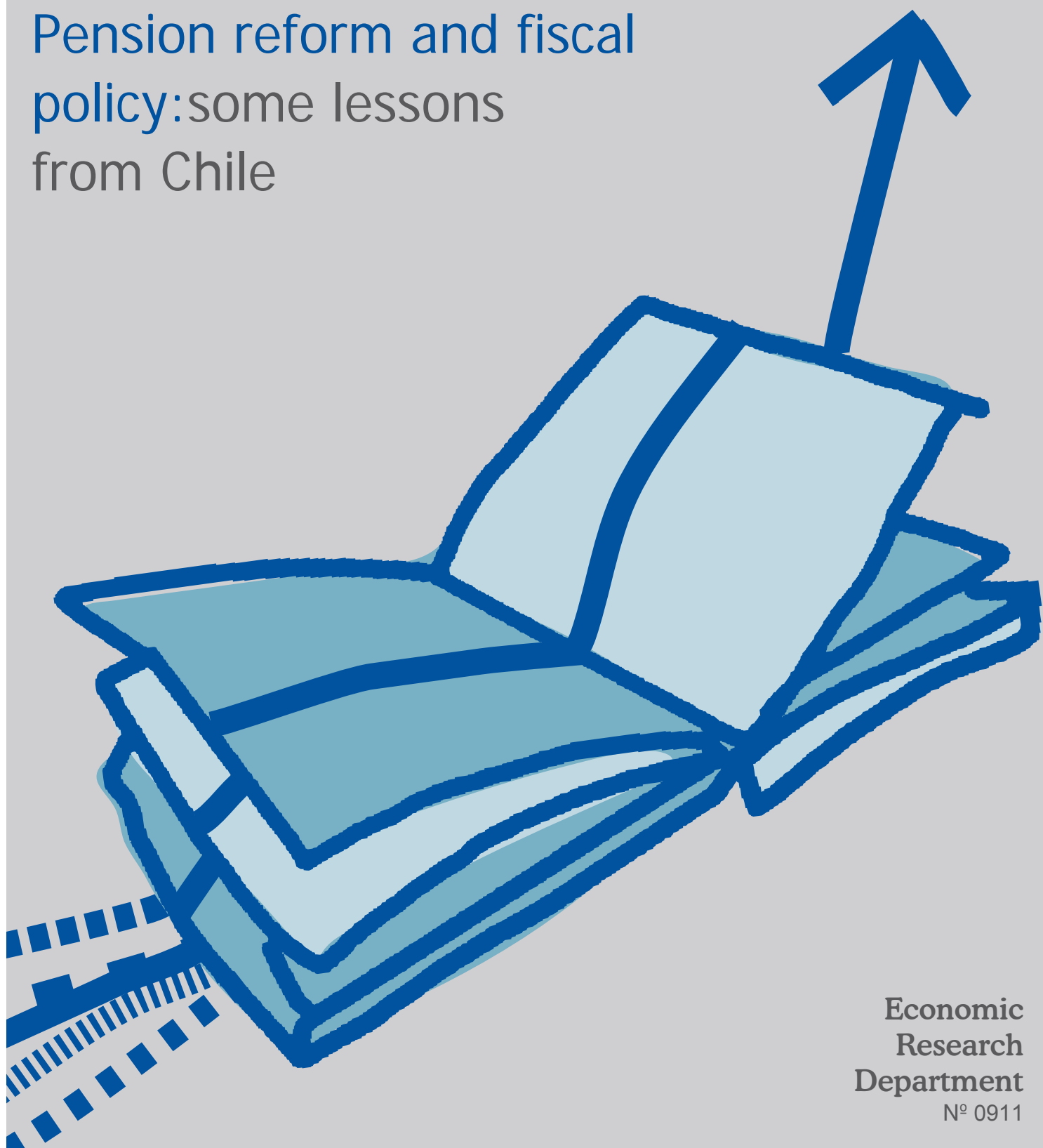


WORKING Papers

Pension reform and fiscal
policy: some lessons
from Chile



Pension reform and fiscal policy: some lessons from Chile*¹

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Abstract

In this paper we analyze the short and medium term fiscal costs stemming from structural pension reform, taking Chile as workhorse. The Chilean pension system, based on individual capital accounts managed by the private sector, has been in operation for almost 30 years, providing a rich evidence of the impact of pension systems on public accounts. Besides, a recent reform that crucially changes the solidarity pillar is being implemented now. In the paper we argue that although much lower than its benefits, fiscal transition costs tend to be high and persistent, so a fiscal consolidation prior to the reform is advisable. This also allows filling the coverage holes that labour market informality generates, as illustrated for Chile, Colombia, Mexico and Peru. Finally, in more general terms, the exportability of this type of pension reform depends not only on its specific design, but on the quality of market and public institutions.

Keywords: pension reform, implicit debt, fiscal costs, solidarity pillar, minimum pension, Chile.

JEL classification: E62, H55, H68.

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1. Motivation

The report *Averting the old age crisis. Policies to protect the old and to promote growth* by the World Bank, published in 1994, set the agenda for pension reform, in particular in Latin America². The rapid demographic transition, the weakening of informal protection networks, and the present and expected financial burden justified the need of setting a multi-pillar pension system, with a complementary participation of the public and the private sector.

‘Structural pension reform’ (understood as the introduction of a mandatory individual capital accounts, managed by the private sector) was also expected to produce various positive macroeconomic effects, namely an increase of domestic saving and investment, an increase in formal employment, the development of domestic capital and financial markets, and a higher rate of potential growth (see World Bank, 1994 and Lindbeck and Persson, 2003 for the pro-growth vision, and Barr, 2000, Orszag and Stiglitz, 2001 and Barr and Diamond, 2006 for a critical review).

Evidence on these macroeconomic effects is controversial (see Gill et al., 2005 for a survey for Latin America). Even though it might be too early to tell due to the relatively short period of time since the reforms (around fifteen years on average, with long lasting transition rules), it seems that the incentives to join the formal sector and pay contributions to the new system, and the projected increase in potential growth are weaker than expected. However, the general consensus is that the long-term fiscal position of reformer economies is significantly more robust. The financial burden of pensions has been reduced (at least those corresponding to future pensioners), and most of implicit costs have emerged, increasing the transparency of the system as a whole. This process is not easy. Reformers face significant up-front fiscal costs, since pensioners stay under the old rules, while some or even all contributors move out to the new system. In addition, all the privately managed systems maintain a solidarity pillar.

The Chilean pension reform represents a useful case study. It has been in operation for nearly 30 years and enjoys an extensive political and social support. Besides, the Chilean economy exhibits some of the aforementioned macroeconomic effects. As estimated by Corbo and Schmidt-Hebbel (2003), the overall impact of

² Peru (1993), Colombia (1994), Argentina (1994, re-reformed in 2008), Uruguay (1996), Mexico and Bolivia (1997), El Salvador (1998), Costa Rica and Nicaragua (2000) and Dominican Republic (2003) followed the experience of Chile (1981), introducing mandatory individual capital accounts managed by the private sector.

pension reform (on savings, investment, labour and total factor productivity) could explain almost one-tenth of Chilean economic growth up to 2001. The country enjoys a healthy fiscal position and is entering a phase in which fiscal commitments due to the transition begin to recede. Finally, the on-going pension reform enacted in 2008, significantly reinforces the structure and size of the solidarity pillar. For these reasons, in this paper we analyze the fiscal impact of structural pension reform using the Chilean case as workhorse.

In a nutshell, the paper concludes that the fiscal impact stemming both from the transition costs and the solidarity pillar is high and persistent (as stated in Mesa-Lago, 2004), but in the long-term is significantly lower than the one in not reformed systems. Besides, its composition should be taken into account, since there are significant heterogeneities within the ‘transition cost’, especially from an international perspective (old-system operational deficit, recognition bonds and minimum pensions). Our analysis suggests some economic policy recommendations: fiscal position would remain more favourable as long as reform is supported by a good combination of market and public institutions, by a gradual development of financial markets, by a fiscal consolidation prior to the reform, and by a careful design of pension and labour regulation.

The paper is organized as follows. In the next section we summarize the ‘promises’ of pension reform in the fiscal front, and report its main results for Chile. A preliminary assessment of the on-going reform, focused on the minimum pension pillar is presented in section three. In section four we expand the geographic span, highlighting the fiscal constraints and some of the main characteristics of the solidarity pillars in Colombia, Mexico and Peru. Finally, in section five we conclude putting forward some criteria to evaluate the exportability of the Chilean reform.

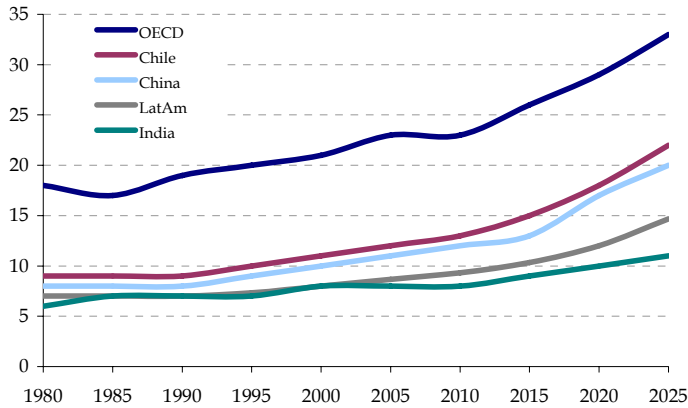
2. The promise and outcome of pension reform: the fiscal impact

As Holzmann and Hinz (2005) put it, the main goal of pension reform is to achieve ‘adequate, affordable, sustainable and robust pensions, while at the same time

contributing to economic development. The Chilean reform considered closely the fiscal sustainability³.

Back in the eighties, Chile was a very young society. The population over 65 years was just 10 per cent of the working-age population in 1980, compared to 20 per cent for the OECD average, according to United Nations data (see Figure 1). In spite of it, there were already serious concerns about the fiscal sustainability of pension benefits in the old system at the time of reform in 1981. Workers retired very young and the legitimacy of the pension system had been under question for more than 20 years due to inequities among different retirement regimes. Estimations by the Budget Office in the late 70s foresaw a significant increase of the fiscal burden in the case of no reform, due to excessive benefits in some of these regimes, exacerbated ageing pressures. The World Bank estimated for a no-reform scenario, that the implicit pension debt of the system would have been about 130 per cent of GDP in 2001, the largest in the region after Uruguay's (Zviniene and Packard, 2004).

Figure 1. Old-age dependency ratio, 1980-2025
(L+65/L15-64)



Note: LatAm is the simple average of Colombia, Mexico and Peru
Source: United Nations. World Population Prospects: The 2006 Revision

Looking backwards, the Chilean experience shows that pension reform is not cheap, but it can be affordable if fiscal discipline prevails. One of the main issues when a country replaces a traditional defined benefit PAYG system by a new one based on individual capitalization accounts is the ‘pure’ fiscal cost of the transition. Firstly, as

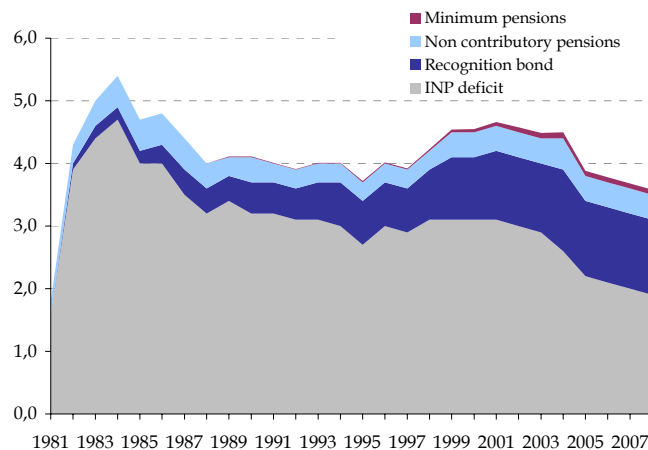
³ For a description of the context and the contents of the reform, see Superintendencia de Administradoras de Fondos de Pensiones (2003), Arenas et al. (2006) and Favre et al. (2006), and more recently Iglesias (2009).

affiliates move to the new system (a move in Chile which was voluntary for those in the labour market before the reform, and compulsory for new entrants), they generate a financial gap in the old scheme ('operational deficit'), since they switch their contributions from one to the other. This gap is augmented if the reform takes place at later stages of the demographic transition, when old-age dependency ratio is on the ramping slope. In Chile this expenditure category peaked as a percentage of GDP in 1984, reaching 4.7 percentage points (p.p.), as represented in Figure 2.

The analysis is made more complex, since a large fraction of the pensions paid in the old system by the *Instituto de Normalización Previsional* (INP) were and still are minimum pensions to retirees of the old system, and their level depends on political (and not just technical, neither transition-related) decisions, as pointed out in Valdés (2006). Secondly, on top of this, the government may compensate workers who switch from the old system to the new system for the contributions made in the past, under the social implicit contract that characterizes pay-as-you-go pension systems. In Chile this was done by issuing a government bond paying an annual real rate of return of 4 per cent to each affiliate with contributions to the old system. The size of this "Recognition Bond" depended on the number of years and size of contributions to the old system. The bond comes due at the legal retirement age (65 for males, 60 for females). Therefore these fiscal costs come later in the case of Chile and they could be high, as the Chilean experience shows (see figures from Bennet and Schmidt-Hebbel, 2001, Arenas and Gana, 2005 and Valdés, 2006). According to official accounts, the expenditure in 'recognition bonds'⁴ has been ever increasing, up to 1.2 per cent of GDP in 2008.

⁴ A negative lesson of the Chilean experience, as reported in Vial (2008), is the poor management of recognition bonds due to the absence of precise statistics on workers history, and the lack of reliable statistics, even today, to base adequate projections.

Figure 2. Transition deficit of the Chilean civil pension system (GDP share)



Note: Military system would add 1,5 p.p. of GDP on average

Source: Chilean Budget Office, Arenas and Gana (2005), and own elaboration

Finally, another source of fiscal stress, which can coincide in time with the previous two, but is independent of the transition itself, stems from the solidarity pillar expenditure. In Chile, this pillar was composed by a minimum pension guarantee (MPG, a benefit for those who have contributed at least for 20 years), and a non contributory benefit for old-age and disabled lower income population (PASIS). As a whole, they added permanently around 0.5 p.p. of GDP to the total ‘transition deficit’ in 2008.

On the aggregate, our assessment is that the ‘transition deficit’ has been relatively high (around 4.0 p.p. of GDP) and persistent⁵, despite the fact that Chile implemented the reform at the early stage of ageing. But, it is crucial to identify and explain each of these factors separately.

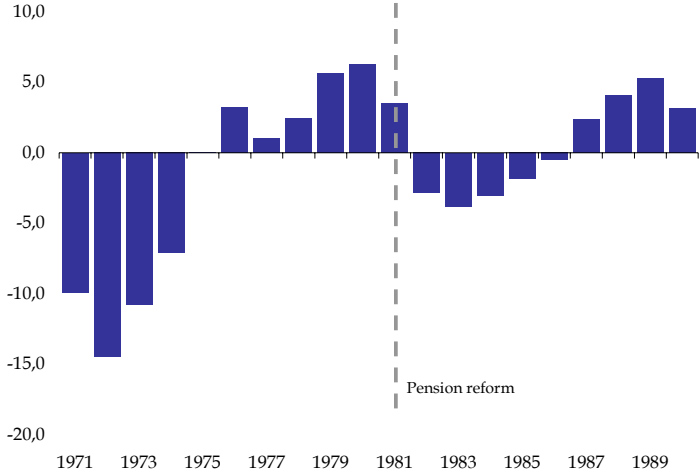
What is remarkable in the case of Chile, besides the extraordinary increase in fiscal outlays in pensions, is that it took place at the same time that the overall tax burden was falling by about 10 p.p. of GDP. In spite of it, fiscal accounts remained in surplus for most of the time since the end of the eighties. The fiscal consolidation process started in the mid-seventies, and by the end of the decade a major surplus was projected (see Figure 3)⁶. According to Melguizo and Vial (2009), the authorities decided to use those resources to fund the pension reform and reduce the tax burden. Even though this was made under military rule, the fiscal position remained in surplus after

⁵ An additional category, which is usually included in the ‘transition cost’, is the military regimen pension deficit, 1.5 p.p. of GDP on average since 1980. See Table A1 in the Annex.

⁶ The deterioration of fiscal accounts after 1981 was cyclical, driven by the economic crisis of 1982-1983, when GDP fell by 17 per cent in real terms.

the switch to a democratic regime in 1990. This sound fiscal policy may have benefited the credit risk rating, since financial markets, and rating agencies in particular, do not significantly weight implicit liabilities, focusing on explicit public debt (Cuevas et al., 2008).

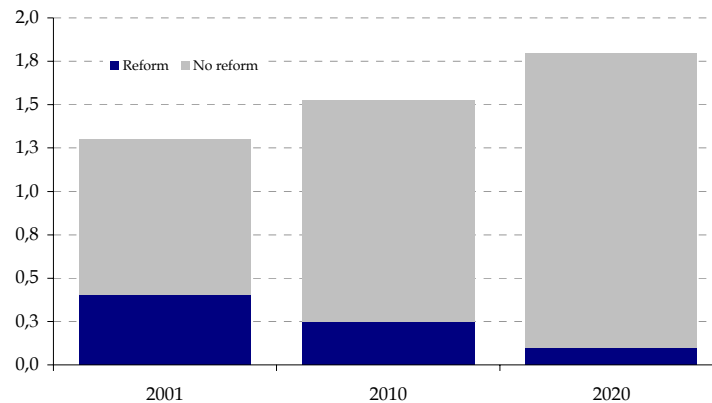
Figure 3. Central government net lending in Chile
(Cash, GDP share)



Source: Melguizo and Vial (2009)

The long-term effects of the replacement of the old system on the fiscal accounts has been positive as shown in almost every projection (see Bennett and Schmidt-Hebbel, 2001 or Favre et al., 2006), as well as in the World Bank estimates of the evolution of the implicit pension debt. Using the *Pension Reform Options Simulation Toolkit* (PROST), the implicit debt may have been reduced in the case of Chile from 211 p.p. of GDP without pension reform in 2050, to zero after the reform (see Zviniene and Packard, 2004 and Gill et al., 2005). These benefits are patent even in the short and medium term. According to the same projections, in absence of the structural reform, the pension implicit debt in 2010 would have been 1.5 times the Chilean GDP (vs. 25 per cent after reform).

Figure 4. Implicit pension debt in Chile
(Reform vs. No reform scenario, GDP share)



Source: Zvinieni and Packard (2004)

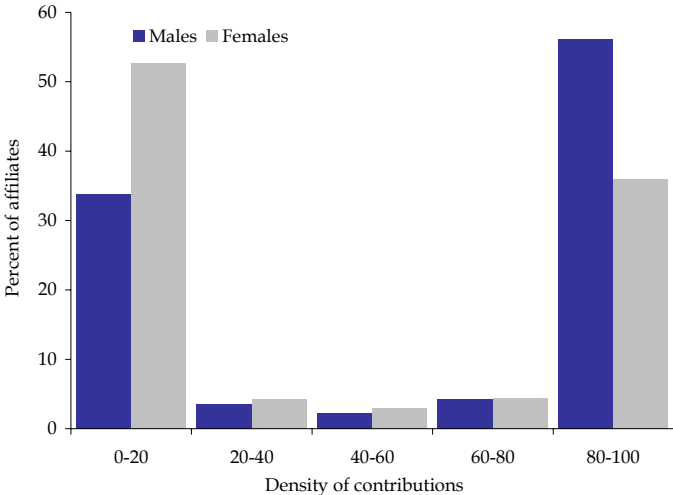
Even though the reform significantly reduced the inequalities of the Chilean pension system and strengthened its long-term fiscal position, it did not solve the chronic problem of providing proper coverage to all workers, as it stood before the 2008 reform. On one hand, women would have had very low replacement ratios, due to a higher life expectancy (but lower legal retirement age) and to their traditionally lower participation rates and salaries. On the other hand, Chile shares, although to a lesser extent, a general trend in emerging economies: many members of the labour force have a very precarious insertion into the labour market, with frequent flows between the formal sector, the informal sector and unemployment. As shown in Figure 5, around 34 per cent of men affiliated to the privately managed pension system have an average density of contributions under 20 per cent (that is, they pay contributions to the pension fund administration less than three months per year), a figure that rises to 53 per cent in the case of women. This means that more than one third of those in the labour force would not have a proper income security in old age from the mandatory pension system. Since the MPG is designed to provide income protection to poor workers with 20 or more years of contribution (about 50 per cent density of contributions) this also meant that these workers had very little hope to qualify for that government funded benefit.

It is important to note that not all those who do not contribute regularly require fiscal support: some self-employed workers have chosen not to contribute and invest in small business to provide for income security in old age instead of contributing to social security systems (contributions were voluntary for independent workers in Chile until

the latest set of reforms). However, there is no doubt that the system would not provide enough coverage for all, especially as the move from the formal to the informal labour market.

In more general terms, it is clear that in spite of better labour incentives that defined-contribution pension schemes introduce (based on a full linkage between contributions and benefits), pension reform is no substitute for adequate social, labour and macroeconomic institutions.

Figure 5. Density of contributions by gender in Chile, 2004-2006



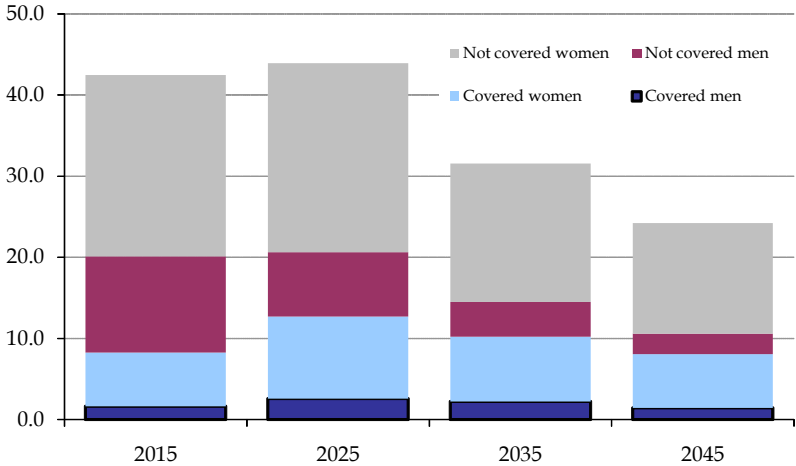
Source: 2006 Social Protection Survey

Based on a macro-actuarial model of the Chilean pensions system⁷, with linkages to United Nations demographic projections, and public finances, Favre et al. (2006) projected that more than 40 per cent of affiliates up to 2025 would accumulate pension rights below the contributory minimum pension at the age of retirement (see Figure 6). Among them, only between 20 and 30 per cent would have been eligible for the contributory minimum pension guarantee, after having contributed for 20 years. The problem of no coverage is exacerbated for women, who represent three quarters of the affiliates who need, but do not qualify for the contributory benefit. This prognosis was widely shared by analysts both from the public and private sectors (see, among others, Faulkner-MacDonagh, 2005 and Arenas et al., 2008). In the baseline scenario Berstein et al. (2005), from the Chilean supervisor, projected that 55 per cent of affiliates would

⁷ The model incorporates 19 cohorts (pensioners, affiliates and future affiliates), disaggregated by four groups of density of contributions (see Figure A1 in the Annex), gender and wage. The outcome of the pension system in terms of pension level and replacement ratio, coverage and fiscal costs are driven by quasi-official demographic and macroeconomic projections, starting from the institutional situation in December 2004. Selected results are summarized in Tables A2 and A3.

have pension rights below the minimum, and among them, only one tenth would qualify for the MPG.

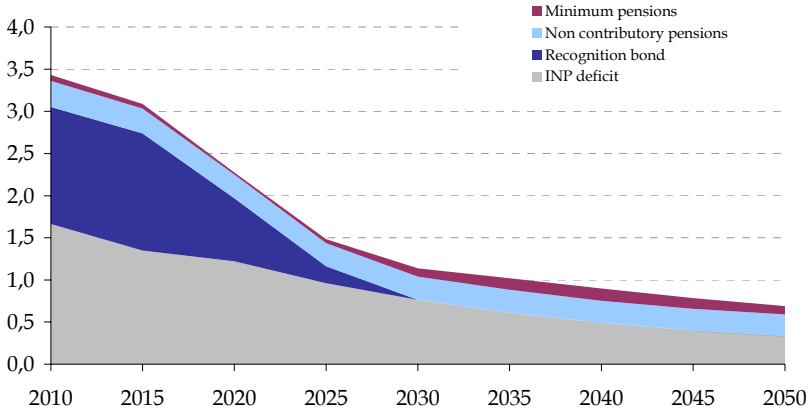
Figure 6. Projection of minimum pension beneficiaries in Chile
(No reform scenario, percentage of pensioners)



Source: Favre et al. (2006)

At the same time, available projections anticipated a significant fiscal relief from 2020 onwards. As shown in Figure 7 (and Table A4 for numbers), the overall transition deficit would decrease down to 2.3 per cent in 2020 and 1.5 per cent in 2025, thanks to the exhaustion of recognition bonds, and the gradual decrease of the INP operational deficit (the ‘pure’ transition cost). Official projections by the Chilean Ministry of Finance (Arenas and Gana, 2005 and Arenas et al., 2008) are even more favourable, reducing the transition deficit down to 1.8 per cent in 2020 and 1.3 per cent in 2025.

Figure 7. Projection of the transition deficit of the Chilean civil pension system
(No reform scenario, GDP share)



Source: Favre et al. (2006)

So, under the old rules, those who needed the minimum pension coverage did not qualify for it, while those who qualified did not need it. Therefore, the social protection network in Chile was, using the World Bank criteria, affordable and fiscally sustainable, but not adequate neither socially sustainable.

3. On-going reform: strengthening the redistributive system

After more than 25 years of the onset of a new system, at a time in which accumulated savings in mandatory pension accounts have reached 60 per cent of GDP, and right before those switching workers begin to approach retirement age, a lively debate arose in Chile about the need to introduce additional adjustments. The design of the transition allowed some leeway in the short-term, since it incorporated strong incentives for young workers to move from the PAYG system to the new one, while middle-old age stayed in the previous one (the ratio of pensioners of the new system is still limited and a large majority of them correspond to high-income early retirees). Besides, there was a long discussion about the costs of administration of the private capitalization accounts, and the need to introduce more competition to reduce fees. Finally, a third catalyst of the discussion was the industry demand for a revision of the investment limits.

The Chilean government that took power in 2006 appointed a national council (*Consejo Asesor Presidencial para la Reforma Previsional*)⁸ to analyze and set the pension reform agenda, while preserving its core components. This council was plural in composition and its members were widely reputed people, with strong academic background. It was headed by Mario Marcel, a much respected economist with strong fiscal credentials. During five weeks, the Council conducted an extensive round of hearings, including all major workers and business organizations, researchers, international experts, etc. After that, the Council submitted to the government a comprehensive report that enjoyed high legitimacy and very strong technical support. This report was the basis for the project of law sent to Congress by the government at the end of 2006 and approved in early 2008. One major virtue of this process is that provided technical and political legitimacy to the new reforms.

⁸ See www.consejoreformaprevisional.cl.

Table 1 compares the main elements of the diagnosis, shared by the Council and analysts, as well as the law 20.255 enacted in March 2008. The main conclusion was that the system was sound, was working fine, but required upgrades. As the Council report states, ‘the individual capitalization system has not failed as a financing mechanism. Even more, it will generate pensions with replacement ratios close to 100 per cent for those workers with formal jobs and a regular history of contributions over their work lives’⁹. The Council also concluded that the system has been beneficial for the country in terms of economic growth and the development of financial markets.

However, they emphasized the need to act promptly, before the bulk of those who transferred from the old system to the new one reached the retirement age. The most pressing problems to be addressed, according to the Council, were strengthening the first pillar (minimum pensions), raising the coverage of the system and the density of contributions, increasing gender equality, improving competition and reducing costs, generating better conditions for investment and several other points of a more general nature (better financial education or expanding voluntary pension savings)¹⁰.

Table 1. Chilean pension system. Diagnostic and reform

Diagnostic	Law 20.255 (March 2008)
Poverty risk at old-age (coverage)	New redistributive pillar (SPS)
Low density of contribution among self-employed	Gradual compulsory contribution Fiscal advantages (same as dependent)
Low projected replacement rates for women	Public contributions in case of maternity
Low competition	Auctioning for new affiliates (based on fees) Join bidding for survivors and disability insurance

The first challenge (‘strengthening the first pillar’) was considered the priority and the government went for a very ambitious reform, establishing a new redistributive

⁹ Consejo Asesor Presidencial para la Reforma Previsional (2006), vol. I, chapter II, p.31. The translation is ours. This figure is in line with the OECD standards, where the theoretical replacement ratio for an average worker is 57 per cent. See Figure A2 in the Annex.

¹⁰ Rofman et al. (2009), in this volume, highlight both the parallelisms on the challenges faced by the Argentinean and the Chilean systems, and the contrasting political approaches. As a result, the outcome and the expected effects will be different.

pillar, *Sistema de Pensiones Solidarias* (SPS)¹¹. This pillar will be gradually implemented between 2008 and 2012, funded out from general revenues of the government budget. For this objective, a reserve fund is created, and will be evaluated every three years. The main goal of the SPS is to cover every pensioner (old-age over 65 years and disabled) with incomes in the lowest 60 per cent of the population according to national census (starting from 40 per cent in 2008). The SPS would not require any contribution at all to the pension system, and would completely replace the existing PASIS and MPG by 2023.

The minimum value of the social benefit for retirees is set by law (75 000 Chilean pesos per month in 2009, around 100 euros), the so-called *Pensión Básica Solidaria* (PBS) for those with no contributions to the pension system. As represented in Figure 8, the benefit would decrease gradually with the size of the self-financed pension, reaching zero from PMAS (255 000 Chilean pesos in 2012, 340 euros/month)¹². In this alternative case, the benefit is labelled *Aporte Previsional Solidario* (APS), as it is a public complementary benefit. In order to maintain the incentives of workers to contribute to the system, the pension 'reference' (the black line in Figure 8) increases with the level of accumulated contributions. By contrast, since this kind of strategic behaviour is not supposed to be possible for disability pensioners, all of the pensioners below the PBS would receive just the difference (Figure 9).

¹¹ Favre et al. (2006) concluded that the problem of coverage was due to low density of contributions and too strict eligibility MPG requirements. In order to increase density, the new law makes contributions gradually mandatory for independent workers. They also improve incentives for these workers to contribute (similar tax treatment, extension of other social security benefits), and mobilizes the tax system as a tool for improving collection. With respect to the second issue, several analysts and the pension funds administration association proposed the gradation of requisites to get access to a fraction of the value of the MPG. Simulations showed that this was powerful enough to cover most unprotected workers, while those who do not make it under this scheme, could still apply and obtain a PASIS, once they deplete their savings. The reform has been much more far-reaching.

¹² For comparison, the average contributory minimum pension guarantee amounted in December 2008 around 115 000 pesos per month (slightly over 150 euros), and the non-contributory one around 55 000 pesos (75 euros). The average monthly wage in Chile stands around 350 000 pesos (470 euros) and the minimum wage 159 000 pesos (210 euros).

Figure 8. Reformed old-age pension system in Chile

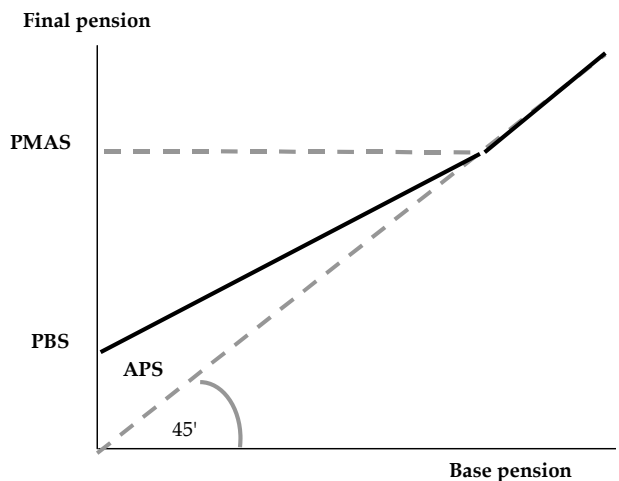
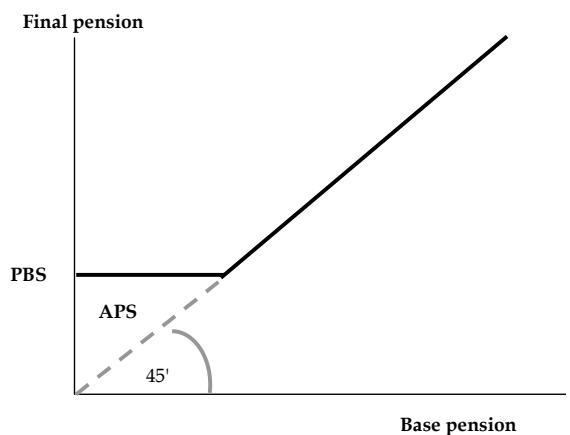


Figure 9. Reformed disability pension system in Chile



As we highlighted in the previous section, the timing for the adjustment was fiscally-speaking right. Pension related fiscal outlays have remained close to 5 per cent of GDP in the last decade, with a changing composition: while the expenses derived from the obligations with pensioners in the old system have been gradually falling in GDP terms, recognition bonds redemptions have been rising fast as those who switched to the new system are reaching retirement age. Therefore, Chile is close to the peak of RB expenses and they should fall fast in the next decade. This provided a unique opportunity, which is further supported by the fact that the Chilean government has accumulated major surpluses during the last years, thanks to the rigorous fiscal policy. As long as the new solidarity pillar is introduced gradually, and its parameters (PBS and

PMAS basically) are set in a conservative way, the government may be able to fund this improvement maintaining the current tax burden.

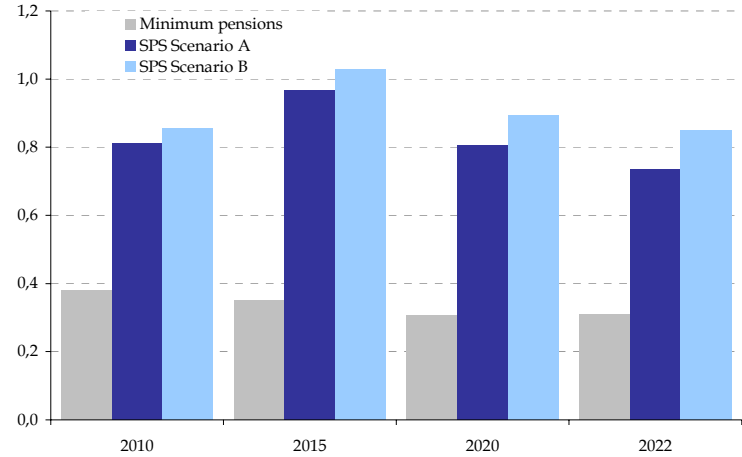
In order to make a preliminary evaluation of the fiscal impact of this new pillar in the short and medium term, we have performed a simple exercise based on public information. We define two scenarios, one which follows the historical trends (Scenario A), and a second one which incorporates the negative effects of the current crisis (Scenario B). Affiliates are classified as regular or informal contributors, according to public information referred for June 2008, published by the supervisor (*Superintendencia de Administradoras de Fondos de Pensiones, SAFP*). Regular contributors exhibit a density of contributions of 100 per cent in Scenario A and 90 per cent in Scenario B; while informal contribute 20 per cent of the time in Scenario A and 10 per cent in Scenario B¹³. This dataset also allows identifying gender, age, salary and accumulated savings in the individual capital account. Mortality evolves according to United Nations demographic projections, while disability is determined as a fixed percentage of mortality rates (10 per cent). Data on the recognition bond (key to calculate the amount of APS) comes from the information provided by pension funds administrators in the bidding process for disability and survivors insurance (referred to June 2002 to June 2008). All of the disability benefits are computed as PBS. Real GDP growth in Scenario A (2.5 p.p. in 2009 and 2010, and 3.8 p.p. from 2011 onwards) is taken from Arenas et al. (2008), while Scenario B is based in the short-term on BBVA Economic Research Department latest projections, as of May 2009 (-1.2 p.p. in 2009 and 2.1 p.p. in 2010). Annual real return of pension portfolio is 5 per cent in Scenario A and 3 per cent in B, real wages increase 2 per cent paper year in Scenario A and 1 per cent in B, and inflation is 3 per cent (the Central Bank target) during the whole period in both scenarios. Annuities are calculated using the mortality table RV 2004, and with a technical real interest rate of 4 per cent in Scenario A and 2.8 per cent in B.

Based on this methodology, annual public expenditure of the solidarity pillar would reach between 0.8 per cent and 0.9 per cent of GDP in 2010 (Scenarios A and B respectively), peak at 1.0 per cent in 2016, and gradually go down to 0.7 – 0.8 per cent

¹³ In the whole period, in Scenario A the overall density is 60.4 per cent. According to Arenas et al. (2008), the density of contributions may increase 12 percentage points, up to 66.8 per cent from 2025 from 54.8 per cent in 2006, due to the mandatory contributions for independent workers. In Scenario B, the density is below the reported current level (around 50 per cent).

in 2022 (see Figure 10)¹⁴. This would imply a permanent increase in expenditure of around 0.7 – 0.8 p.p. of GDP per year with respect to the previous solidarity pillar (the aggregate of MPG and PASIS schemes).

Figure 10. Projection of the expenditure of the solidarity pillar in Chile
(Reform scenarios vs no reform scenario, GDP share)



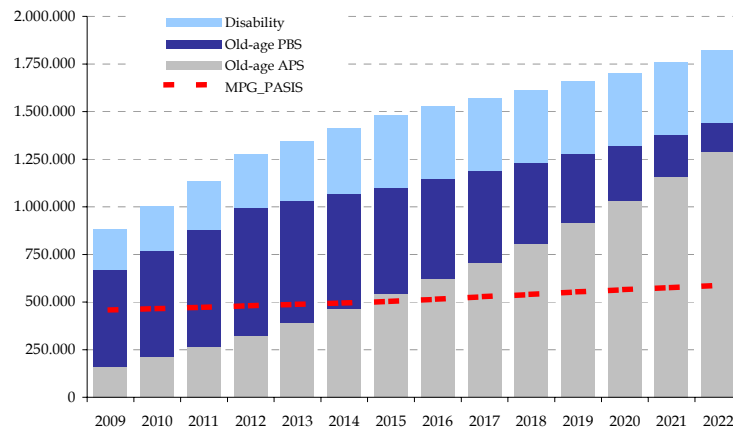
Source: Favre et al. (2006) and own elaboration

This projection is basically driven by the increasing number and share of pensioners of the private system (in comparison to those still in the INP), and by the increase in the affiliation and density of contributions (due to higher per capita income and mandatory contributions for self-employed). These trends are represented in Figure 11, common for both scenarios¹⁵. Beneficiaries of the solidarity pillar would increase from one million people in 2010, to over 1.8 million in 2022, with an increasing share of those receiving the old-age APS. By comparison, Favre et al. (2006) projected that beneficiaries of the old solidarity pillar will range between 450 and 600 thousand people, mostly receiving non-contributory PASIS.

¹⁴ Projection period (up to 2022) is limited due to the lack of disaggregated data of affiliates by sex and age, at earlier years.

¹⁵ Although APS beneficiaries coincide in both scenarios by assumption, accumulated contributions are higher Scenario A, so the percentage of the pension funded by the government is lower.

Figure 11. Projection of beneficiaries of the new solidarity pillar in Chile (Persons)



Source: Favre et al. (2006) and own elaboration

Official figures are lower in the short run and higher in the long run. However, a precise comparability is not feasible due to the lack of published information on key assumptions (distribution of APS and PBS among old-age pensioners, or pension returns, for instance). Arenas et al. (2008), from the Budget Office, estimate that expenditure would increase in the whole projection period, up to 1.2 per cent of GDP in 2025 (from 0.5 per cent in 2009), with a permanent increase of 1.0 percentage point of output. According to these authors, the overall fiscal impact of pension reform would be even higher (0.2 p.p. additional since 2015) if the subsidies for younger workers, the child bond, or the contributions for disability and survivors insurance of civil servants and independents, are added.

All in all, the reform greatly improves the social protection network in Chile, reaching full coverage for poor-middle income workers. The fiscal cost would be not negligible, and the pillar and may be vulnerable to political pressures, but from a social and a financial sustainability perspective, the Chilean reform is a sensible step forward.

4. Reforms in Colombia, Peru and Mexico: work in progress

In Colombia and Peru, reforms took place in the mid nineties. In both cases, the design allowed workers to choose between the public PAYG scheme and the private scheme, generating some kind of competition between both, especially for the new workers. For

affiliates of the old PAYG scheme who decided to migrate to the private system, the public sector recognizes their contributions with bonds to be paid when they receive a pension. In contrast, in the case of Mexico, the reform of 1997 ‘closed’ the PAYG scheme for new workers who have to contribute to their individual private capitalization account for pensions. However those who belonged to the old PAYG system and decided to move to the private scheme keep the right to retire under the old PAYG rules, which are much more generous. Consequently, the Mexican government decided not to introduce a recognizing bond, and choosing that path, left the PAYG system *de facto* open.

Another important point to take into account is how these governments decided to face the implicit debt of their public systems. Depending on their respective institutional frameworks, some of them implement strong parametric reforms in order to reduce their fiscal burdens, while others established mild changes. So, each pension systems face different fiscal and socio-economic constraints in order to get more extensive pension coverage and to implement a sound solidarity pillar *à la Chilean*. In what follows, we will highlight the impact of some of these constraints, with a special reference to ones faced by the minimum pension’s pillar¹⁶.

Colombia

Between 1993 and 1994, Colombia implemented its present dual system. The existing PAYG system, known as RPM (*Régimen de Prima Media* in Spanish) comprises all the various entities such as the old Instituto de Seguridad Social, Cajanal and other minor pension schemes. In parallel, an individual pension scheme known as RAIS (*Régimen de Ahorro Individual con Solidaridad*) was introduced with the participation of eight pension funds companies. Since 1994, important parametric adjustments were implemented to the RPM scheme that reduced the implicit debt from 191 per cent of GDP to 148 per cent. However, significant differences persist with respect of the private scheme, representing one of the most important complexities of the Colombian pension system.

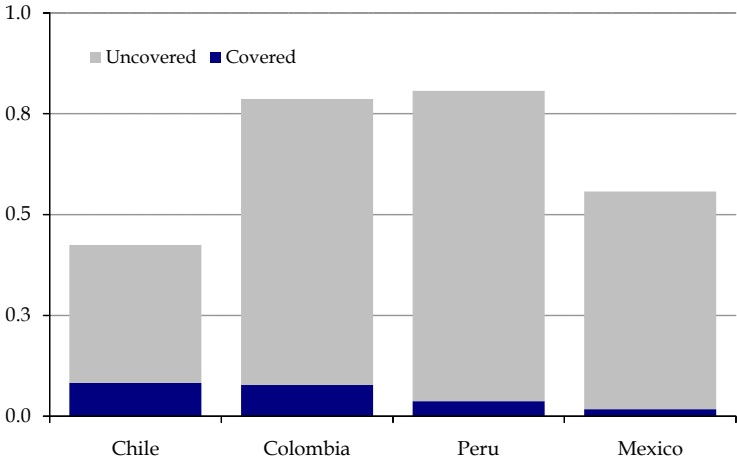
The combination of the characteristics of the Colombian labour market with this fiscal burden constitutes a clear constraint for implementing improvements for low income families as well as to extend the coverage of the system. According to the

¹⁶ For a deeper discussion of the pension system regulation and their main challenges, see Albo et al. (2007) for Mexico, Bernal et al. (2008) for Peru, and Muñoz et al. (2009) for Colombia.

Encuesta Continua de Hogares (Colombian Household Survey), more than 50 per cent of the total workers belong to the informal sector, over 70 per cent of total affiliates declare incomes below two minimum salaries, and more than 50 per cent of total affiliates have a density of contributions below 30 per cent. In order to access minimum pension benefits, 23 years of contribution to the private scheme or between 22 and 23 years to the public scheme are required. Besides, affiliates must be 57 years old (women) or 62 years old (men) in the private system, or 55 and 60 years respectively in public one.

The combination of the aforementioned elements explains the very limited minimum pension’s coverage in Colombia. As shown in Figure 12, Muñoz et al. (2009) project that in 2015 less than 8.0 per cent of the retirees will access to the solidarity benefits (adding the beneficiaries of the public and private pillars). By contrast, nearly 70 per cent of pensioners will retire with accumulated pension savings below the minimum pension, but will not qualify for it (represented by the grey area in the figure; the nearly remaining 20 per cent will have accumulated ‘sufficient’ pension rights). According to the assumptions considered in this study (especially in terms of potential growth and productivity, informality and longevity), in absence of further reforms, access to the benefit could increase slightly up to less than 10 per cent, so the ‘uncoverage rate’ would remain around 70 per cent. In other words, only one out of ten Colombian retirees who would need this benefit, due to insufficient savings at retirement age, actually gets it (vs. one out of five in Chile).

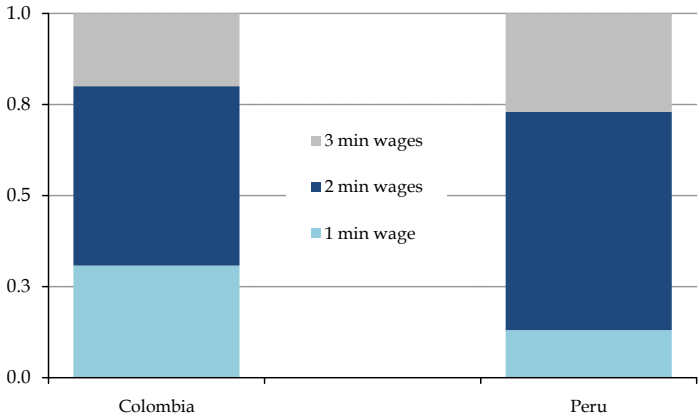
Figure 12. Projection of minimum pension beneficiaries in Latin America
(Percentage of pensioners , 2015 except 2035 for Mexico)



Source: Own elaboration, based on Favre et al. (2006), Albo et al. (2007), Bernal et al. (2008) and Muñoz et al. (2009)

Another interesting perspective to analyze the access to this benefit is by looking the percentage of minimum pension benefit beneficiaries segmented by income level. It is clear from the data that low income people (who at the same time tend to be low density affiliates) find it very difficult to receive this benefit. Figure 13 represents the projected distribution of minimum pensioners according to their income level in Colombia and Peru in 2015. Only one third of Colombian beneficiaries are actually low incomers (defined as those earning up to one minimum wage), whereas nearly 50 per cent earn around two minimum wages, and 20 per cent even earn on average three minimum wages.

Figure 13. Beneficiaries of minimum pensions by income level
(2015, Percentage of total minimim pension beneficiaries)



Source: Own elaboration, based on Bernal et al. (2008) and Muñoz et al. (2009)

These limitations led successive governments to consider some solidarity schemes. The private regime has a special fund, named *Fondo de Garantía de Pensión Mínima* (Minimum Pension Guaranty Fund) that helps to complement the minimum pensions for those who acquire 1 150 weeks of contribution, but are not able to accumulate enough capital to finance their own minimum pension. Affiliates to the private regime make payments to this fund every time they make a contribution to the pension scheme. However, it is very likely that this scheme could be regressive; those who have low income usually exhibit too low densities to access minimum benefits, and their contribution fees will be used to finance the minimum pension of others affiliates with better labour stability and probably with higher income).

In addition there is a very limited scheme named *Fondo de Solidaridad Pensional* (Solidarity Pension Fund), a pension scheme fed by contributors with income over four

minimum salaries. This fund has two sub accounts; the *Subcuenta de Solidaridad* (Solidarity sub account) complements the contribution of some workers with low income from rural and urban areas. Unfortunately, in order to access to this benefit, 500 weeks of contribution are required, which could be considered a demanding requirement. Besides, the data shows that it is losing beneficiaries, so accumulating resources may not accomplish their purposes. The other sub account is the *Subcuenta de Subsistencia* (Subsistence sub account) which basically allocates either monetary transfers or services to poor people over 70 years.

Peru

After the pension reform that took place between 1992 and 1994, the system is integrated by two regimes that work in parallel. On the one hand, the National Pensions System (*Sistema Nacional de Pensiones*, SNP), managed by the public sector, operates under a PAYG financial regime. On the other, the Private Pension System (*Sistema Privado de Pensiones*, SPP), managed by private specialized institutions, operates under a financial regime of individual capitalization, in which each affiliate makes a direct contribution to a personal account until he retires.

SNP is in deficit, and increasing Public Treasury transfers have been necessary over the last few years to make up for the difference. Aggregating the 'operational deficit' in SNP (the difference between contribution income minus pension-related expenses), the deficit in the special regime law 20.530 (similar to the public one, but extinguishing by constitutional order), the recognition bonds, and the minimum pension subsidies, supplementary bonds and disaffiliation to SPP, deficit reaches 58 per cent of the GDP in 2006 (Bernal et al., 2008). Being this figure significant indeed, it is significantly lower than the one before the reform (the fiscal cost of keeping a PAYG system would have been close to 100 per cent of GDP) and, to obligations in Colombia or Mexico.

The current SPP situation also presents aspects that could be improved. Indicators show that, currently, the coverage of the SPP labour force is at slightly less than 30 per cent, one of the lowest levels in Latin America, even when compared with younger systems. At the same time, data shows there is an important group of workers that does not have a regular contribution pattern. Three structural problems in the Peruvian economy help to explain the difficulties to extend the coverage of the system: a

large informal sector, a high level of poverty, and the wide dispersion of wealth distribution. 60 per cent of the economic activity in Peru is informal, with 40 per cent of the labour force self-employed in informal micro-firms (although, even counting those people that work for larger firms, only 20 per cent of the labour force contributes to a formal pension plan). Poverty in Peruvian rural areas (nearly 70 per cent in 2006) is significantly higher than that in urban areas (slightly over 30 per cent). This fact is line with coverage distribution, which is largely lower in rural areas (3 per cent in 2006, vs. 20 per cent in urban areas). Finally, although income inequality has apparently decreased (the main household survey *Encuesta Nacional de Hogares-ENAH*O shows that the Gini coefficient reached 0.43 per cent in 2006, from 0.46 in 1997), still reflects an unequal distribution.

The access to the minimum pension benefit has been very restricted. Bernal et al. (2008) show that less than 4 per cent of pensioners in 2015 will have access to minimum pensions, considering the affiliates of the public and the private systems (Figure 12). By contrast, nearly 80 per cent of pensioners would need it, but do not qualify for them (i.e. one out of thirty). This dismal result stems from the combination of low densities with quite strict eligibility criteria. In order to get it, affiliates must have contributed to the system for at least 20 years and have 65 years old. Projections up to 2050, based on relatively favourable socio-economic trends, do not change significantly the picture.

Besides, low income population in Peru shares with the Colombians the difficulty to access to this benefit. As represented in Figure 13, in 2015, less than 15 per cent of minimum pension beneficiaries earns up to one minimum wage, while 60 per cent earn two minimum wages, and almost one third earn three minimum wages. So it seems that, in absence of reforms, minimum pension pillars end up being a social benefit for middle income population, and not to the lower income segments.

Despite this situation, there is not a formal solidarity pillar reform in progress. Nonetheless, law 28015 (enacted in 2008) promotes and formalizes micro and small enterprises, offering workers in these firms, social security and pensions. With this new law, workers of small enterprises may access a public subsidy to cover 50 per cent of pension and health costs. Taking into account that in Peru micro and small enterprises represent 54 per cent of GDP and 62 per cent of the labour force, this reform could be an important window opportunity to tackle the problem of low coverage in Peru.

Mexico

In 1997, a defined contribution pension scheme at the Mexican Social Security Institute (*Instituto Mexicano de Seguros Social, IMSS*) was established. This scheme transformed the institutional design of retirement arrangements in Mexico by ‘closing’ the PAYG scheme. The worker saves to an individual pension account with the support of the government and the employer (the system is known as SAR, *Sistema de Ahorro para el Retiro*), but its specific rules have many implications. First, total contribution from the worker, the government and the employer to the individual account is around 8 per cent, so the pension generated from the capitalization scheme will be modest for many affiliates. Second, the system allows workers in the private capitalization system before 1997 choosing between the pension obtained under this scheme and the one obtained under the most favourable rules of the ‘previous’ PAYG scheme, generating an imbalance that is to be financed by the Mexican treasury.

In fact, this fiscal burden constitutes one of the main problems for broad the benefits of the pension system to more Mexicans. The pension deficit still depends on the characteristics of the different pension regimes that existed during its history. According to Albo et al. (2007), the pure cost of transition implies an implicit debt of 56 per cent of GDP. Adding to this figure to the other fiscal burdens, including the pension scheme for public workers (known as ISSTE, *Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado*) and the government contributions to the individual worker account, the implicit debt of pension systems in Mexico reaches 92 per cent of GDP.

In addition to this fiscal problem it is important to add the difficulties faced in the Mexican labour market. Although individuals with a formal salaried job in the private sector should by law be affiliated to the IMSS, in practice, a large number of affiliates do not make the required contributions to obtain the system’s protection. Evidence so far indicates that within SAR affiliates’ contribution densities are not uniform and that, at the same time, a high percentage of the total number of individual accounts registered in the SAR become ‘inactive’ for failing to receive the contribution payments (this is the case, for example, of temporary workers and those whose labour situation changes frequently, passing from being employed to unemployed or to independent workers and vice versa).

The Mexican pension system considers a minimum pension benefit for workers that belong to the new private scheme and retiring from 2035 onwards, approximately (retirees before that year, will receive the benefits of the old PAYG scheme, significantly more favourable). In order to get it, affiliates must have contributed to the system for at least 1250 weeks. In their baseline scenario Albo et al. (2007) project that in 2035, less than 2 per cent of pensioners would receive the minimum pension benefit (see Figure 12). Meanwhile, more than half of the pensioners would accrue pension rights below this level, but will not qualify for it due to the low density of contributions. Although it is projected an important increase in the next decades, based on various assumptions on productivity and formality growth, a significant part of pensioners will remain uncovered.

In order to ease the access of low income population to this pillar, the Mexican pension scheme considers a monthly contribution by the federal government to the individual account of the affiliate for each working day. This contribution known as *social quota* is the same for all accounts regardless of the income level of the affiliate, and its value is kept constant in real terms. Precisely, this scheme has been recently reinforced in May 2009, when the Congress approved a governmental initiative to reform the Social Security Law to strengthen its redistributive role. Under this new legislation, public spending through the social quota will be increased by 5 per cent, and to reallocate such spending from high to low and medium income earners. Workers with an income level higher than 15 minimum wages will stop receiving it. Meanwhile, the rest of workers will obtain increases in their social quota inversely related to their income level: 15 per cent for those with an income level between 1 and 4 minimum wages; 10 per cent for those with an income level between 4 and 7 minimum wages; 5 per cent for those with income levels up to 10 minimum wages and between 5 and 0 per cent increase for those with income levels between 10 and 15 minimum wages.

5. To conclude: on the exportability of the Chilean model

Economic institutions and reform processes are by definition one-time shocks. As Barr and Diamond (2006) explain, in a world full of market imperfections formulating pension policy in a first-best framework is not advisable. Therefore, it is difficult to

export the Chilean experience to other countries in the region or overseas, with different political and economic structures and institutions (as highlighted in Rofman et al., 2009). In spite of it, the Chilean reform has been a model not only for many emerging economies, notably in Latin America, but also has been at the heart of debates in industrialized ones (for instance in the US). Some key elements that facilitated or dampened outcomes of pension reform in Chile can be identified, so that local policy makers elsewhere can evaluate them and act accordingly¹⁷.

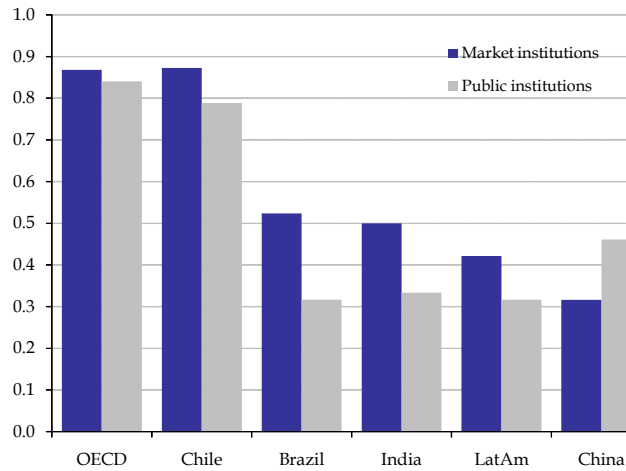
5.1. Market and public institutions

One key element for the success of a system based on individual retirement accounts is the good functioning of market institutions, especially financial markets. The protection of property rights and minority shareholders is crucial for pension funds that have to invest across a wide range of debt instruments and shares of listed companies. When capital markets are not fully developed, pension funds will have to invest in banking deposits, so a sound and well regulated banking system is another key factor of success.

In the Chilean case, private property rights have strong backing in the Constitution and have been reinforced by a legalistic tradition. International indexes on the quality of market and public institutions tend to rank Chile very high, even when compared with OECD countries (see Figure 14). The biggest challenge to the new system arose very early, when, as a result of a major economic crisis, many major banks and other financial intermediaries failed in 1983-1984. The government opted to protect deposits, allowing the pension funds to preserve their value and the system to survive (although at a significant fiscal cost).

¹⁷ This section relies heavily on Melguizo and Vial (2009). For an economic-theory oriented approach of the issue, see also Barr and Diamond (2006).

Figure 14. Market and public institutions rankings
(Doing Business 2009, Governance 2007, Best = 1.0)



Note: LatAm is the simple average of Colombia, Mexico and Peru
Source: World Bank and own elaboration

5.2. Gradual development of financial markets

The Chilean experience shows that it is not necessary to have all the regulations and financial instruments in place to launch the system. There is a learning-by-doing process involving managers of pension funds, regulators, central banks and policy makers. Some authors have highlighted the benefits of the pragmatism in the Chilean regulation, especially in pension markets, as one of its main institutional assets, thanks to a ‘political economy of the possible’ approach (Santiso, 2006).

If financial markets are not well developed at the onset of the pension reforms, it might be desirable to establish a conservative regulation, and gradually proceed to reform it introducing more flexibility. Nevertheless, being too conservative at the beginning has some risks, such as limiting too much the investment options and forcing too much concentration into government debt. The costs of excessive limitations could be substantial, as Berstein and Chumacero (2005) point for Chile. So, low risk international investments might be a good option if not enough good domestic alternatives exist, provided the introduction of some macroeconomic safeguards to avoid excessive foreign exchange rate volatility.

5.3 Fiscal policy and transition design

As we have analyzed in some depth, fiscal policy is extremely relevant. On the one hand, the move from PAYG to individual capitalization accounts will have a positive impact on economic growth if there is a net addition to domestic savings. Given that the transition process entails major fiscal disbursements, the increase in private savings may be offset by a reduction in government savings. Fiscal consolidation, mostly through current expenditure reallocations is needed in order to have a positive effect on savings and capital accumulation. According to Corbo and Schmidt-Hebbel (2003), fiscal consolidation in Chile may explain an increase in the domestic saving rate of 2.9 p.p. of GDP, financing a hike in the investment rate of 1.5 p.p. of GDP..

On the other hand, fiscal policy is relevant for risks to the pension fund portfolio. Traditionally, public debt is considered the safest asset, because the government has the ability to tax the citizens. However, governments can also elude its obligations through inflation, or even default. In many developing countries, especially in Latin America, governments had found politically expedient to take the inflationary way, instead of raising taxes or cutting expenses. Data shows that Chile is an outlier when compared to other reformers in the region: pension funds tend to have a lower share of government debt and a much higher proportion of foreign assets. Given the experience of pension funds in countries that have defaulted or liquated their public debt, it seems important to evaluate the safety of pension funds investments taking into account fiscal sustainability. These arguments are further compounded by lower financial credit risks of reformers if they exhibit a sound fiscal position.

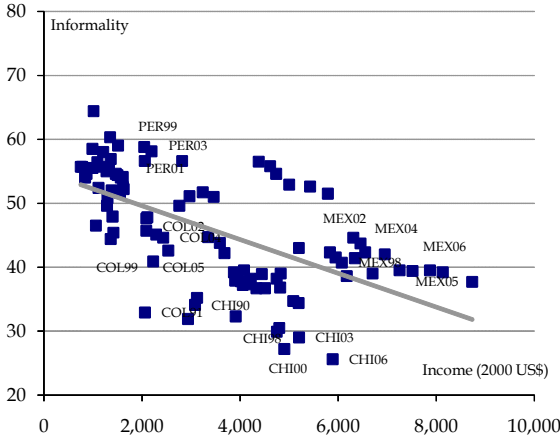
5.4. Informal labour market and solidarity pillar

The experience of Latin America shows that labour market informality severely limits coverage of pension systems, even in the case of individual capitalization accounts where incentives to contribute are theoretically the greatest. If informality is pervasive at the onset of the reforms, it seems almost inevitable to establish a large solidarity pillar. Unfortunately, a large fiscal commitment to a basic pension, not subject to contributions, can act as an important disincentive to formalization, so the design must be very precise.

Informality in Chile is the lowest in Latin America, even below the regional pattern, as can be seen in Figure 15. The country had a non-contributory means-tested

pension (PASIS) targeted to the poor of a value close to 80 euros per month, covering more than 400 thousand retirees, and did not seem to have had a significant impact in labour market informality. The new protection scheme with a significantly higher basic pension poses a risk of a drop in contributions at the low-income level, although the increasing ‘reference pension’ may offset it. For other countries, the reinforcement of the first pillar does not need to be introduced from the very beginning, since in any change of this sort there is a transition period – with high fiscal costs – in which those who enter into the new system accumulate resources in their accounts, well before they begin to retire. Only after that transition the protection mechanism are necessary.

Figure 15. Informality and GDP per capita in LAC (1990-2007, percentage of urban workers)



Source: ECLAC

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7. Annex

Table A1. Fiscal expenditure in pensions in Chile
(GDP share)

Year	Old system deficit		Recognition	Minimum	PASIS	Total
	Civil	Military	Bonds	Pensions	(non contributory)	
1981	1,6	2,0	0,0	0,0	0,2	3,8
1984	4,7	2,2	0,2	0,0	0,5	7,6
1990	3,2	1,3	0,5	0,0	0,4	5,4
1995	2,7	1,2	0,7	0,0	0,3	4,9
2000	3,1	1,3	1,1	0,1	0,4	6,0
2005	2,2	1,3	1,2	0,1	0,4	5,2
2008	1,9	1,3	1,2	0,1	0,4	4,9

Note: The figure for the civilian deficit in the old system includes 0,3 p.p. in minimum pensions, Valdés (2006)

Source: National Budget Office

Table A2. Projection of replacement rates of Chilean pension system
(Percentage over last 10 salaries, by cohorts, densities, salaries and sex)

	2010		2025		2050	
	Men	Women	Men	Women	Men	Women
A	111,7	78,0	69,9	36,5	67,8	50,3
A1	106,5	72,2	89,6	46,9	128,5	79,8
A2	112,6	78,2	62,7	35,3	102,9	67,5
A3	112,6	74,7	68,9	36,4	67,6	44,7
A4	112,6	76,5	67,3	35,5	66,4	44,4
A5	112,6	82,9	66,8	35,8	63,1	44,4
B	52,7	36,7	39,5	16,4	39,3	23,6
C	46,3	30,0	25,7	9,0	29,2	17,8
D	4,8	3,4	15,5	5,2	12,1	7,0
E1					69,4	42,8
E2					59,6	38,9
E3					40,0	26,5
E4					39,0	26,2
E5					37,5	26,2
F					32,7	17,0
Average	54,9	38,6	45,8	17,9	44,3	26,7
Total average		44,9		29,0		33,8

Source: Favre et al. (2006)

Table A3. Projection of the pension level in Chile

(Monthly pension, 2004 Chilean pesos)

	2010		2025		2050	
	Men	Women	Men	Women	Men	Women
A1	1.107	750	930	487	1.336	829
A2	768	515	652	337	1.070	701
A3	365	250	323	176	588	401
A4	210	143	182	96	333	222
A5	121	79	104	50	182	114
B	198	140	214	91	408	245
C	173	115	140	50	303	185
D	18	13	84	29	126	73
E1					721	445
E2					619	404
E3					348	238
E4					196	131
E5					108	67
F					339	176
Average	206	146	244	83	320	204
Minimum pension		77		94		121

Source: Favre et al. (2006)

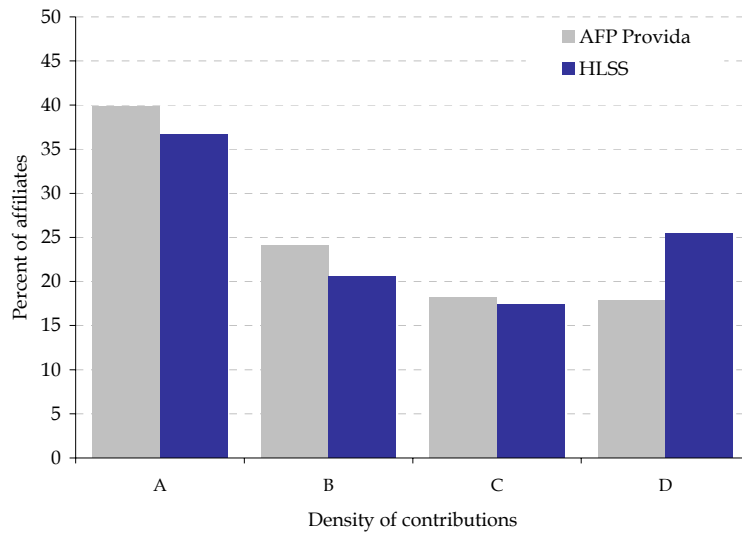
Table A4. Projection of fiscal expenditure in civil pensions in Chile

(No reform scenario, GDP share)

Year	Old system deficit	Recognition Bonds	Minimum Pensions	PASIS (non contributory)	Total
2010	1,7	1,4	0,1	0,3	3,4
2015	1,3	1,4	0,1	0,3	3,1
2020	1,2	0,7	0,0	0,3	2,3
2025	1,0	0,2	0,1	0,3	1,5
2030	0,8	---	0,1	0,3	1,1
2035	0,6	---	0,1	0,3	1,0
2040	0,5	---	0,1	0,3	0,9
2045	0,4	---	0,1	0,3	0,8
2050	0,3	---	0,1	0,3	0,7

Source: Favre et al. (2006)

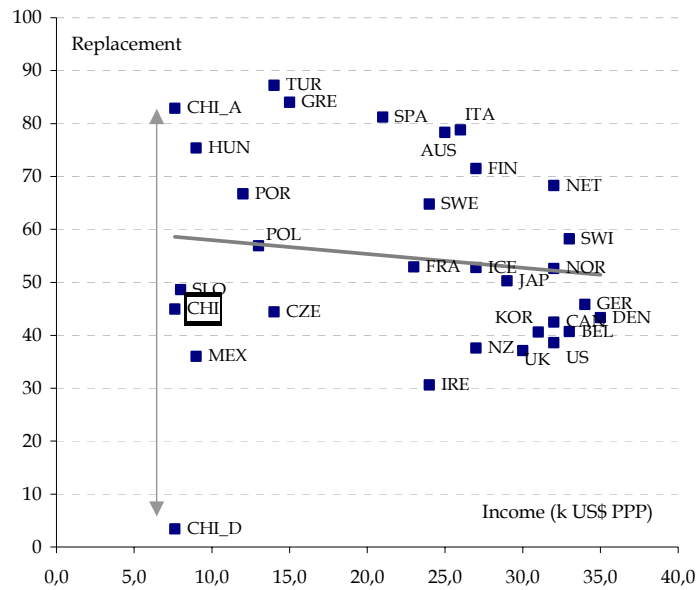
Figure A1. Categories of affiliates by density of contributions in Chile



Note: 'A' affiliate contribute over 80 percent of the time, 'B' between 60 and 80 percent, 'C' between 40 and 60 percent, and 'D' under 40 percent.

Source: 2002 Social Protection Survey and AFP Provida (data up to 2004)

Figure A2. Replacement rate and GDP pc in OECD and Chile
(Percent of pre-retirement gross earnings)



Source: OECD and Favre et al. (2006)

Table A5a. Projection of fiscal expenditure in civil pensions in Chile
(Reform Scenario A, GDP share)

Year	Old system deficit	Recognition Bonds	SPS		Old-age PBS	Old-age APS	Disability	Total
			Total					
2010	1,7	1,4	0,8		0,5	0,1	0,2	3,8
2011	1,6	1,4	0,8		0,5	0,1	0,2	3,8
2012	1,5	1,4	0,9		0,5	0,1	0,2	3,8
2013	1,5	1,4	1,0		0,6	0,2	0,2	3,9
2014	1,4	1,4	1,0		0,5	0,2	0,3	3,8
2015	1,3	1,4	1,0		0,5	0,2	0,3	3,7
2016	1,3	1,3	1,0		0,4	0,3	0,3	3,6
2017	1,3	1,1	0,9		0,4	0,3	0,3	3,4
2018	1,3	1,0	0,9		0,3	0,3	0,3	3,2
2019	1,2	0,9	0,9		0,3	0,3	0,3	3,0
2020	1,2	0,7	0,8		0,2	0,4	0,2	2,8
2021	1,2	0,6	0,8		0,2	0,4	0,2	2,6
2022	1,1	0,5	0,8		0,1	0,4	0,2	2,4

Source: Favre et al. (2006) and own elaboration

Table A5b. Projection of fiscal expenditure in civil pensions in Chile
(Reform Scenario B, GDP share)

Year	Old system deficit	Recognition Bonds	SPS		Old-age PBS	Old-age APS	Disability	Total
			Total					
2010	1,7	1,4	0,9		0,5	0,1	0,2	3,9
2011	1,6	1,4	0,9		0,6	0,2	0,2	3,9
2012	1,5	1,4	1,0		0,6	0,2	0,2	4,0
2013	1,5	1,4	1,0		0,5	0,2	0,3	3,9
2014	1,4	1,4	1,0		0,5	0,3	0,3	3,8
2015	1,3	1,4	1,0		0,4	0,3	0,3	3,8
2016	1,3	1,3	1,0		0,4	0,3	0,3	3,6
2017	1,3	1,1	1,0		0,3	0,4	0,3	3,4
2018	1,3	1,0	0,9		0,3	0,4	0,3	3,2
2019	1,2	0,9	0,9		0,2	0,4	0,3	3,0
2020	1,2	0,7	0,9		0,2	0,5	0,2	2,9
2021	1,2	0,6	0,9		0,1	0,5	0,2	2,7
2022	1,1	0,5	0,8		0,1	0,6	0,2	2,5

Source: Favre et al. (2006) and own elaboration

Table A6. Projection of beneficiaries of the new solidarity pillar
(Persons)

Year	Old-age		Disability	Total
	APS	PBS		
2009	160.676	510.474	211.769	882.919
2010	208.737	562.142	232.909	1.003.789
2011	263.102	617.292	256.380	1.136.773
2012	323.876	671.926	282.470	1.278.272
2013	391.562	639.614	311.509	1.342.685
2014	463.523	603.027	343.873	1.410.422
2015	540.616	561.307	379.990	1.481.913
2016	621.676	524.169	379.994	1.525.839
2017	706.550	483.218	379.997	1.569.765
2018	807.783	425.907	380.000	1.613.691
2019	917.376	360.237	380.004	1.657.617
2020	1.032.257	289.278	380.007	1.701.543
2021	1.155.115	225.093	380.011	1.760.219
2022	1.289.472	149.409	380.014	1.818.896

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