.0	7.5-11.0[41]	(1999)1.5	30.0[42]
Macedonia	2001	22.7	1.3*	6,110	2.0	7.0	n.a.	(2003)0.7	n.a.
Poland	1999	43.9	14.5	9,450	38.6	7.3	9.02[43]	2.6	5.0
Romania	--	19.7	4.2	5,830	22.4	--	--	--	--
Serbia & Montenegro	--	--	--	--	--	--	--	--	--
Slovakia	--	64.4	3.1	11,960	5.4	--	--	--	--
Slovenia	--	50.6	13.5	17,130	2.0	--	--	--	--
CIS Countries									
Armenia	--	13.2	(1999)1.4*	2,650	3.8	--	--	--	--
Azerbaijan	--	13.7	(1999)0.1*	3,090	8.1	--	--	--	--

[35] All data is for 2001, unless otherwise noted.

[36] Annual averages of month-end market capitalization data divided by year-end GDP data. Data indicated with an (*) indicate year-end market capitalization figures divided by year-end GDP figures.

[37] GDP/ capita converted into US$ using a purchasing power parity rate calculated for base year 1996.

[38] Permanent rate yet-to-be determined. Currently it ranges between 2-5% for different employee groups.

[39] Fees include an administrative fee of 2.5% of contributions and a management fee of 0.5% of assets.

[40] Croatian fund managers can charge the following fees: a maximum 0.8% front-end fee on contributions, a maximum 0.8% of net asset value per annum, a switching fee, and a success fee of 25% of real annual return. If managers maintain fees at capped levels, total fees would amount to more than 15% of annual contributions by 2015.

[41] Data on operating costs are not readily available. Rocha and Vittas (2001) estimate operating fees absorb between 7.5 and 11.0% of contributions.

[42] The limit on foreign investments was 0% in 2001 but was scheduled to increase to 30% in 2003.

[43] Weighted average of funds' fee rates for contributors' first year of participation.

Belarus	--	12.3	--	7,620	10.0	--	--	--	--
Georgia	--	10.5	--	2,560	5.3	--	--	--	--
Kazakhstan	1998	14.5	5.4*	6,500	14.9	10.0	1.00	4.3	5.0
Kyrgyz Rep.	--	10.6	(1996)0.3*	2,750	5.0	--	--	--	--
Moldova	--	22.1	23.7*	2,150	4.3	--	--	--	--
Russia	2002	20.4	17.8	7,100	144.8	6.0[44]	2.1 of assets[45]	(2003)0.8	20.0[46]
Tajikistan	--	6.9	--	1,170	6.2	--	--	--	--
Turkmenistan	--	(2000)15.8	--	4,320	5.4	--	--	--	--
Ukraine	--	19.0	4.8	4,350	49.1	--	--	--	--
Uzbekistan	--	--	(2000)0.4*	2,460	25.1	--	--	--	--
The Baltics									
Estonia	--	38.3	26.7	10,170	1.4	--		--	--
Latvia	2001	30.6	7.5	7,730	2.4	10.0[47]	2.5[48]	0.1	15.0
Lithuania	--	24.1	10.5	8,470	3.5	--		--	--

SOURCES

[44] Contribution to gradually increase to 6% by 2006.
[45] Fund managers in Russia can charge a maximum of 1% of assets per annum, while custodians can charge 0.1% of assets per annum, and the administrator can charge 1% of assets per annum.
[46] Investments in foreign instruments will be permitted starting in 2004 but will be limited to 20% of the fund assets.
[47] Contribution rate is scheduled to gradually increase to 10% in 2010.
[48] This reflects the administrative fee. There is no cap on management fees.

Country	Year of Introduction	M2 to GDP/ GDP per capita/ Population	Market Cap/ GDP	Gross Contribution Rate/ Fee to Manager/ Fund Assets to GDP	Regulatory Cap on Foreign Investments (% of Portfolio)
Eastern Europe					
Bulgaria	Mueller (2001)	WDI	S&P *Emerg.Stock Mrkt. Review*	Mueller (2001), USAID (2001)	Parniczky (2002)
Croatia	Hurd (2003)	WDI	S&P *Emerg.Stock Mrkt. Review*	Mueller (2001), Hurd (2003), Anusic, O'Keefe, and Madzarevic-Sujster (2003)	Hurd (2003)
Czech Rep.	--	WDI	S&P *Emerg.Stock Mrkt. Review*	--	--
Hungary	Lindeman, Rutkowski and Sluchynskyy (2000)	WDI	S&P *Emerg.Stock Mrkt. Review*	Mueller (2001), Rocha and Vittas (2001)	Rocha and Vittas (2001)
Macedonia	Mueller (2001)	WDI	WDI	Mueller (2001), Finance Ministry	--
Poland	Lindeman, Rutkowski and Sluchynskyy (2000)	WDI	S&P *Emerg.Stock Mrkt. Review*	Andrews (2001), Knuife	OECD Website
Romania	--	WDI	S&P *Emerg.Stock Mrkt. Review*	--	--
Serbia & Montenegro	--	WDI	--	--	--
Slovakia	--	WDI	S&P *Emerg.Stock Mrkt. Review*	--	--
Slovenia	--	WDI	S&P *Emerg.Stock Mrkt. Review*	--	--
CIS Countries					
Armenia	--	WDI	WDI	--	--
Azerbaijan	--	WDI	WDI	--	--
Belarus	--	WDI	--	--	--
Georgia	--	WDI	--	--	--
Kazakhstan	Lindeman, Rutkowski and Sluchynskyy (2000)	WDI	WDI	Mueller (2001), Andrews (2001), NBK	ADB PCR No.31091 (2000)
Kyrgyz Rep.	--	WDI	WDI	--	--
Moldova	--	WDI	WDI	--	--
Russia	Afanasiev (2003)	WDI	S&P *Emerg.Stock Mrkt. Review*	Afanasiev (2003), Eriksen (2002)	Afanasiev (2003)
Tajikistan	--	WDI	--	--	--
Turkmenistan	--	WDI	--	--	--
Ukraine	--	WDI	S&P *Emerg.Stock Mrkt. Review*	--	--
Uzbekistan	--	WDI	WDI	--	--
The Baltics					
Estonia	--	WDI	S&P *Emerg.Stock Mrkt. Review*	--	--
Latvia	Mueller (2001)	WDI	S&P *Emerg.Stock Mrkt. Review*	Mueller (2001), Vanovska (2002)	Vanovska (2002)
Lithuania	--	WDI	S&P *Emerg.Stock Mrkt. Review*	--	--

TABLE 3
CHILE

End-December figures unless otherwise noted	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Number of Contributors (millions)	--	1.06	1.23	1.36	1.56	1.77	2.02	2.17	2.27	2.64	2.49	2.70	2.79	2.88	2.96	3.12	3.30	3.15	3.26	3.20	3.45	3.42
% of Paid Employees	--	36.0	38.2	40.6	41.9	45.5	50.5	50.8	51.2	59.3	54.8	56.5	56.0	57.7	58.9	58.9	61.3	58.0	60.4	59.4	63.0	--
Fund Assets (billions of pesos)	12	45	100	163	283	434	646	892	1,335	2,251	3,778	4,744	6,844	8,998	10,349	11,694	13,554	14,713	18,288	20,586	23,219	25,522
% of GDP	0.9	3.6	6.4	8.6	10.7	12.7	14.2	15.1	18.2	24.4	31.2	31.2	38.1	42.1	40.0	41.4	42.9	43.8	49.2	50.9	55.0	55.8
Real Rate of Return on Funds*	12.8	28.5	21.3	3.6	13.4	12.3	5.4	6.5	6.9	15.6	29.7	3.0	16.2	18.2	-2.5	3.5	4.7	-1.1	16.3	4.4	6.7	3.0
Number of Funds	12	12	12	12	11	12	12	13	13	14	13	19	20	21	16	13	13	9	8	8	7	7
% of Fund Assets of 3 Largest Funds	71.3	67.6	65.7	65.4	65.8	66.6	66.6	66.3	65.3	62.6	59.0	56.6	54.4	52.7	51.8	53.8	55.6	62.0	70.4	70.2	70.6	70.6
Allocation of Fund Assets (% of total)																						
Domestic Assets	100	100	100	100	100	100	100	100	100	100	100	100	99.4	99.1	99.8	99.5	98.8	94.3	86.6	89.1	86.6	83.6
Bank Deposits	28.1	26.0	44.5	42.1	42.4	46.6	41.4	35.4	41.6	44.1	38.3	40.9	39.3	39.7	39.4	42.1	39.6	41.0	34.6	35.7	35.0	30.0
Govt. Debt	71.3	73.4	53.4	55.6	56.0	48.7	49.4	50.1	39.2	33.4	26.7	25.2	20.7	20.1	23.1	24.6	30.1	32.0	33.7	35.6	33.1	35.0
Corp. Bonds	0.6	0.6	2.2	1.8	1.1	0.8	2.6	6.4	9.1	11.1	11.1	9.6	7.3	6.3	5.2	4.7	3.3	3.8	3.8	4.0	6.2	7.1
Corp. Stocks	--	--	--	--	0.0	3.8	6.2	8.1	10.1	11.3	23.8	24.0	31.8	32.1	29.4	25.1	22.6	14.5	11.9	11.1	9.9	9.0
Other Corp.	--	--	--	--	--	--	--	--	--	--	0.1	0.3	0.7	1.9	5.1	6.1	6.1	5.8	5.2	4.9	4.8	4.5
Foreign Assets	--	--	--	--	--	--	--	--	--	--	--	--	0.6	0.9	0.2	0.5	1.2	5.7	13.4	10.9	13.4	16.4

* Equivalent for a fund held until retirement to a net return of gross return x (1.0- ratio of commissions to total contribution). 1981 figure is 6-month rate for July-December.

Gross Contribution
(Percent of Wages, 2001)
12.44

Fee to Manager**
(Percent of Contribution, 2001)
19.60

** Most funds also charge a small flat monthly fee, which is sometimes rebated when workers switch funds, decreasing the net fee.

Governance Indexes, 2000			
Country	**Regulatory Quality**	**Rule of Law**	**Control of Corruption**
United States	1.50	1.92	1.77
Chile	1.35	1.33	1.54
Belarus	-2.65	-0.99	-0.07

Macroeconomic Indicators																						
	1980	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
M2/GDP (%)	21.0	25.1	34.1	34.4	34.6	33.6	35.0	34.4	34.4	35.9	36.2	34.8	34.8	36.3	35.6	35.0	39.2	41.4	43.8	44.5	45.0	45.5
Market Capitalization/ GDP (%)*	--	--	--	--	--	--	16.2	24.6	25.2	30.5	37.8	70.1	79.8	77.2	110.7	112.5	102.6	104.2	80.3	83.1	86.3	84.9
GDP/ capita (PPP)**	2,600	2,870	2,670	2,520	2,870	3,240	3,520	3,930	4,410	4,680	4,730	5,140	5,820	6,180	6,630	7,390	7,880	8,300	8,360	8,320	8,940	9,190
Exchange Rate per US$ (annual avg.)	39.0	39.0	50.9	78.8	98.5	160.9	192.9	219.4	245.0	267.0	304.9	349.2	362.6	404.2	420.2	396.8	412.3	419.3	460.3	508.8	535.5	634.9

*Annual averages of month-end market capitalization data divided by year-end GDP data.
** GDP/ capita converted into US$ using a purchasing power parity rate calculated for base year 1996.

SOURCES

Number of Contributors (millions)	SAFP Website
Percent of Paid Employees	ILO Online LABORSTA Database
Fund Assets (billions of pesos)	SAFP Website
Percent of GDP	WDI, EIU
Real Rate of Return on Funds	SAFP Website
Number of Funds	SAFP Website
Percent of Fund Assets of 3 Largest Funds	SAFP Website
Allocation of Fund Assets (Percent of total)	SAFP Website
Gross Contribution	Mesa-Lago (2002)
Fee to Manager	Mesa-Lago (2002)
Governance Indicators	Kaufmann (2003)
Macroeconomic Indicators	WDI, *S&P Emerging Stock Market Review*

TABLE 4

REAL TOTAL RETURN FOR STANDARD & POOR'S INDEX 500 [49]

(Percent Change, December to December)

1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
-13.8	17.7	18.8	2.3	27.9	17.5	1.0	12.2	27.1	-9.4	27.5	4.6	7.3	-1.3	35.1	19.6	31.7	27.0	18.3	-12.5	-13.4	-24.5

Source: Global Finance Data

[49] Data reflects returns from both capital appreciation and reinvested dividends. The returns index has been deflated by the U.S. Department of Labor's CPI for all urban consumers.

TABLE 5
ARGENTINA

End-June figures unless otherwise noted	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Number of Contributors (millions)	2.03	2.59	2.99	3.27	3.37	3.35	3.33	2.86
Percent of Paid Employees	68.4	49.6	53.0	54.9	56.1	56.0	--	--
Fund Assets (billions of pesos)	1.4	3.8	7.3	10.1	13.9	18.7	22.2	35.1
Percent of GDP	0.5	1.4	2.4	3.2	4.8	6.4	7.7	10.5
Real Rate of Return on Funds*	--	22.9	22.6	1.1	5.8	12.3	5.2	12.2
Number of Funds	24	22	20	17	15	13	13	12
Percent of Fund Assets of 3 Largest Funds	44.9	44.9	47.3	51.0	52.1	51.2	58.7	60.4
Allocation of Fund Assets (percent of total)**								
Domestic Assets	99.3	99.9	99.6	99.8	99.6	95.5	98.2	91.1
Bank Deposits	34.0	22.0	27.3	21.3	17.6	18.5	12.6	3.6
Government Debt	57.5	51.8	44.8	51.4	53.7	56.0	69.5	77.7
Corporate Bonds	1.8	2.3	4.5	6.6	6.3	8.2	2.0	1.1
Corporate Stocks	6.0	18.7	21.5	18.4	20.5	12.3	10.2	6.5
Foreign Assets	0.7	0.2	0.4	0.3	0.4	4.5	1.8	8.9

*Equivalent for a fund held until retirement to a net return of gross return x (1.0- ratio of commissions to total contribution).
**End-December figures.

Gross Contribution**	**Fee to Manager****
(Percent of Wages, 2001)	(Percent of Contribution, 2001)
5.0	45.4

**These rates were introduced as a temporary measure in June 2001. Prior to this, the gross contribution was 10% of wages and the manager's fee was 23% of the total contribution. Some funds also charge a fixed fee. The split between manager's fee, insurance, and other fees is difficult to separate.

Governance Indexes, 2000			
Country	**Regulatory Quality**	**Rule of Law**	**Control of Corruption**
United States	1.50	1.92	1.77
Argentina	0.44	0.18	-0.36
Belarus	-2.65	-0.99	-0.07

Macroeconomic Indicators							
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
M2/GDP (%)	20.4	20.9	23.8	27.3	30.8	31.6	30.4
Market Capitalization/ GDP (%)*	13.0	15.1	18.6	17.1	19.7	49.4	65.7
GDP/ capita (PPP)**	10,440	11,010	11,730	11,990	11,700	11,880	11,320
Exchange Rate per US$ (annual average)	.9998	.9997	.9995	.9995	.9995	.9995	.9995

*Annual averages of month-end market capitalization data divided by year-end GDP data.
**GDP/ capita converted into US$ using a purchasing power parity rate calculated for base year 1996.

SOURCES

Number of Contributors (millions)	*Annuario* 8, SAFJP (2002)
Percent of Paid Employees	ILO Online LABORSTA Database
Fund Assets (billions of pesos)	*Annuario* 8, SAFJP (2002)
Percent of GDP	WDI
Real Rate of Return on Funds	*Annuario* 8, SAFJP (2002)
Number of Funds	*Annuario* 8, SAFJP (2002)
Percent of Fund Assets of 3 Largest Funds	*Annuario* 8, SAFJP (2002)
Allocation of Fund Assets (percent of total)	SAFJP *Boletin Estadistico*
Gross Contribution	Mesa-Lago (2002)
Fee to Manager	Mesa-Lago (2002)
Governance Indicators	Kaufmann (2003)
Macroeconomic Indicators	WDI, *S&P Emerging Stock Market Review*

TABLE 6
POLAND

End-December figures unless otherwise noted	**2000**	**2001**	**2002**
Number of Contributors (millions)			
Percent of Paid Employees			
Fund Assets (billions of zloty)	9.3	18.8	31.6
Percent of GDP	1.4	2.6	4.1
Real Rate of Return on Funds**	8.5*		
Number of Funds	21	17	17
Percent of Fund Assets of 3 Largest Funds	64.4	65.0	65.0
Allocation of Fund Assets (percent of total)			
Domestic Assets	100.0	99.6	98.6
Bank Deposits	2.0	2.8	2.6
Government Bills	1.7	2.6	1.9
Government Bonds	61.2	65.9	66.9
Corporate Equities	33.9	28.3	27.5
Foreign Assets	0.0	0.4	1.4

**Equivalent for a fund held until retirement to a net return of gross return x (1.0- ratio of commissions to total contribution). *Annualized rate for September 2000 to September 2002.

Gross Contribution
(Percent of Wages, 2000)
7.3

Fee to Manager
(Percent of Contribution, 2002)

Weighted Average for 1st Year of Contribution
9.02
Weighted Average for 21st Year of Contribution
5.06

Governance Indexes, 2000			
Country	**Regulatory Quality**	**Rule of Law**	**Control of Corruption**
United States	1.50	1.92	1.77
Poland	0.60	0.64	0.47
Belarus	-2.65	-0.99	-0.07

Macroeconomic Indicators				
	1998	**1999**	**2000**	**2001**
M2/GDP (%)	35.9	39.4	40.7	43.9
Market Capitalization/ GDP (%)*	9.8	15.7	19.4	14.5
GDP/ capita (PPP)**	8,110	8,620	9,320	9,450
Exchange Rate per US$ (annual average)	3.48	3.97	4.35	4.09

*Annual averages of month-end market capitalization data divided by year-end GDP data.
** GDP/ capita converted into US$ using a purchasing power parity rate calculated for base year 1996.

SOURCES

Number of Contributors (millions)	Knuife Website
Percent of Paid Employees	ILO Online LABORSTA Database
Fund Assets (billions of zloty)	Knuife Website
Percent of GDP	WDI
Real Rate of Return on Funds	UNFE *Quarterly Bulletin*
Number of Funds	UNFE *Quarterly Bulletin*
Percent of Fund Assets of 3 Largest Funds	UNFE *Quarterly Bulletin*
Allocation of Fund Assets (percent of total)	UNFE *Quarterly Bulletin*
Gross Contribution	Mesa-Lago (2002)
Fee to Manager	Mesa-Lago (2002)
Governance Indicators	Kaufmann (2003)
Macroeconomic Indicators	WDI, *S&P Emerging Stock Market Review*

TABLE 7
KAZAKHSTAN

End-December figures unless otherwise noted	**1998**	**1999**	**2000**	**2001**	**2002**
Number of Contributors (millions)	2.92	2.51	2.65	2.79	--
Percent of Employed Population	47.6	41.2	42.7	41.7	--
Percent of Paid Employees	95.0	91.6	--	--	--
Fund Assets (billions of tenge)*	--	23.5	64.5	112.7	182.4
Of which, Private Accumulation Funds	--	5.6	30.6	68.8	123.5
Percent of GDP	--	1.4	3.2	4.3	5.54
Real Rate of Return on Funds**	13	45	--	--	--
Number of Funds	11	11	14	14	--
Largest Fund's Share of Total Assets of Private Accumulation Funds***	--	50	32	--	--
Allocation of Fund Assets (percent of total)^					
Domestic Assets	100.0	98.8	--	96.3	85.7
Bank Deposits	0.2	1.8	--	8.7	8.8
Government Bills	78.0	13.5	--	--	12.8
Government Bonds^^	21.4	81.3	--	60.9	36.6
Corporate Equities	0.4	2.1	--	26.9	27.5
Foreign Assets (Including the securities of international financial organizations)	--	1.2	--	3.7	14.3

* January figures. ^ 2001 data is for January 2002.

**Net return to retirement = gross x (1.0- commissions/ contribution). ^^2001 figure includes bills.

*** Narodny Fund. 2000 figure is for October.

Gross Contribution
(Percent of Wages, 2003)
10.0

Fee to Manager
(Percent of Contribution, 2001)
$\leq$ 1.00
(And no more than 10% of investment income)

Governance Indexes, 2000			
Country	**Regulatory Quality**	**Rule of Law**	**Control of Corruption**
United States	1.50	1.92	1.77
Kazakhstan	-0.47	-0.76	-0.87
Belarus	-2.65	-0.99	-0.07

Macroeconomic Indicators				
	1998	**1999**	**2000**	**2001**
M2/GDP (%)	9.3	10.5	12.9	14.5
Market Capitalization/ GDP (%)*	8.3	13.4	7.3	5.4
GDP/ capita (PPP)**	4,400	4,780	5,720	6,500
Exchange Rate per US$ (annual average)	78.3	119.5	142.1	146.7

*Year-end market capitalization data divided by year-end GDP data.

** GDP/ capita converted into US$ using a purchasing power parity rate calculated for base year 1996.

SOURCES

Number of Contributors (millions)	Seitenova (2003)
Percent of Employed Population	Seitenova (2003)
Percent of Paid Employees	ILO Online LABORSTA Database
Fund Assets (billions of tenge)	NBK *Annual Report*
Of which, Private Accumulation Funds	NBK *Annual Report*
Percent of GDP	WDI
Real Rate of Return on Funds	Andews (2001)
Number of Funds	Andews (2001)
Largest Fund's Share of Total Assets of Private Accumulation Funds	Andews (2001)
Allocation of Fund Assets (percent of total)	Seitenova (2003), NBK *Annual Report*
Gross Contribution	IMF *Statistical Appendix* (2003)
Fee to Manager	Andews (2001)
Governance Indicators	Kaufmann (2003)
Macroeconomic Indicators	WDI, *S&P Emerging Stock Market Review*

APPENDIX 1

This appendix derives expressions for the individually optimal or socially optimal share of foreign investment in a privately managed fund, under different simplifying assumptions.

Let *R* be the revenue that a representative individual derives from a fund *F*, of which α is invested abroad, and (1-α) in the home country. Then,

(A-1) $$R = (\alpha r_F + (1-\alpha) r_D) F,$$

where r_F and r_D are the total annual returns on foreign and domestic investment. Assume that a fraction ê of the foreign investment generates a compensating capital inflow, and, therefore, that the net capital outflow is (1- ê) αF. If the balance of payments constraint

αF at the going international rate (reflecting the country's credit rating), r_S. The proceeds of the international loan are invested in the home country at r_D.

The net social benefit associated with the fund's foreign investment is

$$S = (\alpha r_F + (1-\alpha) r_D) F - (1-\kappa)\alpha (r_S - r_D) F,$$

(A-2) $$= (1-\kappa\alpha) r_D F + \alpha (r_F - (1-\kappa) r_S) F$$

Let the means, variances, and covariances of the returns and borrowing cost be $\bar{r}_F$, $\bar{r}_D$, $\bar{r}_S$, σ^2_F, σ^2_D, σ^2_S, and σ_{FD}, σ_{FS}, σ_{DS}.

Thus, the variances of *R* is

(A-3) $$\sigma^2_R = \left[\alpha^2 \sigma^2_F + (1-\alpha)^2 \sigma^2_D + 2\alpha(1-\alpha)\sigma_{FD}\right] F^2$$

and variance of S is

(A-4)
$$\sigma^2_S = \left[\alpha^2 \sigma^2_F + \left(\alpha^2 (1-\kappa)^2 \sigma^2_S\right) + (1-\kappa\alpha)^2 \sigma^2_D - 2\alpha(1-\kappa)\sigma_{FS} + 2\alpha(1-\kappa\alpha)\sigma_{FD} - 2\alpha(1-\kappa)(1-\kappa\alpha)\sigma_{SD}\right] F^2$$

In order to derive the individually and socially optimal values of α, one must make reasonable assumptions about the nature of the representative individual's utility function and her attitude towards risk. The assumption adopted here is that the utility function demonstrates constant absolute risk aversion (CARA). This function is empirically well

grounded and computationally tractable. We use it to analyze both individual and social well being. The objective of the individual is that α be chosen so as to maximize the expected utility of returns from the portfolio.

$$V^i = E\big(U(R)\big)$$

V^i is the maximand; E is the expectation operator, and U the utility function.

(A-5) $$V^i = E\big(-e^{-gR}\big)$$

If R is normally distributed, (A-5) can be written

$$V^i = -e^{-g\bar{R}+\frac{g^2}{2}s_R^2}$$

The first order condition for V^i to be a maximum is

(A-6) $$\frac{\partial \bar{R}}{\partial \boldsymbol{a}} = \frac{g}{2}\frac{\partial \boldsymbol{s}_R^2}{\partial \boldsymbol{a}}$$

(A-1), (A-3) and (A-6) imply that

(A-7) $$\boldsymbol{a} = \frac{(\bar{r}_F - \bar{r}_D)\bar{r}_D}{\boldsymbol{r}\big(\boldsymbol{s}_F^2 + \boldsymbol{s}_D^2 - 2\boldsymbol{s}_{DF}\big)} + \frac{\boldsymbol{s}_D^2 - \boldsymbol{s}_{DF}}{\boldsymbol{s}_F^2 + \boldsymbol{s}_D^2 - 2\boldsymbol{s}_{DF}},$$

where $\boldsymbol{r} = \boldsymbol{g}\bar{r}_D F$.

Under the assumptions made in the text, (A-7) simplifies to the expressions presented there.

Similarly, the objective function of benevolent national authorities, attempting to maximize the utility of the representative individual subject to the macroeconomic balance of payments constraints, can be written

$$V^S = E\big(U(S)\big)$$

If U is CARA and S is normally distributed, the first order condition for V^S to be a maximum is

(A-8) $$\frac{\partial \bar{S}}{\partial \boldsymbol{a}} = \frac{g}{2}\frac{\partial \boldsymbol{s}_S^2}{\partial \boldsymbol{a}}$$

In the most general case, (A-2), (A-4) and (A-8) imply

$$\alpha = \frac{\left(\bar{r}_F - (1-k)\bar{r}_S - k\bar{r}_D\right)\bar{r}_D}{r\left(\sigma_F^2 + (1-k)^2\sigma_S^2 + k^2\sigma_D^2 - 2(1-k)\sigma_{FS} - 2k\sigma_{FD} + 2k(1-k)\sigma_{SD}\right)} + \frac{k\sigma_D^2 - \sigma_{FD} + (1-k)\sigma_{SD}}{\left(\sigma_F^2 + (1-k)^2\sigma_S^2 + k^2\sigma_D^2 - 2(1-k)\sigma_{FS} - 2k\sigma_{FD} + 2k(1-k)\sigma_{SD}\right)} \quad \text{(A-9)}$$

with the appropriate assumptions, the expression simplifies. In particular, if ê =1, it

APPENDIX 2
PORTFOLIO ALLOCATIONS OF ARGENTINE AJFPS DURING 2001-2002 CRISIS

COMPOSITION OF PENSION FUNDS' INVESTMENTS AND REGULATORY LIMITS BY INSTRUMENTS
DECEMBER 2000
(% of Total Investments)

	TGN		TEE										
	TGN	TGNF	TEE	TEEF	TGP	TGM	**Total**	ACC	ACP	**Total**	TEX	TDE	**Total**
Arauca Bit	20.2	29.3	0.7	0.0	4.6	0.7	**55.5**	10.9	1.1	**12.0**		4.5	**4.5**
Consolidar	20.1	29.5	0.7	0.0	4.5	0.9	**55.7**	9.8	1.1	**10.9**		4.2	**4.2**
Fesi	19.1	29.3	0.2		3.0		**51.6**	14.6	0.7	**15.3**		4.8	**4.8**
Futura	18.6	30.3	0.5		4.0	0.5	**53.9**	11.1	1.0	**12.1**		5.1	**5.1**
Generar	19.8	29.8	0.4	0.0	3.8	1.1	**54.9**	10.9	0.9	**11.8**		5.0	**5.0**
Isol	19.5	29.8	0.2		4.5	0.7	**54.7**	11.5	1.1	**12.6**		5.3	**5.3**
Maxima	19.4	30.1	1.0	0.0	4.0	0.9	**55.4**	11.3	1.3	**12.6**		4.7	**4.7**
Nacion	19.8	25.5	0.5				**45.8**	11.4	1.0	**12.4**		4.9	**4.9**
Origenes	19.7	30.2	0.6		4.7	0.3	**55.5**	12.1	1.5	**13.6**		3.9	**3.9**
Prev	20.6	29.0	0.7	0.0	3.5	0.2	**54.0**	10.7	0.9	**11.6**		4.9	**4.9**
Prorenta	20.7	28.8	0.1	0.1	4.8	0.4	**54.9**	12.2	1.0	**13.2**		3.8	**3.8**
Siembra	19.8	29.8	0.4		4.9	0.9	**55.8**	11.3	1.1	**12.4**		4.4	**4.4**
Unidos	20.9	28.3	0.1		0.5		**49.8**	12.1	0.9	**13.0**		7.0	**7.0**
Total	19.9	29.4	0.6	0.0	4.0	0.6	**54.5**	11.1	1.2	**12.3**		4.5	**4.5**
Std. Deviation							**2.9**			**1.1**			**0.8**
Regulatory Limit	50		15						14	35	10	7	

Source: *Memoria Trimestral*, SAFJP

COMPOSITION OF PENSION FUNDS' INVESTMENTS AND REGULATORY LIMITS BY INSTRUMENTS
JUNE 2001
(% of Total Investments)

	TGN		TEE									TDE			
	TGN	TGNF	TEE	TEEF	TGP	TGM	**Total**	ACC	ACP	**Total**	TEX	ASE	TSE	FIA	**Total**
Arauca Bit	18.3	30.5	0.5		3.8	0.8	**53.9**	10.3	1.1	**11.4**		3.2	0.0	0.3	**3.5**
Consolidar	18.1	30.4	0.6		4.0	1.1	**54.2**	9.4	1.1	**10.5**		2.9	0.1	0.2	**3.2**
Fesi	19.0	30.2	0.2		2.8		**52.2**	13.4	0.7	**14.1**		2.9		0.5	**3.4**
Futura	18.1	30.4	0.4		4.3	0.7	**53.9**	10.3	1.1	**11.4**		2.9	0.5	0.5	**3.9**
Generar	18.1	31.0	0.1		3.6	1.2	**54.0**	10.4	0.9	**11.3**		3.1	0.2	0.4	**3.7**
Isol	18.3	30.5	0.4		3.9	0.6	**53.7**	10.5	1.1	**11.6**		3.1	0.4	0.4	**3.9**
Maxima	18.2	30.5	0.5		2.8	1.1	**53.1**	9.8	1.3	**11.1**		3.1	0.1	0.3	**3.5**
Meta	0.4	29.1	0.3		0.7	0.4	**30.9**	9.7	0.2	**9.9**		2.0		1.3	**3.3**
Nacion	20.7	24.1	0.5				**45.3**	10.8	1.0	**11.7**		3.2	0.2	0.5	**3.9**
Origenes	18.9	30.7	0.6		3.4	0.3	**53.9**	11.2	1.3	**12.5**		2.8	0.2	0.1	**3.1**
Prev															
Prorenta	19.8	29.7	0.1		4.1	0.7	**54.4**	11.2	1.0	**12.2**		1.9	0.2	1.1	**3.2**
Siembra	18.8	30.4	0.3		4.2	1.0	**54.7**	10.4	1.1	**11.5**		3.0	0.1	0.3	**3.4**
Unidos	19.8	29.6			0.9		**50.3**	12.1	0.7	**12.8**		5.6			**5.6**
Total	18.7	30.1	0.5		3.4	0.7	**53.4**	10.4	1.1	**11.5**		3.0	0.1	0.3	**3.4**
Std. Deviation							**6.6**			**1.1**					**0.6**
Regulatory Limit	50		15						14	35	10	7			

Source: *Memoria Trimestral*, SAFJP

COMPOSITION OF PENSION FUNDS' INVESTMENTS AND REGULATORY LIMITS BY INSTRUMENTS
OCTOBER 2001
(% of Total Investments)

	TGN		TEE									TDE			
	TGN	TGNF	TEE	TEEF	TGP	TGM	**Total**	ACC	ACP	**Total**	TEX	ASE	TSE	FIA	**Total**
Arauca Bit	13.9	32.6	0.2		3.0	0.7	**50.4**	6.6	0.8	**7.4**		1.5	0.1	0.2	**1.8**
Consolidar	14.1	33.4	0.1		3.0	0.8	**51.4**	6.4	0.7	**7.1**		1.5	0.1		**1.6**
Fesi	15.9	32.4	0.1		2.4		**50.8**	9.6	0.4	**10.0**		2.1		0.5	**2.6**
Futura	13.8	34.6	0.1		2.7	0.5	**51.7**	6.8	0.7	**7.5**		1.1	0.5	0.1	**1.7**
Generar															
Isol	14.6	33.1	0.1		2.8	0.8	**51.4**	7.1	0.7	**7.8**		1.3	0.4	0.1	**1.8**
Maxima	13.1	33.5	0.1		2.1	0.8	**49.6**	6.7	0.7	**7.4**		1.4	0.1	0.2	**1.7**
Meta	12.8	29.9	0.1		0.9	0.6	**44.3**	6.3	0.7	**7.0**		1.0		0.4	**1.4**
Nacion	14.6	30.7	0.3				**45.6**	7.0	0.6	**7.6**		1.7	0.2	0.4	**2.3**
Origenes	14.7	34.5	0.2		2.7	0.2	**52.3**	6.9	0.8	**7.7**		1.3	0.2	0.1	**1.6**
Prev															
Prorenta	15.2	32.8	0.1		3.0	0.6	**51.7**	7.2	0.6	**7.8**		1.0	0.2	0.7	**1.9**
Siembra	13.8	35.8	0.1		3.0	0.8	**53.5**	6.8	0.6	**7.4**		1.2	0.1	0.1	**1.4**
Unidos	13.5	31.3			1.6		**46.4**	7.6	0.4	**8.0**		5.1			**5.1**
Total	14.1	33.8	0.2		2.5	0.6	**50.2**	6.8	0.7	**7.5**		1.4	0.1	0.1	**1.6**
Std. Deviation							**2.9**			**0.8**					**1.0**
Regulatory Limit	50		15						14	35	10	7			

Source: *Memoria Trimestral*, SAFJP

COMPOSITION OF PENSION FUNDS' INVESTMENTS AND REGULATORY LIMITS BY INSTRUMENTS
DECEMBER 2001
(% of Total Investments)

	TGN					TEE									TDE			
	TGN	TGNF	TGG	FFG	PTG	TEE	TEEF	TGP	TGM	**Total**	ACC	ACP	**Total**	TEX	ASE	TSE	FIA	**Total**
Arauca Bit	4.7	0.0	0.1	0.1	55.3	0.1		2.5	0.5	**63.3**	9.2	1.1	**10.3**		1.5	0.1	0.0	**1.8**
Consolidar	9.4		0.3	0.1	57.7	0.1		2.5	0.6	**70.7**	9.0	0.9	**9.0**		1.6	0.1		**1.7**
Fesi	11.1			0.1	56.1	0.1		2.2		**69.6**	12.5	0.5	**13.0**		1.4		0.5	**1.9**
Futura	3.9	3.3	0.5	0.1	54.4	0.1		2.4	0.4	**65.1**	9.0	0.9	**9.9**		1.0	0.5	0.1	**1.6**
Generar																		
Isol	6.2	0.7	0.1	0.1	56.5	0.1		2.6	0.6	**66.9**	9.4	0.9	**10.3**		1.4	0.4	0.1	**1.9**
Maxima	6.8	1.0	0.5	0.1	57.1	0.1		1.9	0.6	**68.1**	9.2	0.9	**10.1**		1.6	0.1	0.1	**1.8**
Meta	14.7			0.0	39.0	0.1		0.6	0.4	**54.8**	8.9	0.8	**9.7**		0.9		0.4	**1.3**
Nacion	6.0	1.4		0.1	52.4	0.2				**60.1**	9.4	0.7	**10.1**		1.9	0.2	0.4	**2.5**
Origenes	4.6	0.2	1.0	0.1	59.7	0.2		2.3	0.2	**68.3**	9.5	0.9	**10.4**		1.5	0.2	0.1	**1.8**
Prev																		
Prorenta	10.1			0.1	57.5	0.1		2.6	0.5	**70.9**	9.9	0.7	**10.6**		1.1	0.2	0.7	**2.0**
Siembra	7.3	0.5	1.0	0.1	60.4	0.1		2.6	0.6	**72.6**	9.7	0.7	**10.4**		1.5	0.1	0.1	**1.7**
Unidos	6.4			0.1	49.9			1.4		**57.8**	11.4	0.5	**11.9**		6.0			**6.0**
Total	6.8	0.5	0.2	0.1	57.7	0.1		2.2	0.4	**68.0**	9.4	0.8	**10.2**		1.6	0.1	0.1	**1.8**
Std. Deviation										**5.6**			**1.0**					**1.2**
Regulatory Limit	100					30						20	**50**	10	10			

Source: *Memoria Trimestral*, SAFJP

COMPOSITION OF PENSION FUNDS' INVESTMENTS AND REGULATORY LIMITS BY INSTRUMENTS
JUNE 2002
(% of Total Investments)

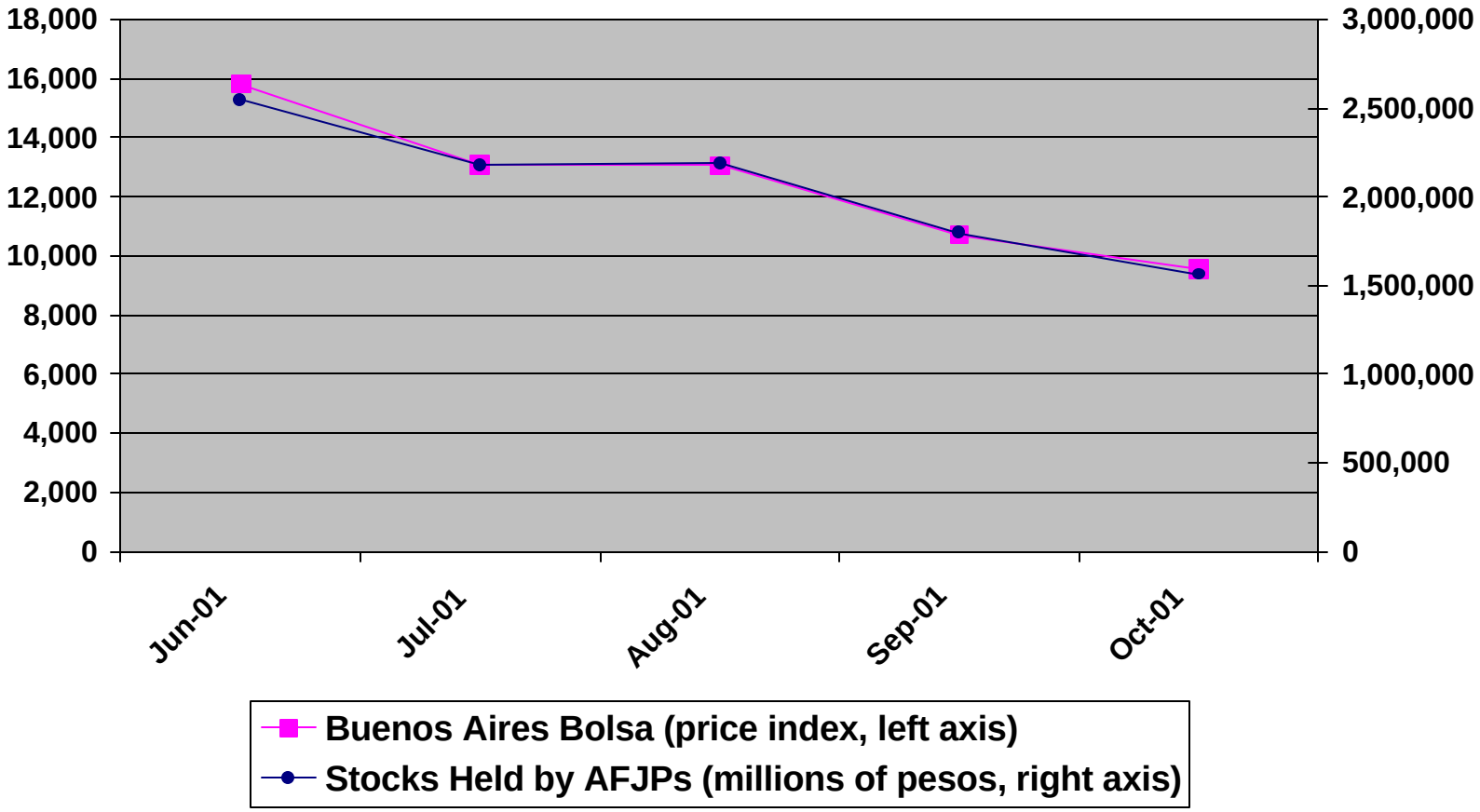
	TGN					TEE							TDE			
	TGN	TGNF	TGG	Otras	PTG	TEE	TGP	TGM	**Total**	ACC	ACP	**Total**	ASE	TSE	FIA	**Total**
Arauca Bit	15.6	0.1	0.2	0.0	60.0	0.1	1.4	0.3	**77.7**	8.1	0.4	**8.5**	3.8	0.2	1.0	**5.0**
Consolidar	13.6		0.5	0.0	61.2	0.1	1.5	0.3	**77.2**	7.5	0.4	**7.9**	3.7	1.1	0.9	**5.7**
Fesi	16.7			0.0	59.2	0.1	1.3		**77.3**	10.0	0.4	**10.4**	2.1		4.1	**6.2**
Futura	14.0	4.5	2.8	0.0	58.1	0.1	1.4	0.2	**81.1**	8.1	0.3	**8.4**	2.7		1.2	**3.9**
Generar																
Isol	13.4	0.9	0.6	0.0	58.7	0.1	1.5	0.3	**75.5**	7.8	0.3	**8.1**	3.1	0.7	1.3	**5.1**
Maxima	11.3	2.4	1.0	0.0	61.2	0.1	1.1	0.4	**77.5**	8.0	0.2	**8.2**	4.6	0.5	0.9	**6.0**
Meta	17.9		0.2	0.0	59.9	0.0	0.1	0.1	**78.2**	6.9	0.2	**7.1**	3.8		1.4	**5.2**
Nacion	8.3	1.7		0.0	55.6	0.2			**65.8**	8.1	0.3	**8.4**	3.9	0.6	1.9	**6.4**
Origenes	13.2	0.3	0.2	0.0	65.3	0.2	1.4	0.1	**80.7**	8.2	0.3	**8.5**	4.5		0.7	**5.2**
Prev																
Prorenta	15.8			0.0	58.5	0.1	1.7	0.2	**76.3**	8.6	0.2	**8.8**	2.2	0.1	5.1	**7.4**
Siembra	12.7	1.3	0.3	0.0	64.1	0.1	1.6	0.4	**80.5**	8.1	0.2	**8.3**	3.6	0.7	1.2	**5.5**
Unidos	13.1			0.0	54.4		0.8		**68.3**	9.7	0.2	**9.9**	10.2			**10.2**
Total	13.0	0.9	0.4	0.0	61.9	0.1	1.3	0.2	**77.8**	8.0	0.3	**8.3**	4.0	0.5	1.1	**5.6**
Std. Deviation									**4.7**			**0.9**				**1.6**
Regulatory Limit	100					30					20	**50**	10			

Source: *Memoria Trimestral*, SAFJP

GLOSSARY

TGN	Títulos Públicos Emitidos por la Nacion
TGN	Títulos Públicos no Garantizados Negociables
TGNF	Títulos Públicos a Mantener al Vencimiento
TGG	Títulos Públicos Garantizados Negociables
Otras	Fideicomisos Financieros
FFG	Fideicomisos Financieros (Cuadros por Junio 2002)
PTG	Préstamos al Gobierno Nacional Garantizados
TEE	
TEE	Títulos Emitidos por Entes Estatales Negociables
TEEF	Títulos Emitidos por Entes Estatales a Mantener al Vencimiento
TGP	Títulos Emitidos por Gobiernos Provinciales
TGM	Títulos Emitidos por Municipalidades
ACC	Acciones de Sociedades Anónimas
ACP	Acciones de Empresas Privatizadas
TEX	Títulos Emitidos por Estados Extranjeros
TDE	Títulos Valores Extranjeros
ASE	Acciones de Sociedades Extranjeras
TSE	Títulos de Dueda Emitidos por Sociedades Extranjeras
FIA	Fondos comunes de Inversión Abierto Según art.3 Inst.18/00

Value of Stocks Held by Pension Funds and the Buenos Aires Bolsa Index



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