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LIBERALISING FOREIGN INVESTMENTS BY PENSION FUNDS: POSITIVE AND NORMATIVE ASPECTS

by

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SUMMARY

The paper evaluates the economics of foreign investment regulation for pension funds, with a focus on developing countries, where fully-funded pension systems are being started de novo. The analysis produces three observations. First, the benefits of global portfolio diversification apply particularly to developing-country pension assets because the volatility of asset returns is high while the risk tolerance of pensioners is low. Second, restrictions of foreign investment by domestic pension funds can hardly be justified on grounds of financial-development arguments: cross-country evidence which little support for the claim that the accumulation of pension assets would provide strong externalities for financial development. Moreover, the home bias generally observed in pension fund investment should translate into sufficient potential demand for domestic financial assets so as to deepen markets and develop the institutional infrastructure. Third, a case for initial localisation requirements, however, can be derived from the fiscal costs of moving from unfunded to fully-funded pension systems if a rise in domestic interest rates due to fiscal illusion and domestic tax collection costs are important.

RÉSUMÉ

Ce document évalue l'économie de la réglementation des investissements à l'étranger des caisses de retraite, notamment pour les pays en développement (PED) où les systèmes de retraite par capitalisation sont récents. L'analyse conduit à trois observations. Premièrement, elle montre que les produits d'épargne retraite des PED peuvent tout particulièrement bénéficier d'une diversification des portefeuilles au niveau mondial ; en effet, les rendements des actifs sont très volatils alors que les retraités sont très vulnérables. Deuxièmement, l'argument du développement financier peut difficilement justifier les limitations à l'investissement étranger par les fonds de pension nationaux : cette étude internationale ne confirme pas vraiment l'idée selon laquelle l'accumulation de produits d'épargne retraite conduirait à des retombées positives importantes pour le développement financier. De plus, le biais national généralement observé dans les investissements de caisses de retraite devrait se traduire par une demande potentielle suffisante de produits financiers nationaux afin d'élargir les marchés et de développer l'infrastructure institutionnelle. Troisièmement, la nécessité d'imposer initialement des règles de localisation peut se justifier par des coûts budgétaires liés à l'évolution des systèmes de retraite par répartition à des régimes par capitalisation si l'augmentation des taux d'intérêt nationaux due à l'illusion fiscale et les coûts de recouvrement de l'impôt sont importants.

PREFACE

Latin America is setting the pace for pension reform worldwide. In recent years, Argentina, Bolivia, Colombia, Mexico and Peru have all set up variants of the 1981 Chilean reform model. Other countries are considering following suit. Such reforms raise new regulatory questions which are largely unanswered. An important — yet virtually unresearched — policy issue is the regulation of foreign investment by pension funds. A 1994 OECD Development Centre Policy Brief argued that "the authorities in OECD countries should consider removing regulatory constraints imposed on pension assets that deprive retirees of the pension-improving benefits of global diversification".

The ageing OECD Member countries can avoid part of their demographic problem by investing in emerging economies. Helmut Reisen argues that the developing countries can also spread some of their idiosyncratic risks, derived from higher exposure to country-specific shocks, by investing some of their pension assets abroad. The author presents cross-country evidence showing that limiting foreign investment by Latin American and other developing-country pension funds can hardly be justified on grounds of financial-development arguments. Under specific conditions, however, the fiscal costs of moving from unfunded to fully-funded pension schemes may justify initial localisation requirements. This paper, which is part of the research project "Macroeconononomic Interdependence and Capital Flows", will also serve as an input into the OECD's Ageing Population Project.

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I. INTRODUCTION

Whether and when to free international investment by fully-funded pension schemes is urgently debated by governments in industrial and developing countries alike. This paper is written with several developing countries in mind (notably in Latin America) where public provision of unfunded, earnings-related Pay-As-You-Go (PAYG) pension is being or has been replaced by a new system of privately-managed, fully-funded and defined-contribution pension schemes. The question is: How should these countries regulate the permissable share of foreign assets to be held by the new pension funds?

In the developing-country context, the nascent literature has given strikingly divergent answers to that question. Pointing to Chile's experience, where foreign investment of pension funds was gradually permitted only ten years after their creation, Fontaine (1996) and Vittas (1995) favour an initial full localisation requirement. The major reason for the initial outflow controls that these authors advance is (a) that pension funds help to develop domestic capital markets, and (b) that they help ease the fiscal cost of moving from a PAYG to a fully-funded system. By contrast, in view of Bolivia's recent social security reform, Kotlikoff (1994) recommends establishing a single Bolivian pension fund whose managers would be instructed simply to hold the world portfolio. Apart from several other considerations (to save administrative costs, to signal openness), Kotlikoff's suggestion seems largely inspired by the theory of portfolio choice.

The paper will focus on these propositions; two companion papers that discuss the pros and cons of liberalising foreign investment from the perspective of ageing OECD countries as well as of macroeconomic stability are Fischer and Reisen (1994) and Reisen and Williamson (1996). Section 2 argues that high volatility of developing-country asset returns combined with low risk tolerance of pensioners with low lifetime incomes would suggest that the benefits of global portfolio diversification advanced by the theory of portfolio choice apply particularly to developing-country pension assets. However, pension funds worldwide display a strong preference for domestic assets (a so-called 'home bias') which can be rationalised (but not easily quantified) with a multitude of factors that the paper will discuss. Section 3 examines some positive externalities that have been suggested for the impact of domestically-held pension assets on developing-country capital markets. The section places doubt on the proposition that these externalities justify outflow controls. There are essentially two reasons for this. Cross-country evidence shows little support for the claim that the accumulation of pension assets would provide strong external benefits for financial development. Second, those benefits that pension funds do provide for the development of domestic capital markets can also be realised under a liberal 'prudent man' rule such as in Britain, given the 'natural' home-asset preferences of pension

funds. Section 4, however, concurs with Fontaine (1996) that the fiscal cost of transition from PAYG to fully-funded pension systems provides a case for initial outflow restrictions when fiscal illusion and domestic tax collection costs are important. The major reason is that the straightforward way to finance social-security reform is to replace the implicit social-security debt of the PAYG system by issuing explicit government debt. Such explicit build-up of government debt is usually massive; if it is not invested into the new fully-funded pension scheme, it will lead to high tax collection costs, a strong rise in domestic interest rates and a crowding-out of private investment.

II. GLOBAL DIVERSIFICATION BENEFITS AND HOME-ASSET PREFERENCES

The potential for risk reduction seems particularly high for Latin America and Africa, regions which have been more volatile than any other region in the world, due to policy and to external shocks (see Table 1). Risk reduction via international diversification will thus clearly protect developing-country pensioners (in the case of defined-contribution funds) or offer pension sponsors such as private companies a hedge against shortfall risk for defined-benefit funds.

Table 1. **Volatility Indicators**
(Standard deviation of annual observations, 1970-92)

	Industrial Countries	Latin America	East Asian Miracle	South Asia	Sub Saharan Africa
Private consumption growth	2.1	5.6	4.1	5.4	10.3
Fiscal deficit (% of GDP)	2.4	4.7	2.4	4.2	3.7
Narrow money (% of GDP)	2.4	5.5	1.9	1.4	3.8
Terms of trade (growth rate)	8.9	15.1	8.0	7.9	22.1
Int'l capital flows (% of GDP)	1.7	2.8	1.5	1.1	6.1

Source: Hausmann and Gavin (1996).

Modern portfolio theory (see, for example, Solnik, 1988) and its major tool, the Capital Asset Pricing Model (CAPM), hold that the world market portfolio is the optimal portfolio in a fully efficient and integrated capital market. For any portfolio underinvested in foreign assets (as a percentage of world market capitalisation) there is the prospect of a "free lunch": international diversification can lower risk by eliminating nonsystemic volatility without sacrificing expected return[1]. Alternatively, global diversification will raise the expected return for a given level of risk. The diversification benefits consist of reduced risk, usually measured by the annualised standard deviation of monthly returns, by investing in markets which are relatively uncorrelated (or even negatively correlated) with the investor's domestic market. International diversification reduces risk faster than domestic diversification because domestic securities exhibit stronger correlation as a result of their joint exposure to country-specific shocks.

The benefits of global diversification, however, look very different from the developing-country perspective compared to the industrial-country perspective. While the OECD-based investor who starts to diversify into emerging markets can enjoy a "free lunch" of simultaneously raising mean returns **and** reducing the overall risk of his portfolio (up to around a 20 percentage point share of emerging-market stocks), the Latin American investor will have to buy lower overall risk by lowering the mean return on his portfolio when he starts to diversify into the global portfolio. Table 2 exemplifies the point.

Table 2. **Total Stock Market Return Indexes**
(US$; Dec. 1990 - Dec. 1995)

	Annualised mean return, %	Annualised standard deviation	Correlation with S&P 500	Domestic market weight in global capitalisation, %, end 1995
Latin America	26.52	27.12	0.38	
. Argentina	48.84	61.14	0.31	0.21
. Chile	34.32	28.13	0.26	0.42
. Peru	35.88	39.56	0.19	0.07
US, S&P 500	15.96	10.15	1.00	
FT Euro Pac	10.20	15.97	0.38	

Source: IFC, *Emerging Stock Markets Factbook 1996*.

While the high mean return yielded in Latin America's stock markets in the first half of the 1990s is unlikely to be sustained, Table 2 nevertheless reveals the strong risk-return trade-off that Latin America's pension funds face in view of global diversification. Under Kotlikoff's instruction rule, Peru's pension funds could only hold 0.07 per cent of their assets in domestic equities. To exclude pension funds from the domestic stock market by instructing them to hold the global portfolio implies denying to the holders of pension rights the strong capital gains that are likely to arise in the early stages of pension reform. On the other hand, if the high return obtainable in domestic equity markets induces pension funds to hold largely home assets, pension benefits (in defined-contribution schemes) and thus private consumption will remain largely correlated to idiosyncratic shocks[2]. The optimal portfolio of pension assets will depend on pensioners' degree of risk aversion; from the developing-country perspective, a higher risk aversion will imply a higher share of foreign assets. Note that the degree of risk aversion is negatively correlated with the per capita level of income and pension benefits.

Pension and other institutional assets in OECD countries have displayed a strong 'home bias', a lack of foreign diversification compared to what standard models of global portfolio choice would predict. The growing literature on that international diversification puzzle (summarised, e.g., by Lewis, 1994) generally agrees that capital controls and other official impediments to foreign investment cannot fully explain the home bias in institutional assets. As far as pension funds are concerned, several explanations (apart from localisation requirements) have been advanced:

— Pension funds not only seek to maximise return: they also worry about the real purchasing power of their assets. In fact, there have been long-term deviations from purchasing power parity (PPP) due mainly to currency fluctuations. To the extent that pensioners consume non-traded, rather than traded goods, pension assets will be biased towards home securities. Pension funds may therefore seek a currency exposure comparable to the traded-goods proportion of the basket of goods consumed by the typical pensioner. Investors in small countries should thus hold a higher share of foreign assets than investors in large, more

self-sufficient countries (which moreover provide more potential for domestic diversification benefits than do small mono-structured economies). However, the argument ignores the fact that currency risk gets partly diversified away in a well-built portfolio, or can be hedged.

— Second, the observation that pension funds and life insurance companies display a stronger home-asset preference than do mutual funds in industrial countries has been interpreted as a sign of low-risk tolerance of pension fund trustees (Folkerts-Landau, Ito et al., 1995). The latters' contracts or jobs are fully exposed to shortfall risk. If pension fund managers bear more downside risk than the pension beneficiaries, but do not fully capture the upside potential of their investment decisions, unlike the mutual fund managers who are typically compensated as a proportion of net asset value, they will tend to allocate pension assets in safe, domestic assets.

— Third, unlike mutual funds which are by definition fully funded, pension funds have to align the mix of their asset holdings to the structure of their liabilities. The definition of retiree benefits (nominal vs. real, defined-contribution vs. defined benefit) and the maturity structure of receipts thus feature prominently among the determinants of portfolio investment. Mature pension funds, particularly if they are at risk of actuarial insolvency, will shy away from instruments that entail currency risk and potential capital loss, and instead will prefer domestic bonds. A conservative asset allocation, however, is induced in several OECD countries by accounting rules that impose penalties for temporary deficits and by restrictions on overall equity holdings (Davis, 1995).

— Fourth, a track record of high real returns on domestic bonds and loans, such as observed in Germany and the Netherlands, may seem to justify a conservative asset allocation in favour of domestic bonds. The growing integration of capital markets, however, makes superior inflation-adjusted bond returns increasingly unlikely, raising the shadow costs of regulation that locks pension funds into domestic fixed-income instruments.

While these factors may explain the observed home-asset preference of pension funds in the OECD countries, they may well operate quite differently in the developing-country context. First, with developing-country assets yielding a higher return at the cost of higher volatility than industrial-country assets, the risk-return trade-off would suggest a negative rather than a positive association between the degree of home-asset preference and of low-risk tolerance. Second, most pension funds, notably in Latin America, are in an early maturity phase and defined-contribution; they can therefore tolerate currency risk and potential capital loss better than mature funds, favouring equity exposure and thus foreign investment. Third, except perhaps in Chile, there is no long-term track record of higher real returns on domestic bonds that would justify a heavy exposure in domestic paper as it did in Germany and the Netherlands. Finally, the lack of suitable domestic investment assets and the illiquidity in domestic securities markets might also

militate for a ‘foreign-asset preference’ of developing-country pension funds. Note, however, that Chile’s pension funds did not generally invest abroad even after localisation requirements were gradually relaxed in 1991.

III. PENSION FUNDS AND CAPITAL MARKETS

Fully-funded pension systems do not provide benefits to the pensioners alone, but they may also exert strong externalities that may benefit the overall economy. The most widely-acclaimed externality that fully-funded pension schemes are held to generate is their stimulus for financial development. It is often claimed, for example, by Davis (1995) or Vittas (1995), that fully-funded pension systems help (a) raise the supply of long-term funds, (b) strengthen the efficiency of fund allocation, and (c) stimulate the financial infrastructure of a country. Moreover, it is often asserted that a funded pension system would also help stimulate the level of national savings. Fontaine (1996) has argued that "until 1989 [regulations] banned any international portfolio diversification of pension funds. This was probably the most crucial restriction in explaining why the Chilean domestic capital market grew in size and depth, ... despite an internal climate of debt crisis and great uncertainty (p. 5)."

Before we can concur with Fontaine, though, several points have to be settled. First, how important is financial development for economic growth? Second, how firm is the evidence that funded pensions contribute to financial development and to higher domestic savings? Third, are localisation requirements necessary in a developing-country context to capture the externalities? Only if all three questions can be firmly answered in a positive way, can a solid case be made that (initial) localisation requirements should be imposed on the new pension system.

To consider the first question, the literature on the relationship between financial development and economic growth, recently reviewed by De Gregorio and Guidotti (1995), suggests indeed that some proxies of financial development are strongly associated with real per capita GDP growth in a large cross-country sample. To be sure, empirical studies have been hampered so far by the lack of a sufficiently rich variety of reliable indicators of financial intermediation which could have been observed for a longer period on a large cross-country basis. It has been nonetheless shown that (a) the level of development of the banking system (proxied by the ratio of the total claims of deposit money banks to GDP), (b) the fraction of domestic credit allocated to the private sector (again, in relation to GDP), and (c) an index of overall stock market development that averages the means-removed values of market capitalisation, total value traded and turnover ratios to GDP, are strongly correlated with subsequent long-run growth of real per capita GDP (King and Levine, 1992; King and Levine, 1993; De Gregorio and Guidotti, 1995; Levine and Zervos, 1996).

The indicators, unlike many other proxies of financial development (such as the size of the financial sector or the level of interest rate spreads for borrowing minus lending), have displayed a strongly positive and significant correlation with real per capita GDP growth after controlling for initial core conditions (such as the initial GDP per capita level) and measures of

monetary, fiscal and trade performance[3]. Moreover, each of the three proxies of financial development have a distinct theoretical background. The proxy for banking development reflects the fact that capital markets cannot develop without a reliable banking system, because securities dealers operate by borrowing short-term funds from the banking system and because institutional investors, such as pension funds, have to develop faith into the short-term segment of the financial system before they invest into long-term securities (Rojas-Suarez and Weisbrod, 1996). The proxy that measures asset distribution (to the private sector) reflects the presumption that a financial system that simply allocates credit to the public sector may not provide as much screening services as financial systems that primarily fund private firms. Finally, the stock market indicators stand for the hypothesis that thick and liquid equity markets increase risk-sharing benefits and facilitate longer-run higher-return projects (Demirgüç-Kunt and Levine, 1996). The main channel of transmission from financial development to growth appears to be the efficiency, rather than the volume of investment (De Gregorio and Guidotti, 1995).

It is hard to provide sufficient empirical content, for various reasons, to answer the second question. Time-series analysis, for example in the Chilean context, is hampered by strong structural breaks that have characterised the economy since the pension reform in 1981, resulting in non-stationary behaviour of ratio variables. Cross-country studies are complicated by country-specific differences in pension fund regulation (such as the restrictiveness of investment regulations) and by limited data comparability, for example on pension assets. Table 3 seeks to establish whether there is at least a positive association between the importance of private pension and insurance assets, relative to GDP, and the proxies of financial development that have been identified to be strongly associated with growth. The table, adding data for Chile to the sample based on Demirgüç-Kunt and Levine (1996), shows the annual averages from 1986 through 1993 of total private pension and insurance fund assets as a fraction of GDP, plus the three proxies for financial development that have been discussed above to be strongly associated with subsequent real per capita GDP growth. These are the claims of deposit banks to GDP, domestic credit to the private sector and the annual growth rate of a stock market development index that averages market capitalisation, total value traded and turnover as a fraction of GDP.

Table 3 shows how the development of the pension and insurance assets is linked to indicators of financial development that have been identified to have a strong predictive prower for GDP growth for 23 countries (of which 13 belonged to the OECD during the observation period). The correlation between pension and banking development is positive, but fairly weak; the correlation coefficient is 0.37. The correlation between pension assets and the share of domestic credit allocated to the private sector is somewhat stronger, with a coefficient of 0.50. By contrast, there is weak negative correlation between pension and stock market development. The correlation coefficients are all significant at the 0.01 level.

Table 3. **Pension Assets and Indicators of Financial Development, 1986-93**
(annual average)

Country	Assets of private pension and insurance funds to GDP		Claims of deposit banks to GDP		Domestic credit to private sector to GDP		Growth rate of stock market development index	
	Rank	Value	Rank	Value	Rank	Value	Rank	Value
Australia	8	0.35	14	1.19	12	1.07	18	0.05
Canada	6	0.48	18	0.93	18	0.86	20	0.02
Chile	11	0.24	19	0.90	17	0.93	13	0.14
Colombia	19	0.03		..	23	0.25	7	0.31
Denmark	5	0.54	13	1.20	16	0.98	6	0.33
Finland	9	0.33	9	1.60	6	1.60	13	0.14
France	12	0.20	3	2.00	4	1.77	16	0.07
Germany (West)	10	0.33	2	2.16	3	1.80	12	0.17
Italy	17	0.06	15	1.01	19	0.71	22	-0.03
Japan	7	0.43	1	2.58	1	2.27	23	-0.07
Jordan	18	0.07	10	1.52	11	1.24	8	0.31
Korea, Rep. of	13	0.14	16	1.00	14	1.33	10	0.23
Malaysia	15	0.10	8	1.61	9	0.29	1	0.68
Mexico	20	0.02	21	0.48	22	1.53	4	0.37
Netherlands	1	1.08	4	1.97	7	0.55	2	0.51
Pakistan	23	0.00	20	0.70	20	0.34	11	0.20
Philippines	21	0.01	22	0.48	21	1.64	5	0.37
Singapore	14	0.11	7	1.87	5	1.31	9	0.27
Spain	16	0.08	6	1.89	10	0.98	17	0.06
Sweden	4	0.56	11	1.41	15	0.99	21	0.01
Thailand	22	0.01	12	1.23	13	0.99	3	0.46
United Kingdom	2	0.92	4	1.97	2	1.97	15	0.11
United States	3	0.67	17	0.99	8	1.42	19	0.03
Average		0.30		1.40		1.17		0.18
Correlation coefficient				0.37		0.50		-0.17
(t value)				(5.89)		(4.20)		(-2.67)
Number of observations	23			22				23

Sources: Demirgüç-Kunt and Levine (1996); Superintendencia de AFPs de Chile.

Note: See text for the definition of financial indicators.

The negative association between pension assets and stock market development could be due to several factors. First, the observation period 1986-93 has seen deep structural reform and renewed access to private foreign capital flows in some of the non-OECD sample countries, with a corresponding effect on asset-price inflation which in turn has inflated the growth rate of the stock market development index in these countries. Second, pension funds are often not only heavily regulated with respect to localisation requirements, but also through ceilings and accounting rules which limit the permitted share of equity stocks in their asset portfolios (Reisen, 1994). Third, even in the absence of any regulative limits on their equity exposure, pension funds tend to follow a 'buy and hold' strategy in their equity acquisitions and thus may have little effect on stock market liquidity. These factors, and the cross-country evidence produced here, would thus suggest that the development of a fully-funded pension system is unlikely to develop local stock markets per se.

By contrast, the positive if weak association between pension assets and banking development reported here is also in line with Chile's experience. Rojas-Suarez and Weisbrod (1996) point out that Chile's pension funds first largely invested in short-term bank deposits; subsequently, pension funds' willingness to invest in long-term central bank liabilities were exposed to bank risk; from the early 1990s when Chile's pension funds increasingly invested in corporate bonds, liquid bank deposits still remained a safe haven for the pension system to be used when conditions in the corporate bond market were not favourable for investing. The development of faith in the short-term segment of the banking system could well be a requirement for the stable accumulation of pension (and insurance) assets.

Chile stands out in Latin America as the only country that has durably raised its saving rate. The boost in the Chilean saving rate has come in the period when Chile's funded pension system has flourished. Pension reform can raise private savings in different ways. A tax-financed transition from PAYG may reduce consumption of the current work force; higher rates of return on pension assets may stimulate savings, if the intertemporal substitution effect of interest rates outweighs its income effect; a reform-induced higher growth rate may raise savings under consumption habit persistence; as a result of growing pension assets on individual accounts, the awareness of the need to save for the future may be strengthened (Corsetti and Schmidt-Hebbel, 1996).

Table 4. **Pension Assets and Savings Performance, 1986-93**
(annual averages)

Country	Assets of private pension and insurance funds to GDP	Private saving rate (to GDP)
Australia	0.35	0.19
Canada	0.48	0.22
Chile	0.24	0.15
Colombia	0.03	0.18
Denmark	0.54	0.16
Finland	0.33	0.20
France	0.20	0.19
Germany (West)	0.33	0.22
Italy	0.06	0.26
Japan	0.43	0.25
Korea, Rep. of	0.14	0.32
Malaysia	0.10	0.20
Mexico	0.02	0.10
Netherlands	1.08	0.25
Philippines	0.01	0.11
Spain	0.08	0.21
Sweden	0.56	0.15
Thailand	0.01	0.24
United Kingdom	0.92	0.15
United States	0.67	0.16
Average	0.30	0.20
Correlation coefficient		0.00
(t-value)		(0.05)
Number of observations	20	20

Source: Demirgüç-Kunt and Levine (1996); IMF data base.

Table 4 collects data on private pension and insurance assets and on private saving rates for those 20 OECD and non-OECD countries for which reliable information is available. The correlation coefficient between private pension assets and private saving rates, both as a fraction of GDP, is not significantly different from zero. While the correlation does not build on any structural identification of saving determinants, there are several reasons why the growth of fully funded pension systems might also depress the private saving rate.

First, in defined-contribution schemes high real returns on pension assets require a lower rate of saving from achieving a targeted pension level and may encourage an early retirement. Second, the rise of pension assets usually goes along with a higher supply of loanable funds that may stimulate household access to consumer and mortgage credits. Third, funded pensions may imply greater credibility of future pension benefits than in unfunded systems, reducing the need for precautionary savings (Vittas, 1995). The World Bank (1994) asserts that pension reform will produce a higher national saving rate under a mandatory fully-funded scheme than under a mandatory PAYG system. But there is an obvious lack of convincing evidence on the issue.

Though the cross-country evidence shows little support for the claim that the accumulation of pension assets would provide strong external benefits for financial development, that evidence is limited to those variables that are quantifiable in a large cross-country sample. Diamond and Valdes-Prieto (1994), for example, point out that Chile's pension funds have helped to create a corporate bond market and to develop the financial infrastructure of the country. In a regime that allows free portfolio choice, pension reform can foster the development of local securities markets by substituting the intergenerational contract implicit in unfunded Pay-As-You-Go systems by an explicit demand for long-term securities. For example, most of the demand in Chile's long-term corporate bond market comes from pension funds and life insurance companies. Chile's authorities are also reported to have been stimulated to ensure transparency of their local capital market as pension assets have been rising.

The third question is, do the reported effects of pension reform on capital markets and saving provide a sufficient rationale to impose restrictions on foreign investment by the new pension funds? Hardly. To begin with, the home-asset preference that has been observed with OECD pension funds would suggest that those externalities that fully-funded pensions do generate for domestic capital markets can also be captured under a liberal 'prudent man' rule as in Great Britain. This proposition should even hold under the qualification that the 'home bias' in developing-country assets will be less pronounced under a free regime than in OECD countries. Then, even if we accept the proposition that pension reform does raise savings, outflow restrictions on the new pension funds do not seem justified. The old two-gap

literature has suggested that growth in developing countries can be savings-constrained, and in the absence of offsetting inward investment, a liberalisation of outflows does indeed imply a net loss of savings to finance local investment. In contrast, with the possibility of offsetting inward investment, the potential exists for mutual gain through two-way investment that diversifies pension portfolios at home and abroad. Controls on capital outflows reduce the incentive for inward investment by 'taxing' the option of re-exporting capital later (Kenen, 1993).

IV. PENSION REFORM AND THE GOVERNMENT BUDGET

Any country that undertakes a reform from an unfunded PAYG system to a fully-funded pension system will face major fiscal implications. The implicit social security debt is the net present value of pledged state pension benefits minus future state pension contributions; the calculation of the implicit PAYG debt is therefore heavily sensitive to assumptions about the discount rate and future wage and productivity trends. Pension reform will redefine pledged state pension benefits as well as future state pension contributions: The PAYG debt will now only include pensions for those who have already retired, pensions for those who will stay in the old system (minimum pensions for the poor, for example), and accumulated pension entitlements under the old system for those who switch to the new fully-funded system; and pension contributions (taxes) of the latter group that have financed the old pension system will now be diverted into the new pension system (World Bank, 1994). With respect to flows in public finance, government revenues will fall sharply as contributions are diverted to the new system while the call on government pension expenditures will only gradually decline.

There are essentially two ways to finance the transition from PAYG to a fully-funded pension system. First, paying off the implicit PAYG debt by issuing the equivalent amount of government debt or by selling state assets (as in Bolivia); debt financing the PAYG deficit avoids a double burden on the current labour force and is fair in intergenerational terms. Second, the transition can be financed by generating an equivalent non-pension budget surplus through higher tax receipts or lower public spending; a tax-financed transition — as any restrictive fiscal policy which pays off government debt through taxes and hence shifts resources from current to future generations — encourages higher savings, probably higher investment and output levels in the future (Schmidt-Hebbel, 1995).

The implicit PAYG debt is usually massive; in Chile, for example, its present value has been estimated at 80 per cent of GDP (Arrau, 1992). It is therefore unrealistic to assume that debt financing of at least an important share of the implicit PAYG debt can be avoided; a lack of marketable public enterprises will usually preclude financing PAYG debt totally through privatisation; tax finance would generate short-term deadweight cost and easily run into political opposition from the affected cohorts of the population. The transition will hence usually involve a combination of debt and other ways of financing.

To the extent that the pension reform is debt financed, it leaves the net wealth position of the public sector unchanged although the budget deficit is increased by the amount of the pension deficit. If the private sector equates the old implicit pension debt with the new explicit public debt, there is no fiscal illusion. Abstracting from second-order effects that arise from the distortion

costs of taxation, efficiency gains of privatisation etc., the absence of fiscal illusion would imply that debt financing the pension reform will not generate first-order effects on interest rates on government debt. However, some degree of fiscal illusion cannot be ruled out. The fact that the Chilean pension reform did not affect interest rates much, although it was partly debt financed, does not imply the absence of fiscal illusion in Chile, since the localisation requirements imposed on the pension funds were very tight.

In the presence of fiscal illusion, a fiscally weak government will want to restrict the investment of pension funds outside government debt in order to enhance the funding available for the transition deficit. To see why, we have to consider the distortions and collection costs that will arise from future taxation to service the domestic debt build-up, in conjunction with the government's need to recycle its domestic debt at market terms. These elements feature prominently in the two-period model developed by Aizenman and Guidotti (1994)[4]. The model is useful to arrive at a normative statement on whether the fiscal costs of pension reform can justify the imposition of localisation requirements for second-best welfare maximisation. Aizenman and Guidotti model capital controls as a tax on foreign-interest income that introduces a wedge between the international and the domestic real interest rate in much the same way as a localisation requirement would; this proposition has strong empirical support (see, e.g., Dooley, 1995). While the wedge driven between domestic and foreign interest rates represents a welfare-reducing distortion to the private consumption-savings choice, it mitigates the welfare loss associated with tax collection. The net welfare enhancement depends directly on both the marginal tax collection costs and the level of private financial asset holdings. Capital controls reduce the domestic interest rate on government debt. The 'effective' tax base, therefore, is not only the private holdings of foreign assets, but in addition the domestic public debt. Moreover, by lowering the interest bill on its domestic debt, the government obtains revenue that is not subject to collection costs[5]. Aizenman and Guidotti also show that a tax on foreign interest income is welfare-superior to a quota, since the latter reduces the revenue collected by the government and thus implies higher tax collection costs.

Table 5: **Public Debt, Tax Collection Costs and Capital Controls: Numerical Simulations**

Public Debt, % of GDP Recycled in		Tax Collection Cost Parameter	Optimal Tax on Foreign Investment Income, %	Implied Real Interest Diff., % p.a.	Implied Change in Foreign Assets, % of GDP	Implied Restriction on Foreign Asset Share[a]
Period 0	Period 1					
25.0	11.6	0.1	6.6	-0.7	-0.3	28.5
50.0	23.8	0.0	0.0	0.0	0.0	None
50.0	23.1	0.1	26.3	-2.8	-1.2	24.0
50.0	22.2	0.2	52.5	-5.5	-2.4	18.0
75.0	34.8	0.1	60.0	-6.2	-2.6	14.0

a) Assumes pension assets of 20 per cent of GDP, of which 30 per cent would be invested abroad in the absence of any restrictions, implying a foreign asset share of 6 per cent of GDP. The implied restrictions of foreign asset shares are calculated to achieve the implied change in foreign assets.

Source: Aizenman and Guidotti (1994); own calculations.

Table 5, based on numerical simulations by Aizenman and Guidotti (1994), offers a rough idea of the orders of magnitude involved for the optimal tax on foreign interest income. The simulation assumes constant real income (endowment) levels in the two periods considered, an international interest rate of ten per cent and quadratic tax collection costs with a constant parameter αT^2, as it is assumed that tax collection costs rise exponentially with the level of tax burden. The table is set up in a way which shows that both the efficiency of tax administration as well as the level of domestic public debt exert a strong incentive on the government to impose a tax on foreign interest income or, alternatively, localisation requirements on pension funds. The initial debt stock determines the amount of debt that has to be recycled which, in turn, determines the optimal tax on foreign interest income. As the initial public debt stock grows from 25 to 75 per cent of GDP, the optimal tax on foreign interest income rises from 6.6 to 60 per cent, inducing a fall in the domestic interest rate differential from -0.7 to -6.2 percentage points. Likewise, as the tax collection cost parameter is raised from 0 to 0.2 — for an initial stock of domestic debt of 50 per cent of GDP — the optimal tax on foreign interest income increases from zero to 52 per cent.

As a result of controls on capital outflows, the private assets held abroad are implied to fall accordingly, from zero to 2.6 per cent of GDP. A new pension system can be expected to accumulate 2 per cent of GDP annually (Vittas, 1995), so that after the ten first years (before pension benefits will start to grow and affect the level of pension assets) the new scheme will have accumulated 20 per cent of GDP. If we assume that pension funds would invest 30 per cent of these assets abroad (6 per cent of GDP) if they were totally unrestricted in the investment choice, we can carry the numerical simulations a bit further. Table 5 shows that the restrictions on foreign pension fund investment to achieve the necessary demand for the recycling of domestic debt would vary from none (complete freedom to invest abroad) down to 14 per cent of pension assets as a result of the various configurations of initial debt levels and tax collection costs.

If the new pension funds are not willing to hold the massive explicit debt build-up connected with pension reform, interest rates would be driven up which, in turn, would worsen government finances and crowd out private investment (Corsetti and Schmidt-Hebbel, 1996). This effect will be even more pronounced with a fragile domestic banking system which alternatively could, in principle, intermediate the funds between the new pension funds and the government. To reduce the temptation for the government to force pension funds to hold government paper at less than market-clearing interest rate levels, however, the Chilean approach seems very helpful. The government never forced pension funds to hold a given proportion of their assets in public debt (on the contrary, limits were placed on their maximum holdings), but by reducing the menu of available investment options — including outflow restrictions — pension funds were indirectly induced to seek government debt. Consequently, Chile managed to finance its transition deficit without interest rate repercussions. Fontaine (1996) also points to a long-run advantage of pension investment in government bonds to cope with the external transfer problem. In the 1980s, when capital markets required many Latin American countries to generate a net external transfer, this could be financed by tapping pension funds without the interest-rate hikes observed elsewhere in Latin America. Conversely, when the heavy net capital inflows in the early 1990s required massive sterilised intervention[6] in the foreign exchange markets, the corresponding sale of sterilisation bonds did not generate an upward pressure on domestic interest rates because pension funds were willing to hold these bonds.

NOTES

1. The CAPM claims that the world market portfolio must be on the efficient frontier and that it is thus possible to beat the market, whence the idea of a passive index fund approach. Such a portfolio strategy can be self-destructive when markets are not efficient. A case in point is the Japanese stock market bubble when in late 1989 the Tokyo market was worth 45 per cent of world market capitalisation. For those investors following the index approach, this meant an extreme degree of concentration, not risk-reducing diversification, and subsequent tears.

2. This lesson was taken in 1995 by Chile's pension funds which despite a gradual relaxation of localisation requirements had invested virtually all assets at home. After 13 years of high returns — 13.3 per cent on average — the funds' 1995 results plummeted to -3.7 per cent through end October, due to heavy exposure to domestic electric and telecommunications companies (Jackson, 1995).

3. De Gregorio and Guidotti (1995) show, however, that the ratio between domestic credit to the private sector and GDP is negative in a panel data for Latin America, presumably as a result of financial liberalisation in a poor regulatory environment.

4. A limitation of the Aizenman-Guidotti model is its two-period framework: whatever happens in period one, both the behaviour of market participants and macroeconomic results will be heavily influenced by the proximity of the second period.

5. To be sure, tax collection costs also arise with the various forms of taxation on capital flows, if evasion is important. The taxation of institutional investors, such as pension funds, is less likely to be evaded than the tax on foreign-interest income imposed on the individual investor, however (Williamson, 1993).

6. Intervention in the foreign exchange market to prevent a nominal currency appreciation requires an equivalent reduction in domestic credit, in order to keep money supply unchanged.

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