

Latin America's Pension Revolution: A Review of Approaches and Experience *

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Abstract

Latin America (LA) is in the midst of a pension revolution that has caught the attention of pension system experts and policy makers elsewhere. There is one common feature that makes the LA approach unique in providing old-age security: adoption of an important second pension pillar that is fully funded and based on contributions to individual accounts in pension funds that are invested in financial markets and managed by private companies. However most other reform features differ significantly across the eight country reform experiences implemented to date. This paper compares reform approaches, evaluates actual and potential reform effects, and points out issues of concern. Pension reform has been largely successful in helping to defuse the “ticking pension time bomb” of PAYG systems and to make pension arrangements less prone to political interference. Pension reform could also lead to sizable efficiency gains in factor markets, helping to raise social welfare and economic growth. However significant problems of design and implementation remain in LA's 8 reformed pension systems. They represent a challenge for policy makers in both the latter countries and those that are considering future reform.

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1. INTRODUCTION

Of all world regions, Latin America (LA) was the less likely to devise and implement a major pension reform in the 1980s and early 1990s. As opposed to other regions with mature demographics and mature pension systems (like OECD and European transition countries) there was no ticking old-age crisis bomb about to explode in most of LA. Ten years ago most of the region was either recovering or in the midst of deep macroeconomic and financial crises and had in place inadequate structural policies, resulting in stagnating growth and increasing inequality. Under such circumstances – very different from those observed in the world’s then-considered star region (East Asia) – reform in a “second-generation”-type of area such as social security was not expected to be among the priorities of LA policy makers. Moreover, lagging behind the OECD and East Asia in most areas of policy reform, it seemed unlikely that any innovative reform could be first designed and implemented in LA, catching the subsequent attention of policy makers and the general public elsewhere.

Hence why? First, as opposed to industrial countries, existing mandatory pay-as-you-go (PAYG) pension programs were grossly mismanaged by state agencies, highly unfair, and imposed costly distortions. Second, a quantum shift in economic policies took place during the last decades: pension reform was part of a new development strategy based on decentralization of economic decisions to private agents, based on market liberalization and privatization of state enterprises and government programs. Third, the success of the early Chilean reforms undertaken in the 1970s and 1980s, of which pension reform was a major component, got increasing regional attention.

LA’s pension reforms share one common feature that makes the LA approach innovative and unique in providing old-age security. It is the adoption of an important second pension component or pillar that is fully funded (FF), based on contributions to individual accounts in pension funds that are invested in financial markets and managed by decentralized pension-fund management companies (PFMCs), with pension benefits based on defined contributions (DC) during active life and their market returns. This second pillar is regulated and supervised by the government, and complemented by a first pillar of government-provided pension programs. However most other reform aspects and implementation specifics vary a lot among reforming countries, reflecting both country differences in initial conditions, economic and political constraints, and reform objectives, as well as a learning process from the success and shortcomings of reform features in the earlier reforms -- largely the Chilean case. Hence while there is a common basic approach, there is a lot to learn from major country differences in reform design and results.

Eight LA countries have started new pension systems to date: Chile (1981), Peru (1993), Colombia (1994), Argentina (1994), Uruguay (1995), Bolivia (1997), Mexico (1997), and El Salvador (1998). This is a large sub-sample of all major pension reforms implemented in the world since the 1980s (Demirguc-Kunt and Schwartz 1998). By post-reform country years through 1999, LA has accumulated 43 country years – of which 18

come from Chile's experience.¹ Hence evaluating the region's pension reforms from a comparative perspective is justified on three grounds: reform depth, diversity, and relatively long post-reform experience.

This paper reviews reform approaches in the region, evaluates actual and potential reform effects, and points out remaining problems and challenges of the reformed systems. Section 2 describes the common features and differences of the eight pension reforms. Section 3 reviews the features – contributions, benefits, and coverage – of the reformed systems and focuses on the performance of the mostly private pension industry. The fiscal and macroeconomic consequences of LA's pension reforms are analyzed next. Major problems and future reform challenges are also observed in LA's reformed pension arrangements – they are covered in section 5. Brief concluding remarks close the paper.

2. EIGHT MAJOR PENSION REFORMS IN LA: COMMONALITIES AND DIFFERENCES

Initial conditions and reform motivation (see Table 1). Reforming countries had in common a pre-reform mandatory pension system comprised by a one-pillar defined-benefit (DB) PAYG regime managed by state social institutions (SSIs). Distribution of contributions and benefits was not only unfair and unstable across cohorts as would be expected from a PAYG system were initial pensioners benefit from transfers paid by subsequent cohorts. Net benefits also were very inequitable and unpredictable across different sectors and income groups as opposed to industrial countries' PAYG systems. The reasons behind these variations in net benefits were two. First, a large variety of pension regimes – within or across individual SSIs - were allowed to develop for different production sectors and groups of workers, providing major variations in net benefits that reflected the political weight of specific lobbies and unions. The major beneficiaries of generous net pension benefits were urban, middle-income, and formal-sector employees of the government or large state and private-sector enterprises. Second, high macroeconomic instability caused large instability in net pension benefits as both contributions and benefits were frequently adjusted by governments for fiscal purposes and high and unstable inflation led to major changes in real pension benefits. In some countries with mature PAYG systems and a maturing population – Argentina and Uruguay in particular – the fiscal unsustainability of current net pension benefits was increasingly apparent. Not surprisingly evasion of pension contributions (and other taxes on labor and production) was widespread, leading to generally low coverage of active and passive workers.

Pension programs were often badly mismanaged by SSIs. State pension agencies incurred in large administrative costs, bad use of dwindling pension reserves (many had started as at least partially funded programs) investing in bad projects and lending to privileged beneficiaries at highly subsidized terms, dismal information and benefit provision services, and low benefit payments. By design, these DB PAYG systems did

¹ Chile's long post-reform experience explains why so much material on post-reform performance is concentrated on the Chilean case. This bias is also reflected in the evidence presented in this paper.

not allow for individual member choice regarding retirement age, risk-return investment preferences, or benefit payment options.

In addition (or because of) the traditional system's incompetence in providing old-age security, there was growing awareness of its negative externalities on factor market efficiency, saving, and growth. More broadly, LA's traditional pension systems were seen as one more manifestation of a 50-year old development model based on large government sectors and repressed markets whose failure was increasingly apparent in the aftermath of the 1970s oil shocks and 1980s debt crisis. Chile started a radical shift toward adoption of a liberal private-sector based development model, of which pension reform was a significant component. The success of Chile's overall experience and its innovative pension reform contributed to the adoption of similar reforms by other LA countries a decade later.

*Design and implementation of new multi-pillar structure.*² The multi-pillar structure of the new pension systems comprises a government-run first pillar with the distributional aim of providing old-age income security and a second-pillar of FF pensions managed by decentralized institutions. Pension reformers face three crucial design decisions concerning the adoption of the two-pillar structure:

- (a) how much the initial implicit PAYG debt is downsized by raising PAYG contributions and reducing benefits,
- (b) how much of the downsized implicit PAYG debt is cut – that is, how large a pension reform transition cost governments are willing to incur – due to partial or complete substitution of a FF second pillar for the PAYG first pillar, and
- (c) how long the pension transition fiscal costs are spread out over time.

LA reforms differed widely in the initial size of their initial implicit PAYG debt levels, ranging from 37% in Peru to 214% in Uruguay, as will be discussed below. Before or during adoption of the new pension system most governments implemented a non-structural reform of their old PAYG system geared at reducing the size of the initial PAYG liabilities and hence the fiscal costs of the subsequent structural pension reform. As elsewhere in the world when PAYG systems are downsized for fiscal reasons, this was achieved by raising contribution costs and reducing pension benefits. For instance, PAYG contribution rates were raised in Colombia, retirement ages were raised in Chile, Argentina, and Uruguay, contribution periods for pension eligibility were increased in Argentina and El Salvador, and special early retirement regimes were abolished in Chile.

After downsizing the old PAYG regime, the fundamental next step is deciding how much of the PAYG system is to be replaced by a FF second pillar in the long term. This involves defining if the shift from PAYG to FF is partial or complete. It will be the latter if all PAYG members are forced to shift to FF in the long term; partial shifting will

² Due to limitations of space, no reference is made in this paper to social protection programs other than old-age pensions, such as early-retirement pensions and disability and survivors insurance, although these programs are often provided by pension agencies or fund management companies.

result when particular groups of PAYG members are exempted from the reform or when those who shift either contribute to both pillars or retain the option of shifting back.

In the strict sense of not exempting any group of contributors, no LA pension reform involved a comprehensive radical shift to FF. In all eight reform cases, military and police personnel retained their typically generous special PAYG pension regimes, a result of their political weight (specially in Chile's 1981 reform) and shorter professional careers. Additional exempted sectors range from state and local government employees in Argentina, to oil-sector workers and teachers in Colombia, to government and public-enterprise employees in Mexico, and to bank employees, notaries, and teachers in Uruguay. Self-employed workers have the option of affiliating to the new FF pillar in most cases.

Regarding the shift from PAYG to FF of all those affected by pension reform, the LA experience offers a range of four models for long-run membership in either one or both pension pillars (this excludes temporary arrangements for transition generations, discussed below):

- (i) *Radical reform:* the DC-FF second pillar substitutes entirely for the PAYG old pillar. The latter is closed down, either immediately (Mexico and Bolivia) or gradually (Chile).
- (ii) *Endogenous reform toward an either/or mixed system:* the DC-FF second pillar is offered as an either/or alternative to the state-run DB-PAYG first pillar. Pension system members are required to make their full contributions to either pillar at any point in time (Colombia and Peru). In Peru PAYG members retain the option to shift once in their lifetime to the FF pillar but are not entitled to shift back to PAYG, while in Colombia all members retain indefinitely the option of shifting back and forth between both pillars. Pension benefits are paid according to members' affiliation history. Due to the shifting option, the relative size of the first and second pillars is uncertain, and so are the fiscal costs of transition deficits.
- (iii) *Endogenous reform toward a complementary mixed system:* dual contributions to first and second pillars depending on income levels (Uruguay). All members not exempted by the reform are required to contribute partly to the state-run DB-PAYG first pillar. Lower-income contributors earning below a threshold income level are entitled to contribute to both the first pillar and the DC-FF second pillar. Higher-income contributors are forced to contribute to the second pillar in proportion to their income in excess of the threshold level. Pension payments comprise DBs from the first pillar and, when applicable, DC-based benefits from the second pillar. Due to affiliation choice, both relative pillar size and fiscal costs of transition are uncertain.
- (iv) *Endogenous reform toward a complementary mixed system:* dual contributions to a mandatory first pillar and an optional second pillar (Argentina). All members not exempted by the reform are required to contribute to both the state-run DB-PAYG first pillar and to a pillar of their choice – either the first pillar or the DC-FF second pillar. As in Peru, PAYG members retain the option to shift once in

their lifetime from the PAYG to the FF pillar but are not entitled to shift back to PAYG. Pension payments comprise DBs from the first pillar and, when applicable, DC-based benefits from the second pillar. As above, due to affiliation choice, both relative pillar size and fiscal costs of transition are uncertain.

Two factors explain which specific reform models countries decided to implement: fiscal conditions and the political economy of pension reform. Fiscal stress is reflected by high initial pension deficits or a large initial implicit PAYG debt – two fiscal conditions that are not necessarily correlated. The political economy of pension reform is reflected by the strength of reform opponents comprised by three groups of potential reform losers: PAYG beneficiaries, SSI staff and managers, and transition generation that could end up paying for reform transition deficits. Reform design, negotiation with concerned groups, and final implementation hinge significantly on these factors. They strongly influence the scope and depth of the pension reform and how it is financed.

First, they determine if and by how much the initial PAYG debt is reduced as part (or before) pension reform. On one hand, a high initial pension deficit or a large initial implicit PAYG debt provides a rationale for engaging in a first stage of PAYG reform. On the other hand, however, the stronger is the political strength of potential reform losers, the slimmer are the chances of reducing substantially the initial PAYG debt. Second, they determine the depth of pension reform. The larger is the remaining implicit PAYG debt (after its first-stage reduction) and the stronger is the political strength of reform opponents, the smaller will be the relative size of the second pillar relative to the (reformed) first pillar.

The extent of fiscal costs and deficits of existing PAYG systems and hence the costs of pension reform are strongly correlated with population maturity and PAYG system maturity. Relatively older populations and high coverage were the trademark of pre-reform Argentina and Uruguay, and, to a lesser extent, Chile. Not surprisingly, these countries were among those with the highest initial implicit PAYG debt levels. The other five countries had younger population structures and lower PAYG coverage rates, with lower implicit debts, except Mexico.

Large differences in the political power of reform opponents were observed in the eight reforming countries. At one extreme was Chile where reform opponents lacked any effective power under Pinochet's government. In all other countries pension reform was adopted under (more) democratic conditions, allowing pension opponents to mobilize against more radical Chilean-type shifts to a dominant second pillar. Among these 7 countries Uruguay was likely at the extreme: opposition to a radical pension reform was mobilized both by the SSIs and Uruguay's Pensioners Party.

The role of fiscal conditions and reform opponents' strength in shaping both the downsizing of initial PAYG debt and subsequent reduction in (lowered) PAYG debt as a result of adopting a multi-pillar system is depicted in Fig. 1. This qualitative figure (approximately consistent with implicit PAYG debt levels reported below and my own

assessment of reform opponents' strength) suggests that countries under democratic conditions (as opposed to Chile in 1981) and lower initial PAYG debts and lower opponents' strength (as El Salvador) are generally more successful in (a) reducing their initial debt more strongly by reforming the PAYG system, and (b) replacing a larger part of the contributions-based first pillar by a second pillar. In contrast, both Uruguay and Argentina were able to reduce only slightly their initial debt and maintained a very important role for their (reformed) contributions-based first pillar.

Reform depth is also reflected by the share of mandatory contributions to the new second pillar in total (first plus second-pillar) contributions (Fig. 2). Considering that only the military are exempted from pension reform in Chile, Bolivia, and El Salvador, the share of second-pillar contributions will attain close to 100% in the long term (say 70 years after the pension reform). In Bolivia and Mexico the long-term share is attained at reform start as the contributions-based first pillar is closed down at year 0; in Mexico, however, PAYG members exempted from the reform are many more than in Bolivia. In Chile pension reform has raised second-pillar contributions to ca. 90%, 18 years after reform start. In Peru and Colombia the growth of the share of second-pillar contributions is similar to what was observed in Chile 5-6 years after reform start. However future second-pillar contribution shares are largely uncertain due to the membership options open to pension system participants. The same is true for Argentina and Uruguay – but here the uncertain final share of the second pillar is probably even lower due to its complementary and optional character.

First pillar as a complementary safety net. In all reformed systems – with or without a contributions-based first pillar – the first pillar includes a complementary safety net provided by the government. This comes in two forms (universal and targeted means-tested transfers) provided to different groups of the elderly (pension system participants and non-participants). The Bolivian case constitutes the most universal and general social assistance, with the government providing a universal flat pension to all old-age people, financed by returns from a collective capitalization fund invested in shares of privatized enterprises.

In all other countries the complementary safety net comprises separate assistance programs for elderly participants and non-participants. Non-participants are provided with a means-tested assistance pension in Chile, Colombia, and Mexico, targeted at the old-age poor. Pension system participants that meet minimum contribution-period requirements but are not able to finance a pre-determined minimum or basic pension level at retirement are provided with a supplementary government pension or transfer. This means-tested minimum-pension guarantee (MPG) for participants is provided in all countries except Bolivia. MPG values vary significantly across countries, ranging from 25% of the average wage in Chile to 40% in Mexico and 60% in Colombia (Queisser 1998). Finally Mexico encourages pension system participation by providing a flat government subsidy on contributions – financed by general revenue – amounting to 5.5% of the minimum wage.

The second pillar. While there is large country variation regarding the role and size of the first pillar and its relation to the second pillar, all countries have adopted the basic structure of the second pillar embedded in the Chilean pension system. The FF second pillar is based on contributions to individual accounts in pension funds that are invested in financial markets and managed by decentralized pension-fund management companies (PFMCs) during active life and by insurance companies (ICs) during retirement. PFMCs are specialized financial companies that are separate legal entities from the pension funds they manage. PFMC affiliates belong to one of three categories: contributing workers, non-contributing workers, and pensioners under the phased-withdrawal pension option. The investment risk is borne by affiliates during active life – in this sense the system is based on defined contributions (DC). However, depending on pension benefits (discussed below), investment risk is borne by either pensioners or ICs during retirement – hence pensioners are able to choose among defined benefits (DB) or DC.

Decentralized PFMC are restricted to private special-purpose companies in Chile and most other countries and are termed “AFPs” (a Spanish acronym for “Administradoras de Fondos de Pensiones”) or a slight variant of this term. In Colombia, Mexico, and Uruguay, reformed state SSIs are entitled to compete with private PFMCs. There is generally free entry into the industry, subject to certain requirements and regulations described below – the exception is Bolivia, where two PFMC licenses were auctioned off for a five-year period. Pension annuities are provided by non-specialized life-insurance companies. Competition for affiliates is typically strong among PFMC and among ICs.

Consumer choice. Consumer choice is limited to selection of PFMC and pension services. PFMC affiliation is at the individual level in all countries, not allowing for group affiliation by unions or firm-level groups. Affiliates are entitled to select the PFMC of their choice and to switch among PFMCs, typically restricted to twice per year. In most countries PFMCs hold only one portfolio and affiliates are restricted to hold their pension savings in one account at the PFMC of their choice. Hence choice among different portfolios offered by one PFMCs or splitting of pension savings among different portfolios or accounts in separate PFMCs is not allowed. The exception is Mexico where affiliates are entitled to hold two portfolios, starting in 1998. At the start of retirement (and afterwards), in most countries pensioners are entitled to choose among two basic pension options and their combinations: a pension annuity bought from an IC or a phased withdrawal of pension assets from a PFMC.

Bundling of pension services. As noted above, all reforms share an institutional separation in providing consumer services during active and passive life, supplied by PFMCs and ICs, respectively. PFMCs provide four basic services to affiliates: collection of contributions, pension fund investment, record keeping, and client information. Bundled provision of these services is required in 5 reform countries. However collection of contributions is performed separately by a state agency in Argentina, Uruguay, and Mexico.

Government guarantees. Chile's provision of government guarantees is illustrative of the new second-pillar model. PFMCs and ICs are subject to regulations on minimum capital (debt-equity ratios) and pension fund reserves. PFMCs are required to hold a guarantee fund of 1% of pension fund assets to finance any difference between their managed pension fund's annual real rate of return and the larger of 2% and 0.5 times the industry average pension fund return. When replenishment of the guarantee fund in case of required withdrawal by the PFMC is not met within 15 days, its license is revoked and the pension fund is sold to other PFMCs or a new market entrant. If the PFMC guarantee fund is depleted, an ultimate government minimum-return guarantee is triggered, covering any return shortfall by government revenue. The PFMC guarantee fund has been used only twice by PFMCs due to shortfalls in their pension fund returns and the ultimate government guarantee has never been used since 1981. A second government guarantee is on pension annuities managed by life insurance companies. The government guarantees 100% percent of the annuity up to the level of the minimum pension and 75% above that level. This guarantee has been exercised once, when a life insurance company went bankrupt in 1984.

Variations of the Chilean government guarantees on pension fund assets and rates of return are found in subsequent reforms. Regarding rate-of-rate guarantees, however, they are absent in Peru, Bolivia, and Mexico.

Second-pillar industry regulation and supervision. Pension funds, the PFMC industry, and pension annuities paid out by insurance companies are heavily regulated and tightly supervised in most reformed systems. PFMC supervision is performed by specialized PFMC superintendencies or by departments that are part of bank superintendencies. In Chile's 1981 pension reform fund investment by PFMCs was heavily restricted by portfolio ceilings imposed on specific asset classes, issuers, companies related by ownership to the corresponding AFP, and investment by an individual AFP in a particular company. Since then, portfolio restrictions on asset classes have been gradually liberalized. Other country reforms have followed a similar pattern of gradual deregulation while some (i.e. Bolivia) have started with a more liberal investment regime. Investment of reserves for pension annuities by life insurance companies are also subject to portfolio regulations in all reform cases.

Third pillar: voluntary old-age saving plans. A pension system's third pillar is comprised by tax incentives to voluntary old-age savings (additional to mandatory retirement savings). Some of LA's pension reforms have provided limited tax incentives to additional voluntary contributions deposited in individual accounts held at PFMCs, either jointly or separately with mandatory contributions.³

³ A case in point is Chile, with two types of incentives to voluntary old-age saving. The first category is voluntary additional contributions deposited jointly with the mandatory contribution at the corresponding PFMC, benefiting from the same tax treatment of mandatory contributions, i.e. income tax exemption on both principal and returns but pension benefits are treated as any other form of taxable income. The second category is voluntary additional contributions to a separate, second individual account at the PFMC of the first choice; here the principal is not tax exempt but returns are. Funds can be withdrawn at any time from the second account; therefore this is a general saving incentive, not specific to retirement savings albeit

3. FEATURES AND RESULTS OF REFORMED PENSION SYSTEMS AND THE PRIVATE PENSION INDUSTRY

Contribution rates. Pension reforms have introduced major changes in the level and structure of contribution rates in LA (Table 2). Second pillar contributions typically comprise contributions to individual pension savings accounts (typically ranging from 6.5 to 11.0% of wages up to a given wage ceiling), premiums for invalidity and survivors insurance (from 0.5 to 2.5% of wages), and commissions or administrative fees paid to PFMCS (from 0.5 to 2.4% of wages). In those countries where a contributions-based first pillar competes with the second pillar, both pillars have been put on similar footing regarding overall contribution rates.⁴

In six countries total contribution rates are remarkably similar, in the range of 11 to 14% of wages. These countries include Chile, where contribution rates have fallen by half with the reform, and El Salvador, where contribution rates have risen four times.⁵ The two big outliers regarding the level and structure of contribution rates are Argentina and Uruguay, where total contribution rates exceed 27% of wages, more than twice the average total contribution rate in the other six countries. These OECD-type contribution levels reflect that both countries maintain a large PAYG pillar in their reformed systems and aim at high replacement rates.

Pension benefits. Very generous pension benefits were paid by some of the old PAYG systems. Their first-stage reform and subsequent partial or complete substitution led to significant reductions in pre-reform benefits. One extreme case was Uruguay where the replacement rate of the old PAYG system was 80%, implying public pension expenditures of 15% of GDP in 1996 (Queisser 1998). The reform of the first-pillar public PAYG system reduced its replacement rate to 50% and increased retirement ages, implying a significant reduction of the initial implicit PAYG debt. The other case was Argentina, with pre-reform replacement rates ranging from 70 to 70%, also brought down by a first-stage reform of the public pillar (Vittas 1997).

It is hard to compare pension replacement rates of the old PAYG systems, the reformed public DB PAYG pillar, and the new DC FF pillar in the reformed countries. Lack of data, short post-reform time spans, and DB-DC differences make such

managed by PFMCS. There are additional tax incentives on specific savings instruments in Chile but they are totally unrelated to retirement savings.

⁴ Two departures from the standard second-pillar contributions structure are the additional 1% of wages paid by high-income earners in Colombia earmarked for subsidizing new pension system participants and the additional 5% of wages paid by all participants in Mexico into a housing fund, merged into the pension fund at retirement. Another departure is the flat government subsidy provided to all pension system participants, at 5.5% of the minimum wage or some 2% of the average wage (mentioned above). Not being an employee or employer-paid contribution, it is excluded from table 2.

⁵ In Chile the large reduction in contribution rates was returned as increased take-home wages to all contributors that shifted from the first to the second pillar. This significant incentive was not provided to the transition cohorts of workers that remained in the old PAYG system, hence contributing to the rapid shift to the second pillar.

comparisons difficult. Simulations for the Chilean and Colombian pension reforms suggest that average long-term real rates of return of ca. 4% per year on individual accounts held in the DC-FF second pillar would yield replacement rates close to those observed in the reformed DB public pillar, in the range of 50 to 60%.

In the absence of relevant replacement rates, it is useful to look at actual pensions paid by the old and new pension systems in Chile. Due to the gradual transition, most pensions are still paid out by the old system (by an amount equivalent to 2.6% of GDP) while the new system is paying benefits to a much smaller number of people (equivalent to 0.9% of GDP). The average individual pension paid by the old system is 39% of current average taxable income and the comparable pension paid by the FF pillar is 45% of current taxable income in 1997. While one should be careful in drawing too strong conclusions from these figures, they suggest that second -pillar benefit levels are better than first-pillar benefits for this specific period in Chile.⁶

Coverage. Pre-reform coverage of labor force and pensioners by the old PAYG systems varied enormously across different countries due to differences in system design and informality. Pension reform is not expected to change these differences significantly, at least in the short term. However the composition of affiliation has been altered drastically as a large fraction of the labor force has shifted from the PAYG pillar to the new FF pillar, which has also grown due to affiliation of previously uncovered workers (Table 3). The shift in Bolivia and Mexico is mandatory; in the other 6 countries it is voluntary and hence a result of perceived incentives. Incentives ranged from negative in Peru (initially) to very positive in Chile. In 1997 or 1998, affiliation coverage of the labor force varies between 12.2% in Bolivia to 100% in Chile.

However coverage of affiliates – that comprise both active contributors and non-active members – is very different from coverage of contributors. The latter number ranges only from one half to two thirds of affiliates. The causes of this discrepancy include varying degrees of evasion of contributions, large and time-varying degrees of labor informality, and large variations in the composition of the officially-measured labor force and people moving in and out of the labor force. A case in point is Chile where 100% of the labor force is affiliated with the second pillar but only 56.2% are active contributors. In this country most of the difference is due to independent and informal-sector workers, as the ratio of active second-pillar contributors to dependent workers is close to 90%.

⁶ There are various reasons to be careful in doing this comparison. First, the figures are aggregates or averages for old-age, disability, and survivor pensions due to lack of separate data for old-age pensions. Second, pensions paid by the old system aggregate over (more generous) pre-reform PAYG pensions and (less generous) reformed PAYG pensions, while pensions paid by the new system are an aggregate of recognition-bond payments from the reformed PAYG system and benefits from pension assets accumulated under the new FF second pillar. This suggests that the difference between second-pillar pension benefits and reformed-PAYG pensions is larger than what the quoted figures imply. However, and third, pensions of the old system are paid to people that are older (and hence have lower lifetime income levels) than those that receive pensions from the second pillar.

Hence changes in system coverage associated to pension reform should be evaluated by looking at numbers of active contributors. In Chile, 60.5% of employed labor were active contributors to the second pillar and only 4.2% of employed labor were remaining in the old PAYG in 1998 (mostly workers close to retirement). Therefore coverage of total employment (as measured by active contributors) has increased significantly after the pension reform, from 51% in 1980 to 64.7% in 1998 (Fig. 3). Pension system coverage by the PAYG system of old-age population aged 55 and above stood at 68% in 1980. This figure increased to a peak of 75% in 1985, falling gradually afterwards to attain 70% in 1998. Pension system coverage by the new FF system increased gradually over time, attaining 24% in 1998. While the figures of old-age coverage by the old and new system are not directly comparable ⁷, they suggest a significant increase of total pension coverage of the elderly since the start of the new system.

Operational scale and market concentration of the private pension industry. Chile's extended experience offers a relevant pension industry case study that illustrates the dynamics between operational scale, industry returns, and market concentration (Fig. 4). The pension fund industry started with 12 AFPs in 1981, a number that increased to a peak of 21 companies in 1993-1994, then falling again – through mergers, acquisitions, and closures – back to 12 AFPs in 1998, and further to 9 AFPs in early 1999. The average scale of operation trebled from 88,000 active contributors per AFP in 1982 to 274,000 in 1998. Average pension fund assets managed by each AFP have increased from US\$ 51 million in 1982 to US\$ 2.4 billion in 1998. However, average figures are misleading because AFP industry concentration is large and rising. The share of the three largest AFPs is 70.3% by contributors in 1998. Rates of return on AFPs' own capital – not to be confused with the rates of return on pension funds managed by AFPs or on pension assets held in individual accounts, analyzed below – became positive and very high after being negative during the first three years of startup of the system, when the scale of operation was low and marketing costs were high. Very high returns of 39-48% in real terms on AFPs' own capital reaped during 1989-1991 prompted a massive entry into the industry, a substantial reduction in subsequent returns to more normal levels and, again, to industry concentration.

A similar picture of relatively large market concentration is observed elsewhere in LA's private PFMC industry (Fig. 5). Here the number of PFMCs ranges from 2 in the smallest country (Bolivia) to 17 in the largest ones (Argentina and Mexico) in 1997. Market concentration measured as the share of the three largest PFMCs in total contributors ranges from 44% in Mexico to 100% in Bolivia.

Pension fund assets and composition. With the exception of Chile, the fully-funded pension industry is still small in all reformed systems (Table 4). This reflects the recent start of most reforms, their gradualism and the only partial shift to funding in most reforms. Judging from Chile's experience, significant growth is expected in those

⁷ This figure is over-estimated by referring to PAYG pensions, not pensioners. Some people receive more than one PAYG pension and some PAYG pensioners are below age 55.

countries where the second pillar will also fully replace the first pillar in the long term: Mexico, Bolivia, and El Salvador.

Pension fund asset composition is largely bound by government investment regulation. Gradual deregulation over time in Chile and some other countries is reflected in a gradual diversification away from government debt and bank deposits, increasing the share of private-sector and variable-income assets (Fig. 6). Foreign investment is, however, dismally low. Chile has the highest share (3.5% of pension fund assets invested abroad) – a far cry from an internationally diversified portfolio that could provide adequate old-age protection against idiosyncratic national shocks.

Very little variation in pension fund portfolios is observed across PFMCs in all post-reform experiences. Over-regulation of pension funds (including rate-of-return guarantees, portfolio ceilings, and restricting individual accounts to one portfolio offered by one PFMC) and, likely, lack of sophisticated portfolio decision-making by the median pension system affiliate are behind PFMC bunching and portfolio replication.

Returns on pension funds and individual pension accounts. Average real rates of return on pension fund assets have been high in all reformed systems: the 6-country post-reform average has been an annual 11% (Table 5). However large annual variations are behind this figure: the cross-country post-reform standard deviation has been 7.6%. The Chilean experience suggests that rates of return are high during the first years after the reform, falling significantly afterwards (Fig. 7). This could be a result of initial capital gains in domestic variable-income markets resulting precisely from the large initial demand growth for these assets coming from pension funds. As important, real rates of return on individual pension accounts are sensibly lower than those recorded by pension funds – the difference due to the commissions paid by contributors to PFMCs. Available data for Chile over the 1991-97 period shows that individual accounts yielded on average a real 8.3%, a figure that is 1.9% lower – due to commissions – than the real return on pension funds (Fig. 7).

Commissions and costs of the private pension industry. Variable commissions paid by contributors to the second-pillar pension industry are in the range of 0.5% to 2.4% of wages, as discussed above. Far at the lower end of the distribution is Bolivia, with a 0.5% variable commission, set by the government as a condition of auctioning PFMC licenses. Additional fixed monthly commissions are charged (only) in Argentina (at US\$ 1.62 in 1998) and Chile (at US\$ 0.69 in 1998). Finally, Mexico charges an annual commission of 0.70% on outstanding pension fund assets.

Are commissions high in reformed Latin American countries? A recent comparative study provides a resounding yes to this question (Valdés-Prieto 1999). Average annual total commissions – the sum of all types of commissions net of insurance premia – range from US\$ 120 (Colombia) to US\$ 275 (Argentina) in six LA pension systems. Only in two countries commissions are sensibly lower: in Mexico (at US\$ 70) and particularly in Bolivia (at US\$ 19). This puts the 6 more expensive LA pension

systems close to the cost of UK's personal pension plans (at US\$ 222) while the two least expensive LA systems are lower than Australia's Superannuation Guarantee (US\$ 77).⁸

One important explanation of high commissions in 6 LA countries is the large share of marketing costs of the pension fund industry. An extreme case is Chile, where marketing costs in total AFP revenue grew from 10% in 1988 to 34% in 1997, reflecting AFP's expansion of salespeople from 2,727 to 17,448 during the same time span. While this trend was reverted subsequently,⁹ it illustrates how pension system design flaws can have very negative effects on net pension assets and hence on the welfare of the elderly.

4. FISCAL AND MACROECONOMIC EFFECTS OF REFORM

Significant fiscal and macroeconomic consequences can be expected from LA's pension reforms. This section starts by evaluating the reforms' fiscal costs and financing options. Next the focus is on the more difficult task of attempting to isolate the quantitative contribution of pension reform to improvements in labor and capital markets, as well as to aggregate saving, factor productivity growth, and GDP growth.

Estimating and financing the pension reform transition deficit. I discussed above the interaction between fiscal costs, politics, and reform design of pension reform. Next I review the size and financing sources of pension reform transition deficits once reform design has been decided.

The standard measure of the fiscal burden of the initial PAYG system is an estimate of the implicit PAYG debt, given by the present value of pension benefits promised by PAYG to its beneficiaries. A different concept is the present value of pension reform deficits incurred by the government due to the shortfall in PAYG contributions from the shift of contributors to the new FF pillar. The present value of reform transition deficits (PVRD) is smaller than the implicit PAYG debt when the shift from PAYG to FF is not complete, as has been the case in all LA reforms.¹⁰ Estimates of implicit PAYG debt levels show large differences for LA reforming countries, ranging

⁸ When the international comparison is based on PPP exchange rates, the LA systems appear even more expensive – for instance, Bolivia's annual cost increases now to US\$ 60, closer to Australia's US\$ 78 (Valdés-Prieto 1999).

⁹ Explosive marketing costs reflected AFPs' efforts in raising their market share by hiring salespeople that often lured contributors away from competing AFPs by offering side payments or even changing individuals' affiliation without their prior knowledge. A 1997 administrative ruling by the AFP Superintendency has made more difficult these practices, implying a significant drop in salespeople (to 6,363 in late 1998) and marketing costs, that have been partly passed on to consumers in the form of lower variable commissions.

¹⁰ The implicit PAYG debt can be calculated in different ways: assuming termination of PAYG or maintaining PAYG indefinitely into the future. It is the first calculation that should be compared to present value of pension deficit calculations. In general-equilibrium simulations, the two latter calculations differ not only because of incomplete shift to FF (as in actuarial simulations) but also due to the effects of pension reform on macroeconomic variables (including wages, interest rates, and growth rates) that are held constant in actuarial studies.

from 37% of GDP in Peru to 214% of GDP in Uruguay.¹¹ The estimations for Colombia assume a large shift from PAYG to FF in the long term (although this is uncertain due to Colombia's back-and-forth switch option), implying a PVRD that is only 4.5% of GDP lower than the initial implicit PAYG debt. Colombia's reform of its first pillar (raising contribution rates and retirement ages) reduced the initial PVRD by 24.4% of GDP. Hence the PAYG-FF shift requires financing the remaining PVRD level estimated at 59.2% of GDP. Mexico shows a large discrepancy between an implicit PAYG debt of 141.5% of GDP and a PVRD level of 59.3% of GDP. The reason is that Mexico does not recognize past PAYG contributions of current workers other than offering them the PAYG switch-back guarantee at retirement. Actual or estimated reform transition deficit flows during the first years after the start of reforms range from 1% of GDP (Mexico 1998) to 3.3% of GDP (Chile 1982) (Table 8).

In principle governments could make explicit their implicit PAYG liabilities at once by paying off their debts to PAYG participants during the first reform year. However financial and political constraints make this impossible. In fact, all LA reformers went almost to the opposite extreme by spreading out the fiscal consequences of pension reform over many decades to avoid bunching of large fiscal deficits in a few years. Although such reform transition deficits are in principle economically not meaningful since they involve an offsetting reduction in implicit public PAYG liabilities, there are good real-world reasons to avoid large nominal deficits. First, in the absence of market valuation of PAYG liabilities and in view of the uncertainty on future public PAYG promises, it is likely that the reduction in the economic value of implicit PAYG debt is lower than the book-value reduction reflected by explicit transition deficits. Second, both financial markets and finance ministers dislike nominal public deficits even if they are used in paying off implicit government liabilities. In the particular case of LA, attaining a strong fiscal stance – reflected in low nominal deficits – is a major macro policy goal in the 1990s after decades of macroeconomic mismanagement. Hence reformers choose long transition deficit horizons that exceed 60 years (in El Salvador) or even 80 years (in Bolivia, Chile, and Mexico).

These long horizons are attained by a combination of continued pension payments to all PAYG pensioners at the time of the reform and various ways to compensate all PAYG workers that switched to FF, in lieu of their past PAYG benefit rights. In Chile, Colombia, El Salvador, and Peru, PAYG-FF switchers were issued “recognition bonds” that mature at retirement, when governments issue a check on their capitalized value, added to individual pension assets accumulated under FF. Argentina and Bolivia pay compensatory pensions instead of issuing recognition bonds. Mexico avoided explicit compensation to switched PAYG-FF contributors by issuing the switch-back option at

¹¹ Most estimates are based on actuarial models. However they use different methods and assumptions regarding underlying demographic, systemic, and economic variables. Calculations of pension liabilities are very sensitive to underlying assumptions on long-term values for demographics, system coverage, pension rules, and economics (interest rates, GDP growth rate, wage growth rate). Hence cross-country comparisons are problematic unless the estimates are based on a common set of assumptions.

retirement. Uruguay does not compensate PAYG-FF switchers since it maintains a dominant PAYG pillar.

How should pension deficits be financed – by an asset swap (i.e., by floating explicit public debt or selling government assets) or by reducing the non-pension public-sector deficit (i.e., by reducing non-pension government spending or raising taxes)? The answer to this question depends on overall fiscal-policy goals. If the government seeks to combine pension reform with a neutral fiscal policy stance it will prefer the first option. Otherwise it will implement a contractionary policy. As is well known, under the first alternative there are no first-order effects on the welfare and income levels or current and future generations, as well as no first-order effects on macroeconomic aggregates.¹² Under the second alternative transition generations bear the fiscal costs of pension reform. This involves an income transfer toward future cohorts that raises future levels of saving and (under conditions of imperfect international capital mobility) of investment and output.

How is pension reform financed in LA? Here it is essential to distinguish intended from actual government financing. For the case of Chile it has been credibly argued that significant public surpluses were built up before the 1981 pension reform (Diamond and Valdés-Prieto 1994). More explicit ways of intended financing sources were identified in other reform cases, including Peru (where a fund was established from privatization proceeds), Argentina (earmarking certain taxes), Bolivia (with a direct link to bonds on privatized enterprises), and El Salvador (setting up a separate fund for transition financing).

How is pension reform actually financed in LA - and elsewhere? Unless one refers to a counter-factual lab experiment that holds constant other factors affecting government balances, it is impossible to learn from ex-post government accounts in which way a particular government program or reform has been financed in any real-world economy. Fungibility of financial resources does not allow to infer any causal relation from the changes in pension transition deficits and the non-pension transition fiscal position. This appears to be true for both those countries that have not established intended financing mechanisms and those others that have not.¹³

¹² There are second-order effects stemming from changes in taxes paid to service explicit government debt at a rate (the market interest rate) that is different from the return rate in the PAYG system, implicit in PAYG contributions.

¹³ A case in point is Chile's experience, even when considering the government's intention to finance the reform through a more contractionary fiscal policy. In the early 1980s Chile's public finances had to absorb the most intense shocks -- completely unrelated to pension reform -- that hit Chile during the last decades. Among them were a major terms-of-trade loss, complete cut-off from voluntary foreign lending, a deep recession, and a huge banking crisis. Under these circumstances asserting that pension reform was financed by non-pension surpluses before and after 1981 is equivalent to saying that changes in all other non-pension revenue and expenditure categories -- including the costs of the 1982-85 banking crisis estimated at a cumulative 41.1% of GDP (Marshall and Schmidt-Hebbel 1994) -- were accommodated residually by the available mix of tax resources, debt issuance, and inflation taxation. This illustrates that it does not make much sense to single out a particular financing source of Chile's reform transition deficit. While Chile's pension reform was supported by an improvement in the fiscal position some years before the

I conclude four points from the LA reform financing experience. First, it is important to establish financing sources for the transition deficits when planning for the reform. Second, the horizon of pension deficits is so long that the financing decision will be revised by subsequent administrations – independently of the initial commitment. Third, pension deficit financing needs are only part of overall fiscal policy. Due to resource fungibility it is not possible to link any above-the-line financing need to a particular below-the-line financing source. Hence there is no way to measure with precision the actual mix of below and above-the-line financing of any pension reform.

A final lesson is about the conflict between reform depth and fiscal costs. Why there certainly exists such a tradeoff, it has been overstated. A case in point is Chile's post-reform experience. During almost a decade (1990-1998) a center-left coalition government has been able to record an average annual 4.5%-of-GDP non-pension fiscal surplus, more than offsetting an average pension deficit of 2.5% of GDP, hence running a total explicit fiscal surplus of 2% of GDP. This experience suggests that a complete shift toward fully funding in a developing country with a moderately high present value of reform transition deficits of, say, 90% of GDP, should be feasible. If financed over 30 years, such a reform could imply running an average 3%-of-GDP deficit. If partly offset by a 2% non-pension surplus, the country's explicit deficit – the level ministers and markets look at – would be a modest 1% of GDP.

Capital markets. Financial and capital markets have grown rapidly in LA during the 1990s – a result of macroeconomic stabilization, financial liberalization, high capital inflows, and, likely, pension reform. Chile's experience is illustrative. Capital-market deepening is reflected by the substantial increase in broad financial liabilities measured by M3 (from 18% of GDP in 1975-1981 to 37% in the 1990s), stock market capitalization (from 28% in 1980-81 to 92% in the 1990s), and life insurance premiums (from 0.2% to 2.0% of GDP). Private pension fund assets have increased to 35% of GDP in the 1990s and pension funds hold significant shares of Chile's equity, bank deposits, and public debt.

There is little doubt that the private pension fund industry in Chile and other Latin American countries has helped in developing and deepening domestic capital markets. It is argued that the growth of privately-managed mandated pension funds encourages the development of new instruments (long-term bank and corporate liabilities, equity, mortgages, pension annuities) and new financial services (risk rating, individual investment and pension annuities advice), and contributes to financial deepening (Holzmann 1997). In addition, in view of the mandatory character of pension saving flowing into privately-managed pension funds, pension reform requires and encourages putting into place a strong regulation and effective supervisory institutions, not only for the pension industry but for other capital market segments and instruments as well.

reform start it is not possible to identify the precise financing mix of this reform or any other structural change or shock affecting Chile's public finances thereafter.

However there is not much we know about the actual quantitative contribution of a FF privately-managed competitive pension industry to financial development and then to growth. Starting with the latter part of the link, the profession is starting to understand the empirical contribution of financial development to growth and some of its theoretical underpinnings (as documented by Levine 1997). But it is much harder to anchor the contribution of private pension funds to financial and capital-market development in a strong analytical framework subject to empirical testing. Until such a framework is developed we are only able to point to broad positive correlations between pension fund growth and overall financial development (Holzmann 1996, Reisen and Bailliu 1997, Corsetti and Schmidt-Hebbel 1997, James 1997).

Labor markets. As is well known, a PAYG system weakens the link between contributions and pension benefits by imposing an implicit tax wedge between the cost of labor to firms and the sum of the take-home wage and the expected future pension benefits perceived by the worker. The size of the implicit PAYG tax on labor grows with the difference between the market interest rate (or the subjective discount rate in case of borrowing-constrained myopic individuals) and the expected rate of return of PAYG. For the system as a whole, the latter is equal to the economy's growth rate in steady state and when the PAYG system has reached maturity. However at the level of the individual worker – at which it matters – the rate of return of PAYG differs significantly from GDP growth when PAYG provides intergenerational and intragenerational distribution.¹⁴

PAYG causes potential distortions in four dimensions of labor markets: labor force participation of aged people (or early retirement), the supply of labor, the composition of formal and informal employment, and the level of structural unemployment. There is much industrial-country evidence on these distortions. For Latin America there is only partial, suggestive evidence from simple correlations and simulations on some of these dimensions, surveyed next.

One bit of evidence concerns the change in total labor supply during Chile's extended post-reform period. The rate of male labor force participation increased substantially after the start of Chile's pension reform, from 70.2% in the late 1970s to 75.9% during the 1990s.¹⁵

There is somewhat broader cross-country evidence on the evolution of Latin America's large informal sector. The response of formal-informal labor shifts to formal-

¹⁴ Further differences between the relevant rate of return in financial markets and the return on PAYG contributions arise when considering risk. Risk adjustment of market returns (reflecting market uncertainty) may be very different from risk adjustment of PAYG returns (reflecting changing rules over pension contributions and benefits). But one should note that here a tradeoff emerges between efficiency losses due to the PAYG distortion and the insurance gains from intra and inter-cohort income insurance (Diamond 1977, Kotlikoff 1995).

¹⁵ Male labor force participation is a better indicator of labor supply than total male plus female labor force participation because of the long-run trend increase that is observed in female participation.

sector taxes depends on an economy's structure and its PAYG system features. Labor mobility declines with PAYG system coverage, declines with government controls on tax compliance, increases with the size of the pre-PAYG informal sector, and increases with other taxes and restrictions imposed on formal employment and production (Corsetti 1994, Loayza 1996). Given the high correlation of the preceding features with the level of development, the size of informal sectors is much larger in developing than in OECD countries.

One measure of the relative size of the informal sector, based on the structure of non-farm employment, is estimated by ILO for most Latin American countries since 1980 (Fig. 9). The evidence shows that the informal-sector share of employment has grown steadily in each and every of 13 Latin American countries since 1980 – including the eight countries that have reformed their pension systems, except Chile. This is likely to be no coincidence. Hence pension reform may contribute significantly to employment formalization – as reflected in expanding pension system coverage – in countries where initial informality is large. Estimates for production informality are provided by Loayza (1996) for 9 Latin American countries in 1990 (Fig. 10). The shares of the informal economy range from 18% of official GDP in Chile to 66% in Bolivia, with a mean regional share estimated at 39%. In concluding, informal sectors are very large in most countries but may shrink after introducing FF pension systems, in response to lower net labor taxes in the formal sector that encourage resource reallocation toward the formal sector.

The PAYG tax on labor is also likely to affect the level of structural unemployment. Edwards (1997) develops a partial-equilibrium two-sector (formal-informal) Harris-Todaro model with sector-specific capital and an exogenous labor force. He applies the model for simulating the contribution of pension reform to labor-market improvements in Chile, considering the extreme case when the full 26% PAYG contribution is a pure tax on labor. In that case pension reform could have reduced structural unemployment by a range of 2.0 to 3.2% and could have raised real wages in the informal sector by a range of 4.6 to 7.7%.¹⁶

Saving, productivity, and growth. There is increasing evidence from simulation models and econometric estimations on the effects of pension reform on saving, productivity, and growth.¹⁷ Most of it is for representative or real-world industrial economies – very little has been written on Latin American pension reform experiences.

The effects of a PAYG-FF reforms on private (and hence national) saving depend critically on how the transition deficit is financed, on possible crowding out of voluntary

¹⁶ Edwards' simulations should be taken as upper-bound values of pension-reform benefits. When considering a pure-tax component of PAYG contributions less than 100%, or allowing for capital reallocation among sectors that differ in capital-intensities and for static and dynamic general-equilibrium feedback effects (as in Schmidt-Hebbel 1997a), the values are likely to be much lower than those obtained by Edwards.

¹⁷ For a recent survey see Schmidt-Hebbel (1998).

saving by mandatory FF pension saving, and on the strength of intergenerational transfer motives. Further changes in private saving arise when the reform involves redistribution among income groups or age cohorts that differ in their marginal saving propensities or in their degrees of myopia and access to borrowing. Pension reform reduces overall uncertainty by decreasing political risk but raises it because of the reduction of insurance. Therefore the net effect on overall uncertainty is ambiguous and so is its effect on precautionary saving. Finally, indirect effects of pension reform on private saving are reaped when growth is accelerated by efficiency gains in factor markets, giving rise to a virtuous cycle of higher saving and growth.

Overall effects of PAYG-FF reform on income and welfare depend on specific features of PAYG, its distortions imposed on factor markets, saving decisions, and the growth process, and, certainly, on the way FF is implemented and financed by the reforming government. The short and medium-term effects of pension reform on saving, income, and welfare can be very different from their steady-state effects.

The seminal contributions by Samuelson (1958) and Diamond (1965) introduced the two-cohort OLG model to analyze the main public finance, accumulation, and intergenerational welfare dimensions of public debt and old-age security arrangements. A major extension of Diamond's (1965) two-cohort OLG model is Auerbach and Kotlikoff's (1987) many-generations OLG dynamic model which provides a realistic number of interacting cohorts and is particularly useful in showing impact, transition, and steady-state effects of mandatory pension systems and reforms. The Diamond-Auerbach-Kotlikoff (DAK) has been applied to simulate long-term income and welfare level effects of pension reforms in Chile (Arrau 1991) and Colombia (Schmidt-Hebbel 1997), assuming full tax-financing of the transition deficit (Table 9). The results for both countries show modest single-digit income and welfare gains – in the range of 2% to 7% - - of future generations living 50 or 80 years away. These figures are similar to those obtained for non-LA pension reform cases. Their small magnitude reflects the fact that the standard DAK model only considers capital accumulation, income, and welfare effects that stem from intergenerational transfers, as a result of pension reform financed by a contractionary fiscal policy. It abstracts from potential Pareto-improving efficiency gains in capital and labor markets arising from the removal of PAYG distortions. The standard DAK model also abstracts from endogenous-growth effects of pension reform because it is based on a Solow growth model.

A very different approach that allows for saving effects, potential efficiency gains, and endogenous-growth effects is based on evaluating actual post-reform experiences. Holzmann (1997) estimates ex-post growth effects of Chile's 1981 pension reform. He identifies two channels of growth gains from capital-market development: higher TFP growth and higher investment rates. Based on econometric estimations for the two latter variables, the (permanent) growth gains due to capital market development range from 0.9% (low estimate) to 1.7% (high estimate). Additional (temporary) growth gains are attributed in this study to higher employment growth in response to pension

reform, yielding a further high-estimate effect of 1.1%. Hence overall growth gains due to pension reform are estimated at a range of 1.0-2.9%.

A similar study, based on econometric estimation of structural equations, attempts to identify the contribution of pension reform in Chile to the large increase in saving, factor productivity, and overall growth, controlling for other structural reforms (Schmidt-Hebbel 1998). Pension reform is found to have increased the national saving ratio to GDP by 3.8 percentage points, out of a total increase of 12.2 percentage points recorded between 1961-74 and 1990-97. Pension reform also raised real annual GDP growth by an estimated 0.9 percentage points, out of a total growth increase by 3.8 percentage points during the same time span. Hence pension reform contributed roughly by 30% to Chile's saving and growth takeoff – the remaining 70% should be attributed to changes in other policies and structural determinants of saving and growth. Of the 0.9 percentage-point rise in the growth rate, roughly half is due to higher saving and capital accumulation and the remainder is due to higher factor productivity growth.

5. CURRENT PROBLEMS AND REFORM CHALLENGES

Future pension reforms in Latin America and the Caribbean are following the path of the 8 pension reforms that have already taken place. Reform implementation of a multi-pillar system is at an advanced stage in Venezuela and ongoing discussions and reform planning are taking place in another 10 countries in the region (Table 10).

LA's ongoing pension revolution toward a three-pillar pension system is successfully defusing the "ticking pension time bomb" of PAYG systems – the old-age crisis is addressed early on the path toward demographic maturity (World Bank 1994). Another strong advantage of the reformed systems is that its decentralized design – combining private management and individual pension accounts – makes it more robust to pressures or outright assault from the political system.

However significant problems of design and implementation remain in LA's 8 reformed pension systems. They represent a challenge for policy makers in both the latter countries and those that are considering future reform. Some of these problems are inherited from the old pension systems while others reflect design or implementation failures of the new multi-pillar models. Next I identify 7 major problems of reformed systems and mention some secondary issues of concern. Many of these issues have been flagged in other recent studies (Diamond 1994, Diamond and Valdés 1994, Uthoff 1994, Mitchell and Barreto 1997, Queisser 1998, World Bank 1999, CBO 1999, Schmidt-Hebbel 1999).

Incomplete shift to fully funding. While 4 countries are transiting toward a contributions-based fully-funded second pillar, the shift to fully funding is only partial in Colombia and Peru (where workers can opt between the PAYG and the FF pillar) and in Argentina and Uruguay (where the FF pillar is complementary to the PAYG pillar). While political-economy and fiscal explanations can explain this partial shift, it is also clear that the

benefits of pension reform are proportionally smaller. Uruguay in particular, with a very small second pillar, seems to be a candidate for a future reform reform deepening. In Colombia the back-and-forth shift option introduces significant systemic uncertainty, deserving future revision.

High commissions of pension industry. As documented by Valdés-Prieto (1999) and summarized above, commissions are outrageously high in those of LA's new second pillars that have followed closely the Chilean model. Exceptions are Mexico and, in particular, Bolivia – the latter country deviating from the Chilean model by fixing commissions as part of auctioning off PFMC licenses. This major drawback of reformed systems has serious negative effects on net pension assets and hence on the welfare of the elderly.

What is to blame for excessive commissions? One reason is excessive marketing costs incurred by PFMCs to lure affiliates away from the competition – itself a result of design faults including lack of portfolio differentiation among competing PFMCs, non-differentiation of commissions that precludes group and loyalty discounts, and an inefficient commission structure. Furthermore lack of international competition is to blame. If workers were given the choice of acquiring pension assets from highly competitive pension fund managers abroad, local commissions would come down quickly. But this would require designing and implementing major changes in financial, regulatory, and tax treatment of pension investments abroad. In addition it would accelerate portfolio diversification into international assets.

High costs of pension annuities. The problem of high costs of pension annuities rises exponentially with maturity of the second pillar as increasing numbers of contributors retire. High costs of annuities are observed universally but afflict severely most reformed pension systems (Diamond 1994, Valdés and Edwards 1997). In Chile, for instance, annuity intermediation costs have increased from 1.5% of gross premiums in 1988 to more than 5% in 1998 (Queisser 1998).

What is to blame for excessive costs of annuities? First, insurance companies charge a high implicit premium for adverse selection, as people who buy them are expected to live longer than those choosing an alternative pension benefit – phased withdrawal of their pension savings. One way to avoid this premium is by prohibiting pension benefits other than annuities, as implemented by Uruguay. An alternative option, proposed by Valdés and Edwards (1997), is to allow for group contracting of annuities, an option currently not open in LA's reformed systems. The latter authors also propose to reduce net costs of annuities further by allowing pensioners to engage in short-term contracts with insurance companies, allowing them to switch companies. Investment risk premia of annuities – currently borne by insurance companies – could be lowered for those pensioners whose are less risk averse. Finally, as in the case of pension services during active life, if pensioners were given the choice of acquiring annuities services from life insurance companies abroad, costs would come further down. Again this would require major regulatory changes in current pension systems.

Low coverage. While LA's pension reform have been successful in changing quickly the composition of covered pension system participants from the PAYG state-managed first pillar to the FF mostly privately managed pillar, not much overall increase in coverage has been attained yet. As documented above, large gaps are observed between the number of total affiliates and active contributors in all new second pillars. The new pension system is not directly to blame for this – insufficient coverage of active and passive population by mandatory pension systems reflects to a large extent the size of informal employment and production in the region. Reducing or eliminating the pure tax component implicit in PAYG contributions may not be sufficient to induce a major reallocation of labor from informal to formal markets – in particular when other labor-market taxes remain unchanged or when informal-sector workers are borrowing-constrained individuals close to subsistence consumption levels with little appetite for mandatory old-age saving contributions.

Under these conditions the question arises about the design of optimal policies to encourage low-income informal-sector workers to join the second pillar. Affiliation or contribution subsidies like those provided in Colombia (financed by richer contributors) and Mexico (financed by government taxes) merit closer scrutiny.

Lack of consumer choice. As discussed above, reformed pension systems provide little room for exercising consumer choice of pension services. In most systems, there is a one-to-one relation between funding and investment risk-taking across pension pillars. Contributions-based state-managed PAYG first pillars designed for the long term in 4 countries are defined-benefit systems while contributions-based mostly private-managed second pillars in 8 countries are defined-contribution systems, and annuities provided by second-pillar insurance companies are defined benefits. However there is no reason why the degree of funding or active-passive pension services should be correlated with the investment risk taking embedded in DB-DC choices. In particular, second pillars should provide both active workers and pensioners choosing annuities a portfolio choice between defined-benefit and defined-contribution programs.

More generally both PFMCs and insurance companies should be allowed to increase their supply of alternative investment portfolios to allow people to choose portfolio – subject to certain regulatory limitations – closer to their (typically age-correlated) risk-return preferences. This should be complemented by a quicker liberalization of excessive investment restrictions (tight ceilings on asset classes). However a balance has to be struck between avoiding excessive risk-taking by AFP management of pension funds and achieving better risk-adjusted returns.

Consumer choice should also be extended to group negotiation and choice of PFMCs and ICs instead of exclusively individual affiliation, allowing for the discounts mentioned above. More generally, enlarging consumer choice of pension services does not only raise individual welfare but helps in reducing PFMC commissions and annuities costs, as argued above.

Government rate-of-return guarantee. The floor guarantee on pension fund returns is perceived as a major cause of excessive herding of PFMCs regarding their investment strategies, leading to almost uniform pension fund portfolios. Reduction or outright elimination of this guarantee (as in Peru, Bolivia, and Mexico) would provide an incentive to PFMCs to specialize better in investment strategies, therefore enhancing consumer choice.

The efficiency-equity tradeoff of the government's minimum-pension and assistance-pension guarantees. Means-tested minimum-pension and assistance-pension guarantees are the major distributional instruments of governments in many of the reformed pensions systems. From a fiscal point of view they dominate the universal flat pension benefits provided in Bolivia, for example. But they have incentive costs because they lead to lower mandatory (and voluntary) old-age savings and lower pension-system participation by those low-income groups that move frequently in and out of the labor force and between the formal and informal sectors and qualify for government pension transfers. Therefore design and implementation of government guarantees should be based on careful studies of their social benefits and their fiscal and incentive costs.

There are many other issues of concern in LA's reformed pension systems and in countries considering future reform. These issues include extending reforms to exempted sectors (the military and police in all countries, other sectors in some countries), revising the commissions structure (fixed/variable, on wages/assets), overcoming the political-economy stalemate between reform supporters and opponents in countries with incomplete reforms (as in Uruguay), defining an optimal level of corporate oversight by PFMCs (a hot issue in Chile), bringing in decentralized government PAYG systems into the reform (in Colombia and Mexico), and integrating non-regulated private pension plans (in Brazil).

Addressing these challenges will take center stage in LA's future second-generation pension reforms.

6. CONCLUDING REMARKS

Latin America is in the midst of a pension revolution that has caught the attention of pension system experts and policy makers elsewhere. There is one common feature that makes the LA approach unique in providing old-age security: adoption of an important second pension pillar that is fully funded and based on contributions to individual accounts in pension funds that are invested in financial markets and managed by private pension-fund management companies. However most other reform features differ significantly across the eight country reform experiences implemented to date.

This paper has compared reform approaches, evaluated actual and potential reform effects, and pointed out issues of ongoing concern. Its main conclusions are the following. Pension reform has been largely successful in helping to defuse the "ticking

pension time bomb” of PAYG systems and to make pension arrangements less prone to political interference. Pension reform could also lead to sizable efficiency gains in factor markets, helping to raise social welfare and economic growth. However significant problems of design and implementation remain in LA’s 8 reformed pension systems. They represent a challenge for policy makers in both the latter countries and those that are considering future reform.

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Table 1
Main Features of Eight Latin American Pension Reforms

Country	Chile	Peru	Argentina	Colombia	Uruguay	Mexico	Bolivia	El Salvador
Month/Year	May 1981	June 1993	July 1994	April 1994	May 1995	July 1997	May-97	April 1998
Old System (main)								
<i>Mandatory Pillars</i>	One-pillar DB PAYG managed by state SSIs	One-pillar DB PAYG managed by state SSIs	One-pillar DB PAYG managed by state SSIs	One-pillar DB PAYG managed by state SSIs	One-pillar DB PAYG managed by state SSIs	One-pillar DB PAYG managed by state SSIs (b)	One-pillar DB PAYG managed by state SSIs and unions	One-pillar DB PAYG managed by state SSIs
<i>Reform of Old System before or during adoption of New System</i>	Increased retirement ages. Unified pension indexation. Abolished special early retirement regimes and pensions based on years of service		Gradual increase of retirement ages. Increased contribution period for eligibility of minimum pension	Increased contribution rates and changed eligibility conditions	Increased retirement age for women			Increased contribution period for eligibility of old-age pension
New System								
<i>Reform/Phasing Out of Old System</i>	Gradual phase out	Reform	Reform	Reform	Reform	Eliminated	Eliminated	Gradual phase out
<i>Affiliation to Mandatory Pillars</i>	Only to second pillar	Individual choice between public PAYG and an individual account	Individual choice between public PAYG and PAYG plus individual account	Individual choice between public PAYG and an individual account		All private sector workers must participate in the new system	Only to second pillar	Only to second pillar but Male workers over 55 & Female workers over 50 must remain in the old one
<i>Switching among Pillars</i>	Not applicable	Entitled to switch from public to private only	Entitled to switch from public to private only	Entitled to switch back and forth every three years		Not applicable	Not applicable	Not applicable
Mandatory First Pillar								
Contribution-based first pillar	None	DB PAYG managed by Government (Option 1)	-Mandatory Basic Pension -DB PAYG managed by Government (Option 1)	DB PAYG managed by one state SSI: (Option 1)	DB PAYG managed by Government (Option 1) Mandatory for low income contributors		None	DB PAYG
Complementary safety net: social assistance for non-participants	Means-tested assistance pension	Not Available information	Means-tested assistance pension	Means-tested assistance pension	Means-tested assistance pension	Means-tested assistance pension	Universal flat annuity to persons over 65 years old	Not Available information
Complementary safety net: minimum pension guarantee for second-pillar participants	Means-tested MPG	Means-tested MPG	Flat pension	Means-tested MPG		Subsidy on contributions and means-tested MPG		MPG
Mandatory Second Pillar								
Contribution-based second pillar	DC FF IPAs managed by private PFMCs and private ICs	DC FF IPAs managed by private PFMCs and by private ICs: (Option 2)	DC FF IPAs managed by private PFMCs and by private ICs: (Option 2)	DC FF IPAs managed by private and state PFMCs and by private ICs: (Option 2)	DC FF IPAs managed by private & State ICs: Option 2) for contributors above income threshold.	DC FF IPAs managed by private and state PFMCs and private ICs	DC FF IPAs managed by two private PFMCs and private ICs	DC FF IPAs managed by private PFMCs and private ICs
Consumer choice on:								
Affiliation	Individual	Individual	Individual	Individual	Individual	Individual	Individual	Individual
PFMC switching	Twice per year		Twice per year	Twice per year	Twice per year			Twice per year
Fund portfolios	None	None	None	None	None	2 portfolio options	None	None
Pension benefit categories	Three	Four			Annuitiy is mandatory		Two	
Exempted sectors	Self-employed (optional) Military exempted	Military Self-employed (optional)	Military and state and local governments, and employees, and other independents	Military, oil sector, and teachers. Self-employed (optional)	Military, bankers, notaries, and teachers	Military, public sector and parastatal employees	Self-employed (optional)	Military. Self-employed, and citizens working abroad (optional)
Bundling of pension services:								
PFMCs and ICs	Separated	Separated	Not collection	Decentralized	Not collection	Centralized		
Within PFMCs:	Bundled	Decentralized	Centralized		Centralized			
Contribution collection	Decentralized							
Government guarantees	On pension fund assets and rates of return (relative). Part guarantee on annuity	Rate-of-return guarantee suspended in 1997. Pending regulation	On pension fund assets and rates of return (relative). Part guarantee on annuity	On pension fund assets and rates of return (relative)	A 2% real return for state fund	None	None	On pension fund assets and rates of return (relative)
Industry regulation	Heavy regulation of PFMCs and ICs							
Investment regulation	Heavy regulation of pension fund investment	Heavy regulation of pension fund investment					Light regulation	
Industry supervision	By specialized superintendency	By specialized superintendency	By specialized superintendency	By specialized department (Superintendency of Banks)	By specialized department (Central Bank)	By specialized superintendency	By specialized superintendency (Financial Sector superintendency)	By specialized superintendency
Country and Year	Chile (1981)	Peru (1993)	Argentina (1994)	Colombia (1994)	Uruguay (1995)	Mexico (1997)	Bolivia (1997)	El Salvador (1998)
<i>Complementary (voluntary) Third Pillar</i>	Tax incentives on complementary voluntary old-age savings							
Reform Transition								
Transition Affiliation								
Transition labor force eligibility to join second pillar	Optional for current; mandatory for new entrants	Optional	Optional	Optional	Mandatory only for contributors above income threshold and younger than 40 years	Mandatory	Mandatory	Mandatory for younger than 35
Length	+ 50 years	Indefinite	Indefinite	Indefinite	Indefinite	0 years	0 years	30 years
<i>Accrued PAYG Pension Rights</i>	Continuing payment of benefits to PAYG pensioners and recognition bonds issued to switched affiliates	Continuing payment of benefits to PAYG pensioners and recognition bonds issued to switched affiliates	Continuing payment of benefits to PAYG pensioners and compensatory pension paid to switched affiliates	Continuing payment of benefits to PAYG pensioners and recognition bonds issued to switched affiliates	No explicit compensation for acquired rights	No compensation for acquired rights but life-time switch back to PAYG option at retirement	Continuing payment of benefits to PAYG pensioners and compensatory pension paid to workers affiliated to the old system	Continuing payment of benefits to PAYG pensioners and recognition bonds issued to switched affiliates
<i>Transition Deficit Financing</i>								
Projected fiscal financing source	Non-pension fiscal surplus	Non-pension fiscal surplus and special fund (Fondo consolidado de Reservas Previsionales) -intended	Additional taxes, stricter enforcement of tax payments to reduce evasion					Set up of a "transition fund" to which funds will be transferred annually
Length of transition deficit	+ 80 years	Indefinite	Indefinite	Indefinite	Indefinite	+ 80 years	+ 80 years	+ 60 years

Table 2
Pension System Contribution Rates in LA (Sum of Employee and Employer Contribution as Percentage of Wages)

	OLD SYSTEM	NEW SYSTEM						TOTAL
		First Pillar	Second Pillar					
		Old Age	Old Age	Invalidity & Survivors	Administrative Fees	Other Programs	Total	
Argentina	21.0	16.0 (+11.0)	7.5	3.5		-	11.0	27.0
Bolivia	5.0-15.0	-	10.0	2.0	0.5	-	12.5	12.5
Chile	26.0	-	10.0	0.5	2.4	-	12.9	12.9
Colombia	6.5	13.5	10.0-11.0	3.5		-	13.5-14.5	13.5-14.5
El Salvador	3.0	-	10.0	4.0		-	14.0	14.0
Mexico	15.5	-	6.5	2.5		5.0	14.0	14.0
Peru	13.0	11.0	10.0	1.4	2.3	-	13.7	11.0-13.7
Uruguay	15.5	27.5-31.5	27.5-31.5	0.6	2.1	-	30.2-34.2	27.5-34.2

Table 3
Coverage Rates in Fully-Funded Second Pillars in LA, 1997-98

Country	Affiliates/ Labor Force (%)	Contributors/ Labor Force (%)
Argentina	41.2	21.7
Bolivia	12.2	n.a.
Chile	100.0	56.2
Colombia	14.3	9.5
El Salvador	17.7	n.a.
Mexico	29.6	19.2
Peru	18.9	8.3
Uruguay	33.2	n.a.

Notes: 1997 data for Argentina, Colombia, Mexico, and Peru; 1998 data for remaining countries.

Table 4
Second-Pillar Pension Fund Assets in LA, 1998

Country	US\$ Million	Ratio to GDP
Argentina	10,102	2.97%
Bolivia	216	2.49%
Chile	28,381	37.44%
Colombia	1,521	1.69%
El Salvador	2	0.02%
Mexico	4,000	0.95%
Peru	1,703	2.66%
Uruguay	278	1.34%

Notes: Pension fund assets as of June 1998. Ratio to 1998 GDP at June 1998 market exchange rate.

Source: PrimAmerica Consultores, others.

Table 5
Real Rates of Return on Pension Fund Assets in LA

(Average annual rate, percentage)

Argentina, 1994-98	12.2%
Chile, 1981-98	11.0%
Chile, 1995-98	1.1%
Colombia, 1994-98	12.4%
Mexico, 1997	8.6%
Peru, 1994-98	10.2%
Uruguay, 1997	6.4%
6-country weighted average	11.0%
6-Country standard desviation	7.6%

Source: PrimAmerica Consultores (1998), Schmidt-Hebbel (1999), and Queisser (1998).

Table 6
Pension Fund Average Commissions and Contributor Incomes in LA, U.K., and
Australia (Annual)

	Average Total Commission (US\$)	Average Taxable Income (US\$)	Commission/ Taxable Income
Argentina	275	10,332	2.7%
Bolivia	19	2,400	2.0%
Colombia	120	4,284	2.8%
Chile	135	6,828	2.0%
El Salvador	126	4,800	2.6%
Mexico	70	4,524	2.7%
Peru	143	4,560	3.1%
Uruguay	192	9,312	2.1%
U.K. (Private Pension Plans)	222	28,056	0.8%
Australia (Superannuation Guarantee, 23 Funds)	77	27,600	0.3%

Note: The data refers to one or two specific months during the 1996-98 period, varying by country.

Source: Valdés-Prieto (1999), Table 1

Table 7
Implicit PAYG Debt Levels and Present Values of Reform Transition Deficits in LA
(percentage of GDP)

	Implicit PAYG Debt/GDP	Present Value of Reform Deficit (before reforming public pillar)	Present Value of Reform Deficit (after reforming public pillar)
Argentina	n.a.	n.a.	n.a.
Bolivia	40%	n.a.	n.a.
Chile	n.a.	n.a.	86.1%
Colombia	88.1%	83.6%	59.2%
El Salvador	n.a.	n.a.	n.a.
Mexico	141.5%	n.a.	59.3%
Peru	37.0%	n.a.	n.a.
Uruguay	214%	n.a.	n.a.

Note: Estimations are based on different methodologies underlying the corresponding studies and are therefore not strictly comparable.

Source: Bolivia: Von Gersdorff (1997); Chile: author's estimation; Colombia: Schmidt-Hebbel (1997); Mexico: Grandolini and Cerda (1998) and Serrano (1999), respectively; Peru and Uruguay: Kane and Palacios (1996).

Table 8
Reform Transition Deficits in LA
(percentage of GDP)

Argentina, 1996	2.6%
Bolivia, 1998	2.8%
Chile, 1982	3.3%
Chile, 1997	2.4%
Colombia, 1995	1.9%
El Salvador	n.a.
Mexico, 1998	1%
Peru	n.a.
Uruguay	n.a.

Source: Argentina: Rofman et al. (1997); Bolivia: Von Gersdorff(1997); Chile: Ministry of Finance; Colombia: Schmidt-Hebbel (1997); Mexico: Grandolini and Cerda (1998).

Table 9
Estimated Saving and Growth Effects of Pension Reforms in Chile and Colombia

	Chile	Colombia
<u>Steady-state output and welfare levels of tax-financed pension reforms (simulations from general equilibrium exogenous-growth OLG models.</u>		
Output level increase	3.1% (1)	2.4-3.9% (2)
Welfare level increase	7.0% (1)	4.2-6.5% (2)
<u>Estimated post-reform growth effects (3)</u>		
TFP Growth increase due to pension reform:	1.0-2.9%	
TFP growth from financial development	0.4-1.1%	
High investment due to financial development	0.5-0.6%	
High employment growth	0-1.1%	
<u>Estimated post-reform saving and growth effects (4)</u>		
Total increase in national saving ratio to GDP from 1961-74 to 1990-97	12.2%	
of which due to pension reform	3.8%	
Total increase in annual GDP growth rate from 1961-74 to 1990-97	3.4%	
of which due to pension reform:	0.9%	
Higher saving rate	0.5%	
Higher capital productivity level	0.1%	
Higher TFP growth	0.2%	
Growth during feedback	0.1%	

Sources: (1) Arrau (1991). (2) Schmidt-Hebbel (1997). (3) Holzmann (1997b). (4) Schmidt-Hebbel (1998).

Table 10
Pension Reform Plans in other Latin American and Caribbean Countries
(as of April 1999)

Country	Implementation Schedule or Current Discussion Stage	Basic Reform Features
Venezuela	Law approved (but public discussion about its contents). Licensing of PFMCs in the last quarter of 1999. Second pillar starts in January 2000.	Multi-pillar system.
Ecuador	Debate was initiated in 1993 (government currently considering a reform proposal).	Two-pillar system (first pillar: basic pensions as Argentina; second pillar: DB-FF system, and eventually individual accounts and choice).
Nicaragua	Reform proposal elaborated by the government (It should be completed by July 1999)	DB-FF second pillar, with recognition bonds in the transition.
Costa Rica	Reform proposal completed in December 1998. Law will be sent to Congress.	Multi-pillar system.
Honduras	Government plans to study the possibility of reform.	Only very general, President in favor of to privatizing the pension system.
Guatemala	Two projects made discussion by tripartite forum	One project: multi-pillar system (reduced public pillar). Alternative project: mixed system.
Paraguay	Discussions and proposals since 1993. Recently, the Cubas administration was preparing a proposal.	Mandatory fully funded system to new workers and self-employed.
Panama	Newly created complementary pensions funds are being put in place.	Complementary system similar to Mexico's.
Dominican Republic	Two proposals currently discussed by the Senate.	One project: DB-FF second pillar, minimum pension guarantee, and voluntary pillar. Alternative project: mixed system (public first pillar, and a private second pillar).
Brazil	Constitutional amendment approved in 1998.	Establishes close links between benefits and years of contributions, and limits public benefits.
Trinidad and Tobago	The Government outlined plans in the 1998 budget law to start developing a reform agenda.	
<u>Source:</u> World Bank (1999).		

Figure 1
Implicit PAYG Debt Reduction and Reform Opponents' Strength in LA Pensions Reforms

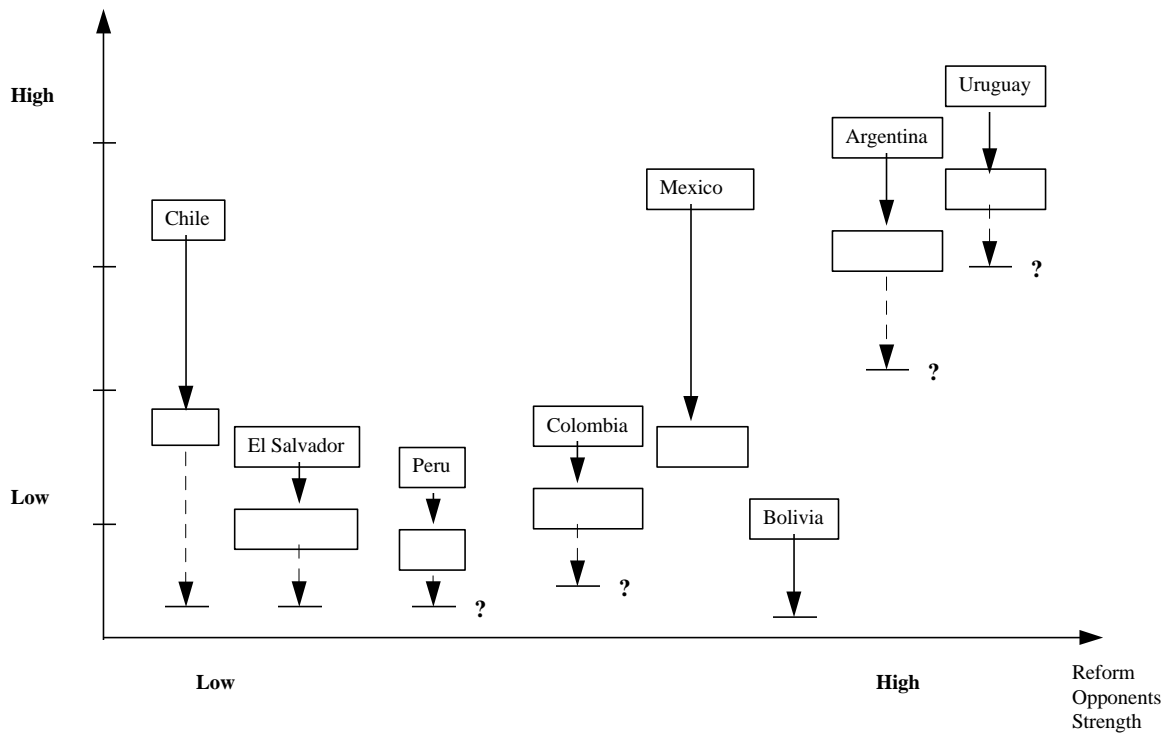
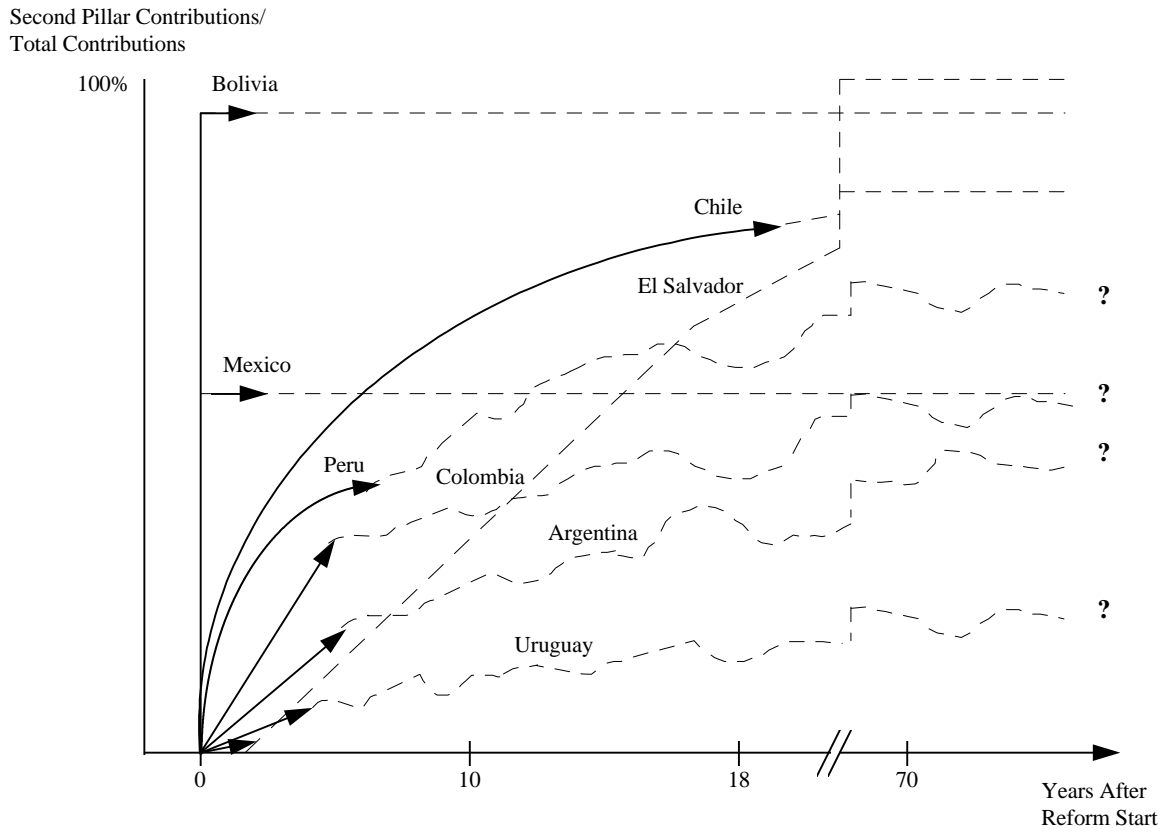
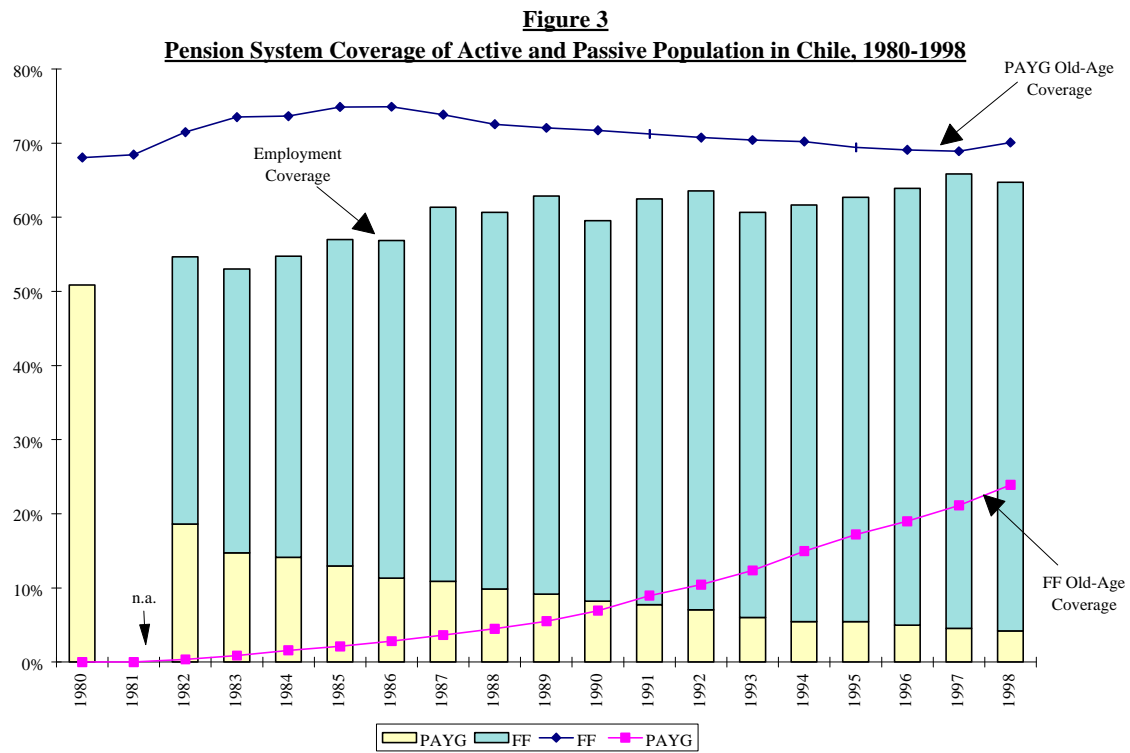
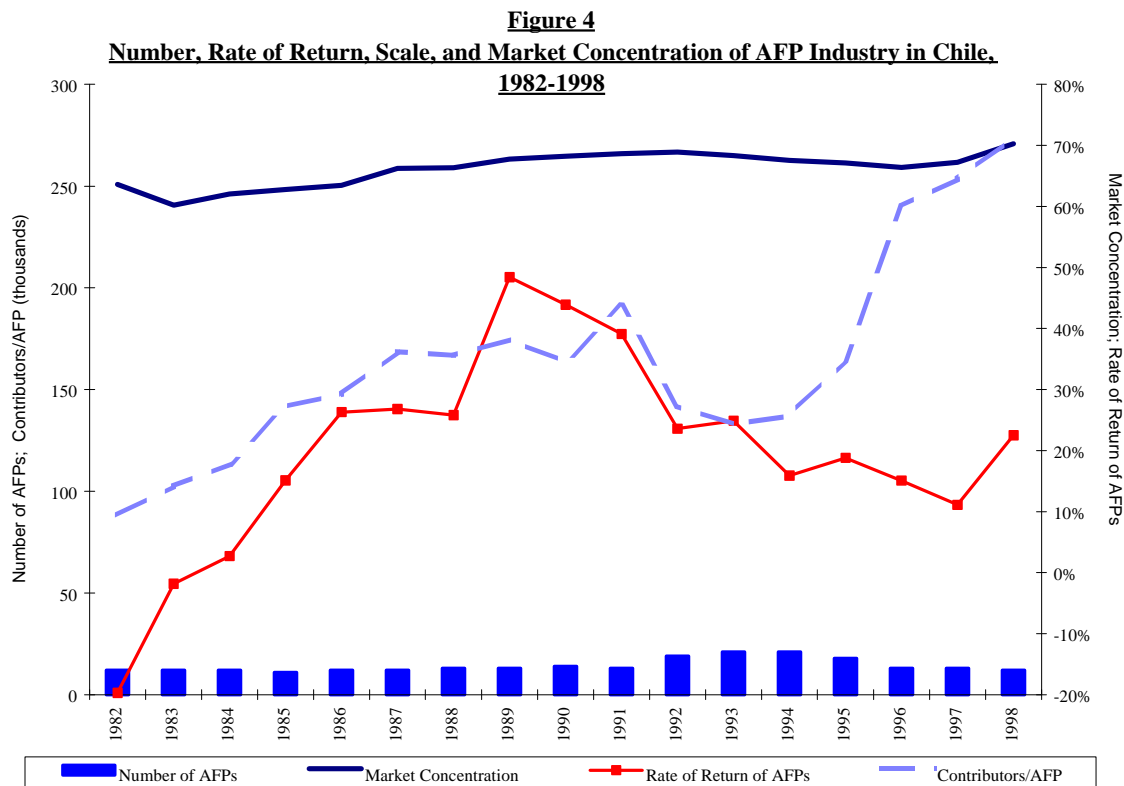


Figure 2
Dynamics of the Share of Second Pillar Contributions in LA Pension Reforms

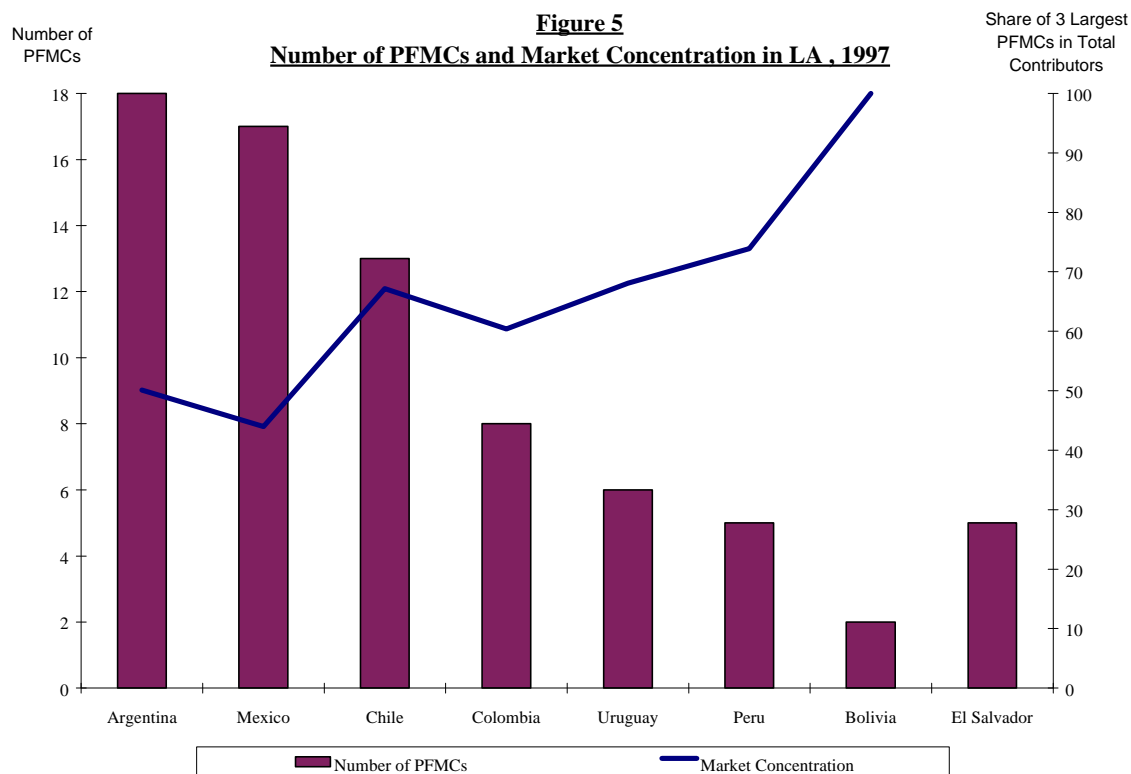




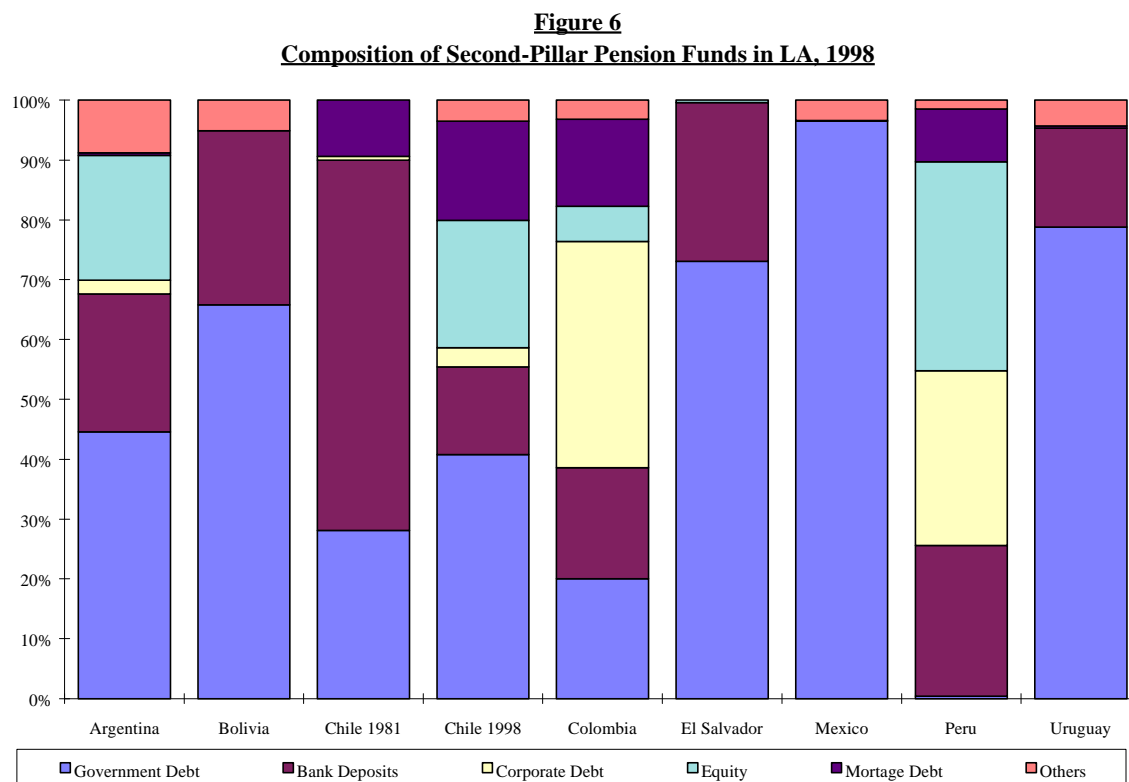
Source: Schmidt-Hebbel (1999).



Source: Schmidt-Hebbel (1999).

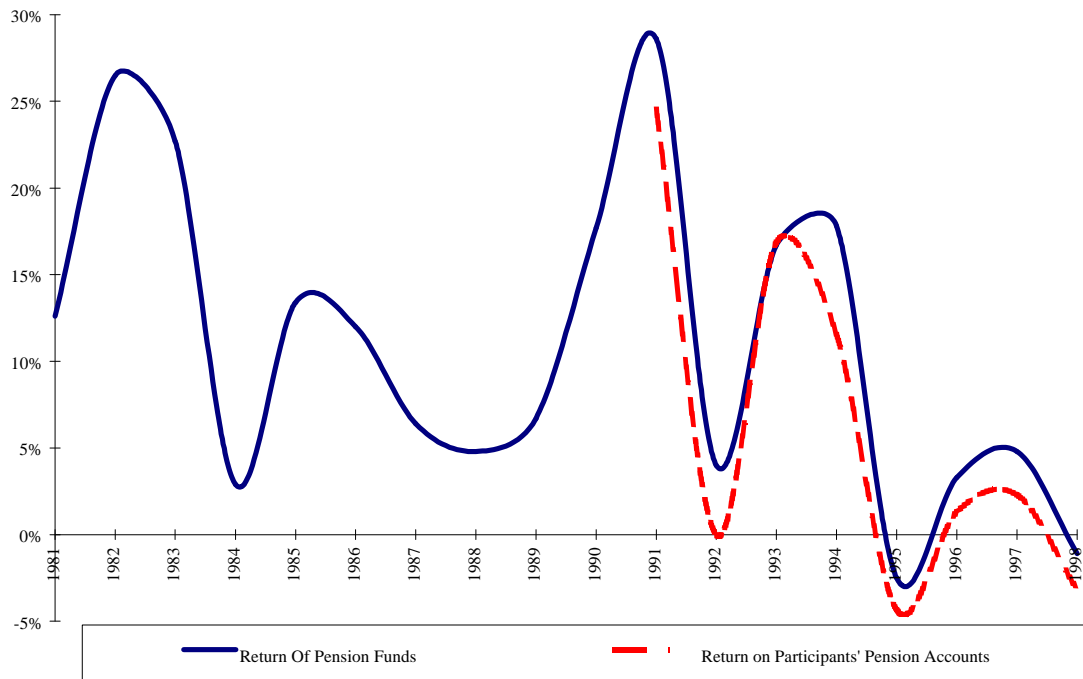


Source: PrimAmerica Consultores



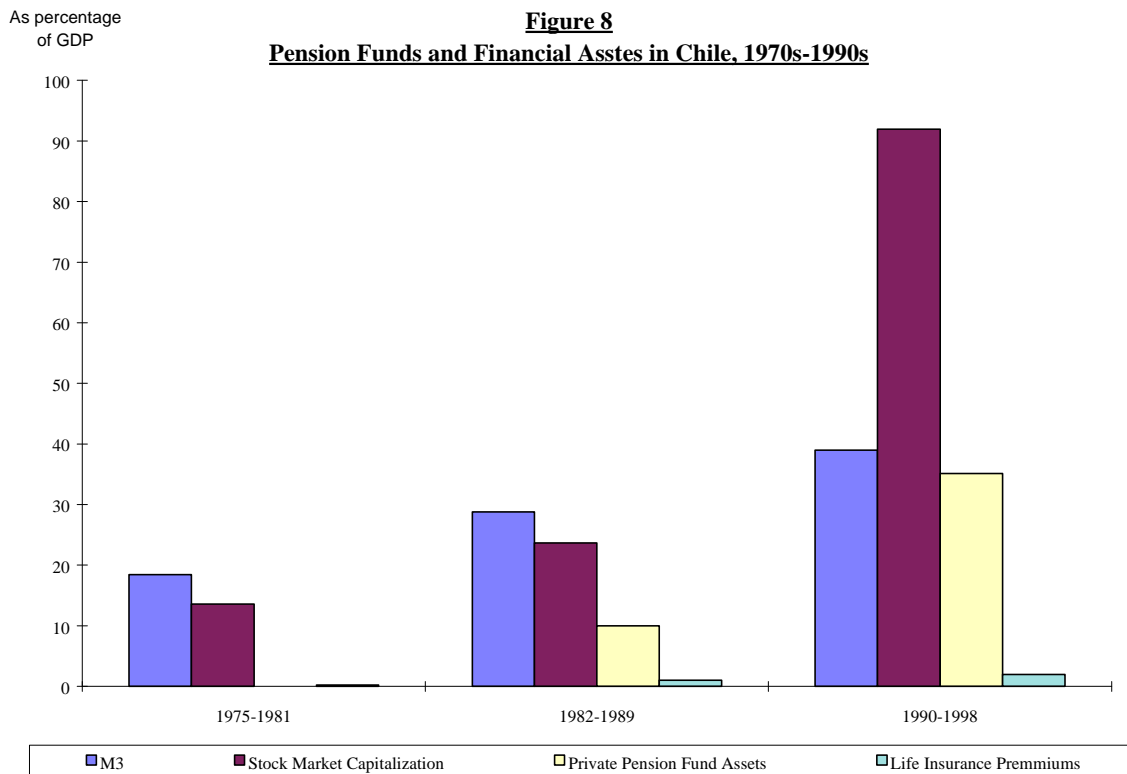
Source: PrimAmerica Consultores, others.

Figure 7
Real Rates of Return on Pension Fund Assets and
Individual Pension Accounts in Chile, 1981-1998



Source: Schmidt-Hebbel (1999).

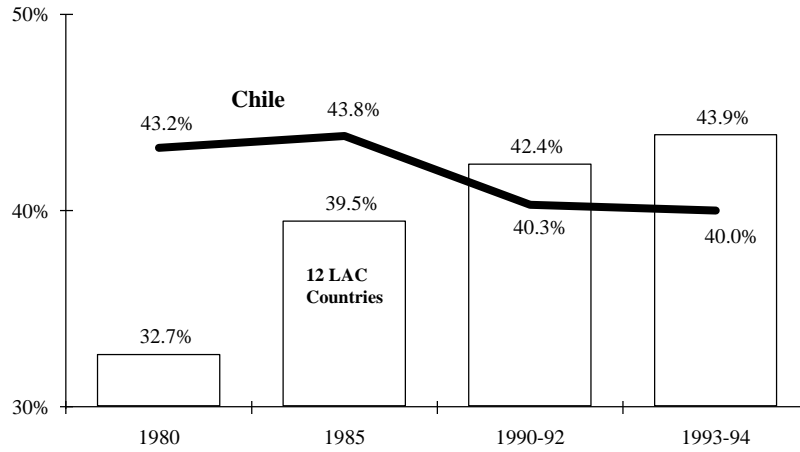
Figure 8
Pension Funds and Financial Asstes in Chile, 1970s-1990s



Source: Central Bank of Chile.

Figure 9

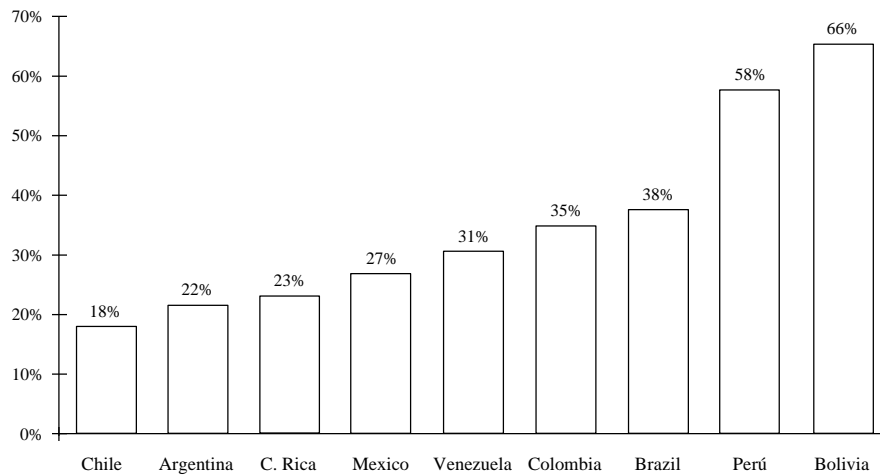
INFORMAL - SECTOR NON-FARM EMPLOYMENT SHARES IN LATIN AMERICA AND CHILE, 1980-1994



Source: ILO (1996).

Figure 10

INFORMAL SECTOR SHARE IN GDP, LATIN AMERICA 1990



Source : Loayza (1996)