

CEPAL

REVIEW

NUMBER 63
DECEMBER 1997
SANTIAGO, CHILE

OSCAR ALTAMIR
Director of the Review

EUGENIO LAHERA
Technical Secretary



UNITED NATIONS

CONTENTS

The public sector's role in Latin American development <i>Ricardo Carciofi</i>	7
Equity in the public budget <i>Juan Martin</i>	17
Pension system reforms, the capital market and saving <i>Andras Uthoff</i>	29
Public institutions and explicit and implicit environmental policies <i>Nicolo Gligo</i>	51
Non-market valuation of natural and environmental resources in Central America and the Caribbean <i>Steve Shultz</i>	65
An integrated macro-model for the Caribbean subregion <i>Lucio Vinhas de Souza</i>	77
Swerves and skids by the Venezuelan economy <i>José Miguel Benavente</i>	85
How non-traditional are non-traditional exports? The experience of seven countries of the Caribbean Basin <i>Alberto Gabriele</i>	99
Trade openness and structural change in the Brazilian motor industry <i>Ruy de Quadros Carvalho, Sérgio Robles Reis de Queiroz, Flávia Luciane Consoni, Ionara Costa and Janaína Pamplona da Costa</i>	115
The ongoing history of a Chilean metal products and machinery firm <i>Jorge Katz and Héctor Vera</i>	129
The importance of local production and small-scale enterprises for Latin American development <i>Francisco Albuquerque</i>	147
Recent ECLAC publications	162

Pension system reforms, *the capital market* and saving

Andras Uthoff

*Financing Unit,
International Trade,
Transport and
Financing Division,
ECLAC.*

Pension system reforms seek to combine and reconcile both economic and social functions. On the basis of both conceptual aspects and the actual experience of Chile, this article illustrates the difficulties encountered in trying to make reforms fulfill both types of functions. These difficulties stem from two factors: i) the need to consider the reform of the pension system as a whole, where, parallel with the capitalization component, it is necessary to develop another unfunded component to finance the costs of the transition from one pension system to another, minimum pensions, and social welfare pensions; and ii) the need to distinguish between financial saving and real saving (or national saving in the national accounts sense) and to study the financial sector's capacity to intermediate financial saving towards real investment. The Chilean experience confirms this view. The fiscal resources needed to finance the cost of the transition and the other items of the unfunded component represent flows which exceed those coming from workers' contributions, thus affecting the size and composition of the net flows of savings generated by the reforms. Furthermore, the relatively incipient nature of the capital markets and the regulation needed to ensure protection of the workers' pension funds in an investment portfolio approach make it more difficult to turn this financial saving into real investment. In the final analysis, although both types of functions include objectives which are desirable from the point of view of public policies, the mere reform of pension systems to change them from predominantly unfunded systems to others with substantial capitalization components does not guarantee that such objectives will be achieved.

I

Introduction

Two types of functions are usually assigned to pension systems: those of a social nature and those of an economic and financial nature (box 1). The functions of a social nature aim to provide contributors to the system with a good old age or disability pension,¹ or, in the event of death, a good survivor's pension for the corresponding dependent, and seek to establish financing mechanisms to assist those who could not save up for their old age (minimum social welfare pensions); within these functions, it is necessary to distinguish between social security responsibilities proper, which can be financed through the effort of the pension fund contributors themselves, and responsibilities connected with income redistribution, which may be financed from other general taxes in the fiscal budget. The aim of the functions of an economic and financial nature is to contribute to national

saving without taking the place of other forms of voluntary saving and to supplement the development of the financial sector through the design of instruments which facilitate the financial intermediation of the accumulated funds, as well as the development of institutions for the prudential regulation of the sector (box 1).

From the beginning, pension systems have been organized primarily on the basis of the pay-as-you-go or unfunded system. They represent social contracts for compulsory intratemporal and intergenerational transfers from active workers to pensioners, backed up by an implicit commitment by the government to the cohorts of contributing workers that, when they reach retirement age, they in turn will benefit from the contributions of future generations of workers. Such schemes are balanced from the financial point of view when the amounts of pensions paid out correspond exactly to the contributions received. Unfunded systems need to be actuarially adjusted because at the beginning (when they are "young systems") they register surpluses which should be invested in the form of reserve funds to be used for the payment of pensions when the system begins to suf-

¹ The idea of what is a good pension is a relative concept. A good pension may be considered as one which provides, in real terms and in cases of disability, old age or death, a significant proportion of the average income on the basis of which the pension system member made contributions during his working life.

Box 1 THE SOCIAL AND THE ECONOMIC FUNCTIONS OF PENSION SYSTEMS	
Social functions	Economic functions
1. To ensure the saving needed to finance satisfactory levels of consumption through old age, disability or survivor's pensions, under the following assumptions: a) Individuals do not save voluntarily to cover such risks ("short-sightedness") b) Individuals do save to cover such risks (various theories). 2. To contribute to equity through solidarity with those who are not in a position to save for their old age a) Through the pension system itself (common fund), paid for from the payroll b) Through fiscal policy (subsidies), paid for out of general taxes.	1. To contribute to national saving a) The system does not take the place of other forms of saving b) The system does take their place. 2. To contribute to financial saving and the development of capital markets a) The funds are intermediated on the domestic capital market b) Pension funds are protected from political pressures.

TABLE 1

Estimated yield of two different pension systems ^a

Pension system	Amount of contributions or saving in period 1 (1)	Amount of participant's pension in period 2 (2)	Yield for the participant (3) = 1 -(2)/(1)
Pay-as-you-go (unfunded)	$c_1 * w_1$	$(c_2 * w_2 * T_2) / T_1$	$1 - (c_2 * w_2 * T_2) / (T_1 * (c_1 * w_1))$
			$r_c + r_w + r_T$
Individual capitalization (funded)	$c_1 * w_1$	$c_1 * w_1 * (1+r)$	$1 - c_1 * w_1 * (1+r) / (c_1 * w_1) = r$

Source: Uthoff, 1995, table 4.

^a c_i = rate of contribution, period i ($i = 1, 2$)

w_i = real average wage, period i

T_i = number of workers, period i

r_c = growth rate of contributions

r_w = growth rate of real average wage

r_T = growth rate of number of workers

r = rate of return in capital market.

fer from losses (as it moves towards maturity). These actuarial calculations make it necessary to keep a close watch on the ratio between the number of persons of retirement age and the number of contributors (the demographic dependency ratio). Increases in this ratio lead to losses by the system unless contributions and/or pension benefits are corrected to take account of these increases. When the surpluses or deficits of unfunded systems are absorbed by the government budget it is not possible to maintain the proper inter-generational financial management of the reserve fund.

The regional indicators on the ratio between potential workers (persons between 15 and 64 years of age) and persons of retirement age (those over 65) and on the structure of the labour market and real wage levels display substantial demographic and labour force changes which make it necessary to correct contributions in order to fulfill the established benefits of an unfunded system.²

Unfunded systems only reach a state of equilibrium in ideal conditions: constant population growth and a balanced financing scheme. In this situation, each pensioner (at the individual level) will receive on average, as the yield on his contributions, a rate equal to the growth rate of the real wage mass of the

contributors (table 1). There are two reasons why this yield may be unfair to an individual worker from a strictly actuarial point of view. First, the growth rate of the real wage mass of the contributors is usually lower than the yield on the capital (this is a characteristic of dynamically efficient economies). Second, the yield obtained by each individual worker is different from the average yield for each worker in the system, because of a component which, without being related to the contributions, transfers resources between cohorts. In theory, this distributive component should favour low-income workers, but in practice, however, it has favoured those groups of workers who are in a position to obtain more generous pensions because of their influence on the political leadership.

The above description highlights the inherent problems of unfunded systems, which have been described in various ECLAC publications.³ These problems may be summarized as: i) the coexistence of several different schemes, so that workers have access to different benefits depending on the scheme they belong to; ii) the low level of generation of productive employment and the decline in the ratio of contributors to beneficiaries; iii) evasion and delays in the payment of contributions; iv) the absorption of

² These estimates show that both the initial value of these rates and the rate at which they go down over time vary from one country to another. The differences are connected with the particular features of the demographic transition in each country.

³ See Uthoff (1995), which is a study based on the following publications of the "Financial Policies for Development" project: Uthoff and Szalachmann, eds. (1992, 1993 and 1994); Iglesias and Acuña (1991) for Chile; Schulthess and Demarco (1993) for Argentina, and Ayala (1992) for Colombia.

pension system surpluses in the fiscal budget, which means that their investments will have a low yield because of the historical difficulty of insuring the surpluses against inflation; v) the low degree of coverage of the population; vi) the low ratio between the contributions that a worker makes in the course of his working life and the pension he finally receives, and vii) inefficient and excessively costly administration (see Uthoff (1995) table 5).

An alternative compulsory financing scheme is that which has wrongly been called, since the Chilean pension system reforms, the "privatization of pension systems".⁴ This system is based on the complete financing of benefits from funds related to the contributors' income; it converts retirement pension contributions into a savings flow at the level of each individual, estimated as a proportion of his earnings in each period of his working life (this is also known as the individual capitalization scheme). The average yield of the funds accumulated by each worker depends on interest rates (domestic and international) and on the yield of investments in the capital markets. In principle, this system can also include schemes for solidarity among groups of workers of the same generation (distributive schemes), which would weaken the connection that should exist between the remunerations on which the workers contributions are based, the yield obtained by the workers' funds in the financial markets, and the benefits they receive in the form of pensions. If we leave out these solidarity schemes, then the pensions under this system are actuarially fair for each individual, since they relate his savings and their corresponding yield with the pension benefit he receives (table 2).

The arguments in favour of the privatization of the present pension schemes claim that by making this change at least three weaknesses of unfunded schemes are overcome because: i) the links between the contributions made by each worker and the bene-

TABLE 2

Table of possible subsystems

Contributions: Benefits:	Contributory scheme		Non-contributory scheme
	Compulsory contributions	Voluntary contributions	
Defined in advance	Different unfunded systems		Basic pensions paid for out of the fiscal budget
Not defined in advance	Individual capitalization system	Savings systems	Ex-gratia pensions

fits he can receive are strengthened; ii) part of the implicit debt owed to contributors under the unfunded system is made explicit, and iii) the distributive function of the old system is made separate and assigned directly to the fiscal budget rather than to the new pension system. The most important motive for making the change, however, is that the new scheme is supposed to isolate the social security system from possible losses and impacts on the fiscal budget caused by increases in the demographic dependency ratio and in the maturity of the system. Although increased national saving is one of the aspirations of the reforms, it is not a guaranteed result of them.

In the present article, the arguments put forward in order to highlight the importance of the individual capitalization system for the development of capital markets and, ultimately, national saving are reviewed, and an analysis is made of some of the preliminary results of the experience of Chile, where an unfunded system is being replaced with an individual capitalization system. The article concludes with some words of caution with regard to the relevance of the arguments usually put forward to encourage countries to carry out pension system reforms of the same type as those applied in Chile.

⁴ In practice, although the scheme is financed by the workers and the funds are managed by private enterprises, the State intervenes at four levels: i) it regulates demand (by obliging workers to contribute); ii) it regulates supply (by supervising the role of the pension fund management companies); iii) it finances

pensions (in the case of minimum social welfare and supplementary pensions), and iv) it manages and finances the old social security system and will continue to do so until that system comes to an end.

II

Pension funds, the capital market and saving

In order to highlight the contribution that pension funds can make to the financial market and saving, three arguments are usually put forward: i) that the accumulation of private funds is a source of long-term saving and ultimately of the provision of capital for enterprises and the development of the securities market; ii) that the competition for the intermediation of these funds helps economic growth by reducing the cost of such resources and allocating capital to the most efficient uses, and iii) that the compulsory contributions by workers do not take the place of other forms of saving.

1. Effects of the accumulation of pension funds

It is argued that a private pension fund is a source of capital for enterprises and support for the securities market, because it has a long-term saving structure and, unlike individual investments, offers the possibility of investing not only in assets such as shares and bonds but also in the financing of housing and infrastructural projects.

This is indeed true in schemes organized under the system of individual capitalization and in the "young" stages of unfunded systems which include the accumulation of reserve funds. In these cases, the social security contributions (or part of them, in the unfunded systems) are a potential source of long-term financial saving. With the exception of saving to cover possible disability or death (for which additional insurance is taken out), the contributions for old age pensions are built up during a long period. In the case of individual capitalization, if working life begins at the age of around 20 and ends at the age 65, without interruptions, each individual has 45 years to build up a stock of capital.

In this respect, two observations may be made in connection with the characteristics of the labour market and the stage of maturity of the system. Firstly, the introduction of private pension funds may in fact give rise to heavy current fiscal expenditure to aid those who do not manage to contribute during the whole of their working life. Although the average working life may last 45 years, there is no certainty that every person will be continuously employed dur-

ing the whole of that time. Either because of family circumstances (especially in the case of married women with household responsibilities) or labour market conditions (unemployment, underemployment, informal activity), there is no guarantee of continuity of employment. Consequently, if the State undertakes to give such persons minimum pensions, this obligation may come to be a substantial burden for the authorities.

Secondly, although in the accumulation of a fund the individually capitalized portion is insulated from demographic pressures, this does not guarantee that individual capitalization will be any better than the unfunded system for increasing private saving in the long term. It is necessary to consider what will happen with regard to this accumulation when the system matures, that is to say, when a large number of the participants are reaching retirement age. As long as the majority are still in the accumulation phase, and if no account is taken of the liabilities assigned to the government or other changes in the saving of the economic agents, then total saving could be greater. Subsequently, however, workers' saving will be offset by a growing number of pensioners who dissave, and demographic effects will recover their importance (Barr, 1993).

2. Effects of competition for the intermediation of the funds

It is argued that competition for the intermediation of pension funds aids economic growth by reducing the cost of capital resources and allocating them to the most efficient uses.

It is also argued that pension funds aid economic growth through the diversification of financial intermediaries, more efficient allocation of capital and improvements in productivity. The funds act as financial intermediaries between individuals and their future pension benefits, and if they do so in a competitive and transparent manner this will help their capital to be allocated to the most profitable investment opportunities. As they handle large amounts of money, their transaction and information costs are low, and if the regulations permit this they can invest in a broader range of assets (for

example in high-yield risk capital and innovative high-technology industries).

In order to achieve these objectives, individual capitalization calls for the (public or private) administration of the investment portfolio. This administration may be limited solely to investments in government securities, or it can also include private assets. The relative shares of government debt and private instruments in the fund will depend on the degree of development of the capital market.

In their present state, Latin American financial markets have two characteristics which militate against competitiveness: the first of these is the limited supply of risk-rated financial instruments in emerging markets, with the predominance of State securities, and the second is the economies of scale of the pension fund administration industry.

a) *Lack of financial development*

The Latin American markets have not yet developed the conditions needed to ensure that long-term financial saving (associated with pension funds) is intermediated to real investment projects which are reflected in private enterprise capital formation. The very limited development of suitable institutions is the main factor restricting the possibility that the financing needs of real long-term investment projects may be financed by pension funds. The low degree of diversification of the instruments, their low initial rating and the lack of the regulations needed to guarantee a suitable combination of risk and yield tend to give rise to yields which are due to the capital gains deriving from the excessive demand for certain instruments rather than the generation of wealth (or capital). The yields thus generated may quickly be reversed when the demand for those instruments dies down.

The dilemma lies in the fact that the portfolio approach applied to the investment of the funds does not ensure that the instruments available on the market are in keeping with the real investment needs of the country. The need to rate instruments according to their risk level in order to protect institutional investors contributes to this situation. The credit risk ratings associated with certain bonds issued by emerging enterprises or banks, as well as the risk ratings associated with enterprises in emerging markets which issue securities, leave large segments of business outside the reach of the pension funds.

The absence of institutions such as "second-tier banks" and the lack of mechanisms for the granting of concessions and the charging of suitable tariffs for infrastructural services, to give only two examples, prevents small businessmen from gaining access to such funds and hinders the private sector from contributing to investment in infrastructure. These big gaps in the markets for the intermediation of long-term resources result in a supply of financial instruments which are predominantly of a short-term nature.⁵ In these circumstances, the mere establishment of private pension funds is no guarantee of investment in capital.

b) *The conditions of competition in pension fund administration*

Both the management of the information on members and the intermediation of the funds are subject to growing economies of scale. Thus, in small economies (like most of the Latin American countries) the intermediation of pension funds is not carried out in conditions of real competition. This results in a concentrated industry, with imperfect competition, highly regulated, and with heavy management costs (largely for the marketing of the products they are trying to sell).

3. Social security saving compared with other forms of saving

The way the retirement fund is financed in the different pension systems of the region largely determines the contribution of the latter to national saving. Mention is often made of the negative effect that the fiscal deficit is supposed to have on private saving, in order to support the claim that such saving is higher in countries where pensions are financed with a private insurance scheme rather than by a State social security system, especially if the latter is unfunded. This argument calls for at least three comments (Barr, 1993). First, it is only during the period of accumulation of the fund that saving could be greater, since subsequently workers would only save

⁵ This tendency is strengthened by the fact that the pension fund administration companies (AFPs) have to comply with strict regulations when deciding on their investments (in order to ensure a suitable mix between risk and yield) and have to compete for members who are not educated to take decisions on the basis of long-term yields.

the same amount that pensioners dissave.⁶ Second, even when the fund is still in the accumulation stage, the compulsory saving may be taking the place of voluntary saving which would have been generated in any case: a matter on which there is considerable controversy (Feldstein, 1974 and 1979; Aarón, 1982; Barro, 1974 and 1978; Leimer and Lesnoy, 1982; Auerbach and Kotlikoff, 1990). And third, there is no certainty that this financial saving will be effectively reflected in productive investment and will thus represent an increase in saving as measured in the national accounts (Held, 1994; Held and Uthoff, 1995).

In the final analysis, the link between the provision of income for old age and capital accumulation has at least two different facets when studying the transition between two schemes of pension financing (Diamond, 1995). One is the amount of resources that must be transferred to the generations which were already retired when the system begins. The other is the response of private saving and the government budget to the particular design of the system.

The important point is comparison with the saving behaviour of families before the new method of financing was put into effect. A generous system which gives retired persons high levels of benefits compared with the contributions they made discourages voluntary saving and results in less capital than another scheme which does not do this.⁷ Conversely, a capitalization system which builds up a fund results in greater capital than one which does not do so. This does not mean that an unfunded system does not have any impact at all on capital accumulation, especially if it is compared with a situation in which a compulsory system does not exist. If workers do not save voluntarily, neither the taxes paid nor the promises of future benefits can alter saving; consumption will be transferred from the young generations to the old ones. In contrast, if workers act rationally and make voluntary savings for their old age, there will be a reduction in current saving in response to greater expected benefits and to any gain or loss of wealth in

the course of life. As both types of workers exist at the same time in reality, the response of saving to the design of the system is difficult to determine.

Likewise, the impact on government saving will depend on the adjustment of other taxes and government expenditure in line with the existence of a given system of retirement contributions. In particular, if the capitalization system serves to finance and ultimately increase government consumption, then it will not contribute to capital accumulation. If the transition requires the social security debt to be made explicit and financed, however, it can significantly modify government saving and, depending on the type of financing, can also affect private saving.

Individual capitalization will require some form of administration (public or private) of the corresponding portfolio of investments. This may be restricted solely to public debt instruments, or it may be invested in private assets, which will influence government expenditure. The relative shares of public securities and private instruments in the fund will depend on the degree of development of the capital market. This composition will be a more important issue in small and segmented capital markets, since in large flexible markets the difference between the aggregates resulting from the selection of instruments will only be small and is explained by small changes in the corresponding yields. A drop in the yield of private instruments and a rise in that of public debt securities will affect government investment and expenditure. The long-term aggregate effect of an "open market operation" which changes the mix of the investment portfolio between public debt and private instruments will not be very significant. In small and segmented capital markets, in contrast, investments have little mobility, which makes it more difficult to estimate the yield of the workers' funds implicit in a given system of retirement contributions.

Three observations may be made on the way of measuring the impact on saving in the light of the foregoing considerations. First, the effect of a compulsory individual capitalization scheme on saving (and the yield on capital) cannot be evaluated without taking into account both the capitalization component and the redistributive component. Both of these must be taken into consideration when comparing that effect with the effect produced on saving (and the yield of capital) by a single redistributive system. This phenomenon is particularly important when changing from one system to another; the financing needed to

⁶ Indeed, the Chilean case shows that changing from a (mature) unfunded system to an (incipient) individual capitalization system causes the fiscal deficit associated with the payment of the pensions of retired persons and recognition bonds in respect of the past contributions of those who changed to the new system to be greater than the saving of the workers in the new system (Arrau, 1996).

⁷ This should not invalidate the purpose of providing good pensions through these transfers, however, since they raise the consumption of those receiving them.

cover the rights acquired under the old system will have to come one way or another from future contributors and must be taken into account in the calculations on saving (and on the yield on capital).⁸

Second, the net effect that the change in the system will have on workers' saving must be evaluated. The replacement of voluntary saving by compulsory saving when moving from one system of retirement pension financing to another raises questions which are difficult to answer. It is not possible to attribute the transfer of contributions to savings accounts as a net contribution to workers' saving without first analysing the changes in the saving behaviour of families, enterprises and the government caused by such measures.

Third, it should be borne in mind that if the reform promotes investment in private instruments

it can make an important contribution to the promotion of saving through the development of the capital market. That development and its effects on saving depend on a number of factors, however, and not exclusively on the reform of the pension financing system. Changes in the financial sector which include different types of regulation form part of the process of liberalization of various markets and also of the process of privatization of many activities which were originally in the hands of the public sector. The benefits resulting from pension system reform in each country will depend on the degree of development of its capital market before the reform and also on inherent difficulties in its markets which will not respond solely to improvements in the regulatory framework.

III

Examples from the Chilean experience

1. The cost of the transition

It has been asserted that the costs of transition from an unfunded system to an individual capitalization system are long-term commitments which can affect the long-term saving flow.

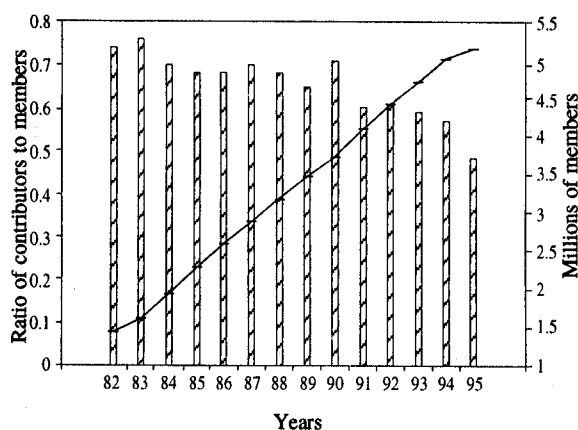
The Chilean experience indicates that the social security commitments inherited from the previous system and the current commitments with those who do not have stable employment may become a serious problem.

Figure 1 analyses the problem associated with the Chilean labour market structure. It is noted that during the period 1981-1995, although the number of

members of the system increased, the proportion of them making contributions went down. Thus, while the number of members has come to represent 100% of the labour force, those who actually make contributions under the system only amount to 56%. This problem is associated with delays in the payment of contributions and employment instability. The information presented shows that these phenomena appear to be most marked in segments of the population

FIGURE 1

Chile: Number of members and ratio of contributors to members, 1982-1995

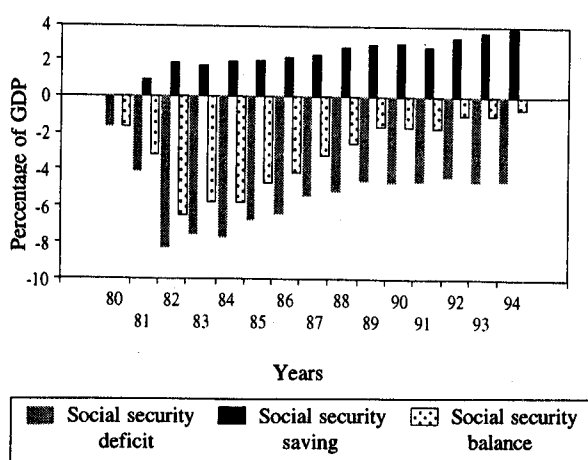


Source: Klevens (1996), on the basis of official data.

⁸ When changing from defined benefits to defined contributions, there are two alternatives for financing the benefits inherited from the system in force before the reform; both of them have substantial consequences for economic policy in the transitional period, since they identify those who must pay the cost of the transfer. The first alternative is financing through current taxes; in this case, the transfers to previous generations are made by the generations actively employed during the transition, who may not be in the most suitable position to bear such a tax burden. The second alternative is financing through indebtedness, converting the implicit debt into explicit debt. Such conversion affects the growth of the debt and may have indirect consequences, probably on the determination of who is to pay for the transfers which have been made, on other government taxes and expenditure, or simply on the perceptions prevailing in the bond market (Diamond, 1995).

FIGURE 2

Chile: Saving and dissaving flows directly associated with pension system reform, 1980-1993



Source: Arrau (1996), on the basis of data from the Social Security Normalization Bureau (INP).

which accumulate little (possibly the lower-income segments) and/or are engaged in own-account activities. These persons are granted a minimum pension (when they comply with certain minimum requirements).⁹ This minimum pension is fixed in the national budget, and although it has come to represent an increasingly small proportion of the minimum wage, it may have a substantial incidence on the fiscal budget, thus affecting government saving.

Figure 2 analyses the possible impact of the social security commitments associated with the maturity of the old system. It shows that in the Chilean case the saving associated with the individual capitalization system (which is in course of formation), together with the fiscal commitments¹⁰ associated with the unfunded system (already mature), give a consistently negative balance (Arrau, 1996). With small variations, and in view of the fact that the debt owed to those who moved from the old system is paid in the form of bonds, the flow can correspond to the withdrawal of funds that will take place in the individual capitalization system when it is mature.

⁹ A minimum pension is guaranteed to all those pensioners who, while having contributed to the new and/or old system for a cumulative total of 20 years in the course of their active life, have not accumulated sufficient funds to obtain the minimum benefit.

¹⁰ These consist of the payment of pensions to retired persons and recognition bonds in respect of the past contributions of those who move to the new system.

2. Intermediation of the funds

a) Absence of financial development

The figures for Chile also confirm the importance of the degree of development of the financial market for the individual capitalization system. In 1996, after 15 years of operation of the system, the pension funds still put over 60% of their total investment in instruments which do not represent investments in real capital (figure 3). Furthermore, the Chilean pension funds have their investments highly concentrated in State instruments, especially Central Bank promissory notes (figure 4), and when they increase their investment in shares the real level of the selective or general share index rises significantly (figure 5).

FIGURE 3

Chile: Proportions of instruments other than bonds, shares and mortgage bills in the pension fund management companies' portfolios, 1981-1995

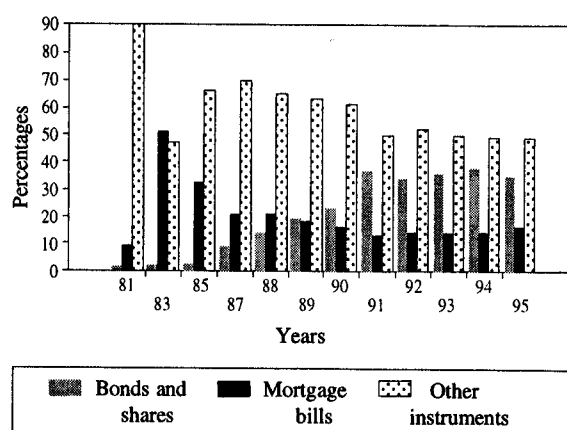


FIGURE 4

Chile: Proportion of State instruments in pension fund management companies' portfolios, 1981-1995

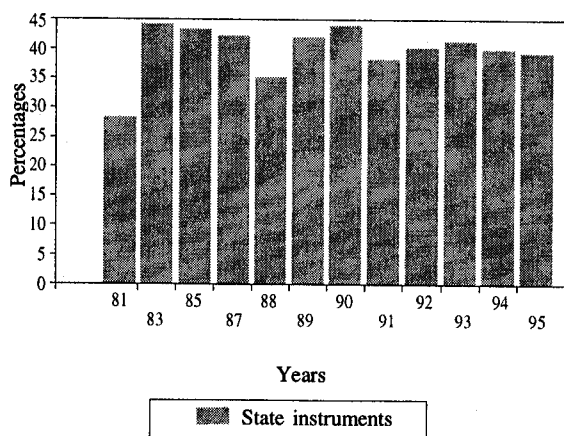
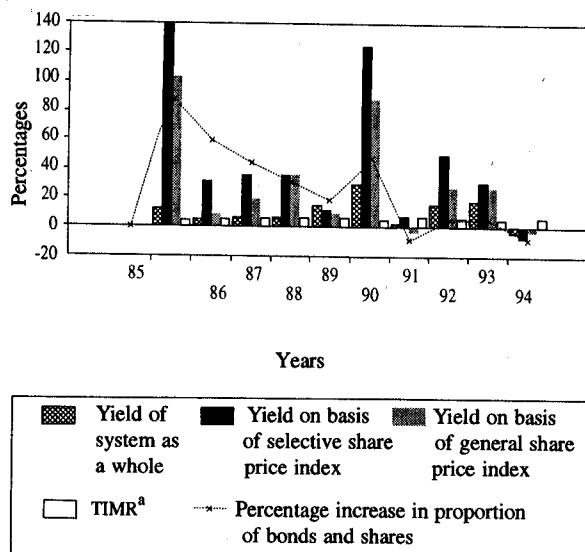


FIGURE 5

Chile: Real yield of shares and demand for shares by the pension fund companies
(Twelve-month averages, per cent)



^a TIMR = Average Domestic Rate of Return (of fixed-income instruments on the domestic market).

The difficulty of channeling these funds directly into real investment is clear from the figures. In 1995, after nearly 15 years of operation, 40% of the pension funds were still invested in Central Bank promissory notes whose counterpart is the accumulation of international reserves but not the direct generation of real capital, while a further 10% were in time deposits and other financial instruments whose results in terms of capital formation are neither certain nor direct.

In more direct support for real investment, 16% have been channeled into housing finance through the acquisition of mortgage bills of the banks providing housing loans. Only 5% have been used for the acquisition of bonds issued by private companies, and 30% for the purchase of shares. Moreover, the latter are shares which already existed on the stock exchange and do not necessarily correspond to increases in capital. The funds have benefited from increases in share prices due largely to their own demand, which does not have any direct effect on capital accumulation.

The composition of the current investment portfolio of the funds does not give any guarantee that the whole of the long-term saving has been allocated to capital formation, and this is manifested in various ways. The profitability associated with the increase in share prices is subject to the volatility of those

prices, and furthermore it may be assumed that the Central Bank is not likely to continue to accumulate international reserves at the rate of previous years. This situation was already clearly visible in 1995, when the pension funds registered negative profit margins. It is important to recall, in this respect, that the profits on members' funds which have not yet been withdrawn are due but not actually paid, and are subject to regulations imposed by the government authorities, who are concerned to strike a fair balance between risk and yield. Thus, for example, between 1986 and 1995 the real annual yield due on the pension funds has been 10.8%, whereas an individual investor who invested in 1986 in a package of shares included in the selective share price index (IPSA) or the general share price index (IGPA) and sold those shares in 1995 would have obtained real annual yields of 39.9% and 27.3%, respectively. If he had invested his money in fixed-income instruments, the yield would have been 6.4%. A pension fund member can only obtain the real yield of his funds when he retires, and by then it is possible that the shares may have gone down in price and that there are no other shares to make up for those declines. This, together with the fact that workers can only use their funds to accumulate capital to finance their pensions (for example, they cannot use them as collateral for other needs during their working life), sheds some doubt on the assumption that workers who are members of this system are more ready to view the relations between capital and labour in a new light.

In the final analysis, the system needs two changes. On the one hand, it needs a process of institutional development in the financial market which will facilitate the increasing assignment of resources to real investment projects, and on the other hand, from the point of view of the pensioners, there should be facilities enabling the pension fund management companies to manage alternative funds designed to ensure that those who are close to retirement age receive the yields due up to that moment (especially if they have been high). This means insulating the fund from possible disturbances in the financial markets.

b) *Concentration and inefficiency of the pension fund management industry*

Figures 6 and 7 show two features of Chilean pension funds: the fact that their management is concentrated in the three largest pension fund management companies, and the fact that their financial

FIGURE 6

Chile: Total number of pension fund management companies (AFPs) and market shares of the three biggest companies, 1981-1995

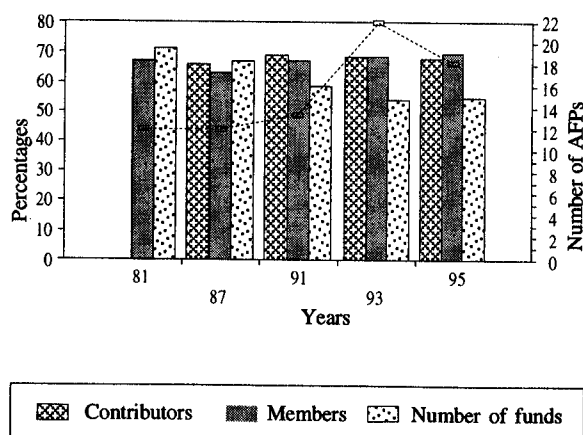
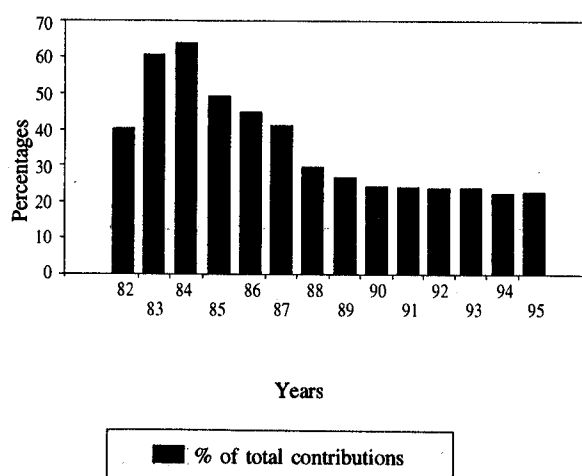


FIGURE 7

Chile: Average management costs of pension fund companies, 1982-1995
(As a percentage of total contributions)



management costs (including the contracting of insurance policies in respect of disability, old age and death benefits), although they have gone down, are still high when expressed as a percentage of the total contributions.

The big accumulation of resources belonging to third parties and their concentration in a few pension fund management companies operating in a non-competitive market give rise, *inter alia*, to three serious market flaws which affect the efficient allocation of resources. First, the problem of the implicit insur-

ance already observed in the case of the banks has been extended to the insurance companies providing pensions. Second, the lack of information on complex aspects of the product demanded (the administration of third-party funds and lifetime benefits) is passed on to members, which means that attention should be given to protection of users and to the competitive bases of the system. Third, the product has to be differentiated through aggressive marketing, with heavy administration costs for each individual account. Thus, for example, in the case of Chile the explosive growth of the sales force for attracting members by emphasizing secondary aspects has prevented the management costs from continuing to go down and has opened up many opportunities for abuse of information which must be avoided (Arrau, 1994).

In short, the intermediation of the funds of third parties in Chile is far from taking place in a competitive market, so that there is an urgent need to regulate the capital market and the pension system in order that the capital resources may be allocated efficiently. This means in turn that new financial enterprises must be set up. In small markets like those of Latin America, serious measures will be needed for the regulation of financial conglomerates in order to ensure efficient allocation of the funds of third parties.

3. Social security saving competes with other forms of saving

In Chile, national saving has grown by 17 percentage points of GDP since the initiation of the pension system reform. It is not clear how much of this result is due exclusively to that reform. There are important mutual relations between compulsory and voluntary forms of saving, as well as between the variables through which the different economic reforms and the macroeconomic context could influence the saving of the economic agents. In order to take account of the simultaneous action of all these variables and the complex relationships between them, highly sophisticated models will be needed to isolate the effect that the change in the manner of financing pensions would have on saving.

Nor is the necessary information available for specifying the factors determining the saving effected by the different economic agents and their interrelations. Two different forms of accounting will give rise to two different interpretations of the same source of information (Arrau, 1996). The two sources

TABLE 3

Chile: Gross national saving and external saving, 1970-1994
(As a percentage of GDP, at current prices)

Year	Base 1977 ^a			Base 1986 ^b		
	Gross national saving	External saving	Total gross saving	Gross national saving	External saving	Total gross saving
1970	15.2	1.2	16.4	...	...	...
1971	12.4	2.1	14.5	...	...	...
1972	8.3	3.9	12.2	...	...	...
1973	5.2	2.7	7.9	...	...	...
1974	20.7	0.4	21.3	...	...	...
1975	7.9	5.2	13.1	...	...	...
1976	14.5	-1.7	12.8	...	...	...
1977	10.7	3.7	14.4	...	...	...
1978	12.6	5.2	17.8	...	...	...
1979	12.4	5.4	17.8	...	...	...
1980	13.9	7.1	21.0	...	...	...
1981	8.2	14.5	22.7	...	...	...
1982	2.1	9.2	11.3	...	...	...
1983	4.4	5.4	9.8	...	...	...
1984	2.9	10.7	13.6	...	...	...
1985	5.4	8.3	13.7	7.8	9.4	17.2
1986	7.7	6.9	14.6	11.5	7.3	18.9
1987	12.6	4.3	16.9	17.3	5.0	22.2
1988	16.3	0.7	17.0	22.3	0.5	22.8
1989	17.2	3.1	20.3	23.7	1.9	25.5
1990	17.5	2.8	20.3	24.2	2.0	26.3
1991	19.0	-0.2	18.8	24.1	0.4	24.5
1992	19.6	1.7	21.3	24.8	2.0	26.8
1993	...	...	...	23.9	4.8	28.8
1994	...	...	...	25.4	1.4	26.8
Average 1970-1979	12.0	2.8	14.8	...	...	...
Average 1980-1984	6.3	9.4	15.7	...	...	...
Average 1985-1992	14.4	3.5	17.9	19.5	3.6	23.0

Source: Arrau (1996) and the sources indicated below.

^a Up to 1988, Banco Central de Chile (1989). From 1989 on, Banco Central de Chile (1993b).

^b Up to 1989, Banco Central de Chile (1993a). From 1990 on, Banco Central de Chile (1995).

available are, on the one hand, the national accounts, which provide series on national public and private saving (table 3)¹¹ and, on the other hand, the series on the social security deficit, which make the prior debt

explicit, and on the social security saving assigned to workers who are members of the new pension system, which is the same as the contribution to the individual accounts (table 4).¹²

¹¹ Table 3 shows the changes in the series on national and external saving resulting from the new methodology used for estimating the national accounts from 1986 on. The gap in the national accounts series is still substantial, even though it has been reduced from 45% to 27%. The main changes which affect the measurements of the product, income and saving at current prices are: i) the manner of taking account of VAT in the valuation of intermediate purchases, final purchases, imports and sales; ii) the manner of including bank imputations in order to avoid differentials with negative rates; iii) the manner of imputing investment to provide greater coverage of industrial goods of domestic origin and the construction sector, and the reclassification of certain imported goods from the category of inputs to that of capital goods (Central Bank, 1993a). At constant prices, the change in base also influences the results by affecting the relative prices used in making the calculations.

¹² Table 4 shows two series relating to the transition from the unfunded system to the individual capitalization system. On the one hand there is the social security deficit caused because the government continues to be responsible for the commitments acquired under the old system in two different ways: i) by paying the pensions of those beneficiaries of the old system who were already receiving disability, survival or retirement benefits in 1981 (the operating deficit), and ii) by recognizing the contributions made under the old system in the past by those active workers who decided in 1981 to change to the new system (recognition bond). On the other hand, there is the compulsory saving represented by the compulsory contributions that workers have to make under the new system in the form of their contributions to their individual retirement accounts.

TABLE 4

Chile: Social security deficit and saving in the transition, 1980-1994

Year	Government ^a	Families ^b
	Total social security deficit	Social security saving
1980	1.7	-
1981	4.1	0.9
1982	8.3	1.8
1983	7.5	1.7
1984	7.7	1.9
1985	6.7	2.0
1986	6.3	2.2
1987	5.4	2.3
1988	5.2	2.7
1989	4.5	2.9
1990	4.6	3.0
1991	4.5	2.8
1992	4.3	3.3
1993	4.5	3.6
1994	4.5	3.9
Average 1980-1984	5.9	1.6
Average 1985-1989	5.6	2.4
Average 1990-1994	4.5	3.3

Source: Arrau (1996) and the publications mentioned below.

^a1980-1984: Arrau (1992). 1985-1988: Arrau (1992), adjusting the figures by GDP, base 1986. 1989 on: Chile, Ministerio de Hacienda, Dirección de Presupuesto (1995).

^b Private saving less saving by enterprises.

The breakdown of national saving into public and private saving is carried out here on the basis of the general government income and expenditure performance accounts, which do not include the results of public enterprises or the cash situation of the Central Bank (table 5). Both these are consolidated in the balance, together with the saving of private enterprises.¹³ The estimates of public saving also include the deposits in the Copper Stabilization Fund (FEC), which do not form part of the definition of current general government surplus or saving.

a) *The first form of accounting*

Under this form, private personal saving is increased by the amount of social security saving, and the social security deficit has to be financed from the current budget of the government.

Public saving, estimated as the sum of the current account surplus plus the FEC, includes the social security deficit as a government outlay whose financ-

¹³ For the purposes of this calculation, it is assumed that the total saving of public enterprises will be cancelled out by the Central Bank cash deficit (Arrau, 1996).

ing is reflected in the budget. The deficit appears implicitly in the current account result. Under this form, the compulsory social security saving of workers is considered as personal saving.¹⁴ The financing of the social security deficit by the government involves an adjustment in its current accounts.

In this option (and using these assumptions), the direct effects of pension system reform on national saving are only small. There is an increase in personal saving equal to the net contributions by workers to their individual accounts (this figure increased from 0.5% in 1980-1981 to 3.6% in 1992-1994) and an adjustment in the government accounts to finance the cost of the transition which is substantial but is not sufficient to maintain the current surplus (as a percentage of GDP) registered before the crisis (the surplus went down from 7.2% of GDP in 1980-1981 to 4.9% in 1992-1994).¹⁵ In net terms, it could be said that the reform only directly increased national saving by 0.8 percentage points of GDP, since personal saving increased by 3.1 points of GDP between the two periods, while the current surplus component of public saving went down by 2.3 points of GDP because of the impossibility of adjusting the government accounts by the total amount of the social security deficit. Under this form of accounting, the bulk of the increase in national saving came from an increase in non-social security private saving, and the reform only has an indirect effect on this saving.

b) *The second form of accounting*

In this form, the social security deficit has to be added to the current surplus in order to estimate the public saving effort, while it must be deducted from compulsory private saving.

In order to highlight the public sector saving effort that must be made to bring about the transition

¹⁴ This form assumes that families compensate for every other form of saving. In particular, it is assumed that saving in the form of social security contributions and payments of mortgage debts by some persons is offset by the dissaving of other persons who receive benefits from the social security and housing programmes. Rather than being the result of empirical observations, this is a simplifying assumption to facilitate the calculations in view of the lack of reliable information on these variables and their interactions.

¹⁵ In making this comparison, it must be borne in mind that the current surplus of the government has not only been affected by the need to finance the social security deficit, but also by the recession and the fiscal costs of the period of adjustment to the external debt crisis.

TABLE 5

**Chile: Breakdown of national saving, without
inclusion of social security deficit, 1980-1994**
(As a percentage of GDP, at current values)

Year	Gross national saving ^a	Government saving			Private saving		
		Current surplus ^b	Copper Stabilization Fund (FEC) ^b	Total	Social security ^c	Non-social security ^d	Total ^e
1980	13.9	8.5	-	8.5	-	5.4	5.4
1981	8.2	5.8	-	5.8	0.9	1.5	2.4
1982	2.1	-2.9	-	-2.9	1.8	3.2	5.0
1983	4.4	-2.3	-	-2.3	1.7	5.0	6.7
1984	2.9	-1.2	-	-1.2	1.9	2.0	4.1
1985	7.8	0.4	-	0.4	2.0	5.4	7.4
1986	11.5	1.3	-	1.3	2.2	8.0	10.2
1987	17.3	3.0	0.5	3.5	2.3	11.5	13.8
1988	22.3	3.0	3.0	6.0	2.7	13.6	16.3
1989	23.7	3.0	3.7	6.7	2.9	14.1	17.0
1990	24.2	2.5	2.3	4.8	3.0	16.4	19.4
1991	24.1	3.7	0.7	4.4	2.8	16.9	19.7
1992	24.8	4.9	0.3	5.2	3.3	16.3	19.6
1993	23.9	4.8	-0.2	4.6	3.6	15.7	19.3
1994	25.4	4.9	0.2	5.1	3.9	16.4	20.3
Average 1980-1984	6.3	1.6	-	1.6	1.6	3.5	4.7
Average 1985-1989	16.5	2.1	2.4	3.6	2.4	10.5	12.9
Average 1990-1994	24.5	4.2	0.7	4.8	3.3	16.3	19.7

Source: Arrau (1996) and the publications mentioned below.

^a Up to 1984, data with base 1977. Since 1985, data with base 1986.

^b Up to 1988, Vial and Marfán (1995). Since 1989, Chile, Ministerio de Hacienda, Dirección de Presupuesto (1995).

^c Up to 1988, AFP Hábitat (1992). Since 1989, Superintendencia de Administradoras de Fondos de Pensiones (1994).

^d Private saving less personal saving.

^e Gross national saving less public saving.

from an unfunded system to an individual capitalization system, there is an alternative form of calculation based on a different interpretation of the original unfunded system. In this form of calculation, the benefits provided by the previous system are considered old debt that the government cannot refinance with new debt because the new system prevents it from collecting contributions. As both types of debt appear in the current accounts of the government authorities, it is argued that the social security deficit should be excluded from the current surplus of government in order to reflect the true saving effort that the latter must make to pay the old debt without being able to obtain new debt through the social security system itself. In this case, it is necessary to offset private saving by the amount of the social security deficit, which is done by deducting that deficit from personal saving. This adjustment is justified on the grounds that persons receive capital transfers (payment of the old debt in the form of benefits) in an amount which is larger than the compulsory deductions for the new system (social security saving).

In this form of calculation (and using these assumptions) the reform will continue to have small direct effects on national saving, but only with a significant saving effort on the part of the government (table 6). In this case there is a reduction in the dissaving of individuals (which went down from -2.5 % in 1980-1981 to -0.6 % in 1992-1994) corresponding to the changes in their net transfers of capital with the authorities (benefits from the old debt and contributions to the individual capitalization system). There is also a major saving effort on the part of the public sector, in spite of the recession due to the crisis of the 1980s. Thus, saving barely went down at all, from 10.1% of GDP in 1980-1981 to 9.3% in 1992-1994 (not including the FEC). The net direct effect on saving is the same as in the previous exercise, but is due to a reduction in the dissaving of persons and a slight fall in public saving in its components corresponding to financing of the social security deficit and current account surplus. The bulk of the increase in national saving is the result of increased non-social security private saving.

TABLE 6

**Chile: Breakdown of national saving, including
the social security deficit, 1980-1994**
(As a percentage of GDP, at current values)

Year	Gross national saving ^a	Government saving				Private saving		
		Total social security deficit ^b	Current surplus ^c	Copper Stabilization Fund (FEC) ^c	Total	Social security saving ^d	Non-social security saving	Total ^e
1980	13.9	1.7	8.5	...	10.2	-1.7	5.4	3.7
1981	8.2	4.1	5.8	...	9.9	-3.2	1.5	-1.7
1982	2.1	8.3	-2.9	...	5.4	-6.5	3.2	-3.3
1983	4.4	7.5	-2.3	...	5.2	-5.8	5.0	-0.8
1984	2.9	7.7	-1.2	...	6.5	-5.8	2.2	-3.6
1985	7.8	6.7	0.4	...	7.1	-4.7	5.4	0.7
1986	11.5	6.3	1.3	...	7.6	-4.1	8.0	3.9
1987	17.3	5.4	3.0	0.5	8.9	-3.1	11.5	8.4
1988	22.3	5.2	3.0	3.0	11.2	-2.5	13.6	11.1
1989	23.7	4.5	3.0	3.7	11.2	-1.6	14.1	12.5
1990	24.2	4.6	2.5	2.3	9.4	-1.6	16.4	14.8
1991	24.1	4.5	3.7	0.7	8.9	-1.7	16.9	15.2
1992	24.8	4.3	4.9	0.3	9.5	-1.0	16.3	15.3
1993	23.9	4.5	4.8	-0.2	9.0	-0.9	15.7	14.9
1994	25.4	4.5	4.9	0.2	9.6	-0.6	16.4	15.8
Average 1980-1984	6.3	5.9	1.6	-	7.4	-4.6	3.5	-1.1
Average 1985-1989	16.5	5.6	2.1	2.4	9.2	-3.2	10.5	7.3
Average 1990-1994	24.5	4.5	4.2	0.7	9.3	-1.1	16.3	

Source: Arrau (1996) and the publications mentioned below.

^a Up to 1984, data with base 1977. Since 1985, data with base 1986.

^b 1980-1984: Arrau (1992). 1985-1988: Arrau (1992), adjusting the figures by the GDP with base 1986. Since 1989: Chile, Ministerio de Hacienda, Dirección de Presupuesto (1995).

^c Up to 1988: Vial and Marfán (1995). Since 1989: Chile, Ministerio de Hacienda, Dirección de Presupuesto (1995).

^d Private saving less personal saving.

^e Gross national saving less public saving.

c) Supporting a climate favourable to saving and investment through development of the capital market

The big increase in non-social security private saving may be interpreted as the result of the indirect effects of the pension system reform on national saving: after the entry into force of the social security reform this saving increased from 8.0% of GDP in 1986 to 16.4% in 1994. This result was also considerably influenced by an average GDP growth rate of over 6% and rapid financial development. The indirect effects of the reform would appear to be due to the fact that it contributed to a deliberate, systematic policy of developing the securities and insurance markets, together with firm regulation and prudential supervision of the pension funds (Held, 1994).

The rapid growth which has taken place in the funds, and which is projected to continue in the future,¹⁶ has raised the challenge of providing the capital market with a solid set of institutions which will allow these funds to be channeled towards profitable

uses with limited risks. The development of these institutions has been considered a decisive factor in the accumulation of funds—which had a real average yield of around 13% per year between 1981 and 1994—and their consolidation in time (Arrau, 1994).

The institutional development of the securities and insurance market has taken place gradually since the end of 1980. From that time on, regulations were adopted for the pension funds, their respective management companies, and the Office of the Superintendent responsible for their regulation and supervision. The authorities of the financial system are making a continuing effort to update and perfect the regulations on open limited companies, the issue and trading of securities on public sale, the transpar-

¹⁶ By the end of 1994, the new pension system had accumulated funds with a value at market prices of US\$ 22.3 billion (44% of GDP). By around the year 2015 the pension funds could be equivalent to the entire GDP.

Box 2

CHILE: DEVELOPMENT OF INSTITUTIONAL AND REGULATORY FRAMEWORK FOR PENSION FUND MANAGEMENT COMPANIES AND THE SECURITIES MARKET

November 1980	(Decree-Law) D.L. No. 3.500	Set up private pension systems, including Pension Fund Management Companies (AFPs) and the Office of the Superintendent of Pension Fund Management Companies (SAFP)
December 1980	D.L. No. 3.538	Organic Law for the Office of the Superintendent of Securities and Insurance (SVS)
October 1981	Law No. 18.045	Law on the Securities Market
October 1981	Law No. 18.056	Law on Joint Stock Companies
December 1985	Circular No. 574 of the SVS	Defines "related persons"
January 1986	Circular No. 585 of the SVS	Makes it obligatory to report share transactions effected by majority shareholders, directors and executives
March 1986	Circular No. 601 of the SVS	Makes it obligatory to report any event which could significantly affect the activities of open joint stock companies
October 1987	Law No. 18.660	Makes it obligatory to classify publicly offered securities by risk categories on an ongoing basis
July 1989	Law No. 18.815	Law on Investment Funds. Allows pension fund management companies to invest in real estate, transferable securities and risk capital.
December 1989	Law No. 18.876	Regulates the establishment and operation of private establishments for the safe-keeping of securities
May 1992	Agreement of the Risk Classification Commission	Authorizes pension fund management companies (AFPs) to invest in projects without a prior history
May 1993	Circular No. 776 of the SAFP	Makes it obligatory to provide standardized information on the rate of return of individual pension accounts, by income brackets of members
1993	Bill	Proposes substantial changes in the laws on the securities market: Establishes security analysis companies Makes improvements in the risk classification industry Defines the responsibilities of stockbrokers dealing in bonds Establishes funds for investments in business development (FIDEs) Strengthens the regulations on the solvency of insurance companies Establishes more flexible limits on the investments of AFPs Regulates the risk factors for foreign investments by AFPs
Source: Arrau (1994).		

ency of the market, the rating of securities by risk categories, the gradual expansion of the investment options open to the pension funds, adjustments in the investment limits per instrument and issuer, ongoing improvement of the life insurance industry, redefinition of the role of the regulatory bodies, and other aspects demanded by a capital market which is rapidly expanding (box 2).

Since the compulsory savings of workers will be their main source of income after they retire, the prudential regulation includes the following rules: pension funds can only invest in financial instruments

authorized by law; the equity of the pension fund management companies must be completely separate from the pension funds themselves, and they must guarantee a certain minimum yield in managing the latter; all securities must pass through rigorous risk evaluation procedures and must be rated in low-risk categories; and the portfolio of assets must maintain broad diversification in terms of instruments and issuers and must be subject to continuous valuation at market prices, while the securities making up the portfolio must be held in the Central Bank for safe-keeping (Iglesias and Acuña, 1991).

In the evolution of the Chilean capital market, not enough links have been established with the long-term financing of real investments, for which pension fund resources are particularly suitable.^{17 18} They have, however, helped to create a context of stability, ensuring depth and stability in the financial sector, which has helped to strengthen a favourable environment for saving and investment (boxes 3 and 4).

At present, there are signs that point to the likelihood of an increase in the channeling of pension funds to real investments. The extraordinary rise in the prices of shares between 1986, when the pension funds were first authorized to invest, and 1994¹⁹ now gives companies strong incentives to procure resources by issuing shares. The proportions of pension funds invested in business development investment funds and real estate investment funds are registering a rapid increase (albeit from low levels). In the near future, the financing of investments in infrastructure will also provide the pension funds with new investment options.

Nevertheless, it is not possible to attribute the increase in non-social security private saving exclusively to the development of capital markets resulting from pension system reform. There are various other factors at the economic and financial level which have contributed to saving and investment: i) for over ten years inflation has been kept under control and has shown a gradual downward trend, while mechanisms have been developed for the indexing of financial instruments; ii) interest rates in the financial system have been positive in real terms, but also moderate and in keeping with the productivity of capital; iii) the real exchange rate has been realistic

and credible; iv) economic activity has expanded at rates of over 5% for a number of years; v) the financial situation of the public sector has been strengthened through the solvency and autonomy of the Central Bank, the elimination or reduction of quasi-fiscal burdens and the financing of the social security deficit, and vi) the banking system has been reformed, strengthening the solvency of banks and debtors and promoting prudential regulation and control of guarantees and deposit insurance, together with regulation of banking system organization (table 7).

A particularly important element in this context has been the promotion of investment through tax incentives designed to encourage the reinvestment of profits by retaining family income in the form of saving in enterprises. Thus, the 1984 Chilean tax reform was aimed explicitly at providing tax incentives for the reinvestment of profits, since it significantly reduced the marginal rate of tax on the retained profits of companies, compared with the tax on distributed profits. This reform gave the same tax treatment to both joint stock companies and limited companies, eliminating the extra tax on the former; made retained profits subject only to the Category I tax of 10%; eliminated retained profits from the taxable income of limited companies, and made tax credit for the Category I tax the same for all types of entrepreneurs (table 8). This reform came into effect in 1987 with the gradual reduction of tax rates and made "in-house" saving an extremely advantageous option for businessmen. For the first time in the tax history of the country, the marginal rate of personal taxes was very different from the rate on retained profits.²⁰

¹⁷ At the end of 1994, the following instruments accounted for 90 % of the investment portfolios of the pension funds: Central Bank securities, 38.5%; shares in open limited companies, 31.7%; mortgage bills, 13.7%, and bonds, 6.3%. Neither the Central Bank securities nor the shares are directly related with real investments, since in the latter case the shares in question are acquired on the secondary market (although there have undoubtedly been some favourable indirect effects which have spread throughout the capital and credit markets through the broader availability of funds and growing macroeconomic stability).

¹⁸ An important exception in this respect is the development of housing finance. Mortgage bills are issued by the banks and acquired by the pension funds in order to provide housing finance, including housing for middle and high income groups,

which is also subject to a requirement for prior saving. These bills represent a considerably smaller percentage of the portfolios of the funds than the securities mentioned earlier, but they do form part of a complete capital formation chain. This has been a decisive factor in the dynamism shown by investment in housing over the last ten years. There is a similar situation in the case of bonds, which have also been linked with the provision of finance for the investment projects of large companies.

¹⁹ The real price index of shares rose from 100 in 1985 to 2719 in 1993.

²⁰ In 1990, the rate of the Category I tax was raised from 10% to 15%, but the difference with the personal income tax rate continues to exist, since the latter rate was also increased in that year.

Box 3**CHILE: ENVIRONMENT OF THE PENSION SYSTEM BASED ON INDIVIDUAL CAPITALIZATION OF FUNDS****A. Macroeconomic environment****1. Low and controlled inflation (or an indexed financial system)**

Long time horizon for the individual capitalization system

Extension of the time horizon for economic agents' decisions

- Medium- and long-term financial instruments

- Investment projects

Elimination of risk associated with price system fluctuations

2. Positive but moderate real interest rates

Efficiency in real and financial resource allocation

Solvency of financial institutions and debtors

Attractiveness of national-currency financial instruments

3. Realistic and credible exchange rate

Attractiveness of profitable projects in production sectors with competitive advantages
Prevention of speculative capital movements between the country and the exterior

B. Financial environment**1. Strengthening of the public sector's financial situation**

Financing of the social security deficit

Solvency and autonomy of the Central Bank

Elimination or reduction of quasi-fiscal burdens on the financial system

2. Reform of the banking system

Solvency of banks and debtors

Reform of prudential regulation

Guarantees or insurance on deposits

Mechanisms to keep a check on solvency

Organizational reforms

- Multi-purpose banking

- Financial complementation of banking system

3. Development of securities and insurance markets

Attractiveness of the Stock Exchange

Conditions for gaining access to the Stock Exchange

Legal requirements for open limited companies

Requirements for clear and reliable information

Prudential regulation of institutional investors (AFPs, insurance companies)

Diversification of portfolios and limitation of risks

Establishment of reserves

Minimum capital requirements

Classification of financial instruments by level of risk

Safe-keeping of securities

Expansion of the market

Incentives for new open companies

Incentives for new financial intermediaries

Incentives for the issue of new securities

Box 4

CHILE: PRUDENTIAL REGULATION REQUIREMENTS FOR PENSION FUND MANAGEMENT COMPANIES

A. Management companies

1. Management company's assets must be completely separate from those of the fund itself
2. Each management company can manage only one fund
3. Management companies must guarantee a certain minimum rate of return of the fund, drawing if necessary on a compulsory reserve fund maintained by the company in the Central Bank

B. Investment portfolios of the funds

1. Pension funds can only invest in securities or financial instruments authorized by law.
2. All securities or instruments in which the funds invest must first have been favourably rated by the Risk Classification Commission.
3. Strict rules are applied with regard to the diversification of the portfolios by types of financial instruments and issuers, in order to ensure a low risk profile for the funds.
4. As a general rule, all securities and financial instruments must be traded on Stock Exchanges or other established secondary markets.
5. The investment portfolios must be valued daily in a standardized manner on the basis of prices supplied by the Office of the Superintendent of Pension Fund Management Companies.
At least 85% of the portfolio must be valued at market prices.
6. At least 90% of the securities and other instruments making up a pension fund company's investment portfolio must be deposited with the Central Bank for safe-keeping.

TABLE 7

Chile: Indicators of the macro-financial environment, 1987-1994

Year	Inflation ^a	Indexed value				Real interest rate ^f		Real exchange rate ^g	Annual GDP growth rate	Current account deficit ^h
		"Unidad de fomento" ^b	"Unidad tributaria" ^c	"Unidad reajutable" ^d	"Cuota de ahorro" ^e	Deposits	Loans			
1987	21.5	22.3	22.1	20.1	22.9	4.3	7.3	91.3	6.1	3.1
1988	12.7	10.9	10.9	11.1	13.3	4.6	7.6	102.0	7.0	0.9
1989	21.4	21.2	21.3	18.8	20.1	6.8	9.4	96.4	9.7	2.4
1990	27.3	30.1	30.4	26.1	26.1	9.5	13.3	100.0	3.3	2.0
1991	18.7	17.7	17.6	18.5	22.7	5.4	8.5	98.9	6.8	0.7
1992	12.7	13.5	13.3	12.9	16.8	5.3	8.1	95.3	10.6	2.4
1993	12.2	13.3	13.8	11.0	16.2	6.4	9.2	96.6	5.9	5.0
1994	8.9	8.4	8.2	8.9	11.9	6.4	9.3	95.5	4.1	2.0

Source: Data provided by the Central Bank of Chile.

^a As measured by the December-December variation in the Consumer Price Index.

^b December-December variation in the value of the "Unidad de Fomento Reajutable" (UF) (readjustable unit of account).

^c December-December variation in the value of the "Unidad Tributaria" readjustable unit of account.

^d December-December variation in the value of the "Unidad Reajutable" readjustable unit of account.

^e December-December variation in the value of the CORVI (Housing Corporation) readjustable savings unit.

^f Average readjustable interest rate in the financial system (deposits and loans).

^g Real effective exchange rate, as estimated by ECLAC.

^h Current account deficit, as a percentage of GDP at current prices.

TABLE 8

Chile: Tax rates before and after the 1984 tax reform
(Per cent)

Tax	Joint stock companies		Limited companies	
	Before reform	After reform	Before reform	After reform
On retained profits	46	10.0	31.5	10.0
On distributed profits	43.3	31.5	31.5	31.5

Source: Arrau (1996), on the basis of Marfán (1984, table 3). A marginal tax rate of 35% on the personal income of entrepreneurs has been assumed.

IV

Conclusions

This article has explored the relation between national saving and possible reforms to pension systems which involve an individual capitalization component, illustrating this with some results relating to Chile, which is in the course of transition from an unfunded system with defined benefits to an individual capitalization system with defined contributions.

We have assumed that in all cases the participation of workers in the pension system is compulsory and that the reforms involve a transition from an original unfunded system to another system with some individual capitalization component. In order to analyse the effect of this transition on saving it is therefore necessary to consider at least two fundamental aspects of the reformed system which may affect the original saving situation. The first aspect is that of the measures a government must take to fulfill its obligations under the previous system; this demands a considerable adjustment in the government's current accounts, or else a major saving effort. The choice of one or the other of these options will affect the distribution of saving between individual persons and the government. At all events, what is essential is to make both the social security debt and its financing explicit.

The second aspect is the recognition that the nature of the contributions has changed, since instead of being a social security tax for the acquisition of a defined benefit they become a form of compulsory saving for generating a stock of assets with which to

finance future social security benefits. What is affected by this is personal saving. If it is considered that contributions to an unfunded pension system are current expenditure of the government and it is assumed that families do not save voluntarily for their old age, the effect is an increase in net personal saving. If it is considered, however, that contributions under an unfunded system correspond to a debt owed by the government to members of the system, then the effect is a gradual reduction in the dissaving of individuals.

The Chilean case brings out the difficulty of determining the net effect of social security reforms on saving. A highly sophisticated model and disaggregated information are needed in order to study the multiple effects which make themselves felt on the different forms of saving. An exercise of a purely accounting nature shows the vulnerability of the results to the assumptions made in the calculations. It is noted that the direct effect of the social security reform on saving is very small, but its indirect effect is much greater, because it helps to create a suitable environment for saving and investment, through the strengthening of the public sector financial situation and the development of securities and insurance markets. The contribution of social security reform might not be reflected in greater saving, however, unless reforms are made in other areas of the economy, including in particular measures designed to restore realistic and credible macroeconomic prices, to

guarantee macroeconomic (and political) stability, to resume growth, to privatize public enterprises not quoted on the stock exchange, to regulate and super-

vise the solvency of the financial sector, and to create tax incentives for the reinvestment of profits.

(Original: Spanish)

Bibliography

- Aarón, H. J. (1982): *Economic Effects of Social Security*, Washington, D. C., The Brookings Institution.
- AFP Habitat (1992): *10 años de historia del sistema de AFP*, Santiago, Chile.
- Arrau, P. (1992): El nuevo régimen previsional chileno, *Regímenes pensionales*, Seminario Internacional de Reforma al Régimen Pensional, Santafé de Bogotá, Fundación Friedrich Ebert de Colombia (FESCOL)/FAUS/International Development Research Centre (IDRC).
- (1994): *Fondos de pensiones y desarrollo del mercado de capitales en Chile: 1980-1993*, "Financiamiento del Desarrollo" series, No. 19, Santiago, Chile, Economic Commission for Latin America and the Caribbean (ECLAC).
- (1996): *Nota sobre el aumento del ahorro nacional en Chile, 1980-1994*, "Financiamiento del Desarrollo" series, No. 39, LC/L.984, Santiago, Chile, ECLAC.
- Auerbach, A. J. and L. J. Kotlikoff (1990): Demographics, fiscal policy and U.S. saving in the 1980s and beyond, L. H. Summers (ed.), *Tax Policy and the Economy*, vol. 4, Cambridge, MA, The MIT Press.
- Ayala, U. (1992): Un sistema pensional de capitalización individual para Colombia, A. Uthoff and R. Szlachmann (eds.), *Sistemas de pensiones en América Latina. Diagnóstico y alternativas de reforma: Bolivia, Brasil, Colombia, Guatemala, México*, vol. 2, Santiago, Chile, S. R. V. Impresos.
- Barr, N. (1993): *The Economics of the Welfare State*, Stanford, CA, Stanford University Press.
- Barro, R. J. (1974): Are government bonds net wealth?, *Journal of Political Economy*, vol. 84, Chicago, IL, The University of Chicago Press.
- (1978): *The Impact of Social Security on Private Saving: Evidence from the U.S. Time Series*, Washington, D. C., American Enterprise Institute.
- Chile, Ministerio de Hacienda, Dirección de Presupuesto (1995): *Estadísticas de las finanzas públicas 1989-1994*, Santiago, Chile.
- Central Bank of Chile (1989): *Indicadores Económicos y Sociales 1960-1989*, Santiago, Chile.
- (1993a): *Cuentas nacionales de Chile 1985-1992 (síntesis anticipada)*, Santiago, Chile.
- (1993b): *Boletín mensual*, No. 782, Santiago, Chile.
- (1995): *Boletín mensual*, No. 808, Santiago, Chile.
- Diamond, P. (1995): Economic support in old age, *Proceedings of the World Bank Annual Conference on Development Economics*, Washington, D. C., World Bank.
- ECLAC (1992): *Social Equity and Changing Production Patterns: An Integrated Approach*, LC/G.1701/Rev.1-P, Santiago, Chile, August. United Nations publication, Sales No. E.92.II.G.5.
- Feldstein, M. S. (1974): Social security, induced retirement and aggregate capital accumulation, *Journal of Political Economy*, vol. 82, No. 5, Chicago, IL, The University of Chicago Press.
- Held, G. (1994): ¿Liberalization or financial development?, *CEPAL Review*, No. 54, LC/G.1845-P, Santiago, Chile, ECLAC.
- Held, G. and A. Uthoff (1995): *Indicators and Determinants of Savings for Latin America and the Caribbean*, Working Paper No. 25, Santiago, Chile, ECLAC, April.
- Iglesias, A. and R. Acuña (1991): *Sistemas de pensiones en América Latina. Chile: experiencia con un régimen de capitalización 1981-1991*, Santiago, Chile, S.R.V. Impresos.
- Klevens, J. (1996): Poor treatment: Low income workers in the Chilean pension system, Princeton, NJ, Princeton University, Bachelor of Arts Thesis.
- Leimer, D. R. and S. D. Lesnoy (1982): Social security and private saving: New time-series evidence, *Journal of Political Economy*, vol. 90, No. 3, Chicago, IL, The University of Chicago Press.
- Marfán, M. (1984): Una evaluación de la nueva reforma tributaria, *Colección estudios CIEPLAN*, No. 13, Santiago, Chile, Economic Research Corporation for Latin America (CIEPLAN).
- Ramos, J. (1994): Síntesis del planteamiento de la CEPAL sobre la equidad y transformación productiva, *Desarrollo Productivo*, No. 17, Santiago, Chile, ECLAC.
- Schulthess, W. and G. Demarco (1993): *Sistemas de pensiones en América Latina. Argentina: evolución del Sistema Nacional de Previsión Social y propuesta de reforma*, Santiago, Chile, S. R. V. Impresos.
- Superintendencia de Administradoras de Fondos de Pensiones (1994): *El sistema chileno de pensiones*, Santiago, Chile.

- Uthoff, A. (1995): Pension system reform in Latin America, *CEPAL Review*, No. 56, LC/G.1874-P, Santiago, Chile, ECLAC.
- Uthoff, A. and R. Szalachmann (eds.) (1992): *Sistemas de pensiones en América Latina. Diagnóstico y alternativas de reforma: Costa Rica, Ecuador, Uruguay, Venezuela*, vol. 1, Santiago, Chile, S.R.V. Impresos.
- (1993): *Sistemas de pensiones en América Latina. Diagnóstico y alternativas de reforma: Bolivia, Brasil, Colombia, Guatemala, México*, vol. 2, Santiago, Chile, S. R. V. Impresos.
- (1994): *Sistemas de pensiones en América Latina. Diagnóstico y alternativas de reforma: El Salvador, Honduras, Jamaica, Paraguay, Trinidad y Tabago*, vol. 3, Santiago de Chile, S.R.V. Impresos.
- Vial, J. and M. Marfán (1995): Políticas para el crecimiento económico en los 90: el caso de Chile, *Notas técnicas de CIEPLAN*, No. 157, Santiago, Chile, CIEPLAN.