BBVA

Toward the Strengthening of the Pension Systems in Mexico:
Vision and Reform Proposals

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"Toward the Strengthening of the Pension Systems in Mexico:
Vision and Reform Proposals"

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Foreword

BBVA is a multinational financial services group and an important pension fund manager in Latin America, and in accordance with its corporate vision of working for a better future for people, it seeks to contribute to the strengthening of the region's pension systems through analysis and diffusion on their overall situation.

Within the framework of the aforementioned vision, BBVA's departments of Economic Research and Pensions & Insurance America (Pensiones y Seguros America) started in 2004, a joint research project that made it possible to identify an agenda of adjustments to be introduced into the pension systems in Latin America. The results of the study "Road Map for the Reform of the Pension Systems in Latin America" were presented by David Taguas Coejo and Agustin Vidal-Aragon de Olives in the forum on "Pension Reform: Transition issues and Deepening reforms" organized by the Inter-American Development Bank in Washington D.C. in December 2004.

The "Road Map for the Reform of Pension Systems in Latin America" is the research project that defines the focus and began the series of studies undertaken by BBVA on the pension systems in Latin America. The first country study was presented in April 2006 and involved the case of Chile ("25 years after the Reform of the Chilean Pension System: Evaluation and Adjustment Proposals"). The study "Toward the Strengthening of the Pension Systems in Mexico: Vision and Reform Proposals" represents the second publication in the series and other research projects are underway for Argentina, Colombia, and Peru.

The aim of this study of the pension systems in Mexico is to offer new elements of analysis for a better diagnosis of their current situation and at the same time to provide a comprehensive perspective for their future operation. In this sense, this project seeks to identify in advance the issues that can be problematic and formulate proposals that could contribute to improving the country's pension plans.

In order to achieve its objectives, this research study greatly benefited from the experience, vision, and comments offered by different members of the Senior Management of BBVA. We would like to express our appreciation to our Editorial Board comprised of Vicente Rodero Rodero (Chairman), Agustin Vidal-Aragon de Olives (Vice Chairman), Jose Luis Escriva Belmonte (Vice Chairman), Francisco Gonzalez Almaraz, Joaquin Vial Ruiz-Tagle, Jorge Sicilia Serrano, and David Tuesta Cardenas for having enriched the analysis and extended the scope of this study with their opinions. The authors of this book would especially like to thank Agustin Vidal-Aragon de Olives for having promoted this research project within BBVA and for having expanded our vision on the issue of pension systems with his reflections on the need for having an overall focus in considering the agenda of adjustments.

In addition to the comments from our Editorial Board, a series of interviews in different stages of the project and comments by various specialists in the public and private sec-

tor enabled us to better understand the operation of the pension systems in Mexico. We would like to express our gratitude to all these specialists for having shared their opinions and knowledge with us and especially, to the following individuals, in alphabetical order: Aaron Abramovici Kirsch, Noelia Bernal Lobato, David Lopez Campos, Angel Melguizo Esteso, David Madero Suarez, Lorenza Martinez Trigueros, Antonio Mora Tellez, Moises Schwartz Rosenthal, Fernando Solis Soberon, David Taguas Coejo, and Patricio Urrutia Sepulveda.

We would also like to express our special gratitude to the National Commission for the Retirement Savings System (Consar for its Spanish initials). The statistical information that this agency offered us on the Retirement Savings System in Mexico was decisive in introducing in our calculations the concept of density of contributions and enabled our research project to offer results for different categories of affiliates to the country's social security program.

This study was prepared by:

Adolfo Albo Marquez, research project director
Fernando Gonzalez Cantu, demographic perspective
Ociel Hernandez Zamudio, macroeconomic perspective
Carlos A. Herrera Gomez, analysis of pension systems, fiscal effects, diagnosis and proposals
Angel Muñoz Blanco, design and construction of the actuarial model of the Mexican Social Security Institute (IMSS for its Spanish initials) pension system based on defined-contributions and of the individual simulators for the pension systems of the IMSS and the Federal Government Employees Institute of Social Security Services (ISSSTE for its Spanish initials).

Fernando Tamayo Noguera and Carlos A. Herrera Gomez were in charge of the graphic design and edition of the study, respectively.

All the possible limitations, errors, and omissions in the study are the responsibility of the authors.

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Executive Summary

More than a decade has passed since the implementation of the defined-contribution pension scheme at the Mexican Social Security Institute (the IMSS, for its Spanish initials). This scheme radically transformed the institutional design of retirement arrangements in Mexico, since for the first time in the country's social security history, it allowed guaranteeing affiliates' ownership of their pension benefits.

At the same time, the opening of a defined-contribution scheme in the IMSS, supported in its operation by the participation of the public and private sectors, made it possible to advance toward the establishment of viable retirement systems that were better planned in line with the country's demographic changes. This was because the social security reform allowed replacing the former IMSS defined-benefit and pay-as-you-go scheme —without long-term financing, vulnerable to demographic change and with broad government guarantees— with a defined-contribution scheme based on individual accounts with a minimum pension guarantee provided by the government. A new scheme better oriented toward people with lower resources through the "social quota" (a contribution by the federal government to the retirement savings accounts) and with better funding for a number of affiliates who currently represent slightly more than one fourth of the country's employed population.[1]

In more than 10 years that the defined-contribution scheme has been in operation, different indicators report a dynamic activity. The number of affiliates, the amounts of the funds managed, and the number of Retirement Fund Administrators (Afore for its Spanish initials) have shown a notable expansion in a market characterized by a strict regulatory supervision and growing competition among the Afore. This provides protection to the affiliates, and offers them various options for the management of their individual accounts and the investment of their funds.

However, the aging of the population demands that the IMSS pension system evolve and be prepared to better serve a growing number of affiliates nearing retirement age. It is in this context that BBVA has decided to conduct an in-depth study of the retirement arrangements in Mexico under the framework of a demographic and economic projection that covers the period from 2005 to 2050.

The purpose of this study is to know the pension levels that will be paid under the IMSS defined-contribution scheme, the replacement rates that it will provide with respect to the average wages of the affiliates in the last ten years of their active work life, as well as estimating its coverage and evaluating the effect that the different economic and demographic variables and the key parameters of the scheme will have on pension levels and on the fiscal commitments derived from the new retirement arrangement.

1 The government's monthly contribution to the individual retirement savings account of each affiliate for each day is known as the "social quota". When the July 1st 1997 reform came into effect, it was equivalent to 5.5% of the general minimum wage for Mexico City (the SMGVDF for its Spanish initials). The value of this initial amount is updated quarterly in accordance with the National Consumer Price Index.

Based on the projection exercises, a diagnosis is submitted, the sensitivity of variables in the system to parametric changes is evaluated and the effects on pensions, replacement rates and fiscal costs are estimated if a group of proposals are applied that could contribute to resolving the problems identified.

BBVA is of the opinion that the defined-contribution schemes have promoted savings and the development and stability of those countries that have incorporated them as part of their pension and social security programs. However, an erratic creation of formal employment, a significant participation of informal labor relations and some problems in the design of the social security programs can be clearly identified as factors that still limit the potential benefits that the defined-contribution schemes could provide to affiliates in terms of coverage and/or replacement of income in their old age.

It is therefore advisable to review the institutional framework under which the various pension systems in Mexico operate, to prepare a diagnosis that will allow a better understanding of those mechanisms that have proven to be imperfect and to propose measures that could lead to better results. Having said this, this study proposes that the analysis of the country's pensions must be faced with a comprehensive view that takes into account not only the parameters of the retirement arrangement itself but also the demographic and economic conditions under which individuals, companies and the government itself must act in the following decades to carry out their respective planning efforts with regard to old age pensions.

Because of this, it is clear for example that retirement arrangements require certainty regarding the course of the economy to link different income flows throughout time. In this sense, economic and financial stability are indispensable elements for the success and total development of pension systems. Nevertheless, long-term economic growth is also affected by the development of pension systems and demographic variables. On one hand, pension systems that do not have sustainable financing become a source of public deficits, which limit the savings and investment possibilities in the economy, and on the other hand, the aging of the population has a direct impact on the available labor supply and also on decisions regarding consumption, savings and investment, and, in the final instance, on production, productivity and labor wages.

It is therefore under a context of multiple interrelations that policy makers face the challenge of developing retirement arrangements with a comprehensive focus. By facilitating on one hand, the conditions that will allow companies to create jobs in the formal sector of the economy, and on the other, for people to build appropriate savings for their retirement through a solid pension design that will allow recognizing its different contribution patterns and at the same time be sufficiently flexible to meet different labor situations.

In view of the above, the results of this study identify that a key variable in retirement arrangements with savings accounts and defined-contribution schemes is precisely the size of social security contributions. These depend on wage levels and the frequency with which the respective contributions are paid. However, the evidence increasingly points

to the fact that there is great heterogeneity in the density of contributions by affiliates to the retirement plans. Because of the above, this variable plays an important role in the calculations of this study. Thus, with statistical information on the affiliates of the Retirement Savings System provided by the National Commission for the Retirement Savings System (Consar for its Spanish initials), four principal groups of workers were defined in terms of the average density of contributions; these were then separated by gender and in three income categories in order to reach a reasonable desegregation and thus cover the profiles of different types of affiliates. We believe that the above breakdown of information serves to enrich the analysis of retirement arrangements in Mexico since, due to data limitations, information had been centered mostly on the case of a "representative individual".

1. Results

The main results of the projection exercises are:

- Coverage of the IMSS pension system shows an important increase based on various indicators. For example, measuring the number of old-age pensioners of the population over 64 years of age, these will increase from 32% in 2010 to 69% in 2050. Nevertheless, coverage is a concept resulting from the combination of pensioners under the rules of the former IVCM plan (Spanish initials for disability, old age, severance at old age and life insurance plan) in the Social Security Law of 1973 (LSS-73 for its Spanish initials) and the growing share of pensioners in the new pension plan under the reformed law (LSS-97 for its Spanish initials). We estimate that up to the year 2035, affiliates in transition will choose the conditions of the LSS-73, and only as of that date, will the LSS-97 treatment become the only retirement arrangement.

- In order to consider the right of affiliates in transition to choose, at the moment of retirement, between the LSS-73 or LSS-97 pension plan, the old-age pension levels and replacement rates were projected under both treatments. The calculations show that:
  - The IMSS retirement system offer a clearly differentiated perspective for the different categories of affiliates considered in terms of income and density of contributions. Nevertheless, the pensions and replacement rates will always be higher for those affiliates that show a greater consistency in their contributions, which translates into higher contribution densities. This is true, independently of whether the affiliates reached retirement under the previous or the new law, or whether the balance in their housing sub-account is used or not to finance their pension.
  - For those affiliates with lower contribution densities, there is a high risk of reaching an unprotected old age. The situation could have different nuances for affiliates in transition depending on the pension treatment that they choose. Under the LSS-73 plan, they could lose their right to a pension and their contributions to the system if they have not complied with at least 500 weeks of contributions. In turn, under the new LSS-97 plan, although the balances in their individual accounts would be low due also to the low contribution density, the funds in these would always be theirs and could, at any given time, be increased through voluntary savings.

  - The pensions calculated under LSS-73 are higher than those under the new LSS-97 until the year 2035. However, there are significant differences between the two pension plans in terms of their financing sources. On one hand, the IVCM pension plan under LSS-73 must be financed with budgeted resources based on the income of taxpayers, whereas under the new defined-contribution scheme, financing will have the support both of tri-party contributions (government, employers and employees) as well as from the net returns from the Pension Fund Investment Management Companies (Siefore for its Spanish initials).
  - The results demonstrate that in order to aspire to better pensions it is indispensable to contribute regularly to the retirement system during a person's active work life. However, the pension replacement rates under LSS-97 treatment in no case are greater than 51% unless the possible use of the balance in the housing sub-account is considered. In this last situation, for example, affiliates with an income of up to one minimum wage and a higher contribution density could reach a replacement rate of 73%, calculated based on their average salary during the last 10 years of their active work life.

- In an alternative economic scenario, with deeper structural reforms and therefore greater productivity gains and economic growth, pensions could be 52% higher on average than that estimated in our base scenario. Such a situation is proof of the potential benefits that exist if the modernization process of the Mexican economy is completed.

- The projection exercises also show that mandatory savings through the RCV sub-account (Spanish initials for retirement, severance at old age and old-age insurance plan) will have a very significant impact on the country's financial savings. These savings will allow the savings balance in all types of financial instruments to increase as a percentage of GDP during the projection period, as all accrued balances due to RCV will grow from a level of 5.7% of GDP in 2005 to 23% of GDP in 2050. The new IMSS pension plan thus shows a clear contrast with the former IVCM plan, which due to its fiscal imbalances, was an important source of public deficits.

- With the aim of offering a long-term comprehensive view on the operation of the pension systems in Mexico, the indicators of fiscal costs in this study were not limited only to the IMSS defined-contribution scheme, but also considered the commitments of the state due to the effects of the former IVCM defined-benefit scheme under LSS-73 and the transition between the two arrangements. Moreover, an analysis of the case of ISSSTE (Spanish initials for Federal Government Employees Institute of Social Security Services) was also included, both due to the importance of the ISSSTE as well as the recent reform of its Pension Fund. The results show that:
  - The reform of the IMSS pension system had an important fiscal benefit. According to our estimates, the difference between disbursements under the inertial scenario and the new design (total amount of government contributions and guaranteed pensions) is 61.4% of 2004 GDP. However, the transition between pension schemes in the IMSS still imposes a significant fiscal effort (56.4% of 2004 GDP).

- The option of affiliates in transition to choose their pension plan when they retire delays and reduces in practice the fiscal benefits of the reform. Moreover, the transition mechanism also hinders the full development of the new retirement system because it does not create incentives for affiliates in transition to want to contribute on a regular basis to the reformed plan. This limits the consolidation of the defined-contribution scheme and reduces its potential benefits.
- The reform of the ISSSTE Law is an important advance in the strengthening of public finances. If the previous ISSSTE pension plan had been maintained, the fiscal cost would have been equivalent to 38.4% of GDP only in the period from 2008 to 2050.
- As regards an inertial scenario, the reform of the ISSSTE Pension Fund allows the state to liberate resources in the medium and long-term for an amount equivalent to 19.6 points of GDP, whereas with a fiscal cost of 18.6 points of GDP in the 2008-2050 period, the defined-contribution scheme allows guaranteeing affiliates the ownership of their pension benefits—a clear contrast with the previous plan—and provide them with economically viable pensions, which with a high probability, could be higher than the guaranteed pension due to the new design of contributions.

2. Diagnosis

The scenario that emerges from the projection exercises shows very positive elements based on the past pension reforms in the IMSS and the ISSSTE:

- The new design of IMSS pension plan with a defined-contribution scheme and guaranteed pensions allows strengthening the social security system in Mexico because it introduces transparent and economically viable mechanisms to accumulate the funds necessary for financing the pensions. The design also allows a better directing of supports from the state toward people of lower resources through the "social quota" and incorporates new and important ownership and portability rights for affiliates.

- The reform of the ISSSTE Law, in clearing the way for the portability with IMSS pension benefits, will facilitate in the medium and long-term greater labor mobility and thereby contribute to improving the allocation of resources in the economy, thus benefiting potential economic growth.

- The IMSS and ISSSTE pension reforms allow stopping a growing fiscal pressure on public finances deriving from the operation of retirement plans under pay-as-you-go mechanisms vulnerable to demographic change. Thus, the pension reforms result in significant savings for the state and also benefit long-term stability and economic growth.

- The projections indicate that the new IMSS pension plan has the capacity to continue strengthening financial savings in the Mexican economy. This will allow deepening and developing the different financial markets in the country even more, thereby generating important positive external effects for productive activity.

However, the information available also reveals that the benefits that the defined-contribution schemes can actually grant, particularly under the new IMSS pension plan, are limited by factors beyond the sphere of the retirement systems:

- Although the new IMSS pension plan has the necessary mechanisms to channel the savings of almost three fourths of the labor force in the country toward the end of the projection period, the fragmentation of social security in Mexico and the presence of different retirement arrangements that still do not offer mechanisms for affiliates' portability of rights limit the possibilities that in the future the IMSS pension system could offer universal coverage.

- The economic coverage and protection that the new IMSS pension plan can actually provide depends greatly on the contributions it receives and the regularity with which it receives them during the economically active life of its affiliates. However, a reality of the social security system is that a great number of affiliates do not register a high contribution density. This is a warning that better mechanisms for pension contributions should be implemented for people that up to now are self-employed or engaged in informal labor activities, and signals the need to carry out actions beyond the sphere of the pension systems to facilitate a greater expansion of formal labor relations.

- The pensions and replacement rates in the new retirement system are differentiated in terms of the income and density of contributions of the affiliates. However, in order to have a general reference as to how high or low these are, it would be necessary to conduct an international comparison. In this sense, the evidence available shows that there is an inverse relationship between the replacement rates and the level of economic development. Thus, using this relationship, it is possible to see that the replacement rates that the new IMSS pension plan will provide (43%) toward the end of the projection period will be below the average for other countries within the Organization for Economic Cooperation and Development (OECD) with defined-contribution pension schemes (52.7%).

- Although the balance in the housing sub-account, when used for financing pensions, could increase significantly the pensions and replacement rates, the results in the base scenario in which these balances are not used indicate that two other key variables for the new IMSS pension system face restrictions: the mandatory contribution rates and the return rates on retirement funds.

On the other hand, considered as a whole, the different state-run pension systems operating in the country still present a dual problem for policy makers regarding those systems: a) macroeconomic-fiscal and b) microeconomic-social.

a) Macroeconomic-fiscal: pensions in the public sector continue to be, as a whole, an important source of budget imbalances and pressure on public finances. Even when the recent reform to the ISSSTE Law allows attending the most serious fiscal disequilibrium, we cannot overlook the fact that there are still defined-benefit pension

schemes operating in the country in many other public agencies such as state-run companies and local governments. Furthermore, in the IMSS, its pension commitments to its labor force will continue to generate pressure on the public budget, but so will the pensions to be paid in line with the former IVCM insurance plan under LSS-73 and the transition costs due to the reform. Going forward, all these pension promises will demand a significant additional fiscal effort for public finances.

b) Microeconomic-social: Although, in macroeconomic terms, the pension system reforms already in place preclude fiscal benefits, the projected pensions and replacement rates signal that it is necessary to strengthen the IMSS defined-contribution scheme even more, so that it can really provide better benefits at a microeconomic level. However, this will require attending aspects beyond pension promises, such as, for example, the links between education, productivity and employment and the defined-contribution mechanisms in order to achieve pensions with a higher purchasing power.

Because of the above, we believe that in order to strengthen the defined-contribution schemes it is necessary to first recognize that these schemes only provide benefits in terms of the contributions they receive and the conditions under which they operate. In this sense, the projected levels and replacement rates for the new IMSS pension system offer valuable information regarding the mechanisms that must be strengthened in the future, but are also a warning signal that this task requires the joint participation of the public and private sectors to resolve problems of productivity and employment, which are beyond the sphere of pension systems.

The following are a series of measures that we believe will contribute to establish more solid retirement arrangements in Mexico.

3. Proposals

The fiscal and social problems identified indicate that a redesigning of the social security programs in the country is necessary. In this sense, we believe that it is possible to build on the advances achieved and make the pertinent adjustments to face the following challenges:

- The lack of portability of benefits for the affiliates
- High fiscal costs in the state-run pension plans that still operate with defined-benefit schemes
- Modest pensions and replacement rates in the IMSS defined-contribution scheme.
- Low effective coverage of the pension systems.

To meet these challenges, the following is a series of proposals that seek to strengthen the retirement systems in Mexico, especially the IMSS defined-contribution scheme.

a) Establish a National Pension System

In the next 50 years, demographic factors will augment the imbalances between income and expenditures of the defined-benefit schemes that still operate in most public agencies. This outlook demands moving as soon as possible toward viable long-term pension programs. An obvious alternative is the incorporation of defined-contribution mechanisms in the country's pension systems.

A recognition bond granted by the state is an instrument used successfully by many countries that have reformed their pension systems, which was recently introduced in Mexico with the reform of the ISSSTE Law. The use of recognition bonds will allow translating into monetary value the pension promises in different pension subsystems and this will facilitate the portability of such rights between subsystems for the benefit of affiliates. Thus, with this instrument, firmer steps could be taken toward the implementation of a "National Pension System" (SNP for its Spanish initials) as proposed by the First National Finance Convention of 2004; a National Pension System that would have a pension design based on a defined-contribution scheme and pension guarantees.

A SNP with the design mentioned and based on individual accounts would make it possible to include more independent workers in the pension plans, overcome the fragmentation of social security and increase the density of contributions and the pensions of those who currently pay into one or several pension subsystems in an intermittent manner.

b) Increase contributions in the IMSS defined-contribution scheme

The modest pensions and replacement rates that the IMSS defined-contribution scheme offers indicates that there must be a counterpart and possible explanation also in the contribution rates into the system. Certainly, when the nature of contributions in Mexico is reviewed, two facts are evident: 1) the contributions of the affiliate, the main beneficiary of the new IMSS pension system, are low and 2) overall contributions—including the support contributions of employers and the federal government—are low by international standards.

Our proposal to correct this serious problem, which at the outset limits and conditions the results of the defined-contribution scheme is to increase the total amount of mandatory contributions for retirement, severance and old age (RCV for its Spanish initials) by 4.8% of the base salary for purposes of contribution dues. This increase would allow equalizing the mandatory contributions of the IMSS with those of the ISSSTE and bring Mexico's contribution rates more in line with its development level. The 4.8% increase in mandatory contributions would be immediate so that affiliates could have a greater time period to take advantage of the capitalization mechanisms in the defined-contribution scheme. However, a gradual alternative to mitigate the short-term impact of the increase in contributions might consist in implementing annual increases of 0.5%. However, prolonging the increases over time also elevates the risk that the reform might not be concluded with the desired effect.

c) Increasing the balance amount for the pension in the defined-contribution scheme[2]

Under the current legislation, the pension is financed exclusively with the accumulated balance in the RCV sub-account, in case there are no voluntary savings, and, as an extraordinary situation, with the resources in the housing sub-account when the worker does not make use of these to obtain a credit with the National Workers' Housing Fund Institute (Infonavit for its Spanish initials).

Our proposal to increase the balance amount of pensions is based on respecting the affiliate's freedom of choice and in recognizing that he or she could have more funds in his or her individual account for financing the pension than registering it directly in the Siefore. Thus, what we are suggesting is that, if it is more to his benefit, the affiliate is granted the possibility of directing his contributions and the balance in the housing sub-account toward financing his or her pension before retirement so as to take advantage of the capitalization mechanisms in the IMSS defined-contribution scheme and higher return rates than estimated for the Siefore compared to those of the Infonavit.[3]

This measure would be especially beneficial for those affiliates that already have housing and/or do not intend to use the Infonavit credit.

d) Strengthen further the risk-return options in the investment regime for Siefore

A possible route to strengthen even more the latest and important advances in the flexibilization of the Siefore's investment regime is to expand the range of asset classes available. In this sense, our proposal is to introduce new investment vehicles such as mutual funds. In this manner, the Siefore could invest in specialized funds such as private capital, mutual, infrastructure and raw material funds. Moreover, the current list of stock indices allowed for investments could be expanded to stock indices of the emerging economies with a high economic growth potential, and later on, in direct stock holdings.

The proposed modifications will allow a more direct and specialized participation of the Siefore in different markets and/or sectors in expansion as well as in high-return emerging economies, such as China, India and Brazil, and in sectors related with infrastructure, energy, real estate and services such as those related to health and tourism. At the same time, in the domestic market, a greater number of investment vehicles for the Siefore would allow developing new markets and financial instruments provided for in the Retirement Savings System Law. For example, a securities market specialized in infrastructure that could be provided with liquidity by the Siefore. However, in these cases, the investment regime would have to consider that the participation of the Siefore in these markets must be guided only by criteria of profitability and risk in

2 The initial amount is the amount required to contract annuities and survival insurance with an insurance company.
3 The return in the housing sub-account is determined based on the remaining funds in the Infonavit account and depends on the active rate that the Infonavit charges for its credits, its operating expenses and its past-due or non-performing loans.

the investment projects and, by the same token, be free of possible considerations of industrial policy, so that the main interest would always be that of the worker, who is the ultimate owner of the resources.

In a second phase, it would also be necessary to advance in broader possibilities of diversification for the Siefore portfolios. To this end, the proposal would be to increase or even eliminate in the medium term the 20% limit that still exists for investments abroad (including fixed and variable income securities), as this restriction impedes forming global portfolios that allow taking advantage of risk-return opportunities for pension funds. From a technical standpoint, this proposal is more efficient in terms of risk management than the country-bias criteria, since risks can be controlled with value at risk parameters (VAR), sensitivity limits for the portfolios or stop-loss rules.

In the future, a vast assortment of assets and diversification possibilities in the Siefore portfolios would allow paving the way for the development of financial products with assymetrical risks that provide higher returns with lower risk. The Siefore could make use of a new generation of funds known as "total return funds" that seek to maximize total return in a portfolio over that of risk-free assets in accordance with a prudent management of investments.

e) Target the "social quota" to the poor in the Retirement Savings System

The federal government's social contribution to the individual accounts is an important benefit for affiliates in the defined-contribution scheme. This is especially true for wage earners with lower resources, because, as a proportion of their income, the social quota contribution is always greater for low-income wage earners.

It is because of the positive and differentiated impact of the social quota contribution on that of lower-income affiliates that our proposal consists in targeting even more this solidarity support instrument toward lower-income affiliates. Nevertheless, this must be done taking care that the increased benefits for these groups would not result in unsustainable fiscal costs for the state. We believe that a viable alternative, among many other possibilities, would be for the federal government to grant this contribution to affiliates in two segments of income: a contribution based on 11% of the SMGVDF (Spanish initials for General Minimum Wage in Mexico City) instead of the current 5.5% for people earning up to three minimum wages, and a 0% contribution for people earning more than three minimum wages.

f) Strengthen the solidarity pillar of the IMSS defined-contribution scheme

A significant number of affiliates in the IMSS defined-contribution scheme will not be able of comply with the 1,250 weeks of social security affiliation required to have access to the pension guaranteed by the state precisely because of their low contribution density. This naturally places them in serious risk of facing poverty in their old age.

To meet this problem, the proposal is to ease the requirements in order to have access to the guaranteed pension, at the same time taking care that this does not translate into a disincentive for affiliates to contribute into the system. Specifically, the proposal is that after 900 weeks of paying social security contributions, the affiliates have the right to 50% of the guaranteed pension and that this percentage of the guaranteed pension will increase 7 percentage points for each additional 50 weeks that they contribute, until reaching the 100% contemplated in the Law, with 1,250 weeks of social security dues paid. This measure would allow assuring income in their old age to many people that under the current rules would be excluded of a pension. Moreover, it would maintain incentives for all affiliates to contribute, because it maintains the rule that those who pay more will obtain more benefits from the system.

g) Establish a government system of co-financing for individual accounts

It is not possible for a country like Mexico to achieve a social security goal and protect the population in its old age if public policy measures are not considered that could incorporate self-employed and informal workers in the pension systems. This is due simply to two facts: 64% of the employed population does not have social security services and 57% of the employed population is outside the formal sector.

To expand the coverage of the defined-contribution scheme to independent and informal workers, the proposal is to incorporate a system of government co-financing with the voluntary savings in the individual accounts contemplated for independent workers in the Retirement Savings System. The program suggested consists in having the state make a monthly contribution to the long-term savings sub-account in the worker's individual account for every 30 pesos that the worker saves voluntarily in accordance with the following rule: for the first 30 pesos saved voluntarily by the worker, the government contributes 90 pesos; for the second 30 pesos saved by the worker, the government also contributes 30 pesos, and for the next 30 pesos saved by the worker, the government contributes only 10 pesos, and thereafter 5 pesos for every 30 pesos saved, until reaching a maximum contribution of 750 pesos monthly by the worker, after which the state stops the co-financing. The design of this government contribution plan is for the State's participation to decrease as the worker's contribution increases, for which there is a dual purpose: to support low-income independent and informal workers more and provide incentives for middle-income workers to shift toward the IMSS formal pension system in order to obtain greater benefits.

The fiscal cost of the co-financing program proposed would represent in present value slightly less than half of the cost of the government's contribution due to the social quota for IMSS affiliates. However, in addition to this important consideration in terms of cost, offering independent and informal workers with incentives to contribute into the system would represent a considerable advance in the objectives of social security protection and coverage in the country. At the same time, having a greater number of persons identified with an individual account would also be an important step in the formalization efforts for the economy.

h) Increasing the productive capacities of informal workers.

Although it is beyond the scope of this study to provide specific recommendations on how to achieve sustained economic expansion and a greater level of formal employment, it should be noted that the agenda of economic reforms should contemplate various measures that can increase the productive capabilities of informal workers. This is because the information available suggests that one of the main reasons for individuals in Mexico to be employed informally is because there are few opportunities of finding formal employment and this seems to be a result that is closely related to low levels of human capital and productivity.

i) Strengthening the financial culture and retirement education

A deeper, more developed financial culture and an awareness or education regarding pension funds and retirement arrangements in the country could contribute much to the better operation of the pension systems. This would allow the population to make better use of the advantages offered by the introduction of the new IMSS and ISSSTE defined-contribution schemes in terms of the new rights, obligations and services they provide, but a better knowledge as well of the savings mechanisms for retirement, which in the final analysis would result in better pensions.

4. The effect of applying a series of proposals

Strengthening the design of the IMSS defined-contribution scheme with only some of the measures proposed in this study would lead to significant gains in the welfare of affiliates. A simulation exercise shows that with more adequate contributions for the defined-contribution scheme, a social quota that is targeted more toward persons with lower resources and a more flexible investment framework that allows obtaining at least one additional point in returns, the new IMSS pension system would have the capacity to deliver greater benefits to affiliates and allow Mexico to have replacement rates that are more consistent with the expected level of development for the country toward the end of the projection period. Moreover, a more positive economic scenario where the country could overcome various obstacles to the accumulation of physical and human capital would lead to a more solid pension system.

Conclusion

The in-depth analysis of the IMSS defined-contribution scheme leads to the conclusion that by reinforcing its current pillars and introducing new ones in its design, the system is fully capable of offering better protection for its affiliates. Our proposals are aimed precisely at strengthening the system in several dimensions: a) facilitating the portability of rights, b) expanding the system's coverage, c) raising the level and replacement rates of pensions in line with international standards and d) providing better support to lower-income affiliates. The measures proposed are viable, since, applied as a whole, the result would be a lower fiscal cost than currently projected. Thus, we believe that the proposal made in this study allows attending immediately both the fiscal and social problem facing policy makers and generating welfare gains for the affiliates.

Introduction

More than a decade has passed in the operation of a new defined-contribution scheme at the Mexican Social Security Institute (IMSS for its Spanish initials), which radically transformed the bases for the design of retirement systems in Mexico. The change in the financing plan from a pay-as-you-go scheme with defined-benefits for IMSS affiliates to one of capitalization with defined-contributions to an individual account and a guaranteed pension by the government was transcendental. For the first time in the country, a social security institution was granting the ownership of the pension funds to its affiliates. At the same time, the change made it possible to advance toward the establishment of viable and better prepared retirement arrangements for demographic changes, given that the reform allowed replacing a retirement plan with ample state guarantees, but without long-term financing and vulnerable to demographic change with another more supportive pension design toward lower-income persons and, also, better funded for a number of affiliates that represent slightly more than one-fourth of the employed population of the country.

In the time that the IMSS defined-contribution scheme has been in operation, various indicators have shown a dynamic activity. The number of affiliates, the amounts of the funds managed, and the number of Retirement Fund Administrators (Afore for its Spanish initials) have shown a notable expansion under an institutional sphere characterized by a strict regulatory supervision and growing competition among the Afore. This provides protection to the affiliates, and offers them various options for the management of their individual accounts and the investment of their funds.

However, the demographic transition and the gradual aging of the population in the country demand that the new defined-contribution scheme evolve and be ready to better serve the growing number of affiliates that are approaching retirement age. In addition to this, the number of pensioners due to disability and survival will also be increasing. Thus, the IMSS defined-contribution scheme, with the support of the Afore industry, must adapt to the new reality.

Moreover, the state must also be prepared to face the new era. Fiscal policy must be adjusted over time to finance the operational deficit that was left as a legacy of the previous pay-as-you-go scheme under the disability, old age, severance at old age and life insurance plan (IVCM for its Spanish initials) of the Social Security Law of 1973 (LSS-73 for its Spanish initials) and, in particular, to meet the cost of transition between the schemes, since the reform left the possibility open to affiliates in transition to choose retirement under the former rules vs. the new ones in the reformed Law (LSS-97 for its Spanish initials). To these obligations, which will be in force in the coming decades, it will be necessary to also add those others actually derived from the operation of the new pension design as the “social quota” (a fixed contribution from the federal government to the individual retirement accounts) and the pension guarantee.

Also, those responsible for the economic guidance of the country must also attend the growing concern of the affiliates, who upon approaching retirement age, will demand better information as to the degree of economic protection in their old age. In recent years, we have witnessed the importance that this topic has gained in public opinion, as well as the appearance of diverse adjustment positions in view of the deficiencies attributed to the new system.

With this background, BBVA has decided to undertake an in-depth study of the pension systems in Mexico within the framework of a demographic and economic projection covering the 2005-2050 period. Although this projection period seems to be short to represent all the possible effects that the demographic transition of the country will have on the pension system and on public finances, it should be noted that, by the middle of this century, the system will reach its full maturity. Thus, due to the above and to the availability of official demographic projections through 2050, this study only projects the first half of the 21st Century.[4]

The objective of the projection is to know the pension levels that will be paid under the IMSS defined-contribution scheme, the replacement rates that the scheme will provide with regard to the average wages of the affiliates in the last ten years of their active work life, as well as to estimate its coverage and evaluate the effect that the various economic, demographic and key parameters will have on pension levels, replacement rates and fiscal costs. Based on the projection, a diagnosis is being prepared, evaluating the sensitivity of the pension system to parametric changes and estimating the effects of a series of measures that we think can contribute to resolve the problems identified. It should be noted that the study does not claim to cover exhaustively all of the topics of a possible agenda of adjustment to the individual capitalization pension systems and has not included important topics relative to the management of the system because they are not adaptable to the characteristics of the methodology used on this occasion.

This study has detected that a key variable in determining the results of the defined-contribution scheme with individual accounts is precisely the size of the contributions. These depend on wage levels and on the frequency with which the respective contributions are made. Given that the evidence increasingly points to the fact that there is great heterogeneity in the density of contributions of the affiliates to the pension systems, in this study, this variable plays a central role in our calculations. Thus, with additional statistical information on the affiliates to the Retirement Savings System, kindly provided by the National Commission for the Retirement Savings System (Consar for its Spanish initials), in this study, four principal groups of workers were defined in terms of their average contribution density. These groups were then separated by gender and in three income categories, so as to have reasonable desegregation and thus cover the profiles of the different types of affiliates. We believe that the above breakdown of information serves to enrich the analysis of retirement systems in Mexico, because, due to data limitations, analysis had previously been centered mostly on the case of a "representative individual".

4 This project is framed within an extensive effort of BBVA that seeks to identify the main relevant topics for an agenda of adjustments to the pension systems in Latin America and to contribute constructive proposals. For greater details see Taguas and Vidal-Aragon de Olives (2005).

The document has been organized in eight sections: in Section I, the BBVA thesis on the reform to the pension systems in Latin America is presented and the need to establish a new agenda of adjustments under a comprehensive vision. In Sections II and III, the demographic development and the economic panorama are respectively presented in which the pension systems will operate during the first half of the XXI Century.

In Section IV, the characteristics of the retirement arrangements in Mexico are broken down: coverage, financing mechanisms and reform process. Following, the interrelation that arises between the economy and the pension systems is discussed in Section V.

The macro-actuarial model and the assumptions used to project the operation of the IMSS defined-contribution scheme are presented in Section VI. In this same Section, the main results of the projection and the sensitivity of these to variations in the key assumptions are set forth. In Section VII, we offer our diagnosis of the pension systems in Mexico and, immediately following, our main proposals for adjustment in order to improve the operation of the systems.

In our conclusions, we submit some brief reflections on the importance, present and future, of the defined-contribution schemes in Mexico. Details of the macro-actuarial model of the economic projection are part of the respective appendices.

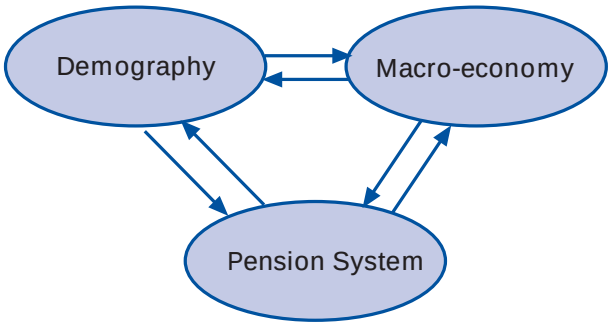
I. Vision of the Study

This study is part of the corporate vision of BBVA of working for a better future for people. We believe that retirement arrangements are key for that future and with this study, BBVA —a leading pension fund administrator in Latin America with more than 20 years of experience— wishes to provide elements of analysis for a better diagnosis of the situation and perspectives of the retirement systems in Mexico, to help identify those issues that could be problematic, and to formulate some proposals that could contribute to enriching the informed debate on the how to improve the country's pensions.

BBVA maintains the thesis that the retirement arrangements based on defined-contribution schemes have supported the savings, development, and stability, on both the economic and social level, of those nations that have incorporated them as part of their social security systems. Nevertheless, an erratic creation of formal employment, an important level of informal labor relations, and some problems in the design of the social security systems in the region can be clearly identified as factors that still limit the potential benefits that such schemes can offer to their affiliates in terms of coverage and/or providing income in old age.

It is thus a very opportune moment to review the institutional framework under which the different retirement systems operate in Mexico, in order to offer a diagnosis that would allow for a better understanding of the mechanisms that have proven to be imperfect and to propose measures that can lead to improved results. This being said, this study proposes that an analysis of the country's pensions should be approached with a comprehensive vision that takes into account not only the parameters of the pension systems under consideration, but also the demographic and economic conditions under which individuals, companies, and the government itself should act in the following decades to carry out their respective efforts in pension planning. In the context of this vision, it can be clearly anticipated that the measures to achieve greater coverage and better pensions in Mexico will necessarily require the combined and complementary participation of the public and private sectors, given the constant interaction of demographic and economic factors that influence the results of the pension systems.

BBVA Overall Vision
of the Pension Systems



Indeed, Mexico is in the middle of experiencing an important demographic transition. At the same time that the population is registering lower growth rates, its age structure is undergoing changes that in the next few decades will lead to a situation in which there is a gradual decrease in the number of youth and individuals of working age and at the same time an increase in the relative percentage share of persons above 65 years of age and retirees. Therefore, solely as a result of this aging of the population there will be growing pressure on the pension systems and the country's public finances. This is above all the case because the state should complete or absorb the financing of a large number of public pension systems that still base the payment of their defined-benefit obligations with pay-as-you-go schemes—extremely dependent on the ratio of active workers to retirees—and also because the demographic changes will have an important specific weight on the very expenditures that will be generated based on the new design of IMSS pension programs and the fiscal costs of the transition between the old and new rules.

The aging of the population will also affect long-term growth and economic development. This is not only due to its direct impact on the available labor supply but also given its effect on decisions concerning consumption, savings, and investment in the economy, and along with it, on production, productivity, and workers' wages. In this context, policy makers will face the challenge of establishing the elements that will allow companies to create quality jobs in the formal sector of the economy and individuals to improve their living conditions by increasing their productive capacities while they are economically active. Furthermore, those economic conditions and formal jobs that are required will also be indispensable so that even with a social security system that is strong and capable of granting financially sustainable insurance, the country's pension systems can achieve maximum coverage and its affiliates can have a sustainable way of fulfilling the necessary contribution requirements to build up adequate savings for their retirement.

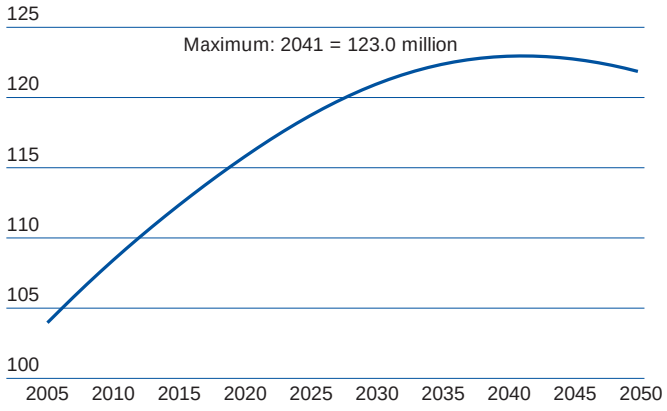
Given this comprehensive vision that we have proposed, before entering into an analysis of the pension systems in Mexico as such, in the following section we will discuss the demographic evolution and the economic panorama that, in accordance with the official projections of the National Population Council (Conapo for its Spanish initials) and a base macroeconomic scenario that we have elaborated, could be a reference point for the conditions in which the pension systems could operate in the first half of the 21st century.

II. Demographic Evolution 2005-2050

Between 2005 and 2050, the evolution of the population in Mexico will prolong the demographic trends of the last 30 years: increasingly lower population growth, change in structure by age and, of course, the modification in the ratio of the dependent age population in relation to the working age population.[5] Although we can anticipate that in this future evolution there is an underlying change in fertility, mortality and migration patterns, a discussion of the determining factors of demographic change is beyond the scope of this study. Therefore, only those aspects that are pertinent to the retirement systems in Mexico will be discussed briefly below:

1. Total population. It is estimated that the population will grow from 103.9 million people in 2005 to 121.9 million in 2050, which implies an increase of 17.9 million in 45 years, and an annual average growth rate of 0.35%. But, perhaps more important than the amount will be its evolution: growth will be lower and the population will reach a maximum of 123.0 million in 2041, to then decline marginally toward 2050. This implies that annual population growth will be significant in the initial years of the projection (around one million persons per year), but not as much in the later years.

Population
Millions of inhabitants



Source: BBVA Bancomer with Conapo data

Mexico: Population 2005 - 2050

	Millions	Annual average change	
		Millions	%
2005	103.9	1.10	1.09
2010	108.4	0.89	0.84
2015	112.3	0.78	0.71
2020	115.8	0.69	0.61
2025	118.7	0.59	0.50
2030	120.9	0.45	0.37
2035	122.3	0.28	0.23
2040	122.9	0.12	0.10
2045	122.7	-0.04	-0.03
2050	121.9	-0.18	-0.15
2005-2050	17.9	0.40	0.35

Source: BBVA Bancomer with Conapo data

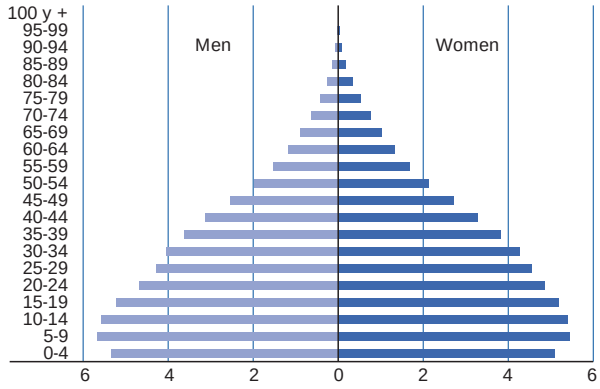
2. Structure by age. Changes in the dynamics of the population will be accompanied by a transformation in the structure by age and, consequently, in the dependence ratio.[6] In absolute terms, the young population (0-14 years of age) will decline from 32.5 to 20.5 million people in this period. The active age group (15-64) will increase during the first 25 years, to then experience a contraction in the following 20 years; while the number

5 In this document, the population projection for the 2005-2050 period by the National Population Council (Conapo) has been used, based on the adjusted data of the 2005 II Population and Housing Count.

6 The dependence ratio is equal to the percentage of the population of dependent age in relation to the working age population. This comparison made among population groups of different ages and not between employed and unemployed groups since in the latter case it would be an indicator of load per worker and not of structure by age.

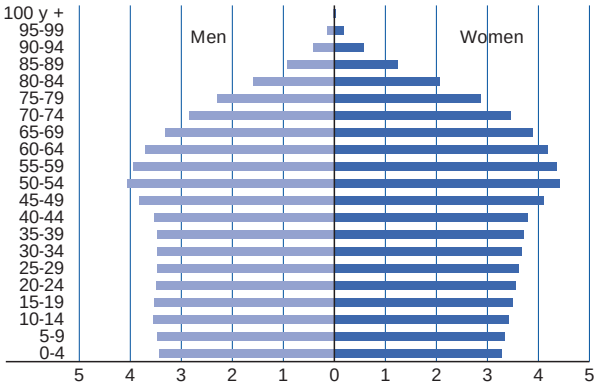
of older adults (65 and over) will grow throughout the whole period. Therefore, while the young decrease their relative share to almost half (31.3% vs. 16.8%), the number of older adults will increase four times (from 5.2% to 21.2% of the total).

Population Breakdown by Age and Gender
2005, millions of inhabitants



Source: BBVA Bancomer with Conapo data

Population Breakdown by Age and Gender
2050, millions of inhabitants



Source: BBVA Bancomer with Conapo data

3. Dependence ratio. In relative terms, that is, as a percentage of the total, during the first years of the projection period, the decline in the 0-14 years of age group is greater than the increase in the number of adults and therefore, the ratio of the working age population increases. Thus, the dependence ratio allows comparing these three large age groups among themselves and a young dependence ratio or an adult dependence ratio or both at the same time can be defined. In the case of young dependents, the ratio drops from 49.3% to 27.2%, which means that for every 100 persons of working age there were 49.3 children and the number will drop to almost 27. For adult dependents, the ratios will increase from 8.2% to 34.3%, and for the total ratio, the ratios will be 57.5%, 45.5% and 61.5% in 2005, 2020 and 2050, respectively. This means that in the coming 15 years, the ratio will be increasingly favorable and will reverse its trend as of 2020.

Characteristics of the Population in the 2005 - 2050 Period
Percentages, dependency ratio*

	Children (0-14) / (15-64)	Adults (65 y +) / (15-64)	Total (0-14) + (65 y +) / (15-64)
2005	49.3	8.2	57.5
2010	42.6	9.0	51.6
2015	37.1	10.0	47.2
2020	33.8	11.7	45.5
2025	32.2	14.3	46.4
2030	30.9	17.6	48.4
2035	29.6	21.5	51.1
2040	28.5	25.7	54.2
2045	27.6	30.0	57.6
2050	27.2	34.3	61.5

* The dependency ratio is equal to the percentage of the dependent-age population with relation to the working-age population
Source: BBVA Bancomer with Conapo data

An increase in the dependence ratio implies, up to a point, a higher burden per worker, but this could be modified by two aspects: with the modernization of the economies, participation patterns and job quality change, which, in an ideal situation, would help to support the change in the dependence ratio. However, the economic variables do not always evolve favorably, and, in addition, adults imply a higher cost per person than per child. This surely will translate into an increase in social spending in the foreseeable future. What is evident and indisputable in the data is the aging of the population and the increase in the dependence ratio starting at a relatively close date.

4. Economically active population. In order to estimate the economically active population (EAP), specific activity rates were used by sex and age, applied to the population projections. For the year 2005, values derived from the National Occupation and Employment Survey (ENOE for its Spanish initials) were used; for 2050, the ratios derived from the projections for the EAP of the National Population Council (Conapo), and, for the intermediate years, a lineal interpolation between these values. Although the information is available by five-year age groups, for the operating purposes of our study, we worked with larger age groups and by sex: 15-24, 25-54, 55-64, and older than 65 years of age.

Specific Rates of Activity
For each age group: EAP*/population, %

	2005	2050	Differ. pp
Both genders			
Total	59.90	59.73	-0.17
15 - 24	44.62	52.28	7.66
25 - 54	72.25	78.91	6.66
55 - 64	54.86	62.91	8.06
65 y +	29.30	28.31	-0.99
Men			
Total	79.96	75.60	-4.36
15 - 24	57.72	59.50	1.78
25 - 54	95.22	95.80	0.58
55 - 64	80.56	83.40	2.84
65 y +	46.77	42.00	-4.77
Women			
Total	40.99	45.42	4.42
15 - 24	31.69	45.10	13.41
25 - 54	50.56	63.10	12.54
55 - 64	31.65	44.60	12.95
65 y +	15.03	17.30	2.27

* Economically active population
Note: The results of both genders is the sum of the profile by gender and the total of all the ages is the sum of the parts; therefore, it is important to analyze, although superficially, the behavior by gender and age group, rather than the total figures
Source: BBVA Bancomer with Conapo data

In general terms, the participation rates, by sex and age group for the 2005-2050 period, indicate that there will be an increase in the share of the population in productive activities, although this increase will be differentiated by sex and age. However, for the total

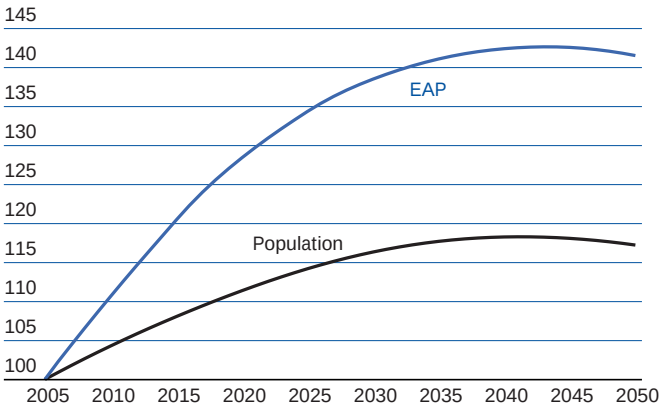
population, the change in structure by age will conceal the increase by specific ages and, consequently, the total participation rate will not increase because there will be a greater adult-age population.

It should be noted that because women's participation levels have been historically lower than those of men, these have a higher margin to increase relatively, if conditions are favorable, a fact that is reflected in the projection used in this study. The above takes into account lower implicit fertility in population projections, progress in gender equality in education, and/or the labor market, the urbanization of the country, and, in general, economic development and social modernization, which, similar to other countries will translate into a change in attitude and more possibilities for the incorporation of women in economic activity for the 15-64 age group, although only marginally for the population over 65 years of age.

With regard to age groups, the participation rates in economic activity of the age group of adults over 65 present the following characteristics: first, progress in social security coverage could lead to a higher number of pensioners and fewer persons in active working age; second, within the group, there is relative aging and therefore, the rates increase little or do not increase due to the change in its structure by age—within the group, there is aging—and, third, higher life expectancy could alter the retirement age. The combination of these elements will affect the participation results for this age group and will be different by sex: a moderate contraction of the masculine population and a small increase in the feminine, since it is derived from a lower base.

It should be pointed out that the projection for the economically active population follows a performance pattern similar to that of the population as a whole, although modified by the changes in structure, participation and by growth getting out of step in groups of the most productive age. Consequently, in the period being analyzed, the growth of EAP will be more dynamic than that of the total population (See attached graph). It is estimated that the EAP will increase by 17.8 million (41.5%) in the coming 45 years, and, of this increase, 49% will represent men and 51%, women.

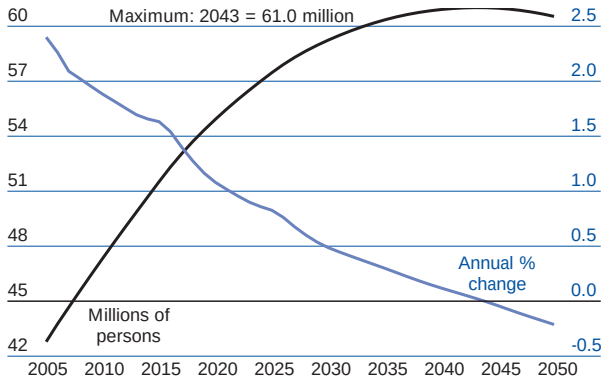
Population and EAP Growth
Index 2005 = 100



Source: BBVA Bancomer with Conapo data

However, the same as in the population, the most important aspect will be the lower growth throughout the period: from about one million persons that will be incorporated per year in the 2005-2010 period, the number will decline to 500,000 in 2030, and it will be negative in the last years of the projection. Under the current patterns, the higher share of women will be insufficient to counteract the demographic trends and, except for a change in the demographic patterns, in migration and immigration or in participation levels, the country is heading toward a significant change in its demographic structures.

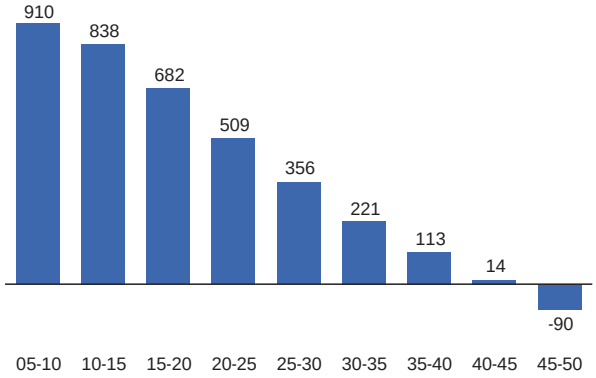
Economically Active Population



Source: BBVA Bancomer with Conapo data

EAP: Annual Increase

Thousands of persons



Source: BBVA Bancomer with Conapo data

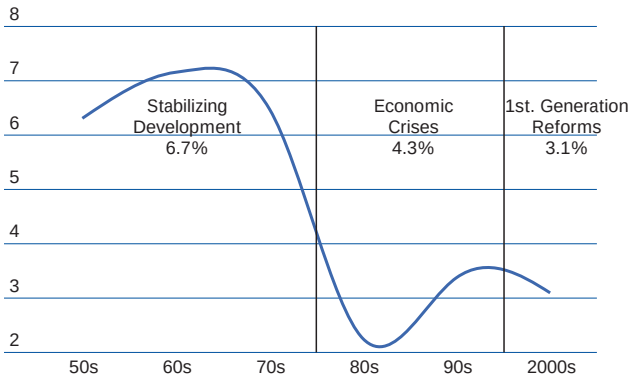
III. Economic Panorama 2005-2050

In the operation of pension systems, the economic context is a key element, since it determines the growth of formal employment, and, together with the demographic evolution, the patterns of affiliation and contribution to the systems. In order to outline the economic panorama in which the pension systems in Mexico could operate in the coming 50 years, we have simplified the number of restrictions that productive activity will face in an economic base scenario, and, at the same time, developed a model that captures a realistic trend in economic dynamism measured by GDP growth.[7]

To provide a reference regarding the evolution of the economic variables that will be assumed under the base scenario, a brief review of the performance of the Mexican economy in the last 50 years is presented below.

Widely recognized studies for their conclusions on historic sources of economic growth in Mexico such as those of Santaella (1998) and Faal (2005) indicate that the productive capacities of the Mexican economy have varied significantly and can be divided into three stages. In the first, starting in the later years of the decade of the nineteen fifties through the end of the seventies, economic activity experienced sustained expansion, and the creation of employment was boosted by an important accumulation of capital and an increase in productivity. This period covered part of the economic boom denominated "stabilizing development". However, in the second stage, that of the nineteen eighties through 1995, economic activity faced recurrent economic and financial crises. During this period, the drop in total factor productivity (TFP) contributed, to a greater extent, to lower production growth, and, consequently, low generation of employment.

Economic Growth
% change, five-year average



Source: BBVA Bancomer with INEGI data

7 Our model is based on a classic analysis of the sources of economic growth that consider that the dynamics of long-term GDP can be represented in terms of the labor force, the accumulation of capital and total factor productivity (TFP). The latter, also called the "Solow residual" is a measure of the contribution to economic growth that does not come from the direct share of inputs or labor productivity, but from technological change, efficiency, as well as any relevant event that changes the course of the dynamics of the economy.

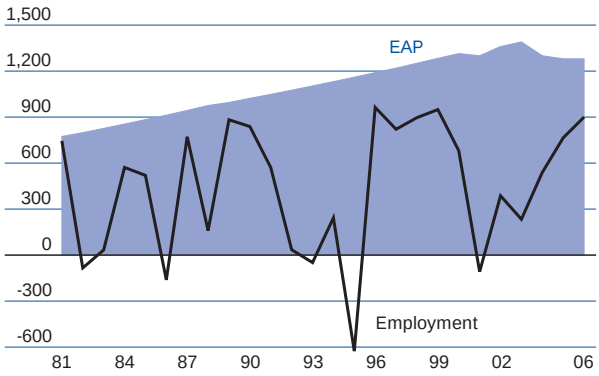
In the third stage, starting at the end of the decade of the nineties, a greater contribution of the factors of production to economic growth is perceived. However, this contribution is still low, considering that previously and during the period, there were important structural changes in the Mexican economy, such as the intensification of the trade opening, the strengthening of the financial markets, economic deregulation, and the recovery of macroeconomic stability. See the previous graph.

Everything indicates that the extreme volatility that characterized the country's economic cycles in the past two decades impeded the structural advances in place since the middle of the nineteen eighties to crystallize into greater investment and productivity, and consequently into greater production and employment.

On one hand, the ratio of investment to GDP was 20% on average. Although this percentage implied annual investment growth rates of 3% and capital accumulation to continue an ascending trend, it was not sufficient for capital formation in the country to acquire an exponential pattern, which, in principle, should occur in an emerging economy in the process of development.

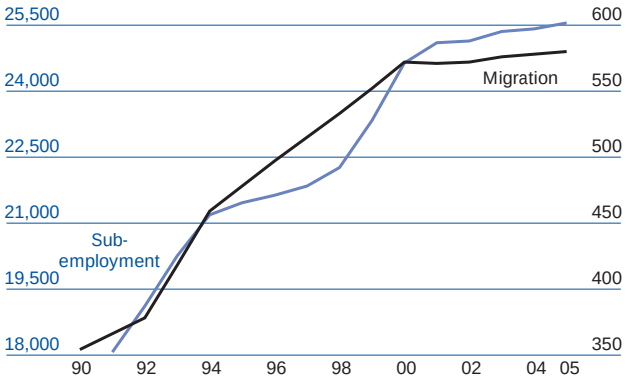
On the other hand, with regard to job creation during the period in reference, the results were also limited. Formal employment in the private sector, measured by the number of affiliates registered in the Mexican Social Security Institute (the IMSS), was on average almost 400,000 persons, a figure substantially below the annual rise in the economically active population (EAP) of almost one million persons, but consistent with annual economic growth of 2.7%. This insufficiency in the creation of formal jobs can be considered as one of the main reasons why phenomena such as migration and other employment alternatives such as the informal job market have expanded significantly. For example, the informal sector in the economy has expanded to the point that it represents slightly more than 50% of the economically active population (EAP).[8]

Lower Employment Creation than Necessary
Thousands of persons, annually



Source: BBVA Bancomer with INEGI data

Alternative Sources of Employment
Thousands of persons, annually



Source: BBVA Bancomer with INEGI data

8 In this study, the informal sector includes employed persons that are part of the economically active population but who are not duly registered in the public social security institutions. This definition coincides with measures employed by the World Bank, but it is different from that of the INEGI, which considers as informal workers only those persons in units that operate based on the resources of the home, but not incorporated as companies. Under the INEGI definition, informal workers represented 27% of the employed population in 2006. For other measures on the dimension and employment of the informal sector In Mexico and Latin America, see Perry et al (2007).

In turn, the contribution of total factor productivity to annual GDP in the last twenty years has been extremely low for an emerging economy such as that of Mexico (1%). This underscores the need for the Mexican economy to advance toward a more efficient use of its main productive resources to reach sustained growth rates and achieve greater strength in formal employment given that, should the current levels of the informal economy, unemployment rates and growth of the EAP continue, an average of only 340,000 formal jobs would be created in the economy over the next ten years.

However, with this background, we believe that the structural transformation process of the Mexican economy will continue nevertheless to complete its modernization.[9] Therefore, our economic projection is based on defining the institutional conditions that will possibly mark the rate of economic growth and productivity in the coming decades.

In structuring our projection scenario, we avoided the pessimism that arises as a result of the uncertainty regarding these types of studies and if we considered the possibility of increases in the potential growth of the economy for the next decade, we did so without exaggerating or falling into unfounded optimism.

1. Base economic scenario: partial progress in reforms

For purposes of the projection, the investment growth rates are defined, and consequently, the demand for labor, which makes it possible to absorb the growth of the work force, increase economic capital and, gradually, productivity in the economy as well as workers' real average wages.

We believe that an increase in real wages can only be justified without the disequilibrium of price stability in a more productive economy that promotes more employment in the formal sector. Thus in the series of assumptions that were raised in this study, it is presupposed that advances in the pending agenda of structural reform will increasingly allow making use of the existing assets in the economy and, under the appropriate conditions, these will be transformed into productive capital that will lead to employment growth in the economy.

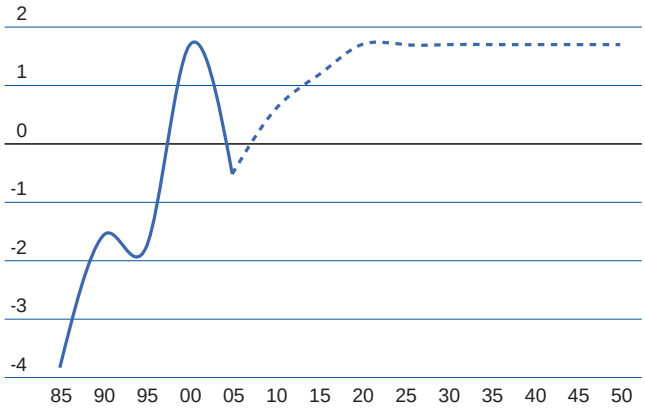
Thus, in the base scenario denominated "partial progress in reforms", the following economic conditions are assumed:

a) Throughout the next ten years, the Mexican economy will enter a positive cycle of economic and institutional reforms, which will support the increase in the efficiency of capital and labor. This will mean that the contribution of total factor productivity to economic growth will rise gradually until reaching annual average growth of 1.7% in a ten-year period. This is a higher figure than that of the current levels (0.8% on average in the last ten years), although significantly lower than that observed during the decade of "stabilizing development" of around 2.6% (so as to not formulate an

9 In this respect, it should be noted that in the BBVA Bancomer Economic Research Department, a document is periodically published, called "Proposal Series", in which a reflection is offered on how to create the most appropriate conditions to strengthen economic growth. In issue number 33 of this publication, "Ten actions to increase productivity and well-being in Mexico", some economic reforms are analyzed. See http://serviciodeestudios.bbva.com/TLBB/fbin/0602_Seriespropuestas_02_eng_tcm268-115125.pdf

extremely optimistic bias). This implies that we are not considering a context where all the structural reforms that the country requires can be implemented immediately and be entirely efficient, given that under this scenario, total factor productivity (TFP) could reach levels greater than 2%.[10]

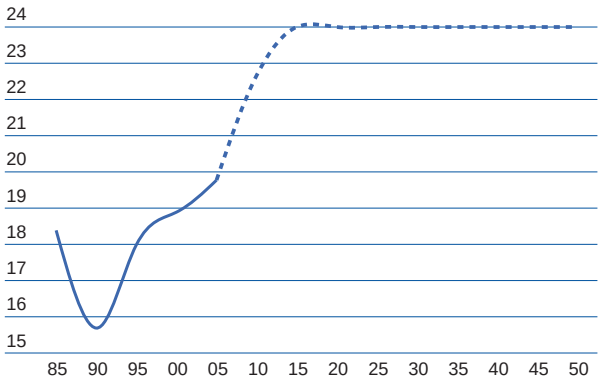
Total Factor Productivity
Five-year average



Note: Estimated as of 2010
Source: BBVA Bancomer

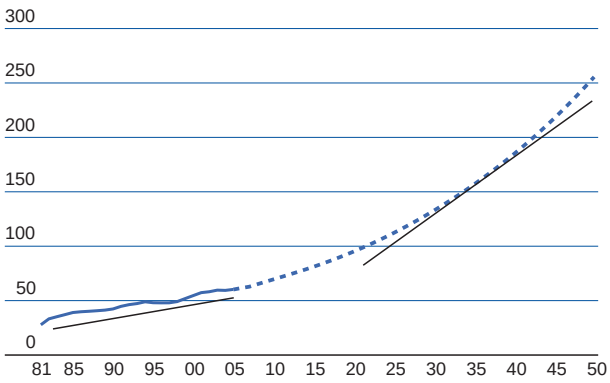
b) Also, in line with the reform scenario considered, investment will grow progressively until it reaches a ratio representing 24% of GDP on average throughout the next 44 years. It is important to recall that average investment in the past two decades has been lower than 20% of GDP.

Investment
% of GDP, five-year average



Note: Estimated as of 2010
Source: BBVA Bancomer

Working Capital Ratio
% of GDP



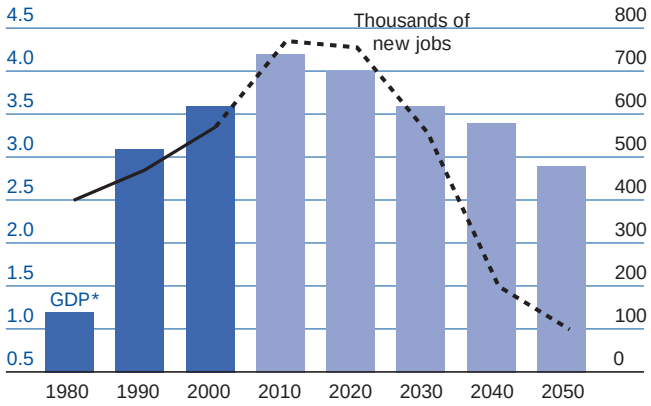
Note: Estimated as of 2006
Source: BBVA Bancomer

c) In accordance with our estimates and statistic ratios between investment, production and employment, a rise in the investment ratio, such as the one we are projecting, would translate into an average rate of formal employment creation of around 2.2%

10 In our reform scenario, we believe that these will advance in accordance with a gradual negotiation agenda. Within this context, the reforms that we believe have the greatest probability of approval are those not requiring modifications in the constitutional framework and that can be approved by a simple majority in legal ordinances for diverse topics: pensions to limit the liabilities of public pension plans; fiscal, to increase tax collection; legal, to better protect persons' property rights; and, energy, to obtain gains in efficiency.

during the coming 45 years, and of close to 1% growth in total employment.[11] A long-term econometric exercise allows us to corroborate that for each percentage point of economic growth, slightly more than 150,000 private jobs are generated.[12] This figure backs what was previously mentioned and indicates that if the potential growth of the economy were 3.6%, the creation of new jobs would be in the order of between 540,000 and 560,000 jobs (allowing for a margin of error).

Job Creation in the Formal Private Sector and GDP



* Growth trend of the economy, annual average % by decade
Note: Estimated as of 2010
Source: BBVA Bancomer

d) Our projection considers that in the next 45 years, the total supply of new jobs derived from the growth of the EAP will be absorbed, and that, in addition, a part of informal employment will be incorporated into the economy at a rate in line with economic growth. We assume that this process will allow informal employment to converge in a proportion to the EAP closer than that observed in developed countries. See Schneider (2002).[13]

e) The assumption of greater investment in our projection translates into higher economic and employment growth, also lowering the open unemployment rate (OUR). In this economic scenario, the projection for the OUR drops from 3.64% in 2005 to 3.0% in 2012, later rising to 3.7% in 2050, considering a higher number of formal workers. These unemployment rates are in line with the ratio between economic growth and the creation of formal employment.

11 See Box "Demographic Change and Opportunities to Promote Growth" in BBVA Bancomer (2006), "Situacion Mexico", Economic Research Department, Third Quarter, available at http://serviciodeestudios.bbva.com/TLBB/fbin/0607_SituacionMexico_20_eng_tcm268-115179.pdf

12 Estimate that considers a long-term ratio between employment and GDP, an effect that allows us to derive the effect of the co-integration between economic growth and the creation of new jobs, controlled by effects of simultaneity.

13 To estimate the evolution of employment in Mexico in the coming decades, the basis was the following data: work was done with the EAP projections of the National Population Council (Conapo, in "Projections of the economically active population 2000-2050"). The initial projections overestimated the development course of the population as shown by the Population and Housing Survey of 2005. Therefore, in this study the National Occupation and Employment Survey (ENOE) on the new official population datum of 2005 was used, and it was estimated through 2050 with the evolution available in the current projections. Also, marginal and residual employment or under-employment (informal employment) is obtained from the difference between the EAP, formal employment, and open unemployment.

It should be noted that the production function used in this study to project the evolution of economic growth is presented in Appendix 1, Section a, and is based on data for gross fixed investment published by the National Institute of Statistics, Geography and Information Systems (INEGI for its Spanish initials) and on the National Population Council (Conapo) statistics and projections for the economically-active population.

2. Long-term economic growth and relevant variables

Under the base scenario of partial progress in reforms, the projections of our model result as expected in higher long-term growth rates. For example, in the next two decades, total factor productivity (TFP) will increase gradually, and the growth rate in formal employment, in line with the EAP and the natural unemployment rate, will maintain a pattern that will allow absorbing the new labor supply. Also, investment will be more relevant in an initial stage, fostering optimism with regard to a more efficient economy. Because of this, once the investment and TFP growth rates are strengthened, long-term equilibrium is achieved, given that GDP dynamics is in line with employment growth. This is why, as of the middle of the projection period, the dynamics of long-term economic activity converge toward average annual growth of slightly less than 3%, after having reached average rates of 4% throughout the first twenty years.

Base Scenario: Partial Advance in Reforms
Main Macroeconomic Variables
Five-year average

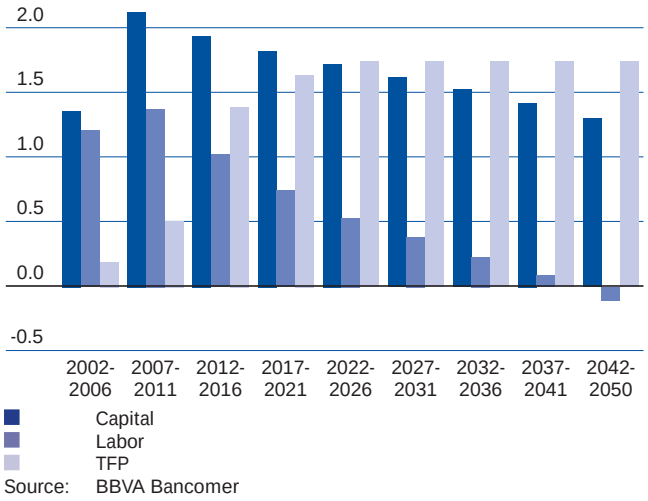
	Real annual %									
	GDP	Population	GDP[1]	Wages	Employm.	GDP[2]	Population[3]	GDP[4]	Wages[5]	Employm.[6]
2010	3.9	1.0	3.0	1.7	2.3	862	106.7	8,079	6,457	45,080
2015	4.2	0.8	3.3	2.4	1.8	1,045	110.8	9,435	6,623	49,850
2020	4.3	0.7	3.5	3.0	1.3	1,288	114.4	11,260	6,771	53,660
2025	4.0	0.6	3.3	3.0	0.9	1,570	117.6	13,355	7,144	56,491
2030	3.7	0.5	3.2	3.0	0.7	1,889	120.1	15,726	8,063	56,608
2035	3.5	0.4	3.2	3.0	0.4	2,242	121.8	18,403	8,853	59,949
2040	3.2	0.2	3.1	3.0	0.2	2,635	122.8	21,465	9,827	60,730
2045	3.0	0.0	3.0	3.0	0.0	3,069	122.9	24,973	10,916	60,945
2050	2.8	-0.1	2.9	3.0	-0.3	3,543	122.3	28,978	12,110	60,756

1 Per capita GDP
2 Billions of 2005 dollars
3 Millions of inhabitants
4 Per capita GDP, 2005 dollars
5 Real wages in dollars, 2005 base
6 Total employment, millions
Source: BBVA Bancomer

In the model, both gross fixed investment and the share of labor are the main source for higher sustained economic growth in the long-term. Both represent 72% of the economic growth of the next fifteen years (See attached graph). Accordingly, the levels of capital stock in Mexico, compared to other industrialized countries, clearly establish a potential investment, as well as a return on capital and on work in a first phase. As total factor productivity increases and remains at an equilibrium level, the contribution of capital will gain relevance with regard to labor, although at a lower rate, with the growth of economic activity in Mexico depending more on improved productivity.

Sources of Economic Growth

Contribution share of growth, percentage points



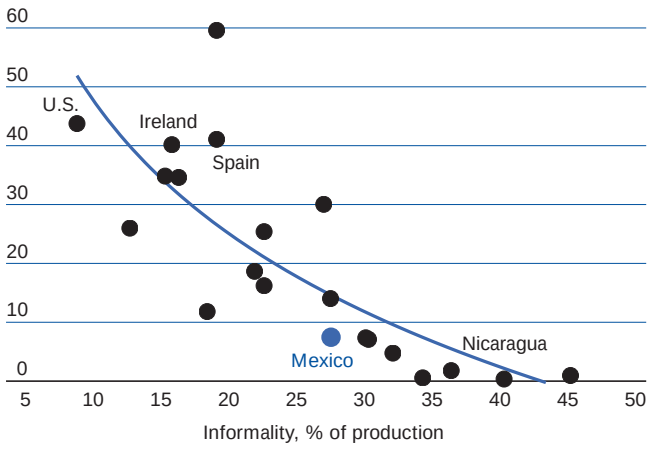
Source: BBVA Bancomer

The results obtained are in line with the ratio between production, productivity, investment and employment. Per capita GDP will increase from an annual US$7,300 in 2005 to US$30,711 in 2050. This will be clearly related with the increase in real wages, which will average growth of 1.5% in the coming decades. This last value is directly derived from the model as a result of labor productivity, adjusted in terms of gains in capital depth, which should be equal to the spread between economic and population growth. (See Appendix 1, Section b).

Moreover, as a result of the higher potential growth rates projected, incentives will be generated for a percentage of informal workers to be incorporated into the formal sector. This makes sense considering that part of the substantial changes that the country requires in structural terms is motivated by the need to incorporate the informal sector into the formal, and through this, to bolster sustained economic growth.

Per Capita Income and Informal Employment Levels

Per capita income, thousands of dollars

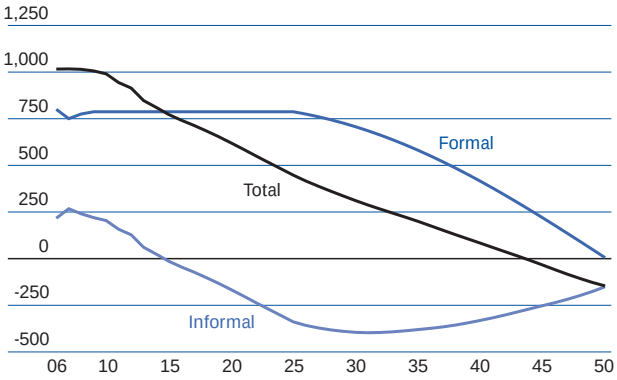


Source: BBVA Bancomer

Based on the inverse ratio between the degree of informal employment and economic activity pointed out by Loayza (1997) and illustrated in the previous graph, in our base scenario, the informal sector decreases to a rate directly related to the per capita income levels derived from our model. Thus, the ratio of informal employment to the EAP will converge toward the levels observed in countries that today have the real per capita income level that Mexico will have in the year 2050.

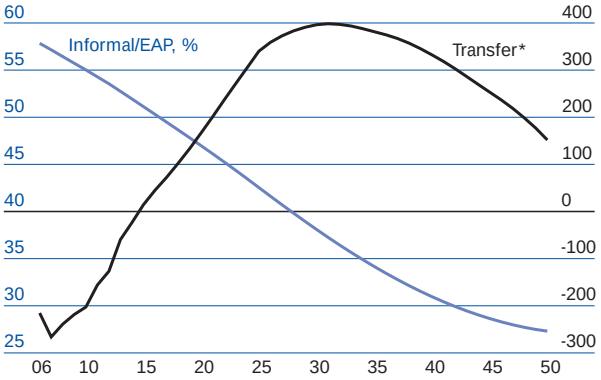
As shown in the following graphs, while the evolution of formal employment tends to decrease due to the drop in the EAP growth rates, the contribution, in number of workers, of the informal sector to the formal one will reach its peak by the end of 2030 (when around 400,000 workers in the informal sector will be incorporated in the formal sector). Toward the end of the projection period, informal employment will be reduced to 27.3% of the EAP, a percentage that is within a range close to that of some developed countries.

Absorption of the Labor Supply
Thousands of persons



Source: BBVA Bancomer

Formalization of the Informal Labor Supply



* Transfer of informal workers to the formal sector, thousands
Source: BBVA Bancomer

The macroeconomic scenario that was presented in this section is an integral part of the foundations of the macro-actuarial model for the IMSS defined-contribution scheme described later in this document. The central message of the results obtained herein is that only in an sphere of greater investment, productivity and economic growth will it be possible to expand the opportunities of formal employment and thus improve the conditions in which the pension systems operate.

It should be noted that, certainly, actions leading to a greater deepening of economic transformations that the country requires will be compensated with improved opportunities for economic growth and conditions for operating the pension systems. Thus, the results of an economic panorama in which more progress is made in correcting the structural deficiencies of the Mexican economy are shown in Appendix 2. Under the alternative scenario denominated "progress in reforms", the effect of a greater investment in the economy translates into higher gains in productivity and higher wages.

IV. Pension Systems in Mexico

Throughout the world, most pension plans have been offered by government social security institutions as part of a broader range of insurance and social benefits provided by the state. Mexico has not been an exception to this worldwide trend and the coverage of its main pension plans has a clear antecedent in the development of the country's social security systems.

Among the main reasons why the state actively participates in providing social security services are the lack of information and appropriate incentives among the population to protect itself against future risks. These reasons are briefly commented on in the following box along with the argument that the design of the pension system is key element to achieving social welfare objectives.

Social Security and Well-being

In economic publications, a large number of authors justify state intervention in protecting society from various risks. The main reasons for the state to assume such an approach are the lack of information and incentives so that individuals can anticipate and protect themselves against future risks.[a] Thus, state intervention is set forth as a convenient means for establishing social security systems that will allow people to better face the conditions that are derived from contingencies due to illness, accidents, and old age, among others.

Nevertheless, state intervention in the development of diverse social protection policies does not necessarily imply that it is the government that should operate them. Its role can be limited to making individuals participate in the private sector's social protection programs or to manage them only in case there is no adequate institutional arrangement in place to fulfill the public objectives of social protection.

It should be noted that given the diverse risks that a population can face, the social security systems generally have a multiplicity of objectives. These, for example, range from providing the means for health care and consumption during old age to improving income distribution, and can include those that seek to increase efficiency in the economy and even to achieve the stabilization of the economic cycle. Therefore, it should come as no surprise that in practice the social security systems present a complex organization and different degrees of effectiveness in achieving their different objectives, which can even be at odds among themselves.

However, to achieve their multiple objectives, the social security systems, in essence, only have two instruments: social spending and economic benefits. Within the expenditures category, health care is one of the most important items while in terms of economic benefits the most important monetary transfers for

individuals are pensions (old age, retirement, disability, life insurance, etc.) and unemployment compensation.

Although in pension systems for retirement the main goals center on providing sufficient income to live on when reaching old age and preventing poverty among senior citizens, another important objective in the design of these systems is that they be financially sustainable. The World Bank (1994) points out that this latter objective is essential so that on a macroeconomic level, fiscal imbalances are not generated for the economy and other social imperatives are not displaced. According to the World Bank, most of the pension systems in the world have not been able to fully meet their multiple social objectives, they have created significant distortions in the operation of the market economies, and in many cases they have been financially untenable in dealing with the aging of the population. This is why with the publication in 1994 of the report "Averting the Old Age Crisis. Policies to Protect the Old and to Promote Growth", the World Bank launched the beginning of an agenda of possible ways to reform the social protection systems.

In relation to this point, the World Bank has proposed a model of multi-pillar pensions with different degrees of commitment by the public sector. A first obligatory pillar with defined-benefits, a second obligatory pillar of defined-contributions to individual capitalization accounts, and a third pillar, complementing the second, of managing the voluntary savings of those insured. More recently, the World Bank has pointed to the advisability of adding a couple of pillars to the previously delineated social protection policies. In its report "Old Age Income Support in the 21st Century" published in 2005, the idea was set forth of creating a "zero" non-contributive pillar, financed with tax resources in order to more explicitly deal with the fight against poverty and a fourth pillar of informal intra-family or intergenerational support to facilitate access on the part of the elderly to health care and housing. See the following chart.

Pension Systems Design, According to the World Bank

Pillar	Target population			Characteristics		
	Without resources	Informal sector	Formal sector	System	Participation	Financing
0	XXX	XX	X	Universal benefit	Universal or residual	General income
1			XXX	Public benefits (DB or rational accounts)	Mandatory	Contributions and reserves
2			XXX	Pension plans, capitalization, DB o DC	Mandatory	Financial assets
3	X	XXX	XXX	Pension plans, capitalization, DB o DC	Voluntary	Financial assets
4	XXX	XXX	XXX	Family assistance, health, housing	Voluntary	Financial and non-financial assets

DB Defined Benefit
DC Defined Contribution
Notes: The shaded area represents the triple-pillar focus proposed by the World Bank since 1994
The number of "X" indicates the importance of the different population sectors in each pillar
Source: Holzmann and Heinz (2005)

An important advantage of the multi-pillar model is that its design allows for increasing the capacity of the pension systems to address their multiple objectives of social protection, savings and redistribution.[b] Nevertheless, the multi-pillar model is only a reference point for the reform of the pension systems in each country. The World Bank has pointed out clearly that in the final analysis it is the specific circumstances and necessities of each nation that should define the most appropriate manner of combining the different pillars of social protection.[c]

As we will see, the main elements of the mutli-pillar model are to some extent already present in Mexico. Pillar 0 and 4 under the framework of the "Opportunities" and "Senior Citizens 70 years of Age and Older" programs of the Department of Social Development; pillar 1 in most of the public sector departments and agencies with defined-benefit schemes, and pillars 2 and 3 with the operation of the retirement savings system through the Retirement Fund Administrators (Afore for its Spanish initials). Nevertheless, to increase coverage it is undoubtedly necessary to strengthen the "zero" pillar to combat poverty and to promote the development of pillars 2 and 3. At the same time, pillar 1, corresponding to defined-benefits, would have to be evaluated in terms of its costs and social benefits since, in most government departments and agencies that operate such programs, there are currently serious financial pressures due to the vulnerability of their design given the demographic changes and the imbalances between affiliates' rights and obligations in such plans.

a See World Bank (1994) and Feldstein and Liebman (2001). For a broader focus on economic policy, see Stiglitz (2000). In the latter text, among other reasons also given for state intervention in the economy are the presence of imperfections in the markets and the need for regulation toward their efficient operation.
b See World Bank (2005) and Lindbeck and Persson (2003) and, for a critical review, see Barr (2000), Orszag and Stiglitz (2001) and Barr and Diamond (2006).
c In Latin America, many countries have already adopted the multi-pillar system, thus joining Chile's pioneer experience (1981). Such countries include Peru (1993), Colombia (1994), Argentina (1994), Uruguay (1996), Mexico and Bolivia (1997), El Salvador (1998), Costa Rica and Nicaragua (2000), and the Dominican Republic (2003).

Meanwhile, in reviewing the evolution of social security in Mexico, one of the most noteworthy elements is that up until the past few years there has been no explicit policy line to establish a single pension system in the country. Thus, the social security and pension system has been constructed with several subsystems that coexist with each other, but which in most cases do not operate in an integrated manner nor do they offer portability of benefits for their affiliates. (See the following box). Further on, in our section on diagnosis, we will comment in greater detail on this institutional configuration, the advance that the recent reform to the ISSSTE Law represents for the portability of benefits, and the implications for social welfare.

Brief Historical Review of Social Security in Mexico

Social security and pension plans

The modern concept of Social Security in Mexico had its origin as a constitutional right in 1917. Article 123, section XXIX of the Mexican Constitution stipulates that the "enactment of a social security law is considered to be in the public interest and it shall include insurance for disability, death, involuntary job dismissal, accidents, and for other similar ends, for which both the federal government as well as each state government will promote the organization of institutions of this nature, to instill and impart social protection."

In compliance with the constitutional mandate, the first piece of federal legislation with regard to pensions was the General Law on Civil Pensions, which was adopted in 1925 to protect retirement benefits for state employees. Then, in 1929, the Constitution was reformed to stipulate that "the enactment of the Social Security Law is considered to be in the public interest and includes insurance for disability, death, involuntary job dismissal, illness and accidents and other (legislation) with similar ends." Subsequently, in 1931 the Federal Labor Law (LFT for its Spanish initials) included protection against occupational accidents and illnesses.

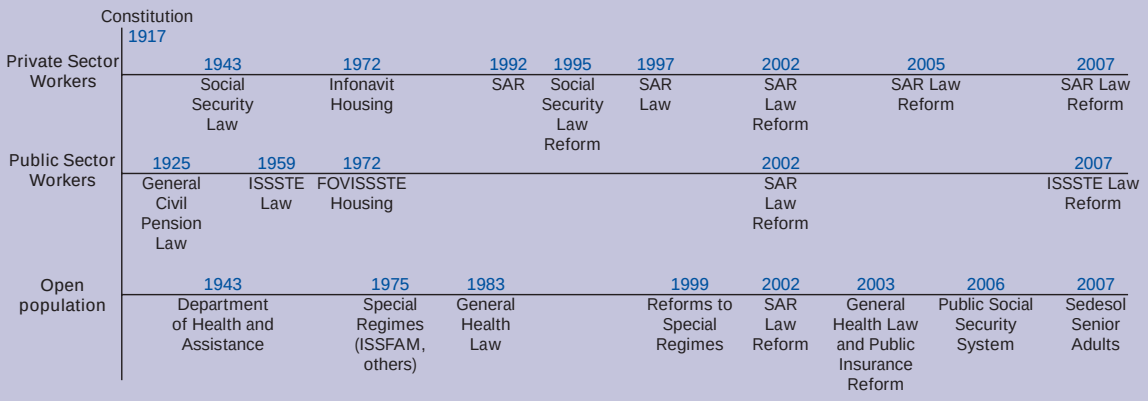
In 1942, Congress approved the Social Security Law (the LSS for its Spanish initials) and in 1943 the Mexican Social Security Institute (IMSS for its Spanish initials) was founded as an institution in charge of insuring and protecting salaried workers in the private sector. With this in mind, within the IMSS a tripartite financing policy was established based on contributions from workers, employers, and the federal government. In that same year, the Department of Health and Assistance was created to unify medical and social-welfare services that were provided to the non-salaried population. Such functions currently correspond to the Department of Health.

Social security benefits were expanded in the country beginning in 1949. In the IMSS, the rights that only protected the salaried worker as such were extended to his or her family, except in relation to labor contingencies. In the case of government employees, the availability of medical services and pension plan mechanisms were strengthened with the Law on the Federal Government Employees Institute of Social Security Services (ISSSTE Law) and the creation of the ISSSTE in 1959.

Subsequently, other insurance, services and institutions have gradually been integrated into Mexico's social security system. For example, in 1972, the National Workers' Housing Fund Institute (Infonavit for its Spanish initials) was created for the purpose of offering loans and support measures to workers employed in the private sector to acquire housing, and for government employees, the ISSSTE Workers Housing Fund (Fovissste for its Spanish initials) was established. Meanwhile, the Mexican Armed Forces Social Security Institute (ISSFAM for its Spanish initials) was founded in 1975 to complement the retirement pensions already received by members of the armed forces since 1955 with clinical, social welfare, and cultural benefits. More recently, the reform to the General Health

Law in 2003 established the Popular Insurance in order to increase the coverage of health services to the open population, that is, those not covered by other programs (see the following diagram).

Development of Social Security in Mexico



Source: BBVA Bancomer based on ISSSTE, "Reforma Integral al ISSSTE" at www.issste.gob.mx

Nevertheless, in an overall retrospective view, the above-mentioned efforts to expand the institutional social security infrastructure in the country were not part of an explicit and comprehensive policy. Given this situation, the country does not have a national pension system but rather several institutional subsystems. These subsystems coexist with each other but in most cases they do not offer the possibility of benefit portability for their respective affiliates. Thus, social security benefits and in particular those corresponding to pension plans are very heterogeneous and the public availability of pensions is distributed both on the level of federal as well as state government institutions, state-owned enterprises, and other public agencies that offer pension protection programs as part of their collective bargaining agreements. For example, see the following chart.

Social Security Benefits by Institution

Federal ISSSTE*	State ISSSTE**	IMSS
• Health care • Workplace liability insurance • Disability and life insurance • Retirement, due to age and for time served insurance • Severance at old age insurance • Full retirement services for pensioneers • Total indemnity • Mortgage loans • Medium-term loans • Short-term loans • Funeral services • Contribution to SAR • Day-care centers • Social benefits • Sale and lease of housing	• Health care • Workplace liability insurance • Workplace accident insurance • Non-professional illness insurance • Loans for retirement • Pension due to disability, cause of death • Life insurance • Short-term loans • Long-term loans • Housing loans	• Health care • Workplace liability • Disability and life • Retirement for time served and severance at old age (IMSS workers) • Housing loans • Retirement Savings System (SAR), (affiliates) • Day-care centers • Social benefits

Pemex	CFE	ISSFAM

• Full health-care services
• Workplace liability
• Indemnity
• Retirements
• Life insurance
• Housing loans
• Administrative loans
• Funeral expenses for workers and affiliates
• Scholarships for workers' children
• Contribution to SAR
	• Life insurance due to death from natural cause
	• Workplace accident insurance
	• Contribution to SAR
	• CFE housing fund
	• IMSS:
	  • Health-care services
	  • Workplace liability
	  • Disability and life
	  • Social benefits
		• Full health-care services
		• Lifetime retirement pension
		• Lifetime pensions for military survivors
		• Retirement insurance
		• Military service insurance
		• Sole economic compensation
		• Funeral expenses for workers and survivors
		• Work Fund
		• Savings Fund
		• Mortgage loans
		• Aid to retired military personnel
		• Scholarships for workers' children
		• Social benefits
		• Sale and lease of housing

* Services current prior to the reform of the ISSSTE Law in March 2007
** Also considered were ISSSTELEON, ISSTAB, ISSTEY and ISSSEMOR
Source: Legislation corresponding to each institution

In order to understand the operation of pension systems in Mexico, in the following section we will describe the coverage offered by the most important subsystems and then will comment on the way in which they are organized to provide and finance their respective promises. With this background information, we will then explain the main motivations to establish pension systems with defined-contribution schemes and will further comment on the advances that have been registered within the country's pension systems in this regard and, in particular, in the IMSS, an institute whose number of affiliates represents slightly more than a fourth of the country's employed population.

1. Coverage

Most pension plans in Mexico are offered by public institutions and are provided to salaried formal workers and their beneficiaries.[14] Among the public institutions of social welfare and protection, the Mexican Social Security Institute (IMSS) and the Federal Government Employees Institute of Social Security Services (ISSSTE) together stand out due to the large number of affiliates on their rolls (see the first attached chart). In turn, the importance of these institutions as the main providers of social welfare and protection insurance has increased over time because different public departments and agencies and local governments often sign agreements with one or another of these institutes to

14 Although private pension plans derived from collective labor agreements as well as others offered by insurance companies have been in place in the country for many years, it is only recently that aggregate information on them has become available. On February 14, 2006, the National Commission for the Retirement Savings System (Consar) created the "electronic registry of pension plans established by companies or derived from collective labor agreements." Based on this registry, the latest available information as of October 15, 2006 indicates that there are 1,652 private pension plans that cover 1,086,200 individuals, of whom 1,023,376 are active workers, 43,083 are pensioners, and 19,741 are former employees with vested rights. Thus, the coverage of the private pension plans represents 6% of the employed workforce. At the same time, 72% of all private pension plans correspond to defined-benefit pensions, while the remaining 28% is divided between defined- contribution (10%) and mixed plans (18%). For further information see "Statistics on private pension plans", at www.consar.gob.mx

partially or totally receive their services. For example, workers of the development banks, the Federal Electricity Commission (CFE) and the Central Power and Light Company of Mexico (LFC) have a pension plan and in addition pay fees to the IMSS. At the same time, some local governments have their own social security systems but most partially or totally contract their services with the ISSSTE (see the second attached chart).

Main Social Security Institutions
July-September 2004

	Pop. of legal rights holders*	Affiliate workers**
Public Institutions	97.6	97.2
IMSS	74.5	78.3
ISSSTE	16.3	17.2
Others[1]	6.9	1.6
Private Institutions[2]	2.4	2.8
Total	**100.0**	**100.0**

* Percentage of total population of legal rights holders
** Percentage of total affiliated workers
1 Includes Pemex, Department of Defense and the Navy and SSA (Public Health Insurance)
2 Includes population with benefit and health-care rights in private institutions engaged by the employer or personally through prepayment
Source: BBVA Bancomer with INEGI data, Encuesta Nacional de Empleo y Seguridad Social, 2004

Workers Incorporated to the ISSSTE by Type of Institution
December 2005

	Persons
Government agencies	431,280
Government-managed public enterprises	386,604
State governments	350,629
State agencies	1,190,431
Municipal governments	39,364
Total	**2,398,308**

Source: BBVA Bancomer with data from VI Annual State of the Nation Report, 2006

However, despite the enormous importance of the IMSS and ISSSTE as social security institutions on a national level, the coverage of their services is still limited when we consider the economically active population or the country's total population. For example, in 2005, the number of workers affiliated to those institutes together accounted for 35% of the economically active population, while in the past nine years their affiliates have represented 54.2% of the total population on average. As can be seen in the following chart, the IMSS is the public institution that provides the most significant coverage.

Coverage of the Main Social Security Institutes
Thousands of persons

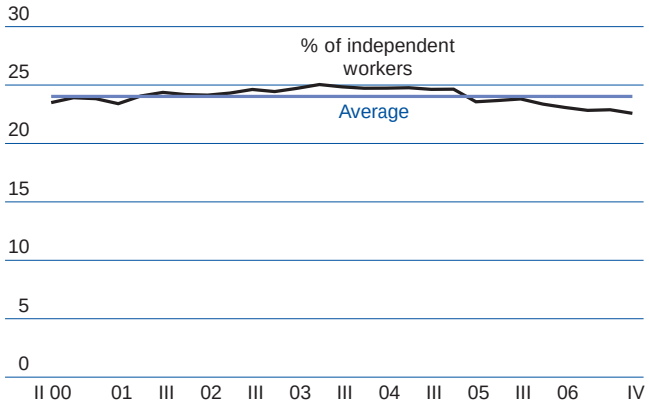
	Total rights holders			% of population*			Total contributors			% of EAP**		
	Total	IMSS	ISSSTE	Total	IMSS	ISSSTE	Total	IMSS	ISSSTE	Total	IMSS	ISSSTE
1997	48,934	39,462	9,472	51.8	41.8	10.0	12,376	10,155	2,221	33.4	27.4	6.0
1998	51,666	41,942	9,724	53.9	43.8	10.2	13,326	11,051	2,275	34.6	28.7	5.9
1999	54,454	44,557	9,897	56.1	45.9	10.2	14,112	11,808	2,304	36.0	30.1	5.9
2000	56,600	46,534	10,066	57.5	47.3	10.2	14,744	12,407	2,338	37.6	31.6	6.0
2001	56,109	45,872	10,237	56.3	46.0	10.3	14,283	11,914	2,369	35.4	29.5	5.9
2002	56,508	46,199	10,309	56.0	45.8	10.2	14,374	12,001	2,373	35.3	29.5	5.8
2003	52,203	41,851	10,352	51.2	41.0	10.1	14,358	11,991	2,367	33.8	28.2	5.6
2004	53,456	42,993	10,463	51.9	41.7	10.2	14,749	12,370	2,379	34.4	28.9	5.6
2005	55,569	44,961	10,608	53.5	43.3	10.2	15,365	12,967	2,398	35.0	29.5	5.5

* Legal rights holders / population
** Contributors / EAP
Source: BBVA with INEGI data

It should also be noted that although individuals with a formal salaried job in the private sector should by law be affiliated to the IMSS, this norm could lead to errors in terms of the real coverage of the IMSS pension system since, in practice, a large number of affiliates do not make the required contributions to obtain the system's protection. For example, information from the Mexican Association of Retirement Fund Administrators (Amafore for its Spanish initials) shows that within the Retirement Savings System (SAR for its Spanish initials)—which is obligatory for workers affiliated to the IMSS—63% of the individual accounts registered in December 2006 corresponded to inactive workers.[15]

Furthermore, in the public pension systems, coverage is also limited for institutional reasons, since, for example, independent workers do not have the legal obligation to become affiliated and pay fees into a pension system. Thus, this factor excludes almost a fourth of the country's working population—which corresponds to such workers—from an obligatory pension plan.

Independent Workers
% of total employed population



Source: BBVA Bancomer with INEGI data

As a result, we can thus understand the reform to the Retirement Savings System Law (LSAR for its Spanish initials) in 2002.[16] The objective of the reform was to expand the opportunities for coverage for non-salaried workers and independent professionals. In order to achieve this objective, the reform consisted in enabling workers not affiliated to the IMSS, including workers registered with the ISSSTE, to open an individual account in the Afore of their choice to voluntarily deposit in it the resources earmarked to establish or strengthen a pension.[17]

15 In December 2006 the total number of accounts in the system was 37.4 million and of these, only 13.9 million corresponded to active workers. See http://www.amafore.org/estadistica.htm

16 For the country's savings mechanisms to have a broad regulatory framework, the Law for the Coordination of the Retirement Savings Systems (LCSAR) published in the Official Gazette (Diario Oficial) on July 22, 1994 and that only coordinated the SAR systems in the IMSS and ISSSTE was repealed on May 24, 1996 and replaced on the same date by the Retirement Savings Systems Law (LSAR).

17 The individual account for an independent worker has two sub-accounts: 1) voluntary contributions and 2) long-term savings. The voluntary contributions can be withdrawn every two months while the resources in long-term savings and their returns can only be withdrawn after five years counted as of the date when the contributions were made. In the event the affiliate has SAR 92 resources, these can be added to the individual account upon the prior request of the worker involved. The system is managed by the Afore, which can charge a commission.

According to the National Commission for the Retirement Savings System (Consar for its Spanish initials), the potential coverage of the reform could extend to 11 million people.[18] To date, there is no official statistic that reveals the evolution of the number of voluntary contributors, but information on the accumulated balances of the voluntary savings within the Retirement Savings System (SAR for its Spanish initials) indicates that this savings alternative represents a still very low percentage in relation to the mandatory contributions to the system (0.3% of the total in 2006).

Meanwhile, with the aim of protecting the open population, especially those with low-income levels, a support mechanism exists in the Opportunities Program for senior citizens. The program offers bimonthly assistance of 500 pesos for those 70 year of age or older who live in urban or rural areas marked by extreme poverty.[19] In addition, recently new measures have been undertaken that will allow expanding such assistance-type coverage in the country.

In May 2007, the Department of Social Development (Sedesol for its Spanish initials) launched two new support programs for senior citizens, the "Attention to Senior Citizens 70 Years of Age or Older Program" and the "Attention to Senior Citizens in Rural Areas Program." The objective of the former program is to provide monthly support of 500 pesos, which will be delivered on a bimonthly basis to senior citizens who are 70 years of age or older in towns of up to 2,500 inhabitants, while the latter will offer an annual transfer of 2,100 pesos to senior citizens who are 60 years of age or older and live in rural communities with less than 2,500 inhabitants, which are marked by extreme or very extreme levels of poverty. According to Sedesol, there are about one million senior citizens who are 70 years of age or older living in towns of up to 2,500 inhabitants. It should be pointed out that the support provided in these new support programs for senior citizens does not overlap those of the Opportunities Program, because those eligible must select only one of the programs to enroll in.[20]

However, despite the aforementioned institutional efforts, the deficit in coverage of the country's social security and pension systems is significant. For example, using information from the National Occupation and Employment Survey (ENOE for its Spanish initials) for 2006 as a reference point, the figures indicate that of a total of 42.3 million workers, only 15.3 million have access to the social security institutions. Thus, also considering a combined potential coverage extending to one million people in the assistance programs of Sedesol and Opportunities, 61% of the country's employed population would not have social welfare and pension protection services. See the following graph.

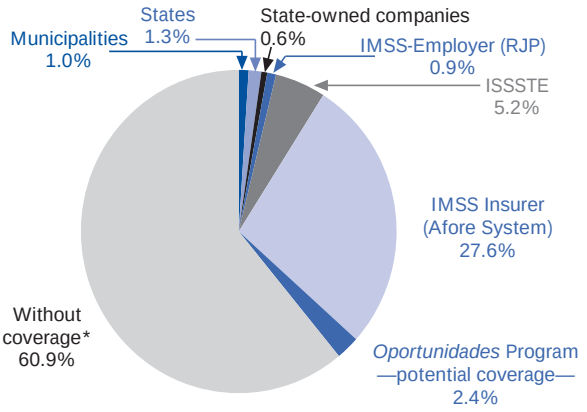
18 See Consar (2005), "Trabajador independiente… tu eres la pieza que faltaba!: Apertura del SAR a todos los Mexicanos" ("Independent Worker… You are the missing piece!: Opening up the SAR to all Mexicans") Presentation, August.

19 The Opportunities Program is a federal program for the human development of the population living in extreme poverty. To achieve its goals, since 1997 the program has provided assistance in education, health, food, and income. The Department of Public Education, the Department of Health, the Mexican Social Security Institute, the Department of Social Development, and state and municipal governments participate in the program. For further information see http://www.oportunidades.gob.mx.

20 See www.sedesol.gob.mx

Coverage in Main Social Security and Pension Systems

Employed population, % of total, 2006



* Estimated based on persons without access to health institutions

Source: BBVA Bancomer with INEGI data

At the same time, within the social security institutions, pensions for the population with coverage are of increasing importance both in terms of their number as well as the amount of the expenditures that they represent. For example, in the main public institutions (IMSS and ISSSTE), the number of pensioners between 1997 and 2005 almost doubled, and as a percentage of the number of affiliates reached 17.8% in the IMSS and 22.8% in the ISSSTE. In addition, as shown in the following chart, the amount of the average yearly pension in both institutes has posted sustained increases, and this is especially the case in the ISSSTE. In the latter institute, pensions have been relatively more generous than in the IMSS and in addition have posted more significant increases in relation to the general minimum wage.

IMSS and ISSSTE Pensions

Number of pensioners (thousands) and annual average pension value (pesos)

	Pensioners		% of total contributors		Average pension		Times general min. wage	
	IMSS	ISSSTE	IMSS	ISSSTE	IMSS	ISSSTE	IMSS	ISSSTE
1997	1,681	318	16.5	14.3	9,890	22,812	1.1	2.6
1998	1,735	338	15.7	14.8	11,594	35,199	1.1	3.4
1999	1,797	367	15.2	15.9	13,642	39,900	1.2	3.4
2000	1,861	386	15.0	16.5	15,264	45,253	1.2	3.5
2001	1,951	411	16.4	17.4	16,614	49,971	1.2	3.6
2002	2,034	442	16.9	18.6	18,878	56,572	1.3	3.9
2003	2,134	476	17.8	20.1	20,574	68,886	1.4	4.5
2004	2,216	510	17.9	21.4	23,740	66,490	1.5	4.2
2005	2,305	547	17.8	22.8	24,809	67,989	1.5	4.1

Source: BBVA Bancomer with data from VI Annual State of the Nation Report, 2006

2. Most public pension plans have a defined-benefit scheme

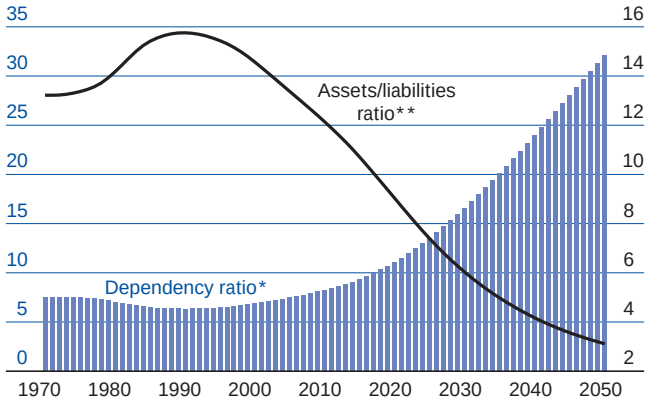
Even though all the contribution-based social protection and pension plans are based on the savings of workers when the latter are economically active in order to subsequently provide them with benefits in response to a possible contingency, substantial differences exist among the pension programs in terms of the way in which they operate,

are financed, and grant their benefits. With this in mind, pension plans can be classified into three main categories: defined-benefit (DB), defined-contribution (DC) and mixed, combining elements of the first two types.

In the defined-benefit (DB) model, the amount of the pension is established at the beginning of the pension plan as a percentage of the affiliate's wage (replacement rate) and to obtain it, the worker must fulfill minimum requirements of age and time paying into a fund. With the resources contributed by all the active workers to a common fund or account, the pensions of the inactive workers are financed[21] (the pay-as-you-go system). At the same time, in the defined-contribution plan, the amount of the pension is determined at the time of the worker's retirement based on the regular contributions made into an individual savings account that are defined at the beginning of the plan. With the contributions and the interest that is generated in a capitalization account, the necessary savings to finance the affiliate's pension are established. Finally, in a mixed model, the pension generally is established through a defined-contribution plan, but with a guarantee of a minimum pension, equivalent to a minimum defined-benefit.

In Mexico most of the public social security institutions operate pension plans under a DB-type model. However, the country's demographic evolution and medical advances have led to these models losing their economic viability as they do not have appropriate long-term funding.[22] Meanwhile, the reduction in birth rates and the aging of the population have led to a situation in which the number of active workers for each retired worker is increasingly smaller, while, at the same time, advances in health indicators and the increase in life expectancy have extended the time during which the pensions are paid. See the following graph.

Population Dynamics in Mexico



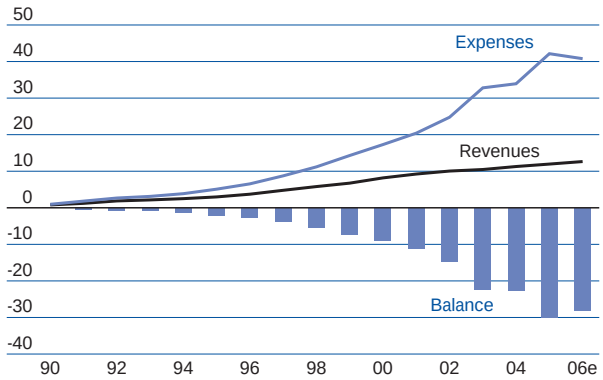
* Adults over 65, % of population between 15 and 65 years
** Persons between 15 and 65 for each person over 65 years
Source: BBVA Bancomer with Conapo data

21 It should be noted that when the financing of current pensions takes place with the current contributions of active workers, the pension system is known as the "pay-as-you-go" plan.

22 A pension plan is considered funded if, at present value, the ratio of liabilities (expenditures on pensions) to assets (revenue from contributions) of the pension plan is equal to one. On the contrary, the plan is under-funded and registers an actuarial deficit when the ratio of its liabilities is higher than that of its assets at present value. For further details on the different classifications of pension plans sees Solis (2000).

In addition, the country's public pension plans have serious imbalances between the rights and obligations of the affiliates that affect their financial solvency since, historically, the benefits in these programs have increased, whereas this is not the case with the contributions that sustain them. This has resulted in the main government social security institutions in Mexico being plagued by long-term financial solvency problems and this has become a factor of growing pressure on public finances. For example, in recent years the gap between the revenues and expenditures on pensions in the ISSSTE has been growing, as can be seen in the following graph, and this disparity had to be financed by law with transfers from the federal government.

ISSSTE Pension Payroll
Billions of pesos



Source: BBVA Bancomer with data from VI Annual State of the Nation Report, 2006

The ISSSTE Pension System: 1959-2007*

The ISSSTE was founded in 1959 to provide health and social security services to workers covered by section B of article 123 of the constitution. Thus, those enrolled in the ISSSTE are public servants, pensioners, and their respective family members.

In the period under discussion, the institute obligatorily covered a series of 21 benefits—three of them medical, six social, and twelve economic. Taken together, these benefits encompassed medical services, workplace accident insurance, retirement savings, loans, and housing, social, and cultural services. The benefits were financed through a system comprised of fees paid by workers and contributions by state departments or agencies. The fees and contributions were based on the affiliate's base salary for determining social security contributions (SBC for its Spanish initials). Thus, as a percentage of that salary, the worker had to pay the institute a fixed fee of 3.5%, and the government departments and agencies an additional percentage for the payment of retirement and pensions. Furthermore, the government departments and agencies had to notify the Institute of contributions to the Retirement Savings System (SAR for its Spanish initials) made in banks, the amount of which was equivalent to 2% of the SBC. Therefore, the worker affiliated to the ISSSTE had an institutional pension plan and the SAR as its complement.

Over time, the financing sources for the ISSSTE institutional pension plan were insufficient to pay its extensive obligations. The plan posted an imbalance given

that the pay-as-you-go mechanism that operated to finance its defined-benefits was very sensitive to the ratio between the number of active or contributing workers and pensioners. For example, while in 1975, there were 16.3 active workers for each pensioner, in 2005 the corresponding figure was 3.8. This meant that the contributions and revenue necessary to pay the benefits of retirees and pensioners were increasingly lower and this explains why the institution's pension fund showed a deficit. In addition, the situation was exacerbated by other elements that expanded the gap between the plan's revenues and expenditures.

In terms of expenditures, two factors explain its growing evolution: 1) a rise in the life expectancy of the ISSSTE affiliates but not in their age of retirement, which thus increased the period in which the pensions were to be paid. While in 1975, the average age of retirement was 62 years and life expectancy was 64 years, in 2003 the corresponding figures were 55 and 76 years, respectively; and 2) the constant increase in benefits for retirees and pensioners. For example, since 1983 diverse prerogatives were added, among the most important of which were the establishment of a retirement pension of up to 100% of the base average salary for social security contributions (SBC) of the last year and an increase in the annual amount of pensions in the same proportion as inflation or the increase in active workers' wages. Furthermore, in comparison with the IMSS, the benefits for ISSSTE pensioners were greater. For example, in 2005, the average pension per individual was 2.7 times greater (67,989 vs. 24,809 pesos a year) and the minimum age for retirement was lower (55 vs. 60 years).

In terms of revenue, income was negatively affected by three main factors: 1) with an average retirement age of 55 years, the employees spent little time paying fees into the system in relation to the average period in which they would be receiving retirement benefits; 2) the rates for fee payments by workers and for the contributions paid by government departments and agencies practically had not been modified since the founding of the institute. This would severely restrict obtaining revenue for the pension fund; 3) an inability to monitor the ISSSTE's finances also limited its revenue. As opposed to the IMSS—which has the power to collect contributions from management—the ISSSTE cannot impose sanctions on government departments and agencies that in their capacity as employers fail to comply with their contributions to the ISSSTE social security system.

Therefore, it is not surprising that the ISSSTE Pension Fund, under the modality of a defined-benefit plan, would not have reserves, would in practice operate under a pay-as-you-go system, and would also register major financial imbalances. This situation has had a great impact for all of the country's taxpayers, since the ISSSTE Law in effect up to March 30, 2007 required the federal government to cover the obligations that the ISSSTE itself could not pay.

* The ISSSTE Law was reformed, and the new law published in the *Diario Oficial* (the Official Gazette of the Federation) on March 31, 2007. The new law guarantees the continuity of and access to the ISSSTE's 21 services, insurance, and benefits, which were reclassified into four insurance and four benefits and services categories, namely: a) insurance (health, workplace-related risks, retirement, severance at old age and old age, disability and life insurance), and b) benefits and services (mortgage loans, personal loans, social services, and cultural services). In the section on advances toward a new pension system, the main aspects of the ISSSTE reform are discussed in the body of this text.

3. Advances toward a new pension system

The IMSS managed its pension plan under a defined-benefit scheme up to June 30, 1997. The IVCM plan (known by its Spanish-language initials of the insurance that it covered: disability, old age, severance at old age, and life insurance) was plagued by serious financial imbalances, as was also the case with the ISSSTE Pension Plan. However, in December 1995 a reform was introduced in the Social Security Law (LSS for its Spanish initials) that established the bases so that the IMSS pensions for retirement, old age, and severance at old age would cease to be a future fiscal burden and so that IMSS-affiliated workers could have greater control over the amount of their pension.[23]

a) Reforms in the IMSS pension system

The Social Security Law (in effect since 1973) was modified so that as of July 1st, 1997 (LSS-97) a new financing structure could operate for IMSS insurance categories and, at the same time, a new pension system based on defined-contributions could function, with the guarantee of a pension for IMSS-affiliated workers.[24] Specifically, IMSS' operational and administrative functions for insurance for retirement, old age and severance at old age (RCV for its Spanish initials) were removed from the Institute. The operations involved in collecting fees and the certification of RCV rights remained in the hands of the Institute, but the financial management of the resources was transferred to financial institutions specializing in managing retirement funds, known as Retirement Fund Administrators (Afore for its Spanish initials), which could have one or more Pension Fund Investment Management Companies (Siefore for its Spanish initials) to invest workers' resources in different risk and return options.

The new pension system offered workers greater legal security with regard to their pension since it enabled each individual to have an individual savings account in the Afore of their preference and because the resources in this account were also recognized as their property.[25] Moreover, the intention of the reform was to enable the worker to accumulate sufficient resources in order to enjoy a pension with the tripartite contributions—from the affiliate himself, from the employer, and from the federal government—to the system of individual accounts in the Retirement Savings System (SAR).[26]

In turn, the LSS-97 contemplates the guarantee of a pension for the affiliate who, having fulfilled the age and payment requirements, was not able to accumulate the resources necessary to cover the survival insurance for his or her beneficiaries, and to obtain a

23 With the 1995 reform to the Social Security Law (LSS for its Spanish initials), other social security benefits were also incorporated into the legislation. Family Health Insurance was created, which allows non-salaried workers who are self-employed to have access, together with their families, to the integral medical care offered by the IMSS, and extends the mandatory regime to agricultural laborers to create day care centers for the children of mothers who work in the fields.

24 The four types of insurance that the IMSS managed were: 1) health and maternity, 2) workers' compensation, 3) day care, 4) disability, old age, severance at old age, and life insurance. With the reform, five such categories were codified: 1) health and maternity, 2) workers' compensation, 3) day care, 4) disability and life insurance and 5) retirement, old age, and severance at old age.

25 Further details are provided in this chapter on the components and operation of the system of individual accounts in the Afore.

26 To launch the new pension system in the IMSS, the accounts created with the Retirement Savings System in 1992 (SAR-92 for its Spanish initials) were used. The SAR-92 was a obligatory savings and defined-contribution program that through a single payment of the accumulated resources or the acquisition of a life annuity served to complement the defined-benefit plans of the workers affiliated to the IMSS and ISSSTE. The individual SAR-92 accounts had two sub-accounts, one for retirement and the other for housing.

pension equivalent to the guaranteed pension. At the time in which the reform entered into effect, the guaranteed pension was a monthly amount equivalent to the current general minimum wage for the Federal District (SMGVDF). This amount was to be upgraded annually, in the month of February, in accordance with the National Consumer Price Index, in order to maintain its purchasing power.

Reforms to the IMSS Pension System —Main Motivations—

The factors that led to the IMSS reform can be summarized as follows:

a) The contributions to the IVCM insurance remained at very low levels. They only rose from 6% of the SBC or base salary for determining social security contributions in 1994 to 8.5% in 1996.
b) The benefits of IVCM insurance were increasing, since they were gradually extended to the affiliate's dependents.
c) The minimum pension increased considerably, rising from 40% of the minimum wage in the past four decades until reaching 100% in 1995.

These factors led to a major actuarial imbalance. If the system had been maintained, contributions would have had to increase to 23.3% of the SBC in 2020, or the funds would have had to come from the public budget.

In addition, although when IVCM insurance first began to operate, there were few pensioners in relation to the number of active workers, and therefore, the resources from their contributions could have been channeled to a reserve fund, the absence of affiliates' rights of ownership on the pension resources allowed these to be used to finance the IMSS infrastructure and to reduce the deficit from health and maternity insurance. The decapitalization of the reserves reached such a level that by 1994 they represented 0.4% of GDP, when they should have accounted for 11% of the product that year.

At the same time, the country's demographic evolution also played a fundamental role in motivating the reform, since this was reflected in the population structure of IMSS affiliates:

a) The country's birth rates fell from an annual 3.7% to 1.9% between 1970 and 1995.
b) Life expectancy increased from 49.6 to 70.8 years between 1950 and 1995.

Source: BBVA Bancomer based on Solis and Villagomez (1999).

To make the transition from the old to the new pension model, three rules were applied:

1. Pensions that are still being paid for retirees and pensioners at the time the reform proposal was approved were not affected and their payment was guaranteed by the federal government.
2. Starting from July 1st, 1997 all workers newly affiliated to the IMSS were incorporated into the new defined-contribution scheme.
3. All workers who were paying fees under the defined-benefit system up to June 30th, 1997 were given the right to choose, at the moment of their retirement, the option that best favored them as pensioners between the defined-benefit and the defined-contribution schemes.

Nevertheless, the latter rule implies simultaneously maintaining two pension models during a long period of transition: defined-benefit schemes under LSS-73 and defined-contribution schemes under LSS-97. Thus, to summarize, all the pensions granted or that will be granted in the future under the previous plan (LSS-73) represent, in part, liabilities corresponding to the federal government during the period of transition and are not the responsibility of the IMSS. Meanwhile, under LSS-97, pensions are financed through the funds in the individual accounts and there is a pension guarantee on the part of the federal government for all the affiliates who fulfill the requirements of age and contribution payments.

In December 2001, new reforms and additions were enacted to the Social Security Law to increase pension benefits. Specifically, a) no pensioner due to old age would have a pension less than one minimum wage; b) orphans and blood relatives and widows with pensions of up to 1.5 minimum wages would receive, at the moment the reform is approved, an 11% increase; c) all retirees 60 years of age or more in the old age and severance at old age categories would receive an 11% increase, and d) as of the approval of the reform, all pensions were indexed to the National Consumer Price Index to guarantee their purchasing power.[27]

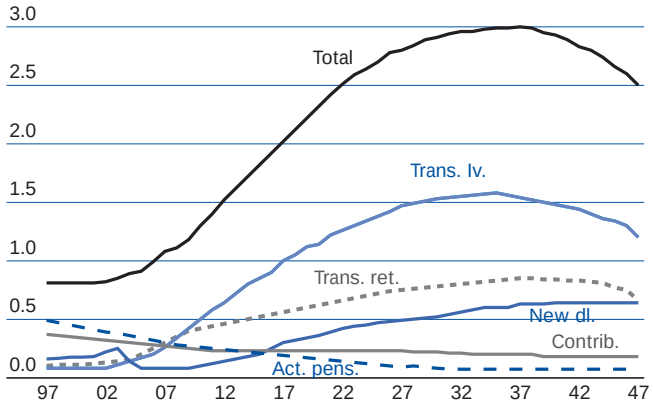
Among the most important initial studies that have analyzed the economic effects of the reform to the IMSS pension system are those developed by Sales, Solis and Villagomez (1996) and Grandolini and Cerda (1998). These studies provide detailed explanations for the reasons behind the reform and the possible impact on national savings, but above all, present the first estimates in fiscal terms of the change in the pension plan systems.

Sales, Solis and Villagomez (1996) point out that the cost of not having reformed the IVCM insurance would have been significant for public finances. Nevertheless, they warn that even though the reform had a positive effect in terms of fiscal policy during the first years of its operation, a negative effect also exists in relation to the costs corresponding to the transitional phase, the result of having made the debt of the IVCM plan's obligations explicit. Assuming annual rates of real GDP growth of 5%, 2.8% in

27 The reforms also contemplated a new policy on reserves for the other IMSS insurance categories (workers' compensation, disability and life insurance, etc.) and the creation of a Fund for Compliance with Labor Obligations to favor IMSS workers. This was a fund that in terms of new jobs or replacements in the IMSS workforce could no longer be financed with resources from worker-employer fee payments or the social security contributions from the federal government following the approval of the reforms to articles 277 D and 286 K of the Social Security Law in 2004.

wages, 6% in the retirement, old age, and severance at old age sub-account, and 0% for the housing account, these researchers estimated that the cost of the transition would reach its maximum level toward 2035, fluctuating between 2 and 2.3 percentage points of GDP, and that the fiscal cost of the reform at current value would total 80% of GDP, mainly derived from the actuarial deficit that was generated under the system that was in place up to 1997. See the following graph.

Cost of the Reform
% of annual GDP



Source: Sales *et al*. (1996)

Grandolini and Cerda (1998) emphasized that the IMSS reform could not be postponed any longer because of the serious financial imbalances in IVCM insurance. These researchers reported that in accordance with the official estimates of the time, the actuarial deficit would have reached an amount equivalent to 141% of 1994 GDP on a 74-year horizon.

Present Value of Future Deficits in the IMSS-IVCM Insurance Pension
December 31, 1994, thousands of 1994 pesos

Assets		Liabilities	
Reserves	3.25	Present value of old-age pensions	96.93
Present value of future contributions	683.67	Present value of future obligations	2,390.61
Current affiliates	179.74	Current generation	1,017.40
Future generations	503.93	Future generations	1,373.21
Total assets	683.92	Total liabilities	2,487.54
Present Value of Future Pension Deficits: 1,800.62 (141.5% of GDP)			

Source: Grandolini and Cerda (1998)

In terms of the fiscal consequences of the reform, Grandolini and Cerda estimated an annual fiscal impact of 1% of GDP for the first twenty years and a transition cost between the systems of almost 17.7% of 1994 GDP for the 1997 to 2024 period.

Although the previous estimates indicate significant differences between each other, attributable both to methodological reasons as well as to the economic and actuarial suppositions under which they were prepared, both studies reveal that the pension

system reform signified an important fiscal benefit for the country, given the scenario of inertia in which IVCM pensions were being granted.

At the same time, the need for a reform to the IMSS pension system cannot in any way be considered an isolated phenomenon within the field of social security. In the past 25 years, the aging of the population has been one of the main issues of concern for those responsible for economic policies throughout the world since, while it imposes the need to have pension plans that can provide sufficient income to avoid poverty in old age, such programs should have a viable long-term financing structure so as not to affect public finances, interest rates, and ultimately economic growth and the population's living standards. The following box briefly explains the experience with reforms to pension systems in Latin America, which serves as the background for the IMSS reform in Mexico.

Reforms to the Pension Systems in Latin America

In Latin America, public pension systems were established starting from the 1930s, using the experience of the most advanced European countries as an example. The public pension system, based on the defined-benefits scheme, was functional in its beginnings, since the population was young. However, as the countries entered the more advanced stages of the demographic transition, the need for reforms became increasingly clear, since the number of active workers per pensioner was diminishing rapidly.

The oil crisis in the 1970s and the subsequent debt crisis in the 1980s in Latin America, resulted in a decade marked by low growth and a severe crisis in public finances, exposing the problems of sustainability of the public pension systems. This was combined with the implementation of reforms to reduce the size of the state as a means of diminishing the pressures on public finances.

As a result, in the decade of the 1990s, reforms were introduced to the pension systems in a significant number of Latin American countries. These pension reforms were mainly based on the design adopted by Chile in 1981, which consisted in replacing the public system of defined-benefits (or pay-as-you-go) with one of individual savings with defined-contributions and managed by private companies.

The reforms in Latin America had the common objective of making the pension systems efficient and ensuring their financial viability through the following modifications:

a) Increases in the retirement age, in the level of contributions, and in the minimum period during which they have to be paid into the system.
b) The incorporation of a system of individual capitalization, either by substitution, integration, or complementation of the previous pay-as-you-go systems; the private management of such plans; and the investment of the funds accumulated in the national and international financial markets.

The individual capitalization systems in Latin America, partially or totally replacing the pay-as-you-go models, began to operate in Chile in 1981, followed by Peru in 1993, Argentina and Colombia in 1994, Uruguay in 1996, Bolivia and Mexico in 1997, El Salvador in 1998, Costa Rica in 2000, and the Dominican Republic in 2003.

Source: Jimenez and Cuadros (2003).

b) Reforms in the ISSSTE pension system

A vulnerable pension design in the face of demographic change and an imbalance between the claims and obligations of its affiliates, led the ISSSTE Pension Fund to register serious financial problems and exert growing pressure on public finances. For these reasons, but also due to the high operating costs and the deficiencies in the Institute's services as a result of its precarious financial situation, reforming the ISSSTE Law was a necessity in order to provide it with renewed viability and to enable the ISSSTE to better serve its affiliates in the long-term.

The reform was enacted on March 31, 2007 and with it a new and important institutional step was aimed at the establishment of economically viable pension systems in the country, but above all toward systems that can grant full security and portability of rights to their affiliates, independently of the social security institute into which they contribute.

Briefly, the ISSSTE reform in terms of pension plans can be summarized in the following points:

1. There was a change from a defined-benefit scheme in the ISSSTE Pension Fund to a pension system based on defined-contributions with a guaranteed pension. The new system will thus be supported by a program of defined-contributions to individual capitalization accounts, but will also have a joint pillar in, with government support in the guaranteed pension.

2. The new ISSSTE pension system incorporates a federal government contribution in the retirement savings system (known as a "social quota") as a support element for affiliates, but it also introduces a new joint savings mechanism. This new mechanism consists of a government co-financing policy to motivate affiliates' voluntary savings. Specifically, the new law stipulates that for each peso that the worker voluntarily contributes to his or her individual account for retirement purposes, the state in its capacity as employer, will contribute 3.25 pesos. This entails a ceiling for workers of 2% and for the employer of 6.5% of the affiliate's base salary for determining social security contributions.

3. The National Pension Fund for Federal Government Employees, known as Pension-ISSSTE, was established as an ISSSTE decentralized public agency. For its operation, administration, and functioning, this fund is subject to the regulation and supervision

of the Consar (the National Commission for the Retirement Savings System), and must comply with the provisions of the SAR Law.

4. In practice, PensionISSSTE will operate as an Afore, and it will be financed in the same way by charging commissions for managing the affiliates' accounts and funds. However, what the PensionISSSTE charges for commissions cannot exceed the average of the commissions charged by the private Afore.

As in the case of the IMSS, the reform to the ISSSTE Law contained three rules for making the transition between the previous and the new pension system:

1. Pensions that are still being paid for retirees and pensioners are not affected by the reform and their payment is guaranteed by the federal government.

2. As of the enactment of the reform, all those workers newly affiliated to the ISSSTE are to be incorporated into the new defined-contribution policy with the guarantee of a pension.

3. All workers who at the time the reform was approved were contributors to the ISSSTE Pension Fund will have the right to choose between the new defined-contribution scheme or remain in the Pension Fund's defined-benefit plan, which will experience some gradual modifications. The affiliate will have six months as of January 1st, 2008 to choose between these two transitional options.

Options for the Generation in Transition

New regime			Former regime (modified)

Financial Regime of RCV Insurance

Workers	Public Sector Agencies	Federal Government
Percentage of Base Wage	Percentage of Base Wage	Daily Social Quota for every worker
6.125%	5.175%	5.5%[1]

1 Percentage of the current general minimum wage in the Federal District on July 1, 1997, updated quarterly in accordance with the National Consumer Price Index on the date the ISSSTE Law became effective. The resulting initial amount will be updated quarterly in accordance with the National Consumer Price Index.
Source: BBVA Bancomer

Changes in Age and Service Time Required for the Right to a Pension

Section of transitory Art. 9	Type of Pension	Years of service and age required for Pension		Age required for modified pension
		Service time	Age	Increases 1 year every 2 years until reaching:
I	Retirement	30	50	60
II	Age and service time	15	55	60
III	Severance & old age	10	60	65

Note: For pensions established in the table, the average base wage of the final year prior to the worker's retirement will be considered
Source: BBVA Bancomer

Under the latter rule, the affiliates in the transitional phase who should decide to move to the new defined-contribution scheme will receive a pension bond that with a monetary value will recognize their rights for the periods in which they paid fees prior to the reform. This bond will be credited in the individual accounts of the affiliates. At the same time, the affiliates who should decide to remain in the defined-benefit scheme will have to pay under new conditions. Specifically, their minimum retirement age will gradually increase from 50 to 65 years of age toward 2035 and their fee payments for retirement, old age, and severance at old age will be increased from 3.5% to 6.125% of the base salary for determining social security contributions in a period of six years following the approval of the reform. The previous boxes illustrate the rules for the two options applicable to the generation in transition between the systems.

Nevertheless, even though the rules on the transition between the pension systems in the ISSSTE and IMSS are similar, the differences that remain will have a significant impact in the fiscal costs of both reforms.

Viewed with a long-term perspective, the reform in the ISSSTE pension system has transition policies that are more efficient than in the case of the IMSS. In the first place, the workers should not wait a long period to choose a pension system. Secondly, the introduction of the pension bond, by translating the rights acquired by the affiliate under the old pension system into a current monetary value, will be a mechanism that will allow greater certainty to be offered in relation to the fiscal cost of the reform and, therefore, will allow treasury authorities to act congruently to obtain the benefits of an adequate long-term financial and fiscal planning.

ISSSTE Pension Bonds

The ISSSTE pension bonds will have the following characteristics:

- They will be securities issued by the federal government
- They will represent direct and unconditional general obligations of the Mexican government
- Each will have a nominal value of one hundred investment units
- They will be zero coupon securities, issued at par value and they will have a constant nominal value in investment units
- They will be non-negotiable securities
- The conversion of the investment units will be undertaken in accordance with their value the day that the securities mature
- The securities will be issued in series, with successive maturity dates, in accordance with the profile determined by the Finance Ministry
- The amount and maturity date of each series will correspond to what results from the worker's retirement characteristics. That is, when the first of the following takes place: the worker becomes 55 years old or has spent 30 years paying contributions to the Institute
- The bonds can be redeemed prior to their due date, when the federal government, through the Finance Ministry, considers it advisable or when the worker

has the right to retire ahead of time. In these cases, a formula for early redemption will be applied.
- The Central Bank (Banco de Mexico) will be responsible for the custody, administration, and service functions of the ISSSTE pension bonds.

Source: ISSSTE Law, Official Gazette 31/03/2007.

In contrast, the fiscal costs of the reform in the IMSS will still be plagued by considerable uncertainty in the long-term, since the affiliate will have the option of choosing the pension plan that is most favorable for him or her only at the time of retirement.

At the same time, the differences in the design and the financial regime of the new ISSSTE pension system also provide better conditions to offer higher pensions to its affiliates, given that its central element is a mandatory contribution rate that is higher than in the case of the individual accounts. Specifically, with the reform, the mandatory contribution rate in the ISSSTE increased from 7.0% in the old pension fund to 11.3% in the new fund. This is a higher rate than in the IMSS and, as will be seen later on, is key for the results that a scheme of defined-contributions can deliver.

In addition, the new mechanism of joint savings in the ISSSTE pension system offers strong incentives so that the affiliates can increase the initial amount for their pension through voluntary savings and, furthermore, in the event that, after fulfilling the necessary contribution requirements they are not able to accumulate the sufficient funds, they are entitled to a guaranteed pension that is relatively more generous than what is offered in the IMSS. See the following chart.

Financial Regime of the New Pension Systems: ISSSTE vs. IMSS

Financial regime	IMSS	ISSSTE
Contributions	6.5% SBC	11.3% SBC
Social quota	5.5% SMGVDF	5.5% SMGVDF
Joint savings*	nd	3.25 x 1 peso**
Guaranteed pension	1 MW	2 MW

* Government co-financing
** Limit of 6.5% of SBC (base wage for social security contributions)
SMGVDF Current general minimum wage in Mexico City
Source: BBVA Bancomer

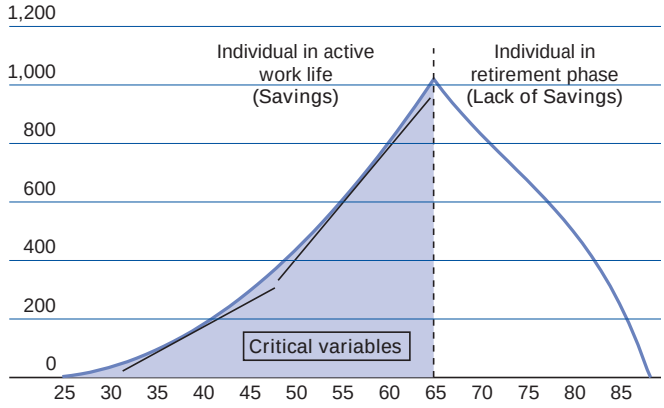
In sections VII and VIII of this study, on diagnosis and proposals, respectively, an estimate is presented of the fiscal costs of the ISSSTE reform and some measures are listed that would allow limiting the fiscal costs of the transition in the IMSS and also improve its affiliates' pensions. In the following section, we explain the general regulatory and institutional framework under which the IMSS pension plan operates within the broadest model of the Retirement Savings System (SAR for its Spanish initials).

4. Pensions under the retirement savings mechanisms

The IMSS pension plan, with support from the defined-contribution scheme, established an important precedent so that public social security institutions in Mexico can offer viable benefits to their clients. Under the defined-contribution scheme of the IMSS pension plan, the key variable in long-term savings is to be found precisely in the contributions to the individual account.

In point of fact, it is the resources that are regularly contributed to an individual account that put into motion the process of long-term savings. This is a process that allows the worker to accumulate the resources for his or her pension through the capitalization of the returns obtained from the contributions paid. See the following graph.

Retirement Savings
Accumulated balance in a hypothetical worker's individual account, thousands of pesos*



* Assumes a monthly income of 2 minimum wages, annual increases in real wage of 1.5% and a real yield rate in retirement savings of 4%

Critical variables: Contributions: Density of contributions (regularity in payments): Fund yield; Commissions and Time (by design, the greater the savings time, the stronger the benefits of the capitalization system).

Source: BBVA Bancomer

The exact amount of the resources that a worker can accumulate in his or her individual account depends in the final analysis on the amount and the frequency of his or her contributions, but also on the return obtained by the funds once deposited in the account, after discounting management costs. Thus, the bigger the contributions, the greater the frequency with which they are paid, and the higher the net earnings of the resources managed, the larger will be the amount available for retirement. Of course, the opposite occurs when the contributions are small, when they are paid with less frequency, and when the net return of the funds in the accounts is low.

The defined-contribution scheme in the IMSS pension system also allows the workers to obtain other benefits, such as a) ownership rights over the contributions and certainty on their use; b) a control mechanism on the amount of their pension through the administration of their voluntary contributions; c) the possibility of becoming a pensioner prior to the legal retirement age if they have accumulated sufficient resources and d)

greater legal security of receiving a pension, or if applicable, a pension guaranteed by the federal government.[28]

The following section describes the main institutional factors that intervene in the operation of the retirement savings mechanism in the individual accounts of the workers affiliated to the IMSS. This is not only mentioned due to the important participation of the IMSS in pension fund coverage, but also because such aspects remain important for the operation of the individual accounts of workers not affiliated to the IMSS, independent workers, and especially for the workers registered with the ISSSTE following the reform of the ISSSTE law.

a) Individual account (sub-accounts and contributions)

The individual account is the financial instrument that manages the bimonthly worker-employer fees and the government's contributions to insurance for retirement, old age, and severance at old age; the additional payments made voluntarily by the worker and/or his or her employer; and the returns on the total of the previous contributions. In addition, in the individual account the Afore keep accounting data on employer fees to the housing funds.

Given these factors, the individual account consists of four sub-accounts for contributions.[29]

i. **Retirement, old age, and severance at old age (RCV)**. In this sub-account, the resources whose origin is the mandatory contributions of both workers and employers as well as the government contributions are deposited and accumulated. See the following box for details on the contributions. The amount of the mandatory contributions is calculated on the basis of the worker's base salary for determining social security contributions (the SBC) until a maximum limit that is expressed by a number of times the prevailing general minimum wage in the Federal District (SMGVDF).[30]

ii. **Voluntary contributions**. Resources that the worker or employer freely decides to contribute in order to increase the balance in the individual account are deposited in this sub-account. Nevertheless, the use of these resources is not limited to savings, since the law allows such funds to also be used for other personal savings or invest-

28 In contrast, under the IVCM insurance: a) there are no ownership rights over the pension resources. These resources, by being placed in a common fund, could be used for purposes other than pensions; b) the amount of the pension represented a fixed percentage of the base salary for determining social security contributions that was established at the beginning of the pension plan; c) there was no possibility of receiving an early pension; on the contrary, the periods of paying partial contributions increased the risk of not having a pension, and d) there was no security as such of receiving a pension. On the one hand, the pension liabilities as well as other IMSS insurance plans put the Institute in a delicate financial situation and, on the other, pension rights were lost when workers left the covered sector. In addition, the IVCM pension plan represented a highly regressive program because its minimum pension was generally financed with the contributions of the workers with lower-income levels and women who did not meet the minimum contribution payment requirements.

29 On December 10, 2002 a decree to reform the SAR Law added the Complementary Retirement Contributions sub-account to the individual accounts. Nevertheless, in the prevailing legislation it is still necessary to unify the reform provisions to article 74 of the SAR Law with those of article 159 of the Social Security Law, in which only three sub-accounts are contemplated, namely, retirement, old age, and severance at old age; voluntary contributions; and housing. Nevertheless, in point of fact, for voluntary contributions there are the corresponding sub-accounts, which supplement retirement and long-term savings. Also, it should be pointed out that the SAR-92 retirement sub-account is also included in the RCV sub-account, with the amount broken down for each item.

30 The base salary for determining social security contributions (SBC) for workers affiliated to the IMSS is calculated on the basis of payments made in cash for the daily fee, bonuses, perceptions, food, lodging, premiums, commissions, in-kind benefits, and any other amount or benefit provided to the worker for his or her job, except for the items stipulated in article 27 of the Social Security Law.

ment projects. In particular, two months after the first deposit or the last withdrawal, the worker can make full or partial use of both the resources as well as the returns.

iii. **Complementary contributions**. Resources deposited in this sub-account are those that the worker or employer freely decides to contribute in order to increase the balance in the individual account with an exclusive use for retirement. Given such considerations, these resources and their returns can only be withdrawn by the worker when he or she turns 65 years of age or when there is a legally provided for situation of disability or inability to perform paid labor. The resources can be removed in a single withdrawal or can be used as a complement for the acquisition of a pension in the form of a life annuity.

iv. **Housing**: This is a sub-account in which only the mandatory contributions that employers make to the National Workers' Housing Fund (Infonavit for its Spanish initials) on behalf of their workers are registered. Infonavit directly manages the funds and for their use assigns an interest rate that the Infonavit itself calculates in accordance with its balance after operations. In case the worker obtains a loan from the housing fund institute, the resources in the sub-account should be applied to paying off the debt. On the other hand, if the worker does not take out a loan from the institute, the Infonavit will transfer to the Afore the resources to obtain the corresponding pension, for old age, severance at old age or deliver the funds to the affiliate, in accordance with the stipulations of the LSS.[31]

Individual Account: Sub-accounts & Contributions Breakdown

Branch	Worker	Employer	State	Total	Amount[1]
1. Retirement	0.0%	2.0%	0.0%	2.0%	25
Severance at old age and old age	1.125%	3.150%	0.225% + SQ*	4.5% + SQ*	25
2. Housing	0.0%	5.0%	0.0%	5.0%	25
3. Voluntary contributions	Optional	Optional	0.0%	Optional	na
4. Complementary contributions**	Optional	Optional	0.0%	Optional	na
Total	**1.125%**	**10.15%**	**0.225% + CS***	**11.5%**	**na**

* The "social quota" is a contribution to retirement savings by the federal government. Initially it is 5.5% of the current general minimum wage in the federal district (SMGVDF) for each workday, adjusted quarterly in accordance with inflation. It is a joint contribution very important for low-income workers that significantly increases their retirement savings
** It is comprised as a sub-account through reform decree to the SAR Law on December 10, 2002
1 Contribution amount limit, times the SMGVDF
Source: BBVA Bancomer, based on the Social Security Law (LSS)

31 It should be noted that in the case of workers in the transition phase, the use of the resources in the housing sub-account—as of the 4th two-month period of 1997—for acquiring a pension is still a matter of legal controversy. At the beginning, the Reform Decree to the Law on the National Workers' Housing Fund Institute (Infonavit for its Spanish initials) of January 6, 1997 stipulated that the workers subject to the Social Security Law in effect up to June 30, 1997, in addition to obtaining a pension in the terms of this legislation, should also receive in a single allotment the funds accumulated in the housing sub-account corresponding to the accumulated contributions through the third two-month period of 1997, and the respective returns that had been generated. Nevertheless, their subsequent contributions should be paid to the IMSS to cover these pensions. However, on March 3, 2006, the Second Chamber of the Mexican Supreme Court (SCJN for its Spanish initials) specified through its jurisprudence that for these workers [in transition] the resources in the housing sub-account could only be added to the initial amount for the acquisition of a pension with their explicit consent, since, based on the criteria of the SCJN, the rights to obtain accessible and inexpensive credits for acquiring a home and for disability or old age insurance have constitutionally different ends and therefore their contributions should not be mixed together or earmarked for the same purposes. The SCJN ruling can only be applied individually through a special writ of injunction ("amparo"), since the general legal framework has still not been modified.

In addition, workers affiliated to the IMSS who pay fees under the LSS-73 can request from their Afore that the balances accumulated in the old SAR-92 be concentrated and transferred to the new individual accounts of the SAR-97 in order to increase the funds in the RCV sub-account.[32] It should be recalled that the SAR-92 was a savings plan that was to complement the IMSS defined-benefit program and to which the employer was to deposit 2% of the worker's base salary for social security contributions (the SBC) in a credit institution.

In the case of workers enrolled in the ISSSTE, since December 2002 they have had the right to voluntarily open up an individual account in the Afore of their choice.[33] However, given the reform to the ISSSTE Law in March 2007, from now on, all workers must have an individual account operated by PensionISSSTE or by an Afore of their choice. This is because those who remain in the modified defined-benefit system will have their SAR-92 account and those who choose the pension bond will have RCV insurance in the SAR ISSSTE retirement sub-account. In the latter case, the SAR-92 account is eliminated and the resources are added to the RCV account.

PensionISSSTE will transitorily manage the individual accounts of the affiliated workers or those who are affiliated to the ISSSTE in the first 36 months following its creation.[34] Once this period is concluded, the workers can transfer their individual account to any Afore or remain with PensionISSSTE. Furthermore, as of that same date, PensionISSSTE will be able to also receive the transfer of individual accounts of IMSS affiliates or independent workers.

In terms of voluntary savings, the SAR legal framework anticipates some incentives for the resources deposited in the sub-accounts of voluntary and complementary contributions to the retirement funds. On the one hand, the Law allows the Afore to grant incentives in the commissions that they charge in accordance with the permanency of the deposits in these sub-accounts and, on the other, permits the existence of fiscal benefits. In this sense, Article 176, section V of the Income Tax Law (LISR for its Spanish initials) stipulates that the deposits in the sub-accounts of complementary contributions and voluntary contributions, when in the latter they comply with the legal permanency requirements, can be tax deducible for up to 10% of the taxpayer's accumulated income in his or her annual fiscal year and with an upper limit equivalent to five times the general minimum wage of the taxpayer's geographical area, translated into yearly terms.[35]

In relation to opening the individual account as such, it is the worker affiliated to the IMSS who, since the system began, has had the right to open the account in the Afore of his or

32 Independently of whether or not the SAR-92 resources are transferred to an Afore, they will be furnished in a single allotment to the worker at the time he or she goes into retirement or upon reaching 65 years of age. When they are transferred to an Afore, they are included in the RCV sub-account.

33 The individual account of the ISSSTE affiliate has three sub-accounts: 1) retirement savings, 2) housing fund, and 3) voluntary contributions. The first two are regulated by the ISSSTE Law and the latter by the SAR Law.

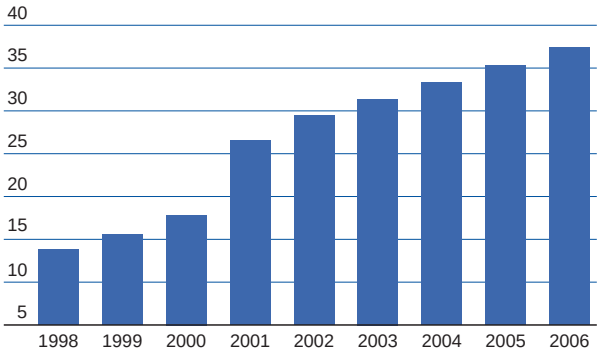
34 In accordance with transitory article 25 of the new ISSSTE Law, the workers who enroll in the ISSSTE following approval of the reform and who already have an individual account opened in an Afore, can choose to remain with the same Retirement Fund Administrator.

35 Article 176, section V of the Income Tax Law (LISR for its Spanish initials) also stipulates that when the resources invested in the complementary and/or voluntary contributions sub-accounts (when applicable) plus their respective returns are withdrawn before the account holder meets the requirements of reaching 65 year of age or of having a disability or incapacity, in accordance with the LSS, the withdrawal of the resources will be considered accumulated income in fiscal terms.

her choice.[36] In turn, the worker has had the possibility to change Afore after a calendar year has transpired or when the Retirement Fund Administrator has modified its investment or commission policies, has begun the process of dissolution, has merged with another Afore, or when the worker has the possibility of enrolling with an Afore charging lower commissions. Nevertheless, in case the worker does not choose an Afore, the Retirement Savings Systems Law (SAR Law for its Spanish initials) anticipates that through the application of general rules, the worker's resources are to be assigned to the Afore with the lowest commissions and subsequently he or she could exercise his or her right to choose a different Afore. These workers have been termed "assigned workers", to distinguish them from the rest of the workers affiliated to the IMSS that have chosen an Afore.

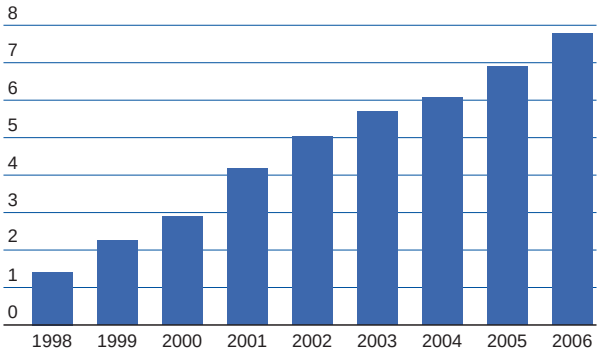
However, a new reform to the SAR Law, published in the Official Gazette on June 15, 2007, will modify the conditions under which the Afore can charge commissions, the conditions under which the worker can exercise his or her right to transfer funds between Afore, and the criteria under which Consar can, when applicable, assign accounts among Afore. Thus, in accordance with the reform decree, nine months after its publication, the commission on cash flows will be eliminated and the Afore will only be allowed to charge commissions on balances. In addition, workers will only have the right to transfer their individual account from one to another Afore after a year has transpired or beforehand only to a Afore whose investment management funds have registered higher returns net of commissions, while the Consar will only assign accounts to the Afore that have registered a greater net return.

Number of Individual Accounts Managed by the Afores
Millions at the close of each year



Source: Consar

RCV Savings in Afores
Accumulated balances at the close of each year, % of GDP



RCV Retirement, severance at old age and old age sub-account
Source: Consar

At the close of December 2006, the number of individual accounts in the Afore was 37.4 million, while the amount of resources accumulated in these accounts topped 712.21 billion pesos for RCV and close to 2.34 billion pesos for voluntary contributions, bringing the total to nearly 714.55 billion pesos. This figure, equivalent to 7.8% of GDP, places the Siefore as the country's second most important private financial intermediary, after

36 The resources in the RCV sub-account are the worker's property and are not subject to attachment or garnishment, as is also the case with the voluntary and complementary contributions sub-accounts, for an amount equivalent to twenty times the prevailing general daily minimum wage in the Federal District, translated into annual terms for each sub-account. In addition, in the event of the death of the account holder, his or her legal beneficiaries or their designated replacements are entitled to have access to the voluntary and complementary retirement contributions and, if applicable, maintain the pension for disability and life insurance.

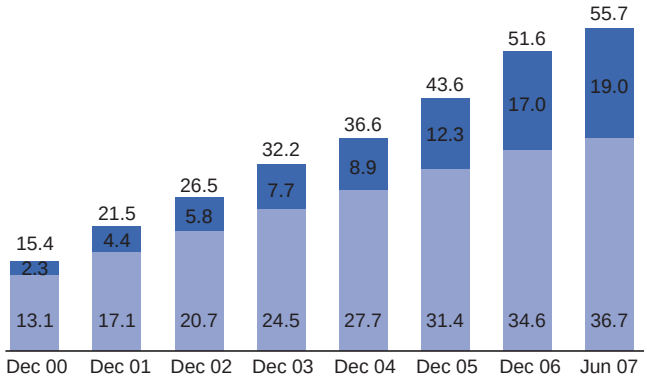
multiple banking institutions. The evolution in the number of accounts and in the accumulation of their balances can be seen in the previous charts.[37]

b) Siefore and Afore (services, commissions, and returns)

The mechanism for retirement savings in Mexico stipulates that the contributions in the individual accounts are to be invested in order to obtain interest and to increase the balance available to finance pensions. To this end, it is precisely the Siefore that are in charge of investing the funds. This includes the fees paid into the social security system and the voluntary contributions and complementary retirement payments, but also those earmarked for the pension funds of private companies and of the three levels of government (federal, state and municipal), in addition to the capital surplus and the special reserve that the Afore are required by law to have.

As shown in the following chart, Siefore returns have a significant impact on the individual account balance and therefore in the initial amount to establish workers' pensions.

Accumulated Balance in an Individual Account of an Average Worker*
Balances in thousands of June 2007 pesos



Net yields
Contributions
* Average worker: active worker who began with the system and earns three minimum wages
Source: Consar

The Afore can operate several Siefore and the workers have the right to invest their resources in any of the Siefore that are operated by the Afore that handles their individual account. Each Siefore can have an investment portfolio with a different composition, corresponding to diverse degrees of risk and different terms, origins, and use of the resources invested in them. Nevertheless, by law, all the Afore must have at least one Siefore whose portfolio is comprised of securities that preserve the purchasing power of the workers' savings.

In terms of the investments made by the Siefore, each of these investment management companies must operate with the securities, documents, cash, and other instruments

37 Afore only keep accounting records for the housing sub-account contributions. At the close of December 2006, such contributions reached almost 326.54 billion pesos, which represented 45.7% of the savings managed by the Afore.

allowed to them by the investment regime authorized by the Consar. In this sense, the SAR Law stipulates that the main objective of the Siefore investment regime is to provide greater security and profitability to the workers' resources.

In addition, the law indicates that the investment regime should tend to increase internal savings and promote the development of a market for long-term instruments in accordance with the pension system. With this in mind, the legal framework anticipates that the investments should be preponderantly channeled through their placement in securities, to promote:

- National productive activity
- Greater job creation
- Housing construction
- The development of the country's strategic infrastructure, and
- Regional development.

There are currently four types of Siefore: basic 1 (SB1) and basic 2 (SB2), Siefore specializing in voluntary contributions, and Siefore specializing in pension funds. However, in accordance with Consar circular letter 15-19 published in the Official Gazzete (Diario Oficial) on July 9, 2007, the Afore will soon have the possibility of opening three additional basic Siefore, SB3, SB4 and SB5 (surely as of 2008). Thus, the Siefore will operate under a life cycle system, receiving workers in accordance with their age and will offer products based on different risk-return ratios and different limits in terms of value at risk, as well as variable income securities and structured instruments.

As regards voluntary savings, these can be invested in the basic Siefore or in additional investment companies for voluntary savings. The latter can be any of the following types:

i. Additional short-term mutual funds, in which only workers' resources from voluntary contributions and long-term savings can be invested;
ii. Additional long-term mutual funds, in which only workers' resources from complementary retirement contributions, long-term savings, and voluntary savings with a long-term investment horizon can be invested.

The investment regime for additional investment companies for voluntary savings will be within the parameters established for the SB5, while the mutual funds whose exclusive objective is the investment of pension funds will be able to invest their resources in instruments, real estate trust funds in Mexican territory (FIBRAS for its Spanish initials), foreign securities, derivatives, and any other instruments allowed in the Law.[38]

38 The detailed definition of the different investment instruments can be found in Consar Circular Letter 15-19 available at www.consar.gob.mx.

The following box contains the main characteristics of the investment regime and diversification criteria of the basic Siefore.

Siefore Investment Regime

By type of instrument and issuer, percentage of net assets

	SB1	SB2	SB3	SB4	SB5
1. Debt instruments denominated in "investment units" (UDIS) or Mexican currency, interest of which guarantees a return equal to or greater than the variation of UDIS or of the National Consumer Price Index.	51% Min.				
2. Debt instruments issued or backed by the federal government or issued by the Banco de México (excluding the development banks).	100% Max.	100% Max.	100% Max.	100% Max.	100% Max.
3. Corporate debt instruments for short-term issues with an A+ rating, and for medium- and long-term issues with a AAA rating.	100% Max.	100% Max.	100% Max.	100% Max.	100% Max.
4. Corporate debt instruments for short-term issues with an A+ rating, and for medium- and long-term issues with a AA rating.	35% Max.	35% Max.	35% Max.	35% Max.	35% Max.
5. Corporate debt instruments for short-term issues with an A+ rating, and for medium- and long-term issues with an A rating.	5% Max.	5% Max.	5% Max.	5% Max.	5% Max.
6. Foreign-debt securities, for which the minimum acceptable credit rating must be greater than that applied to Mexican issues in a foreign currency.	20% Max.	20% Max.	20% Max.	20% Max.	20% Max.
7. Exposure to variable income		15% Max.	20% Max.	25% Max.	30% Max.
8. Stock market instruments	10	15	20	30	40
9. Demand deposits in banks, plus the amount necessary for payment of obligations	$ 250,000 ps. max.	$ 250,000 ps. Max.	$ 250,000 ps. Max.	$ 250,000 ps. Max.	$ 250,000 ps. Max.
10. Foreign-debt instruments and securities denominated in foreign currencies	30% Max.	30% Max.	30% Max.	30% Max.	30% Max.
11. Foreign-debt instruments and securities, issued, backed or accepted by corporations related among themselves	15% Max.	15% Max.	15% Max.	15% Max.	15% Max.
12. Foreign-debt instruments and securities of the same issue	20% Max.	20% Max.	20% Max.	20% Max.	20% Max.

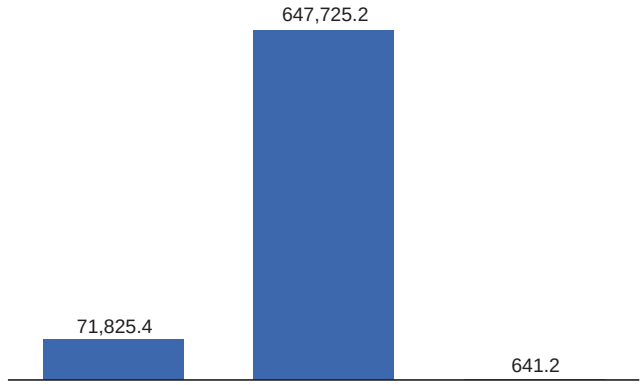
Global scale rating	Limit per issuer in % of net assets	Eligible issuer type
A- or better	5	Any foreigner

Source: BBVA Bancomer with information from Consar Circular 15-19

Of the total amount of funds saved and invested in the Siefore at the close of 2006, 89.9% were concentrated in basic Siefore 2, 10% in basic Siefore 1, and the remaining 0.1% in the other Siefore. See the following chart.

Distribution of Savings Funds among Siefores

Millions of pesos at the close of December 2006



Source: Consar

In addition to the Siefore, the Afore also manage the retirement savings that the workers accumulate in their individual accounts. With this in mind, they have among their main obligations: a) to open, manage, and operate individual accounts at the request of the workers; b) to receive the fees and contributions; c) to register the housing account contributions; d) to send at least two account statements each year to the worker's home address; e) to pay additional benefits (such as partial withdrawals for marriage and unemployment, discounting them from the balance in the individual account), handling withdrawals for purposes of voluntary savings, and providing other services such as additional account statements, replacing documents, and account balance enquiries.

In addition, as was previously mentioned, the Afore are required to create and maintain a special monetary reserve that would allow workers' resources and investments to be safeguarded, since in the event of default, the Afore must cover the losses with the special reserve, and if this proves to be insufficient, with their own capital stock. These legal previsions allow the institutional mechanism for retirement savings in Mexico to safeguard workers' resources and investments.

Regulation and Competition in the Afore Industry

The services, prices and market structure of the Afore industry are closely linked to the evolution of the legal framework. The very origin of the industry has its antecedents in a reform to the Social Security Law (LSS) that anticipated the creation of the Afore and Siefore to assist the IMSS public pension program through the management of the accounts and resources in the retirement, old age, severance at old age insurance plan (RCV), beginning on July 1, 1997.

Thus, under a novel pension plan design with public and private sector participation, the IMSS should collect the fees and contributions and certify the rights derived from the RCV insurance account, while the Afore should manage a savings mechanism that in the long-term will provide sufficient resources to the affiliates for financing their pension. However, the resources that the Afore can provide to their affiliates depends, in turn, on different variables, such as the contribution rates in the individual accounts, the regularity of the contributions to the accounts, wage increases, the number of years an affiliate has been paying into the system, the voluntary contributions from the affiliates, but also on the real return rate that the Siefore provides to RCV resources net of the commissions that the Afore charge for their services.

Based on the previous design, the Afore industry can offer competitive conditions in at least three fields: services, commissions, and returns.

a) Services

Since their creation, the Afore have operated under a market structure that favors competition in services. On the demand side, the affiliates have the right to chose the Afore with management services for their individual account and are also free to change their Retirement Fund Administrator once a calendar year has transpired, counted from the time the worker registered or the last occasion in which he or she exercised his transfer rights. On the supply side, the legal framework also favors competition in services because no Afore can have more than 20% of the total number of individual accounts and this prevents a concentration in the market.

In turn, the Afore industry is required to provide information to the affiliates so that the services being offered by the different Afore can compete on their own merits. In fact, by law each Afore must have a specialized customer service unit, with personnel in the states in which it has offices, to exclusively attend to affiliates' enquiries, requests, and paperwork procedures. For example, the client services that are offered in such offices include, among others, correcting personal data, receiving deposits of voluntary contributions, processing requests for total and partial withdrawals due to marriage and unemployment, registering and transferring accounts, and facilitating enquiries regarding account statements.

In turn, the technological advances by expanding the contact possibilities between the Afore and their affiliates have also increased the possibilities of competition in their services through different electronic and communications media. For example, through the Internet and telephone service centers, it is possible to consult account statements and review deposits and withdrawals of the voluntary contributions and update and/or correct address information. In addition, through e-mail it is possible to receive account statements and through the use of ATMs affiliates can consult their balances.

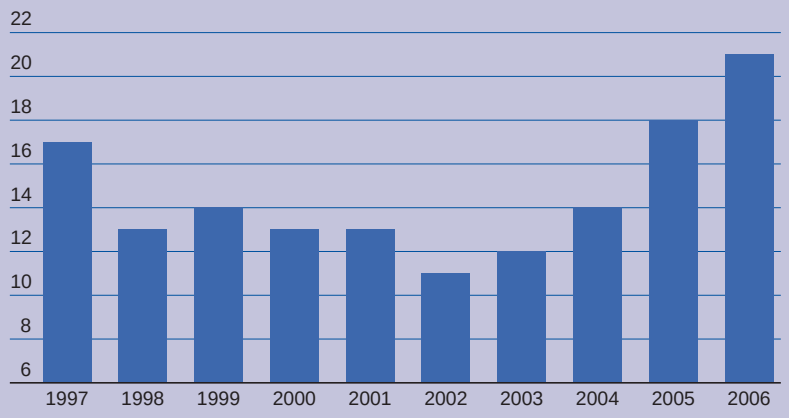
b) Commissions

Since the individual account system went into effect, the legal framework has placed special emphasis on competition via commissions. With this in mind, for example, the modification in commission policies—with the prior authorization of Consar—has been one of the main reasons why an affiliate can change Afore. Furthermore, since its creation in 1997, the Afore industry has experienced different stages of deregulation precisely in order to boost competition via commissions. For example, in 2002, the paperwork procedures involved in transferring an individual account was moved from the assignor to the recipient Afore to facilitate mobility toward the Retirement Fund Administrator charging lower commissions. In 2003, the process of assigning individual accounts for the affiliates who did not choose an Afore—assigned affiliates—was modified to move from a process of prorating the accounts between one and another Afore to one in which the accounts can only be assigned to those Afore that charge lower commissions. Moreover, as of 2005, the change in Afore for assigned affiliates was only possible toward the most inexpensive Afore.

It should also be pointed out that given that the legal framework has contemplated that the Afore can apply commissions on the basis of cash flow and/or balance and at the same time can apply discounts, the direct comparison between the charges applied by the various Afore can end up being difficult for the affiliates. Nevertheless, the comparison has been facilitated in part by the Equivalent Commission indicator, which the Consar has been issuing since 1998.*

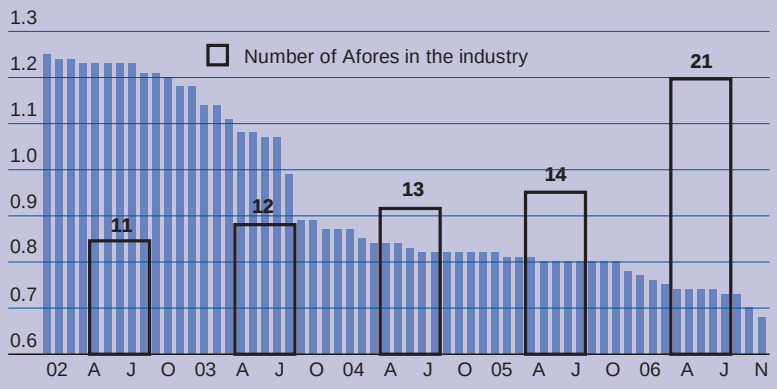
In addition, the Consar has adopted different measures over time to reduce the entry barriers to the industry and to strengthen its price signals. For example, the capital necessary to establish a Voluntary Siefore was reduced and the quantity and quality of the information provided to the affiliate was increased. Given these considerations, the Afore industry has not only experienced conditions allowing for intense competition via commissions, but even episodes of trade wars. The results for the industry have been a series of mergers and acquisitions among Afore, the entry of new participants, and also a declining trend in their commissions. See the following charts.

Afore Industry
Number of participants at December of each year



Source: Consar

Equivalent Commissions on Balance
25 years, %



Note: To obtain the equivalent commissions, we assumed a real return rate of 5% annually, contribution periods of 1, 2, 3, 4, 5, 10, 15, 20, and 25 years, an initial balance of $22,000 pesos, a bimonthly contribution of $723.57 pesos, a social quota of $2.76077 per day of contribution, 5-year seniority and 0% wage increase.

Source: Consar

However, a recent reform to the SAR Law now heralds an important structural change in the conditions of competition in the Afore industry, since as of March 15, 2008, the commissions for cash flow will be eliminated and the Afore will only be allowed to charge commissions on the account balance.** This legislative change will create strong incentives for the Afore to shift their current interest in managing the largest possible number of active accounts toward the administration and increase of the balances in these accounts so as to be able to obtain higher revenues. In this sense, the measure contributes to significantly increasing the possibilities for the affiliates to obtain better pensions, since both their interests as well as those of the Afore will be better aligned.

c) Returns

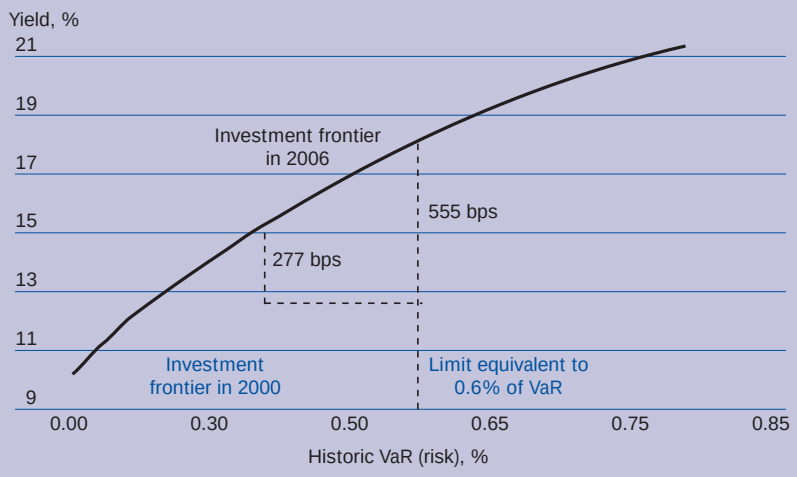
For the Afore, competition through returns is mainly defined by the investment regime to which the Siefore are subject, since it establishes the levels of risk

and categories of assets and/or instruments in which the Siefore can invest RCV funds in order to provide the greatest possible security and profitability for the workers' resources.

In the 10 years of operation of the Afore and Siefore system, the investment regime has experienced gradual modifications. Between 1997 and 2000, to limit some risks and facilitate the supervision of the system, the assets in which the Siefore could invest RCV resources were specifically defined. Thus, based on a focus of controlling credit risks through the use of investment categories, the bulk of the RCV resources were invested in federal government debt instruments. However, this also restricted the possibilities of risk diversification and limited the possibilities of differentiation and competition via returns among the Siefore, since the investment regime promoted the formation of portfolios with similar assets.

Starting from 2000, the investment regime has become more flexible to allow for better risk diversification and a greater differentiation in the investment portfolios. For example, between 2002 and 2003, the investment restrictions by type of issuer were eliminated and credit quality limits were introduced. New issuers were allowed (state-owned enterprises, municipal and state governments) and the use of derivative financial products and the value at risk (VAR) indicator were introduced to control risks. However, it was not until 2004 when, for the first time, investment was allowed in variable income instruments (limited to up to 15% of the portfolio and based only on stock market indexes) and in international securities different from foreign currencies (limited to up to 20% of the portfolio), which also, for the first time, opened up the possibility that the affiliates could have access to two Siefore, the SB1 for those older than 56 years of age with local and international fixed income instruments, and the SB2 for those under 56 years of age, with the added component of variable income securities in their portfolio.

Investment Regime and Risk/Yield Frontiers in Siefore



Source: Consar

Although it is relatively recent that the real possibilities of differentiation and diversification have been expanded for Siefore investment portfolios, it can be said that the Afore industry, based on its regulations, is posting results that provide increasingly better return-risk strategies for their affiliates. See the preceding chart.

Of course it is to be expected that to the extent that the Siefore investment regime continues to become more flexible, there will also be greater possibilities for competition in the Afore industry in the form of different return-risk strategies. It can be said that it is precisely in this sense that the new modifications to the Siefore investment regime published in the Consar circular letter 15-19 dated July 9, 2007 are contemplated.

The main innovations in Consar circular letter 15-19 are the following:

- The number of basic Siefore was expanded from two to five. This expansion is only for worker under 56 years old, and therefore basic Siefore 1 remains unchanged and only basic Siefore 2 could experience adjustments.
- The expansion in the number of Siefore will not be obligatory, but rather each Afore, depending on its investment strategy, will decide on the additional investment management funds it wishes to open. However, the opening should be sequential or simultaneous.
- The affiliates can only choose to transfer to a Siefore with lower risk in relation to what they were assigned at the beginning.
- The new funds will have a greater exposure to variable income assets. This will only be through protected capital notes and/or other instruments that are based on the permitted stock market indexes or sub-indexes. This provision thus maintains the prohibition against directly investing in individual stocks.
- The risk exposure in variable income securities will be controlled by the level of value at risk (VAR) of the Siefore' net assets in accordance with what is indicated in the following chart.

Modifications to the Siefore Investment Regime

Siefore	Var. income[1]	Secur.inst.[2]	Risk[3]	Age group[4]	Accounts[5]
Existing					
Basic 1	0	10	0.60	over 55	1.1
Basic 2	15	15	1.00	46 to 55	3.1
New					
Basic 3	20	20	1.30	37 to 45	5.7
Basic 4	25	30	1.60	27 to 36	9.2
Basic 5	30	40	2.00	under 27	18.7
Voluntary savings	**30**	**40**	**2.00**	**All groups**	**37.7**

1 Maximum % in variable income assets
2 Stock market instruments. Instruments or securities that represent credit rights. % of net assets
3 Risk parameter (VAR as % of assets)
4 Target age group (years)
5 Potential accounts (millions), assuming that the assigned accounts have the same distribution by age as the non-assigned. Figures through March 2007.
Source: BBVA Bancomer with information from Consar Circular 15-19

Based on these factors, the new investment regime represents an important additional step on the road toward a greater risk diversification and differentiation in the Siefore portfolios. This will undoubtedly offer better investment options to the affiliates with different preferences and characteristics.

To summarize, competition in the Afore industry is closely tied to the legal framework that regulates the sector. The recent modifications to the SAR Law and the Siefore investment regime will promote greater competition in the industry based on a combination of higher returns and/or lower commissions. This should translate into greater possibilities for the affiliates to increase the balances in their individual accounts and, consequently, in their pensions. Given the new rules governing competition among Afore, it cannot be ruled out that in the immediate future a new process of mergers and acquisitions in the industry will be underway, so that the participants can achieve optimum operation.

* For further details on the commissions by Afore and the calculation of the equivalent commission on cash flows or balance, see www.consar.gob.mx
* * Reforms published in the Official Gazette of the Federation (*Diario Oficial de la Federación*) June 15, 2007
Source: BBVA Bancomer with Consar information

c) Pensions: scheduled withdrawals and life annuities

In accordance with the Social Security Law, when a worker fulfills the age requirements and fee payment obligations he or she can chose between two pension modalities, a scheduled withdrawal of the funds or contracting a life annuity. The following is a brief explanation of the two pension modalities.

With the scheduled withdrawal modality, the affiliate's balance in the individual account is still managed by the Afore and therefore continues to obtain the returns of the corresponding Siefore. In this case, the Afore pays the pension through monthly withdrawals from the individual account until its balance is depleted. However, the amount of the monthly payment is adjusted annually considering the life expectancy of the pensioner at the time of the recalculation and the new balance in the individual account, which includes the return earned in the last period and discounting the payments made.[39]

In a scheduled withdrawal plan, the affiliate continues to maintain ownership of the balance in his or her individual account, and therefore in the event of death it would become part of his or her inheritance. The amount of the scheduled withdrawal plan cannot be lower than the guaranteed pension. If in the periodic recalculation, the resulting amount were to be below the guaranteed pension, the Afore would pay the affiliate a monthly amount equivalent to the guaranteed pension until the balance is depleted, in which case

39 The Afore calculates the amount of the scheduled yearly withdrawal as the amount that results from dividing the balance in the individual account by the capital necessary to finance one life annuity unit for the affiliate and his or her beneficiaries. It should, at least, be equal to the value corresponding to the guaranteed pension. Thus, the monthly pension corresponds to a twelfth of the annual amount of the scheduled withdrawal for each year, while the life annuity unit is equal to the present value of the total amount of the benefits that are estimated for an affiliate based on mortality rates and the technical interest rate that the authorities have established for such purposes.

the federal government would be under obligation to pay the affiliate the guaranteed pension if the affiliated fulfilled the corresponding requirements to obtain it.

In the life annuity modality, the affiliate signs an irrevocable contract with an insurance company to acquire his or her pension. Under this contract, the worker transfers ownership of his or her funds in the individual account to the insurance company and the latter commits to pay him or her a monthly pension for life, indexed to inflation. Nevertheless, a life annuity can only be contracted by the affiliates who have enough funds to obtain a pension that is equal to or higher than the guaranteed pension in effect at the time that he or she chooses this modality.

Under both pension modalities, scheduled withdrawal and life annuity, the worker's legal beneficiaries are protected by a survival (or life) insurance plan. This insurance is contracted by the Afore in the name of the worker at the moment that he or she is granted the right to the pension and it is charged to the resources accumulated in the individual account.[40]

d) Requirements to obtain a pension

To be entitled to a pension for old age or severance at old age, the affiliate must prove his or her age and the number of weeks that fees have been paid into the IMSS. Workers affiliated as of July 1, 1997 should fulfill the requirements of LSS-97 while those in the process of transition between pension plan systems can choose the pension regime that best suits their interests in accordance with LSS-97 or LSS-73.[41] See the following chart.

Requisites to Obtain an IMSS Pension

Type pension	1973 Law (LSS73)	1997 Law (LSS97)
Severance at old age	• 500 weeks of contributions • To be deprived of paid work	• 1,250 weeks of contributions* • Between 60 and 64 years old • To be deprived of paid work
Old age	• 500 weeks of contributions	• 1,250 weeks of contributions • 65 years old

* In case the affiliate does not meet the required weeks of contributions, he or she may withdraw the balance from his individual account in one installment or continue paying until covering the weeks stipulated.
Source: Social Security Law, LSS73 and 1997

Under LSS-73, the annual pensions for old age and severance at old age are determined by combining a base monetary amount and annual increases calculated in accordance with the number of weeks paid into the system certified for the affiliate after the first 500 weeks.

40 See articles 128 to 137 of the LSS for further details on the requirements, amount, and duration of the benefits for the legal beneficiaries once the worker has died (pensions for widows, orphans, and descendents).

41 The worker, in deciding what is in his or her best interest, has the right to request the calculation of the amount of the pension under each of the laws from the IMSS. This is a step that is only undertaken at the worker's explicit request.

To determine the annual base amount of the pension and its increases, the daily salary is considered as the average corresponding to the last 250 weeks of fee payments. If the affiliate does not have these weeks recognized, then those that he or she has accredited will be taken into consideration, provided that they are sufficient to grant a pension for disability or death.

The daily salary that results from this equation is expressed in number of times the general minimum wage for the Federal District (SMGVDF) in effect on the date at which the affiliate is pensioned, in order to determine the category in which he or she is placed in accordance with the following chart. The percentages to calculate the base amount of the pension, as well as the annual increases, will be applied to the previously mentioned average daily salary.

Table for Calculation of Pension under LSS-73

Salary group in SMGVDF times	Basic value % of wages	Annual increase %
Up to 1	80.00	0.563
1.01 to 1.25	77.11	0.814
1.26 to 1.50	58.18	1.178
1.51 to 1.75	49.23	1.430
1.76 to 2.00	42.67	1.615
2.01 to 2.25	37.65	1.756
2.26 to 2.50	33.68	1.868
2.51 to 2.75	30.48	1.958
2.76 to 3.00	27.83	2.033
3.01 to 3.25	25.60	2.096
3.26 to 3.50	23.70	2.149
3.51 to 3.75	22.07	2.195
3.76 to 4.00	20.65	2.235
4.01 to 4.25	19.39	2.271
4.26 to 4.50	18.29	2.302
4.51 to 4.75	17.30	2.330
4.76 to 5.00	16.41	2.355
5.01 to 5.25	15.61	2.377
5.26 to 5.50	14.88	2.398
5.51 to 5.75	14.22	2.416
5.76 to 6.00	13.62	2.433
6.01 and more	13.00	2.450

SMGVDF Current General Minimum Wage in the Federal District (Mexico City)
Source: Social Security Law, LSS 1973

The right to the annual increase is acquired for every additional 52 weeks of fee payments. The increases to the base amount of the pension, in dealing with fractions of a year, are calculated as follows: the affiliate is entitled to 50% of the annual increase with 13 to 26 weeks accredited payments, and with more than 26 weeks paid in and recognized, he or she has the right to 100% of the annual increase.

It should be noted that when workers decide to receive their pension under LSS-73 they are also able to withdraw the balance accumulated in the SAR (retirement savings

system) account during the period from 1992 to June 1997 from their individual account and the balance in the voluntary contributions sub-account.

Meanwhile, contrary to the LSS-73, in the LSS-97 the affiliate can, in some cases, obtain a pension even when he or she has only partially fulfilled the legal requirements:

- When the affiliate meets the age requirement but not the prerequisite for the number of weeks paying into the system, he or she can remove the balance from his or her individual account in a single withdrawal or continue paying until covering the necessary weeks.
- When the affiliate fulfills the required number of weeks paying into the system and has the sufficient funds to acquire a life annuity higher than 30% of the guaranteed pension and, in addition, can cover the survival insurance premium for his or her beneficiaries, he or she can retire even though he or she does not meet the age requirement.
- When the affiliate complies with the legal requirements of age and number of weeks paid into the system, but his or her resources are insufficient to take out a life annuity or a scheduled withdrawal, he or she is entitled to receive the complementary contribution from the federal government sufficient to do so. In this case, the pension will always be granted under the system of scheduled withdrawals.[42]

e) Other individual account withdrawals

With the Retirement Savings System in Mexico, IMSS affiliates are also entitled to make partial withdrawals from the balance in their individual account in two specific cases: marriage and unemployment.

- **Marriage**: Affiliates who at the moment they marry have complied with a minimum of 150 weeks of contribution payments to the IMSS are entitled to a partial withdrawal of funds from the individual account for an amount equivalent to 30 days of the current general minimum wage in the Federal District. This right can only be exercised once and cannot be requested for subsequent marriages. In addition, if the marriage is between a pair of workers who both pay fees to the IMSS and they both fulfill the requirements, they can each independently request the benefit. Nevertheless, exercising this benefit reduces the balance in the individual account and the total number of weeks with fees paid into the IMSS, which have to be subsequently covered in order to have a pension for incapacity, disability or death.

- **Unemployment**: Affiliates who have been paying fees into the IMSS for a minimum of 250 weeks and who have not made withdrawals due to unemployment in the past five years are entitled to withdraw funds from the individual account for the amount that is the lower of 10% of the balance in the retirement savings account or 75 days of the base salary for determining social security contributions (SBC) to the IMSS in the past 250 weeks. As in the previous case, exercising this benefit reduces the balance in the individual account and the total number of weeks of fees paid into the IMSS, which have to be subsequently covered in order to have a pension for incapacity, disability or death.

42 In this case, the Afore will continue to manage the retirement funds for the pensioner and will make withdrawals from the accumulated balance for the payment of the guaranteed pension. Once the balance is depleted in the individual account, the federal government will take charge of the pension.

V. Interrelation between the Economy and the Pension Systems

Pension systems have a significant impact on productive activities. In previous sections we have commented that when pension systems are not backed by long-term viable financing, the public dissavings that are generated have a negative impact on domestic savings. In this section, we will explain in greater detail the effects that pension systems have on the economy given their influence on the factor markets and economic growth. Nevertheless, to better understand the functioning and possible performance of the pension systems it is necessary to also consider the influence of the economic sphere on the operation of such programs. With this in mind, in section two we will discuss the limitations that the economy can impose on the pension systems.

1. Effects of the pension systems on the economy

Even though a pension system can provide considerable benefits to society by protecting it against different risks, this does not imply that the system operates without costs. In addition to operating and administrative costs, the multiplicity of objectives that characteristically are imposed on the pension systems has an impact on different aspects of the economy, such as public finances, the operation of the factor markets—capital and labor—and economic growth.

For example, when a pension system seeks to support the income levels of its affiliates when it becomes time for them to retire from the job, what it does, in essence, is to establish future rights for the present generation of workers. These are rights on the income derived from the future production of new generations of workers. Based on this consideration, so as to be in a position to offer a similar promise to the new generations, the pension system should also contribute to future production and economic growth. To do so, Barr (2000) said that it is necessary to minimize the negative impact that the pension system can have on economic stability and the labor markets, and at the same time, to strengthen its positive impact on the development of the financial markets and national savings.

In the next section we will review the economic effects that the pension systems for old age and/or retirement have on the factor markets, savings, and economic growth.[43]

a) Labor market

A pension system can influence economic growth and activity due to its impact on supply and demand in the labor market.[44] On the supply side, the system can reduce the availability of labor for production when it encourages retirement at an early age or when the obligatory contributions—necessary to finance the pensions—reduce the worker's income and discourage his or her job performance. However, this initial negative effect

43 A review of the macroeconomic effects that the pension systems have had in Latin America can be found in Taguas and Vidal-Aragon de Olives (2005).

44 See Mitchell (1993), Barr (2000) and Feldstein and Liebman (2001).

on job performance is also compensated by other benefits from social security to which the worker is entitled when he or she pays fees into a pension system, such as health and maternity insurance.

On the demand side, when employers absorb part of the contributions to the system, such payments serve as a tax on hiring labor. Thus, the higher the tax, the less incentive employers have to use labor force in their productive processes and the greater are their incentives to elude or avoid the tax. This latter consideration can translate, for example, into a displacement of jobs toward the sectors that are less regulated or informal.[45]

In the previously mentioned context, the choice between the pillars of protection that have been proposed by the World Bank (2005) for the pension systems can reduce or expand the distortions. Theoretically, a defined-contribution scheme can introduce better work incentives than one based on defined-benefits and, at the same time, can generate desirable results for the economy, more balanced jobs and greater formality in the labor market.

This is based on the work incentives that each pillar or model generates by linking the contributions to the system with its benefits. In a defined-benefit scheme, the link is weak because the size of the pension for the affiliate is fixed and independent of the amount of his or her contributions. Thus, under such a policy, the contributions work similarly to a tax that, by reducing job income, fosters tax evasion or encourages workers to diminish their performance on the job. On the contrary, under a defined-contribution system, the amount of the pension for the affiliate depends directly on his or her contributions. In this case, the contributions, by increasing the worker's account balance, also boosts the possibilities of a higher pension. Thus, a defined-contribution system can, in principle, favor improved job performance and also encourage the worker to want to remain under a formal labor relation.

Thus far, available evidence only offers some initial indications that the defined-contribution plans indeed increase formal labor relations. For example, Corbo and Schmidt-Hebbel (2003) estimated that the reform to the Chilean pension system at the beginning of the 1980s had a positive and significant impact on that country's formal employment and economic growth. Using a model of two sectors—formal and informal—the researchers estimated that the reform to the pension system allowed total employment in that country to increase between 1.3% and 3.7% in 2001. This was due thanks to the increase in formal employment (between 3.2% and 7.6%) and the reduction of informal employment (between 1.1% and 1.3%). In addition, by increasing the degree of employment formalization in the economy—and its associated level of productivity—it also boosted GDP between 0.1% and 0.3%, while unemployment decreased in a range between 0.7% and 2.0%. The previous figures are similar to those estimated by Edwards and Cox (2002).

45 Gruber (1997), in a study of the Chilean case, found that in a system of defined-benefits, contributions can stop having a significant impact on employment levels when they are entirely absorbed by the workers via lower wages.

b) Financial markets

A pension is ultimately a financial mechanism for social protection that allows a person to be guaranteed a monetary benefit in the face of possible future risks. Thus, the operation of the pension systems is closely tied to the operation of the financial markets over time.

There is a two-way relationship between the financial markets and the pension systems. On the one hand, the financial markets should have experienced a certain level of development so that pension funds can balance their different income and expenditure flows over time. And on the other hand, pension funds as institutional investors contribute to stimulating competition and the development of the financial markets with their demand for products and services.

On a global level, the financial markets that are most important within worldwide economic activity are those of the developed countries. However, in emerging economies, the financial markets already present important differences in their development on a geographical level. For example, the largest markets are concentrated in Asia, while the smallest are located in Eastern Europe and the Middle East. In Latin America, the financial markets are relatively larger than the average for the emerging economies, but their development potential is still very high when compared to the emerging economies of Asia or the economies of developed countries such as the United States and the United Kingdom. See the following chart.

Size of the Financial Markets in 2005
Billions of dollars

	GDP (A)	Stock Market	Debt Instruments	Bank Assets	Sum (B)	Relative size, % (B) / (A)
World	44,446	37,168	58,949	55,673	151,791	342
European Union	12,808	9,556	18,690	27,290	55,536	434
United States	12,456	17,001	23,841	9,343	50,185	403
Japan	4,567	7,543	8,646	4,389	20,578	451
Germany	2,792	1,221	4,095	3,490	8,806	315
U. Kingdom	2,230	3,058	2,556	6,547	12,161	545
Canada	1,132	1,482	1,106	1,626	4,215	372
Emerging Eco.	11,969	6,574	4,479	9,433	20,486	171
Asia	5,394	4,409	2,380	6,522	13,311	247
Latin America	2,436	1,161	1,290	1,166	3,618	148
Europe	2,211	296	625	679	1,600	72
Middle East	1,120	159	62	734	955	85
Africa	807	549	123	331	1,002	124

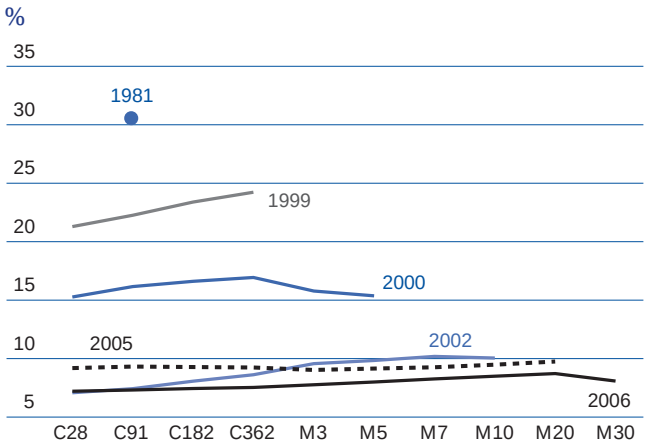
Source: BBVA Bancomer with data from IMF, Global Stability Report, September 2006

According to Jeanneau and Tovar (2006) the development of the financial markets in Latin America has faced different obstacles: a) macroeconomic instability, b) the absence of a broad and diversified base of investors, c) legal restrictions on the activity of the primary and secondary markets, and d) lack of an appropriate infrastructure for the issue of debt instruments by the private sector. The previous limitations largely explain the reason why the operation of the financial markets in the region has historically leaned toward the use of government instruments, especially those indexed to the U.S. dollar and/or with short-term maturities. An additional factor is the relatively small size of the private-debt and securities markets in the region. For example, in 2006 the capitalization value of the stock markets in Mexico, Brazil and Chile was 41%, 106% and 120% of the respective countries' GDP, figures that indicate that in relation to other emerging economies and industrialized countries, in Latin America the financial markets still have high development potential.

However, the economic sphere in which the financial markets in Latin America operate has registered significant improvements in recent years. In many countries of the region, economic policies directed toward fiscal discipline and price stability have created appropriate conditions for greater control of inflation and a decline in interest rates. These developments have enabled public and private issuers of debt instruments to once again place their offerings at fixed interest rates. In Mexico, for example, the issue of government bonds at a fixed interest rate rose from less than 5% to slightly more than 40% of the total between 2000 and 2006.

In turn, government efforts in the region to reduce the vulnerability of the economies in response to external shocks have resulted in a growing use of the local financial markets to meet the financing needs of the public sector. In Mexico, for example, economic policy on public debt has been directed toward reducing the weight of the foreign debt and increasing the terms of the internal debt. As can be seen in the graph below, this strategy has allowed, on the supply side, extending the interest rate curve in the local market.

Evolution of the Interest Rate Structure in Mexico

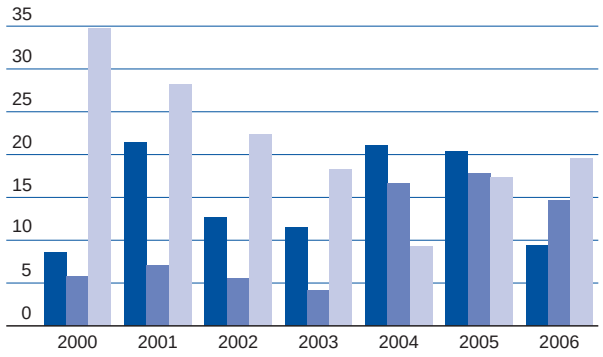


Source: BBVA Bancomer

Such results have an extremely positive impact on the operation of the pension systems. For example, the extension of the terms of the return curve in Mexico has allowed the Siefore to have investment instruments with broader horizons, but also with better indicators and tools to manage their assets and long-term liabilities.

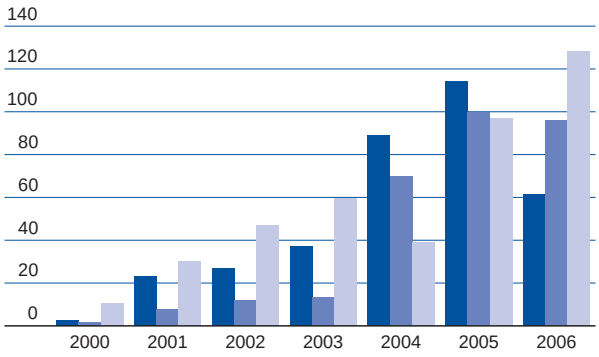
Meanwhile, the growing participation of pension funds as institutional investors in Latin America has contributed to the development of the financial markets in the region. In Mexico, for example, the operation of the Siefore has given depth to the government debt markets and provided them with greater liquidity. As can be seen in the following charts, the Siefore hold a significant share of government securities and the growing evolution of their balances in these instruments increases liquidity in the market and facilitates the participation of other investors.

Market Share of Government Bonds
%



Source: BBVA Bancomer

Investment Balances in Government Bonds
Billions of pesos

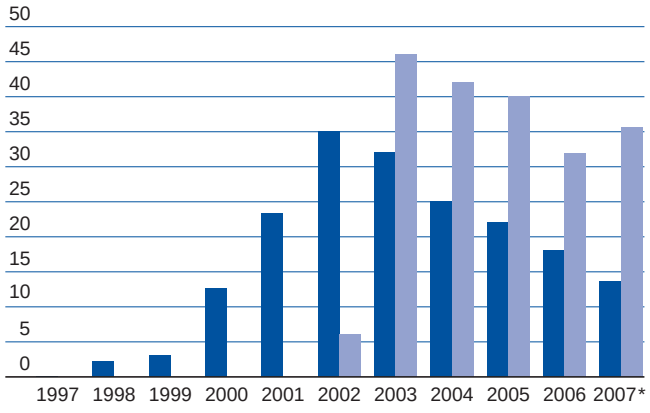


Source: BBVA Bancomer

By the same token, the private debt market in Mexico has also been supported in its development by the operation of the Siefore. On the demand side, the contribution of the Siefore to the effort to extend the curve of government interest rates has also served to create, with these interest rates, a benchmark for the placement of corporate bonds while the Siefore, as institutional investors, have registered a growing demand for corporate debt instruments. See the following chart.

Siefore Share in Domestic Corporate Bond Issues

% of total issued



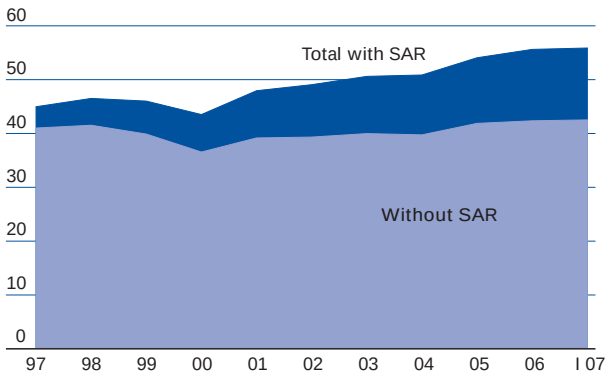
* Data through June

Source: BBVA Bancomer with Consar data

Undoubtedly, processes such as those described above contribute to further developing Latin America's financial markets. Yermo (2003) has found a positive correlation between institutional investment—including pension funds—and the development of the financial markets in emerging economies, particularly those in Latin America. In the case of Mexico, the SAR resources managed by the Afore can now be identified as the main source of growth of the country's financial and long-term savings, resources that represent an increasingly greater percentage of the economy. See the following graphs.

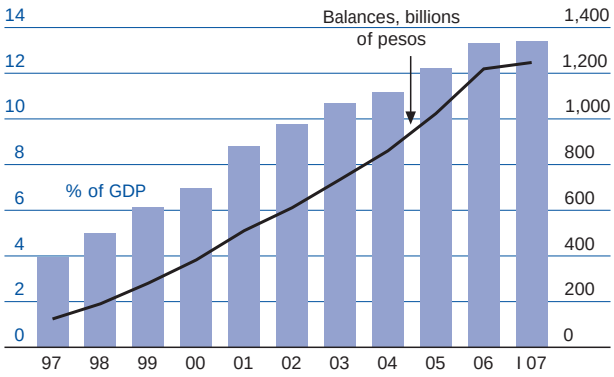
Financial Savings With & Without SAR

% of GDP



Source: BBVA Bancomer with Banco de México data

SAR Resources



Source: BBVA Bancomer with Banco de México data

In the future, the new advances in the development of the pension systems and the financial markets will, in turn, be conditioned by the legal framework that regulates them. That is, the range of products with different return-risk profiles that the Siefore will be able to offer the Afore affiliates will depend, in turn, on the investment regime to which the Siefore are subject and on the availability of the investment instruments in the local financial system.

In relation to this point, it should be noted that Mexico has already taken firm steps toward the configuration of a flexible investment regime. For example, the basic fund with which the pension system managed by the Afore was initiated in 1997 was replaced in 2004 by the current basic SB1 and SB2 funds that operate with fixed-income instruments in the case of the former, and with a combination of fixed- and variable-income securities in the latter. Furthermore, as was commented in the previous section, the opening of three new investment funds -SB3, SB4, and SB5 is already projected. These will have a greater exposure to variable-income instruments (minimum 15% and maximum 30%).

In terms of making the Siefore investment regime more flexible, the previous advances are undoubtedly pointed in the right direction to increase return possibilities and improve risk management. Nevertheless, the experience in Latin America gives us an idea that in the future even more value could be placed on the advisability of incorporating new instruments and giving greater weight to overseas investments. As illustrated in the following chart, the composition of the Siefore' portfolio at the close of 2006 showed a high concentration in government instruments, considerably above the average in Latin America, and the role played by securities linked to the stock market is still relatively low.

Breakdown and Yield of Retirement Managed Funds
December 2006

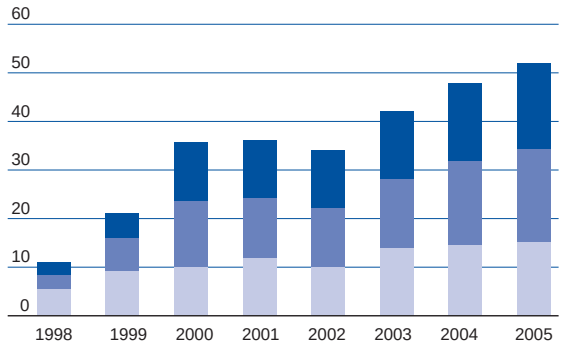
	Total[1]	Porcentage of total fund							Yield[2]	
		Govnt. debt	Finan. institutions	Non-fin. institutions	Shares	Mutual & investment funds	Foreign issuers	Other	Nominal	Real
El Salvador	3,352	78.7	15.5	5.8					12.3	8.8
Bolivia	2,299	74.8	11.1	9.3	0.1	0.2	2.7	1.9	13.1	8.8
Mexico	**66,613**	**73.1**	**5.0**	**10.5**	**1.8**		**9.6**		**15.9**	**7.8**
Costa Rica	1,020	65.2	13.9	3.5	0.3	5.4	8.1	3.6	18.6	6.9
Argentina	29,371	60.6	2.5	1.6	12.7	11.6	9.7	1.3	15.7	9.8
Uruguay	2,586	59.8	36.9	1.7	0.1			1.4	22.4	11.8
Colombia	16,739	47.2	8.8	12.1	14.5	5.8	8.2	3.2	18.3	6.7
Peru	14,260	19.1	9.5	10.9	42.2	2.4	8.5	7.3	15.5	9.9
Chile	88,632	13.1	26.3	7.9	17.0	3.6	32.0	0.1	22.7	10.2
Dominican R.*	639		98.1	1.9					18.2	0.1
Average	**22,531**	**49.1**	**22.8**	**6.5**	**8.9**	**2.9**	**7.9**	**1.9**	**17.3**	**8.1**

* Corresponds to pension funds in the individual capitalization system
1 Millions of dollars
2 Historic gross yield (%)
Source: AIOS 2006

This would allow increasing return possibilities, opportunities for portfolio diversification on an international level, and reducing a possible systemic risk inherent in the trend favoring investment in local instruments, as well as correcting the deficiencies that are derived from the relatively small size of the Mexican stock market. In fact, these lines of action are already being implemented in the more developed countries. In the past 15 years, the increase in assets managed by institutional investors and pension funds in the United States, Japan, Western Europe, and the United Kingdom has been accompanied by a tendency to reduce the bias in favor of domestic investments, and

expand exposure to fixed- and variable-income instruments in foreign markets. See the following graph and chart.

Assets Managed by Institutional Investors in Developed Markets
Trillions of dollars



Source: IMF, Global Stability Report, April 2007

Breakdown of Pension Fund Assets
Selected countries, % of total assets

	Variable income		Fixed income		Other
	Local	Internl.	Local	Internl.	
United States					
1994	41	7	42	1	9
1999	55	10	27	1	7
2005	48	15	32	1	4
Japan					
1994	24	6	55	6	9
1999	40	19	32	7	2
2005	30	18	24	13	15
United Kingdom					
1994	54	23	9	4	10
1999	51	24	13	4	8
2005	34	32	22	3	9
Netherlands					
1994	10	13	62	4	11
1999	12	38	22	19	9
2005	6	43	5	33	13
Australia					
1994	35	12	30	3	20
1999	39	16	22	3	20
2005	32	27	14	5	22
Canada*					
1994	32	13	48		7
1999	34	17	45		14
2004	30	26	36		8
Spain*					
1994	4	1	57	3	35
1999	11	14	40	13	22
2004	6	16	18	28	32

* OECD (2006)
Source: UBS Global Asset Management (2005) and OECD (2006)

c) Savings and economic growth

Pension systems are important savings mechanisms for individuals, and on an aggregate level, for the economy. For this reason, we will analyze the impact of the pension systems on savings and economic growth.

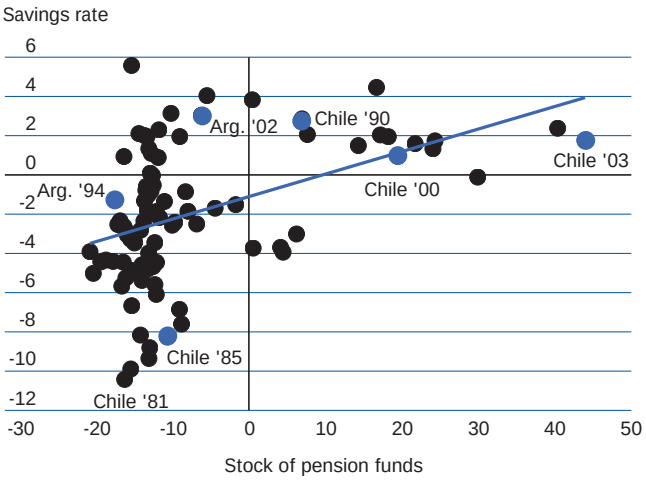
In terms of the contribution made by pension systems to domestic savings, some studies argue that their impact depends on the obligatory or voluntary nature of the contributions paid into the pension system. Specifically, it has been pointed out that the increase in assets held by pension funds is accompanied by a rise in financial and internal savings only if the contributions are obligatory.[46] However, the specific operating model that is

46 Lopez Murphy and Musalem (2004)

chosen for the pension system also has an important impact. Thus, since the pioneer work by Feldstein (1974) it is common to sustain that the defined-benefit pension systems, managed by the public sector, reduce private savings and, as a result, growth potential. At the same time, the individual capitalization systems, managed by the private sector, contribute to an increase in domestic savings.

Taguas and Vidal-Aragon de Olives (2005), in an analysis of the Latin American economies, found a certain positive correlation between the development of private pension funds (approximate, in terms of the accumulated stock) and the domestic savings rate, both measured as a percentage of GDP, once adjusted by the dependency rate, and the presence of human capital in the economies of the region, with Chile and Argentina highlighted as paradigmatic cases. According to the estimates of Taguas and Vidal-Aragon de Olives, a 10-point increase in pension fund resources would contribute to increasing the savings rate in the economy by 0.5 points in the long-term.

Savings Rate and Pension Funds
% of GDP, variables orthogonal to
demographic dependency rate and education grade



Source: Taguas and Vidal-Aragón de Olives (2005)

The previous effect is especially relevant for Latin America, since the internal savings rate in the region is lower than in other emerging economies. For example, in the 1980-2003 period, Latin America posted a savings rate similar to that of the African economies (19% of GDP) and below that of Eastern Europe (23% of GDP) and Asia (28% of GDP).

Meanwhile, in Latin America the only country that offers sufficient accumulated experience to estimate the effects of a defined-contribution system on domestic savings and economic growth is Chile. This country reformed its pension system in 1981 and is a pioneer in the introduction of individual capitalization accounts and private sector management.[47] At the time the country's pension system was reformed, the Chilean

47 For an extensive analysis of the reform to the Chilean pension system and its impact on the economy and on social security, see Favre, Melguizo, Muñoz and Vial (2006), "A 25 años de la reforma del Sistema Previsional Chileno: Evaluación y propuestas de ajuste" ("25 years After the Reform of the Chilean Pension System: Evaluation and Proposals for Adjustment"), BBVA Provida.

financial market was plagued by many problems. Not only was it closed and not very solid, but, in addition, between 1982-1983 it suffered a sharp crisis as a result of the economic recession and the weaknesses of an abrupt liberalization of the market in the mid-1970s. Nevertheless, the pension system reform led to the improvement of regulations, increased the efficiency of the financial market, and strengthened its expansion.

Once adjusted in terms of the variables that determine demand for different portfolio products and for cyclical effects, the evidence shows a positive long-term relation between obligatory private savings (a variable that incorporates the reform in the pension system) and financial development.[48] Based on this consideration, Corbo and Schmidt-Hebbel (2003) showed that the provisional reform contributed to a third of the total advances registered in different indicators of the depth of the financial system between 1980 and 2001.

In turn, Corbo and Schimdt-Hebbel estimated that in the 1981-2001 period, the national savings rate in Chile increased between 0.7% and 4.6% of annual GDP, and concluded that the new pension system allowed the economy to grow by half a percentage point on average in the 1981-2001 period. This is the equivalent of practically a ninth of the growth of the period and a third of the accelerated pace of growth. The increase in total productivity of the factors for financial development and the rise in internal savings and investment were the main bases for such growth.

Impact on GDP of the Pension System Reform in Chile

	Case1	Case 2	Case 3
Real avg. GDP growth 1980-2001	4.63	4.63	4.63
Effects of the reform on GDP growth*			
Savings - investment	0.03	0.13	0.32
Labor markets			
Employment increase	0.04	0.07	0.11
Productivity increase	0.01	0.03	0.04
Financial development and TFP	0.13	0.20	0.27
Total	0.22	0.49	0.93
Effects of the reform on 2001 GDP level*			
Savings - investment	0.27	1.39	4.28
Labor markets			
Employment increase	0.35	0.78	1.40
Productivity increase	0.12	0.27	0.50
Financial development and TFP	1.19	2.17	3.57
Total	1.92	4.62	9.75

* Estimate
Source: Corbo and Schmidt-Hebbel (2003)

48 In addition, it should be pointed out that the reform of the pension system had a favorable effect on the public accounts, which also positively contributed to increasing the internal savings rate due to the reduction of the implicit debt, that is, debt that represents the obligations assumed by the public sector derived from the generation of rights by the affiliates, but not recognized by the public accounting system.

The previous chart presents the results obtained in estimating the effect of the pension system reform on the growth and level of GDP based on capital assets, employment, and total factor productivity, as well as the global effects of the pension system reform on GDP. The cases correspond to the different parameters used in the estimates.[49]

Corbo and Schimdt-Hebbel's results offer evidence of the positive impact of the pension system reform on economic growth in the years following its implementation.

Savings, Financial System and Economic Growth

The relation between internal savings and capital accumulation has played a central role in the neoclassical models of economic growth. These models emphasize that a high savings rate in an economy translates into greater economic growth because it leads to further capital accumulation and investment. Based on this line of research, Aghion, Comin, and Howitt (2006) argued, for example, that internal savings improve the conditions to attract foreign direct investment and facilitate access on the part of local productive processes to new and more modern technologies, benefiting productivity.

Nevertheless, the researchers explained that in the previous dynamics of savings and investment, the financial sector of the local market plays a very important role. Although greater internal savings can, in principle, mean more resources for investment in productive projects, the activity of the financial intermediaries in co-financing such projects is what generates the appropriate incentives to monitor them and what improves their possibilities of success. Thus, this financial activity boosts the expected profitability of investment projects and increases the attractiveness of the local markets for foreign investors.

With a sample of 118 countries for the 1960-2000 period, Aghion *et al*. uncover evidence that internal savings have a positive and significant impact on productivity and economic growth in the countries most removed from the technological frontiers*. For example, the following chart shows that the coefficient that measures the effect of internal savings on productivity in poor countries is statistically significant, and is more than two times that registered in rich nations.

The estimates of Aghion *et. al*. also show that the most important contribution to productivity by internal savings comes from private savings and that its positive effect is greater the more developed the financial system of the local market is. Once again the chart illustrates that private savings have a bigger effect on the productivity of countries with greater financial development. See the coefficients for countries with high and low financial development and note that these ratios are statistically different in accordance with the *p-value*.

49 It should be mentioned that the overall effects of the pension reform on GDP are different from the sum of the individual effects, because they are calculated as a compound rate.

Effect of Savings and Financial Development on Productivity and Growth after 10 Years

Dependent variable	Productivity growth			GDP growth per worker		
	Rich countries	Poor countries	Total countries	Countries high finan. developmnt.	Countries low finan. developmnt.	Total countries
Trend variable	0.32	-0.14	-0.01	1	0.4	0.77
	(3.42)	(1.3)	(0.14)	(6.87)	(2.17)	(7.23)
Initial GDP level per worker	-0.049	-0.038	-0.039	-0.045	-0.061	-0.049
	(15.31)	(8.77)	(14.25)	(5.87)	(8.12)	(9.95)
Internal savings rate (past 5 years)	0.0176	0.039	0.036	NA	NA	NA
	(1.67)	(3.6)	(4.79)			
Private savings/GDP ratio (past 5 years)	NA	NA	NA	0.031	-0.016	-0.002
				(1.48)	(0.95)	(0.17)
Number observations	1,893	1,781	3,674	622	600	1,222
R^2	0.42	0.23	0.31	0.16	0.24	0.18
Proof of equality in savings rate coefficient p-value		0.45			0.013	

Note: Statistics t in parenthesis. Errors corrected by Newey-West. All regressions include dummies of country.
p-value test:
The first case, productivity growth, proves invalid the hypothesis that internal savings have the same effect on growth for rich and poor countries. The second case, GDP growth per worker, proves invalid the hypothesis that private savings have the same effect on growth for countries with high and low financial development
Source: Aguion, Phillip, Diego Comin and Peter Howitt, "When does domestic savings matter for Economic Growth" NBER Working Paper No.12275, May 2006

* It is estimated that a country is further away or closer to the technological frontier based on its level of per capita GDP. Thus, poor countries, due to their low per capita GDP level, are considered further removed from the technological frontier, whereas rich nations, due to their high per capita GDP, are closer to the technological frontier.

2. Limitations of the economy on the pension systems

In establishing rights on the income derived from long-term production for the pension systems, it is extremely important that there be certainty as to the direction of the economy. In this sense, economic and financial stability are indispensable elements for the success and full development of the pension systems.

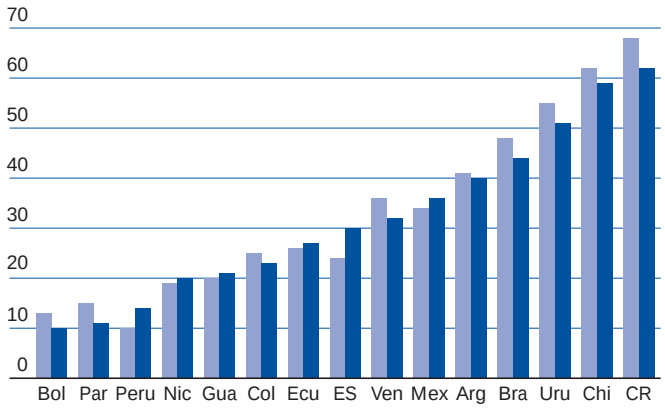
In Latin America some of the institutional factors that recently have contributed the most to macroeconomic stability are the presence of autonomous central banks—with a solid reputation in their fight against inflation—and governments with the commitment to maintain an economic policy of fiscal responsibility. Thus, a greater development of the pension systems necessarily requires the continuity and strengthening of these institutional conditions that provide certainty with regard to the region's economic direction.

Nevertheless, there are economic factors that can also limit the advances in coverage and in the income level that the pension systems can offer to their affiliates. Some of the most important of these factors will be mentioned in the next section.

a) Coverage

The evidence shows that the adoption of defined-contribution schemes in the pension systems of Latin America allowed for a moderate increase in formal employment in the 1980s and 1990s. However, in the past decade, the coverage provided by the pension systems apparently has stagnated at levels below 50% of the economically active population.[50]

Pension Coverage in Latin America
% of EAP



Source: Rofman and Lucchetti (2006)

Gill *et. al*. (2004) attribute the stagnation in coverage to factors that generate a certain skepticism with regard to the new pension systems based on defined- contribution schemes, since they argue that the population still perceives the private systems based on individual capitalization to be relatively risky. For example, the fact that the portfolios of the private pension funds in many countries of Latin America are still mainly concentrated in government bonds and that developments such as Argentina's decision to suspend payments on its government debt continue to occur in the region, does not contribute to strengthening credibility in the pension funds as a safe form of long-term savings. In this sense, Gill et al. (2004) note that the capacity of a multi-pillar model to isolate the pension system from the fiscal abuses of some governments has possibly been overvalued by the reformers.

Another explanatory factor behind the fewer advances in terms of coverage is the possible existence of a "learning" period prior to the new system gaining the full confidence of its affiliates. For example, Packard (2001), in an empirical study on 18 economies in Latin America, pointed out that the percentage of workers who contribute to the pension systems only begins to increase once both employees and employers become familiar with the new institutions. Furthermore, according to Packard it is common that at the beginning there will be a decline in coverage, a trend that is reversed only after a considerable period of time.

50 Coverage can be measured, alternatively, as the percentage of the retired population with benefits.

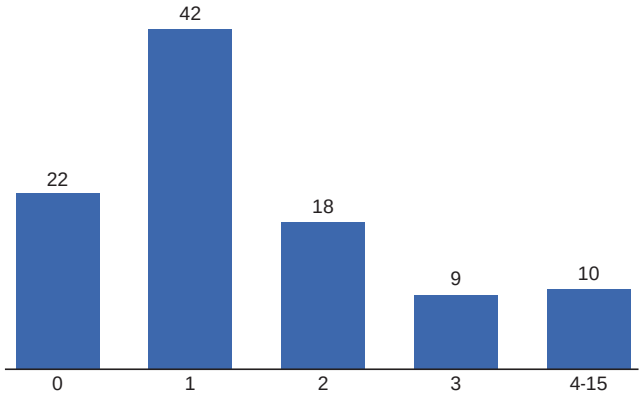
In addition, individuals' freely adopted decision to not participate in the formal labor markets and, therefore, not be covered by a pension system has been considered within the literature on the topic and by different empirical studies as a possible cause of the lower level of pension plan coverage. On the one hand, Packard *et. al*. (2002), after analyzing the patterns of formal employment in 13 economies in Latin America and adjusting them in terms of household socioeconomic, labor, and productive variables, found that being an independent worker or being employed in the agricultural sector negatively and significantly affects an individual's pension system coverage. This situation could reflect the limitations of maintaining a single pension plan system that is to provide solutions to different labor situations.

On the other hand, the very existence of non-contributive assistance programs within the design of the social protection systems has been pointed out by Levy (2006) and Perry et. al. (2007) as an important element that can also generate incentives against formal employment. This is because some segments of the population can obtain free of charge some benefits similar to those received by those who pay fees into the social security systems.

b) Income replacement at retirement

In the reformed pension systems operating under defined-contribution schemes, the amount of the pension for the affiliate at the moment of his or her retirement depends, in essence, on three elements: the fees the individual has paid into the system, the return that these contributions have obtained, and the charges and commissions on his or her savings for administrative costs and other services.

Retirement Savings System (SAR):
Breakdown of Accounts by Number of Interruptions in Contribution Payments
Number of withdrawals from / entries in the system, %



Source: Consar, figures through February 2007

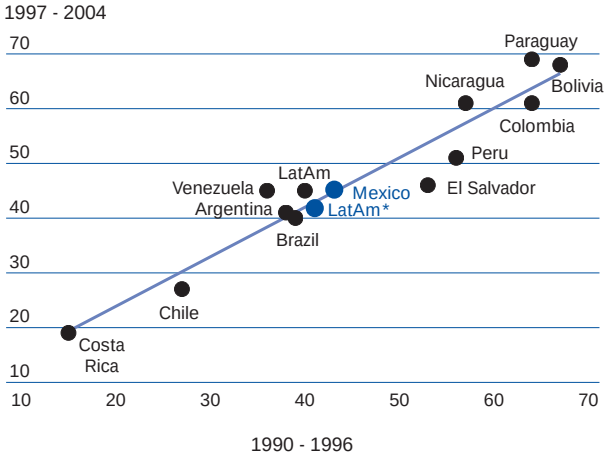
While the charges for commissions are determined by the intensity of the competition in the Afore industry and the return on pension fund savings in relation to the Siefore investment regime, the effect that the contributions have on the amount of the pension is influenced by the legal contribution rate, the worker's real wage and, particularly, by

the density or frequency of pension fee payments.[51] In the case of this latter variable, the evidence in Mexico indicates that within SAR, affiliates' contribution densities are not uniform and that, at the same time, a high percentage of the total number of individual accounts registered in the SAR become "inactive" for failing to receive the contribution payments. See the previous graph.

The previous phenomenon reflects both conditions of unemployment and the migration of workers abroad as well as their participation in informal labor relations.[52] It should be noted that not only in Mexico, but in all of Latin America, the informal labor market is one of the main obstacles to the pension systems achieving their objectives on the level of coverage and income replacement. As can be seen in the following chart, the increase in the informal labor market in Latin America in the 1997-2004 period, compared to the 1990-1996 period, was also accompanied by a rise in the number of salaried workers without social security benefits.

Evolution of Informal Employment in Latin America

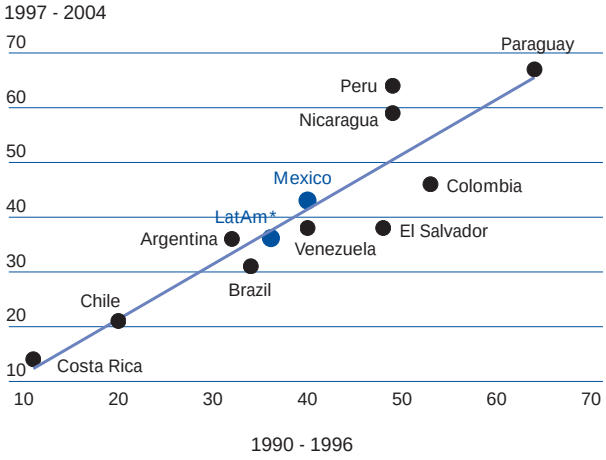
1997-2004 vs. 1990-1996, %



* Weighted average
Source: Inter-American Development Bank, Sociometer, RES-IADB

Wage Earners Without Social Security Benefits

1997-2004 vs. 1990-1996, %



* Weighted average
Source: Inter-American Development Bank, Sociometer, RES-IADB

The phenomenon of the informal labor market hurts affiliates under any pension plan policy. In a defined-benefit system, failure to comply with the number of required weeks of fee payments can mean the permanent loss of rights for the affiliate. And in the defined-contribution model, it can involve low contribution density and therefore a low balance on hand available for retirement.[53] Due to these factors, it is clear that to strengthen the pension systems in an economy, there should be a decline in informal labor relations. However, this challenge takes on significant dimensions because in most of the Latin

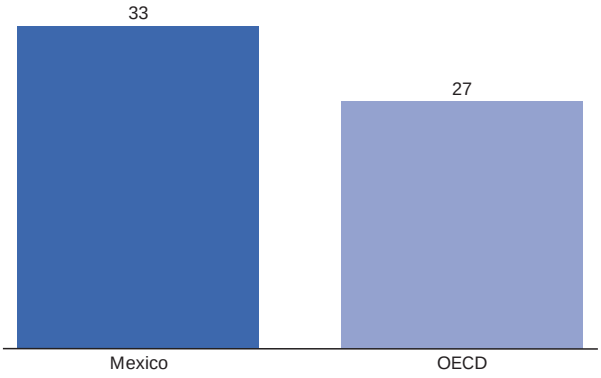
51 Contribution density represents the percentage of time in which an individual has been paying fees into the pension system in relation to the total time worked.
52 With regard to migrants, their accounts become "inactive" because there are no legal and financial mechanisms that allow these workers to receive contributions in their accounts from their employers or to make their voluntary contributions directly into an Afore abroad. Their only alternative is limited to sending remittances to Mexico to deposit a voluntary savings account in an Afore.
53 See Gabriel (2006).

American economies, informal labor relations involve 45.1% of the economically active population on average, while in developed countries the corresponding figure is around 16.4%.[54]

The high level of informality in labor relations and the considerable crossing over between the formal and informal sectors in Latin America are closely related to distortions in the labor markets and to insufficient economic growth due to institutional deficiencies that still plague the economies of the region. Information from the World Bank's "Doing Business" program (2007) indicates that the labor markets in Latin America and the Caribbean face serious obstacles in contracting workers and that it costs almost double to discharge them in relation to the average of OECD countries. See the first graph attached.

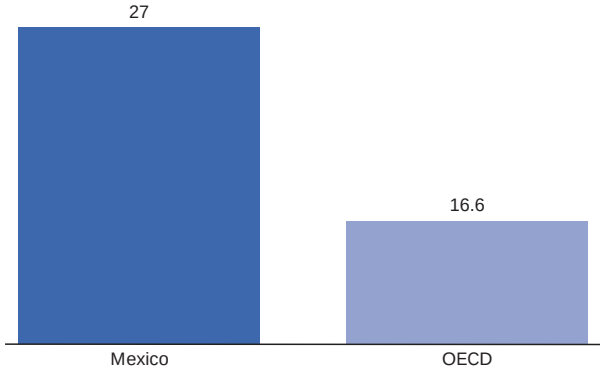
At the same time, in terms of how easy it is to carry out productive activities, the balance is also unfavorable for Latin America in comparison with the conditions that prevail in the developed economies. For example, while in the developed countries of the OECD, the time required to launch a new business is 16.6 days and 149.5 days for the established businesses to be able to comply with the various paperwork procedures to obtain licenses and permits for their operations, in Latin America the corresponding figures are 73.3 and 198.7 days respectively. In the case of Mexico, the 27 days that it takes, on average, to establish a new business is 63% more than the average in the OECD. See the second graph attached.

Difficulty in Hiring Labor
2006, Index*



* 0 least difficulty, 100 most difficulty
Source: World Bank, Doing Business 2007

Time for Initiating a Formal Business
2006, days



Source: World Bank, Doing Business 2007

Therefore, reducing the inefficiencies prevailing in the labor markets and making it easier to undertake productive activities can be among the first economic policy measures required to eliminate informal labor relations and strengthen economic growth. A higher level of formal employment in the economy would also translate into greater affiliation to and coverage by the pension systems, but also in higher replacement rates for the affiliates due to the possibility of having higher contribution densities.

54 See Schneider (2002).

Informal employment in Mexico

In the past 10 years, around 26% of the economically active population has been employed in the informal economy. Data from the National Employment Survey (ENE for its Spanish initials) reveal that between 1995 and 2004, informal employment rose from 8.4 million to 10.9 million workers while statistics from the National Job and Employment Survey (ENOE for its Spanish initials) indicate that 11.8 million workers held informal jobs in 2005*. Given its dimensions and its considerable percentage share of total jobs, it is important to review some of the main characteristics of informal employment:

a) **Size of the establishment**: informal employment is concentrated almost totally in micro and small businesses (establishments of up to 5 employees). However, this does not exclude its presence in large businesses (establishments with more than 251 employees).

b) **Branch of activity and employment**: informal employment is strongly concentrated by branches of economic activity and type of employment. On average, between 1995 and 2004, 58% of such employment was concentrated in construction, retail trade, and independent services, while 83% of those employed were merchants, vendors, artisans, and workers.

c) **Position in employment**: informal employment is mainly comprised of self-employed and salaried workers who together represent 67% of the total. Nevertheless, such employment shows significant differences by gender. For men, 38% of those employed in the informal sector are self-employed workers while for women the percentage rises to 46.5%. Furthermore, within the informal female workforce, 29.1% corresponds to workers receiving no pay, while among men the corresponding figure is 7.2%.

d) **Income level**: the statistical breakdown of informal workers by income level shows that they are concentrated in the lowest strata, with 20% of the total receiving revenue below the minimum wage and 50% with income less than two times the minimum wage. In addition, significant differences exist between genders; while 12% of the men have income levels below the minimum wage and 7.2% receive no income at all, in the case of women the corresponding figures are 34.8% and 29.1%, respectively.

e) **Percentage share by age**: Of those employed in the informal sector of the economy, 50% are below 34 years of age, and 80% below 44 years of age. Of informal workers over the age of 45, 26.6% are men and 31.2% are women.

Taken as a whole, the available evidence indicates that informal employment includes workers of all ages and that it is present in the main activities and jobs in

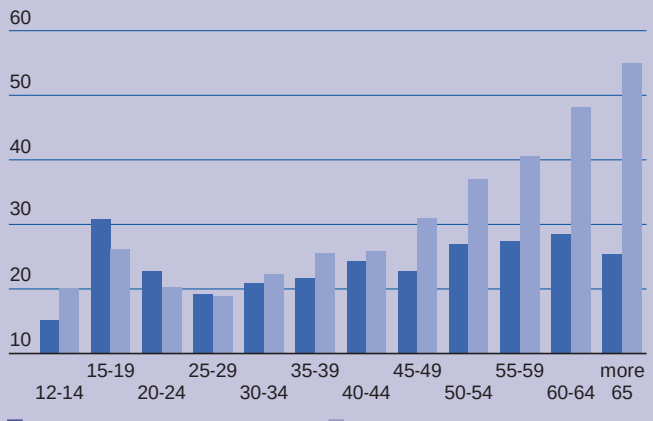
the economy. However, a specific characteristic of the informal economy is that its small scale, low level of organization, little or no division between capital and labor, results in low levels of productivity and wages.

Economically Active Population (EAP)
2005

	Thousands of persons	% of total
Population 14 years and over	73,737	
EAP	42,698	100.0
Employed	41,171	96.4
Companies and businesses	20,438	47.9
Institutions	5,584	13.1
Homes sector	14,833	34.7
Informal sector	11,582	27.1
Paid domestic work	1,680	3.9
Self-sustaining agriculture	1,570	3.7
Special and non-specified situations	316	0.7
Unemployed	1,527	3.6

Source: BBVA Bancomer with INEGI data

Employment by Age in Informal Sector*
% of employed EAP



* Informal employment is approximate due to data on the "non-structured sector" in the ENE questionnaire

Source: BBVA Bancomer with INEGI data

* Note: The ENE and ENOE statistics are not strictly comparable due to methodological differences. The ENOE began in 2005 but still does not have a historical statistical series methodologically organized for the ENE based on ENOE criteria. The figures in this box, except when otherwise indicated, are from the ENE, since it has a longer statistical history. In 2006, 11.5 million workers were employed in the informal sector, which represented 27.06% of the economically active population.

Source: BBVA Bancomer with information from INEGI, ENE.

VI. A Projection of the IMSS Defined-Contribution Pension Scheme

Pension systems are financial mechanisms that allow connecting income flows over time. This is even clearer when dealing with pensions for retirement in which there is a close relationship between the contributions that a person makes to his plan during his active working life and the pension that he can obtain in his old age. In a more aggregate and complete perspective, the link with income over time is also influenced by demography and the economic panorama. On the one hand, demography defines the basis for contributions and savings that support the pension system, but also the size of the insured amount and the demand for the necessary funds to pay its benefits. Moreover, the economic panorama determines the fundamental variables to operate the pension fund systems such as employment, the number of affiliates and the evolution of wages and interest rates.

Thus, once the demographic sphere, the economic panorama and the more important institutional elements that influence the pension systems in Mexico were already discussed, the macro-actuarial model is presented in this section, as are the main premises that allow knowing the retirement, severance at old age and old age pensions that will be paid under the IMSS defined-contribution scheme, the replacement rates that it will grant in terms of the average income of the affiliates in the last ten years of their active working life, as well as the estimate of the coverage of the system and evaluation of the effect of the different economic and demographic variables, and of key parameters in the pension levels and in the fiscal commitments derived from the design of the pension system.

1. Macro-actuarial model

The macro-actuarial model projects the pensions that are granted under the format of a life annuity, and uses the data available for affiliates to the Retirement Savings System (SAR).[55] This information is structured based on the cohorts by age groups and gender, which, in turn, are divided into categories in terms of their contribution densities.

This allows defining four large cohorts of affiliates to the pension fund system, of which the initial size is determined by the size of the working-age population. Each of the cohorts is distinguished from the rest by the contribution density that it exhibits at the time the exercise is initiated. The persons that are at an age of entering the work force are incorporated in the defined cohorts or groups based on affiliation assumptions without altering the proportionality in the distribution of contribution densities. All of the affiliates contribute until their retirement time, which occurs when reaching the legal age requirement.

55 The LSS (Spanish initials for Social Security Law) considers two pension modalities: life annuity and scheduled withdrawals. The LSAR (Spanish initials for Retirement Savings System Law) regulates the modality of life annuity and the Consar 31-5 circular matters relative to scheduled withdrawals. Nevertheless, in this section, the results of the projection model are presented only under the life annuity modality, so as not to complicate the presentation of results excessively.

Since there are population groups who join the work force belatedly, the option to create an auxiliary group to include them is considered. So as not to complicate the model excessively and, taking into account that this is a relatively small number of affiliates who in addition will begin to retire at the end of the projection period, it was established as a work hypothesis that the auxiliary group would have a contribution density equal to the average of the affiliated population. Lastly, and as a way of introducing a differentiation by income level, all of the groups open up into three income sections.

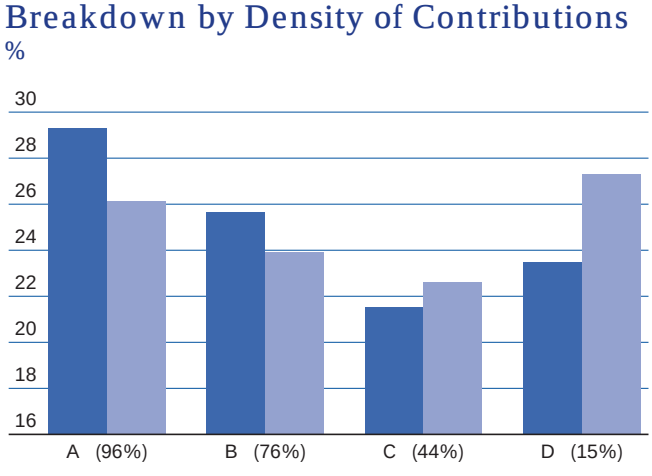
The dynamics of the macro-actuarial model comes from applying probabilities of death and disability to the affiliates in the previous cohorts, grouped by five-year age spans and of the income for labor activity at younger ages. The actuarial model and the detail of its dynamics appear in Appendix 3. Next, the item information and the main assumptions used in the projection are referred to briefly. Then, the main results are explained in greater detail.

a) Startup scenario

The information of those affiliated to the Retirement Savings System is dated December 31, 2004, and was made available by Consar. The data was provided in an aggregate and summarized way in matrixes that distinguish them by sex and age, in addition grouping the persons by ranges of five percentage points of contribution density and number of minimum wages. The contribution density considered is an index of the number of months of payment contributions in relation to the number of months that each affiliate is current in the capitalization system. This same distribution is applied to the balance averages of the RCV individual account (Retirement, severance at old age and old age).

The group of affiliates consists of 15.2 million men and 9.1 million women. In addition, there is a group of assigned persons, who are workers that have not exercised their right to choose an Afore, which total 10.2 million persons. It is contemplated that at least one fourth of these assigned persons is a duplication of the affiliate accounts in force. There is no data as to sex or age for these groups of assigned persons.

Breakdown by Density of Contributions

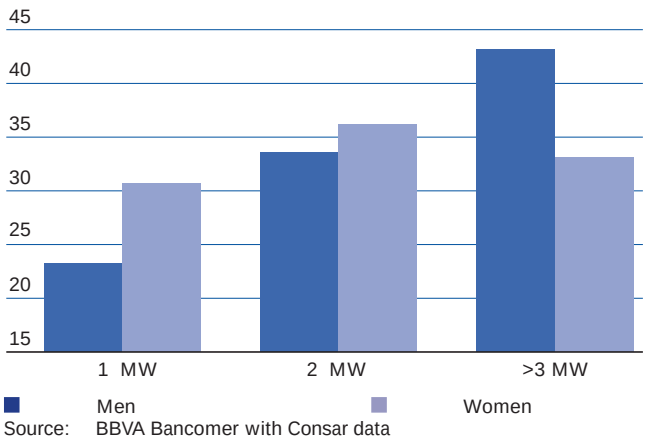


Source: BBVA Bancomer with Consar data

For purposes of our projection, affiliates are classified by contribution density into four large categories A, B, C and D. The A category has a contribution density of 96%, that is, they make their pension fund contributions practically every month. The B category has a density of 76%, the C category of 44% and the D category of 15%. In addition, to consider the persons who enter the labor activity belatedly, there is an E auxiliary category, with a contribution density equal to the average (60%).

Affiliates are also classified by wage level, which is based on the current general minimum wage in the Federal District (SMGVDF for its Spanish initials), the measure for classifying them into three income categories: up to one minimum wage, more than one and up to three minimum wages and more than three minimum wages.

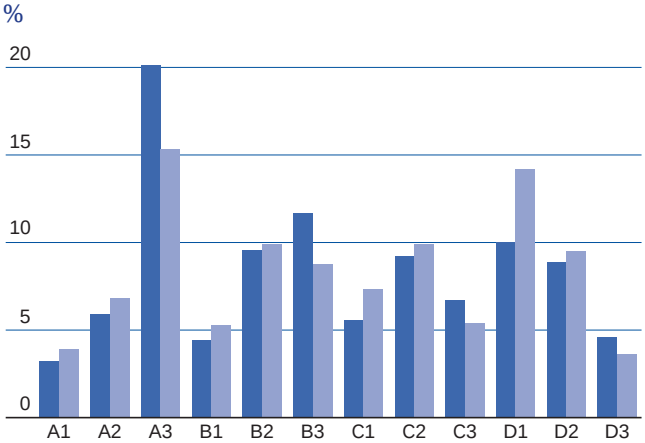
Breakdown by Number of Minimum Wages



Source: BBVA Bancomer with Consar data

In combination, the two prior distributions allow having 12 large categories of affiliates for each gender. It should be pointed out that this separation very much enriches the analysis of the pension systems in Mexico, since most of the previous studies on the subject have centered a large part of their analyses and conclusions on the profile of an "average" affiliate or worker.

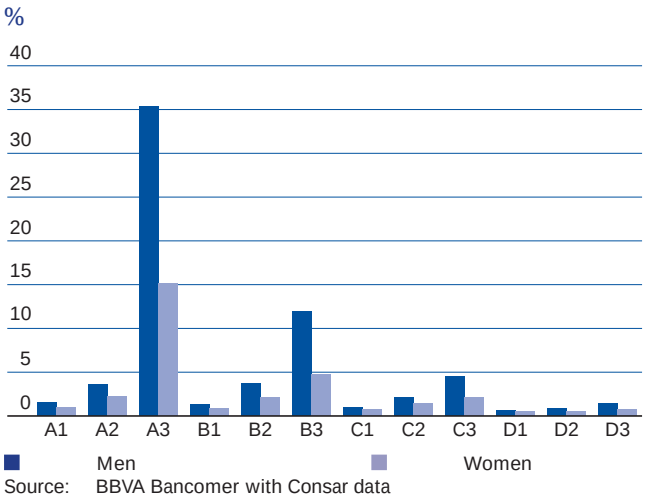
Breakdown of Affiliates by Contribution Density and Number of Minimum Wages



Source: BBVA Bancomer with Consar data

Once the classification and distribution of affiliates has been made, the average of the balances in the individual RCV account for each one of the categories is identified in terms of sex, age, contribution density and wage.

Breakdown of RCV Account Balances



Source: BBVA Bancomer with Consar data

In the case of the assigned persons, for whom both the number and the distributed balances by minimum wage and by contribution density are known, these are distributed by sex and age spans, using the same criterion as in the case of non-assigned affiliates.

With regard to the housing sub-account and the resources managed by the Infonavit, there is no itemized information available on the balances and, therefore, the total figure is broken down in proportion to the distribution of balances in the RCV account.

With regard to wages, groups 1 and 2 have no variation by age span. Only group 3 shows wage changes due to seniority, determined by the average wages in the cohort identified for this group, differentiated by men and women. It should be pointed out that in the projection of the pension system, wages are affected by the hypothesis of wage growth due to productivity.

b) Hypothesis of the model

In line with the demographic sphere, the economic panorama and the institutional relations operating in the pension system, the following work hypotheses are carried out.

i) Demographic aspects

- The mortality applied in the development of the projection is based on the projected mortality rates by Conapo through the year 2050.

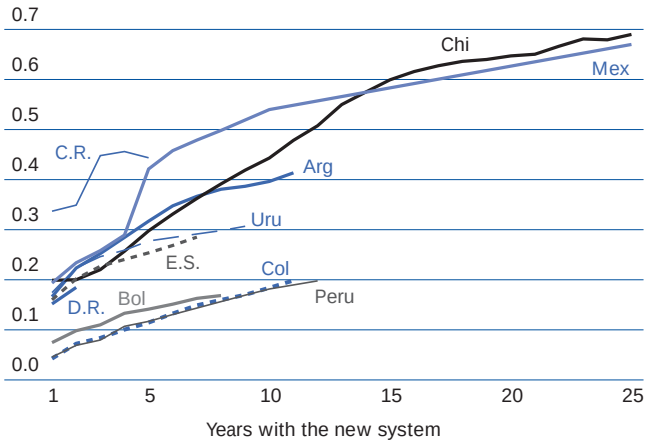
- The disability rates used in the model are those that the IMSS determined for the year 2004, without projection.

- The demographic tables applied to determine the benefits for pensioners (retirement, survival and disability), are those that are currently in force in Mexican legislation, based on the IMSS experience (EMSS tables for invalids and non-invalids, by sex).

ii) Aspects of the pension system

- The affiliation assumptions as a percentage of the working-age population for the IMSS defined-contribution scheme take as a general reference the historic experience in Mexico and in the different Latin American countries. In particular, the work hypothesis considered was that the affiliation be coherent with the evolution in Chile, because it is the country with the most years of experience with this type of systems. See attached graph.

International Comparison: Affiliates
Percentage of population between 15 and 64 years



Source: BBVA Bancomer

- The affiliation assumption for men between the ages of 20 to 24 is 50% of the population of this age group and rises to 65% in the 25-to-29 age group. For women, it is 40% in the first group and 50% in the latter. For purposes of the group of assigned persons, the following hypotheses were applied: men between the ages of 20 and 24, 21% of the population, and between the ages of 25 and 29, 27%; for women, 18% in the first group and 23% in the latter group. See attached chart.

Affiliates

Percentage of the population

	Non-assigned		Assigned	
	20 - 24	25 - 29	20 - 24	25 - 29
	Men		Women	
2005	42%	62%	21%	27%
2010	50%	65%	21%	27%
2015	50%	65%	21%	27%
2020	50%	65%	21%	27%
2025	50%	65%	21%	27%
2030	50%	65%	21%	27%
2035	50%	65%	21%	27%
2040	50%	65%	21%	27%
2045	50%	65%	21%	27%
2050	50%	65%	21%	27%
	Men		Women	
2005	31%	45%	18%	23%
2010	40%	50%	18%	23%
2015	40%	50%	18%	23%
2020	40%	50%	18%	23%
2025	40%	50%	18%	23%
2030	40%	50%	18%	23%
2035	40%	50%	18%	23%
2040	40%	50%	18%	23%
2045	40%	50%	18%	23%
2050	40%	50%	18%	23%

Source: BBVA Bancomer

- To maintain consistency between projected employment in the macroeconomic scenario and those who contribute to the pension system, the contribution density is allowed to increase over time for the defined affiliate categories, so as to reflect the advances of formal employment in the economy. In particular, a five-year increase is allowed for the density ratio of 2%, 3%, 2% and 2.5% for the B, C, and the D and E groups, respectively. In the case of the A group, its density of 96.2% is maintained, under the assumption that it is already sufficiently close to the fee payments of all the weeks that the affiliate remains in the system, and therefore its increase, is not relevant.

The contribution densities at the startup and at the end of the projection period are presented next.

Evolution in Contribution Density

Percentage of affiliates

Category	2005			2050		
	Density, %	Men	Women	Density, %	Men	Women
Non-assigned affiliates						
A	96.2	18.3	9.8	96.2	14.5	9.6
B	76.2	16.1	9.0	94.2	11.8	9.0
C	44.5	13.5	8.5	71.5	9.2	8.6
D	14.8	14.7	10.2	32.8	9.8	10.6
E	59.6	0.0	0.0	82.1	9.6	7.2
		63.0	37.0		55.0	45.0
Total			24,287,197			39,171,769
Assigned affiliates						
A	94.9	2.0	2.0	94.9	2.0	1.0
B	74.8	7.0	5.0	92.8	5.0	4.0
C	42.7	11.0	7.0	69.7	8.0	7.0
D	11.3	38.0	28.0	29.3	28.0	27.0
E	27.9	0.0	0.0	50.4	9.0	8.0
		59.0	41.0		52.0	48.0
Total			10,200,380			16,882,674

Source: BBVA Bancomer

- The contributions considered are those currently in the legislation, and are the following to be applied on the wages:
  - Retirement contributions = 2%
  - Contribution to RCV = 4.5%
  - Housing contribution = 5%
  - "Social quota" (government contribution to retirement savings) = an initial value of 5.5% on the minimum wage of the Federal District in July of 1997, updated quarterly in line with the National Consumer Price Index.

- The following have been considered as long-term administration expenses.
  - Commission on flow = 0.0%[56]
  - Annual commission on balance = 0.5%

- For purposes of determining family composition, the assumption is applied that all the affiliates are married and without children, and that the woman's age is three years less than that of her spouse. This assumption simplifies the calculations of the projection and allows assuming a reasonable hypothesis when trying to compensate, at least theoretically, the existence of beneficiary children and ascendants, with the absence of spouses for a part of the affiliated population.

- The amount of the guaranteed pension corresponds to that stipulated in the legislation: a monthly amount equivalent to one general minimum wage for the Federal District of 1997, an amount that is updated annually in the month of February, in line with the National Consumer Price Index to guarantee the purchasing power of the pension.

56 A reform of the SAR Law, published in the Official Gazette of the Federation on June 15, 2007, eliminated charging commissions on flows as of March 2008.

iii) Economic Aspects

- Based on the macroeconomic scenario, the hypothesis is adopted that wages achieve annual 1.5% growth in productivity. This assumption affects the minimum wage of the Federal District, the parameter used as reference for all wages.

- Also, as a result of the previous macroeconomic analysis and in coherence with the experience of the pension system during the years it has been in operation, the hypothesis of real annual income return of the individual RCV capitalization sub-account is 4%.

- For the housing sub-account a lower return of 3% is applied, which is higher than what historically has been offered, but is in accordance with the medium- and long-term expectations that the new management of the Infonavit generates.

- As regards the technical interest rate to determine the benefits for the beneficiaries for retirement, survival and disability, a value of 3.5% is assumed, a rate in force for this purpose in accordance with the current legislation, in line with the hypothesis for the return of the individual capitalization account.

- The determination of the cost of the benefits for beneficiaries includes an expense of 3% of the premium.

- All the monetary variables are expressed in pesos at constant 2004 prices.

2. Main results

The results of the macro-actuarial model are based on the projection of the main variables of the pension system. Exercises of this nature were made at the end of the decade of the nineties, a few years before the start of the reform and when there was still great uncertainty regarding its results.[57] The emphasis placed on the initial investigation was centered in particular on measuring the fiscal impacts of the transition and, to a lower extent, on the results for the affiliates to the new system.

It is only in recent years past and after almost ten years in force of the defined-contribution scheme, that some new research work has estimated, in greater detail, the impact on the affiliates of the key variables in the pension system such as the contribution density. The above has made use of the information on the Chilean experience through the survey on pension fund histories (HLSS for its Spanish initials) of the University of Chile.[58] In our case, the analysis of contribution densities and other relevant variables was enormously supported by recently generated information by the Consar in relation with the affiliates to the Retirement Savings System.

In this study, four main indicators are used to evaluate the operation of pension system:

a) Coverage: our model offers coverage indicators both in absolute terms and in relation to the target population. It also permits presenting coverage estimates for the guaranteed

57 See, for example, Sales, Solis, Villagomez (2006) and Grandolini and Cerda (1998).
58 See, for example, Valencia (2005) for Mexico and Favre, Melguizo, Muñoz and Vial (2006) for Chile.

pension and an estimate of the population that is unable to meet the requirements to obtain said benefit. All the previous indicators are presented at an aggregate level, by gender, and for the diverse affiliate profiles in terms of contribution density and income that characterizes the model.

b) Pension level: this indicator explicitly refers to the income level that the pension system provides to its affiliates. To this end, the average value of the monthly pensions is estimated in 2004 pesos and the replacement rates, defined as the value of the average pension in terms of the average wage of the last ten years of working life.[59]

c) Long-term savings: it is impossible to evaluate the operation of the pension systems completely without considering the results that these achieve as long-term savings mechanisms. Thus, this indicator shows the resources that the affiliates to the IMSS defined-contribution scheme can accumulate.

d) Fiscal expenditures: the macro-actuarial model allows estimating the fiscal impact of the different commitments of the state with the pension systems, expressed as a percentage of GDP.

Once the main result of our projection is made known, this section ends with some exercises that show the sensitivity of the results to variations in some key assumptions.

a) Coverage

Our model offers coverage indicators in two main dimensions: extensive and effective. In the first dimension, the aim is to provide a measure of coverage of the retirement, severance at old age and old age insurance (RCV for its Spanish initials) in terms of its target population, and, for this, both the proportion of the number of affiliates to the working age population is employed, and the ratio of the number of old age pensioners to the population older than 64. In turn, in a second dimension, we consider the ratio between the number of contributors and affiliates as an approximation of the effective coverage that the system offers to those affiliates who actually contribute to it.

In the first dimension, the indicator of the number of affiliates to the working age population reflects a progressive increase in the coverage. For example, the ratio rises from 56% in 2010 to 74% in 2050. Nevertheless, important differences by gender are noted. In men, the coverage achieved an 83% rate, while, in the case of women, the coverage was 66%. These results critically depend on the assumptions related to the share rates in the work force, in particular of women, as well as the affiliation rates of new participants. Both are exogenous variables in the projection and are derived from Conapo estimates and from our own assumptions that we have already commented on.

59 In comparative studies of pension fund systems at an international level, the replacement rate is the indicator used the most as a measure that attempts to capture the degree of social protection of these systems. However, several authors comment that this measure is not necessarily trustworthy and should be complemented with the use of other indicators. For greater detail on the scope and limitations on the use of the replacement rates in international comparisons, see Whiteford (1995) and Appendix 4 in this document for some considerations on its proper interpretation.

Affiliates and Coverage Rate

	Affiliates			Coverage rate*		
	2010	2025	2050	2010	2025	2050
Men	23,419,230	30,860,352	30,340,616	67%	79%	83%
Women	16,383,246	24,365,313	25,713,827	45%	58%	66%
Total	**39,802,476**	**55,225,665**	**56,054,443**	**56%**	**68%**	**74%**

* Affiliates / population > 14 y < 65
Source: BBVA Bancomer

With regard to coverage as measured by the indicator for the number of old age pensioners to the population older than 64, important gains are projected in terms of coverage. The ratio increases from 32% in 2010 to 69% in 2050.

Pensioners and Coverage Rate

	Old-age pensioners			Coverage rate*		
	2010	2025	2050	2010	2025	2050
Men	1,447,428	2,959,527	9,802,732	50%	57%	85%
Women	601,337	1,448,807	8,131,825	17%	23%	57%
Total	**2,048,765**	**4,408,334**	**17,934,557**	**32%**	**38%**	**69%**

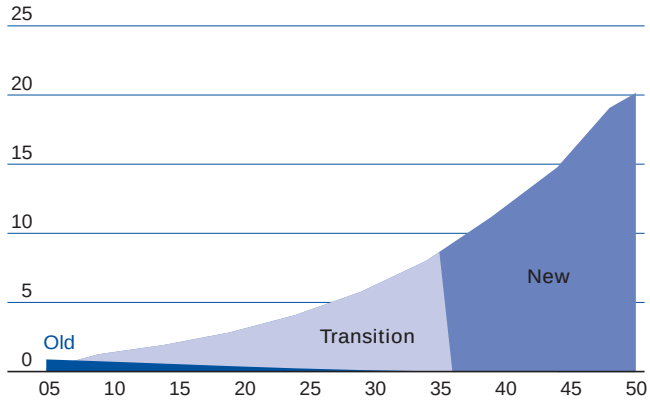
* Old-age pensioners / population > 64
Source: BBVA Bancomer

It should be noted that the coverage through the RCV insurance is an ample concept, since it results from a combination of the pensioners under the previous IVCM insurance (Spanish initials for disability, old age, severance at old age and death), based on the LSS-73—a closed group that is gradually decreasing due to its demographic evolution—and the growing participation of the pensioners in the new system under the LSS-97. It is an ample concept because, within the new system, there is a generation of affiliates in transition that, at the time of retirement, have the right to select the option that best suits them between the new and the old rules. Due to the pension levels that our model shows under the two sets of rules, which are specified in the following paragraph, we estimate that, until the year 2035, the affiliates of the transition will opt for the conditions under LSS-73.

The attached graph summarizes the absolute numbers of the persons covered by each one of these mechanisms, assuming that all persons who reach retirement age do so, despite the fact that for all intents and purposes, this is an age that is merely referential. At the initial point, 1.1 million retirees are recorded, of whom 78% are pensioned under the old program and the remaining 22%% is doing it technically under the new rules, but when they form part of the generation in transition, they could choose a pension plan under the LSS-73.

Coverage of the IMSS Pension Systems

Millions of persons



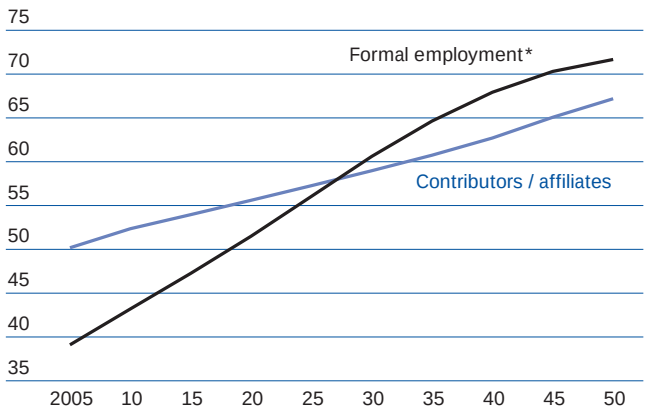
Source: BBVA Bancomer

As time goes by, the absolute and relative importance of the coverage of the old IVCM insurance decreases as such, reaching 0.5% of total pensioners in 2030. In turn, coverage through the individual capitalization system increases progressively until the transition period is over and then becomes the sole system. Between 2036 and 2050, the total number of pensioners rises from 9.3 to 17.9 million, and this last figure, placed within the context of the total population in retirement age of the country, represents the 69% mentioned previously.

As to a dimension of effective coverage, the IMSS defined-contribution scheme reflects the advances that, at a macroeconomic level, translate into greater formal employment. Thus, the ratio of contributing persons to affiliates increases over time.

Evolution of Contributors and Formal Employment

%



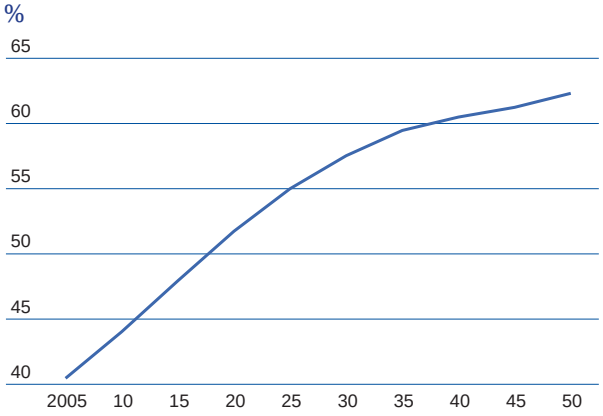
* % of total employed population

Source: BBVA Bancomer

However, progress in effective coverage has a close relationship with the share of the economically active population as a contributor to the system. This implies that, at a given moment, the affiliation levels surpass 100% of the working population. Thus, the key for defining the coverage lies in considering the frequency with which the affiliates

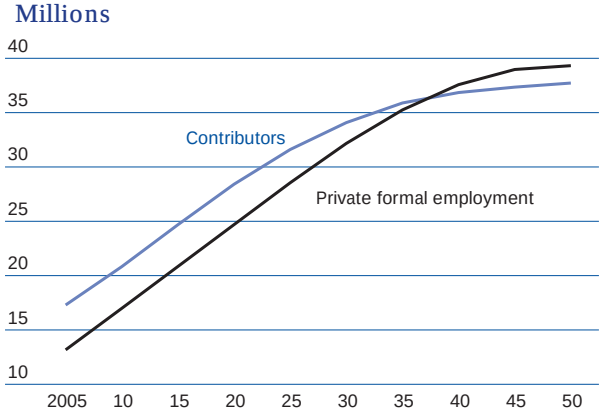
contribute to the system, which also denotes the importance of the contribution density for the results that the pension systems can provide.

Contributors / EAP



Source: BBVA Bancomer

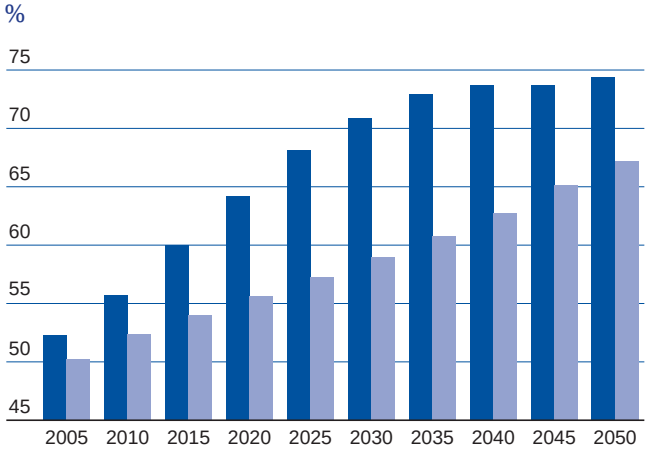
Contributors and Formal Employment



Source: BBVA Bancomer

Finally, the attached graph compares the extensive and effective coverage of the system. In our economic scenario, the opportunities for investment, formal employment and a greater economic participation of women in the coming decades, translate into sustained increases in extensive and effective coverage.

Evolution of Coverage



Source: BBVA Bancomer

b) Pension levels and replacement rates

The macro-actuarial model projects the old age pensions obtained under the former and the new IMSS pension systems. The purpose is to take into account the rights of the affiliates belonging to the transition generation to choose the most appropriate of the two pension systems for them.

In the attached charts, monthly average pensions are presented that the various affiliates can obtain in accordance with the income and with the contribution density category in which they are classified. The charts show the pensions in accordance with two cases,

because the legal framework considers the possibility that the resources in the housing sub-account can be used for financing pensions when they are not used to obtain a loan from the Infonavit. Thus, the first chart presents the basic case in which the balance of the housing sub-account is not used for financing the pensions, and the second chart, when it is used for this purpose.

Case 1. Old-age Pensions under LSS-97 (w/o Housing Balance)

Average pensions, pesos at 2004 constant prices, total affiliates

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	1,677	1,832	2,000	2,183	2,386	2,609	925	1,128	1,333
A2	3,336	3,630	3,950	4,301	4,686	5,101	1,426	1,766	2,105
A3	10,659	11,591	12,613	13,718	14,907	16,192	3,664	4,229	4,834
B1	1,660	1,818	1,980	2,157	2,353	2,569	775	965	1,143
B2	2,981	3,210	3,509	3,907	4,254	4,707	1,197	1,506	1,810
B3	8,440	9,378	10,553	11,856	13,097	14,683	3,063	3,619	4,215
C1	1,654	1,799	1,952	2,119	2,302	2,503	506	637	769
C2	2,209	2,362	2,527	2,836	3,132	3,437	782	992	1,213
C3	4,588	5,512	6,353	7,295	8,559	9,754	2,021	2,419	2,872
D1	16	35	54	79	110	149	196	247	305
D2	25	54	83	122	172	236	312	392	486
D3	75	169	260	373	514	668	813	971	1,172
E1									796
E2									1,280
E3									3,197
Weighted average	**3,717**	**4,884**	**5,861**	**6,668**	**7,321**	**7,907**	**1,727**	**1,695**	**1,657**

Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

Case 2. Old-age Pensions under LSS-97 (with Housing Balance)

Average pensions, pesos at 2004 constant prices, total affiliates

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	1,677	1,832	2,000	2,183	2,386	2,609	1,320	1,603	1,887
A2	3,336	3,630	3,950	4,301	4,686	5,101	2,157	2,667	3,178
A3	10,659	11,591	12,613	13,718	14,907	16,192	5,900	6,821	7,797
B1	1,660	1,818	1,980	2,157	2,353	2,569	1,106	1,374	1,621
B2	2,981	3,210	3,509	3,907	4,254	4,707	1,814	2,279	2,740
B3	8,440	9,378	10,553	11,856	13,097	14,683	4,954	5,860	6,823
C1	1,654	1,799	1,952	2,119	2,302	2,503	724	909	1,093
C2	2,209	2,362	2,527	2,836	3,132	3,437	1,187	1,504	1,841
C3	4,588	5,512	6,353	7,295	8,559	9,754	3,272	3,925	4,660
D1	25	52	79	114	159	214	280	352	434
D2	39	83	127	186	261	358	473	597	739
D3	118	269	416	599	826	1,076	1,317	1,579	1,909
E1									1,133
E2									1,954
E3									5,223
Weighted average	**3,721**	**4,893**	**5,874**	**6,687**	**7,347**	**7,943**	**2,741**	**2,669**	**2,583**

Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

The first thing that can be seen in the results is that the IMSS pension systems offer a clearly different outlook for each category of affiliates, which is considered in terms of their income and contribution density. Furthermore, in Appendix 5, paragraph (a), the results of the system are presented by gender and by type of affiliate, distinguishing among them whether they are or are not assigned. This entire breakdown of the information shows that the pensions are always higher for the affiliates who record greater perseverance in their contributions, which translates into the highest contribution densities. This is true, regardless of whether the affiliates are pensioned under the previous or the current law and whether the balance in the housing sub-account is used or not to finance their pension.

However, the results also reveal that for affiliates with low contribution densities there is a high risk of having an unprotected old age, a situation that for the affiliates in transition can have different nuances, depending on the pension fund treatment that they choose. Thus, for example, under the former IVCM system under the LSS-73, the affiliates who do not record a minimum contribution density of 25%—equivalent to 500 weeks of contribution—will lose their right to a pension and all their contributions to the system, which could be the case of the Group D affiliates in the previous charts. On the other hand, under the new LSS-97 program, even if the balances in the individual accounts were low due to the effect of low contribution densities, the resources in the latter are owned by the affiliates at all times and, in principle, could increase through voluntary savings contributions.

At the same time, the information also shows that the old age pensions calculated under the old IVCM program are superior to those of the new system through the year 2035. In the previous charts, the shaded area indicates precisely those situations in which the pension, calculated under the old regime, turns out to be higher than that of the new, and it is that pension under the old rules which is reported.[60] However, it should be noted that the higher pensions under the IVCM insurance system are the result of the defined-benefits that, because they were not funded, led to the reform of the Social Security Law in 1995, and later to a new plan of defined-contribution in 1997. These defined-benefits were increased once again with a reform to the Social Security Law in December of 2001.

From a social standpoint, there are significant differences between the two regimes of IMSS pensions, as regards financing sources. On the one hand, pensions under the previous IVCM insurance plan are, in essence, financed with budget resources based

60 Technically it is possible that during the transition stage there are low-income affiliates, who, having a contribution density of over 62.5% may consider choosing the LSS-97 to obtain the guaranteed pension that would be higher than the amount of the minimum obtained from the LSS-73. However, in practice, the number of affiliates in this case would be rather insignificant for three reasons: 1) according to Levy (2007), more than half of the low-income affiliates register interruptions in their contributions and, for the same reason, the number of low-income affiliates would be low. 2) Even when, at the start of the projection period the nominal amount of the guaranteed pension could be higher than the minimum obtained through the LSS-73, in time, this difference is reduced in real terms since the guaranteed pension remains constant, while the minimum that is obtained increases in terms of the base wage for social security contributions, which is affected by wage changes due to seniority, and 3) the affiliates in transition who choose the LSS-73 in addition to their pension, which considers benefit improvements derived from the reforms to the LSS of 2001. They can receive, in a single exhibition, the retirement balance in their RCV sub-account, which they cannot do if they choose the LSS-97 and this discourages this last option.

on the income from taxpayers, while under the new scheme of defined-contributions, financing has its highest support in the tripartite contributions and in its net returns from the Siefore. Later in this section, we review the implicit debt for the federal government derived from the pensions of the generation in transition under the LSS-73.

As regards the pensions granted under the new defined-contribution scheme, it is observed that the pensions, of course, are higher, in terms of the higher level of the affiliate's income, but it is also significant to note that for every income level, the pension is higher, in line with the higher the contribution density to the system is. These results are reinforced even more when they are compared to the non-assigned and the assigned affiliates, since the latter have, at the beginning, lower contribution densities (see the attached chart). Thus, the results prove that, to aspire to better pensions, it is indispensable to contribute regularly to the system during the active working life.

Case 1. Old-age Pensions under LSS-97 (w/o Housing Balance)
Average pensions, pesos at 2004 constant prices, total assigned

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	1,668	1,819	1,984	2,166	2,365	2,585	839	1,044	1,265
A2	3,320	3,611	3,925	4,272	4,620	5,008	1,291	1,630	1,997
A3	10,437	11,336	12,321	13,394	14,558	15,823	3,221	3,889	4,596
B1	1,654	1,804	1,963	2,138	2,330	2,542	676	864	1,070
B2	2,940	3,153	3,443	3,833	4,170	4,610	1,043	1,348	1,695
B3	8,254	9,136	10,284	11,562	12,776	14,336	2,672	3,317	4,013
C1	1,651	1,792	1,943	2,108	2,289	2,488	448	576	716
C2	2,173	2,279	2,473	2,776	3,013	3,358	694	899	1,134
C3	4,413	5,136	6,120	7,041	8,074	9,452	1,773	2,216	2,710
D1	8	21	35	54	79	110	148	194	248
D2	13	32	54	84	123	173	236	309	398
D3	29	81	145	228	334	462	609	778	978
E1									438
E2									705
E3									1,781
Weighted average	**1,022**	**1,152**	**1,324**	**1,475**	**1,654**	**1,861**	**498**	**559**	**656**

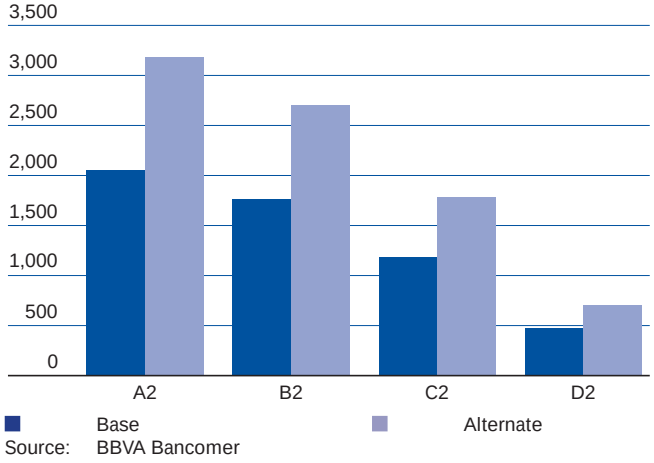
Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

Within this context, it is also worth considering the impact of the economic sphere on pensions. To this end, wage changes due to seniority are taken into account, as are the higher return rates of our alternative economic scenario. It should be recalled that under this scenario, the economic reforms are deeper, and, for the same reason, higher earnings in productivity and greater economic growth are obtained. The attached graph illustrates the effects of the base and alternative scenarios for the case of pensions of non-assigned affiliated men with a two-minimum-wage income and different contribution densities. The results show that, under the alternative scenario, pensions are 52% higher on average.

Base Economic Scenario vs. Alternate

Real average pension level in 2050, pesos

Case: Affiliate men earning 2 minimum wages



Source: BBVA Bancomer

In addition to the absolute value of the pension, the ratio between the pension value and average wages received in the last stage of the working life (the replacement rate) is another indicator of well-being to which reference is usually made when evaluating the pension systems. For purposes of calculating this indicator, our exercise considers the average wages of the affiliate in the ten years prior to retirement.

The following charts present the replacement rates of the IMSS pension systems. The charts take into account once again the possibility of using or not the balance of the housing sub-account for pension financing and, in Appendix 5 (b), the replacement rates appear by gender and by type of affiliate, whether assigned or non-assigned.

Case 1. Old-age Pensions (Without Housing Balance)

Replacement rate over the last 10 years, total affiliates

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	117%	119%	121%	122%	124%	126%	41%	47%	51%
A2	117%	118%	119%	120%	122%	123%	32%	37%	41%
A3	113%	114%	115%	116%	117%	118%	25%	27%	28%
B1	116%	118%	119%	121%	122%	124%	35%	40%	44%
B2	104%	104%	106%	109%	111%	114%	27%	31%	35%
B3	89%	92%	96%	100%	103%	107%	21%	23%	25%
C1	116%	117%	118%	119%	120%	121%	23%	26%	30%
C2	77%	77%	76%	79%	81%	83%	18%	21%	23%
C3	49%	54%	58%	62%	67%	71%	14%	15%	17%
D1	1%	2%	3%	4%	6%	7%	9%	10%	12%
D2	1%	2%	3%	3%	4%	6%	7%	8%	9%
D3	1%	2%	2%	3%	4%	5%	6%	6%	7%
E1									31%
E2									25%
E3									19%
Weighted average	**78%**	**83%**	**85%**	**86%**	**87%**	**87%**	**20%**	**22%**	**25%**

Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

Case 2. Old-age Pensions (With Housing Balance)

Replacement rate over the last 10 years, total affiliates

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	117%	119%	121%	122%	124%	126%	59%	67%	73%
A2	117%	118%	119%	120%	122%	123%	48%	55%	61%
A3	113%	114%	115%	116%	117%	118%	40%	43%	45%
B1	116%	118%	119%	121%	122%	124%	50%	57%	63%
B2	104%	104%	106%	109%	111%	114%	41%	47%	53%
B3	89%	92%	96%	100%	103%	107%	34%	37%	40%
C1	116%	117%	118%	119%	120%	121%	32%	38%	42%
C2	77%	77%	76%	79%	81%	83%	27%	31%	36%
C3	49%	54%	58%	62%	67%	71%	22%	25%	27%
D1	2%	3%	5%	6%	8%	10%	13%	15%	17%
D2	1%	3%	4%	5%	7%	9%	11%	12%	14%
D3	1%	3%	4%	5%	6%	8%	9%	10%	11%
E1									44%
E2									38%
E3									30%
Weighted average	**78%**	**83%**	**85%**	**87%**	**87%**	**87%**	**31%**	**33%**	**37%**

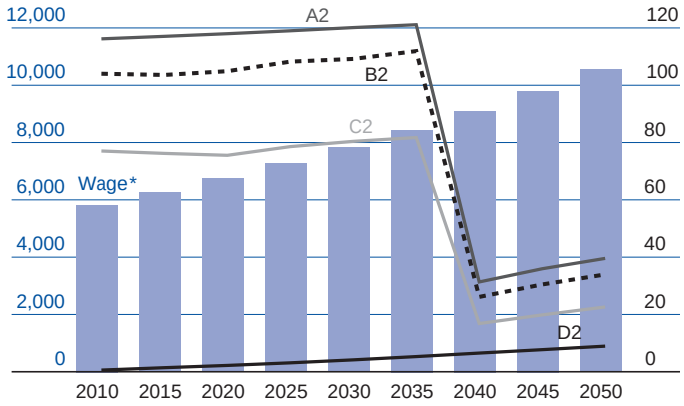
Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

In terms of the replacement rates, the results are in line with the absolute values of the above-mentioned average pensions, and they can be summarized as follows:

- The replacement rates are higher, the longer the affiliate has contributed.
- The replacement rates of the IVCM insurance plan under the LSS-73 for the generation of workers in transition will be high, in most cases higher than 100% of the average wages of the last ten years of the affiliate's active working life.
- The replacement rates under the new defined-contribution scheme will be higher, the higher the affiliate's defined-contribution density is. However, when the possible balance of the housing sub-account is not considered, in no case will they be higher than 51%. On the contrary, the replacement rates increase substantially when the balance of the housing sub-account is used to finance the pension. For example, in the case of the affiliates with the highest contribution density, they can go as high as 73%. It is clear, then, that affiliates could have more money in the SAR for their pension of what is actually in the Siefore.
- The replacement rates increase over time, even though wages grow an annual 1.5% on average. This growth in wages allow noting that even though the replacement rates under the defined-contribution scheme are relatively lower than those under the IVCM insurance plan, this happens under conditions of higher income levels, as the attached graph illustrates for the case of affiliated men with two minimum wages.

Replacement Rate in 2050

% over the last 10 years, case: affiliate men earning 2MW



* Real average wage for determining monthly contribution to IMSS (pesos)

Source: BBVA Bancomer

As with the absolute values of pensions, the replacement rates explain why the affiliates with low frequency in their contributions cannot aspire to obtaining good pensions. Even if the data do not allow linking the regular contributors with salaried workers, it seems reasonable to assume that workers with a low contribution density are mostly independent workers or persons who have participated intermittently in the formal labor markets. In both cases, those persons require new mechanisms that will allow them to be incorporated in a more stable manner in the labor markets and in the defined-contribution program to ensure higher revenues in their old age.

If the hypothesis is adopted that the category D affiliates, mostly consisting of independent workers and persons with a very low presence in the formal work market, it can be concluded that the average replacement rate of affiliates with effective coverage in the system to 2050 is 25%, which rises to 51% when it concerns affiliates who contribute more regularly during their working life (category A). In the case where affiliates used the balance of their housing sub-account for financing the pension, the replacement rate would be 37% and 73%, respectively

The different nuances in the results lead to an awareness of the limitations that exist when trying to evaluate a pension fund system based only on "representative" individuals. In this sense, we believe that the breakdown of the information into different categories of affiliates results in a better knowledge of the IMSS pension systems and offers better bases for their analysis and strengthening.

Coverage of the Guaranteed Pension

Given that an important percentage of those affiliated to the IMSS defined-contribution scheme presents low contribution densities, there is legitimate concern for estimating the number of affiliates who will be left without coverage from the system for not complying with the requirement of a minimum of 1,250 weeks of contribution

payments and, in the same manner, it is imperative to know the number of affiliates who, having the right to the guaranteed pension, will effectively exercise it.

The following chart summarizes the situation, distinguishing between men and women. The five-year projection considers the 2035-2050 period, once there are no longer affiliates in transition and with the possibility of choosing their pension under the old laws.*

Coverage of the Guaranteed Pension
Millions of persons

	2035	2040	2045	2050
Affiliates > 64 years old	**8.1**	**11.3**	**14.8**	**17.9**
Without rights	**3.7**	**5.1**	**6.7**	8.1
Men	2.4	3.2	4.1	4.7
Women	1.3	1.9	2.6	3.4
With rights	**4.4**	**6.1**	**8.1**	**9.9**
Men	2.6	3.5	4.4	5.1
Women	1.8	2.7	3.7	4.8
With guaranteed pension	**0.3**	**1.8**	**3.3**	**4.3**
Men	0.2	1.0	1.8	2.3
Women	0.1	0.8	1.5	2.0

* Sum of partials may not coincide with total due to rounding-out
Source: BBVA Bancomer

The chart shows that as regards the guaranteed pension, the coverage of the pensions due to old age is growing over time. This coverage will increase from 0.3 million persons in 2035 to 4.3 million in 2050, which, as a proportion of the persons with a right to it, means a rise in coverage from 6.8% to 43.2% and, as a percentage of the total affiliates older than 64, an increase from 3.7% to 23.8%. ** This rise in the amount of guaranteed pensions demanded responds to the greater incorporation of pensioners in the period under consideration.

At the same time, the number of persons who do not have the right to the guaranteed pension will reach 8.1 million in 2050, which represents 45% of the total number of affiliates older than 64. By gender, there are more men than women who do not have the right to the pension guarantee due to the effect of the greater absolute participation of the men in economic activity.

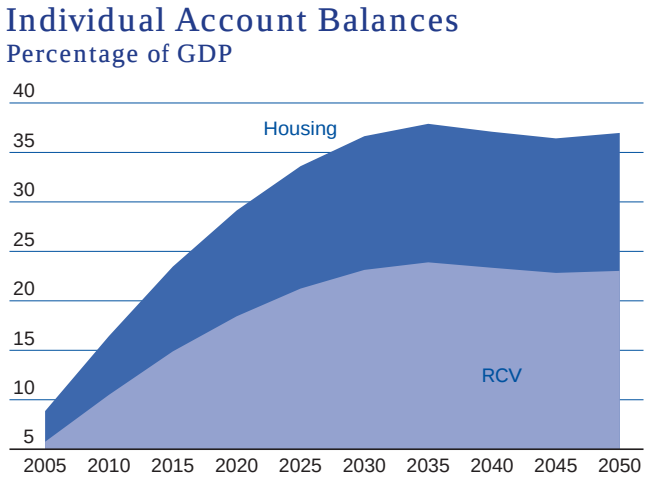
* The number of affiliated pensioners older than 64 and of pensioners with a guaranteed pension comes from the macro-actuarial model. The first is as a result of the demographic projection and of our assumptions of affiliation to the system. The second is part of the calculation of the balances in the individual accounts and of the pensions that each affiliate category obtains in accordance with his income level and contribution density.

** It was necessary to estimate the number of pensioners with or without a right to the guaranteed pension. In order to conduct this exercise, the work hypothesis taken was that the distribution of pensioners with or without a right to the guaranteed pension in relation with the total number of pensioners would be constant over time, and, similar to the distribution that, in this sense, was determined at the start of the projection for the group of affiliates at an age prior to that of retirement (60-64). Thus, assuming a working career of 2080 weeks of contributions (40 years) all persons with contribution densities lower than 60% in the matrixes by gender for said age group were considered to have no right to the pension guarantee.

c) Long-term savings

The macro-actuarial model projects increasing balances in the individual accounts of the IMSS defined-contribution pension system throughout the entire projection horizon. The above occurs even excluding the resources of the housing sub-account that are managed by Infonavit.

The attached graph summarizes the cumulative balances, such as the GDP percentage under every RCV sub-account.



Source: BBVA Bancomer

The results show that the obligatory savings through the RCV sub-account will have a very significant impact in the country's financial savings. These savings will allow the balance of savings in all types of financial instruments (for example, securities issued by the public and private sectors) to increase as a percentage of GDP during the projection period, since the operation of the system of individual accounts would make it possible for the cumulative balances in the RCV accounts to rise from a level of 5.7% of GDP in 2005 to 23% of GDP in 2050.

These results show a clear contrast with the IVCM scheme, which, due to its serious fiscal imbalances, up until prior to being reformed, exercised significant pressure on public finances and had a negative impact on internal savings, as a result of public dis-savings.

d) Fiscal costs: IMSS and ISSSTE

So as to offer a long-term and comprehensive view of the operations of the pension systems in Mexico, the fiscal expenditure indicators in this study were not limited to only the new IMSS defined-contribution scheme, but also some *ad hoc* models were developed to consider the commitments of the state, under the effects of the old regime under the IVCM insurance plan and the transition between the two pension systems. Also, the ISSSTE case was included both due to the importance the ISSSTE has in terms of coverage and in the recent reform of its Pension Fund.

i) IMSS Pension Systems

Fiscal expenditures from the IMSS pension systems have four main components:

1. Pension expenses in the process of being paid, granted by the IVCM insurance plan under the LSS-73. As of the reform, this expense is covered totally by the federal government.
2. Pensions under LSS-73 for the generation in transition. These expenses are partially compensated to the federal government by the return in the severance and old age balances in the individual account.
3. Expenditure in guaranteed pensions under LSS-97.
4. Other expenses of the new pension fund design: contributions by the government (disability and life insurance, retirement, severance and old age insurance; social quota).

Next, briefly commented is the calculating methodology for these expenses and the main results.

1) Pensions in the process of being paid under LSS-73

Pensions in the process of being paid correspond to those operated under the pay-as-you-go scheme in the IVCM insurance plan. The annual expense on these pensions was projected with a simple formula that simulated its continuity from 2005 to 2050. The formula relates the number of pensioners (pensions) per active affiliate with the value of the real average pension that is granted in the LSS-73 rules. As can be seen in the attached chart, the expense flow in a pay-as-you-go scheme depends on factors such as the demographic (dependence rate), economic (employment in the labor market) and those of the pension system itself (coverage rate).[61]

Contributive Pensions Expense under Pay-As-You-Go Systems

The expense of contributive pensions as a percentage of GDP may be broken down based on the following:

$$\frac{\text{Expense}}{p * Y} \equiv \frac{\text{PENS}}{N} * \frac{\frac{PM}{p}}{\frac{Y}{N}}$$

The number of pensions per employed worker (PENS/N) may be broken down:

$$\frac{\text{PENS}}{N} \equiv \frac{\text{PENS}}{P>65} * \frac{P>65}{P16\text{-}64} * \frac{\frac{1}{L^S}}{P16\text{-}64} * \frac{1}{1-u}$$

Coverage rate	Dependency rate	Labor market
p * Y = GDP (nominal)		P>65 = Population over 65 years
Y = GDP (real)		P16-64 = Working age population
N = Number of employed workers		L^S = Labor supply
Y/N = GDP per employed worker		u = Unemployment rate
PM/p = Real average pension		

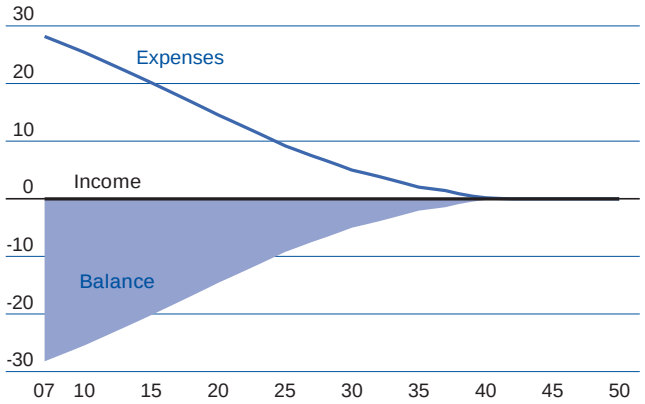
Source: Balmaseda *et al.* (2006)

61 The referred formulation does not constitute an actuarial model, but an accounting identity that allows linking pension expenses in an ad hoc manner with demographic, labor and institutional factors.

So as to realize the projection, the number of pensioners corresponding to the severance and old age insurance of the IVCM to December 2004 was considered. As to the economic variables, the base scenario of the 2005-2050 economic panorama determines its values and, as to what refers to the coverage rate of the pension system, it reflects a decreasing trend in function of that the pensioner group in reference is a closed group that is decreasing as time goes by.[62]

The following graph illustrates the decreasing pattern that can be expected of the expenses in pensions, of the old IVCM scheme, in the process of being paid. The present value of the entire expense current of 2005 to 2050 represents an amount equivalent to 4.3% of the 2004 GDP.

Current Pensions under LSS-73: 2007-2050
Billions of pesos at 2004 constant prices

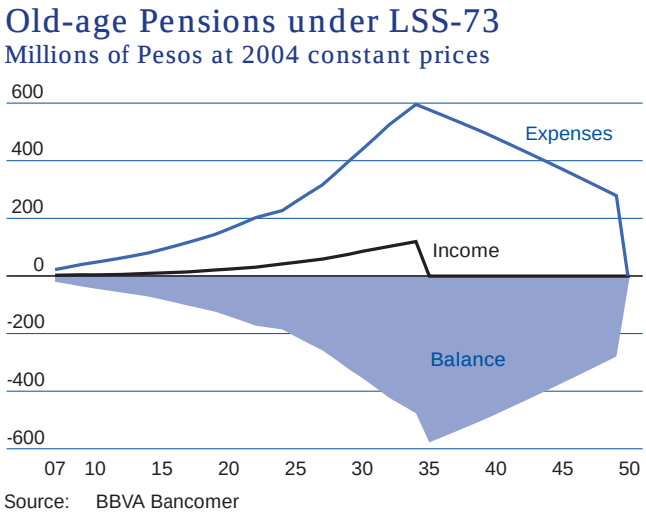


Source: BBVA Bancomer

2) Pensions under LSS-73 for the generation in transition.
For the generation in transition, the old age pension is the highest among the defined by the LSS-73 and the new regime in the LSS-97. The expense on these pensions is determined in both cases by their amount and the number of pensioners that obtain them. Both are the result of the macro-actuarial model after comparing the evolution of the two schemes through time. As it has been previously commented, the results of our macro-actuarial model indicate that the affiliates in transition, eligible in age and with at least 500 weeks of contribution, opt for the pensions under the LSS-73 between 2005 and 2035.

The following graph illustrates the expense and income flows of the federal government from the pensions derived from affiliates in transition. In this exercise, the refund of contributions for severance at old age and old age that the federal government recovers is considered income once the affiliate has decided to receive his pension under the LSS-73 rules.

62 It is believed that these pensioners are mostly those of the IVCM prior to the reform. Nevertheless, the figures could also include some pensioners in transition who were pensioned under the LSS-73 between July 1997 and December 2004. The available historic information of the IMSS, does not allow distinguishing between these two types of pensioners.



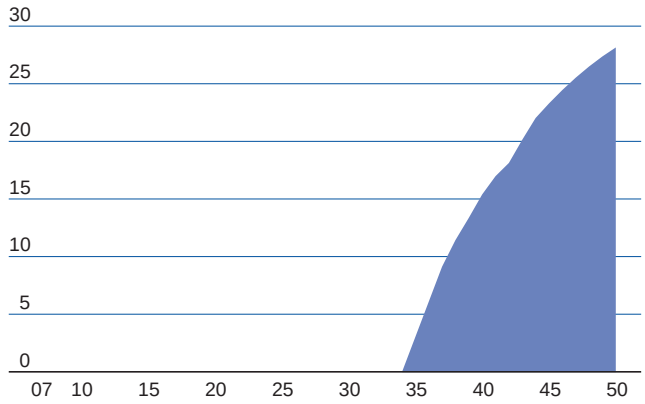
In accordance with this projection, the federal government's fiscal balance during the transition will reflect a deficit. The refunds for the severance at old age and old age item will be very low to compensate the growing expense of new pensions granted up to 2035 under LSS-73 and as of 2036 nonexistent because there will be no more contributors of the generation in transition, but only pensioners and beneficiaries of that generation. In terms of the current value, the sum of all these operational imbalances between 2005 and 2050 is equivalent to 56.4% of the 2004 GDP.

3) Expenditure in guaranteed pensions under LSS-97.
The LSS-97 guarantees a pension to persons who, at the time of retirement, do not have the sufficient resources in their individual account to acquire a life annuity and pay their survival insurance. Eligible persons are those who are 65 years old and have paid 1250 weeks of contributions.

The pension guarantee is paid in the beginning with the existing balance in the individual account, and when this balance is depleted, directly from the federal budget. To take these conditions into account, the macro-actuarial model offers results in the projection in terms of the current value of the minimum pension. This is an indicator of how much it would cost the federal government to pay, in one sole initial payment, the complement of the guaranteed pension for the retiree's entire life. So as to pass to annual expenditure flows, the amounts of the existing securities were distributed uniformly over time, dividing them by the life expectancy of the retirees. According to the mortality tables in Mexico, the life expectancy of men at 65 years of age is 16.5 years and, for women, 19.9 years.

The following graph illustrates the performance of the expense on guaranteed pensions of the federal government. These pensions are paid as of 2036 and until the final year of the projection (2050). In terms of present value, the sum of these expenses is equivalent to 0.9% of the 2004 GDP.

Guaranteed Pension Expenses under LSS-97
Billions of pesos at 2004 constant prices

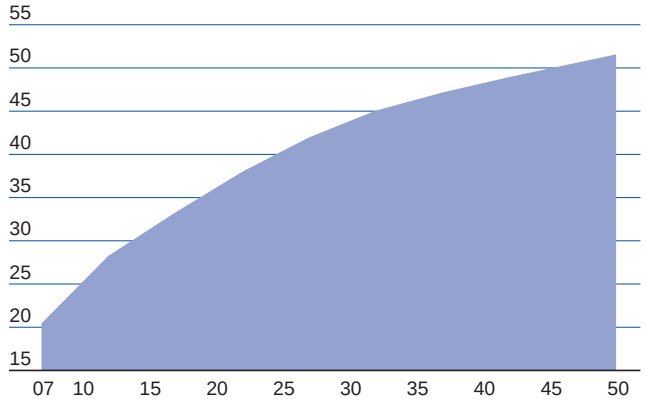


Source: BBVA Bancomer

4) Other expenses under the design of the new system under LSS-97

The macro-actuarial model also allows us to project the federal government's expenditures for items linked to the design of the new pension system: contributions to the retirement, severance at old age and old age insurance and for the "social quota" or federal government contribution to the retirement savings system. The following graph illustrates the flow of expenditures during the projection period. At current value, the sum of these expenditure flows during the 2006-2050 period is equivalent to 10.3% of the 2004 GDP.[63]

Contribution Expenses under LSS-97
Billions of pesos at 2004 constant prices



Source: BBVA Bancomer

Finally, so as to provide a more complete perspective of the fiscal commitments that the federal government will face derived from the pension systems in Mexico, we believe it is appropriate to include a projection for the ISSSTE Pension Fund.

ii) ISSSTE Pension Fund

To illustrate the benefits of the ISSSTE reform for public finances and the country, the following is a projection of the expenditures that the ISSSTE would have had to face under an inertial scenario without reform, and those that it will face starting in 2008 as a result of the reform. However, it should be noted that due to information limitations at the time this analysis was undertaken, all estimates follow a focus referred to average variables.

63 Expenditures for the retirement, severance at old age and old age item are, in this case, considered net of the refunds that due to severance and old age the federal government recovers for affiliates in transition.

Undoubtedly, to the extent that in the future it will be possible to have access to more detailed information by gender, income and contribution density on the ISSSTE affiliates, it will also be possible to structure a macro-actuarial model similar to that of the IMSS and obtain more precise estimates on its new defined-contribution pension system.

As in the previous exercises, the income and expenditure flows during the projection horizon are discounted at a real discount interest rate of 3.5% and are presented as a percentage of the 2004 GDP.

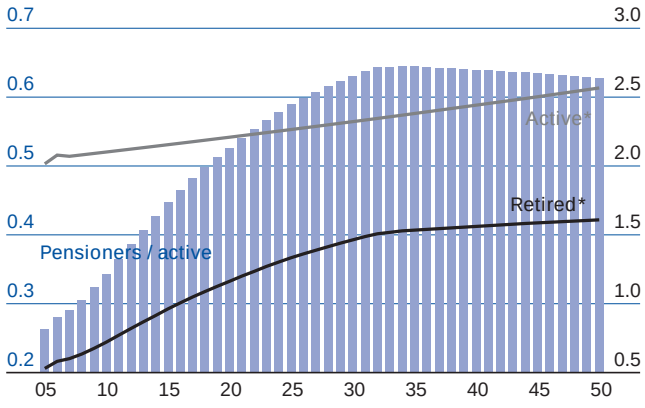
a) Inertial Scenario

To project the payroll expense of the pensioners of the ISSSTE Pension Fund, a formula similar to that used to model the old pay-as-you-go system under the IVCM of the IMSS is used. Thus, the expenditure on pensions is presented as a percentage of GDP with the ratio of pensioners to active workers and the value of the real average pension (AP / P) compared to the value of apparent labor productivity.

$$\frac{\text{Pension Expense}}{P \bullet GDP} \quad \frac{PENS}{N} \cdot \frac{AP / P}{GDP / N}$$

The value of the real average pension and the value of apparent productivity of labor are projected, taking as a reference our base economic scenario of real growth in wages and productivity, while the number of active workers *(N)* and pensioners *(PENS)* take as reference a projection made by the ISSSTE in its actuarial and financial valuation for 2005.[64] The ISSSTE projection allows considering in a more precise manner the evolution during the time of employment in the public sector and of the persons with a right to a pension that it expects to attend. The attached graph illustrates the projection for both groups of persons, as well as the ratio of pensioners per each active worker that results.

Projection of ISSSTE Active Workers and Pensioners



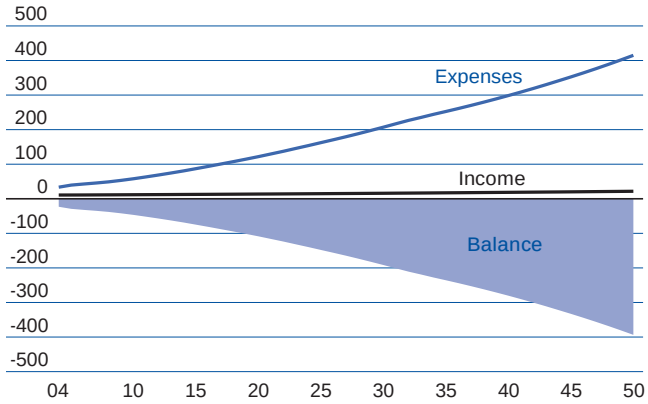
* Millions
Source: BBVA Bancomer with 2005 ISSSTE Actuarial Valuation data

64 The ISSSTE projections do not distinguish by type of pension. Thus, except when indicated otherwise, persons with a right to a pension refer to the total ordinary pensions, which, in addition to the retirement, old age and time and severance at old age pensions, also include others due to disability, widowhood and orphans as well as ancestry. However, within the total ordinary pensions, pensions for retirement, age and time and severance are the most important. As per the 2005 actuarial valuation, they represent 77% and 78% of the total in 2004 and 2005, respectively

At the same time, the income from the ISSSTE Pension Fund is projected based on its social contributions. For the purpose of doing the calculation, the projection of the ISSSTE was taken as a reference in terms of the number of contributors and the income from contributions implicit in the projections of the deficit of its actuarial and financial valuation for 2005. This income was then made compatible so that it would be equal to the result of multiplying the number of contributors by the average contribution.

The attached graph illustrates the balance between the expenditure and income flows of the ISSSTE Pension Fund in an inertial situation without reform. Under our basic economic scenario, the results of the projection indicate that the fiscal imbalances of the pension fund would have represented annual expenditures for the federal budget in an amount equivalent to 0.9% of GDP and that, in the 2008-2050 period, they would have represented, at current value, an amount equivalent to 38.4% of the 2004 GDP. The above points to the importance that reforming the pension fund system had for public finances.

ISSSTE Pension Fund Without Reform
Billions of pesos at 2004 constant prices



Source: BBVA Bancomer

b) Pension Fund Reform
Fiscal expenditures due to the ISSSTE reform have three main components:

1. Expense due to pensions in the process of being paid under the pay-as-you-go and defined-benefit scheme of the Pension Fund. As of the reform, these expenses are completely covered by the federal government, and there is no income due to the fact that the affiliates already pensioned have no legal obligation to continue contributing.
2. Expense due to pensions for the generation in transition. These expenses have two possibilities: pensions granted under the modified pay-as-you-go regime approved by the reform and the ISSSTE pension bonds for persons who choose to translate into monetary value their retirement rights under the old Pension Fund.
3. Expense derived from the design of the new defined-contribution scheme: contributions by the government (disability and life insurance, and retirement, severance and old age insurance), the "social quota" or federal government contribution to retirement savings, joint savings under a government co-financing plan and pension guarantee.

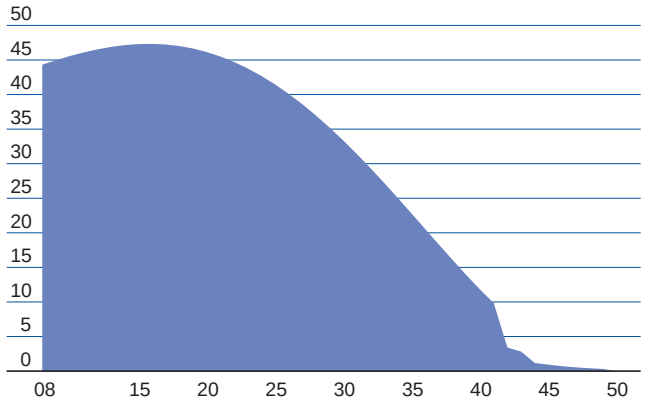
Following, the calculation methodology is briefly commented on for these expenditures and the main results.

1) Pensions in the process of being paid
Pensions in the process of being paid correspond to those granted by the Pension Fund prior to the reform. The annual expenditure in these pensions was projected by relating the number of pensioners with the value of the real average pension over time, in terms of our economic scenario of real growth in productivity and wages.

It should be noted that after the reform, the pensions in the process of being paid correspond to a closed population group consisting of retired workers and their beneficiaries until prior to the reform. Thus, the evolution of the disbursements for these pensions depends on the life expectancy of the population each year. Due to the above, our projection applies the projected mortality rates by Conapo through the year 2050 for the pensioned population of an average age of 64, in accordance with reports by the ISSSTE in its actuarial and financial valuation. Also, the same as in the IMSS case, it is assumed that all the affiliates are married and without children and that the woman's age is three years less than that of her spouse. The above attempts to theoretically compensate for the existence of beneficiary children and of ascendants.

The attached graph illustrates the performance over time of the expenditure flows for pensions in the process of being paid. The projection indicates that the expenditures have the expected decreasing trend due to the mortality effect in the reference group and that its cumulative amount, in the 2008-2050 period, is equivalent to 6.6% of the 2004 GDP.

Pensions Expense Currently under Payment
Billions of pesos at 2004 constant prices



Source: BBVA Bancomer

2) Pension expenses for the generation in transition
The reform to the ISSSTE law stipulated that the workers contributing to the Pension Fund at the time of the reform would have the right to choose between the new defined-contribution pension system and the old pay-as-you-go scheme with some modifications. Workers who chose to remain in the modified regime would see their contributions, age and time of service gradually increase as requirements to obtain a pension, which

will be calculated based on the average base wage of the year immediately prior to the date of the worker's retirement.

In contrast, those workers who choose to migrate to the defined-contribution scheme are to receive a pension bond in their individual account, the amount of which will be equivalent to their pension rights as stipulated under the previous Pension Fund system at the time of the reform. It should be noted that the reform recognizes the benefits of all active workers, including 60% of the total contributors who, under the rules of the Pension Fund, did not have a right to a pension because they had fewer than 15 years of contributions. Thus, the pension bond system offers potential benefits to all workers.

ISSSTE Pension Bonds and Public Debt

The ISSSTE pension bonds are of the zero-coupon type that adjust their nominal value to a real value through the use of investment units (UDIS). This type of bond is redeemed in a single exhibition at its maturity.

The nominal value of a debt issue through pension bonds is calculated by using the table of transitory article nine of the new ISSSTE Law, using three variables of the worker: age, seniority and base wage for determining social security contributions*. Nevertheless, the joint distribution of the workers in accordance with these variables is not available public information on the part of the ISSSTE.

Due to the above, the total balance of the debt due to pension bonds is estimated based on a matrix that distributes ISSSTE workers by age and seniority groups, for which the corresponding average wage is applied to their age group. To make these calculations, simple, distributions are used by age, seniority and wage of the ISSSTE workers, reported in the actuarial and financial valuation for 2005, and it is assumed that there is a direct correspondence between age and seniority, as well as between age and the basic average wage. Thus, persons of an older age are also those with greater seniority, and it is also possible to configure a wage increase for affiliates in accordance with their age.

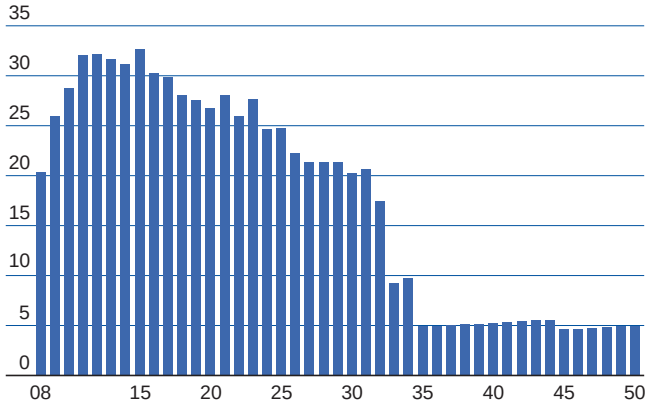
In line with the above procedure and the use of the table provided in transitory article nine, it is possible to estimate the value of the public debt issue of ISSSTE pension bonds at 13.4% of the 2004 GDP if 100% of the affiliates should choose this option. This value indicates the amount of resources that the federal government would have to pay out in a single exhibition to cover the transition cost between the pension fund systems. However, in practice, as commented in the text, the amortization of this debt is contingent, depending on the retirement profile of the workers in transition.

* To determine the amount of the ISSSTE pension bonds in each particular case, the corresponding numeral in the table In transitory article nine corresponding to the years of contribution and the worker's age must be multiplied by the basic wage and expressed in investment units that the worker was perceiving on the last day of the year before this Law becomes effective.

In accordance with the Law, the workers will have six months, starting in January 2008, to select the pension system that best suits his or her interests. Due to this, the calculations presented in this paragraph consider, as a work hypothesis, that 100% of the workers will choose the pension bond so as to be able to illustrate the maximum scope of the reform in fiscal terms.

The attached graph illustrates the annual amounts to be paid for pension bonds during the coming decades, taking into account that each year the pensioners obtain one bond on average.[65]

ISSSTE Pension Bond
Annual amounts to be paid,
billions of pesos at 2004 constant prices



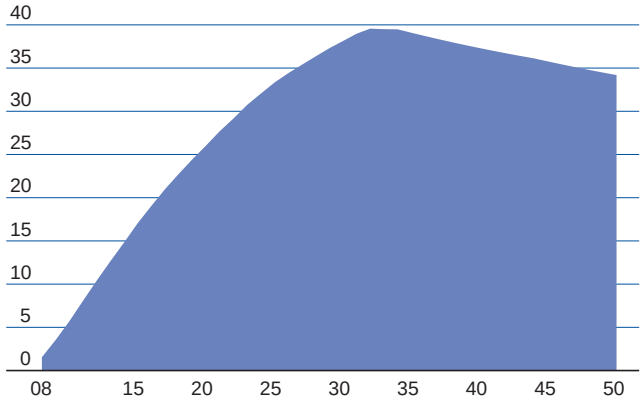
Source: BBVA Bancomer

To calculate the annual flow of fiscal expenditures derived from pension bonds, it is assumed that the federal government will gradually replace these bonds (non-negotiable securities) with other instruments of ordinary public debt that do pay interest. To this end, the work hypothesis adopted is that the public debt issued each year is not withdrawn and can be exchanged at any time for other debt with equal interest. Thus, all interest to be paid on the debt that allows paying off the pension bonds is homogenous and constant during the projection. The attached graph illustrates the flow of interest payments that the federal government would have to cover each year on the debt of reference.[66] During the projection period, this service payment on the debt would represent a cumulative amount equivalent to 6.5% of the 2004 GDP.

65 The average bond is estimated at 694,768 pesos. The figure is obtained by multiplying a matrix that distributes the estimated total of active workers by the Institute for 2008 by groups of old age and seniority for which the corresponding average wage is applied to their age group. The value of this bond remains constant in real terms throughout the projection period.

66 The calculations assume conservative inflation rates and long-term public debt placement rates of 3.5% and 7.75%, respectively.

Public Debt Service
that Substitutes Pension Bonds
Billions of pesos at 2004 constant prices



Source: BBVA Bancomer

3) Expenses derived from the design of a new pension system

The new pension design based on defined-contributions to individual capitalization accounts contains several associated expenditures for the state. In the first place, obligatory contributions for the new retirement, severance and old age insurance of 5.175% of the basic wage for social security purposes and a "social quota" or federal government contribution to retirement savings of 5.5% of the SMGVDF in force as of July 1st, 1997, updated quarterly for inflation. In the second place, contributions for the joint savings plan, whereby the worker makes voluntary contributions for retirement purposes. In this case, the agencies and entities of the public sector commit to deposit 3.25 pesos for each peso that the worker saves, with a maximum limit of 6.5% of the basic wage; and in the third place, the expenditures corresponding to a guaranteed pension that the new pension system grants when the cumulative balance in the individual account of a worker with a right to a pension is insufficient to contract a life annuity or a scheduled withdrawal plan that guarantees him or her a pension for life and the acquisition of survival insurance for his rightful claimant relatives.[67]

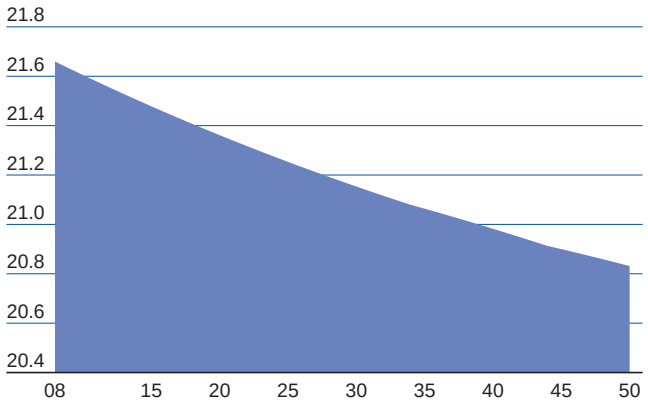
To project the expenditures inherent to the new ISSSTE defined-contribution pension scheme, the following assumptions are made: a) the obligatory contributions are made based on an average wage in the ISSSTE of 4.7 minimum wages; b) all the workers make maximum use of the joint savings concept, due to the high implicit return that it offers for every peso contributed voluntarily, and c) the contribution density to the system corresponds to the maximum in the IMSS system of 96.2%. This assumption is conservative, considering that the actuarial and financial valuation for 2005 of the ISSSTE manages a figure of 100%.

The attached graph illustrates the projection of the inherent annual expenditure to the new ISSSTE pension design for the item of obligatory contributions, "social quota" and joint savings. During the 2008-2050 projection period, the cumulative value of these expenditures represents an amount equivalent to 5.5% of the 2004 GDP.

67 In the case of the ISSSTE, the guaranteed pension is in the amount of 3034.20 pesos, equivalent to two minimum wages in the Federal District in 2007, which will be updated annually in the month of February in accordance with the annualized change in the National Consumer Price Index.

Public Disbursements Due to New Pension System Design

Billions of pesos at 2004 constant prices

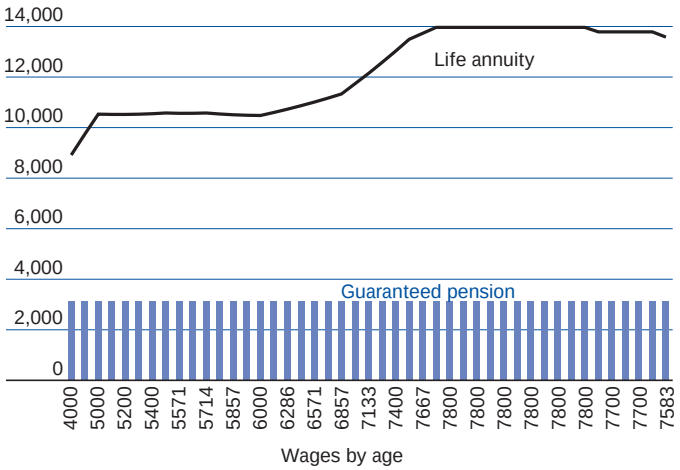


Source: BBVA Bancomer

Finally, as regards the pension guarantee, the available public information does not permit running a macro-actuarial model that will specifically define the cases that could be exercised under this guarantee. However, a simple simulation exercise of the balances in the individual accounts and the life annuities that could be obtained based on the different income levels—but with the same assumptions of real return rates (4%) wage growth (1.5%) and commissions (0.5% on the balance) as those used in our projections of the IMSS—indicates that the life annuity that the ISSSTE workers could obtain with a contribution density of 96.2%, and once the pension bond is taken into account, is always greater than the guaranteed pension that the system offers. See attached graph.[68]

Life Annuity and Guaranteed Pension by Wage Level

Pesos at 2004 constant prices

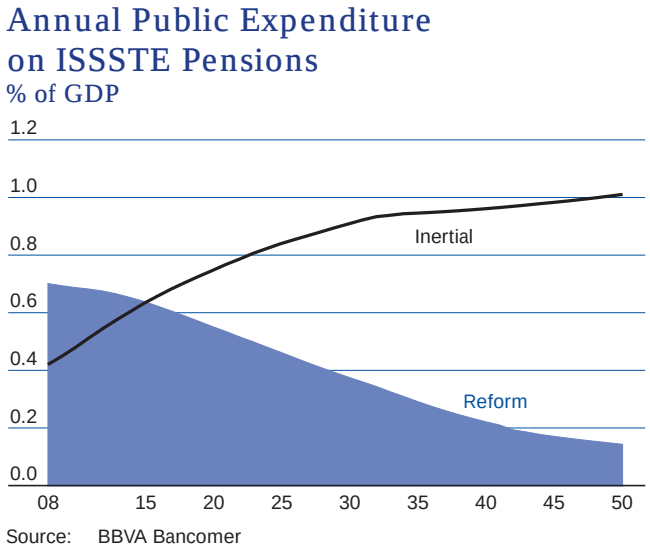


Source: BBVA Bancomer

68 The calculation takes, as a reference of income, the wage curves by age and seniority reported in the ISSSTE actuarial and financial valuation and assumes that the older the age and seniority the higher the income in general corresponds.

c) Benefits of the reform to the ISSSTE Law

Our previous projections with regard to fiscal expenditures under an inertial scenario without reform, and another considering the reform of the ISSSTE Pension Fund allow a first quantification of the benefits derived from the reform of the ISSSTE Law. As illustrated in the attached graph, the total budgetary expenditures to operate a funded pension system, based on defined-contributions is significantly lower than what is required to maintain the defined-benefit scheme in operation and that had the ISSSTE in a financial crisis.



Source: BBVA Bancomer

Compared with an inertial scenario, the ISSSTE Pension Fund reform allows the state to liberate resources in the medium and long-terms for an amount equivalent to 19.6 GDP points, while, with a fiscal cost of 18.6 GDP points in the 2008-2050 period, the pension system allows guaranteeing affiliates the ownership of their pension fund resources—in clear contrast with the previous system—and grants them economically-viable pensions which, with a high probability could be higher than the guaranteed pension under the new contribution design.

To the previous benefits, we would also have to add that the reform:

- Offers legal certainty that the pension fund resources in the individual accounts will not be subject to attachment and can be inherited.
- Fosters competition in the retirement fund industry. The creation of the Pension-ISSSTE introduces a new and important competitor in the market that will contribute to expand the supply of services in the Afore industry.
- Allows workers to have greater labor mobility and to develop a career both in the public and private sectors and transport their pension and health rights between the IMSS and the ISSSTE regime.
- Strengthens the ISSSTE medical services. As part of the reform to the Law, the federal government will contribute 8 billion pesos for the ISSSTE medical services.

3. Sensitivity of results to key assumptions

In the projection of the IMSS defined-contribution scheme there are assumptions that are very important for the results, and because of this, before continuing to our next section of diagnosis, it is advisable to bear in mind the impact on the projections of variations in some of the key assumptions for the defined-contribution scheme. The exercises are centered on pensions for those affiliates that are not part of the transition generation.

The sensitivity exercises are developed in four variables: 1) mandatory contribution rates; 2) growth rate of the real wage; 3) widowhood benefit rate, and 4) interest rate obtained by the retirement funds.

To control the differentiated effect that the change in an assumption could have on the pensions of persons with a different income level, in all the exercises, the effects that are commented on the pension levels and the replacement rates refer only to pensioners with the same income level but with different contribution densities, since this is the key variable in terms of payments into a defined-contribution scheme. Also, given that in the general results there are no significant differences by gender, the different cases are illustrated, for purposes of simplicity, toward the end of the projection period with affiliated pensioners, non-assigned men who receive two minimum wages, the "average" income level in accordance with our affiliate distribution.

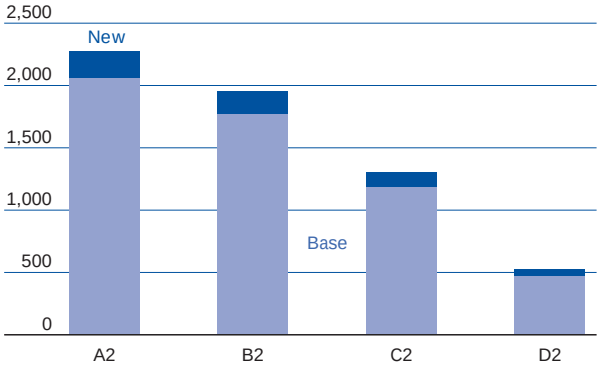
At the same time, the impact of the variations in the key assumptions on the coverage of the guaranteed pension and its fiscal cost refers to the whole of all the affiliates.

a) Mandatory contribution rates

In order to identify the impact that mandatory contributions have on the different results of the model, in this exercise we considered it appropriate to contrast the impact of a higher obligatory contribution rate for the retirement, severance and old age item of 7.5% of the base wage for social security purposes (SBC) compared to the current contribution rate of 6.5% of the SBC in the base scenario.

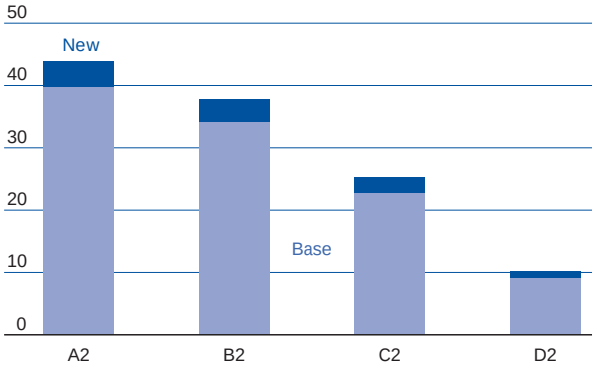
The result of increasing by one percentage point (pp) the obligatory contribution rate for the RCV on the base wage for social security contributions is positive and results in an average increase of 10.7% of the real average pension, equivalent to 145 pesos. This benefit, however, is different for the pensioners in accordance with their contribution density: those who contribute in a more regular way benefit more. A similar result is found in terms of the replacement rates. See the following graphs.

Effect of Increasing Mandatory Contributions by 1 percentage point
Average pension in 2050*, constant pesos



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

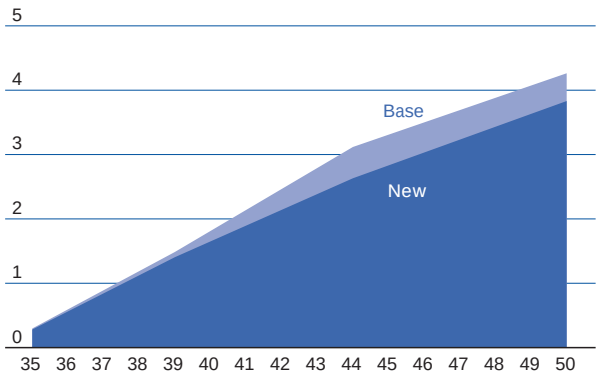
Effect of Increasing Mandatory Contributions by 1 percentage point
Replacement rate in 2050*, % last 10 years



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

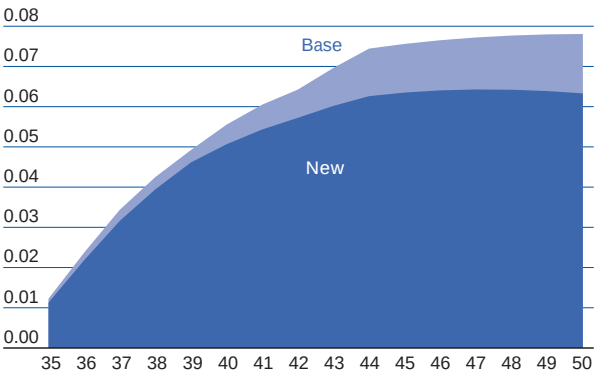
At the same time, the positive effect of increasing by 1 pp the obligatory RCV contributions and, by this, increasing the balances in the individual accounts results, as is to be expected, in a lower demand amount of guaranteed pensions and lower fiscal costs for the state. Thus, throughout the projection period, the number of guaranteed pensions is reduced by 10.1% (431,000 persons) and the fiscal costs by 0.13% of GDP. See the following graphs.

Guaranteed Pension Coverage
Effect of increasing mandatory contributions by 1%, millions of persons



Source: BBVA Bancomer

Fiscal Cost
Effect of increasing mandatory contributions by 1%, percentage of GDP



Source: BBVA Bancomer

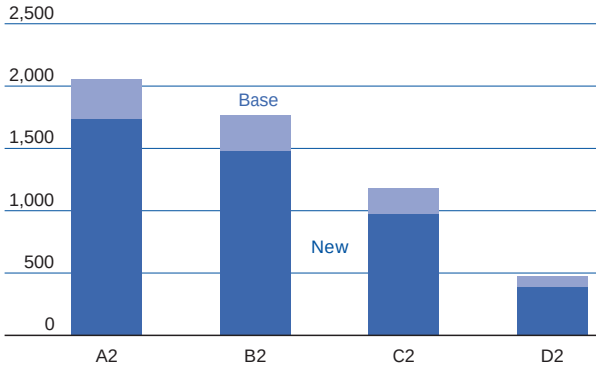
b) Real wage growth rate

The growth rate of real wages is also a key assumption in the results of the defined-contribution scheme. This is because it directly affects the magnitude of income on which the mandatory contribution rates are imposed. To exemplify the effect that the growth rate of real wages has, we considered it appropriate in this exercise to contrast the growth rate in real wages of 1.5% in the base scenario with a growth rate of 0%. The reason is so that the reader can contrast our results with other works that, for

purposes of simplicity, do not assume growth in real wages or the existence of wage changes due to seniority.

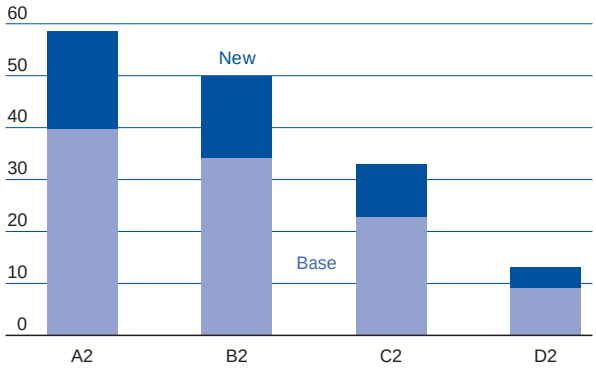
The result of not having a growth assumption in real wages has contrary effects on the pension levels and the replacement rates. In the first case, the pensions are reduced by an average of 15.9%, equivalent to 218 pesos, due to the effect of lower relative contributions, and in the second case, the replacement rates increase 12.4 percentage points on average. These diametrically opposed effects once again indicate the limitations of the replacement rates as an indicator of well-being in the pension systems, since it is possible to have very high replacement rates with very low pension amounts for the affiliates. See the following graphs.

Effect of a Wage Increase of 0%
Average pension in 2050*, constant pesos



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

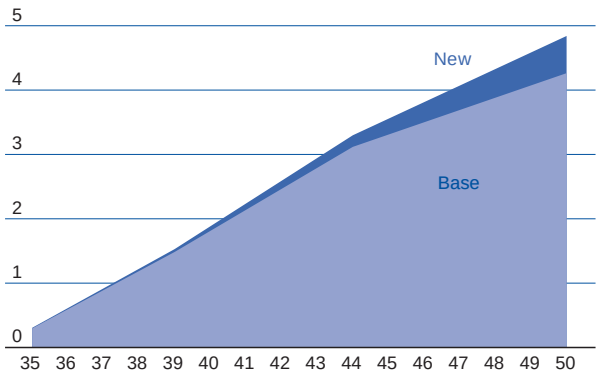
Effect of a Wage Increase of 0%
Replacement rate in 2050, % last 10 years



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

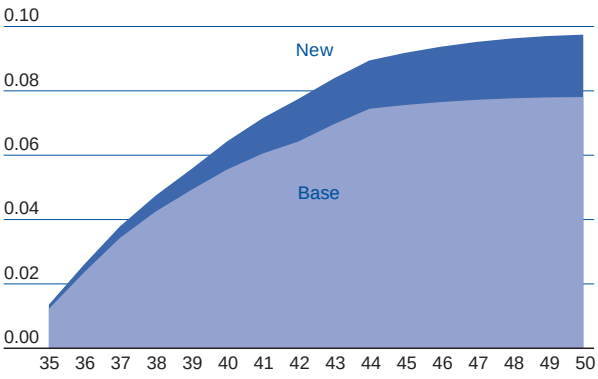
The exercise shows that in a scenario with no wage changes due to seniority, the amount of guaranteed payments throughout the projection period rises by 13.6% (577,000 persons) and its fiscal cost by 0.19% of GDP. This occurs because in relation to the base scenario, the taxable income does not increase and, for this reason, it generates lower balances in the individual accounts.

Guaranteed Pension Coverage
Effect of a wage increase of 0%, millions of persons



Source: BBVA Bancomer

Fiscal Cost
Effect of a wage increase of 0%, % of GDP



Source: BBVA Bancomer

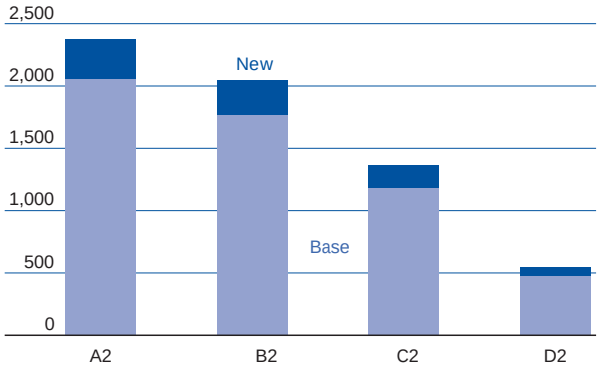
c) Widowhood benefit rates

For a better understanding of the impact that the widowhood benefits have on Mexicans' pensions, we considered it appropriate to conduct a sensitivity exercise and compare the benefit rate of 90% in our base scenario with the benefit rate of 42% that exists, for example in the case of Chile.

The results show that a lower widowhood benefit rate increases the value of the pensions of non-assigned men by an average of 15.8%, equivalent to 212 pesos and the replacement rates by 4.1 pp. The above is due to the effect of the life annuities that male pensioners have to acquire under the alternative scenario, which are relatively less onerous when considering a lower amount of benefits over time for the widow.

Effect of a Widowhood Benefit Rate of 42%

Average pension in 2050*, constant pesos

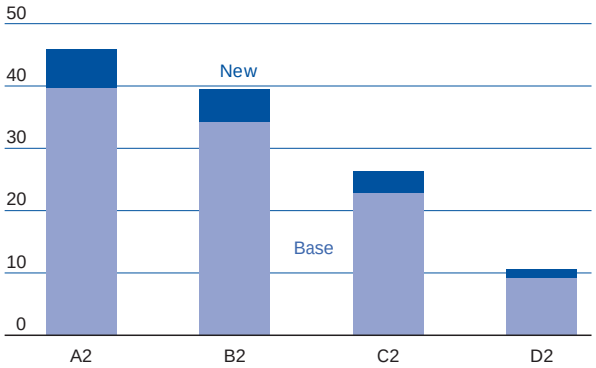


* Case of non-assigned affiliate men earning 2 minimum wages

Source: BBVA Bancomer

Effect of a Widowhood Benefit Rate of 42%

Replacement rate in 2050, % last 10 years*



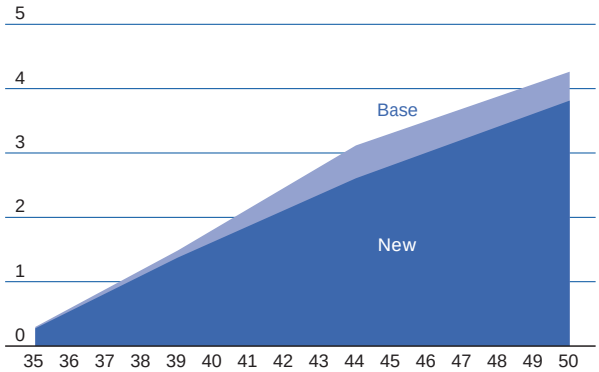
* Case of non-assigned affiliate men earning 2 minimum wages

Source: BBVA Bancomer

The sensitivity exercise shows that a lower rate of benefits for the widow allows reducing by 10.5% the number of guaranteed pensions. This contraction will reduce the fiscal costs by an amount equivalent to 0.16% of the 2004 GDP: See attached graphs.

Guaranteed Pension Coverage

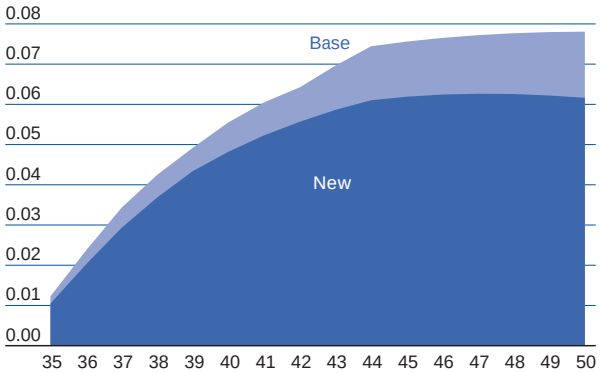
Effect of a widowhood benefit rate of 42%, millions of persons



Source: BBVA Bancomer

Fiscal Cost

Effect of a widowhood benefit rate of 42%, percentage of GDP



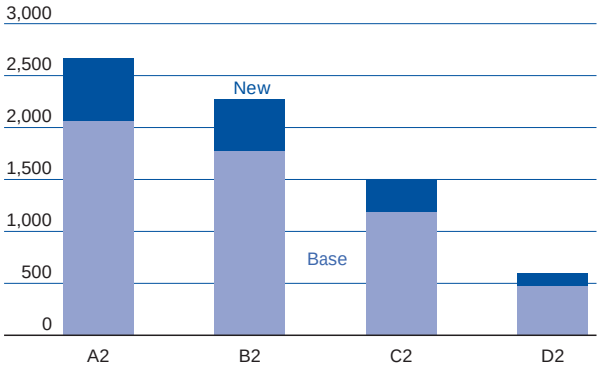
Source: BBVA Bancomer

d) Interest rate on the retirement funds

Once the mandatory contributions to the individual account are considered, the most important variable for a defined-contribution scheme, which capitalizes the contributions, is undoubtedly the interest rate that the retirement funds receive. To consider the impact of this variable on the projections, the case of a real Interest rate of 5% vs. 4% is considered in the base scenario.

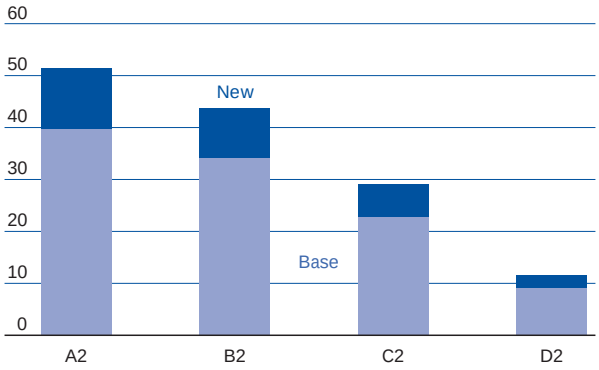
The results of obtaining one point more in the return of the retirement funds are important: The real average pension increases its level by 28.4%, equivalent to 387 pesos, and the replacement rates increase on average 7.5 pp. Thus, the higher return increases the possibilities of the benefits of the capitalization system and provides greater compensation to those who contribute more frequently to the system.

Effect of a Yield Increase of 1 pp
Average pension in 2050*, constant pesos



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

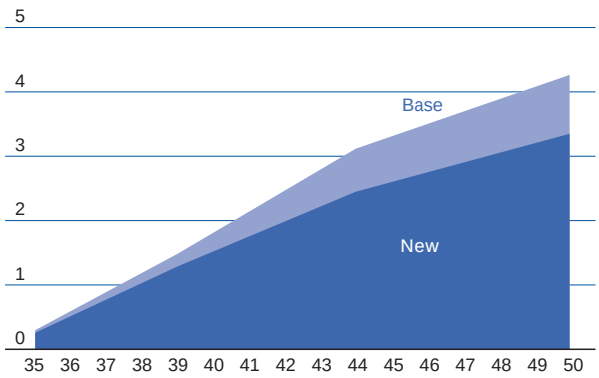
Effect of a Yield Increase of 1 pp
Replacement rate in 2050, % last 10 years*



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

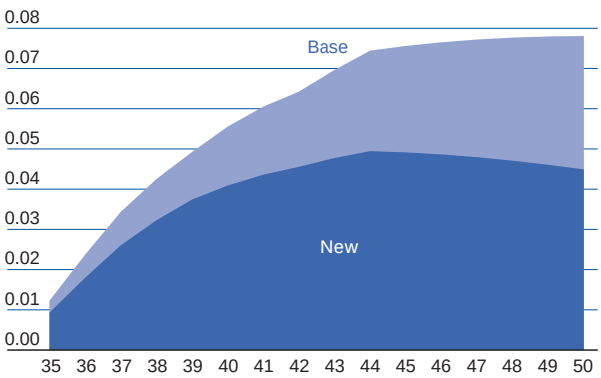
Moreover, it is not surprising that with a higher return on the retirement funds and higher balances in the individual accounts, the number of guaranteed pensions demanded will be lower and, for the same reason, so will the fiscal cost for the state. This exercise shows that when the return is increased by one point, the amount of guaranteed pensions is reduced by 21.4% (914,000 persons) and its fiscal cost by 0.32% of GDP during the projection period.

Guaranteed Pension Coverage
Effect of a yield increae of 1 pp, millions of persons



Source: BBVA Bancomer

Fiscal Cost
Effect of a yield increase of 1 pp, % of GDP



Source: BBVA Bancomer

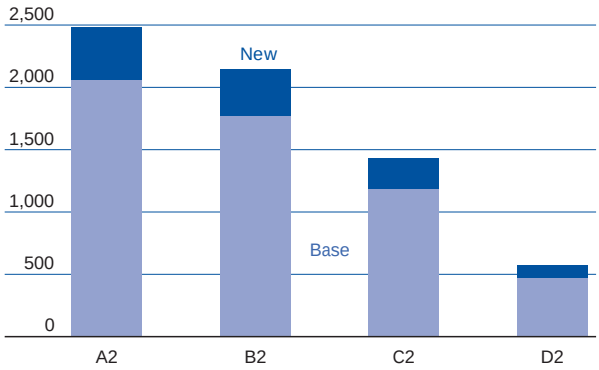
e) Other sensitivity exercises

In a defined-contribution system, the payments into the individual account are key. Thus, the affiliate who is able to contribute voluntary savings can take better advantage of the capitalization mechanisms for accumulating a higher balance in his individual account and obtain a better pension. Of course, the potential benefits are higher if the voluntary contributions are more regular.

In order to consider the impact of voluntary savings on the average pension and the replacement rate, the following exercise considers a simulated case of a voluntary contribution of 30 pesos per month. The results show that the voluntary savings of one peso per day can increase the amount of the pension by an average of 21.3% and improve the rates 5.6 percentage points. See attached graphs.

Effect of a Voluntary Monthly Contribution of 30 Pesos

Average pension in 2050*, constant pesos

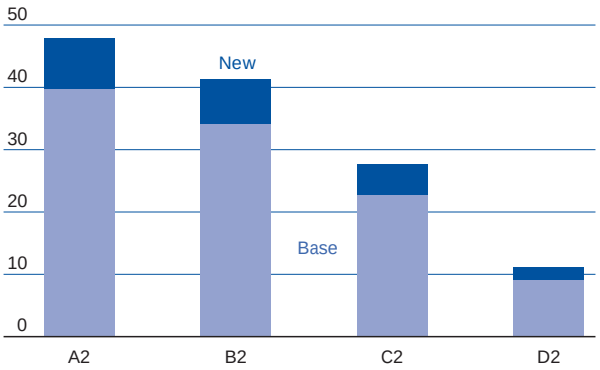


* Case of non-assigned affiliate men earning 2 minimum wages

Source: BBVA Bancomer

Effect of a Voluntary Monthly Contribution of 30 Pesos

Replacement rate in 2050, % last 10 years*



* Case of non-assigned affiliate men earning 2 minimum wages

Source: BBVA Bancomer

Next, a chart is presented that summarizes the sensitivity of the value of the pensions and the replacement rates in the variables considered, taking into account different contribution densities. The results show that, with the exception of the hypothetical case of no wage changes due to seniority, an improvement in the regularity of the contributions has the expected positive effects on pensions and replacement rates.

Sensitivity Exercises

Concept	Average pension in 2050*				Replacement rate in 2050**			
	A2	B2	C2	D2	A2	B2	C2	D2
Level 0% in base	**2,051**	**1,762**	**1,176**	**471**	**39.6%**	**34.0%**	**22.7%**	**9.1%**
Wage increase, 0%	-309	-281	-197	-84	19.3	16.1	10.4	4.0
Yield + 1 pp	606	500	321	122	11.7	9.7	6.2	2.4
Commissions 0%	294	243	156	60	5.7	4.7	3.0	1.1
Widowhood benefit 42%	319	274	183	73	6.2	5.3	3.5	1.4
RCV contribution + 1 pp	214	188	127	52	4.1	3.6	2.5	1.0
Voluntary contribution +1 pp	429	377	254	103	8.3	7.3	4.9	2.0

* Variation in pesos
** Variation in percentage points
pp ppercentage points
Source: BBVA Bancomer

VII. Diagnosis

The overall picture that results from our projection exercises shows very positive elements derived from the past pension fund reforms in the IMSS and the ISSSTE. On the one hand, the reform served to halt the growing pressure on public finances due to the operation of pension systems that were vulnerable to demographic change. Thus, an initial element of the diagnosis is that pension reforms brought about important savings for the state, benefiting long-term stability and economic growth in the country. Moreover, the new design of pension systems with defined-contribution schemes and a guaranteed pension, strengthens the solidarity of social security in Mexico by directing government support toward low-income workers, at the same time introducing transparent and economically viable mechanisms for accumulating the necessary funds to finance the pensions. In addition to this, there are the new property rights and portability benefits for affiliates.

Nevertheless, the projections also reveal that there is a series of topics regarding the benefits that the new pension systems can effectively grant, and, particularly, the IMSS defined-contribution scheme. This section deals with each of these topics.

1. Coverage

First and foremost, the new IMSS defined-contribution pension system and the guaranteed pension have the necessary mechanisms to channel the savings of almost three fourths of the labor force of the country. In principle, this can offer the conditions to provide pension-fund coverage to slightly more than 69% of the population over 64 years of age toward the end of the projection period.

Nevertheless, the fragmentation of social security in the country and the presence of diverse defined-benefit pension systems that still do not offer the mechanisms for the portability of affiliates' rights, greatly limits the future possibilities of the IMSS defined-contribution pension systems to offer universal coverage. For example, workers engaged intermittently in labor activity between the private sector and different employers in the public sector, such as the states, government agencies and other social institutions such as universities, could end up with very little money in their individual accounts or, worse still, without complying with the minimum contribution requirements in the institutional pension plans. Therefore, despite having contributed to various pension sub-systems, they would still be unprotected. Because of this, the ISSSTE pension-fund reform already represents important progress toward the portability of workers' rights between this ISSSTE and the IMSS.

On a second level, it should be recalled that the coverage that the IMSS defined-contribution scheme can effectively grant, depends, to a great extent, on the workers' contributions to the system and the frequency or regularity of these payments during their active working life. The macro-actuarial model shows that the higher the contribu-

tion densities of the affiliates, the better the pensions they can obtain from the system. However, a reality that is evident regarding the IMSS defined-contribution scheme is that a large number of affiliates do not have high contribution densities. This is the case, for example, of many self-employed workers, temporary workers and those whose labor situation changes frequently, passing from being employed to unemployed or to independent workers and vice versa. Thus, even when these persons can, at some time in their lives, be affiliated to an Afore, their life as an active contributor is limited, in most cases, to the time that they were formally employed and received a salary.

The discrepancy between the number of affiliates and active contributors to a pension system is the result of the economic conditions of the country in general and of the performance of the labor markets in particular. It is a fact that the Mexican labor market registers a high level of informality compared to the average among the OECD countries, which translates into low contribution densities and into a polarization of the benefits that the IMSS defined-contribution scheme can deliver to its affiliates. Thus, when exploring proposals to improve the effective coverage of the system, this topic should be of fundamental importance, since, even under relatively positive macroeconomic conditions, some affiliate categories, such as those in group D, only manage to improve their contribution density from 15% to 30%, in the case of non-assigned workers, and from 11% to 29% in the case of assigned workers.

The above is therefore an alert signal for the need to design better contribution mechanisms within the IMSS defined-contribution scheme for persons until now in self-employed activities, and also of the imperious need to undertake actions outside the pension system to facilitate a greater expansion of formal work relations. Only in this way would the risk be lowered for a large number of affiliates to face indigence in their old age because they were unable to comply with the minimum number of contributions required to obtain the pension guaranteed by the state.

2. Pension levels and replacement rates

As in the matter of coverage, the benefits of the IMSS defined-contribution scheme, in terms of pension levels and replacement rates, are differentiated in accordance with the affiliates' contribution density. Those who, in general, contribute more to the system have higher pensions and replacement rates.

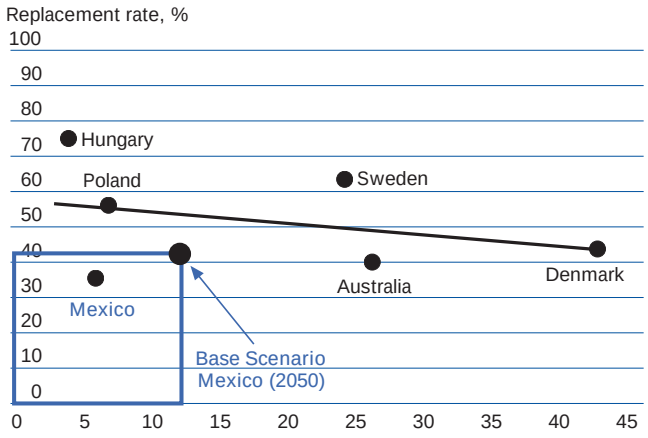
However, even when considering the differences due to affiliates' contribution density, the pensions and the replacement rates granted by the pension system are apparently low when compared with those obtained by the affiliates in the transition generation. These differences will be commented on in the following paragraph, but the explanation is that the higher replacement rates for the transition generation depend, in essence, on the financing they will receive from the state. This financing, of course, does not have a guaranteed long-term budgetary income and will represent a significant fiscal cost.

Moreover, so as to have another reference that will allow us to evaluate how high or how low the replacement rates are under the IMSS defined-contribution scheme, a

comparison at the international level is in order. For purposes of this comparison, we considered the OECD countries with this scheme.

It should be noted that comparing the projected replacement rates for the IMSS defined-contribution scheme with the historic rates of other countries is difficult, for many reasons: differences in growth of income, wages, contribution rates and retirement requirements. However, taking the previous considerations with appropriate caution, the following graph indicates that there is an inverse relation between the replacement rates level that defined-contribution schemes grant and the economic development of the country in which the system is located (measured by the average worker's income in industry). Thus, countries with a higher level of economic development and higher incomes offer lower replacement rates to their affiliates.[69]

Defined-contribution Pension Systems
Replacement rates by income level, 2002*



* Considers individual average lifetime earnings (100% contribution density) and the income of an average worker in industry (equivalent to 3.9 minimum wages in the case of Mexico).
Source: BBVA Bancomer and OECD (2006), Pensions at a Glance

Taking as a reference the inverse relation between the replacement rates and economic development (the straight line in the cloud of points in the graph) and the income level which, according to our base economic scenario, could be expected in Mexico toward to end of the projection period for an average worker in industry with a full-time career, it can be said that the replacement rates that the IMSS defined-contribution scheme will offer, will be relatively modest. These will be, on average, 43%, which is lower than the average for the OECD countries considered (52.7%).[70]

69 Whitehouse (2007) points out that in the OECD countries, replacement rates reflect a balance between pension systems with mandatory and voluntary savings; thus, a possible hypothesis that can explain the inverse relation between the replacement rates and the development level is that the more developed a country is, its citizens will also have a higher income and more possibilities to make voluntary savings outside the mandatory savings system.

70 According to the parameters used by the OECD in Pensions at a Glance, an average industry worker in Mexico with individual lifetime average earnings would correspond to a person with an average income of 3.9 minimum wages and a contribution density of |00% in 40 years. Our projection considers these parameters only for this exercise of international comparison, considering the base case that the individual does not use the balance of the housing sub-account to finance the pension. When the housing balance is considered, the replacement rate rises to 69%.

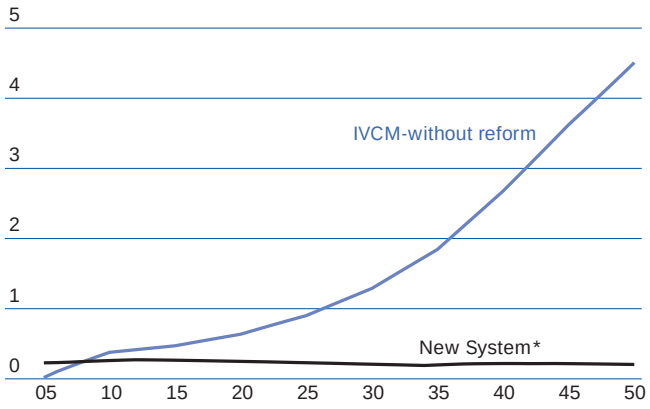
The above is an indication that not only the low contribution densities are a limitation for the IMSS defined-contribution scheme but that there are also other restrictions of an institutional nature that affect their performance. In particular, the results that the defined-contribution scheme can deliver are affected by two other key variables: the mandatory contribution rates and the return rates that the retirement funds receive.

In section VII of the proposals for improvement to the system, we discussed the above in more detail, but it is worthwhile to advance, as a reference, that, in the first case, while mandatory contribution rates in Chile—a pioneer country in defined-contribution systems in Latin America—are along the order of 10% of taxable income, in Mexico, the rates are 6.5% and only increase, on average, to 8.1% when the government contribution to retirement savings (known as the "social quota") is considered. In the second case, even with the important advances in terms of flexibility in the Siefore investment regime, the greater part of the resources that these companies can manage can only be invested in government securities, which despite offering lower risks also offer lower returns. Because our sensitivity exercises reflect that increases in the real interest rates of retirement funds have a very positive impact on pensions, we should also explore what else can be done in the Siefore investment regime to improve return rates and, in general, the benefits that the defined-contribution system can deliver to the affiliates.

3. Fiscal costs

As has been commented, most of the studies that have analyzed the effects of the reform to the IMSS pension system, have done it from the standpoint of the fiscal impact. The topic has been widely studied, always under the assumptions of representative individuals, and the general consensus that seems to emerge from the various studies is that the pension-fund reform allowed delimiting the fiscal cost of the pay-as-you-go sub-system of the IMSS under the old IVCM insurance plan. This cost would have grown with the expected demographic aging, with critical results for the country's public finances when the IMSS did not have the reserves to finance it.

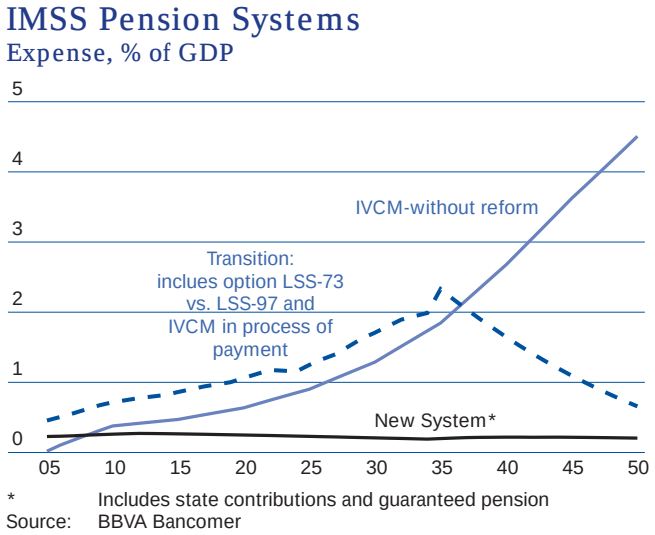
IMSS Pension Systems
Expense, % of GDP



* Includes state contributions and guaranteed pension
Source: BBVA Bancomer

Our projection results coincide, of course, with the general opinion of the previous studies in the sense that the reform had an important fiscal benefit. In accordance with our estimates, the difference between the expenditures under the inertial scenario and the new design (the total of governmental contributions and guaranteed pensions) is in the order of 61.4% of the 2004 GDP. See previous graph.

However, our analysis allows us to perceive that, despite the great fiscal benefits that were implicitly achieved when replacing the pay-as-you-go system with another of defined-contribution, the transition between the systems in the IMSS still imposes a significant fiscal effort (54.6% of the 2004 GDP). See attached graph.



* Includes state contributions and guaranteed pension
Source: BBVA Bancomer

The above is derived from the payment of pensions in process for retirees under the LSS-73 and because the generation in transition (affiliated prior to 1997) maintains very generous retirement conditions. On the one hand, these retirees can choose the system that best suits them between the LSS-73 and the LSS-97, and on the other, the pensions under the LSS-73 were once again increased with a reform to the LSS in 2001. Thus, the option for affiliates in transition to select their pension system at the time of retirement delays, in practice, the positive effects of the reform until 2035, when the generation in transition ends. Thus, the transition model does not provide an incentive for affiliates in transition to want to contribute regularly to the reformed system and acquire a financial education. This, of course, does not contribute to consolidating the operation of the new defined-contribution scheme and thus limits its potential benefits.

4. Other considerations

Our projections indicate that the new IMSS pension system has the capacity to continue strengthening financial savings in the Mexican economy. This will undoubtedly contribute to strengthen and develop even more the different financial markets of the country, generating important positive external factors for productive activity as well as a better allocation of resources. Moreover, under a more flexible investment regime, the financing of viable productive activities could be made possible in the future and

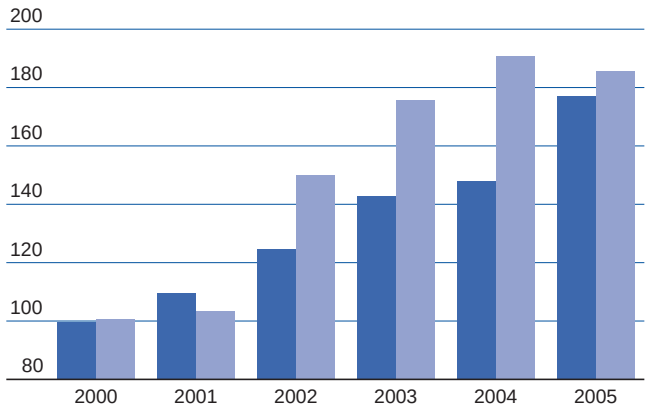
with high economic and social return, and thus benefit not only the return on workers' resources but the development of the country as well.

Nevertheless, from an overall view of all the different public pension systems operating in the country, it can be perceived that there is still a dual problem for policy makers with regard to these systems: a) macroeconomic-fiscal and b) microeconomic-social.

a) Macroeconomic-fiscal

In macroeconomic and fiscal terms, the public sector pensions remain, as a whole, an important source of internal dissavings and of pressure on the public finances of the country. This is because the pension funds that are still operating in most public institutions (state-owned firms, universities and local governments) do so under pay-as-you-go systems and register serious financial imbalances. As illustrated in the following graph, the magnitude of the pension expenditures of the federal public sector represents an amount practically equivalent to that of the revenues obtained by Pemex from its activities in the oil industry.

Pension Expense and Budgeted Revenue
Billions of pesos



Source: BBVA Bancomer

Even when the recent reform to the ISSSTE Law allows attending the more serious fiscal imbalances of the public pension systems under the pay-as-you-go and defined-benefit schemes, the pension fund commitments of the IMSS with its labor force will continue to generate pressure on the public budget, as will the pensions in the process of payment under the old IVCM plan of the LSS-73 and the transition expenses derived from the reform. Toward the future, all these commitments will demand an additional important fiscal effort for public finances. Just from the systems reformed In the IMSS and the ISSSTE, contingent liabilities can be expected of 91.7% of the 2004 GDP. See the attached chart.

Public Cost of IMSS and ISSSTE Pension Systems

Present value discounted, % of 2004 GDP

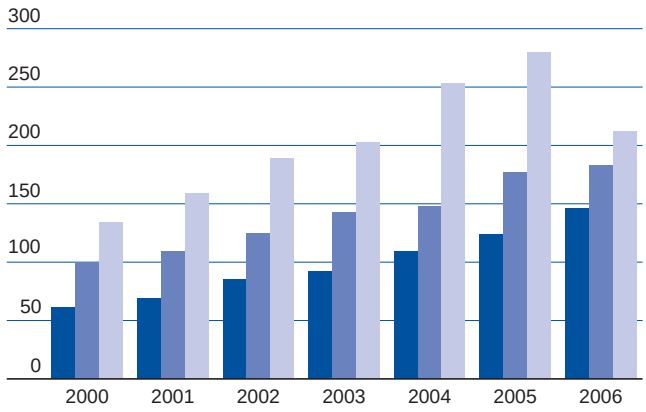
	2005-2010	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050	2005-2050
IMSS-IVCM in process										
Expense	1.9%	1.3%	0.9%	0.5%	0.2%	0.1%	0.0%	0.0%	0.0%	**4.3%**
Revenue	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**
Balance	-1.9%	-1.3%	-0.9%	-0.5%	-0.2%	-0.1%	0.0%	0.0%	0.0%	**-4.3%**
IMSS – Transition										
Expense	1.8%	3.9%	6.1%	8.5%	11.8%	15.4%	13.1%	8.8%	5.5%	**62.9%**
Revenue	0.2%	0.4%	0.8%	1.4%	2.2%	2.5%	0.0%	0.0%	0.0%	**6.5%**
Balance	-1.6%	-3.5%	-5.3%	-7.1%	-9.6%	-12.9%	-13.1%	-8.8%	-5.5%	**-56.4%**
IMSS – New design										
Government contribution	-1.3%	-1.4%	-1.3%	-1.2%	-1.1%	-1.0%	-0.9%	-0.7%	-0.6%	**-8.2%**
Contributions (RCV + IV)	-0.1%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	-0.3%	**-2.2%**
Minimum pension	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.2%	-0.4%	-0.4%	**-0.9%**
Reformed ISSSTE*	-3.2%	-4.1%	-3.8%	-3.3%	-2.8%	-2.2%	-1.7%	-1.2%	-1.0%	**-19.7%**
Total IMSS + ISSSTE	**-5.3%**	**-7.3%**	**-8.3%**	**-9.3%**	**-11.1%**	**-13.9%**	**-13.4%**	**-8.7%**	**-5.1%**	**-91.7%**

* Does not include minimum pension
Source: BBVA Bancomer

This invites us to think about how the country can have pension systems that are financially viable and that, at the same time, allow liberating resources in the short term toward other social priorities. See attached graph. This is a point of interest to which we pay particular attention in our proposal section.

Public Sector Programmable Expense

Billions of pesos



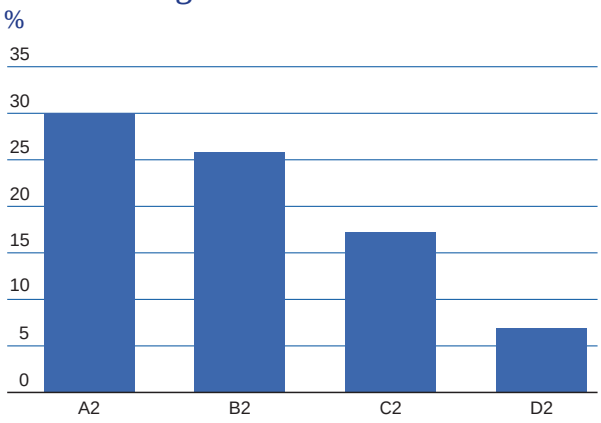
Source: BBVA Bancomer

b) Microeconomic-social

Even though in macroeconomic terms the fiscal bases that the pension-fund reforms grant are positive, the results of our projection indicate that it is still necessary to strengthen the IMSS defined-contribution scheme so that it can offer better benefits at a microeconomic level.

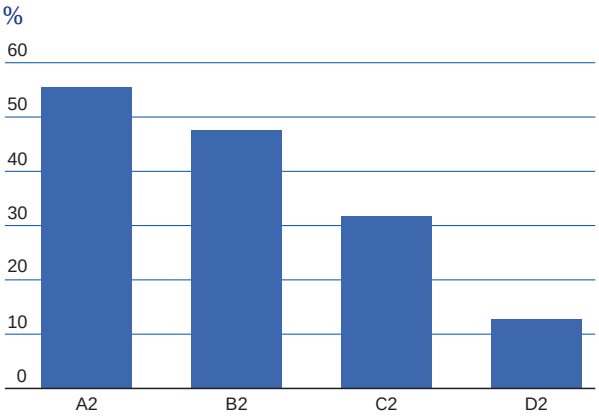
Our projections indicate that it is still necessary to attend to aspects beyond the pension fund sphere (for example, the links between education, productivity and employment) and of the defined-contribution mechanisms themselves in order to obtain pensions with a higher purchasing power. For example, without considering the possible use of the balance in the housing sub-account for financing a pension, the real average pension that the system could grant in 2050 to an affiliate with an average income of two minimum wages would represent, at present value, less than 40% of the current real minimum wage, a percentage that, of course, could be lower for people with a lower contribution density. In turn, the present value of the average pension would not cover 60% of the current basic food basket for this type of affiliates. See the following graphs.

Coverage of the Real Minimum Wage by the Present Value of the Real Average Pension in 2050*



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

Coverage of the Basic Food Basket by the Present Value of the Real Average Pension in 2050*



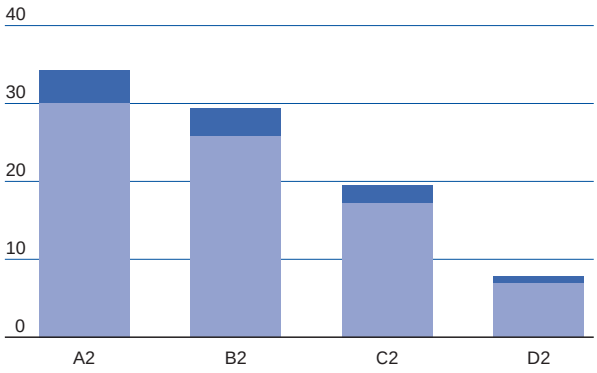
* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

However, the previous results are not inherent to the defined-contribution scheme, under the IMSS pension system. This system only delivers benefits in terms of the different inputs that it receives and of the conditions under which it operates. In this sense, the average pension levels serve to alert that its strengthening in the future will require also resolving productivity and employment problems in the economy that are beyond the pension fund sphere. For example, in December 2004, practically at the beginning of our projection period, the coverage of the basic food basket by the minimum wage was already 41.64%. See Meixueiro (2005).

Moreover, in the IMSS defined-contribution scheme, the variables that can increase the purchasing power of the pensions through higher balances in the individual accounts are the contribution density and the return, net of commissions. However, between both

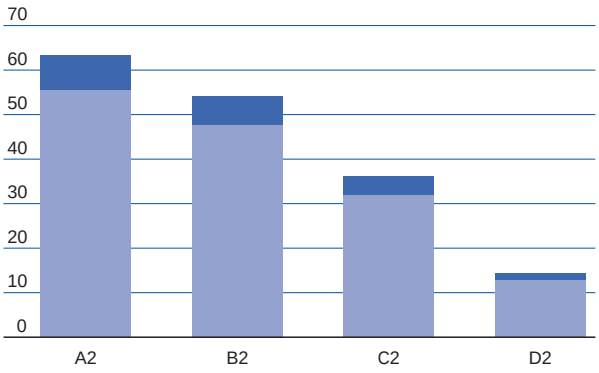
alternatives, the possibilities of a higher increase are found in perhaps taking advantage of better new risk-return strategies in the markets through an investment regime in continuous evolution, since the conditions of formal employment in the economy can impose limits sooner on possible increases in contribution densities and, at the same time, the intense competition between the Afore leads to increasingly lower margins for additional reductions in commissions as the industry approaches its optimum scale. For example, when an extreme case of "zero" commissions is considered, pensions improve only a little in terms of their purchasing power. Thus, for a non-assigned male affiliate of two minimum wages, the present value of the real average wage in 2050 would still not allow him to cover 40% of the current real minimum wage, or more than 60% of the basic food basket. See the following graphs.

Coverage of the Real Minimum Wage by the Present Value of the Real Average Pension in 2050*
%, case of 0% commissions



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

Coverage of the Basic Food Basket by the Present Value of the Real Average Pension in 2050*
%, case of 0% commissions



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

Based on what has been presented, we believe that in order to strengthen the defined-contribution schemes, it is necessary to first recognize that these systems deliver benefits only in terms of the different inputs that they receive and of the conditions in which they operate. In this sense, the levels and projected replacement rates for the new IMSS pension system offer valuable information on the mechanisms that it is necessary to strengthen in the future, but also serve to alert that this task requires a joint participation of the public and private sectors to resolve the productivity and employment problems that are actually outside the pension fund sphere.

In the following sections we present a series of measures that we believe could contribute toward establishing, through a joint participation, more solid defined-contribution pension systems in Mexico.

VIII. Proposals

The fiscal and social issues identified indicate that it is necessary to redesign the pension fund systems in the country. In this sense, we believe it is possible to build on the progress already made and make the pertinent adjustments to face the following challenges:

- Lack of portability of benefits for affiliates
- High fiscal costs in the public pension programs that still operate with defined-benefit schemes
- Modest pensions and replacement rates in the IMSS defined-contribution pension scheme
- Low effective coverage of pension benefits.

To meet the challenges mentioned, the following points are set forth: 1) a series of proposals that, as a whole, seek to strengthen the pension systems in Mexico, particularly the IMSS system, because of its great importance in terms of coverage; 2) an exercise that simulates the simultaneous application of a series of proposals to the IMSS defined-contribution scheme in order to show its combined effects on pension levels and replacement rates. This simulation considers our base economic scenario, although an alternative one is also considered, of greater depth in economic reforms and, finally, 3) some exercises are presented to evaluate the benefits of our proposals and their impact on the fiscal commitments of the state.

a) Establishing a National Pension System

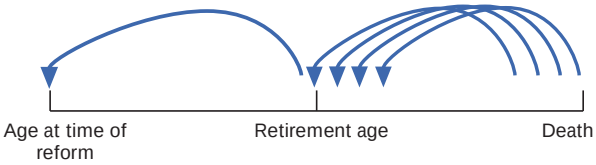
In Mexico, demographic factors in the next 50 years will aggravate the imbalances between revenues and expenditures of the defined-benefit pension plans, which in most of the public institutions are still operating under a pay-as-you-go mechanism. The aging of the population and lower birth rates will reduce the number of active workers per retiree, and the increase in life expectancy will extend the pension payment period. Thus, the trend toward lower revenues and higher expenditures point to the economic non-viability of these plans with high costs for the state and society.

This perspective demands, therefore, closing, as soon as possible, the defined-benefit schemes that are still operating under a pay-as-you-go model and moving on to plans that are viable in the long-term. For this, one clear alternative is the incorporation of defined-contribution mechanisms in Mexico's pension systems. The defined-contribution schemes by design are viable in the long-term, since the affiliate always finds a correspondence between the contributions he/she makes and the benefits he obtains, that is, between his/her obligations and his claims.

Closing the operation of the pension systems currently operating under a pay-as-you-go model requires transparent mechanisms that allow recognizing the rights of affiliates in the different subsystems currently existing in the country, at the same time, transferring them to other systems with a defined-contribution design. A recognition bond issued

by the state is an instrument used successfully to this end by many countries that have reformed their pension systems and one that was recently introduced in Mexico through a reform to the ISSSTE Law. The recognition bond translates pension promises made under a defined-benefit program into money, which the worker receives upon retirement, together with the benefits to which he is entitled under the new pension plan.

Operation of a Recognition Bond



$$\text{Bond} = \frac{1}{(1+r)^{EJ-ER}} * \sum_{i=1}^{EV-EJ} \frac{C * SBC}{(1+r)^{i}}$$

Where:
SBC = Base wage for determining social security contributions;
C = Percentage of rights; EV = Life expectancy;
EJ = Worker's age at retirement; ER = Age at time of reform

Source: BBVA Bancomer

Our proposal is that Mexico take advantage of the international experience and, at the same time, build on the new experience of the ISSSTE with recognition bonds to close the various defined-benefit plans that are still operating with pay-as-you-go mechanisms.

The application of the proposal must, however, observe four conditions: 1) not to modify the pensions of the affiliates already retired (their pension must continue, payable by the corresponding state or public agency); 2) the rights of the people paying into the system to be reformed must be valued with the recognition bond and transferred to the new defined-contribution scheme; 3) once the reform becomes effective, all affiliates must only pay into the new defined-contribution scheme; and 4) the defined-contribution design must incorporate joint support mechanisms, either in the form of a guaranteed pension, a voluntary savings plan with co-financing by the State or a combination of both. On these points other proposals are developed further on.

The use of recognition bonds and the converting into money the pension promises under the various subsystems will allow the portability of such rights between the subsystems for the benefit of the affiliate, since there could be advances toward building a single public pension system at the federal level, as was suggested by Solis (2000). Furthermore, our diagnosis of the problems being faced by the pension systems in Mexico, leads us to join the more concrete proposal of the First National Finance Convention of 2004 for building a National Pension System (SNP for its Spanish initials) based on defined-contribution programs and pension guarantees.

The above is because we believe that in order to resolve the fiscal and social challenges of the country with regard to pensions, it is necessary to have a pension fund design that

is viable and at the same time mutually binding. A National Pension System would allow incorporating independent workers in the pension fund program based on individual accounts, and at the same time improve the pensions of those persons who are currently contributing only intermittently into one or several pension subsystems. Thus, individuals would preserve their pension fund rights at all times, and independently of the social security institution that they pay into, could have greater labor mobility, thereby benefiting their professional development, and at the same time, their contribution density, which is key to effectively obtaining better pensions.

The above having been said, overcoming the fragmentation of the public pension systems would additionally provide other benefits, such as: ownership guarantees over retirement funds, having a transparent pension fund system (individual accounts with names and last names) that is fair (each person receives in terms of what he contributes) and secure (the retirement funds will always be in the individual accounts), in contrast with the uncertain situation surrounding the pension subsystems which, under the current pay-as-you-go mechanisms, are already operating with an actuarial deficit.

It is due to this that we believe that the recent reform to the ISSSTE Law already represents significant progress toward the building of the National Pension System that the country requires, but it must also be noted that the reform of the ISSSTE pension system and the simulations that we have carried out in Section VI, are already an indication that in order for the defined-contribution scheme to effectively protect affiliates, it is also necessary for them to make the appropriate contributions. As shown in the chart, the new financial program of the ISSSTE considers mandatory contributions that are 74% higher than in the case of the IMSS, in addition to support mechanisms such as the government's "social quota" and a joint savings commitment. See attached chart.

The ISSSTE Reform reinforces the Importance of the Defined-Contribution Mechanisms in Mexico's Pension Systems

- Positive for **ISSSTE**: offers long-term economic viability
- Positive for **Public Finances**: reduces fiscal pressures
- Positive for **Affiliates**: ownership rights and legal protection

- Positive for **Pension Systems**: offers a more permanent nature to the defined-contribution schemes within the design of the systems
- Positive for **Reform Processes**: signals the need of greater contributions for better pensions

Financial regime	IMSS	ISSSTE
Contributions	6.5% SBC	11.3% SBC
Social quota (gov't support)	5.5% SMGVDF	5.5% SMGVDF
Joint savings (state co-financing)	n.a.	3.25 x 1 peso*
Guaranteed pension	1 SM	2 SM

* Limit of 6.5% of SBC (base wage for determining social security contributions)
n.a. not available
Source: BBVA Bancomer

b) Increasing mandatory contributions in the IMSS defined-contribution scheme

A pension system with defined-contributions is a transparent and fair savings mechanism. All affiliates obtain benefits in terms of the funds they contribute, but also because of its design, the system can neither provide less or more. Because of this, it becomes imperative for policy makers to reinforce the contribution channels in the system as well as the financial know-how of affiliates regarding the operation of this type of system so that they can truly take advantage of it as a long-term savings mechanism.

Even though higher contributions to the system can and must be boosted in different ways, such as mandatory, voluntary and joint contributions, in this proposal we focus on the mandatory contributions, because these represent the vertebral column of defined-contribution schemes and long-term savings pension systems. Later, in other proposals, other types of contributions are discussed.

As we anticipated in our diagnosis, the modest pensions and replacement rates that the IMSS defined-contribution scheme offers, indicate that there should be a counterpart and a possible explanation for the low contribution rates paid into the system. Actually, when the nature of contributions in Mexico is reviewed, two facts stand out: 1) the contributions made by the affiliate, who is the main beneficiary of the pension system, are very low, and, 2) the contributions as a whole, including the mandatory support of employers and of the state, are also low in terms of international standards.

With regard to the first point, it should be recalled that the contributions to the IMSS retirement, severance and life insurance program (RCV for its Spanish initials) are tripartite, with contributions from the workers, the employer and the state. In terms of overall contributions, the worker, who is the main beneficiary or the person that is the direct recipient of the results of the defined-contribution system, is the party that contributes the least. As a percentage of total contributions, the worker's share is 13.9% and even for retirement—the concept that accumulates his retirement funds—his contribution represents 0%, which denotes a serious problem of origin in the design of the current system of defined-contributions and which limits its capacity to provide high pensions to the affiliates. See attached chart.

Mandatory Contributions in RCV

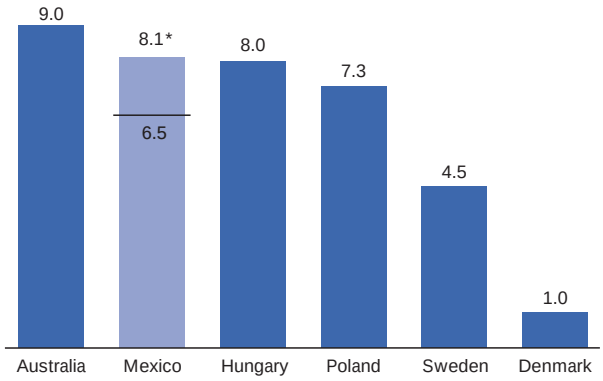
	SBC	% of total
State	1.796%	22.3%
Severance at old age and old age	0.225%	
Social quota*	1.571%	
Employer	5.150%	63.8%
Worker	1.125%	13.9%
Severance at old age and old age	1.125%	
Retirement	0.000%	
Total	**8.071%**	**100.0%**

* Considers a social quota (government contribution to savings) of 5.5% of the SMGVDF (current general minimum wage for Mexico City) for each day of work for an average worker earning 3.5 minimum wages

Source: BBVA Bancomer

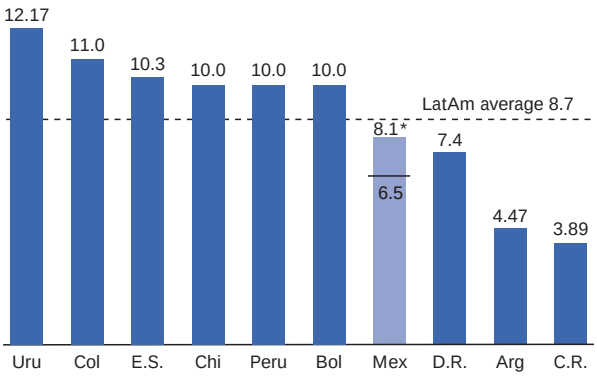
Regarding the second point, mandatory contribution rates in Mexico are relatively low when compared with those of other countries with defined-contribution schemes. For example, the contribution rate in Mexico, including the "social quota", is lower than the contribution rate of a more developed economy such as that of Australia, but it is also lower than the rates of other economies of lower or similar development in Latin America. See attached graphs.

Contribution Rates for Capitalization
% of worker's income



* Includes social quota
Source: OECD, Pensions at a Glance, 2005

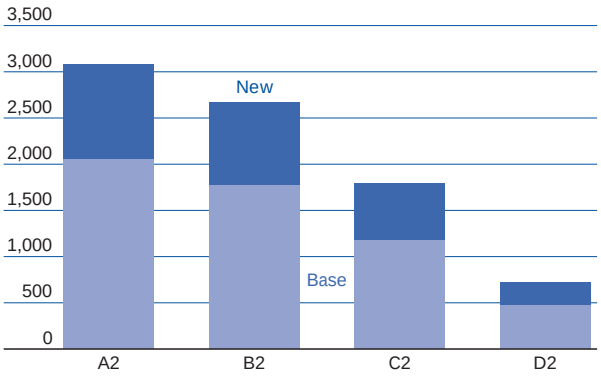
Contribution Rates for Capitalization
% of worker's income



* Contribution for RCV 6.5% + social quota of 5.5% of the SMGVDF for each day of work (equivalent to 1.6% of the wage of an average worker earning 3.5 minimum wages)
Source: AIOS Bulletin, Table No. 32 (December 2006)

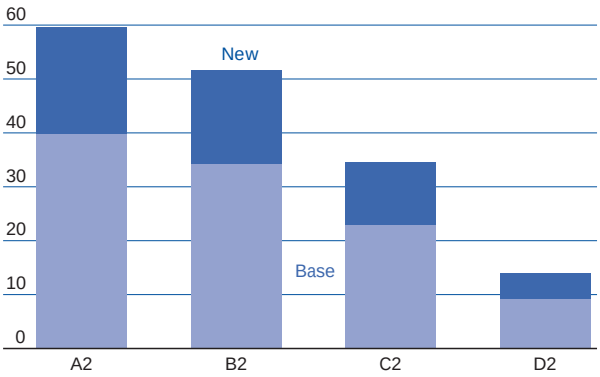
Our proposal for correcting the serious problem that limits and conditions in origin the results of the defined-contribution scheme in the IMSS pension system is to increase the total mandatory contributions for retirement, severance and old age (RCV) by 4.8% of the wage for determining social security contributions. This increase would allow bringing mandatory IMSS contributions in line with those of the ISSSTE and take Mexico to contribution rates more in accordance with its development level.

Effect of Increasing RCV Contributions 4.8%
Average pension in 2050, constant 2004 pesos



* Case of non-assigned affiliate men
Source: BBVA Bancomer

Effect of Increasing RCV Contributions 4.8%
Replacement rate in 2050, % last 10 years*



* Case of non-assigned affiliate men
Source: BBVA Bancomer

In accordance with our projections, among other benefits, the proposal would tend to raise the average pension 51.3% and the replacement rate 13.5 percentage points.

The above, similar to other exercises, uses as reference our base scenario and non-assigned affiliate workers with two minimum wages. Of course, even with the increases in contributions, the differences in the pensions to be obtained would be maintained in accordance with the affiliate's contribution density. But this, in view of the perspective of a better pension could also become an incentive to contribute on a more regular basis and thereby obtain greater benefits. See the previous graphs.

The 4.8% increase in mandatory contributions for RCV should be immediate for affiliates to receive the benefits over a greater time period of the capitalization mechanisms offered by the IMSS defined-contribution scheme. However, a more gradual alternative could be annual increases of 0.5% so as to mitigate the short-term impact on contributors' income. Nevertheless, prolonging the time for implementing the increases would also increase the risk that the reform would not be completed with the desired effect.

On the other hand, an increase in mandatory contributions could also motivate a deeper interest and more regular contributions into the system by affiliates in transition. This could be by earmarking part of the increase to the retirement sub-account, since affiliates in transition can choose either the LSS-97 or the LSS-73 for their retirement. If they choose the LSS-73, they can withdraw in just one movement the funds in the retirement sub-account. Thus, under both pension options, there would be conditions for affiliates in transition to obtain benefits when contributing more regularly: if in the end they choose the LSS-97, they could accumulate more resources for a greater annuity and if, in the end, they should choose the LSS-73, they could obtain additional complementary savings that they can withdraw in just one movement.

c) Increasing the initial amount for pension in the IMSS defined-contribution scheme

Another alternative to improve the pensions that the defined-contribution scheme offers lies in finding mechanisms that allow increasing the initial amount for the pension.[71] It should be recalled that under the current legislation, the pension is exclusively financed with the cumulative balance in the RCV sub-account—should voluntary savings not exist— and as an extraordinary situation, with the resources of the housing sub-account, when the worker has not used it to obtain a loan from the Infonavit.

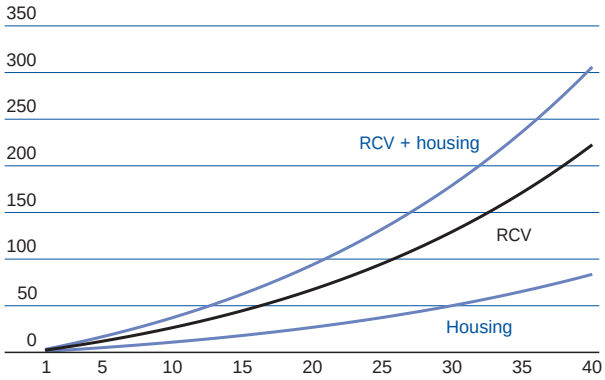
Our proposal to increase the initial amount of the pension lies in respecting the affiliate's free to choose and recognize that he can have in his individual account more resources for financing his pension than what the Siefore actually has. Thus, what we are proposing is that, if it is more to his interest, the affiliate should have the possibility of targeting his contributions and the balance of his housing sub-account toward financing his pension prior to his retirement so that he may take advantage over a greater time period of the capitalization mechanisms in the IMSS defined-contribution scheme and the higher expected profitability rates of the Siefore compared to those of the Infonavit.[72] The

71 The initial amount is the amount required to contract life annuity and survival insurance with an insurance institution.
72 The return rate in the housing sub-account is determined based on the remnant of the operation of the Infonavit and depends on the active rate that the Infonavit charges for its loans, its operating expenses and its past-due loans or insolvent portfolio.

proposal can be quite attractive and beneficial for all those persons who already have a home and/or do not intend to use their Infonavit credit to acquire a new one.

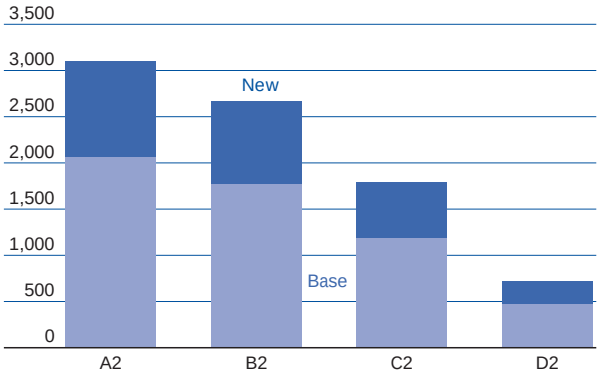
A simple simulation exercise that incorporates the funds in the housing sub-account with those of the RCV until retirement time, already shows that pensions improve significantly and in a similar amount to that resulting from increasing the mandatory contributions by 4.8% of the workers' wage for determining social security contributions, seen in the previous exercise. That is, that the real average pension increases on average 51.4% and the replacement rates rise by 13.5 percentage points. See the attached graphs.

Retirement Savings Accumulated Balance in Individual Account
Constant pesos



Source: BBVA Bancomer

Effect of Adding Housing Resources to those of RCV
Average pension in 2050*, constant 2004 pesos



* Case of non-assigned affiliate men. Assumes that the housing balance is added upon retirement

Source: BBVA Bancomer

d) Further strengthening the risk-return options in the Siefore

Our sensitivity exercises showed that in a system of defined-contributions and the capitalization of those contributions, the interest rate on retirement funds has a significant impact on the cumulative savings balances and on the pensions these can finance. It is not surprising, therefore, that improving IMSS pensions will also require continuously improving the conditions for obtaining better returns for retirement funds.

In Mexico, the above is of course linked to strong competition among the Afore that ensure the conditions for the funds to be invested in an efficient and innovative manner by the Siefore. However, the magnitude of the return that the Siefore can actually offer to the affiliates fundamentally depends on the investment regime, which determines the investment options for the retirement funds. The investment regime is the one that will ultimately determine the risk/return possibilities for the affiliates' resources and the conditions of competition among the Afore are those that ensure that the funds are invested in the most efficient manner.

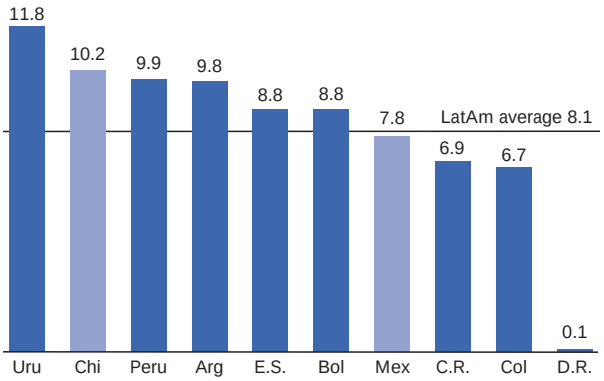
As can be recalled from our analysis in Section IV, in a decade of operation of the Retirement Savings System, the Siefore investment framework has made significant progress in terms of flexibility in the investment of pension funds. Furthermore, the new reforms to the Law for the Retirement Savings System and to the investment regime published in the Official Gazette of the Federation in June and July 2007 already anticipate additional firm steps so that affiliates can have better risk-return options in accordance with their age.[73] In this sense, in addition to the expected expansion in the number of Siefore, the possibility that some of these pension fund can increase their exposure to a maximum of 30% in equity securities and must make use of VAR (value at risk) parameters to control the risk on their investment, already offers better conditions and tools for the Siefore to obtain better results.

However, due to the importance that the return derived from retirement funds has for pensions, it is worth reviewing other aspects of the investment regime that could imply greater benefits for affiliates. It should be recalled that one additional percentage point in profitability increases the real average pension by 28.4%.

As shown in the following graphs, the historic return that pension funds register in Mexico has been lower than the average of other defined-contribution schemes in Latin America. When the assignment of pension fund portfolio investment in different countries is reviewed, the data show that, in Mexico's case, the funds are notoriously concentrated in government debt instruments. This situation, for example, is clearly in contrast with the case of Chile, a country that not only invests a considerable amount of pension fund resources in securities other than government debt instruments (private fixed or variable income instruments), but also registers higher than average return rates for Latin America.

Real Yield in Defined-Contribution Systems

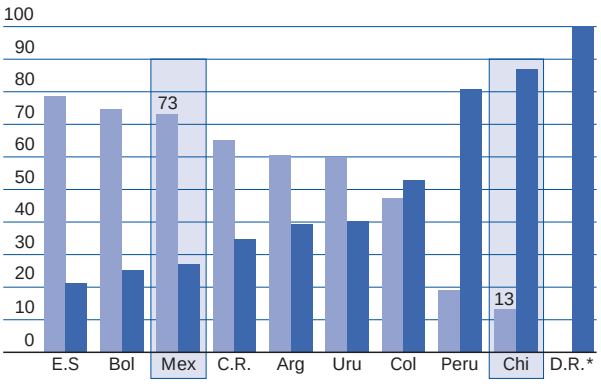
Real historic % at December 2006



Source: AIOS December 2006

Breakdown of Funds Under Management

%, total of portfolios at December 2006



Government debt Other instruments

* Corresponds to pension funds in the individual capitalization system

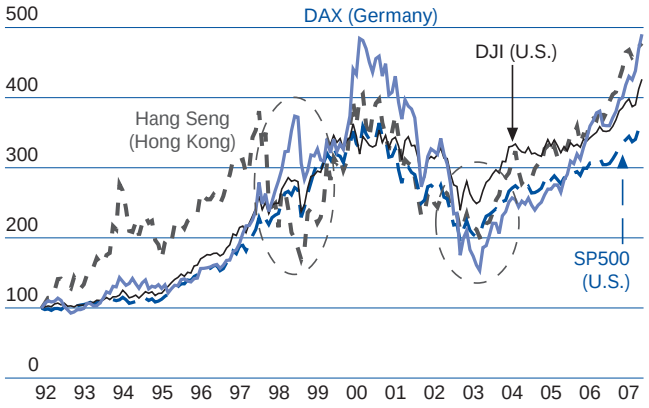
Source: AIOS December 2006

73 To this respect, see "El Sistema de Ahorro para el Retiro: Un futuro promisorio" ("The Retirement Savings System. A promissory future"), a presentation by Dr. Moises Schwartz Rosenthal, President of Consar, in the XIII National Forum of Specialists in Social Security, College of Public Accountants of Mexico, C.A., July 4, 2007. Available at www.consar.gob.mx

Even though, in Mexico the legal framework explicitly indicates that "the investment regime" (of the Siefore) should have as its main objective providing the best security and return for workers' resources" (Art. 43 LSAR), the bias in the investment portfolios toward government debt instruments is due, among other reasons, to the background of instability and economic crisis that the country has experienced in past decades, and in the recent past to various events on the international financial markets, which have caused abrupt adjustments in the stock markets and on alternative investment instruments compared to those of fixed income. Examples of this are; the bursting of the bubble and the drop in the stock prices of companies linked to the Internet (many of the famous dot-com firms), the scandals of corporate government, the Middle East crisis, terrorist attacks, etc.

However, despite the fact that conditions such as those mentioned above have contributed so that fixed income instruments (particularly in government bonds) are considered safe investments, though with moderate returns, the international experience shows on the one hand that adjustments on the stock markets are temporary and, in general, followed by sustained recovery trends. For example, after the drops in the international stock markets of 1997 and 2001, some leading indices at a world level, such as the Dow Jones Industrial Average (USA), Standard & Poor's 500 (USA), DAX (Germany) and Hang Seng (Hong Kong) have registered sustained recoveries. See attached graph.

Stock Indexes Worldwide
December 1991 = 100



Source: BBVA Bancomer with Reuters data

In this sense, the cautiousness in Mexico's investment regime as regards variable income instruments and securities, could, to a certain extent be excessive and not necessarily offer the best conditions of security and return for the savings of the affiliate owners of pension fund resources. For example, taking as reference the information of Dimson et al (2002) on risk premiums and long-term surplus returns (for different types of assets on the global capital markets), it is possible to find evidence that securities offer higher returns per risk unit than fixed income securities, such as bonds, when the Sharpe ratio

is considered for this type of assets.[74] The data reveal that in the long-term, securities on average offer three times the excess return of bonds per each risk unit. See attached chart.

Long-term Yields by Asset Type

1900 - 2000 period, annual %

	Stocks		Bonds		Sharpe ratio*	
	Average	Std. dev.	Average	Std. dev.	Stocks	Bonds
Canada	7.7	16.8	2.4	10.6	0.53	0.47
United Kingdom	7.6	20.0	2.3	14.5	0.48	0.18
Australia	9.0	17.7	1.9	13.0	0.47	0.10
The Netherlands	7.7	21.0	1.5	9.4	0.46	0.47
Switzerland	6.9	20.4	3.1	8.0	0.40	0.26
Sweden	9.9	22.8	3.1	12.7	0.38	0.24
Denmark	6.2	20.1	3.3	12.5	0.36	0.18
Ireland	7.0	22.2	2.4	13.3	0.35	0.02
United States	8.7	20.2	2.1	10.0	0.29	0.03
Belgium	4.8	22.8	0.3	12.1	0.28	-0.07
Spain	5.8	22.0	1.9	12.0	0.26	0.06
Japan	9.3	30.3	1.3	20.9	0.23	0.02
France	6.3	23.1	0.1	14.4	0.21	0.01
Italy	6.8	29.4	-0.8	14.4	0.19	-0.15
Germany	8.8	32.3	0.3	15.9	0.16	-0.02
South Africa	9.1	22.8	1.9	10.6	0.14	-0.10
Average	**7.60**	**22.74**	**1.69**	**12.77**	**0.32**	**0.11**

* High positive Sharpe ratios indicate a higher yield surplus per risk unit. In the long term, stocks triple on average the yield surplus of bonds per risk unit.
Source: BBVA Bancomer based on Dimson *et al* (2002)

With this background, it is understandable that in many developed countries, pension funds invest not only in equities and stock indices but also in a wide range of asset types, which include among others: real estate or private capital investments. For example, the following chart illustrates the pension fund investment regime for different member countries of the OECD, while in Appendix 6 there is a chart with securities holdings under this investment regime for the year 2004.

74 The Sharpe ratio is a financial performance indicator. It measures excess return of an asset per risk unit. The excess return is equal to the return that an asset registers above the return that another asset offers, considered as risk-free on the market (characteristically a short-term government debt instrument). Risk is determined as measured by the standard return deviation. The greater the standard deviation and the greater dispersion, the higher the risk is.

Pension Funds Investment Regime

OECD countries, %

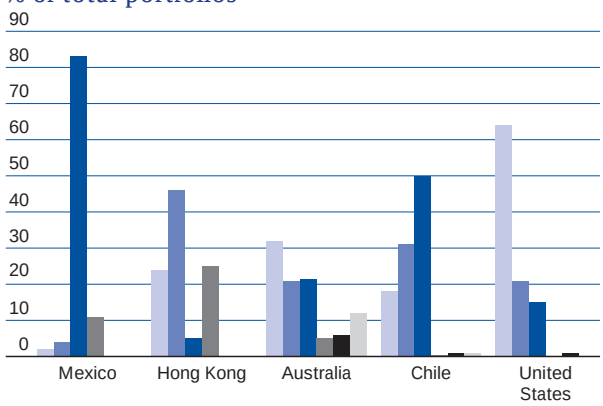
	Fixed income corporate	Land & constructions (real estate)	Investment funds	Stocks
Australia	100	100	100	100
Austria	100	20	100	50
Belgium	100	40	30	100
Canada	100	25	100	100
Czech Republic	100	100	25	25
Denmark	nd	40	40	70
Finland	100	40	100	50
France	100	nd	nd	65
Germany	50	25	30	100
Hungary	40	nd	50	50
Ireland	100	100	100	50
Italy	100	100	20	100
Japan	100	100	100	100
Korea	nd	15	nd	10
Luxembourg	100	100	100	100
The Netherlands	100	100	100	100
New Zealand	100	100	100	100
Mexico	35	0	0	15
Norway	30	100	30	35
Poland	100	nd	15	40
Portugal	60	45	30	55
Spain	100	100	100	100
Sweden	nd	100	nd	25
Switzerland	nd	50	nd	50
United Kingdom	100	100	100	100
United States	100	100	100	100
Average	**87**	**70**	**67**	**69**

Source: OECD, Pension Markets in Focus, published June 2005 with information through 2004

Moreover, many pension funds in developed countries have also sought to complement and expand their availability of asset types with a strategy of greater exposure to international assets so as to reduce the so-called "country bias" in their portfolios and improve their risk diversification. See attached graph.

Typical Pension Fund Portfolios

% of total portfolios



Source: Hazel McNeilage, Principal Global Investors 2006

A specific example of a pension fund subject to a flexible investment program in a developed country is CalPERS. This is the pension fund for workers of the State of California and for its portfolio of managed assets—of almost US$235 billion—it is the largest public pension fund in the United States. The CalPERS resources are assigned strategically over a wide range of local and foreign markets so as to obtain high returns and a greatly diversified portfolio.

Generally, the type of assets that the fund handles are investments in projects of the State of California, securities (including a program known as AIM or Alternative Investment Management, which allows capital associations, investment in private capital, a share in initial public offerings (IPO's), direct investment in companies, acquisitions, etc.), fixed income instruments and real estate investments. See attached chart.

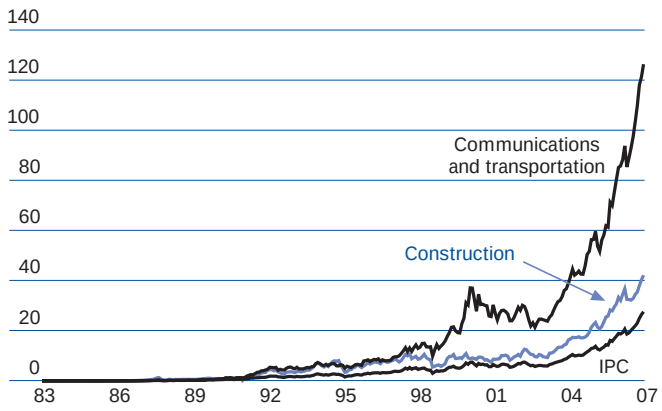
CalPERS: Assignment of Assets through March 31, 2007

Type of asset	Market value US$ billions	Assignment %	Target assignment* %
Cash & equivalents	2.7	1.1	0.0
Total AIM: direct and in association	13.6	5.8	6.0
Total in Global Fixed Income	54.9	23.4	26.0
Stocks			
Local	92.2	39.3	40.0
International	51.9	22.1	20.0
Total in stocks	144.1	61.4	60.0
Total in real estate	19.1	8.3	8.0
Fund Total	**234.8**	**100.0**	**100.0**

* Effective as of January 1, 2005
Source: CalPERS

Because of the above, a possible route to strengthen even more the latest and most important advances in the flexibility of the Siefore investment framework lies in expanding further the asset types at its disposal. In this sense, our proposal is that new investment vehicles be introduced, such as other types of investment funds. Thus, the Siefore could invest in specialized funds such as private capital, mutual funds, infrastructure and raw materials. Also, the current list of stock indices allowed could be expanded to stock indices of emerging economies with a high potential for economic growth, and toward the future in direct investment in stock market securities.

Mexican Stock Exchange Price and Quotations Index (IPC)
Thousands of points



Source: BBVA Bancomer with Reuters data

The proposed modifications will allow greater direct and specialized participation of the Siefore on the different markets and/or sectors in expansion, in emerging economies with high profitability such as China, India and Brazil, and in sectors related to infrastructure, energy, real estate and services, such as those related to health and tourism. In turn, on the domestic market, a greater number of investment vehicles for the Siefore would allow developing new financial markets and instruments exactly as foreseen In the Retirement Savings System Law. For example, a securities market specialized in infrastructure could be endowed with liquidity by the Siefore. However, In these cases, the investment regime would have to consider that the participation of the Siefore in such markets be guided only by criteria of return and risk in the investment projects and, for that very reason, remain independent of possible considerations of industrial policy, so that the main interest would always be protecting the worker, who is the ultimate owner of the resources.

In a second phase, it would be necessary to expand the possibilities for diversification of the Siefore portfolios. To this end, we propose increasing, or even eliminating in the medium term, the 20% limit that still exists for investments abroad given that this restriction impedes the structuring of global portfolios that allow taking better advantage of risk/return opportunities for the pension funds. From a technical standpoint, this proposal is more efficient in terms of risk management than the country-bias criterion, since risks can be controlled with value at risk (VAR) parameters, sensitivity limits for the portfolios, or through stop-loss rules.

In the future, a wide range of assets and of diversification possibilities in the portfolios will allow paving the way for the development of financial products with asymmetric risks that offer higher returns with lower risks. The Siefore could then make use of a new generation of funds known as “total return funds”, which, through tactical selection strategies, seek to maximize the total return of a portfolio in accordance with prudent investment management. In this type of funds, diversification allows controlling return volatility, identifying high-return assets through a tactical investment strategy, consolidat-

ing higher returns through the use of structured products and derivative instruments, and designing hedging plans.

e) Targeting the support of the "social quota" even more on lower-income affiliates

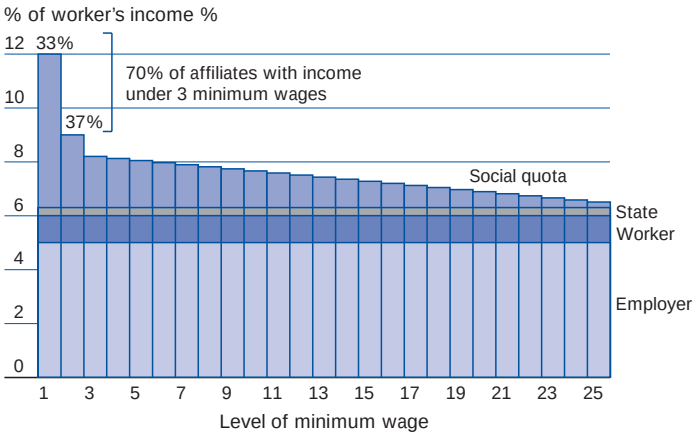
The IMSS defined-contribution scheme is an efficient long-term savings mechanism that also offers its affiliates property rights over their retirement funds. This type of rights had never been available to affiliates by a social security institute in Mexico prior to the reform of the IMSS Law in 1995, and clearly represents important progress in pension protection in the country.

However, the operation and protection of the IMSS defined-contribution scheme is restricted by the conditions of informal labor relations in Mexico that have a bearing on the existence of low contribution densities in a pension system that specifically bases its results on the contributions that it receives. Thus, increasing the amount of benefits that the pension system can deliver to its affiliates demands attending those situations thoroughly that are beyond the capacities of the system itself. How to attend some of these conditions is commented further on in other proposals.

Nevertheless, within the IMSS defined-contribution scheme itself, there are mechanisms that can be reinforced or even complemented with other new ones to improve the amount of benefits to its affiliates. Following, the government contribution to retirement savings (the "social quota") is reviewed as one on the important support mechanisms of the system.

The federal government contributions to retirement savings in the individual accounts under the "social quota" heading are an important benefit for affiliates to the defined-contribution pension system.[75] This is especially true for those with the lowest incomes in the defined-contribution scheme, since in proportion to the affiliate's income, the "social quota" is always higher for persons with lower-incomes. See attached graph.

Contributions for Retirement, Severance at Old Age and Old Age (RCV) Insurance



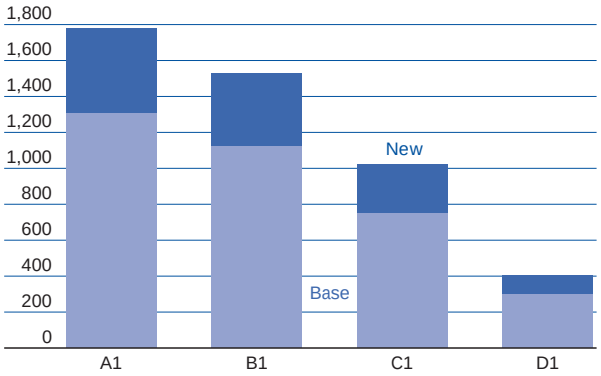
Source: BBVA Bancomer

75 A monthly contribution by the federal government to the individual account for each day paid in and whose initial price was equivalent to 5.5% of the general current minimum wage in Mexico City on July 1st, 2007. The fixed value of that price will be updated quarterly as per the national consumer price index.

It is due to the positive and differentiated impact of the "social quota" in the contributions of lower-income workers that our proposal consists in targeting this support instrument even more on lower-income affiliates. This entails always taking care that the increase in benefits for those groups does not cause unsustainable fiscal costs for the state. We believe that a viable alternative, among many other possibilities, is that the federal government provide this special contribution to the individual retirement accounts to affiliates in two income categories: one contribution would be based on 11% of the SMGVDF (the general and current minimum wage in Mexico City) instead of the current 5.5% for persons earning up to three minimum wages and a contribution of 0% for persons with incomes higher than 3 minimum wages.

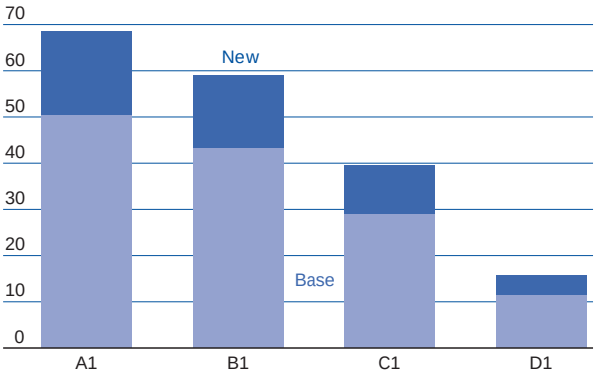
This measure would allow benefiting 70% of the current affiliates and, in particular, those with lower-income. As illustrated on the attached graph, the real projected average pension, for example for affiliates with up to one minimum salary, would be increased 36.6% and its replacement rate 12.2 percentage points on average.

Effect of a Social Quota of 11%
Average pension in 2050*, constant 2004 pesos



* Case of non-assigned affiliate men earning 1 minimum wage
Source: BBVA Bancomer

Effect of a Social Quota of 11%
Replacement rate in 2050, % last ten years*



* Case of non-assigned affiliate men earning 1 minimum wage
Source: BBVA Bancomer

From a fiscal standpoint, the measure applied as proposed does not significantly increase the fiscal costs. These would increase in present value from 8.2% to 9.9% of 2004 GDP. This is due to both the contribution density of the groups favored and to a partial compensation of the fiscal cost that results in the case of workers in transition, because, when those workers decide to become pensioners under LSS-73, the federal government recovers the "social quota" contributions with their respective returns. In contrast, to equally grant all affiliates an 11% increase in the "social quota" would raise the fiscal costs to 14.7% of GDP.

f) Strengthening the pillar of joint support in the IMSS defined-contribution scheme

Our diagnosis revealed that a significant number of affiliates to the IMSS defined-contribution scheme, due to their low contribution density, will not be able to comply with the 1,250 weeks required to have access to the pension guaranteed by the state. Naturally, this places affiliates in serious risk of having to face poverty in their old age. See attached chart.

Coverage of the Guaranteed Pension

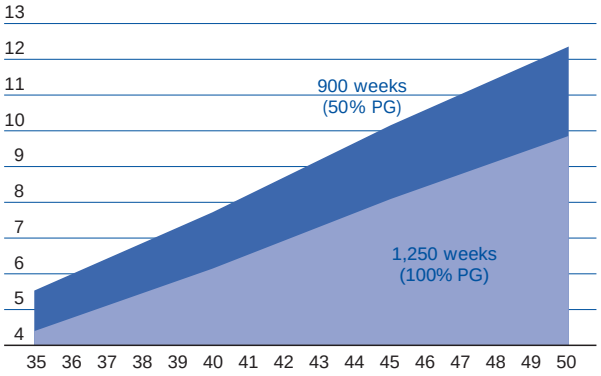
	2035	2040	2045	2050
Old-age pensioners	8.1	11.3	14.8	17.9
With right to guarantee	4.4	6.1	8.1	9.9
With guaranteed pension	0.3	1.8	3.3	4.3
Without right to guarantee**	3.7	5.1	6.7	8.1

* Projection under base scenario
** Do not comply with 1,250 weeks of contributions
Note: the sum of the partial figures may not coincide with the total due to rounding-out
Source: BBVA Bancomer

To face this problem, the proposal is to ease the eligibility requirement for a guaranteed pension, but taking care also not to discourage the contribution effort of the majority of affiliates in the system. The specific proposal is that, after 900 weeks of paid-in contributions, affiliates would have the right to 50% of the guaranteed pension and that this percentage of the pension would be gradually increased by seven percentage points for every 50 additional weeks of contributions, until reaching 100% with the 1250 weeks of contributions stipulated by Law.

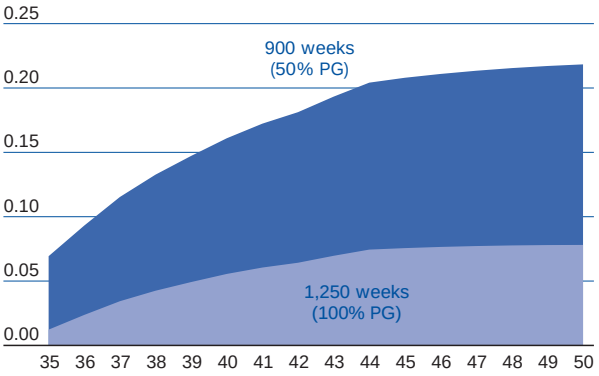
This measure would allow ensuring an income in their old age for many persons who, under the current legal conditions would be excluded, and would also maintain the incentives to pay into the system for all affiliates. The above is because the rule is maintained that those who contribute the most into the system should obtain the greatest benefits. According to our projections, the proposal would allow providing an income in old age to 25.4% more affiliates with low contribution density, and the fiscal costs of this measure would increase from 0.95% to 1.80% of 2004 GDP.[76] See the attached graphs.

Persons with Right to a Guaranteed Pension (PG)
Millions of persons with coverage



Source: BBVA Bancomer

Persons with Right to a Guaranteed Pension (PG)
Fiscal cost, % of 2004 GDP



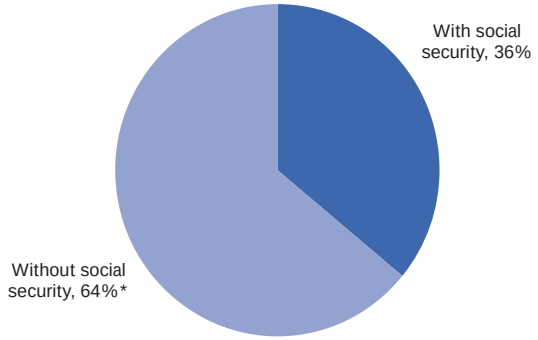
Source: BBVA Bancomer

76 This is a conservative estimate that considers the extreme case where affiliates who potentially can pay social security contributions between 900 and 1250 weeks choose to pay 900 weeks and obtain a half guaranteed pension. With a greater number of weeks paid, the fiscal costs of the associated guaranteed pensions would be compensated at least partly also through additional contributions.

g) Establishing a program of government co-financing

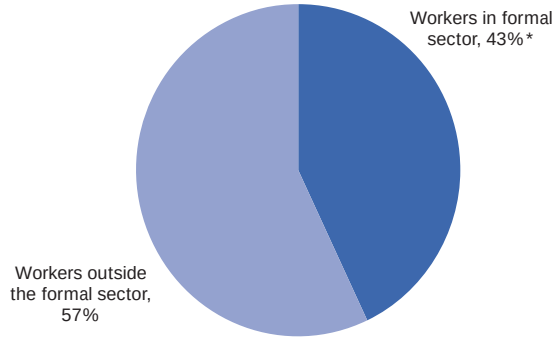
It is not possible for a country like Mexico to meet a social security and protection objective for its population upon reaching old age if public policy measures are not taken into account that would allow incorporating independent and informal workers in the pension systems, simply due to two facts: 64% of the working population does not have access to social security services and 57% of the actively working population is outside the formal sector. See attached graphs.

Employed Population
% of total, 2006



* Estimated based on access to health institutions
Source: BBVA Bancomer

Salaried Employed Population
% of total, 2006



* Refers to employment in the public and private sectors
Source: BBVA Bancomer

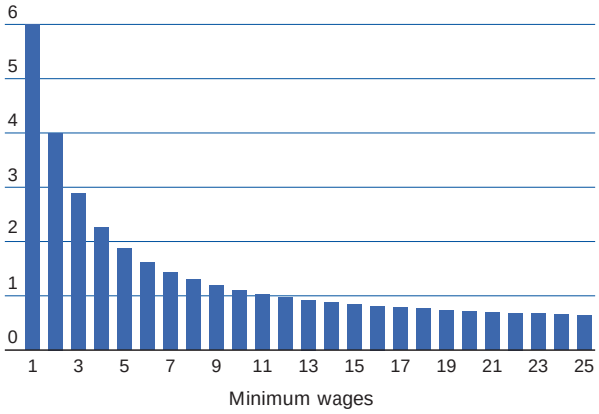
To expand the coverage of the defined-contribution schemes to independent and informal workers, the proposal is to incorporate a program of government co-financing in the individual accounts provided for independent workers within the Retirement Savings System. The proposed plan to be applied consists in that the government make a monthly contribution to the long-term savings sub-account in the individual accounts of independent workers for every 30 pesos that workers make voluntarily, in accordance with the following rule: for the first 30 pesos provided by the worker, the state contributes 90 pesos; for the second 30 pesos saved by the worker, the state contributes 30 pesos; for the next 30 pesos, only 10; and, from then on, the government contributes 5 pesos for every 30 saved by the worker until reaching a maximum contribution by the affiliate of 750 pesos monthly, after which the state stops providing the co-financing. The design in the state contribution plan decreases in accordance with the worker's contributions, with a dual purpose: to support the lower-income independent and informal workers more and to also provide incentives for middle-income affiliates to be able to pass to the IMSS defined-contribution scheme and obtain greater benefits. See attached chart and graph.

Scheme of Contributions in Co-financing

Worker's contribution Accumulated		State contribution for every 30 pesos	Accum.
-	30	+ 90	90
	60	30	120
	90	10	130
	120	5	135
	150	5	140
	180	5	145
	210	5	150
	***	***	***
	750	5	237
+	780	- 0	237

Source: BBVA Bancomer

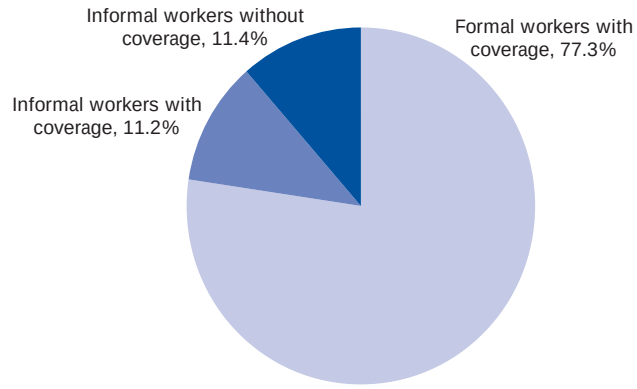
State Contribution
% of worker's income



Source: BBVA Bancomer

In accordance with our estimates, which for the sake of simplicity assume a contribution density by age, sex and income level for independent and informal workers, similar to that of formal workers in the private sector, the measure would permit covering almost half the number of informal workers that is estimated toward the end of the projection period and as a whole to 88.5% of the employed working population. See attached graph.

Salaried Employed Population
% of total, 2050

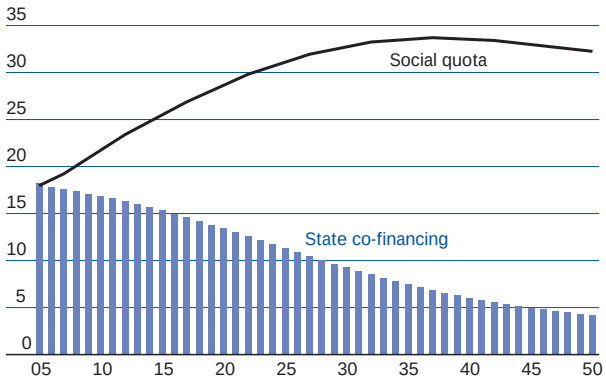


Source: BBVA Bancomer

The fiscal cost of the proposed co-financing plan (3.7% of the 2004 GDP) would represent a little less than half the cost that at present value the current "social quota" for IMSS affiliates represents (8.2% of 2004 GDP). Nevertheless, in addition to this important cost consideration, having independent and informal workers with clear incentives to pay in on a regular basis would already represent significant progress for the social security protection and coverage goals of the country. Not only that, but it would also offer incentives for informal workers to seek at a given time to pass to the formal sector. This is because in the formal sector with the IMSS defined-contribution scheme, pension funds are always going to be higher than in the informal sector, precisely due to the

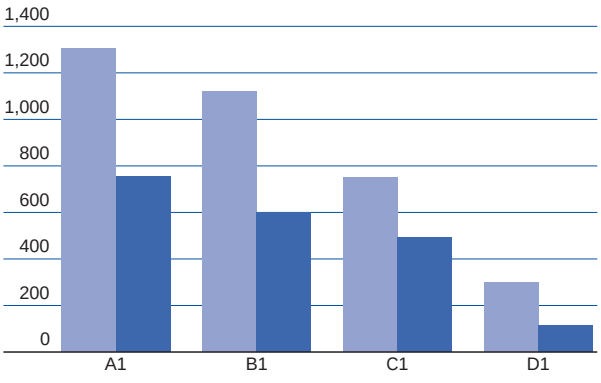
tripartite contributions and to support mechanisms such as the government's "social quota". See attached graphs.

Fiscal Cost
Billions of pesos, at constant 2004 prices



Source: BBVA Bancomer

Informal Workers' Voluntary Contributions with State Co-financing
Average pension in 2050, constant 2004 pesos*



* Case of non-assigned affiliate men earning 1 minimum wage. In the informal workers, only voluntary contributions with state co-financing are considered, and not the social quota, which is a joint mechanism in the formal system

Source: BBVA Bancomer

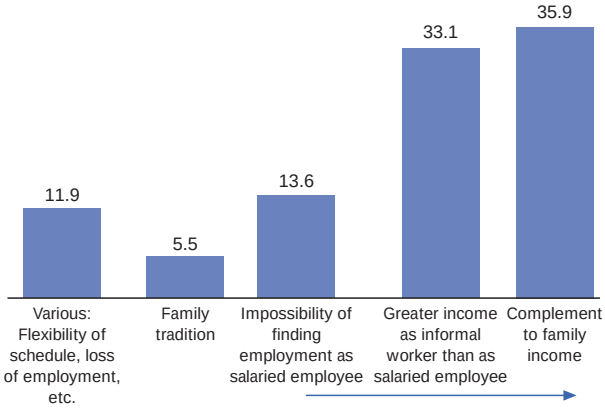
h) Increasing the productive capacities of informal workers.

To obtain a greater coverage and better pensions from the defined-contribution schemes clearly requires actions that transcend the capacities inherent in a pension system. A comprehensive review of the various obstacles that pension systems are facing to raise their benefits, suggests that public policies are also necessary that will create the conditions for accumulating more physical and human capital and, in the final analysis, achieve increases in productivity that will allow expanding productive activity. International experience reveals with numerous examples that the developed countries are the ones that have the broadest pension coverage, and, to a great extent, this is a result of their prior economic expansion. This is because it is only with sustained economic growth that the population can obtain the formal and well-paid jobs that it demands, which at the same time, provide the support for effective pension system protection.

Although it is beyond the scope of this study to provide specific recommendations on how to achieve sustained economic growth and greater formal employment, it can be noted that the economic reform agenda should consider several measures that can strengthen the productive capacities of informal workers.

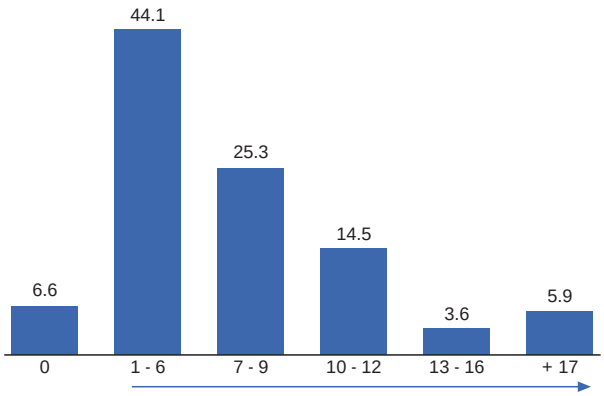
This is due to the fact that available information reveals that among the main reasons for informal employment in Mexico are those related to the few opportunities of finding a formal job, seemingly a result closely associated with low human capital and productivity (see attached graphs). Thus, public policies that can lead to better education and training of informal workers so as to incorporate them in formal jobs also strengthen the protection capacity that pension systems can provide.

Reasons for Initiating Informal Employment Activity
%



Note: 82.6% find little opportunity in formal employment
Source: BBVA Bancomer with data from INEGI and Daniel Flores and Jorge Valero (2005)

Breakdown of the Informal Population by Years of School Education
2000



Note: 50.7% have only a basic education level
Source: BBVA Bancomer with data from INEGI and Daniel Flores and Jorge Valero (2005)

i) Strengthening the financial culture and a pension fund education in the country.
A deeper, more developed financial culture and an awareness or education regarding pension funds in the country could contribute much to the better operation of the pension systems. As regards a financial culture, the introduction, at an early age, of the concepts of interest rates, present and future value, etc. would make it easier for people to make better informed decisions on the consequences of their consumption over time and to have greater clarity on the importance of their medium- and long-term savings projects. In this manner, people could have elements to better plan for future commitments and create, over time the necessary monetary reserves to meet different needs, which could include enjoying a vacation, having savings to cover the education of their children, or even the purchase of a home and the funds for retirement.

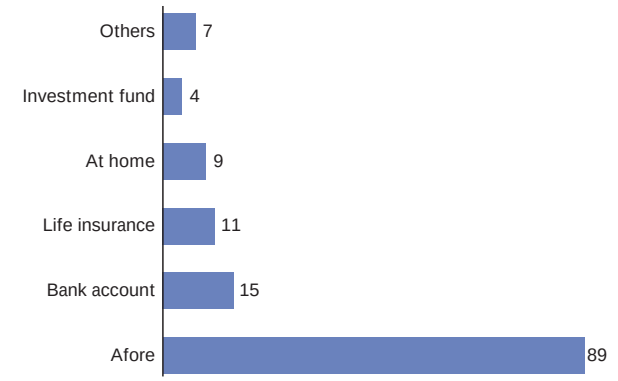
A pension fund education that explains to people the concepts of contribution density, risk, return, diversification and investment portfolios would lead to a better understanding of the operation of the Retirement Savings System so they could make better use of the advantages of such a system under the defined-contribution schemes of the IMSS and the ISSSTE. The affiliates would thus have a better understanding of the rights, obligations and services of the systems, but also of the savings mechanisms that, ultimately would allow them to obtain better pensions: amount and frequency of contributions and net return.

The evidence available shows that developing a financial culture and a solid pension education or awareness will require a significant effort, but the potential benefits would also be significant. According to information from Consar, even though the population knows and uses the Afore to channel their retirement resources, the relative importance assigned to such savings is still low.[77] See the following graphs.

77 See Consar presentation, "Conocimiento y percepcion del Sistema de Ahorro para el Retiro: Evolucion Historica (2003-20069)" ("Knowledge and Perception of the Retirement Savings System. Historic Evolution (2003-2006)"), November 2006", at www.consar.gob.mx

Retirement Savings Options Used by the Population

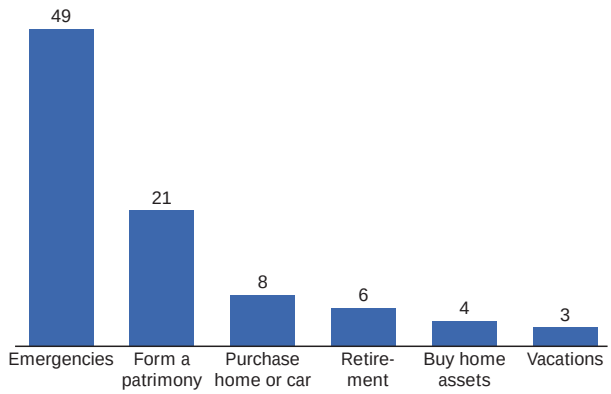
%



Source: Consar with information from Mitoftky (2006)

Purpose of Savings

%



Source: Consar with Mitoftky (2006) data

The little relative importance that the population currently gives to retirement savings—which could be due partly to a relatively young demographic structure—contrasts however, with the great importance of initiating this type of planning for the future at an early age. In this sense, it is extremely valuable that people have more and better information on the savings mechanisms for retirement so they may take advantage of these in time and effectively build a better pension. For example, a better knowledge of the different alternatives in voluntary contributions would make it easier for people to use their individual account as a viable long-term savings mechanism. Voluntary savings have a significant potential considering the fact that they currently represent a very small fraction of total contributions to the Retirement Savings System (0.1% in 2006). These savings are an instrument that allows small savers to have access to investment instruments and returns that in the past were only accessible to large investors.

2. The effect of applying a series of proposals

Due to the diversity of the problems analyzed and to the important interactions that could arise when applying several of the actions that we have proposed, this section presents a simulation exercise regarding the application of a specific series of steps.

Although the results of every reform effort will ultimately depend on the specific measures that are selected, as well as the times and the application mechanisms, we believe that this simulation as a whole could be a useful reference to illustrate the potential benefits of applying, under a comprehensive vision, actions that will permit complementing and strengthening the operation of the IMSS defined-contribution pension scheme in several dimensions.

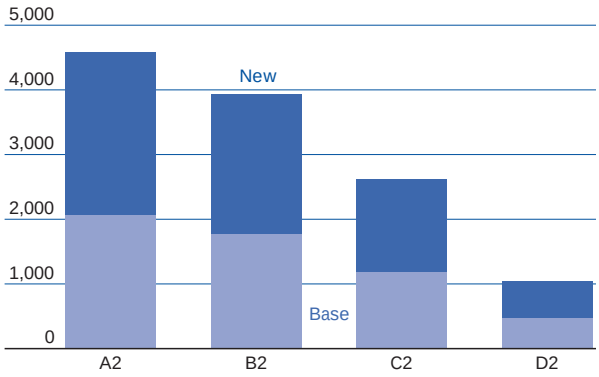
The simulation considers two economic scenarios: the base scenario of partial progress in the reforms employed throughout the study and a new scenario of greater in-depth progress in the structural transformations favoring productive expansion. The above serves to illustrate the potential benefits that an institutional context that favors greater productivity and economic growth can have for the pension system, at the same time offering better possibilities of greater returns from retirement funds and growth of real wages.

The measures considered for evaluation in the study are: an increase in the mandatory contributions of 4.8% of the wage for determining social security contributions, and an increase in the government's "social quota" contribution to retirement savings, with differentiated rates for affiliates in accordance with their income level (11% for workers earning up to three minimum wages and 0% from then on); a more flexible investment regime in the Siefore that incorporates new asset types and that conservatively permits gaining in a sustained way at least one additional percentage point in the return obtained from the retirement funds in the base case.

a) Base economic scenario: partial progress in reforms

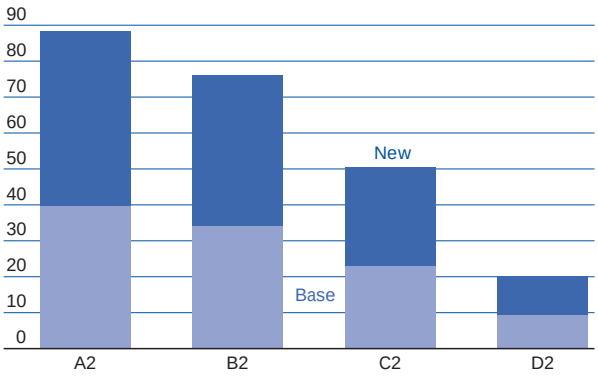
Reinforcing the design of the IMSS defined-contribution scheme with some of the measures that we have proposed in this study offers important gains in the well-being of its affiliates. Our simulation exercises show that the system has the capacity to deliver better pensions with more adequate contributions for the defined-contribution plan, government support through the "social quota" targeted more toward lower-income affiliates and a more flexible investment regime. For example, for the "average" case that we have handled throughout the study of the non-assigned affiliate, a worker with an income of two minimum wages, the real average salary toward the end of the projection period increases 122% and the replacement rate improves by 32 percentage points. See attached graphs.

Effect of Applying a Series of Proposals
Average pension in 2050*, constant 2004 pesos



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

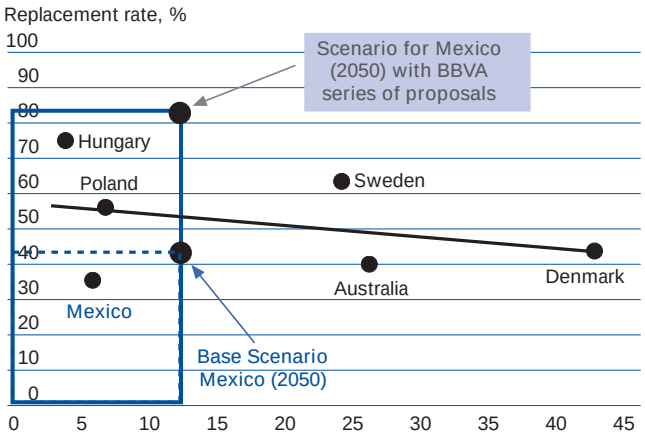
Effect of Applying a Series of Proposals
Replacement rate in 2050, % last 10 years*



* Case of non-assigned affiliate men earning 2 minimum wages
Source: BBVA Bancomer

In addition, the joint application of various measures that can strengthen the IMSS defined-contribution pension scheme would allow Mexico to register replacement rates more consistent with the level of development that would be expected of the country toward the end of the projection period. As illustrated in the attached graph, Mexico's replacement rate (83%) would surpass the target line relating the replacement rates with the level of economic development.

Defined-contribution Pension Systems
Replacement rates by income level, 2002*

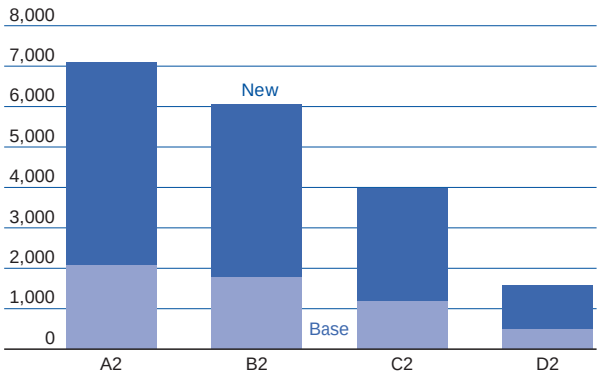


* Considers individual average lifetime earnings (100% contribution density) and income of an average industry worker (equivalent to 3.9 minimum wages in the case of Mexico).
Source: BBVA Bancomer and OECD (2006), Pensions at a Glance

b) Alternative economic scenario: efficiency in reforms

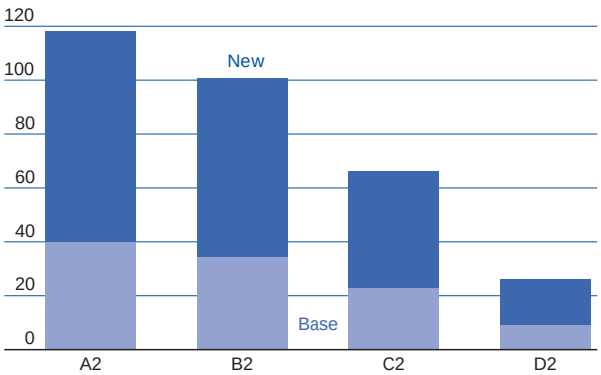
An economic scenario where the country manages to surpass the various obstacles to the accumulation of fiscal and human capital to obtain sustained earnings in productivity would allow Mexico to enter an ascending expansion course in productive activity and facilitate a more rapid convergence of per capita income toward levels in developed countries. This scenario considers important additional gains in productivity, key variables for the IMSS defined-contribution plan such as growth in real wages and investment return rate, which assume values of 1.9% and 5.5%, respectively.[78]

Effect of Applying a Series of Proposals in a Better Economic Scenario
Average pension in 2050*, constant 2004 pesos



* Case of non-assigned affiliate men
Source: BBVA Bancomer

Effect of Applying a Series of Proposals in a Better Economic Scenario
Replacement rate in 2050, % last 10 years*



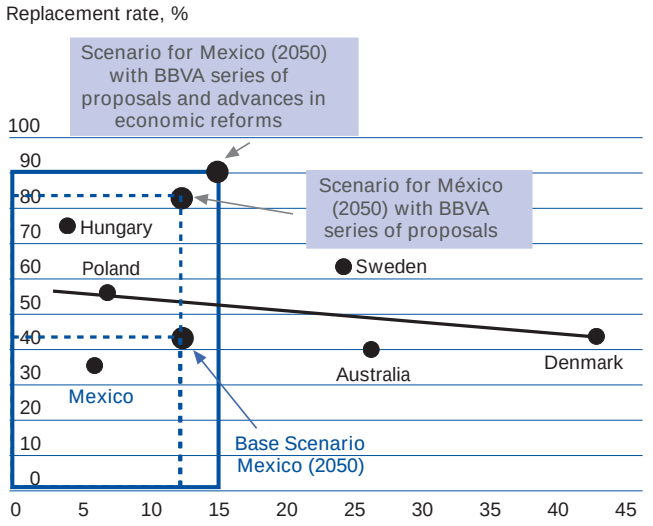
* Case of non-assigned affiliate men
Source: BBVA Bancomer

78 See Appendix 2 for a broader and more detailed exposition of the scope of the economic scenario that can also be considered as one of reform efficiency.

According to our simulation exercise, the benefits of having a much more positive economic scenario are very encouraging in terms of the variables of the pension system. For example, the real average pension toward the end of the projection period increases 239% and the replacement rate improves by 51 percentage points. See previous graphs.

The realization of in-depth economic reforms, thereby generating wealth for the country, and the steps that we propose for strengthening the IMSS defined-contribution pension system would lead toward the end of the projection period to a very solid pension system capable of granting benefits consistent with the greater development projected for the country. As illustrated in the attached graph, the replacement rates for Mexico under the economic scenario of efficiency in reforms, plus the proposed series of measures would be sensibly superior to those of the scenario base. In an individual case, an average industry worker who has completed his work life could obtain a replacement rate of 90%, which is in extreme positive, considering the inverse ratio between the income level and the replacement rate.

Defined-contribution Pension Systems
Replacement rate by income level, 2002*



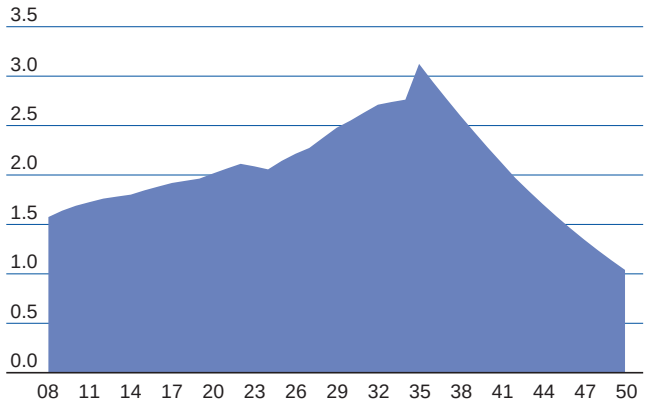
* Considers individual average lifetime earnings (100% contribution density) and income of an average industry worker (equivalent to 3.9 minimum wages in the case of Mexico).
Source: BBVA Bancomer and OECD (2006), Pensions at a Glance

3. Fiscal viability

Our proposals for strengthening the pension systems offer important gains in coverage and the well-being of affiliates, making it possible to immediately attend to the macroeconomic and social problems discussed in Section VII of the diagnosis. However, the application of our proposals, as well as of any other measures for strengthening the pension systems, must also be in line with another very important objective for public finances: to achieve long-term economic viability. In this sense, the pension systems can only be strengthened by measures that do not worsen the macroeconomic and fiscal problems of the country in the long-term.

Since several of our proposals assume new expenditures by the state, it is advisable to evaluate the joint impact of such proposals from a fiscal standpoint. To this end, we begin by using some graphic supports and later on, quantitative ones. For example, the attached graph illustrates the fiscal commitments that the state will have annually as a result of the reforms made in its main IMSS and ISSSTE pension systems, which have been amply discussed, and in the projection period from 2005 to 2050, these will represent, at present value, a cumulative amount equivalent to 91.7% of 2004 GDP.

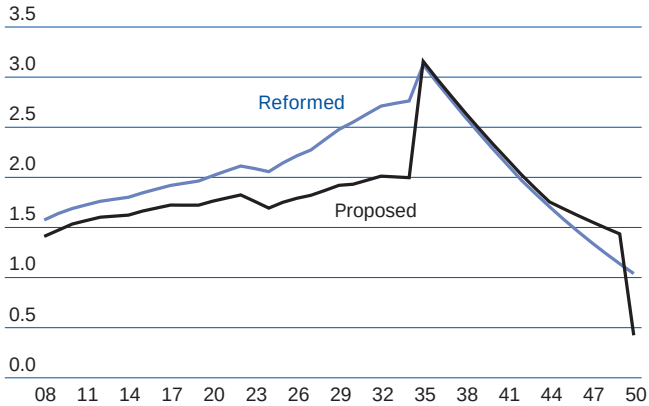
Fiscal Commitments Due to IMSS and ISSSTE Reforms
% of 2004 GDP



Source: BBVA Bancomer

Relative to the above, the following graph contrasts the fiscal commitments of the state as a result of its IMSS and ISSSTE reforms with another situation in which the fiscal commitments for the ISSSTE remain the same, although they are applied in our proposals for strengthening the IMSS defined-contribution pension system. In this sense, the main additional fiscal expenditures considered are: the expansion of coverage of the guaranteed pension to persons with contributions totaling 900 weeks; the increase in the government's "social quota" contribution for persons with an income of up to three minimum wages; and government co-financing with a limit for independent or informal workers who make voluntary contributions to their individual accounts.

Fiscal Commitments Under Reformed System and that Proposed by BBVA
% of 2004 GDP



Source: BBVA Bancomer

From a graphic standpoint, the contrast between the fiscal expenditures profile as a result of the reforms made and the measures that we now propose for the IMSS defined-contribution scheme, indicate that, with our proposal, a relatively less pronounced profile could be achieved in public expenditures as well as a lower fiscal cost. This can be explained by the fact that when the measures that we propose are fully applied, their benefits cancel part of their fiscal effects and those of other measures. For example, the higher mandatory contributions and the greater return from pension funds due to the effect of a more flexible investment regime contribute toward increasing the balances in the individual accounts, which in some cases reduces the pension expenditures under the LSS-73, and, in others, allows the state to recover a higher amount of contributions for the pensions that it effectively grants under the LSS-73. In turn, the proposed plan to target government support more on low-income individuals' resources and the co-financing plan for informal workers, would also contribute to balancing fiscal expenses over time, by leaving out the groups with the highest income and contribution density. It should be noted, however, that, as illustrated in the graph, between 2005 and 2045, the fiscal commitments from the effect of the guaranteed pensions would be considerable under any scenario, although, with our proposal, greater coverage is achieved.

In quantitative terms, the differences in fiscal costs, between the currently reformed scenario and the new one that we propose, also offer a positive balance in favor of our proposals. With the measures that we set forth, the fiscal cost in the 2005-2050 projected period would represent, in present value and as a percentage of 2004 GDP, a cumulative amount equivalent to 72% vs. 91.7% in the currently reformed one. The fiscal savings allow our proposals to be economically viable in the long-term and represent an additional argument to apply them, since, with a lower cost, it is possible to achieve a more solid pension system with greater benefits and well-being for affiliates.

Finally, it should be noted that in the coming decades, the government will not only face fiscal commitments derived from the current pension fund reforms, but possibly also from other reform processes and previously acquired public debt commitments and other guaranteed obligations such as those related to productive long-term infrastructure projects (previously Pidiregas for its Spanish initials), trusts and support funds, development banks, etc. which are jointly summarized in the statistics of Financial Requirements of the Public Sector (RFSP for its Spanish initials). For example, the historic balance of the financial requirements of the public sector (SHRFSP for its Spanish initials), through December 31, 2006, represented 37.5% of 2004 GDP or 35.9% of 2006 GDP.

When the contingent pension fund liability due to the future commitments of the reforms to date (84% of 2006 GDP) is added to the balance of past commitments, SHRFSP (35.9% of 2006 GDP), it is then that, in a broad sense, the public sector must be capable of settling a total net debt of approximately 120% of 2006 GDP in the 2008-2050 period. It is then possible to evaluate the ability of public finances to meet such commitments.

A relation that can offer useful information regarding the sustainability of the public debt is evident through a simple formula derived from the uses and sources of government financing over time. This formula uses the primary annual surplus as a percentage of GDP as an indicator of the fiscal effort required to maintain or reduce the public debt

toward a determined percentage.[79] See attached chart. Thus, by using the primary surplus statistic, it is possible to evaluate the sustainability of the public debt in two scenarios of indebtedness: 36% and 120% of GDP, which are covered by the current SHRFSP, in addition to the pension fund liability contingent.

Primary Surplus and Public Debt Evolution

The evolution of the public debt in any two periods of time can be expressed as the change in the stock of debt from a preceding period minus the primary surplus recorded in the current period. Such a difference is then multiplied by the ratio of the real interest rate less the economic growth rate over one plus the economic growth rate. This formula can be expressed as:

$$\Delta d = \frac{(r - g)}{(1 + g)} * d_{t-1} - s_t$$

In which:

Δd = Change in the public debt between two periods
d_{t-1} = Stock of public debt in a preceding period (as percentage of GDP)
r = Real interest rate (constant)
g = Real economic growth rate (constant)
s_t = Primary economic surplus in the current period (as percentage of GDP)

According to the above formulation the public debt is increased or decreased in time by the amount of the primary economic surplus.

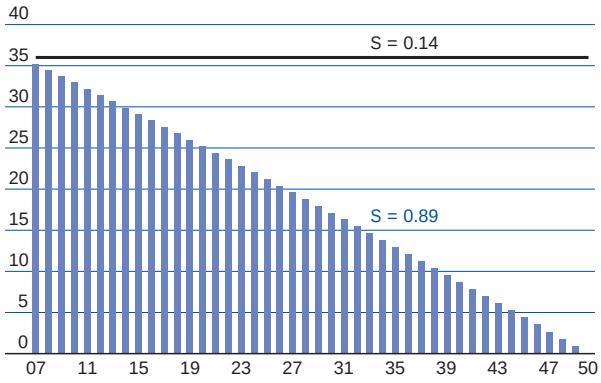
Source: BBVA Bancomer based on Cuddington (1997) and Buiter (2004).

Under conservative assumptions of a constant growth rate of GDP (3.6%) and of the real interest rate (4%), the result is that the required primary surplus to maintain a constant debt of 36% of GDP is of 0.14%, and of 0.89% to reduce it, for example, to zero in 50 years. See the first attached graph. On the other hand, to maintain a constant debt of 120% of GDP, the primary surplus must be 0.47% and to eliminate it in 50 years, of 3%. See the second attached graph.

79 The primary surplus is obtained by deducting the financial costs from the economic balance, which include interest, commissions and expenses of the federal government, government agency sector and support programs for savers and debtors.

Primary Surplus Necessary to Maintain a Debt of 36% of GDP Constant vs. Taking it to 0 in 50 years

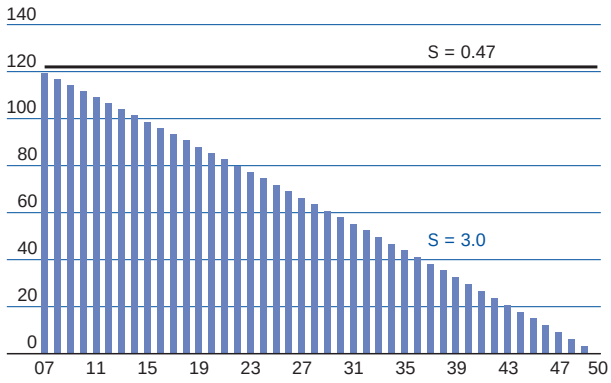
% of GDP



Source: BBVA Bancomer

Primary Surplus Necessary to Maintain a Debt of 120% of GDP Constant vs. Taking it to 0 in 50 years

% of GDP



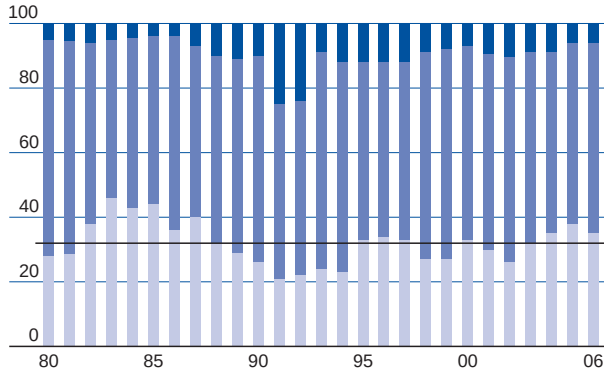
Source: BBVA Bancomer

Although the previous exercises cannot be understood at any time as suggestions to maintain a constant debt, or even take it to zero in 50 years, they are a useful reference to identify a possible range of values to determine the primary surplus in order to settle public liabilities adequately. This being said, it can be stated that the primary surplus experience in Mexico is positive. On average, it was 3.7% of GDP in the 1990-2005 period, for which reason, in accordance with the indicator used, public finances are in a position to settle the analyzed liabilities adequately.

However, it should be noted that the sustainability formula used also assumes a permanent effort on the part of public finances to obtain a constant primary surplus. In this sense, the most recent experience in Mexico with regard to the primary surplus is slightly less positive. For example, between 2000 and 2006, the average primary surplus was 2.4% of GDP. Thus, it is advisable to explore measures that would strengthen public finances even more, above all considering the commitments that lie ahead.

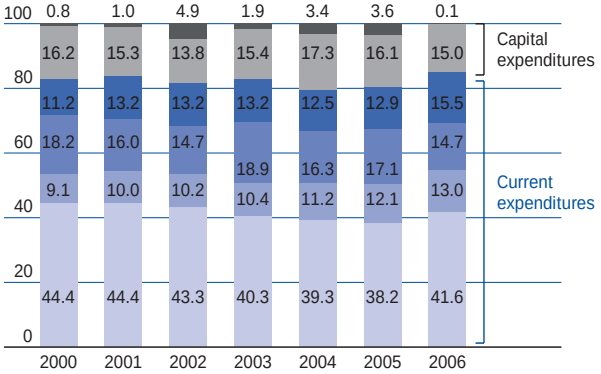
Although it is beyond the scope of this study to offer proposals to strengthen public finances beyond the sphere of pension funds, it can be said that such measures must be directed, undoubtedly, toward reducing the vulnerability of public revenues, in view of their high dependence on oil resources, and on obtaining additional gains in efficiency in terms of public spending. See attached graphs.

Federal Government Revenues
Percentage breakdown



Non-tax
Tax
Oil, 32% of total on average
Source: BBVA Bancomer with SHCP (Finance Ministry) data

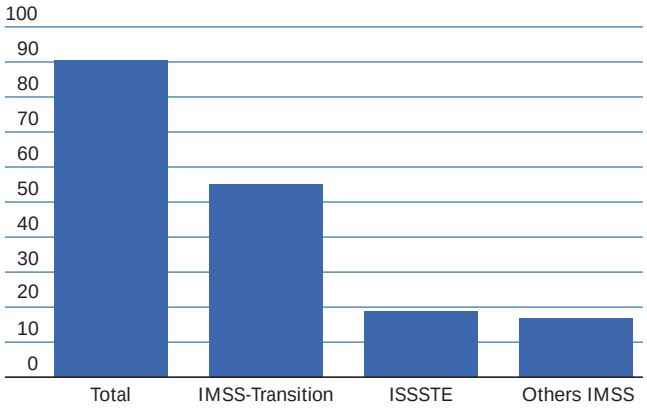
Evolution of Programmable Expenditures
Percentage breakdown



Current Expenditures
Subsidies and transfers
Other operating expenses
Pensions and retirements
Personal services
Source: BBVA Bancomer with SHCP (Finance Ministry) data

Within the sphere of pension systems, the experience with recognition bonds, at an international level and in Mexico with the recent reform of the ISSSTE Law, highlights that it would be advisable to evaluate the possibility of again reforming the IMSS pension system with regard to its transition plan between the LSS-73 and the LSS-97. As illustrated in the attached graph, in terms of pension liabilities, the transition costs in the IMSS are the most significant.

Present Value of Pension Liabilities
2008 - 2050
% of 2004 GDP



Source: BBVA Bancomer

The use of a pension bond to fully recognize pensioners' rights under the LSS-73 for affiliates in transition would permit finally closing the old plan of the IVCM and to delimit with total certainty the fiscal costs of the reform to the IMSS pensions systems. Also, this measure would also prevent the high costs entailed in maintaining two parallel benefit plans until retirement time for every affiliate in transition, as defined under the LSS-73 or the LSS-97.

Finally, a new reform of the IMSS pension systems in the sense indicated would also strengthen the new IMSS defined-contribution scheme, because, after the reform, the incentives would be reinforced for affiliates to pay into the system, as well as to acquire and transmit a long-term financial education and of savings for new generations.

Conclusions

In Mexico, the implementation of a new pension system in the IMSS, based on a defined-contribution scheme and a guaranteed pension, has represented an important advance in what the public sector offers in terms of pensions for many reasons, among others:

- Ownership rights were granted to IMSS affiliates over their retirement resources for the first time in the history of the country's social security system.
- The pension resources were individualized and the individual accounts provide legal certainty to the affiliates.
- State support was better channeled through the government's contributions to the retirement savings system, especially toward individuals earning low incomes and the guarantee of a pension was provided for.
- An efficient and transparent long-term savings mechanism was established, based on a defined-contribution model.
- Upon approval of the reform, the rights previously acquired by pensioners were fully respected, and for the new affiliates, the system offers viable and sustainable financing.
- Financial pressures on the IMSS and public finances were reduced, benefiting the country and its economic stability.
- A new specialized industry was created to manage retirement resources and pension-related services.

With the defined-contribution scheme in more than ten years, the results are positive both in terms of the number of affiliates as well as the amount of resources under management. At the same time, a strict supervision of the regulatory institutions and an intense competition in the Afore industry promote an increasingly more efficient allocation of pension resources, with better risk-return options, and at a lower cost for the affiliates.

The IMSS reform and more recently the ISSSTE reform, also based on a defined-contribution scheme and a guaranteed pension, represent important steps toward the construction of a solid social security system, with economically viable pension plans. In reaffirming the importance of the defined-contribution mechanisms with the ISSSTE reform, the legislation also provided them with a more permanent character and advances were made in establishing the necessary foundations for the creation of a National Pension System with portable benefits for all the affiliates. In this sense, the possibilities of benefit portability that in the medium and long-term are opening up between the IMSS and ISSSTE will facilitate greater labor mobility and will contribute to improving the allocation of resources in the economy and raising the economic growth potential.

Nevertheless, it should not be forgotten that the pension systems based on defined-contribution policies are ultimately financial mechanisms to transfer revenue from the present to the future and that their results are necessarily tied to the contributions that they receive and the frequency with which they receive them. In this sense, an evaluation of a pension system should always keep in mind the congruence between the objectives of the system and the demographic and economic context under which it

operates. Therefore, under conditions of macroeconomic stability and strong competition in the markets, the conditions can exist for the operation of the system to be efficient. In addition, if it is accompanied by the development of new products and financial services, it can also have better mechanisms to capitalize the contributions and increase the benefits for the affiliates. Otherwise, the benefits of the system will always be limited to the extent that conditions exist that could translate into low levels of fee payments and contribution densities on the part of the affiliates.

A prospective analysis of the IMSS defined-contribution scheme shows that the system will provide significant coverage of the country's work force during the first part of the 21st century and that its results will be differentiated, better rewarding those who contribute to the system. However, economic conditions prevailing in the country—such as a high degree of informality in labor relations and a reduced number of formal jobs—already translate into low contribution densities for a significant number of affiliates, which will represent low pensions for them. Furthermore, many of the system's affiliates will not have reached the minimum number of required weeks of fee payments into the system to access the pension guaranteed by the state. These workers face a serious risk of living in poverty at old age.

Our diagnosis of the pension system points to a double problem for policy makers. On the one hand, there is a prevailing need to close the defined-benefit pension systems, which under a pay-as-you-go model still operate with a deficit in most of the public institutions, a task that will imply an additional fiscal effort. On the other hand, there is the need to improve the economic outlook in which the new defined-contribution mechanisms operate so that they can offer better results.

A long-term perspective in reviewing the pension systems in Mexico allows us to point out that the defined-contribution model offers a viable alternative for undertaking the pending pension reforms and, at the same time, liberating part of the resources that the government requires to attend to other social priorities, such as health, education, and infrastructure, which then translates into a greater accumulation of physical and human capital. These conditions also strengthen the pension systems themselves, because they are necessary to improve the possibilities of formal, stable and well-paid employment that the affiliates require to take maximum advantage of the benefits of the defined-contribution plans.

Having better pensions requires many measures that go beyond the pension systems. Nevertheless, a detailed analysis of the case of the IMSS also allows us to conclude that by strengthening its current pillars and introducing other new ones in its design, the system has the complete capacity to offer better protection to its affiliates. Our proposals are directed precisely toward strengthening the defined-contribution scheme on several levels: a) to facilitate the portability of rights, b) to expand the system's coverage, c) to raise pension levels and replacement rates to international standards, and d) to better support low-income affiliates. The proposed measures are viable and if applied as a whole will also result in a lower cost from a fiscal standpoint. Therefore, we think that the positions expressed in this study will allow the combined fiscal and social problems that policy makers face to be immediately attended to and to generate gains in well-being for the system's affiliates.

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Appendix 1

1) Long-term economic growth model

An aggregate production function is estimated that depends on the growth of the workforce, of physical capital accumulation, and of total factor productivity (TFP). The properties of the model imply that the economy presents constant returns to scale, and therefore, the returns of the labor and capital factors decline over the long-term (contribution of K and L). The classic growth model uses a Cobb-Douglas production function:

$$Y_t = A_t L_t^{1-\alpha} K_t^{\alpha} \quad \ldots\ldots\ldots\ldots (1)$$

In which Y_t denotes the level of production in the economy, L_t is the labor force, K_t represents the wealth of physical capital and A_t is the parameter that promotes (in this case exogenously) the contribution to growth of the production factors, that is, the element that encompasses total factor productivity. The subindex t represents the period measured in years of the data.

The function (1) can be expressed in terms of the change in the natural logarithm of the variables (percentage growth):

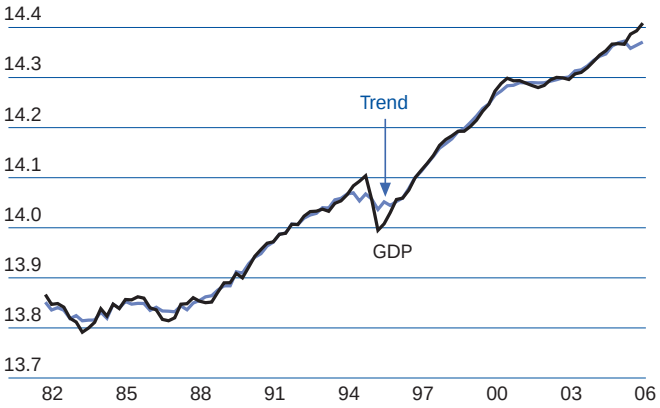
$$\Delta \ln Y_t = a + (1 - \alpha)\, \Delta \ln L_t + \alpha \Delta \ln K_t \quad \ldots\ldots\ldots\ldots (2)$$

in which *a* represents the residual of the estimate and approximation of total factor productivity. The *alpha* parameter is assumed to be 0.4. It is important to point out that this parameter was not estimated. In order to make the exercise comparable, we made use of the elasticity proposed by Faal (2005) and Santaella's analysis (1998), which is based on theoretical ratios and estimates. The capital wealth is estimated by using the methodology of perpetual inventories, in which it is assumed that the capital depreciation rate is 10% (the calculations did not vary significantly when assuming that the depreciation is 15%). It should be noted that our estimate coincides with what was obtained in the above-mentioned studies. Thus we have:

$$K_t = I_t + (1 - 0.1)\, K_{t-1} \quad \ldots\ldots\ldots\ldots (3)$$

Next graph shows the evolution of estimated and registered real GDP. As can be seen, our estimate of the growth trend does indeed encompass a dynamics similar to the cycles registered during the past 36 years.

Real GDP and Trend in Mexico
Natural logarithm



Source: BBVA Bancomer with INEGI data

2) Labor productivity: measure of the expected strength of real wages

The growth function in labor productivity can be directly obtained from the transformation of the production function (2). Given that the model is derived on the basis of a perfect competition structure and constant returns to scale, the marginal labor productivity is equal to the worker's real wage. Thus, we have:

$$\Delta \ln \hat{L}_t = \alpha^* [\Delta \ln K_t - \Delta \ln L_t] + a \ldots\ldots\ldots (4)$$

in which $\hat{L}_t$ is labor productivity, which will depend on the difference in the growth of capital and the labor force, as well as on total factor productivity. Given the properties of the model, this would imply that as long as the capital growth rate, derived from the investment capacity of the economy, is greater than the growth of the workforce, productivity will have an additional margin (which will depend on capital elasticity in growth) over total factor productivity. Thus, the solution (4) should be equal to the difference between the growth of the economy and that of the workforce:

$$\Delta \ln \hat{L}_t = [\Delta \ln Y_t - \Delta \ln L_t] = w \ldots\ldots\ldots (5)$$

with w being the real wage.

Appendix 2

An alternative scenario: "Efficiency of reforms"

In this second scenario we are more optimistic with regard to the evolution of the economy. This positive view is based on the potential impact that the second-generation economic reforms could have on the economy, particularly in relation to productivity. Although growth of productivity in the base scenario is significant, it does not correspond to the dynamics observed in countries whose success in implementing reforms is clear.

With the aim of sustaining a course more in accordance with a country fully on the road to sustained growth and rapidly converging toward per capita production levels close to those registered in developed economies, we need to change some assumptions on which the model is based. First, we will modify the intensity with which investment responds to a scenario of reforms. Instead of determining an investment growth rate that increases its percentage of GDP from approximately 20% to 24%, we will consider a context more similar to the international experience of countries that have shifted toward more developed economies, and we will assume a gradual increase in investment in the economy until it reaches 27% of GDP.

In a sphere of greater productive investment, and, in this regard, more in line with the international experience, a greater strength in the dynamics of total factor productivity can be justified. In fact, the dynamics imposed is not far from the levels reached during the period of "stabilizing development". Total factor productivity will average 1.6% over the next few decades, with some periods close to 2%.

Nevertheless, it is necessary to consider that given the present dimension of the informal sector in the Mexican economy, it would be premature to present a more optimistic economic scenario in terms of formal employment than what is contemplated in the base scenario. Thus, a more feasible situation would be that the stimulus to economic growth due to greater advances in reforms and in investment will be tied more to gains in productivity and capital.

The projections of the model show that under these conditions, the potential growth rate of the Mexican economy could reach levels closer to 5% toward the mid-2020s. This implies average growth in real wages of close to 2% and levels of per capita GDP at around $34,000 current dollars and a real wage of $14,000 dollars. This is undoubtedly an optimistic scenario, but it is much closer to the reality of countries that have implemented deep structural changes to increase their sustained economic growth.

Alternative Scenario: Advance in Reforms

Performance of the main macro-economic variables, five-year average

Five-year periods	GDP[1]	Population (millions)	GDP per capita[2]	Wage[3]	Total emplm.[4]
2010	862	107	8,086	6,457	45,080
2015	1,069	111	9,653	6,623	49,850
2020	1,359	114	11,881	6,871	53,660
2025	1,711	118	14,552	7,395	56,491
2030	2,120	120	17,651	8,219	56,608
2035	2,570	122	21,093	9,309	59,949
2040	3,063	123	24,952	10,696	60,730
2045	3,610	123	29,375	12,307	60,945
2050	4,212	122	34,446	14,136	60,756

1 Billions of dollars. Constant 2005 prices
2 2005 dollars
3 Real wage in dollars. Base 2005
4 Millions
Source: BBVA Bancomer

Alternative Scenario: Advance in Reforms

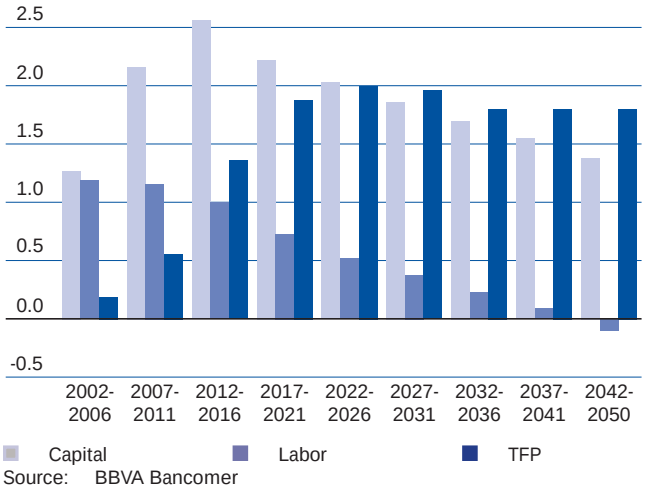
Performance of the main macro-economic variables, real annual %, five-year average

Five-year periods	GDP	Population	GDP per capita	Wage	Total emplm.
2010	4.0	0.8	3.1	0.5	2.3
2015	4.9	0.7	4.0	0.6	1.8
2020	4.9	0.6	4.1	0.9	1.3
2025	4.6	0.5	4.0	1.8	0.9
2030	4.3	0.4	3.8	2.3	0.7
2035	3.8	0.2	3.5	2.9	0.4
2040	3.5	0.1	3.3	2.9	0.2
2045	3.2	0.0	3.2	2.8	0.0
2050	3.0	-0.1	3.1	2.8	-0.3

Source: BBVA Bancomer

Sources of Economic Growth

Contributions to growth, percentage points



Source: BBVA Bancomer

Appendix 3

Methodology of the capitalization model of the IMSS defined-contribution pension system

1. Base parameters:

t = time, measured in five-year periods (2010, 2015, 2020, 2025, 2030, 2035, 2040, 2045, 2050)

Gi = Growth in affiliates by five-year period.

dj = Density and wage cohorts (groups):
A_h, B_h, C_h, D_h, E_h (with h = 1,2 and 3)

x = gender

$AF(Gi\ ,\ d_j)_t$ = affiliates by age and cohort

2. Dynamics of the model

2.a. Affiliates, paying contributors, pensioners, and beneficiaries

- Affiliates:

Based on the total number of affiliates on December 31, 2004, a projection was made on the future evolution of this variable, considering enrollment of new affiliates and removals from the IMSS rolls due to death, disability, and retirement.

The projected addition of new affiliates was made by applying the hypothesis based on the percentage of the total population by gender and the corresponding age bracket. For this purpose, population projections from 2000 to 2050 of the National Population Council (*Conapo*) of the Ministry of the Interior were used.

In the modeling process, new additions to the rolls were anticipated for the 20-to- 24-years and the 25-to-29-years age bracket. It is felt that the greatest percentage of workers will enter the system in the first age bracket, and for the 30-to-34-years age bracket, a breakdown will be applied by age brackets equivalent to what was in existence at the initial date, under the assumption that, based on the time that transpired since the pension reform was approved, this age bracket is sufficiently representative.

The addition of new affiliates in the 25-to-29-years age bracket is made in an E category, with differentiation due to wages from 1 to 3, and with an average contribution density.

- Pensioners' model:

The pensioners in the period are the affiliates who in the previous five-year period were in the 60-to-64-years age bracket, discounting those who have died or are disabled, considering a half period

$$J(Gi\ ,\ d_j)_t^x = AF(Gi_{-5}\ ,\ d_j)_{t-5}^x - F(Gi\ ,\ d_j)_t^x - Inv(Gi\ ,\ d_j)_t^x$$

- Total pensioners:

This corresponds to the total number of pensioners in the model plus the pensioners who were in the system in the previous period, adjusted for mortality. The system's pensioners at the beginning of the study are calculated based on pensioner data at December 2004.

$$JTot_t^x = \sum_{Gi\ ,\ d_j} J(Gi\ ,\ d_j)_t^x + Jsist_t^x$$

$$Jsist_t = \sum_{Gi\ ,\ d_j} Jsist(Gi)_t^x$$

$$Jsist(Gi)_{t\ t}^{x} = Jsist(Gi_{-5})_{t-5}^{x} \times \varphi_{t}^{x}$$

In which $J(Gi\ ,\ d_j)_t^x$ are the pensioners in the model and

$Jsist_t^x$ is the total number of pensioners in the system

φ_t^x is the probability of death, in accordance with gender and age variables.

To be entitled to survival and disability benefits, Mexican pension legislation indicates that the affiliates must meet certain conditions in terms of the number of payments and the frequency of contributions.

To determine the risk exposure or affiliates' right to coverage, we proceeded to estimate coverage density in terms of contribution density. For such effects, a simulation has been employed, using the Montecarlo method. For each percentage bracket of contribution density (in segments of 5% increments) coverage density has been calculated, presupposing time on the job of at least three and six consecutive months, for a total of 10,000 hypothetical cases per bracket.

For the affiliate categories, grouped by contribution densities, which are derived from the modeling process of the pension system, the coverage densities obtained are as follows:

Categories	A	B	C	D	E
Contribution density	96.2%	76.2%	44.5%	14.8%	59.6%
Coverage density	93.1%	90.9%	80.0%	22.3%	87.3%

- Deaths with coverage under the model:

The deceased are calculated by applying the corresponding mortality rate to the number of affiliates of the previous period. This Ψ rate is the mortality rate applied for any cause of death in accordance with the annual projections made by *Conapo* for age i in year t and gender x, discounting the risk of death due to workplace accidents since this is dealt with under another insurance coverage. The mortality rate for workplace accidents that has been applied is 0,322%, without distinction due to gender or age, and taken from the IMSS actuarial valuation report on disability and life insurance dated December 31, 2004.

$$F(Gi\ ,\ d_j)_t^x = AF(Gi_{-5}\ ,\ d_j)_{t-5}^x \times \Psi_{i,t}^x \times \alpha(d_j),$$

with $\alpha(d_j)$ being the coverage factor

- Pensioners as a result of disability, with coverage in the model:

The number of disabled is calculated by applying the corresponding disability rate to the number of affiliates who survived the previous period. This σ rate is the disability rate in accordance with the information published by the IMSS for its actuarial valuation report for 2004, for age bracket i.

$$Inv(Gi\ ,\ d_j)_t^x = AF(Gi_{-5}\ ,\ d_j)_{t-5}^x \times (1- \Psi_{i,t}^x / 2) \times \sigma_i \times \alpha(d_j)$$

- Total number of pensioners due to disability:

This corresponds to the total number of pensioners due to disability in the model in addition to pensioners due to disability that the system had in the previous period, adjusted for mortality.

$$InvT_t^x = \sum_{Gi\ ,\ d_j} Inv(Gi\ ,\ d_j)_t^x + \sum_{Gi\ ,\ x} INVsist(Gi_{-5})_{t-5}^x \times (1 - \Psi_{i,1}^x)$$

in which $Inv(Gi\ ,\ d_j)_t^x$ are the disabled in the model and
INVsist is the number of disabled in the system

- Total beneficiaries:

This corresponds to the total number of beneficiaries in the model plus the beneficiaries that the system had in the previous period, adjusted for mortality.

$$BfT_t^x = \sum_{Gi\ ,\ d_j} Bf(Gi\ ,\ d_j)_t^x + \sum_{Gi\ ,\ x} Bfsist(Gi_{-5})_{t-5}^x \times (1 - \Psi_{i,1}^x)\ ,$$

in which $Bf(Gi\ ,\ d_j)_t^x$ are the beneficiaries in the model due to the death of the affiliate, and $Bsist_t^x$ is the number of beneficiaries in the system.

- Total number of pensioners:

The total number of pensioners includes the pensioners in the model in period *t* plus the number of pensioners in year *t*.

$$Pens_t^x = \sum_x (JTot_t^x + BfT_t^x + InvT_t^x)$$

2.b Income, contributions, balances, and commissions

- Taxable income:

All the monetary projections are made in constant 2004 pesos.

Taxable income in the economy as a whole is evolving in line with apparent labor productivity, projected in the macroeconomic model (rate of productivity $\dot{w}$).

In addition, $w(Gi,dj)^x$ increases throughout the course of individuals' work life according to the characteristics of the data through 2004 for the affiliates in wage category 3, that is, those who have a taxable income base above three times the minimum wage in the Federal District. Combining both effects—the aggregate productivity of the economy and individual productivity by age brackets for category 3—the real wages of the different categories of affiliates for the 2010-2050 period are simulated.

For categories 1 and 2, representing one and two minimum wages respectively, only the hypothesis of productivity growth is applied.

$$w(Gi\ ,\ d_j)_t^x = w(Gi\ ,\ d_j)_{t\ -5}^x \times (1 + w)^5$$

in which $w(Gi\ ,\ d_j)_t^x$ = wage age *i*, density j in year *t*

- Accumulated individual balance in RCV account:

For the calculation of the accumulated individual balances in the period, we are assuming that the contributions are made in the middle of each year:

$$SCRCV(Gi\ ,\ d_j)_t^x = SCRCV(Gi\ ,\ d_j)_{t\ -5}^x \times (1 + i)^5 \times (1 - comsaldo)^5 +$$

$$\left[(w(Gi_{-5}\ ,\ d_j)_{t-5}^x \times (\phi - \chi) + SMGDF_t \times cs) \right.$$

$$\left. x\varepsilon(d_j)_t^x \times M \times \left[\begin{array}{l} (1 + i)^{4.5} \times (1 - \varphi)^{4.5} + (1 + i)^{3.5} \times (1 - \varphi)^{3.5} \times (1 + \dot{w}) + \\ (1 + i)^{2.5} \times (1 - \varphi)^{2.5} \times (1 + \dot{w})^2 + (1 + i)^{1.5} \times (1 - \varphi)^{1.5} \times (1 + \dot{w})^3 + \\ (1 + i)^{0.5} \times (1 - \varphi)^{0.5} \times (1 + \dot{w})^4 \end{array} \right] \right]$$

In which:

ϕ is the RCV contribution rate

cs is the percentage of the government's social quota contribution

$SMGDF_t$ is the general minimum wage in the Federal District in year *t* on which the percentage of the government's contributions is applied in accordance with art. 168 of LSS 97

$\varepsilon(d_j)_t^x$ is the contribution density per cohort *j*, gender *x* and year *t*.

M is the number of benefit payments per year (in model M=12)

i is the return of the RCV fund

$\dot{w}$ is the growth rate of wages

φ is the commission on the account balance

χ is the commission expressed as a % of taxable income

For the case of the new affiliates, the assumption is that their affiliation occurred halfway during the five-year period.

- Accumulated individual balance in the housing account:

To determine the accumulated individual balance in the housing account, a similar methodology is applied as with the RCV account, considering the contribution corresponding to this item and without the application of commissions.

$$SCViv(Gi\ ,\ d_j)_t^x = SCViv(Gi\ ,\ d_j)_{t\ -5}^{\ x} \times (1 + i_{viv})^5 + \left[(w(Gi_{-5}\ ,\ d_j)_{t-5}^{\ x} \times \pi) \right.$$
$$\left. \times \varepsilon(d_j)_t^x \times M \times \left[\begin{array}{l} (1 + i)^{4.5} + (1 + i)^{3.5} \times (1 + \dot{w}) + \\ (1 + i)^{2.5} \times (1 + \dot{w})^2 + (1 + i)^{1.5} \times (1 + \dot{w})^3 + \\ (1 + i)^{0.5} \times (1 + \dot{w})^4 \end{array} \right] \right]$$

In which:

π is the contribution rate for the housing account

$\varepsilon(d_j)_t^x$ is the contribution density rate by cohort *j*, gender *x* and year *t*.

M is the number of benefit payments per year (in model M=12)

i_{viv} is the return from the fund

$\dot{w}$ is the growth rate of wages.

- Contributions in the five-year period to the RCV account:

The contributions made in the five-year period by the overall group of each type of affiliate in each age bracket can be approximated as

$$AP(Gi\ ,\ d_j)_t^x = [w(Gi_{-5}\ ,\ d_j)_{t\ -5}^{\ x} \times (\phi - \chi) + cs \times SMGDF_t] \times M \times \varepsilon(dj)_t^x \times \left[\frac{1 - (1 + \dot{w})^5}{-\dot{w}} \right]$$

$$\times\ AF(Gi\ ,\ d_j)_t^x + \left[\frac{F(Gi\ ,\ d_j)_t^x + I(Gi\ ,\ d_j)_t^x}{2} \right]$$

The final element of the second parenthesis represents the assumption that the contingencies for death and disability occur halfway during the five-year period, so these affiliates contributed until that point.

- Contributions during the five-year period to the housing account:

$$APViv(Gi\ ,\ d_j)_t^x = [w(Gi_{-5}\ ,\ d_j)_{t\ -5}^{\ x} \times \pi] \times M \times \varepsilon(dj)_t^x \times \left[\frac{1 - (1+ \dot{w})^5}{-\dot{w}}\right]$$

$$\times\ AF(Gi\ ,\ d_j)_t^x + \left[\frac{F(Gi\ ,\ d_j)_t^x + I(Gi\ ,\ d_j)_t^x}{2}\right]$$

- Commissions during the five-year period:

Commissions are obtained as a % of the contributions paid during the five-year period:

$$COM(Gi\ ,\ d_j)_t^x = [w(Gi_{-5}\ ,\ d_j)_{t\ -5}^{\ x} \times \chi \times M \times \varepsilon(dj)_t^x \times \left[\frac{1 - (1+ \dot{w})^5}{-\dot{w}}\right] + \varphi \times (SCRCV(Gi\ ,\ d_j)_t^x$$

$$+ SCRCV(Gi\ ,\ d_j)_{t-5}) / 2] \times \left[AF(Gi\ ,\ d_j)_t^x + \left[\frac{F(Gi\ ,\ d_j)_t^x + I(Gi\ ,\ d_j)_t^x}{2}\right]\right]$$

- Total accumulated balance:

Corresponds to the individual accumulated balance multiplied by the number of affiliates

$$STRCV(Gi\ ,\ d_j)_t^x = SCRCV(Gi\ ,\ d_j)_t^x \times AF(Gi\ ,\ d_j)_t^x$$

$$STViv(Gi\ ,\ d_j)_t^x = SCViv(Gi\ ,\ d_j)_t^x \times AF(Gi\ ,\ d_j)_t^x$$

For both enrollments as well as withdrawals from the system, be they due to death, disability, or retirement, the hypothesis used is that they occur halfway during the five-year period.

2.c Survival, disability, and old-age benefits

- Monthly survival pension per beneficiary:

The widowhood pension is calculated based on applying an η^x factor to the disability pension that would have corresponded to the affiliate. At the present time, η^x represents 90%. The annual payment of a year-end bonus has been considered.

$$PSob(Gi\ ,\ d_j)_t^x = \eta^x \times PInv(Gi\ ,\ d_j)_t^x$$

- Monthly disability pension per beneficiary:

The disability pension is calculated based on applying an λ^x factor to the pension in question, such as corresponds to the case of the childless spouse (as is assumed in the model). The pension in question is determined as the average monthly income of the last 500 weeks. At the present time, λ^x corresponds to 35%. The payment of a year-end bonus and financial assistance of 15% has been included.

$$PInv(Gi\ ,\ d_j)_t^x = \lambda^x \times (w(Gi_{-15}\ ,\ d_j)_{t-5} \times 0.25 + w(Gi_{-10}\ ,\ d_j)_{t-5} \times 0.5 + w(Gi_{-5}\ ,\ d_j)_{t-5} \times 0.25)$$

- Necessary technical capital (CTN) for survival per beneficiary:

The necessary technical capital for survival is the current actuarial value of the pension benefit provided for death, applying the probabilities of survival that are derived from the mortality tabulator currently in effect in accordance with the pension legislation, and applying a financial updating based on the technical interest rate.

$$CTNSob(Gi\ ,\ d_j)_t^x = PSob(Gi\ ,\ d_j)_t^x \times M \times \frac{Nx_{(i+3-p)}}{Dx_{(i+2-p)}} + \left[\frac{M - 1}{2M}\right]$$

p is the age difference with the spouse.
Nx and Dx are commutative values of the corresponding mortality tabulator.

- Necessary technical capital (CTN) for disability per beneficiary:

The necessary technical capital for disability is the current actuarial value of the pension benefit for disability, applying the probabilities of survival as derived from the disability tabulators currently in effect according to the pension legislation, and applying a financial updating based on the technical interest rate.

$$CTNInv(Gi\ ,\ d_j)_t^x = PInv(Gi\ ,\ d_j)_t^x \times M \times \left[\frac{Nxi_{(i+3-p)}}{Dx_{(i+2-p)}} + \left[\frac{M - 1}{2M}\right] + \eta^x \times \left[\frac{Nx_{(i+3-p)}^{m}}{Dx_{(i+2-p)}} - \frac{Nx_{axy(i+3)}^{m}}{Dx_{axy(i+2)}^{m}}\right]\right]$$

Nxi and *Dxi* are commutative values of the disability tabulator
Nx_{axy} and Dx_{axy} are joint commutative values of the disabled and non-disabled tabulators

- Monthly old-age pensions per beneficiary:

The old-age pension is obtained by dividing the balance accumulated in the affiliate's individual account and the rate of a life annuity at the age of retirement; that is, the current actuarial value of a unitary annuity, considering the mortality tabulator in effect for old-age annuities and the technical interest rate.

$$PV(Gi\ ,\ d_j)_t^x = \frac{(SCRCV(Gi\ ,\ d_j)_t^x + SCViv(Gi\ ,\ d_j)_t^x \times \theta)}{RV_t^x / M}$$

in which *RV tx* is the rate for calculating old-age pensions with life annuity and θ adopts values from 0 to 1 based on whether the pensioner has applied the balance of his or her housing account for obtaining the old-age pension.

- Supplement to minimum monthly old-age pension per beneficiary:

This corresponds to the supplementary payment that the state must contribute to the beneficiaries' monthly pension that they are entitled to as the minimum state insurance pension.

If $PV(Gi\ ,\ d_j)_t^x > PM_t$

$CPM(Gi\ ,\ d_j)_t^x = 0$

in which PM_t is the minimum pension in accordance with art. 170 of the LSS 97

If $PV(Gi\ ,\ d_j)_t^x \leq PM_t$

$CPM(Gi\ ,\ d_j)_t^x = PM_t - PV(Gi\ ,\ d_j)_t^x$

- Additional individual capital per affiliate; survival:

The additional capital for survival is determined by calculating the difference between the necessary technical capital for survival and the accumulated balance of the individual RCV account.

If $CTNSob(Gi\ ,\ d_j)_t^x - SCRCV(Gi\ ,\ d_j)_t^x > 0$

$KASob(Gi\ ,\ d_j)_t^x = CTNSob(Gi\ ,\ d_j)_t^x - SCRCV(Gi\ ,\ d_j)_t^x$

If not $KASob(Gi\ ,\ d_j)_t^x = 0$

- Additional individual capital per affiliate; disability:

The additional capital for disability is determined by the difference between the necessary technical capital for disability and the accumulated balance of the individual RCV account.

If $CTNInv(Gi\ ,\ d_j)_t^x - SCRCV(Gi\ ,\ d_j)_t^x > 0$

$KAInv(Gi\ ,\ d_j)_t^x = CTNInv(Gi\ ,\ d_j)_t^x - SCRCV(Gi\ ,\ d_j)_t^x$

If not $KAInv(Gi\ ,\ d_j)_t^x = 0$

- Total additional capital per affiliate; survival:

$$CATSob(Gi\ ,\ d_j)_t^x = KASob(Gi\ ,\ d_j)_t^x \times FC(Gi\ ,\ d_j)_t^x$$

- Total additional capital per affiliate; disability:

$$CATInv(Gi\ ,\ d_j)_t^x = KAInv(Gi\ ,\ d_j)_t^x \times IC(Gi\ ,\ d_j)_t^x$$

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Appendix 4

Replacement rates and pension systems: What is the correct measurement?

Favre, Melguizo, Muñoz and Vial (2006)

Traditionally, the so-called replacement or substitution rates are calculated to evaluate the pensioner's situation at the time of his or her retirement. The most common way to measure the rates is based on the ratio between income for retirement and the average income earned during the final years before the individual retired.

This indicator is generally interpreted as a measure of the implicit insurance in the pension and pay-as-you-go systems, based on defined-benefits and variable contributions. It does not pose major problems and has been widely used without further questions being raised. Since it involves defined-benefits, the "amount of the insurance" is known, under certain conditions specified in the mechanism for calculating the pension. However, in capitalization systems that are based on defined-contributions and variable benefits, the amount of the insurance is not known *ex ante* and depends critically on the fees paid into the system during the affiliate's working life. In these circumstances, revising the indicator and exploring other alternatives is justified.

It should be mentioned that even in defined-benefit schemes it is possible to propose the advisability of using different reference bases to calculate the replacement rates. Viewed from the perspective of an individual old-age insurance policy, the traditional measurement mechanism that relates the pension with the wages received just before the individual goes into retirement is the most appropriate, but from the standpoint of the general dynamics of the pension system, it could be more important to compare it with the average wages earned during the pensioner's working life. If the idea, however, is to analyze the elements of fairness in the system, it is very important to compare the pension received with the average level of wages and/or retirement income in the economy.

In the case of a capitalization system, the amount of funds accumulated at the moment of the affiliate's retirement depends on:

1. Wages earned throughout the affiliate's working life
2. Contribution rates during the affiliate's working life, either obligatory or voluntary and net of administration costs
3. Return rates obtained by the funds accumulated over time.

But in calculating the replacement rates, the costs associated with each retirement treatment and the real and projected return rates of the investments of the residual pension fund should also be incorporated, which makes the comparison between individuals and systems difficult.

Given these considerations, it seems advisable to discuss the impact of each of the previously mentioned variables in measuring the replacement rates calculated in the traditional manner and by alternative methods, so as to better interpret them. At the same

time, it also seems useful to advance in developing other indicators that allow for better evaluating the performance of the pension systems based on defined-contributions.

1. For a correct interpretation of the replacement rates

The traditional method of measuring replacement rates leads to ambiguous interpretations in the context of individual capitalization systems, as we will see in the following.

a) Evolution of wages over time

In a capitalization system, the value of the amount accumulated in a pension fund at the moment of the affiliate's retirement depends, among other factors, on the beneficiary's wages throughout his or her working life. If the wages were constant during the affiliate's working life, the contributions paid in the earliest stages, which have accumulated interest longer, will have a greater relative weight in the size of the fund. However, wages evolve over time in relation to, at least, two factors: the skills and capacities acquired through experience on the job and training and improvement efforts during the affiliate's working life, which we will call micro-economic factors; and factors associated with the global performance of the economy, the rhythm at which per capita income and average wages grow in the country, which, in turn, are subject to cyclical fluctuations, which have a greater impact to the extent that the wages have a higher variable component; these are termed macroeconomic factors. In an economy that is growing, both factors will boost real wages upward throughout an individual's working life, so that calculating the replacement rate on the basis of the latest wage levels can have very little to do with the contributions paid into the system. Furthermore, the replacement value is (inversely) sensitive to the annual growth rate of wages, as can be seen in the following chart. The paradoxical situation can arise in which two workers (A and B) with the same characteristics, in two countries (PA and PB, for country A and country B) that have the same level of per capita income and average wages, but in which PA's economy grows significantly more than PB's, enter retirement with very different pensions (A's pension will be higher than B's if all the other conditions are equal); and yet, B's replacement rate will be greater than A's.

Replacement Rates and Real Wage Growth

Annual growth of real wages	Replacement rates	Difference in replacement rates	Value of pensions (% growth = 100)
0%	86%		100
1%	66%	-20%	115
2%	52%	-14%	133
3%	41%	-11%	156
Assumptions			
Yield	5%		
Contribution rate	10%		
Retirement age	65		
Contribution density	100%		

Source: BBVA Bancomer

This characteristic of the indicator suggests that it is necessary to be very careful in making comparisons of replacement rates between countries, and some adjustment should be made due to differentials in sustained growth rates over time.

b) Differences in contribution rates during the affiliate's working life

In concentrating on the relation between pensions and wages, calculating the replacement rate leaves out of the picture the consumption sacrifice that occurs as a result of the affiliate's contributions throughout his or her working life. Thus, for example, two workers who receive the same wages and accumulate the same amount of resources in their pension fund will have the same replacement rates. However, if the contribution rate is different and the difference does not accumulate in the affiliate's fund, either because it represents a contribution extended to the rest of the affiliates, or due to administrative costs, this indicator will not reflect this important difference. This is especially relevant due to the international comparisons, since the systems differ considerably in terms of gross contribution rates.

These two simple examples make it clear that the replacement rates are an imperfect indicator for evaluating pension plan systems and, especially, for making comparisons between systems in different countries. At the same time, they also underscore the difficulty of summarizing in one or two indicators all of the complexities of a system based on the capitalization of contributions throughout an affiliate's working life and, therefore, it seems almost inevitable to try to construct a series of indicators that will encompass different dimensions of the problem.

This does not invalidate the use of the replacement rates as a relevant indicator on an individual level that reflects the adjustment in income that a person will experience at the time of his or her retirement. However, this macroeconomic evaluation requires incorporating other variables in the analysis, since, in the end, what is of interest is the liquid value of the pensions in comparison with the liquid earnings derived from working at the time just prior to retirement. Among the variables to be included are the obligatory contribution rates, tax rates, contributions for health insurance, the commissions that are paid to the institution responsible for arranging the payment of the pension and management of the funds, etc.

Appendix 5

a) Average pensions by gender and type of affiliate

Average Pensions by Gender and Type of Affiliate*

Non-assigned men, pesos at constant 2004 prices

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	1,676	1,831	1,998	2,182	2,385	2,607	913	1,110	1,299
A2	3,335	3,629	3,949	4,299	4,684	5,097	1,402	1,731	2,051
A3	10,708	11,644	12,668	13,776	14,970	16,259	3,622	4,183	4,761
B1	1,660	1,817	1,979	2,157	2,353	2,568	764	946	1,114
B2	2,980	3,209	3,508	3,906	4,252	4,703	1,170	1,468	1,762
B3	8,478	9,421	10,601	11,912	13,157	14,743	3,015	3,572	4,154
C1	1,653	1,798	1,951	2,118	2,301	2,501	493	618	745
C2	2,208	2,360	2,525	2,833	3,129	3,432	757	960	1,176
C3	4,606	5,535	6,380	7,326	8,592	9,787	1,974	2,380	2,826
D1	15	34	54	79	109	146	189	238	295
D2	22	50	79	118	167	227	299	379	471
D3	65	158	248	357	487	632	786	953	1,154
E1									774
E2									1,244
E3									3,147
Weighted average	**3,734**	**4,968**	**5,981**	**6,889**	**7,728**	**8,489**	**1,821**	**1,784**	**1,714**

* Does not consider possible balance in housing sub-account
Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

Average Pensions by Gender and Type of Affiliate*

Non-assigned women, pesos at constant 2004 prices

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	1,678	1,834	2,001	2,185	2,387	2,610	937	1,146	1,366
A2	3,338	3,632	3,952	4,302	4,687	5,104	1,450	1,801	2,160
A3	10,610	11,538	12,557	13,660	14,844	16,124	3,706	4,275	4,908
B1	1,660	1,818	1,980	2,157	2,353	2,569	786	985	1,172
B2	2,981	3,212	3,511	3,909	4,256	4,710	1,223	1,544	1,858
B3	8,403	9,335	10,505	11,800	13,037	14,623	3,112	3,666	4,275
C1	1,654	1,799	1,952	2,120	2,303	2,506	520	657	792
C2	2,210	2,364	2,529	2,838	3,135	3,441	807	1,024	1,250
C3	4,571	5,490	6,327	7,264	8,526	9,721	2,067	2,458	2,918
D1	18	36	55	80	111	153	203	255	314
D2	28	58	87	126	177	244	324	406	500
D3	85	180	272	390	541	703	840	988	1,191
E1									818
E2									1,316
E3									3,247
Weighted average	**3,686**	**4,688**	**5,628**	**6,284**	**6,647**	**6,993**	**1,574**	**1,572**	**1,584**

* Does not consider possible balance in housing sub-account
Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

Average Pensions by Gender and Type of Affiliate*

Assigned men, pesos at constant 2004 prices

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	1,667	1,818	1,983	2,164	2,363	2,582	824	1,023	1,232
A2	3,319	3,609	3,923	4,269	4,617	5,003	1,264	1,592	1,944
A3	10,486	11,388	12,376	13,452	14,621	15,890	3,183	3,837	4,522
B1	1,654	1,803	1,962	2,136	2,328	2,540	662	843	1,042
B2	2,940	3,152	3,441	3,831	4,166	4,605	1,017	1,312	1,649
B3	8,293	9,178	10,330	11,613	12,832	14,397	2,637	3,269	3,948
C1	1,650	1,791	1,942	2,107	2,288	2,486	436	559	695
C2	2,173	2,278	2,471	2,773	3,010	3,353	672	872	1,101
C3	4,433	5,159	6,147	7,071	8,108	9,489	1,744	2,182	2,667
D1	8	20	34	53	77	107	144	188	241
D2	12	30	52	81	119	168	227	299	387
D3	26	78	140	222	325	450	597	766	963
E1									425
E2									685
E3									1,754
Weighted average	**1,007**	**1,153**	**1,345**	**1,543**	**1,770**	**2,023**	**523**	**584**	**673**

* Does not consider possible balance in housing sub-account
Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

Average Pensions by Gender and Type of Affiliate*

Assigned women, pesos at constant 2004 prices

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	1,668	1,821	1,986	2,167	2,367	2,588	854	1,064	1,298
A2	3,322	3,612	3,927	4,274	4,623	5,013	1,318	1,667	2,051
A3	10,387	11,283	12,266	13,336	14,496	15,756	3,259	3,941	4,671
B1	1,654	1,804	1,964	2,139	2,332	2,545	691	885	1,099
B2	2,941	3,154	3,445	3,836	4,173	4,615	1,070	1,385	1,742
B3	8,214	9,094	10,237	11,510	12,720	14,275	2,707	3,365	4,077
C1	1,651	1,792	1,944	2,109	2,291	2,490	461	593	738
C2	2,173	2,281	2,475	2,778	3,016	3,362	715	927	1,167
C3	4,393	5,113	6,094	7,010	8,040	9,414	1,802	2,250	2,754
D1	9	21	36	55	80	113	153	200	256
D2	14	34	56	86	126	179	244	319	410
D3	32	85	149	234	343	474	620	790	993
E1									450
E2									725
E3									1,809
Weighted average	**1,076**	**1,151**	**1,283**	**1,360**	**1,484**	**1,649**	**466**	**532**	**640**

* Does not consider possible balance in housing sub-account
Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

b) Replacement rates based on the last ten years of wages received, by gender and type of affiliate

Replacement Rates Based on Last 10 Years of Wages Received by Gender and Type of Affiliate*

Non-assigned men

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	117%	119%	121%	122%	124%	126%	41%	46%	50%
A2	117%	118%	119%	120%	122%	123%	31%	36%	40%
A3	113%	114%	115%	116%	117%	118%	24%	26%	28%
B1	116%	118%	119%	121%	122%	124%	34%	39%	43%
B2	104%	104%	106%	109%	110%	113%	26%	31%	34%
B3	89%	92%	96%	100%	103%	107%	20%	22%	24%
C1	116%	117%	118%	119%	120%	121%	22%	26%	29%
C2	77%	77%	76%	79%	81%	83%	17%	20%	23%
C3	48%	54%	58%	62%	67%	71%	13%	15%	16%
D1	1%	2%	3%	4%	6%	7%	8%	10%	11%
D2	1%	2%	2%	3%	4%	5%	7%	8%	9%
D3	1%	2%	2%	3%	4%	5%	5%	6%	7%
E1									30%
E2									24%
E3									18%
Weighted average	**76%**	**81%**	**83%**	**85%**	**87%**	**88%**	**20%**	**22%**	**24%**

* Does not consider possible balance in housing sub-account
Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

Replacement Rates Based on Last 10 Years of Wages Received by Gender and Type of Affiliate*

Non-assigned women

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	117%	119%	121%	122%	124%	126%	42%	48%	53%
A2	117%	118%	119%	120%	122%	123%	32%	37%	42%
A3	113%	114%	115%	116%	117%	118%	25%	27%	29%
B1	116%	118%	119%	121%	122%	124%	35%	41%	45%
B2	104%	104%	106%	109%	111%	114%	27%	32%	36%
B3	89%	92%	96%	100%	103%	107%	21%	23%	25%
C1	116%	117%	118%	119%	120%	121%	23%	27%	31%
C2	77%	77%	76%	79%	81%	83%	18%	21%	24%
C3	49%	54%	58%	62%	67%	71%	14%	16%	17%
D1	1%	2%	3%	4%	6%	7%	9%	11%	12%
D2	1%	2%	3%	4%	5%	6%	7%	8%	10%
D3	1%	2%	2%	3%	4%	5%	6%	6%	7%
E1									32%
E2									25%
E3									19%
Weighted average	**84%**	**87%**	**89%**	**89%**	**87%**	**84%**	**20%**	**22%**	**26%**

* Does not consider possible balance in housing sub-account
Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

Replacement Rates Based on Last 10 Years of Wages Received by Gender and Type of Affiliate*

Assigned men

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	117%	118%	120%	121%	123%	125%	37%	43%	48%
A2	116%	117%	118%	120%	120%	121%	28%	33%	38%
A3	110%	111%	112%	113%	114%	115%	21%	24%	26%
B1	116%	117%	118%	120%	121%	123%	30%	35%	40%
B2	103%	102%	104%	107%	108%	111%	23%	27%	32%
B3	87%	90%	94%	98%	100%	104%	18%	20%	23%
C1	116%	116%	117%	118%	119%	120%	20%	23%	27%
C2	76%	74%	75%	78%	78%	81%	15%	18%	21%
C3	47%	50%	56%	59%	63%	69%	12%	14%	15%
D1	1%	1%	2%	3%	4%	5%	6%	8%	9%
D2	0%	1%	2%	2%	3%	4%	5%	6%	7%
D3	0%	1%	1%	2%	3%	3%	4%	5%	6%
E1									16%
E2									13%
E3									10%
Weighted average	**42%**	**40%**	**39%**	**38%**	**39%**	**40%**	**11%**	**13%**	**16%**

* Does not consider possible balance in housing sub-account
Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

Replacement Rates Based on Last 10 Years of Wages Received by Gender and Type of Affiliate*

Assigned women

	2010	2015	2020	2025	2030	2035	2040	2045	2050
A1	117%	118%	120%	121%	123%	125%	38%	44%	50%
A2	116%	117%	118%	120%	120%	121%	30%	35%	40%
A3	110%	111%	112%	113%	114%	115%	22%	25%	27%
B1	116%	117%	118%	120%	121%	123%	31%	37%	42%
B2	103%	102%	104%	107%	108%	111%	24%	29%	34%
B3	87%	90%	94%	98%	100%	105%	18%	21%	24%
C1	116%	116%	117%	118%	119%	120%	21%	25%	28%
C2	76%	74%	75%	78%	78%	81%	16%	19%	23%
C3	47%	50%	56%	60%	63%	69%	12%	14%	16%
D1	1%	1%	2%	3%	4%	5%	7%	8%	10%
D2	0%	1%	2%	2%	3%	4%	5%	7%	8%
D3	0%	1%	1%	2%	3%	3%	4%	5%	6%
E1									17%
E2									14%
E3									11%
Weighted average	**51%**	**47%**	**45%**	**43%**	**41%**	**39%**	**11%**	**13%**	**16%**

* Does not consider possible balance in housing sub-account
Note: LSS-73 pensions in shaded area
Source: BBVA Bancomer

Appendix 6

Investment Holdings in Pension Funds

OECD countries, %

	Fixed income		Land and constructions	Investment funds	Other*	Stocks*
	Government	Corporate				
Australia	2.3	7.0	1.2	65.9	1.9	21.7
Austria	44.4	14.6	1.3	0.0	3.2	36.5
Belgium	6.5	3.0	1.1	74.9	4.7	9.8
Canada	22.1	5.3	3.3	39.8	3.7	25.8
Czech Republic	60.3	22.1	0.6	0.0	17.0	0.0
Denmark	27.4	23.6	1.7	11.2	10.2	25.9
Finland	45.7	5.2	7.7	0.0	0.1	41.3
France	64.4	1.1	3.1	25.8	0.3	5.3
Germany	4.6	56.7	3.4	0.6	0.2	34.5
Hungary	75.5	1.4	0.2	9.0	6.1	7.8
Ireland	28.6	31.7	0.1	1.8	3.3	34.5
Italy	33.6	7.6	7.8	11.3	29.8	9.9
Korea	36.0	61.9	0.0	0.1	1.3	0.7
Luxembourg	40.0	0.0	0.0	45.8	3.6	10.6
Mexico	83.8	11.0	0.0	0.0	3.9	1.3
The Netherlands	5.8	38.4	3.7	0.0	2.3	49.8
Norway	27.4	34.8	4.6	0.0	4.3	28.9
Poland	66.4	1.2	0.0	0.0	0.4	32.0
Portugal	35.1	15.5	8.1	22.1	-1.9	21.1
Spain	25.5	43.0	3.2	9.0	4.1	15.2
Switzerland	33.4	6.3	9.6	33.2	0.6	16.9
Turkey	80.8	0.0	0.0	0.0	7.6	11.6
United Kingdom	15.1	7.9	3.8	18.0	15.1	40.1
United States	13.6	6.6	0.7	23.5	14.3	41.3
Average	**36.6**	**16.9**	**2.7**	**16.3**	**5.7**	**21.0**

* Includes: cash, deposits, insurance contracts, loans, etc.
Source: OECD, Pension Markets in Focus. Published in June 2006 with data through 2004

Cover picture
"*Danza de los Viejitos*" (Dance of the Old Men)

The Indigenous dances represent a close link between ancient and modern Mexico. **"*La Danza de los Viejitos*"** from Jarácuaro, Michoacán has its origin in ancient pre-Hispanic rites. It is related to the agricultural cycle. The mask recalls the ancient God, called *Taré* or *Grande*. The cane substitutes the planter and the foot-tapping corresponds to the rhythmic tapping of the rain; the hat and colored ribbons represent the rays of the sun.

Source: *Consejo Nacional para la Cultura y las Artes* (National Council for Culture and the Arts), Conaculta. For more information, see http://www.conaculta.gob.mx/sladeprensa/2004/10ago/indigena.htm