Volume Title: Privatizing Social Security

Volume Author/Editor: Martin Feldstein, editor

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-24101-7

Volume URL: http://www.nber.org/books/feld98-1

Publication Date: January 1998

Chapter Title: Pension System Reform: The Mexican Case

Chapter Author: Carlos Sales-Sarrapy, Fernando Solis-Soberon, Alejandro Villagomez-Amezcua

Chapter URL: http://www.nber.org/chapters/c6249

Chapter pages in book: (p. 135 - 175)

4 Pension System Reform: The Mexican Case

Carlos Sales-Sarrapy, Fernando Solís-Soberón, and Alejandro Villagómez-Amezcua

This paper analyzes the 1995 reform of Mexico's pension system. The reform substituted for the pay-as-you-go (PAYGO) system a fully funded system with individual accounts and a minimum pension guarantee. Section 4.1 reviews the basic characteristics of the old social security system in Mexico as well as the reasons to reform it. Section 4.2 discusses the main features of the pension reform approved in December 1995. We include an analysis of some specific features related to the design of the new system that are different from recent pension reforms in other Latin American countries. Section 4.3 discusses the costs of the reform on the basis of simulation results from an actuarial model. In section 4.4, we comment on some of the likely effects of the reform on saving and on the development of the financial system. The last section presents final comments.

Recent changes in life expectancy, population growth, and health-care costs, as well as an increased level of benefits without the corresponding adjustment in contributions, made the Mexican PAYGO pension system financially unsustainable. Mexico has joined the group of countries that chose to substitute for the state-run PAYGO system a defined-contribution fully funded scheme with individual accounts. As in most countries, the reform of the pension system in Mexico has important economic, social, and political consequences. Therefore, a better understanding of this process in Mexico requires that it be put in a broad perspective. The implementation of the pension reform should be

Carlos Sales-Sarrapy works at Protego Investment Associates and teaches public finance at the Instituto Technológico Autónomo de México (ITAM). Fernando Solís-Soberón is president at the Comisión Nacional del Sistema de Ahorro para el Retiro (CONSAR) and teaches macroeconomics at ITAM. Alejandro Villagómez-Amezcua is professor of economics at the Center for Research and Education in Economics (CIDE) in Mexico City.

The views presented in this paper are those of the authors and do not necessarily represent the opinions of the institutions with which they are affiliated. The authors are grateful to Cristina Rohde, Francisco Pérez, and Juan Manuel Valle for very efficient research assistance.

viewed as part of a major transformation of the Mexican economy that started in 1988 and that has included profound structural and macroeconomic reforms.[1] It should be stressed that the restructuring of the financial sector undertaken in the last few years has produced a radical change in the Mexican financial system. Measures such as financial deregulation, the strengthening of preventive regulations, and the modernization of supervisory bodies will be an important complement to the pension reform.

4.1 Background to the Reform

Social security in Mexico is provided by two major groups of institutions. IMSS (Instituto Mexicano del Seguro Social) and INFONAVIT (Instituto del Fondo Nacional de la Vivienda para los Trabajadores) provide services to workers in the private sector, ISSSTE (Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado) and FOVISSSTE (Fondo de la Vivienda del Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado) to the labor force employed by the public sector.[2] In 1992, SAR (Sistema de Ahorro para el Retiro), a fully funded system complementary to the existing PAYGO programs, was created on the basis of individual retirement accounts for every worker affiliated with IMSS or ISSSTE.

IMSS provides insurance for health and maternity, old age retirement, severance at old age, disability, life, child-care services, and workers' compensation. INFONAVIT is a housing agency managed by the government and representatives of labor and business organizations. It was created in 1972 with the purpose of providing affordable housing to workers employed in the formal sector and affiliated with IMSS. ISSSTE and FOVISSSTE provide similar services and insurance for workers in the public sector.

Contributions to the social security system have become a heavy burden on private companies and workers and, given its current structure, a major source of distortion in the labor market. Table 4.1 summarizes current social security contributions for workers in the private sector.

Health and maternity insurance has accounted for an average of 63 percent of total expenditures of the system during the last thirty years but only 52 percent of its revenues. During its fifty-one years of existence, the system has had only six years with a positive balance and has therefore placed significant financial pressure on other programs. Although, by law, every branch of insurance at IMSS should be self-financing, it has been a common practice to subsidize programs running a deficit. In particular, surplus funds from the pension

1. For example, a major privatization program, trade liberalization, deregulation of financial markets, legal changes to allow private investment in several infrastructure-related sectors, tax reform, and a significant reduction in government expenditures.

2. There are several other public social security systems directed to the armed forces and workers at the public oil company as well as private retirement programs. These programs are small compared to those described in the text.

Table 4.1 **Social Security Contributions in Mexico as Percentage of Payroll**

	Total	Employer	Employee	Government
IMSS:				
IVCM[a]	8.5	70	25	5
Health and maternity	12.5	70	25	5
Workers' compensation	2.5	100	0	0
Child care	1.0	100	0	0
SAR system:				
INFONAVIT (housing)	5	100	0	0
Retirement	2	100	0	0
Total	31.5	25.2	5.25	1.05

[a]IVCM = Invalidez, vejez, cesantía y muerte (disability, old age, severance at old age, and life insurance). The base salary on which contributions apply has an upper limit equivalent to ten times the minimum wage, except for the retirement SAR account and the health and maternity insurance, which are limited to the equivalent of twenty-five times the minimum wage. The base wage for INFONAVIT contributions is lower than for IMSS contributions.

system have been used to cover expenses related to health and maternity insurance (IMSS 1995).

Workers' compensation provides insurance against accidents that occur on the job, including disability and death, and pays medical costs and compensation while workers are out of work. Child-care services were introduced in 1973 as women's participation in the labor force increased. IVCM[3] is a defined-benefit PAYGO system that provides insurance for old age retirement, severance at old age, and disability and death.[4] Historically, a significant portion of IVCM surpluses has been used to maintain the viability of the health branch.

During the last ten years, social security expenditures have increased over 60 percent in real terms, growing from less than 2.5 to 3.9 percent of GDP in 1994.[5] Pension expenditures have also grown very rapidly in real terms: IMSS pensions alone grew 150 percent during the period, increasing from 0.22 to 0.56 percent of GDP, while IMSS and ISSSTE total pension expenditures increased 98 percent, reaching 0.8 percent of GDP in 1994.

4.1.1 The Old Pension System

Mexico's old pension system consists of a defined-benefit PAYGO public pension scheme. As mentioned above, most of this system is operated by IMSS for private-sector employees and by ISSSTE for federal government employees. The majority of the working population in the formal sector is covered by IMSS. The IMSS system is the one that was reformed in December 1995. Therefore, we will explain the old pension system by referring to the main

3. See the first paragraph of sec. 4.1.1 below.

4. This insurance applies only if the worker dies or becomes disable as a result of an accident or sickness not due to his or her job.

5. This section includes only figures for IMSS and ISSSTE.

features of the IMSS program, known as the disability, old age, severance at old age, and life insurance program (IVCM).[6]

Evolution of the IVCM-IMSS Pension System

The IVCM-IMSS program was implemented in 1944 as a collective fund. The original IVCM-IMSS can be characterized as a partially funded defined-benefit scheme. The surpluses of the program were used to pay for investment or current expenditures of other branches of IMSS. Its main features are as follows:

Coverage. The program covers registered employees participating in the formal private sector and self-employed workers (and their families) who voluntarily choose to contribute to the system. In November 1995, 10.9 million people were affiliated with IMSS. Although this amount represented only 29.6 percent of the economically active population (EAP), it is estimated that it was almost 80 percent of the labor force in the formal sector.[7] The ratio of contributing workers to IMSS pensioners has fallen from around sixty-seven workers per pensioner in 1950 to around eight in 1994.

Contributions. This program is financed by contributions from the employer (70 percent), the employee (25 percent), and the government (5 percent). The total contribution for 1996 amounts to 8.5 percent of the base salary. This base salary, used to compute contributions and benefits, is the worker's contractual wage plus other payments (such as bonuses).[8] The total contribution is distributed as follows: disability and life, 3.0 percent; old age and severance at old age, 3.0 percent; medical services for the retired, 1.5 percent; administrative expenses, 0.6 percent; and social assistance, 0.4 percent. In the case of workers earning the minimum wage, the worker's contribution is paid by the employer.[9]

Eligibility. In order to qualify for a disability pension, disability must be formally certified by IMSS. To be eligible, the worker must have contributed for at least 150 weeks. To receive an old age pension, the insured must be at least sixty-five years old (sixty for severance at old age) and have contributed for a minimum of 500 weeks. At a worker's death, a survivor's pension is paid to the widow and/or descendants or to surviving parents. In any case, the insured must have contributed for at least 150 weeks.

6. *Severance at old age* refers to the case when a worker loses his or her job and is over sixty years old, regardless of whether he or she resigns or is dismissed.

7. The number of IVCM pensioners at that time was around 1.2 million, of which 65 percent were receiving old age pensions and 35 percent pensions for widows, orphans, and other relatives.

8. The base salary on which the contribution applies has a limit of ten times the minimum wage.

9. In Mexico, the minimum wage is set by law, and employers are required to comply with it. This variable is used as a reference of the wage structure of IMSS affiliates. The monthly minimum wage in July 1996 was equivalent to U.S.$90.00. The average wage for workers affiliated with IMSS is 2.8 times the minimum wage.

Benefits. Benefits for the disabled depend on the degree of disability determined by IMSS. The pension for an individual classified as totally disabled is 70 percent of the last wage; for partial disabilities, adjustments are made according to the labor law. Benefits for old age and severance at old age depend on the contributing period exceeding the required 500 weeks. Benefits are based on the average of the base salary of the last five years divided by the current minimum wage. Additionally, all retired workers have the right to receive medical assistance for themselves and their families. All pensions are indexed to changes in the minimum wage. In 1995, the replacement rate for the worker with the average wage path, after contributing twenty years, would be 50 percent.[10] This percentage could reach 100 percent if the individual contributes for forty-five years.[11] The government guarantees that the minimum pension will not be smaller than the minimum wage. Figure 4.1 shows the replacement rates under different assumptions about wage levels and contributing periods.

Reserves and Investment. Reserves should be invested in federal government bonds or in other assets of highly rated issuers as approved by the National Banking and Securities Commission. The income and spending of each branch of insurance should be registered in separate accounts. These resources should be used to cover only the services corresponding to each branch of insurance. As explained below, reserves were not constituted or invested according to the regulations.

Tax Treatment. Employers can deduct as expenses their contributions to IMSS. Workers pay taxes at the moment of retirement when they receive the benefits, but taxes apply only to the amount in excess of nine times the minimum wage.

The Fully Funded Retirement Saving System (SAR)

The Retirement Saving System (SAR) was established in 1992 as a mandatory fully funded savings scheme to complement the public PAYGO system. The SAR program is a fully funded defined-contribution system based on individual accounts. Some of the main characteristics of the SAR system are the following:[12]

Coverage. All workers who are affiliated with IMSS or ISSSTE must contribute to the SAR system.

Contributions. Each worker has an individual bank account integrated by two subaccounts: one for retirement and one for housing. Employers pay 2 percent

10. The *replacement rate* is defined as the ratio of the worker's pension divided by his or her last salary.

11. In 1995, the wage for the average worker was 2.8 times the minimum wage, and the average contributing period was almost twenty years.

12. A more comprehensive discussion of the SAR is presented by Solís-Soberón (1995).

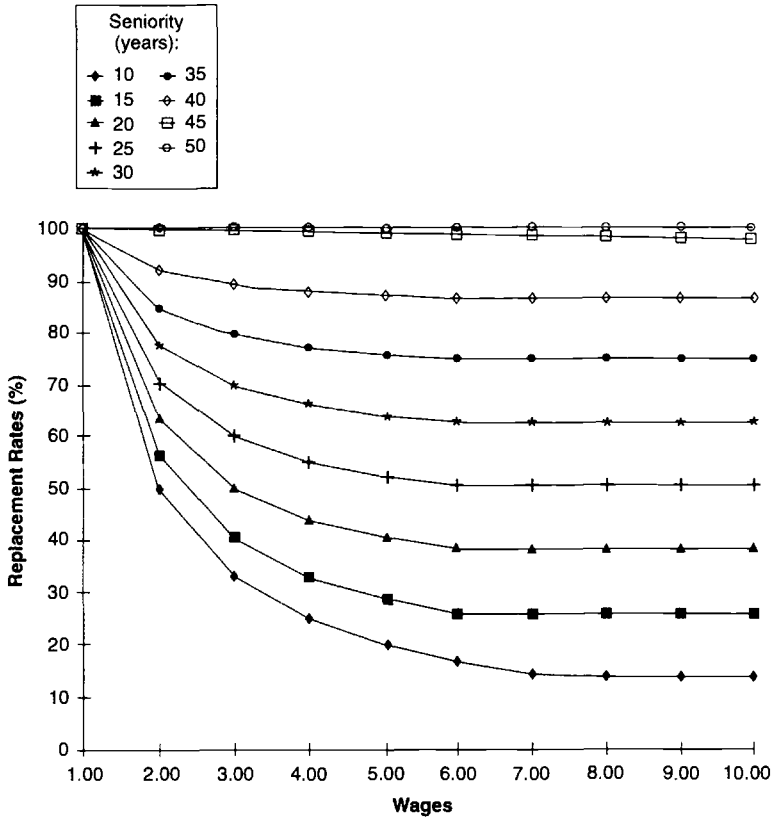

Fig. 4.1 Replacement rates, IMSS, old system (% of final wage)

of the base salary to the retirement subaccount and 5 percent to the housing subaccount.[13] The funds in the retirement subaccount are invested in direct loans to the federal government, while the funds of the housing subaccount are channeled to INFONAVIT. These contributions are in addition to the contributions paid to the IMSS public pension system. Worker can make additional voluntary deposits in their individual accounts.

Benefits. Workers are entitled to receive the total capitalized funds from their individual subaccounts in one payment or to purchase an annuity either at retirement or when they are entitled to receive a pension from IMSS because of partial or permanent disability. In the case of death, the funds are given to the beneficiaries chosen by the insured.

13. The base salary to which this contribution applies has an upper limit of twenty-five times the minimum wage.

Other Benefit Provisions. The insured has the right to withdraw as much as 10 percent of the total balance of the retirement subaccount if partial disability lasts longer than the period established by the social security law or in case of unemployment. The latter can be claimed only by workers whose balance in the retirement subaccount is no less than eighteen times their last contribution and only if there have been no withdrawals during the previous five years. With respect to the housing subaccount, if the worker receives a loan for housing from INFONAVIT, the funds accumulated in the subaccount must be used as a down payment, and the employer's contributions plus a worker's contribution equal to 25 percent of his or her wage are used to pay the loan.

Administration. Contributions are deposited in individual accounts managed by commercial banks. Banks are responsible for record keeping, generating financial statements, and making various required filings. They can hold the SAR funds for up to four days, after which time they must send them to the central bank (Banco de Mexico), in the case of the retirement subaccount, or to INFONAVIT, in the case of the housing subaccount. Commercial banks charge 0.8 percent per year of the retirement subaccount balances for operating expenses.[14]

Investment. Funds in the retirement subaccount are channeled to the government as a direct loan. The government pays an interest rate for the use of these funds that must be no less than 2 percent per year, on a monthly basis, over the inflation-adjusted balance using the inflation rate of the previous month. Funds in the housing subaccount earn interest according to the remaining operation surplus for the corresponding year. Actual returns on the retirement subaccount have been more than 5 percent in real terms. However, returns on the housing subaccount have been negative. In 1995, the real return was −9 percent.

Regulation. The regulatory agency is the Comisión Nacional del Sistema de Ahorro para el Retiro (CONSAR), established in July 1994. Its main function is to determine the rules and procedures that will ensure the correct functioning of the system. This supervisory body is responsible for overseeing all the financial intermediaries that participate in the SAR system, except INFONAVIT.

Tax Treatment. SAR contributions by the employer are deductible. Voluntary contributions by the workers are tax deductible up to a limit. Interest accumulation is tax free. Withdrawals are tax free to the limit of nine times the minimum wage in the case of the annuity option for the retirement subaccount. There is a higher limit for tax exemption if the employee chooses to withdraw all the funds at once. For the housing subaccount, withdrawals are not taxed at all.

14. This fee is divided between 0.5 percent for the bank and 0.3 percent for a clearinghouse that operates a centralized data bank for the SAR system.

4.1.2 The Case for Reform

The most important reason behind the reform was the increasing financial problems being faced by the old IVCM-IMSS pension program, which rendered it financially unsustainable. Another important reason was the need to foster domestic saving. Finally, there were other significant distortions derived from the old pension system, in particular, distortions generated in the labor market owing to the fact that contributions paid did not necessarily reflect benefits received.

Current Pension System Diagnosis

Since the end of the 1980s, it was evident that the public pension system was facing severe financial problems as a result of its actuarial imbalance. Recent estimates of the actuarial imbalance of the IVCM system show that it represents at least 80 percent of the Mexican GDP.[15] Therefore, it became evident that a complete restructuring of the pension system was needed. We stress the main causes of the IVCM financial problems below.

Demographic Trends. The IVCM-IMSS program was being pressured by demographic trends, in particular, the changing population structure and an increase in life expectancy. Mexico's population grew at high rates, 3.7 percent per year on average from 1970 to 1990. Recent estimates yield 1.9 percent for 1990–95. In 1930, the total population was 16.5 million, rising to 90 million in 1994. Despite the fact that the population pyramid shows a significant proportion of young people, 35.8 percent of the population 14 years old and younger, the population measured as contributors to the social security system is aging very rapidly. Mexico's total population is expected to be over 142 million by 2030, and those over sixty-five years of age will represent around 10 percent of that total. These trends imply that the ratio of retirees to workers would drive up the cost of the current pension system and generate major long-term financing problems. The elderly dependency ratio is expected to increase from 7.0 percent in 1995 to 14.8 percent in 2030.

According to IMSS (1995), the expected average annual rate of growth of retirees for the next twenty years will be 5.7 percent, compared with a rate of 2.6 percent for contributors. Moreover, this problem is being accentuated by an increase in life expectancy at birth, which has risen from 49.6 years in 1950 to 70.8 years in 1995. Finally, there is a reduction in the fertility rate, which has gone down from 6.45 children per woman at the end of the fertility period in 1950 to 2.84 in 1995.

The system has also been negatively affected by increased informality in the labor market and lower real wages. In particular, real wages in the manufacturing sector declined 44 percent between 1978 and 1995.

15. This result is highly sensitive to the real interest rate assumed.

Insufficient Contributions. Current contributions will be insufficient in the medium and long terms to finance the increasingly generous benefits of the old system that were extended to all the worker's family. Originally, the system covered only the worker, not dependents. The minimum pension has been increased from 35 percent of the minimum wage before 1989 to 100 percent in 1995, while contributions were gradually raised beginning in 1992 from 6 percent of the base salary to 8.5 percent in 1996 (it is important to remember that, from this contribution, 3 percent corresponds to life and disability insurance and 3 percent to retirement, severance at old age, and old age insurance). According to IMSS (1996), contributions would have to be increased to 23.3 percent of the base salary in 2020 to avoid a cash-flow deficit in the system in that year.

Weak Relation between Contributions and Benefits. There is almost no relation between benefits received and lifetime contributions paid, which encourages evasion, underreporting of wages, and informality in the labor market. For example, on average, IMSS pays each insured worker a pension for a period of eighteen years and the corresponding widow's pension for twelve years more. Together, this amounts to a thirty-year pension toward which the worker can have contributed for as few as ten years, the required vesting period. (Workers who contributed for fewer than ten years receive no benefits at all.) Finally, the reference base salary used to calculate the pension is based on the average of the wages earned during the last five years divided by the current minimum wage, not on earnings during all years of service.

High Payroll Taxes. The marginal payroll tax rate is very high even for low-income workers. For example, for a worker earning between one and two times the minimum wage, the marginal tax rate is over 25 percent. For workers earning more than five times the minimum wage, the marginal tax rate is close to 40 percent. This raises labor costs, favors evasion, and induces informality.

Growing Informal Sector and Low Coverage. Another problem that pressures the financial position of the system has been the increasing size of the informal sector of the economy. It is estimated that about 35 percent of the EAP was affiliated with the social security system (including IMSS and ISSSTE) in November 1995.

Portability Losses.[16] Given the IMSS-IVCM and the ISSSTE pension system defined-benefit formulas, there are portability loses between different pension systems in Mexico. Employees with only one employer might receive higher benefits at retirement than employees with more than one employer. Moreover,

16. Portability of benefits among different pension systems requires that benefits not be lost or diminished by shifting jobs in the formal sector.

some workers might lose all benefits if they change from a job covered by IMSS insurance to one covered by another program.

Inadequate Use of Reserves. Another important problem with the IVCM-IMSS program is the inappropriate use of reserves, which has affected its financial position. From its creation, the surplus generated by the pension program has been used to finance infrastructure requirements of IMSS and (partially) health and maternity insurance, which traditionally operated showing a deficit. These transfers of resources have strongly decapitalized the reserves of the pension system. A conservative estimate of expected IMSS reserves can be obtained by accumulating the annual net flows (contributions minus payments) of IVCM. Accumulated flows in each period were assumed to earn a real interest rate equivalent to 3.5 percent per year. Under these estimates, reserves for 1994 should have been around 11 percent of GDP. However, reserves in 1995 were close to 0.4 percent of GDP (IMSS 1995). It is worth mentioning that the level of reserves presented in the exercise is a conservative estimate of the actual reserves needed to make the system financially viable because, in actuarial terms, the contributions were not high enough to cover future benefits.

4.1.3 The Savings Problem[17]

The Mexican economy still faces a serious shortage of short-term savings and a severe scarcity of long-term savings. During the last seven years, the domestic saving rate declined.[18] According to Banco de Mexico (1996) estimates, gross domestic saving reached an average of 20 percent of GDP during the 1980s, dropping to slightly less than 16 percent of GDP by 1994. The main contributing factor was a reduction in private saving, which declined continuously from a level of around 18 percent of GDP in 1988 to around 11 percent during the first part of the 1990s, showing a recovery since 1995. On the other hand, public saving has shown major fluctuations since the beginning of the 1980s.[19] In any case, Mexico's moderate level of domestic saving has constituted a constraint for investment and has made the country more vulnerable to foreign capital flows. It is now widely accepted that, although foreign savings will continue to play an important role in the medium and long terms, it is crucial to increase domestic saving as the main source for financing growth.

The National Development Plan 1995–2000 stated as one of its main eco-

17. A broader discussion of this issue can be found in Solís-Soberón and Villagómez (1996).

18. As is well known, it is difficult to quantify the precise magnitude of this variable because of several measurement problems. Most of the existing estimates are drawn directly from national income accounts as a residual after deducting the balance of payments deficit on the current account from estimates of gross domestic capital formation. There are other serious problems when breaking down gross domestic savings into its components, private and public savings. These problems arise from different quantitative estimations, although in general these estimations offer similar trends. For a discussion of this issue, see Gil-Díaz and Carstens (1996).

19. For a discussion of this issue, see Villagómez (1993).

nomic objectives the urgent need to foster domestic saving. The goal is to increase domestic saving 6 percentage points of GDP by the turn of the century. This requires an increase in both public and private saving. The creation of a fully funded retirement savings program is one of the elements of this strategy. In this sense, one of the objectives of the recent pension reform has been the creation of a system that could generate domestic saving to support economic development.[20]

4.2 The Pension Reform

Since the early 1990s, there was a generalized consensus that the social security system, and in particular the IVCM-IMSS pension system, needed to be reformed. There was a long debate about the main elements of the reform and about the depth of the measures to be taken. The president submitted to Congress a proposal for a new social security law, which was approved in mid-December 1995, while the regulations regarding the operation of the financial aspects of the system were approved at the end of April 1996.

4.2.1 Main Features of the Pension Reform

The reform substitutes for the old PAYGO system a mandatory defined-contribution fully funded system with individual accounts, complemented with a minimum pension guarantee. Basically, this requires the improvement and strengthening of the individual capitalization fully funded scheme under the SAR system. This includes the development of transparent mechanisms for pension funds management that generate the right incentives for all participants, the development of clear regulations and supervision processes for the management and investment of funds, a clear separation from other social security benefits, a close relation between contributions paid and benefits received, and the design of an adequate transition mechanism.[21] The main features of the new system are summarized below.

Basic Operating Characteristics

Coverage. The new system is mandatory for all workers in the labor force who are affiliated with IMSS. This includes all workers participating in the formal private sector and self-employed workers (and their families) who voluntarily choose to contribute to the system.

Contributions. Contributions will continue to be made by employers, employees, and the government, as shown in table 4.2. The former 8.5 percent of base wage contribution for IVCM will be divided into two parts: 4.5 percent will be

20. In a recent paper, Feldstein (1995) put forward several suggested tax reforms to stimulate saving in Mexico. He also discusses the transition to a fully funded social security system.

21. An interesting discussion about alternative possible reform proposals can be found in Feldstein (1995) and Bosworth, Dornbusch, and Poterba (1995).

Table 4.2 **Contributions to the Pension System (%)**

	Before the Reform	With the Reform	
Insurance	DOSL (IVCM)	RDO	LDA
IMSS contributions	8.5	4.5	4
SAR retirement	2	2	
SAR housing	5	5	
Social contribution	0	2[a]	
(Total)		(13.5)	(4)
Total contributions	15.5	17.5	
Total employer	12.95	12.95	
Total employee	2.125	2.125	
Total government	.425	2.425	

Source: IMSS and CONSAR.

Note: DOSL = disability, old age, severance at old age, and life insurance; RDO = retirement, severance at old age, and old age; LDA = life and disability.

[a]The social contribution is equivalent to 2 percent of the average wage of workers affiliated with IMSS. It was established at 5.5 percent of the minimum wage.

accumulated in individual accounts, and 4 percent will go directly to IMSS for the provision of life and disability insurance (2.5 percent) and of health services for pensioners (1.5 percent). Additionally, contributions to individual accounts will include the former 7 percent contributions to SAR (2 percent for retirement and 5 percent for housing). There is a new "social contribution" by the government that is a fixed amount equivalent to 5.5 percent of the minimum wage in January 1997. This amount will be indexed to the CPI. For workers earning the minimum wage, total contributions to their individual account will represent 17 percent of their salary. For workers earning the average wage, total contributions will represent 13.5 percent.[22] Funds in individual accounts (except the 5 percent that corresponds to housing) will be managed by specialized pension fund management firms, AFOREs (Administradora de Fondos para el Retiro). In the case of workers' compensation, the employer will pay a premium determined by a formula that includes the base wage and the loss ratio for each firm's activity.[23] The new law considers the possibility of voluntary contributions from workers and employers to the individual accounts.

Benefits for Retirement or Severance at Old Age. To be eligible for a retirement pension, the worker must be at least sixty-five years old. In the case of sever-

22. It should be noted that the social contribution in terms of the wage will tend to diminish as real wages increase.

23. The premium paid by each firm is obtained by multiplying the loss ratio of the firm (based on the percentage of permanent, partial and total disabilities, the number of deaths, and the average active life of a worker without an accident considered by this insurance) by a premium factor (equal to 2.9) and adding to this amount 0.0025, the estimated minimum risk premium. The estimated premium will be revised on an annual basis.

ance at old age, the age requirement is reduced to sixty years. Benefits depend on the contributions accumulated during the affiliate's working life, plus the returns minus the commissions paid. Workers who have contributed for 1,250 weeks can chose between two options: (*a*) to purchase an annuity from a private insurance company that guarantees a fixed monthly pension for the insured and their survivors and (*b*) to receive programmed withdrawals from AFORE, calculated by dividing the balance (including interests) from the affiliates' individual account by the number of years that they are still expected to live.[24] In the first case, an annual payment of at least the same amount of the minimum pension guaranteed by the government is required. Otherwise, affiliates should take option *b*, where the government minimum pension guarantee is applied. If workers contributed for fewer than 1,250 weeks, they are not entitled to the minimum pension. However, they are allowed to withdraw the balance of their account all at once if they prefer not to buy an annuity or take programmed withdrawals. Early retirement is possible if workers accumulate in their account the balance necessary to purchase an annuity at least 30 percent higher than the minimum pension.

Figure 4.2 shows the replacement rates under the new fully funded scheme for workers with the average wage path. These rates assume that the worker used neither the retirement funds for marriage expenses or when unemployed nor the housing funds for mortgage loans. Note that the discontinuity at 0 percent real interest rate in the graph is explained by the fact that, for a contributing period under twenty-five years, workers have no right to receive the guaranteed minimum pension. For workers who have contributed for twenty years, a 7 percent real interest rate would be required to guarantee a pension equal to the one they could have obtained under the old system. It must be said, however, that, under the old system, contributions would have been insufficient to finance such a pension.

The replacement rates are highly sensitive to the contribution period and the interest rate. For example, given a 6 percent real interest rate for the retirement subaccount and 0 percent for the housing subaccount, an increase in the contributing period from twenty-five to thirty years raises the replacement rate from 52.5 to 74.5 percent.[25] Regarding the interest rate, workers with a twenty-five-year contributing period will have their replacement rate increased from 68 to 78 percent when the real interest rate in the retirement subaccount increases from 8 to 9 percent.

Benefits Due to Disability or Death. The risk of disability and death is covered by two types of insurance: workers' compensation and life and disability insur-

24. Programmed withdrawals are calculated taking into consideration the age of the worker and his or her dependents.

25. This is due to an increase in the numerator (the result of higher accumulated balances in the worker's individual account) and a decrease in the denominator (the result of the reduction in wages that the average worker faces after forty-one years of age).

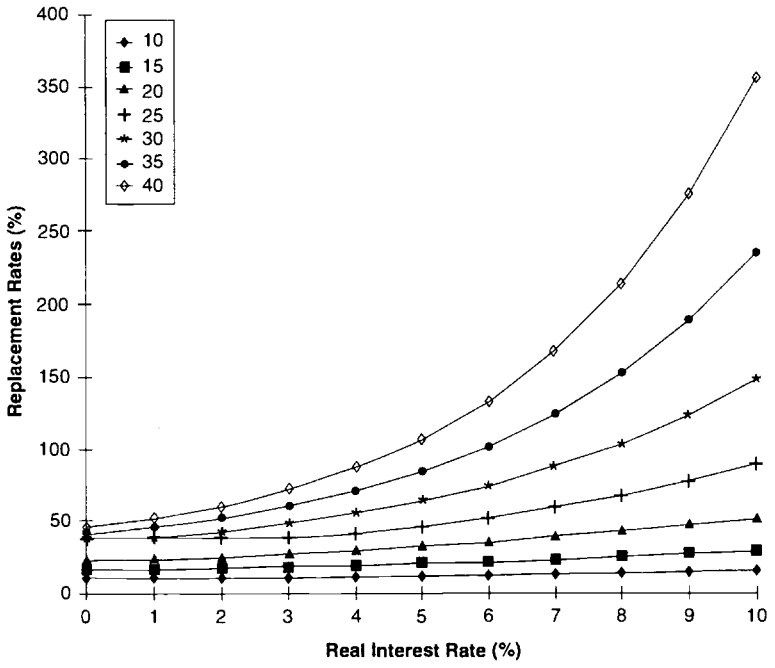

Fig. 4.2 Replacement rates, IMSS, new system (% of final wage)
Source: Authors' calculations.
Note: It is assumed that the IMSS housing subaccount is accumulated with a zero real interest rate.

ance. Both are provided solely by IMSS. When a covered accident occurs at the workplace, workers' compensation applies. Workers who become disabled under such circumstances will receive 100 percent of their current wage for a period of time not to exceed one year, during which IMSS will determine whether the disability is permanent or temporary. If the disability is determined to be permanent, IMSS will decide whether it is total or partial. Workers declared totally disabled will receive 70 percent of their current wage.[26] Workers declared partially disabled will receive a pension adjusted according to the degree of disability. Death benefits for the typical family with three children are 70 percent of the last wage received by the deceased.[27]

In the case of disability or death that is not job related, life and disability insurance applies. Eligibility requires a minimum contributing period of 250

26. If a disability is due to a work-related disease, the pension will be 70 percent of the average base wage of the last fifty-two contributing weeks.

27. The widow will receive an amount equivalent to 40 percent of the insured's corresponding disability pension, and the pension of each child younger than sixteen (or twenty-five if still a student) represents 20 percent of this disability pension. If the deceased leaves neither a widow nor any children, the remaining dependents will receive a pension equivalent to 20 percent of the disability pension.

weeks. However, this requirement is reduced to 150 weeks if the disability is greater than 75 percent. Total disability is declared when a worker cannot be employed at a wage greater than 50 percent of previous earnings. The amount of the pension is equal to 35 percent of the average wage, adjusted by the CPI, of the last 500 weeks of contributions. This pension also includes additional payments for relatives, with the result that, for an average family with three children, the total pension is equivalent to 51 percent of the average wage.[28] For pension benefits in the case of death, the worker must have at least 150 weeks of contributions. For the typical family described above, the pension would be 53 percent of the average wage used to calculate the disability pension.[29]

In the case of both workers' compensation and disability and life, IMSS must pay workers or their beneficiaries a sum insured equal to the difference between the cost of an annuity, based on the benefits mentioned above, and the accumulated balance in the individual account (excluding voluntary contributions). With the accumulated balances and the sum insured paid by IMSS, workers or their beneficiaries must purchase the corresponding annuity from an insurance company chosen by the workers. If the accumulated balance is higher than the cost of the annuity, workers or their beneficiaries can withdraw the excess funds or increase the benefits of the annuity. In any case, if the benefits are lower than the minimum pension, the government will make up the difference, allowing workers to purchase with the income flow an annuity equal to the minimum pension. These pensions are adjusted annually according to changes in the CPI.

Guaranteed Minimum Pension. The government guarantees a minimum pension equal to the general minimum wage at the time of the reform. This pension will be adjusted for inflation according to the CPI. Table 4.3 shows the average yearly returns needed for workers to accumulate sufficient resources to finance a minimum pension, for different wage levels, in the cases of retirement at old age and severance at old age.

Partial Withdrawals from the Individual Accounts. After an unemployment spell of forty-five days, workers are allowed to withdraw at most 10 percent of

28. These additional payments include 15 percent of the pension for the wife and 10 percent of the pension for each child younger than sixteen years or 10 percent of the pension for the insured's parents (if there are no other beneficiaries). Workers who have no beneficiaries will receive an additional 15 percent of their pension, or 10 percent if there is only one beneficiary. In all cases, there is an additional payment equivalent to 20 percent of the pension if the insured requires permanent assistance. Finally, it is required that the total pension should not exceed 100 percent of the average wage used to calculate the pension.

29. The widow will receive an amount equivalent to 90 percent of the insured's corresponding disability pension, and the pension for each child younger than sixteen years (or twenty-five if still a student) will be equivalent to 20 percent of this disability pension. If the deceased leaves neither a widow nor children, any remaining dependents will receive a pension equivalent to 20 percent of the disability pension.

Table 4.3 **Minimum Pension Yearly Implicit Return (%)**

Base Wage[a]	Implicit Real Return
1	9.81
2	6.59
3	4.37
4	2.65
5	1.23

Source: Authors' calculations.

Note: Contributing period = 1,250 weeks. Real wage annual growth equal to 2.5 percent a year.

[a]Number of times the minimum wage.

the accumulated balance in their retirement subaccount if they have at least 250 weeks of contributions and made no other withdrawals during the previous five years. On getting married, workers with 150 weeks of contributions may withdraw from their retirement subaccount an amount equivalent to their monthly wage; this benefit is granted only once. The benefits and operation of the housing funds remain unchanged.

Tax Treatment. Contributions by the employer will be tax deductible, and compulsory contributions will not be taxable income for the worker. Voluntary contributions by the workers will be subject to favorable tax treatment, and interest accumulation will be tax free. Withdrawals will not be taxed up to a limit of nine times the minimum wage, and there is a higher limit for tax exemption when employees withdraw all their funds at one time.

Administration

Management. The management of pension funds will be entrusted to private pension fund administrators (AFOREs), which will be regulated and supervised by CONSAR. These institutions should have as their only activity the management of pension funds. AFOREs will inform workers about the accumulated balances from their retirement, voluntary, and housing subaccounts but will manage the resources only of the retirement and voluntary subaccounts.

Individual Accounts. Participants must choose one AFORE. Affiliates have the right to transfer their accounts to another AFORE once per year. However, workers are free to transfer their accounts whenever the AFORE changes its commissions or its investment policies.

Housing Subaccount. The 5 percent contributions to the housing subaccount will continue to operate as before. These funds will be channeled to INFONAVIT. There will be a return on these funds according to the operating surplus of the institute.

The Role of the AFOREs. Each AFORE is allowed to operate several pension funds for its affiliates. Workers are allowed to invest their resources in one or several of the pension funds managed by their AFORE. In addition, the AFOREs' main functions include record keeping, issuing valuation reports and financial statements, making various required filings, and paying benefits if the affiliate chooses the scheduled withdrawals option. Each pension fund, known as a SIEFORE (Sociedad de Inversión Especializada en Fondos para el Retiro), will have a committee that will make the investment decisions.

The Role of IMSS. IMSS will be responsible for the collection of contributions. It also has auditing and enforcement powers to ensure that employers and workers comply with their obligations. Also, the approved law allows IMSS to own an AFORE as long as it complies with all the regulatory provisions.

Central Account. Contributions will be deposited in an account at the Banco de Mexico while the individualization process takes place and the resources then transferred to the AFOREs and INFONAVIT. All information about contributions will be managed by a centralized entity created for that purpose, supervised by CONSAR. If workers have not chosen an AFORE, the resources from their retirement subaccount will be deposited in this central account for a maximum period of four years, starting 1 July 1997. After this period, CONSAR will assign an AFORE to those workers according to criteria as yet to be determined.

Commissions. AFOREs will be allowed to charge management fees as a percentage of contributions or of the outstanding individual account balance, or some combination of the two. AFOREs will not be allowed to discriminate against any of their affiliates. Individuals will receive differential treatment only in order to encourage permanence in the AFORE and to promote voluntary savings.

4.2.2 Regulation and Supervision

CONSAR

The regulatory and supervisory tasks will be performed by CONSAR. Its main functions are to determine the criteria and procedures that will ensure the correct functioning of the pension system. This supervisory body will have the power to grant and revoke AFOREs' licenses, to monitor the pension funds, and to enforce its regulations. CONSAR is also responsible for supervising the operations and investment policies of the pension funds.

Investment of Funds

The authorities have stated that the basic operating principles that will guide investment will be safety and profitability. Therefore, pension funds will be

invested only in approved and diversified assets. These assets include government securities, the securities of state-owned companies, equity, private debt instruments, shares of other pension funds, and other debt instruments issued or endorsed by credit institutions. Investment in foreign instruments is allowed only in the case of Mexican issuers. CONSAR will establish limits on the amount of investment in specific securities as a share of the value of the fund, but it can at its discretion impose limits expressed as a share of each issuer in the total liabilities of all issuers from the same sector. These limits are maximum limits, and AFOREs are free to seek the highest returns under these rules. There are disclosure requirements with respect to the structure of the investment portfolio and the returns obtained. Finally, it is important to emphasize that the AFOREs are allowed to operate several pension funds but that at least one of those funds should contain only fixed-income securities, including indexed bonds. The law specifies no minimum guaranteed return, in either absolute or relative terms.

AFOREs

Minimum Capital and Fixed Capital. AFOREs should always have fixed capital at least equal to the minimum capital required that is not subject to withdrawal, an amount to be determined by CONSAR. Foreign investors are allowed to own up to 49 percent of an AFORE's capital. But, in the case of affiliates of countries that have signed an international agreement with Mexico that includes financial services provisions, such as NAFTA, foreign investment can rise to 100 percent.

Investment Reserve. AFOREs are required to maintain an investment reserve known as a *special reserve* as a percentage of the total assets under their management. This amount will be determined by CONSAR. The investment reserve must be invested in the same assets as the resources of the pension funds.

Market Share Limits. Starting in 1997, and continuing for the next four years, the law has established a maximum market share limit of 17 percent for each AFORE. After this period, the limit will rise to 20 percent of the market. However, CONSAR can approve larger limits. The law does not specify how the limits are to be determined; however, it is most likely that they will be based on the number of workers affiliated with IMSS registered at each AFORE.

Other. AFOREs must meet rigorous information disclosure requirements. There will be regulations regarding marketing and advertising. In addition, AFOREs are not allowed to issue liabilities, provide guarantees, obtain loans, or control companies.

4.2.3 The Transition

As mentioned above, the new pension system began functioning on 1 July 1997. There are currently around 1.5 million pensioners, of whom 780,000

receive disability and death benefits, 475,000 retirement pensions, and 265,000 workers' compensation. Since the new system is mandatory, all workers are required to switch to the new individual capitalization scheme and stop contributing to the old system as of 1997. In the following discussion, we distinguish between *current pensioners,* or those already receiving a pension when the reform was enacted, and *transition pensioners,* or all active workers who have contributed to the IMSS-IVCM program before 1 July 1997 and therefore have acquired rights under the old system.

IMSS will continue to pay benefits to current pensioners, but those benefits will be financed out of existing IVCM reserves and resources obtained directly from the general revenues of the federal government. In the case of transition pensioners, the reform established the following procedure. Workers already contributing to the old system will now make contributions to the new system. When they reach retirement age, they will be able to choose the higher of the two pensions determined under the rules of the old system (using the IVCM benefit system [see sec. 4.1], including the SAR funds accumulated as of June 1997 plus the returns from that date until retirement) and the new system (the funds accumulated in their individual account). If they choose the latter, the new rules apply. If they choose the former, the pension will be calculated as if they had contributed to the old system during the time that they were actually contributing to the new one, and the pension will be financed with funds from their individual account complemented by government resources.

4.2.4 Analysis of the New Pension System Design

It is clear that successful pension system reform depends crucially on the design of the regulatory and supervisory framework. Obviously, there is no evidence yet with which to evaluate the Mexican reform, but, given the extensive documentation of design problems discovered in recent, similar reforms in other Latin American countries, discussion of relevant issues can usefully highlight the advantages and disadvantages of the new Mexican pension system.

The main advantages of the new pension scheme are that the new system respects acquired as well as expected rights of current workers and pensioners; that the new system completely replaces the old, facilitating the move to a more unified pension system; that transfers between AFOREs are limited to one per year, reducing administrative costs; that AFOREs are allowed to operate several funds; that the law does not establish a minimum guaranteed rate of return for the funds managed by AFOREs; and that there exist a centralized collection agency and a centralized data bank, potentially reducing administrative costs.[30]

In particular, regarding the centralized collection of contributions by IMSS,

30. There is some evidence that there are economies of scale that result from such centralization. For a discussion of this issue, see Diamond (1994), who characterizes the provision of such services as the collection of monthly payments and record keeping as a natural monopoly.

there is a potential gain to be derived from the reduction of administrative costs (e.g., with respect to Chile) since there is some evidence that there are economies of scale involved in the provision of this service. In order for this gain to be realized, adequate supervision—limiting potential political risks and possible excessive administrative costs—is required. Alternatively, a state-run agency (one closely supervised by CONSAR) or, as suggested by Diamond (1994), a clearinghouse collectively owned by the AFOREs and barred from making a profit (to prevent its use in a collusion to raise industry profits) could provide this service exclusively.

Another important feature of the new system is the ability of workers to chose an AFORE, which introduces the element of competition. While the potential long-term benefits resulting from competition are great, they might (as discussed by Arrau, Valdés-Prieto, and Schmidt-Hebbel 1993) be limited in the short run—in particular during the transition period—as a consequence of the amount of information required by the decision to purchase a new and unknown product. Therefore, at the beginning, the costs implied by the learning process will be relatively high. According to Arrau et al., under the new system there will be initially a low elasticity of individual consumer demand, favoring a monopolistic competition structure and resulting in high individual contracting costs and high marketing costs.

The new system also incorporates what we consider to be problematic features: in particular, the prohibition against including foreign securities in the pension funds' investment portfolios; the operation of the housing subaccount; the minimum pension guarantee; the disability and life insurance monopoly; the market share limits; portability problems; and the IMSS AFORE. We elaborate on these issues below.

Foreign Securities. The prohibition against including foreign securities in the pension funds' investment portfolios is based on the argument that channeling long-term savings abroad is not desirable when those savings are urgently required by the domestic economy. However, the possibility of diversifying the investment portfolio and minimizing risk is thereby inhibited. A more diversified portfolio will work in favor of future pensioners.

Housing Subaccount. The housing subaccount, which receives a contribution of 5 percent of the base salary, represents more than 30 percent of total contributions to the new system. These resources are not part of the pension funds managed and invested by the AFOREs and are channeled to INFONAVIT. The institute is structured in such a way that most of the risks are born by the savers. Returns on their savings depend on the operating surplus of the institute, which is the difference between interest payments actually collected by the institute and operating expenses and reserve creation. The interest payments received by INFONAVIT depend on the interest rate charged to the borrower, which is between 4 and 8 percent on the outstanding balance of the loan adjusted ac-

cording to increases in the minimum wage.[31] Total payments to INFONAVIT also depend on the employment situation of the worker. It is difficult for the institute to collect payments from unemployed workers, and it rarely forecloses on homes. The institute is also not always able to keep track of workers who change jobs, and, in many cases, it does not continue to collect payments. These factors, as well as the labor market conditions and real wage behavior during recent years, have affected the operating surplus of INFONAVIT and help explain the negative real returns on individual accounts.

Minimum Pension Guarantee. It has been argued that a PAYGO system plays an important redistributive role by providing retirement income for the elderly poor. This implicit redistributive function could be lost under a fully funded system. As Valdés-Prieto (1994) shows, the introduction of a fully funded system can raise long-run income and welfare. However, a redistributive instrument might still be needed, and a government-guaranteed minimum pension can perform this function. While it can be argued that a guaranteed minimum pension can raise moral hazard issues by increasing the fiscal deficit, it can also be argued that the government has the responsibility to assist the elderly poor. In this case, means-tested criteria might be in order. A positive feature of the minimum pension in Mexico is that it is indexed to the consumer price index, not to the evolution of real wages. Since, in the medium term, real wages should rise, the indexing of the minimum pension to the CPI reduces its rate of increase.

Disability and Life Insurance. Under the new system, disability and life insurance will be provided only by IMSS, which will charge a fixed premium equal to 2.5 percent of the base salary. There are several problems with this arrangement. The cost is high compared to that observed for this type of insurance in other Latin American countries where the pension fund managers compete among themselves and purchase the insurance for their affiliates from an insurance company. In these countries, workers can choose the pension fund manager that offers the best conditions. For example, in 1995, the cost of this type of insurance in Chile and Argentina was, on average, 0.67 and 1.17 percent of the base salary, respectively.[32] In Mexico, IMSS will have insufficient incentive to reduce the loss ratio and its administrative costs beyond what is needed to maintain the financial viability of the system, and therefore it is not likely that there will be a reduction in this premium over time.

Market Share Limits. This provision may entail some negative effects to the functioning of the system. Although the conventional wisdom is that more con-

31. Changes in the minimum wage are determined yearly by a government commission that includes representatives of labor and business organizations.

32. The range is 0.4–1.73 percent of the base salary in Chile and 0.32–2.18 percent in Argentina.

centration implies less competition, a well-known result in the industrial organization literature is that this is unambiguously true only for an industry composed of firms producing homogeneous products for which the strategic variable of competition is quantity produced. For AFOREs, competition will be over commissions, returns, and services provided. Therefore, it is possible that, in the market equilibrium, the market share limits may imply that some workers will not be able to open an account in the AFORE of their choice. A higher social cost for the provision of services may also result if the cost structure of the firms is not the same.

Portability. The new system still generates portability losses because the reform affects only the IVCM-IMSS program, leaving unaltered other pension programs. In particular, it is important to emphasize that, as long as other pension systems, like ISSSTE, remain unreformed, workers changing from a job covered by IMSS to a job covered by other programs might lose pension benefits.

The IMSS AFORE. The new pension law allows IMSS to manage its own AFORE, as long as it complies with the corresponding regulations. However, since IMSS also conducts the collection of all pension contributions and has audit and enforcement powers, there is a real risk of unfair competition, favoring the IMSS AFORE, if the authorities do not enforce the regulations meant to prevent this situation.

An interesting feature of the new system is that transition workers will be able to choose the higher of the old- and new-system pensions when they retire. In other countries, such a situation has been managed through the issuance of recognition bonds. The Mexican scheme does not require the calculation of the present value of past contributions or of future expected benefits, as do systems utilizing transition bonds. This design recognizes that workers have acquired rights, and that recognition helps make the reform politically viable. However, one important problem with the Mexican scheme is that it creates some moral hazard problems. Workers could pursue riskier investment strategies knowing that they can always fall back on the benefits of the old system. Also, because of the distortions of the previous system, workers could have fewer incentives to participate in the formal sector of the economy since they are eligible to obtain a pension under the old system after contributing to it for only ten years.

4.3 Costs of the Current and the New Systems

One crucial issue that shapes the long-term effects and determines the success or failure of a pension system reform that entails a shift from a PAYGO to a fully funded system is the transition. This process has important fiscal and

income redistribution effects that may have long-term implications, affecting the achievement of the reform's goals.[33]

As a consequence of substituting a fully funded for a PAYGO system, the government faces the problem of paying the pensions of current pensioners and of honoring the claims of workers who have contributed to the old public pension system. This situation implies that government expenditures should be financed by higher taxes, a reduction of other government expenditures, or the issuance of new debt because contributions are now directed toward the new individual accounts. The size of these obligations may have an important fiscal effect on the government's budget, while the way this deficit is financed has important effects on intergenerational (between current and future generations) and intragenerational (between rich and poor) income redistribution.

Basically, we can distinguish two ways of financing this deficit. On the one hand, the government may issue new debt, trading the old, implicit PAYGO debt for new, explicit debt. Debt financing implies that, in the short run, national saving, the capital stock, and the intergenerational distribution of welfare are only marginally affected, by magnitudes that depend on the net efficiency gains of the reform. On the other hand, the deficit can be financed by raising taxes or cutting government expenditures. A completely tax-financed transition is equivalent to combining a pension reform with a contractionary fiscal policy, and therefore there is a transfer of resources from current to future generations, encouraging higher saving rates and capital formation and raising future per capita income and wage levels. It is possible to have any combination of both options. The net result will depend on the particular mix of instruments used to finance the transition.[34]

The size of the pension debt and the fiscal effect differ among pension reforms depending on the degree of maturity of the old pension system, the size of the formal and informal sectors, the amount of benefits and its relation to contributions, and the performance of such macroeconomic variables as interest rates, output, and wage growth.

33. Arrau (1990), Arrau and Schmidt-Hebbel (1993), Arrau, Valdés-Prieto, and Schmidt-Hebbel (1993), Schmidt-Hebbel (1994), and Corsetti and Schmidt-Hebbel (1996) analyze these effects in the case of a representative economy and in the Chilean and Colombian reform experiences. These papers are based on a framework developed by Auerbach and Kotlikoff (1987). The main features of the representative economy model used are that households maximize lifetime utility, there is no intergenerational altruism, there are no borrowing constraints, and voluntary savings are higher than mandated savings. Households of a given cohort are identical to each other. There is no uncertainty, and the economy is closed. Labor is supplied inelastically, and market clearing allows continuous full employment.

34. As explained by Arrau and Schmidt-Hebbel (1993), the intermediate case was chosen by Chile. The government distinguished among two components of its pension debt: the part due to current PAYGO pensioners (operational deficit) and the part due to past contributions made by currently active workers to the old system (honored with recognition bonds). Debt was used to pay for maturing recognition bonds, and taxes were used to pay the operational deficit.

4.3.1 The Fiscal Cost of the Reform

In this section, we perform a numerical simulation of an actuarial model that estimates the annual pension revenues, expenditures, and liabilities of the IVCM-IMSS pension program as affected by the reform under various circumstances. This model is a partial equilibrium framework that treats relevant macroeconomic variables as given. Nevertheless, for our purposes, it is a useful instrument, one that allows us to deal with more disaggregation in a simple way, compared with a general equilibrium simulation model à la Auerbach and Kotlikoff (1987).

The model is estimated for the two components of the transition fiscal cost: current and transition pensioners. We call the sum of these two components *total transition deficit.* In both cases, we consider pensions paid for old age, severance at old age, and disability and life insurance. The simulations include the case of reform and the case of no reform. The estimates are performed assuming different performances of the main macroeconomic variables. We present a case that we call *full fiscal cost,* which includes both the transition and the permanent cost of the reform. As explained below, the permanent cost of the reform is a consequence of the particular features of the new system. The basic macroeconomic variables that shape the results are the real interest rate and the rates of growth of output, wages, and number of affiliates.

Case 1: The Cost of the Transition

We estimate the fiscal deficit derived from honoring the rights of current and transition pensioners, including pensions paid to widows, children, and other relatives.[35] We perform the simulations for the period 1997–2047 for two scenarios: one assuming low economic growth and the other assuming better economic conditions (see table 4.4). For each case, we also assume three different interest rates. Remember that, in the reformed system, transition workers have the option at the time of retirement to choose between the pension granted under the old system or that granted under the new one. The decision will be determined by accumulated individual savings, which depend on the contributing period, the real interest rate, and the real growth of wages. Throughout the simulations, it is assumed that the labor force covered by the new system will grow according to IMSS (1995) demographic projections.[36] Our assumptions about these variables satisfy the steady-state condition that real output growth

35. We constructed these simulations using publicly available information; they may vary from those constructed by others, depending on the demographic and macroeconomic assumptions made. In particular, we do not consider changes in the age distribution; also, our fiscal cost estimates do not include workers' compensation pensions, commissions paid by the workers, or the SAR's accumulated balances before the reform.

36. IMSS assumes that the number of affiliates will grow by 2.3 percent in 1997, 2.9 percent in 1998, and 2.2 percent thereafter.

Table 4.4 **Actuarial Model Basic Assumptions (%)**

Scenario	Real Output Growth	Real Wages Growth	Real Interest Rate, Retirement	Real Interest Rate, Housing
High growth	5	2.8	{3.5 6 8}	0
Low growth	3	.8	{3.5 6 8}	0

is equal to real wage growth plus labor force growth (Harrod-neutral rate of technical progress).[37] In all simulations, it is also assumed that the balance from the housing subaccount is accumulated with a zero real interest rate and that there are no withdrawals from the individual account during the contributing period.

High-Growth Scenario. Table 4.5 reports the estimated total transition deficit, as a percentage of GDP, derived from the pension reform under the high-growth scenario. We report only the first year, the last year, and the year in which the deficit reaches its maximum in our simulation period. The appendix figures show the evolution of this variable for the whole period.

Assuming an interest rate of 3.5 percent, the total transition deficit rises from 0.48 percent of GDP in 1997 to a maximum of 2.59 percent of GDP in 2035, falling to 1.87 percent of GDP in 2047. If the interest rate is 6 percent, the maximum transition cost is 2.29 percent of GDP in 2035, falling to 1.76 percent of GDP in 2047. Finally, if the interest rate is equivalent to 8 percent, the maximum transition cost is 1.99 percent of GDP in 2031, falling to 1.47 percent of GDP in 2047.

Current pensioners' deficit represents most of the total deficit in 1997, decreasing continuously after that year. This deficit is not affected by the interest rate, but it does depend on the number of current pensioners, including their widows and other relatives, as well as the increase in the minimum wage. The presence of widows and other relatives explains why the operational deficit lasts for a long period of time. The deficit derived from the transition workers depends on the interest rate because, the higher the interest rate, the higher will be the funds accumulated in the individual accounts, and the lower the number of workers choosing the old system. Finally, both components of this

37. It should be noted that, if the rate of technical progress is not neutral, our results will change. In particular, if wL (where w is the wage rate and L is labor) grows at a higher rate than output, the cost will be higher because the pensions under the old system, which are an option for transition workers, are indexed by the minimum wage.

Table 4.5 **Total Transition Deficit, High-Growth Scenario (% GDP)**

Real Interest Rate and Year	Current Pensioners	Transition Workers	Total
3.5%:			
1997	.45	.03	.48
Maximum (2035)	.03	2.56	2.59
2047	.01	1.86	1.87
6.0%:			
1997	.45	.03	.48
Maximum (2035)	.03	2.26	2.29
2047	.01	1.75	1.76
8.0%:			
1997	.45	.03	.48
Maximum (2031)	.04	1.95	1.99
2047	.01	1.46	1.47

Source: Authors' calculations.

total transition deficit are affected by real wage growth since benefits depend on this variable.

Low-Growth Scenario. Assuming an interest rate of 3.5 percent, the total transition deficit rises from 0.48 percent of GDP in 1997 to a maximum of 2.30 percent of GDP in 2033, falling to 1.79 percent of GDP in 2047. If the interest rate is 6 percent, the maximum transition cost is 1.96 percent of GDP in 2030, falling to 1.41 percent of GDP in 2047. Finally, if the interest rate is equivalent to 8 percent, the maximum transition cost is 1.68 percent of GDP in 2027, falling to 1.04 percent of GDP in 2047 (see table 4.6).

Transition Cost Comparison

To get an idea of the importance of the accumulated total transition cost in terms of GDP at present value with respect to other Latin American countries that have carried out similar reforms, we estimate the cumulative transition fiscal cost relative to GDP for the complete simulated period. To make our estimate comparable to other studies, we use an interest rate of 5 percent, equal to output growth. The total transition pension cost for the next fifty years is estimated at 82.6 percent of GDP for this scenario. If we compare this amount with the Chilean and Colombian cases, it turns out that the Mexican cumulative transition cost is lower. Using similar assumptions for these two countries, Schmidt-Hebbel (1994) estimates a cumulative cost relative to GDP of 86.5 percent for Colombia and 126 percent for Chile. The difference in these amounts can be explained, in particular with respect to the Chilean case, by the lower maturity of the Mexican pension system, its younger population structure, and the lower population coverage of the system.

Table 4.6 **Total Transition Deficit, Low-Growth Scenario (% GDP)**

Real Interest Rate and Year	Current Pensioners	Transition Workers	Total
3.5%:			
1997	.45	.03	.48
Maximum (2033)	.03	2.27	2.30
2047	.01	1.78	1.79
6.0%:			
1997	.45	.03	.48
Maximum (2030)	.05	1.91	1.96
2047	.01	1.40	1.41
8.0%:			
1997	.45	.03	.48
Maximum (2027)	.06	1.62	1.68
2047	.01	1.03	1.04

Source: Authors' calculations.

Case 2: Full Cost

This simulation includes transition costs plus fiscal costs that are permanent as long as the new scheme is in place. The new pension system implies three additional government expenditures: the minimum pension guarantee, the "social contribution," and the government's share of the global contribution for retirement, disability, and life insurance.

As is shown in table 4.7, in the high-growth case, the total cost rises from 0.77 percent of GDP in 1997 to 2.53 percent of GDP in 2031, falling to 2.02 percent of GDP when an 8 percent real interest rate is considered. For medium and low interest rates, the maximum total cost relative to GDP is equivalent to 2.96 and 3.39 in 2035 and 2036, respectively. The full cost declines to 2.46 and 2.72 percent of GDP in 2047, respectively.

In the low-growth scenario, as is shown in table 4.8, the total cost rises from 0.77 percent of GDP in 1997 to 2.16 percent of GDP in 2026, falling to 1.46 percent of GDP with the high interest rate. For medium and low interest rates, the maximum total cost relative to GDP is equivalent to 2.54 and 3.05 in 2030 and 2035, respectively. The full cost declines to 1.98 and 2.62 percent of GDP in 2047, respectively.

Case 3: No Reform

This case assumes that there is no reform and that the IVCM-IMSS program will continue indefinitely. Table 4.9 reports the simulation results for the high- and low-growth scenarios and the same demographic assumptions as the previous exercises in this section. We do not report the simulations for each interest rate because results are not directly affected by this variable. Given the current low level of IVCM-IMSS reserves, the effect of the interest rate on the simulation results is negligible.

Table 4.7 **Reform Full Cost, High-Growth Scenario (% GDP)**

Real Interest Rate and Year	Total Transition Deficit	New Pensions[a]	Other[b]	Total
3.5%:				
1997	.48	.00	.29	.77
Maximum (2036)	2.57	.67	.15	3.39
2047	1.87	.75	.11	2.72
6.0%:				
1997	.48	.00	.29	.77
Maximum (2035)	2.29	.54	.13	2.96
2047	1.76	.59	.11	2.46
8.0%:				
1997	.48	.00	.29	.77
Maximum (2031)	1.99	.40	.14	2.53
2047	1.47	.44	.11	2.02

Source: Authors' calculations.

[a]Includes payments of benefits due to disability and life insurance.

[b]Includes social contribution and government contributions for retirement and disability and life insurance.

Table 4.8 **Reform Full Cost, Low-Growth Scenario (% GDP)**

Real Interest Rate and Year	Total Transition Deficit	New Pensions[a]	Other[b]	Total
3.5%:				
1997	.48	.00	.29	.77
Maximum (2035)	2.29	.65	.11	3.05
2047	1.79	.75	.08	2.62
6.0%:				
1997	.48	.00	.29	.77
Maximum (2030)	1.96	.46	.12	2.54
2047	1.41	.49	.08	1.98
8.0%:				
1997	.48	.00	.29	.77
Maximum (2026)	1.67	.35	.14	2.16
2047	1.04	.34	.08	1.46

Source: Authors' calculations.

[a]Includes payments of benefits due to disability and life insurance.

[b]Includes social contribution and government contributions for retirement and disability and life insurance.

Table 4.9 **No Reform Fiscal Cost (% GDP)**

Year	High Growth	Low Growth
1997	1.55	1.61
2022	3.58	5.43
2047	6.29	14.01

Source: Authors' calculations.

The fiscal cost without reform, assuming high growth, rises from 1.55 percent of GDP in 1997 to 3.58 percent of GDP in 2022 and to 6.29 percent of GDP in 2047. If we assume low growth, these values are much higher; 5.43 percent and 14.01 percent of GDP, respectively. Comparing these results with the values obtained for the full fiscal cost in the case of reform, it is clear that the cost of not reforming the current pension system would be much higher in the future.

4.4 Macroeconomic Implications of the Reform

Pension reform in Mexico can have important effects on labor market dynamics, domestic saving rates, capital market development, investment, and output growth. These elements will lead to improved overall economic efficiency, making it likely that the Mexican economy can enter a period of sustainable growth.

4.4.1 Labor Market Efficiency

Even though the new pension reform does not involve a reduction in the ratio of pretax and after-tax wages, it does imply a substantial gain compared to the current PAYGO system. The pension reform makes the system work more as a mandated benefit scheme than as a pure tax, as benefits become more closely related to contributions. Therefore, it reduces distortions in the labor market (see Summers 1989).

On the other hand, the minimum pension guarantee can have negative effects on labor market efficiency. As interest rates and output grow, the number of low-income individuals will decline, reducing government exposure to the fiscal cost generated by pension guarantees. Nevertheless, at the margin, the minimum pension deters workers from productive activities in the formal sector: because future contributions will not imply more income at retirement, workers entitled to receive the minimum pension will have fewer incentives to offer additional labor.

4.4.2 Savings

Several studies have analyzed the transition from a PAYGO to a fully funded system and the effect on saving, both for a representative economy and for

specific countries, on the basis of the Auerbach and Kotlikoff framework (1987).[38] The majority of these papers analyze the transition cost and the alternatives for financing it, which, as discussed in section 4.3, can be reduced to two: tax and debt financed.

Theoretical simulations for tax-financed reforms yield increases in stationary saving rates of 3–5 percent of GDP (Arrau and Schmidt-Hebbel 1993; Cifuentes and Valdés-Prieto 1994). For the case of Colombia, it has been estimated that a tax-financed reform can increase stationary saving rates by 2.4 percent of GDP. For debt-financed transitions, the representative economy obtains a reduction in long-term output of around 1–4 percentage points of GDP (Arrau and Schmidt-Hebbel 1993),[39] while steady-state saving is slightly lowered. Partially debt-financed transition exercises yield intermediate results.

These authors have also explored the possibility of liquidity-constrained consumers in the transition to a fully funded system.[40] In this case, the new scheme forces individuals to a corner solution where their personal savings are increased to a higher level than originally desired. These exercises yield long-term GDP growth estimates as high as 16 percent for a closed representative economy and 4–14 percent for the Colombian case (Cifuentes and Valdés-Prieto 1994; Schmidt-Hebbel 1994). Mexican reform limits individual total indebtedness capacity since workers cannot use their accumulated balances as guarantees in other financial operations.

Mexico's transition is expected to be partially debt financed, but, at the time of this writing, the government has not announced the way in which it will be financed. To assess the effect of Mexican pension reform on savings, we undertook a simple and conservative estimation of the possible evolution of accumulated balances in the individual accounts.

The exercise assumes real GDP growth of 3 percent per year, a real interest rate of 6 percent, and a real wage increase of 0.8 percent a year. It also assumes that the total fiscal cost is partially (50 percent) tax financed and that there is no reduction in voluntary private saving.[41] The increase in contributing workers behaves like IMSS projections.[42] It is assumed that balances in the housing subaccount keep their real value over time and that there are no withdrawals from any subaccount prior to retirement.

Table 4.10 shows the accumulated balance in the individual accounts (including contributions and interest earned minus withdrawals from future pensioners), the fiscal cost per year as estimated in section 4.3, an implied reduction in public-sector savings as the transition is partially tax financed, and the

38. The specific characteristics of the Kotlikoff and Auerbach framework are explained in n. 33 above.

39. This result is driven by the future tax changes assumed by Arrau and Schmidt-Hebbel.

40. Villagómez (1993) found significant empirical evidence to support the liquidity-constrained consumers hypothesis in the case of Mexico.

41. Workers are supposed to have no voluntary savings. This strong assumption is possible in the Mexican case considering current real wages and saving patterns.

42. For projections, see n. 36 above.

Table 4.10 **Effects of the Reform on Savings (% GDP)**

Years	Accumulated Balances (A = Sum Bs)	Flows to Individual Accounts (B)	Total Fiscal Cost (C)	Public-Sector Savings Reduction (D = ½ C)	Net Savings Annual Increase (E = B − D)	Accumulated Savings Increase (G = Sum Es)
1	3.98	2.21	.48	.24	1.97	3.74
5	13.16	2.44	.52	.26	2.18	12.15
10	25.95	2.72	.72	.36	2.36	23.66
15	40.07	2.97	1.08	.54	2.43	35.7
20	55.31	3.16	1.45	.72	2.44	47.88
30	88.2	3.43	1.91	.95	2.47	72.35
40	123.75	3.74	1.87	.94	2.81	98.57

Source: Authors' calculations.

estimated net financial savings increase, defined as the difference between annual flows into the individual accounts plus interest minus withdrawals and the public-sector savings reduction. Finally, it includes an estimation of the accumulated savings increase associated with the pension reform.

As can be seen, net saving can be increased by around 2.18 percentage points of GDP in five years to around 2.81 percentage points after forty years of the introduction of the pension reform. This is a conservative estimate since it assumes low growth conditions and does not consider a positive real rate of return on the housing subaccount.

4.4.3 Capital Markets

Pension reform will produce a significant long-term increase in the availability of financial resources to the economy. This will promote further financial specialization and the creation of new instruments, especially those related to long-term investments. As can be seen in figure 4.3, total financial savings are highly concentrated in short-term instruments. Long-term instruments account for only 21.7 percent of total financial savings and 11.9 percent of GDP. With the pension reform, long-term instruments could reach 21.9 percent of GDP in 2000 and around 45 percent of GDP in 2010.

The capitalization value of the Mexican Stock Exchange in 1995 was equivalent to 44 percent of GDP. If we consider the accumulated balances of the individual retirement accounts estimated in the savings section and assume that AFOREs invest their resources as does a typical pension fund in the United States (60 percent equity and 40 percent debt), we could expect that total pension fund participation in the stock exchange will be around 1.9 percent of the total during the first year and that after fifteen years it could reach around 15 percent of GDP.

The availability of these resources will promote financial deepening and

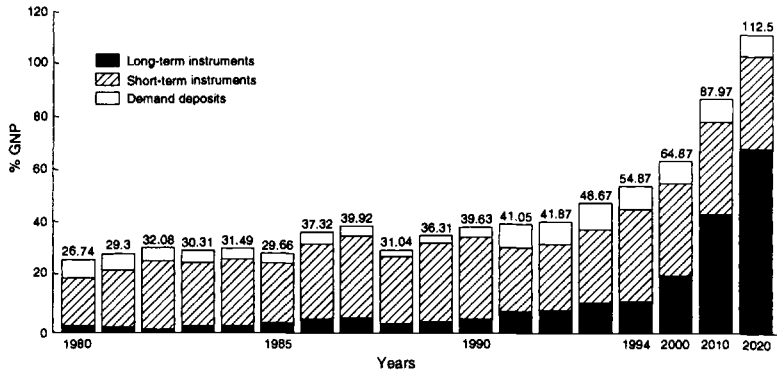

Fig. 4.3 Financial savings (M4N currency)
Source: Banco de Mexico.

long-term investment. These gains could have a significant effect on investment decisions and growth.

4.4.4 Investment and Growth

The National Development Plan 1995–2000 estimates that, in order for the Mexican economy to grow at the rate of 5 percent annually, Mexico requires an investment rate equivalent to 24 percent of GDP. The plan projects that this investment rate will be financed by domestic savings, representing 22 percent of GDP, and foreign savings, equivalent to 2 percent of GDP. The domestic savings goal requires an increase in this variable of about 6 percentage points of GDP.

From the results of the savings projections, and assuming that all new savings are channeled to finance investment and not to reduce the current account deficit, the pension reform will directly generate savings that could finance close to 25 percent of the additional required investment by the year 2000. As the system matures, the effect of the reform on savings will be higher, and therefore its contribution to investment and growth will be more significant.

4.5 Concluding Remarks

Pension reform is now a worldwide phenomenon forced by changing economic, demographic, and social structures. In general, these processes have been part of major economic transformations. Social security reforms involve many different aspects in a complicated manner. There is no one way to proceed, and each country has developed its own model. However, it is clear that any solution chosen should meet at least two requirements: financial and social viability.

This paper analyzed the Mexican pension reform and made some preliminary assessments about its future effects on the Mexican economy. We presented and compared the most important characteristics of the old and the new pension systems. There were several factors that caused the reform. First, the old IVCM-IMSS system was financially unsustainable; second, the Mexican economy needs to increase its domestic saving rate.

The reform basically consists of establishing a fully funded defined-contribution system based on individual accounts with a minimum pension guarantee provided by the government. Total contributions amount to 13.5 percent of the salary of the average worker for accumulation in the individual accounts plus 2.5 percent for disability and life insurance, which is still managed by IMSS.

The new Mexican system shares many common elements with other Latin American reforms. However, it also has its own advantages and disadvantages. The advantages are that the new system respects the acquired rights of current workers, that the old system is completely replaced by the new system, that administrative costs are reduced by limiting the number of transfers between pension fund managers to one per year, that pension managers are allowed to

operate several funds, that the law does not establish a minimum guaranteed rate of return for pension funds, and that there is a centralized collection agency and a centralized data bank. The disadvantages include that the funds are prohibited from investing in foreign securities, that the IMSS is the sole provider of disability and life insurance, and that the minimum pension is guaranteed. Other disadvantages are the IMSS AFORE, the operation of the housing subaccount, portability problems, and the market share restrictions. These situations should be modified in the future to further improve the new system.

The fiscal cost of the transition to the new system is relatively low compared to similar reforms in other Latin American countries. The present value of the transition cost represents about 82.6 percent of GDP, lower, for example, than in Chile and Colombia. This mainly reflects the fact that the reform was undertaken when Mexico's population was still relatively young.

The reform will have a significant effect on financial savings. Accumulated balances in the individual accounts could reach 24 percent of GDP after ten years, around 48 percent after twenty years, and 72 percent after thirty years. This will increase the possibility of financing long-term investment projects in Mexico and will also promote more efficiency in the financial sector.

Appendix

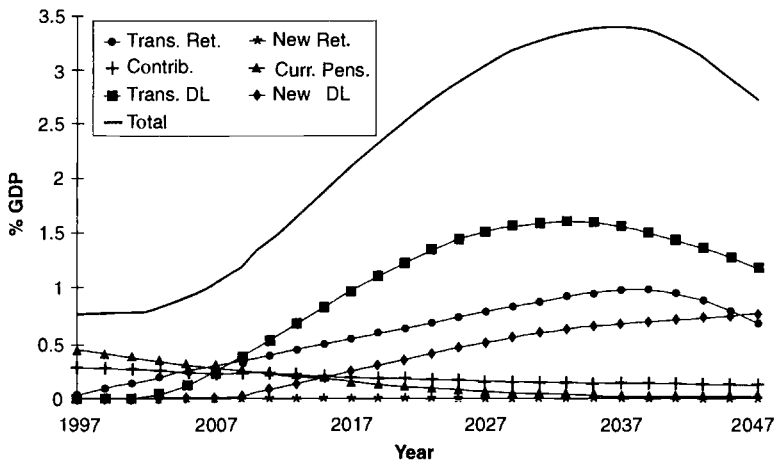

Fig. 4A.1 Cost of the reform, high-growth scenario (interest rate 3.5%)
Source: Authors' calculations.
Note: Trans. Ret. = old age and severance at old age pensions paid to transition pensioners. New Ret. = expenses in old age and severance at old age pensions for new pensioners. Trans. DL = disability and life pensions paid to transition pensioners. New DL = expenses in disability and life pensions for new pensioners. Contrib. = contributions. Curr. Pens. = pensions of current pensioners.

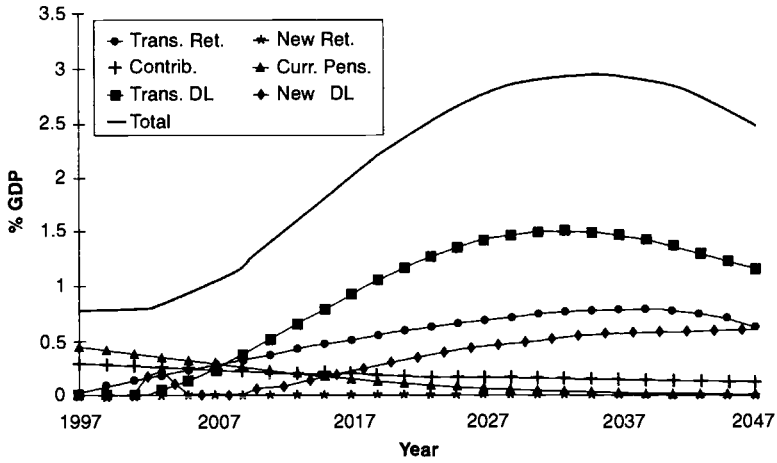

Fig. 4A.2 Cost of the reform, high-growth scenario (interest rate 6%)
Source: Authors' calculations.
Note: For abbreviations, see fig. 4A.1.

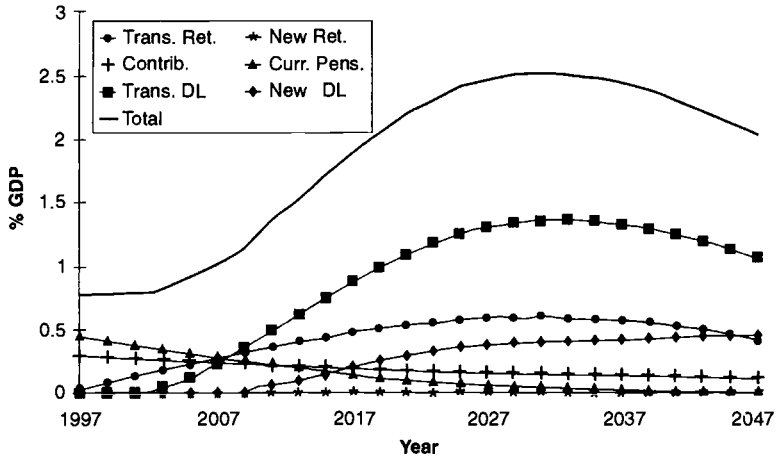

Fig. 4A.3 Cost of the reform, high-growth scenario (interest rate 8%)
Source: Authors' calculations.
Note: For abbreviations, see fig. 4A.1.

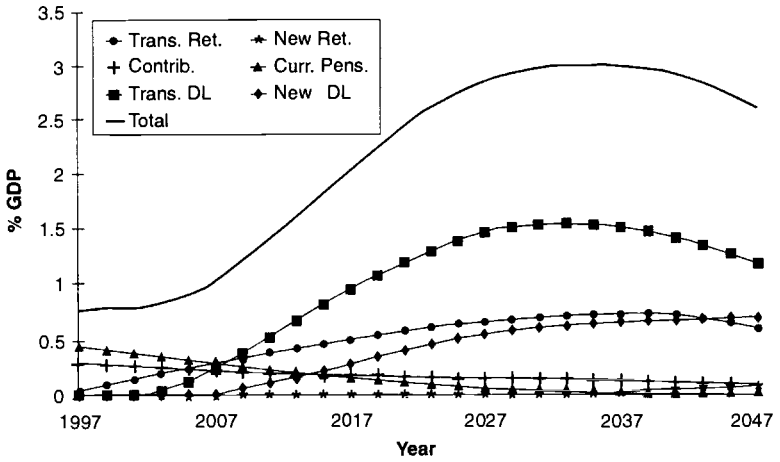

Fig. 4A.4 Cost of the reform, low-growth scenario (interest rate 3.5%)
Source: Authors' calculations.
Note: For abbreviations, see fig. 4A.1.

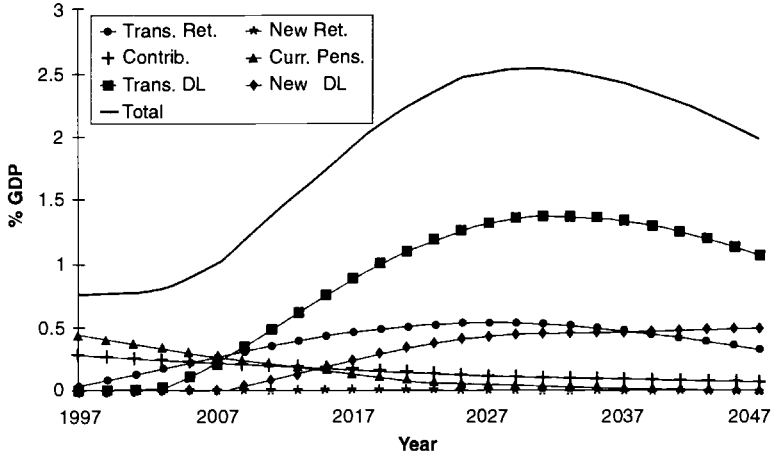

Fig. 4A.5 Cost of the reform, low-growth scenario (interest rate 6%)
Source: Authors' calculations.
Note: For abbreviations, see fig. 4A.1.

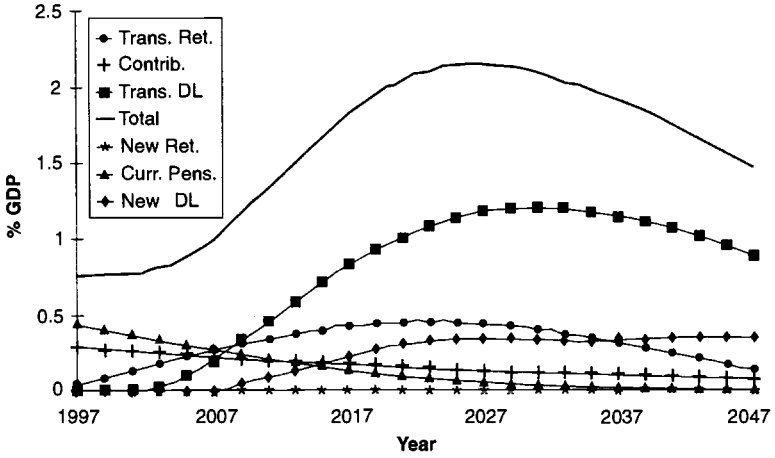

Fig. 4A.6 Cost of the reform, low-growth scenario (interest rate 8%)
Source: Authors' calculations.
Note: For abbreviations, see fig. 4A.1.

References

Arrau, Patricio. 1990. Social security reform: The capital accumulation and intergenerational distribution effect. Working Paper no. WPS 512. Washington, D.C.: World Bank, Policy, Research and External Affairs, October.

Arrau, Patricio, and Klaus Schmidt-Hebbel. 1993. Macroeconomic and intergenerational welfare effects of a transition from pay-as-you-go to fully-funded pension system. Paper presented at the twelfth Latin American meeting of the Econometric Society, Tucumán, Argentina.

Arrau, Patricio, Salvador Valdés-Prieto, and Klaus Schmidt-Hebbel. 1993. Privately managed pension systems design issues and the Chilean experience. Background paper for the Old Age Security Project. World Bank: Washington, D.C.

Auerbach, A., and L. Kotlikoff. 1987. *Dynamic fiscal policy.* Cambridge: Cambridge University Press.

Banco de México. 1996. *Informe anual, 1995.*

Bosworth, B., R. Dornbusch, and J. Poterba. 1995. Public policies to support saving and investment in Mexico. Mimeo.

Cifuentes, R., and S. Valdés-Prieto. 1994. Transition from PAYGO to funding in the case of credit constraints. Paper presented at the conference Pensions: Funding, Privatization, and Macroeconomic Policy, Catholic University of Chile.

Corsetti, Giancarlo, and Klaus Schmidt-Hebbel. 1996. Pension reform and growth. In *Pensions: Privatization, funding and macroeconomic policy,* ed. Salvador Valdés-Prieto. Cambridge: Cambridge University Press.

Diamond, Peter. 1994. Privatization of social security: Lessons from Chile. *Revista de análisis económico* 9, no. 1 (June): 21–33.

Feldstein, Martin. 1995. Public policies to increase the saving rate in Mexico. Mexico D.F.: Asociación Mexicana de Bancos. Mimeo.

Gil-Díaz, Francisco, and Agustín Carstens. 1996. Some hypotheses related to the Mexican 1994–95 crisis. Documento no. 9601. Mexico D.F.: Banco de México.
Instituto Mexicano del Seguro Social (IMSS). 1995. *Diagnóstico IMSS.* Mexico D.F.
———. 1996. Aportaciones al debate. Mexico D.F.
Schmidt-Hebbel, Klaus. 1994. *Colombia's pension reform: Fiscal and macroeconomic implications.* Washington, D.C.: World Bank, Policy and Research Department, October.
Solís-Soberón, Fernando. 1995. Descripción del sistema de ahorro para el retiro. Documento de Trabajo no. 3. Mexico D.F.: CONSAR, September.
Solís-Soberón, Fernando, and Alejandro Villagómez. 1996. Domestic savings in Mexico and pension system reform. Paper presented at the Conference on Mexico sponsored by the Institute of Latin American Studies at the University of London.
Summers, Lawrence. 1989. Some simple economics of mandated benefits. *American Economic Review* 49 (May): 177–82.
Valdés-Prieto, Salvador. 1994. Distributive concerns when substituting a pay-as-you-go by a fully funded pension system. *Revista de análisis económico* 9, no. 1 (June): 77–104.
Villagómez, Alejandro. 1993. Los determinantes del ahorro en México: Una reseña de la investigación empírica. *Economía mexicana* 2, no. 2:305–28.

Comment

Aaron Tornell

This paper analyzes the transition of the Mexican pension system from a pay-as-you-go to a fully funded system. It gives a diagnostic of the old system, describes the institutions under the new system, and evaluates the macroeconomic consequences of the reform. The paper is very informative and provides a well-rounded evaluation of the reform's implementation. My comments concentrate on the possible macroeconomic consequences of the reform. They should be considered as simply speculative and complementary to the paper.

The authors give two reasons why pension reform has been implemented in Mexico. First, the old system became insolvent. Second, pension reform will increase national saving, and this in turn will induce a higher growth rate, as occurred in Chile.

Two issues determine whether pension reform leads to higher growth. One involves fiscal redistribution. The other has to do with the proper functioning of the regulatory framework. I consider each in turn.

The first point I want to make is that pension reform is not a sufficient condition for a higher saving rate. If pension reform is not accompanied by judicial reform, it is unlikely that the saving rate will increase.

During the last quarter century, Mexico has enjoyed several episodes of oil windfalls, which were not permanent with perfect certainty. A puzzling aspect of these episodes is that the windfalls did not increase the saving rate in Mex-

Aaron Tornell is associate professor of economics at Harvard University and a faculty research fellow of the National Bureau of Economic Research.

ico. Moreover, they induced significant deteriorations of the current account. Mexico is not alone in this: Nigeria and Venezuela are prime examples of other countries that had similar experiences. One explanation for this response is that shocks were considered 100 percent permanent, but this is difficult to believe since other countries experiencing similar shocks did not have such deteriorations in their current accounts. Another explanation is that there was an institutional problem, that there were some groups within society with the power to appropriate fiscal resources and no countervailing institutions to check this power. Thus, when the windfall occurred, groups simply became more voracious and appropriated more, and national saving and higher growth failed to materialize. Of course, these mechanisms might not exist in developed countries, but Mexico is not yet in that situation.

Suppose, then, that pension reform is a success and increases workers' savings. This creates a windfall for the country relative to the status quo ex ante. If the same mechanism that operated with the oil windfalls operates now, appropriation in other areas of the economy may increase. As a result, the net effect of pension reform on the national saving rate might be nil. This does not mean that pension reform should not be implemented. Rather, it implies that policy makers should not be content with the implementation of pension reform alone as the way to increase productive investment. Policymakers should also implement judicial reforms to create countervailing institutions that will limit or eliminate the power of special groups to engage in discretionary redistribution.

The previous discussion suggests that simplistic extrapolations of the Chilean experience, in which pension reform led to an increase in savings, might be misleading. The reason is that the political economies of Mexico and Chile are quite different. Pension reform in Chile was undertaken in the aftermath of a civil struggle and a military coup, in which several powerful groups lost the power to appropriate fiscal resources that they enjoyed in the 1960s. One could say that, in the Chilean case, the government was relatively autonomous. This is not the case in Mexico today.

Let me shift now to the second issue, which is the proper functioning of the regulatory framework. The guaranteeing of the pensions' real return by the government might generate incentive compatibility problems with pension funds' managers. Thus, strict regulation is extremely important. Given the recent banking history of Mexico, this should not be taken for granted. During the early 1990s, after the privatization of the banks, there was a lending boom in which bank credit to the private sector increased 116 percent from 1990 to 1994. This lending boom led to a quick deterioration of the quality of banks' portfolios for two reasons. First, consumer credit increased exponentially. Second, banks engaged in risky off–balance sheet investments. In the end, the government absorbed a big share of the costs associated with these risks. The problem cannot be traced back to a lack of regulatory law or the absence of a regulatory body. In fact, at the time of the banks' privatization, a law to regulate

the privatization was drafted, and the National Banking Commission had the power to oversee banks. The problem was that the commission was not sufficiently equipped to monitor the exponential increase in bank lending and investment activities.

Extrapolating from the experience with the banks in Mexico, one should emphasize the need for a very strict regulatory framework for pension managers during pension reform, at least during the transition period.

Discussion Summary

Jeffrey Liebman and Andrew Samwick

The discussion began with comments about Aaron Tornell's suggestion that increased corruption might negate the gains of social security privatization. One participant said that Tornell's arguments were not arguments against market incentives such as privatizing social security; rather, they were an argument for liberalization of both the political and the economic spheres. Another participant questioned whether it was generally the case in representative agent models of rent-seeking behavior that investment would decline in response to a positive terms-of-trade shock. He suggested that there were not clear implications from such a model. He also argued that there would be fewer possibilities for theft of the surplus from social security reform than from a terms-of-trade shock. A third participant argued that the effects of reforms on investment were likely to be the opposite of what Tornell claimed. Since the reforms were likely to boost private and national saving, they would increase the confidence of foreign lenders, and this would lead to a greater inflow of capital from abroad.

However, another member of the group said that Tornell was right about graft and corruption and said that the Mexican reforms are going to be a disaster. He said that, while it makes sense to have a single collection agency, Mexico has chosen IMSS, the most inefficient and corrupt agency in the government, for this role. Another participant questioned whether it was wise for IMSS simultaneously to be administering the program and to be competing as a fund manager. He thought that it might be possible for IMSS to subsidize itself out of general collections of payroll taxes and therefore gain an unfair competitive advantage. Sales responded that he thought that IMSS was capable of doing a good job of collecting the revenues, but he agreed that it was problematic for IMSS to be a fund manager at the same time that it has enforcement powers and the authority to sanction employers who do not comply with the social security law.

It was pointed out that the housing funds run by INFONAVIT have been yielding −5 percent a year. Thus, if a rate of return of 9.6 percent is expected for the entire social insurance contribution and 30 percent is invested in the

housing fund, the other 70 percent will have to yield an unlikely 15 percent for the typical worker to avoid relying on the minimum pension.

The discussion turned to annuitization, and one participant asked whether Mexico had any previous experience with annuities. Sales reported that, under the old SAR system, all workers took a lump sum payment, with the result that there is currently no annuity market in Mexico. People who outlive their lump sum receive the minimum pension from the old IMSS system.

Another participant expressed concern that Mexico was going to give people the option at retirement of choosing the maximum of the old system benefits and the new system benefits. He said that this would create a serious moral hazard problem and that people would buy extremely risky portfolios that contained a small probability of a very high return. Sales agreed that there was indeed a risk that investors would gamble with risky investments since they could always fall back on the minimum pension. Indeed, he reported that he had spoken with a future pension fund administrator who was planning to offer a portfolio with exactly such a strategy.

A member of the group questioned whether it was wise to turn implicit debt into explicit debt in a country like Mexico that often suffered from difficult macroeconomic conditions. Explicit debt can lead to exploding interest payments and an economic crisis.

In wrapping up the discussion, Sales described three troubling trends in Mexican public finance. First, he said tax evasion is increasing. Between the first quarter of 1995 and the first quarter of 1996, the VAT increased from 10 to 15 percent. GDP and consumption fell by 1 percent over this interval. However, tax revenues increased by only 15 percent in response to this 50 percent increase in tax rates. Second, he said that health care expenditures are consuming an increasing fraction of the government budget and that it would be important to keep an eye on the results of the recent reforms of health care financing. Third, he said that privatization of state-owned firms is proceeding very slowly.