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Special Report

Pensions: Risking the twentieth century's biggest social gain

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Pensions: Risking the twentieth century's biggest social gain

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The global financial crisis and its aftermath in the past decade have resulted in inadequate retirement coverage for many. Privatised, savings-based, or 'funded' pension schemes, which had become popular in the previous three decades, were invested in other financial assets, propelled by capital gain objectives. In developed countries, the last decade has seen numerous failures in subnational pension funds.

Conversely, the dominant, century-old, public, mostly payroll tax-based, PAYG ('pay as you go') pension systems were less affected by the financial crisis, and in most cases continued delivering significant surpluses. These surpluses helped breach the growing fiscal deficits of certain governments, and have provided a stable source of long-term financing for infrastructure and real sector projects.

After the crisis, several countries that had partially introduced Chilean style savings-based pension schemes, have been terminating them, returning contributions and funds to the public PAYG systems. Even in the particular and extreme case of Chile, general dissatisfaction with inadequate pensions delivered by the exclusively savings-based AFP system has erupted in massive popular protests. A national debate has grown around the economic, fiscal, social, political, and moral issues involved in rebuilding the public PAYG system that had been scrapped by former Chilean president, Augusto Pinochet, almost four decades ago.

Inadequate pension systems represent an existential threat to economies and the social fabric of many societies. This report will evaluate the pension crisis from two viewpoints: (1)

the economic sustainability of pension systems, and (2) pension systems as a representation of a society's values. There are many origins of these crises: the design of pension systems; long-term trends; the changing nature of financial markets; and sociocultural factors. The role of these issues in regards to pension systems will be evaluated in this paper, and the potential impact of an unresolved pension crisis will be discussed and recommendations for a way forward will be presented.

1. Introduction

Pension systems based on long-term savings schemes invested in financial markets had spread in popularity from the 1980s, in both developed and developing countries. Now they are under threat of imminent collapse in the wake of the global financial crisis.

This gathering crisis is compromising part of the biggest social gain of the 20th Century which, when it was introduced, had upended the increasing trend of poverty endemic to capitalist economies. Pensions have significantly reduced poverty, particularly in countries counted today as developed countries. The growing existential threat to pension systems is a threat to the social viability of many advanced societies.

Conversely, the dominant, century-old, public, defined benefit, mostly payroll tax-based, PAYG ('pay as you go') pension systems were less affected by the crisis, and in most cases continued delivering significant surpluses that helped breach the growing fiscal deficits of their respective governments. They provided a stable source of long-term financing for infrastructure and real sector projects. However, they must be continually updated to adjust to the long-term demographic transition that is one of the main results of urbanisation.

The dawn of the 20th Century saw the rapid introduction of pension systems in industrialised economies. Before this, pension support – in terms of providing income for retirement – had been offered by states for the purpose of recruiting soldiers, guaranteeing income to those disabled from their military service. In 1889, under Otto von Bismarck, Germany created an Old Age and Disability Programme for those 70 years and older, which was financed by

taxes on younger workers. At that time there were 22 workers for every pensioner; in 2018, the average number is expected to be 3.5 workers per pensioner, and the German plan has been continually updated to match these demographic trends. The United Kingdom set up an Old Age Pensions system in 1908, adding unemployment and health insurance in 1911. In 1946, the UK established universal social security.

The United States began offering pensions to civilian (not just military) employees in 1920 with the Civil Service Retirement System. In 1935, as part of Franklin D. Roosevelt's New Deal programme, the US created the Social Security System for all civilian workers, financed by taxes from employees and employers.

Based only on contributions, the US system and the PAYG schemes, in general, utilise a payroll tax-based funding approach which can be regressive if its procedures are diverted to uses other than paying pensions. This diversion could potentially benefit high-income segments of society; in 2017, the maximum amount of taxable earnings for US social security contributions was only $127,200.

The effect of payroll-based pension schemes was, essentially, to introduce a very broad tool to reduce poverty in industrialised societies. Take the US as an example: In 2015, income derived from social security was estimated to have reduced the poverty rate for Americans aged 65 or older from about 40% to below 10% (Romig and Sherman, 2016).

In the US system, retirement benefits are heavily biased in favour of lower paid workers, reducing the probability of workers joining the ranks of the poor upon retirement. However, the savings-based part of financing benefits, which had become important prior to the financial crisis, suffered severe losses and collapsing yields in the wake of the crisis. The financing of pension benefits based on ongoing contributions in PAYG schemes was also affected by the crisis, albeit less so, because employment and wage growth fell significantly, and in several countries, they have still not returned to pre-crisis levels.

In the US, spectacular recent bankruptcies of cities such as Detroit have resulted in widespread losses of pension benefits for public employees, and have exposed their underlying failings. Public pension systems have increased employee contributions and raised the benefit age or service requirements, in order to generate more cash. Mooney (2017) quotes Joshua Rauh, a senior fellow at the Hoover Institution and a professor of finance at the Stanford Graduate School of Business, that the "'true extent' of the crisis in the US public pension system had been obscured because plans calculate both their costs and liabilities on the assumption that they will achieve returns of between 7% and 8% a year".

According to Rauh's research, US public pension funds had developed a $3.4 trillion 'funding hole'. However, it must be noted that such calculations, based on returns of financial assets, are only applicable to the savings-based part of pension funding, and not to the main part, which does not depend on savings but upon ongoing employment and wages in a PAYG scheme. Moreover, all alarmist predictions of long-term unaffordability of welfare provision should be considered with scepticism, as argued by John Kay (2012), Financial Times columnist and a visiting professor at the London School of Economics: "It is possible to calculate enormous measures of unfunded obligations, and it doesn't matter. The value of these obligations is offset by the implied commitments of future generations".

In the US, the part of state and city retirement systems based on saved assets are facing an enormous funding shortfall in the wake of the 2007-08 financial crisis, triggered in North Atlantic economies by the collapse of subprime mortgages. In 2015, the average funding ratio (the proportion of assets to liabilities) of US public pensions was 74%. This improved in 2016 to 76% but is quite a distance from the 95% funding level in 2007. Public pensions based on savings imploded after the financial crisis, forcing cities and states to attempt to reduce spending or raise taxes during the 'great recession', thereby worsening the downturn. Large pension shortfalls, due to losses of saved funds and diminished rates of return, played a huge role in driving several US cities, including Detroit and San Bernardino, California, to file for bankruptcy.

In the US private sector, there have been a series of changes to the management of pensions which permit private employers to reduce pension benefits and there have been indications that existing funds do not have adequate resources to maintain the level of benefits. During the Reagan administration, a series of regulatory interpretations permitted large corporations and insurance companies to exploit loopholes, ambiguous regulations, and new accounting rules to utilise pension plans as sources of easy financing and tax shelters. According to an award-winning investigative *Wall Street Journal* reporter, this explains the widespread losses of pension and health benefits earned by those who contributed to the plans (Schultz, 2011).

Globally, both public social security systems and private sector pensions are under severe pressure (Australian Centre for Financial Studies, 2016). The overall ageing of populations in developed countries had been foreseen at least a decade ago. On top of this, there are new sources of fragility, which will require widespread changes to the economy which could be difficult for societies to adapt to.

The first source of additional fragility is globally high numbers of unemployed youth. There are almost 200 million people unemployed around the world, 37% of which are between the ages of 15 and 24. This is a direct consequence of the global economic crisis. If the young cannot find jobs after their schooling, how can they be ready to work productively when economic growth rates recover?

Secondly, a low-growth, low-interest economic environment is draining away the long-term benefit of compound interest. Maintaining contributions or attempting to increase them has become problematic.

Thirdly, public debt has exploded – practically everywhere – and this has jeopardised the ability to pay benefits in pay-as-you-go systems because these systems are usually the main creditors of governments. The large current surpluses of the public agencies which run different PAYG social security schemes are mostly invested in government bonds. In the US, according to the US Bureau of Public Debt, at the end of 2016 such agencies held

around 30% of federal debt. The largest creditor by far is the Social Security Trust Fund and Federal Disability Insurance Trust Fund, which held more than $2.8 trillion, more than twice the amount of US treasuries held by China (Amadeo, 2017).

2. Theory of pension provision

Pension systems continue to evolve. This evolution from their original design is quite specific to the societies in which they are located. The European Union proposed a two-category classification in 2014: Bismarckian and Beveridgean. This classification points to the underlying nature of the commitments – although in many societies income supports are augmented by schemes which obtain some funds from the other system.

In the Bismarckian system, people acquire the right to social security benefits through a record of work. Pension benefits are earnings-based and profession-specific, and generally subject to maximum limits. Germany, Belgium, Sweden, France, the US, and the southern European countries follow this system. Many countries supplement the system with a minimum income guarantee for those with limited labour participation during their working years.

The Beveridgean system – associated with the William Beveridge proposals (1942) which set out the main outlines of the UK's welfare state –promises each citizen a basic income, regardless of profession and earnings during employment. Denmark, Ireland, the Netherlands, and the United Kingdom follow this system. Workers can supplement the basic guarantee with employer-supported plans.

Three pension pillars

The melding of these basic approaches over time through supplements makes it useful to think of the pension systems as having three pillars (World Bank, 1994):

1) a non-contributive public pillar;

2) an occupational pillar;

3) a voluntary individual pillar.

The non-contributive public pillar refers to the commitment of society independent of income or contributions, and is linked to the standard ‘pay as you go’ (PAYG) support for pensions, in this case from general tax revenues. It is directed at preventing old age poverty. The World Bank (1994) has proposed that this pillar be mandatory and operated by the public sector.

In 1994, the World Bank also proposed that the second pillar – the occupational pillar, which related to the pension commitment being pegged to earnings (and contributions) of the worker – be mandatory but managed by the private sector, and shifted from PAYG to savings-based schemes. This followed the Chilean example.

This proposal was generally not accepted, and most of the existing public pension systems belonging to this pillar, including the largest Bismarckian systems mentioned above, are still operated by the public sector, using the PAYG scheme with defined benefits. In hindsight of the effects the financial crisis had on the savings-based schemes, this seems to have been a good determination. In the wake of the crisis, several countries which had followed the World Bank’s advice have been terminating their privatised, mandatory savings-based schemes, and returning to public PAYG pension systems (Oręziak, 2010; Kryzak, 2018; Turnovo, 2017; Alexe, 2018); even Chile is considering this.

There are many variations related to the second pillar. From one point of view, they can be based mainly in PAYG schemes or, alternatively, mainly in savings-based or ‘funded’ schemes. In the first case, most worker contributions are destined to fund pensions; in the second case, most of the current collection of contributions are diverted to savings in the

financial markets. However, even the most traditional PAYG schemes generate substantial current surpluses that are also saved, usually in the form of government bonds.

Conversely, the Chilean AFP system is one of the most extreme forms of savings-based contributive schemes. Formally, it has no PAYG component, meaning that contributions are saved entirely in individual accounts. In practice, very low monthly savings-based pensions are financed by the AFP, with a minor part, about one-fourth of the current collection of contributions. The net cash flow, after paying pensions and administrators' commissions, is absorbed by an ever-growing pension fund that is permanently invested in financial markets (CENDA, 2017b).

From another point of view, pension systems can be classified in defined-contribution and defined-benefit schemes. Defined-contribution schemes are most often associated with the participation of employers, who set aside amounts each year to fund benefits for employees. There are normally restrictions on when and how employees can withdraw their share without penalties. Defined-benefit plans represent a commitment to provide a pension based on a formula applied to an employee's earnings, length of service, and age; the commitment is usually independent of the returns on the pension fund.

Most defined-benefit plans are pegged as a percentage of the employee's final salary, based on years of service. This type of plan was the most popular employer-provided pension in the US until the end of the 1980s. They have since become very rare and most plans are now of the defined-contribution type when they are provided by employers. However, as noted, all PAYG public systems belonging to the second pillar have defined benefits based on a worker's earnings and contributions or years of service.

In the case of plans provided by employers, both types of plans must seek to cap or make clear the amount of risk being borne by individual participants. Earnings-based PAYG schemes need to maintain sustainability and provide for long-term transition periods from the impact of longevity and productivity. Successful risk management is critical for both

defined-benefit and defined-contribution plans. The management of second pillar funds must also contend with the impact of labour market participation and contributions behaviour. The decline in labour market participation during the crisis reduced the number of contributors to pension plans, which reduced the volume of contributions. Changes in contributions behaviour have a smaller impact on the volume of the collection of pension contributions when these are mandatory; when the method of contribution is not very strict, changes in savings behaviour can reduce the inflows into pension assets. The volume of assets can be adversely affected by the early withdrawal of individual accumulations in pension funds.

The third, voluntary pillar, relates to benefits made possible by the voluntary individual savings-investment made by an individual worker. Since the Reagan administration, reforms in the US have emphasised individual voluntary pension support, even as most experts did not expect the third pillar to be a genuine income replacement except in the most exceptional (and likely speculation-based) financial environments. In the case of Chile, a neoliberal environment during the dictatorship of Augusto Pinochet (1973- 1990) brought a pension system based almost exclusively on the second and third pillars, with an ineffectual first pillar that was overhauled by President Bachelet in 2008. As explained in the first section, the great recession has had a devastating impact on funding levels both in the savings-based component of pillar two and pillar three pensions.

Risk analysis

The operation of pension systems, in general, is subject to four kinds of risk: regulatory; financial; longevity; and behavioural risks. All of these risks, and especially financial and behavioural risks, are increased when pension systems depend mainly upon funded, savings-based, schemes. Risks are reduced when they depend mostly upon PAYG schemes. Longevity risks apply to any kind of pension scheme, because they affect the general proportion between active workers and pensioners and evidently, whatever the pension scheme, only active workers can deliver the goods and services upon which retirees

depend for a decent livelihood. As a result, longevity demands that a larger proportion of the goods and services produced by active workers must be allocated to the elderly, and the pension scheme must adapt to provide this allocation.

Regulatory risks concern the management and governance of pension funds. The transparency and accountability impact of management fees is a key aspect, as is the ability to change pension providers or fund managers. There is a huge range of management fees observed for both second and third pillar pension plans that have not been strongly associated with fund performance. As experienced in Chile, fees have an outsize impact on pension outcomes.

Financial risk stems from the basic reality that the return on financial assets can be volatile, uncertain, and dependent on overall economic performance. Uncertain returns could decouple the rate of savings from the pension outcome. The great recession's impact on pension funds is *prima facie* evidence of the extent of financial risk.

Longevity 'risk' (it seems rather counterintuitive to consider living longer as a 'risk') relates to the scale of uncertainty regarding personal lifetimes. This is a more slowly growing type of 'risk' since demographic trends do not reverse direction in short periods of time. However, as is now the case for most pension funds, inattention to long-term trends is quite common. This is because of (reasonable) political indecision as to whether to enforce the unacceptable levels of contributions that would be necessary to secure adequate pensions from savings-based schemes.

The fact that post-crisis financial returns were expected to be low was aggravated by the perception of unfairness – that the net cash flow surpluses such levels of contributions would divest to financial markets would benefit the highest income segments of society with the savings from workers. Alternatively, governments may be moving towards a post-crisis consensus of replacing the savings-based component of pension systems in favour of PAYG schemes. This will ensure the sustainability of better pensions with lower contributions.

Behavioural risk is mostly confined to the third pillar and relates to failings in individual portfolio management. Overly frequent trading in financial assets (incurring undue trading costs), overly concentrated and insufficiently diversified portfolios, and inflexibility in the risk profile of investment close to retirement age are common sources of behavioural risk. These failings are real enough but often used to redirect blame to consumers for failures in the mandatory system, as most recently seen in the Chilean example. The inability of the Chilean system to generate sufficient income for retirees is blamed on the pensioners themselves.

Pay-as-you-go theory revisited

Following her successful reform to the first pension pillar in 2008, during her second term, Chilean President Michelle Bachelet created a subsequent Presidential Commission for Pension Reform in Chile, with the purpose of addressing “the fundamental problems of the AFP system” (CAPSP, 2015). The Commission delivered three reform proposals, two of which relied totally or partially on enhancing the non-contributive primary pension pillar, suggesting that the reforms could add to the fiscal deficit by 0.5% of GDP (Mander, 2016). The Chilean government and polity are not known for fiscal profligacy and the added deficit created quite a burden, considering the commodity slump confronting the economy. In connection with the recent presidential electoral contest, there is a debate on whether a conservative programme could worsen the deficit beyond any additional burden from a pension reform effort.

One the Commission’s proposals, however, ‘Proposal C’, presented by Warsaw University Professor Leokadia Oręziak, suggested the convenience of terminating the individual private funds system and re-establishing a public pay-as-you-go scheme, following the example of Poland and other countries. The potential benefits implied are too large to be ignored:

1) immediate doubling of current pension amounts;

2) reducing the effective retirement age from around 70 years old for both men and women to 65 and 60, respectively, which could remain unchanged until the second half of the 21st Century;

3) the complete elimination of state subsidies for AFP pensions;

4) reducing the proportion of elderly people with non-contributory pensions from the current 62% to 30% by the 2020s. 'Proposal B' suggested re-establishing a PAYG scheme on a more gradual basis (CAPSP, 2015; SUBPERV-CENDA, 2015; CENDA, 2015).

'Proposal C' was the only proposal in the Commission's report that included a complete projection model, which estimated net cash flows and three levels of a reserve fund until the late 21st Century in a PAYG scheme. More generally, this proposal revisited the theory of the PAYG system and reported some findings that may be of general interest. These are presented below.

The 'golden rule'

The basic theory behind PAYG models was formulated by Paul Samuelson (1958), and has recently been summarised brilliantly by John Kay (2012) in terms of the following principles:

1) "Social security is a means of inter-generational transfer. The only bread fit to eat is bread baked today";

2) "Why should we look after old people, who can no longer do anything for us? The obvious answer invokes Kant's categorical imperative: It would be good for everyone (including ourselves when we are old) if everyone acted in this way";

3) Samuelson showed that "individual answers were inferior to the outcome of the social security contract for every generation except the one alive on judgment day";

4) “That social contract can be implemented if future generations agree to recognise the financial claims created by their predecessors, in the expectation that their successors will do the same. The other means of implementing this golden rule is a social security system through which successive generations of taxpayers agree to support their elderly”;

5) “Both these types of social arrangement can fail, and often have done. Inflation can prevent money acting as a store of value. Or the social contract can be reneged on through an announcement that previously understood commitments are now unaffordable”.

The sustainability of the non-contributive first pension pillar is ensured by general taxation in a PAYG scheme. In strict accordance with the principles summarised above by Kay, there are no question marks over the first pillar because there is a general agreement for ensuring some kind of minimum, public ‘safety net’ for old citizens. Even the Chilean AFP system originally included such a safety net, albeit with a faulty design that had to be replaced by the ‘Solidarity Pillar’ introduced by President Bachelet in the 2008 Chilean pension reform. The real controversy concerns the sustainability of PAYG schemes in terms of the occupational, payroll tax-based second pension pillar, which is by far the largest because it involves pensions for middle and higher income wage earners. The payroll tax is usually one of the three highest items of tax collection.

The rule of the long-term sustainability of payroll tax-based PAYG pension schemes

To ensure PAYG sustainability, payroll tax collection must at least be equal to expenditure in second pillar, wage-related, pensions. Both are easy to calculate. The former is the product of the number of contributors, their average salary, and the contribution rate, while the latter is the product of the number of pensioners and their average pension. A contribution rate that initially delivers a reasonable proportion between average pensions and wages will be able to sustain that proportion in time if the number of contributors grows a least as fast as the number of pensioners in the second, occupational pillar.

For a given retirement age and proportion of pensioners in the non-contributive first pillar, the number of pensioners in the second pillar is a fixed proportion of the number of elderly people, the growth rate of which depends on demographic transition and can be estimated quite precisely[1] from census data.

The number of contributors to social security systems, which is roughly equal to the number of workers in non-farm payroll, is one of the most important statistics in any country and economy, because it is the result of a monthly virtual census of the affiliates to social security systems which cover most of the concrete labour force,[2] identified by name and national ID number; in several countries such as the US, the latter is simply the social security number.

In addition, and even more importantly from an economic point of view, the number of workers on payroll move in impressive synchrony, almost in parallel but slightly below GDP, meaning that the growth rate in payroll numbers is similar but slightly slower than that of GDP.[3] This should not come as a surprise, because it only means that payroll is a good

[1] In Chile, for example, a country in advanced demographic transition, between the census of 2002 and 2017 total population growth was already stalling at a yearly rate of 1.1%; the number of those aged less than 15 was decreasing at a rate of -0.65%; the working-age segment of 15-64 was growing at a rate of 1.25%; and number of elderly people over 65 were growing at a rate of 3.35% (INE, 2017). 'Baby boomers' born in the mid-20th Century during Chile's period of full demographic transition and urbanisation have been reaching retirement age and life expectancy has improved in general. The latter rate is estimated to slow down in the coming decades, to approach a yearly average of 2.37% from 2016 to 2050 (CAPSP, 2015; SUBPREV-CENDA, 2015; CENDA, 2015, 2017d). Chilean GDP grew by an average 3.6% per year from 2002 to 2017, satisfying the sustainability rule of PAYG schemes — these schemes are capable of sustaining pensions that increase at the same rate as that of wages, without changes in their basic parameters (contribution rates, retirement age, and the proportion of elderly in the non-contributive first pillar), if GDP grows slightly faster than the numbers of elderly people — even considering the peak growth rate of elderly during this period (CENDA, 2017b).

[2] In the case of Chile, 97.3% of the contributors to the AFP system in November 2017 were on payroll, the rest were independent and voluntary contributors. The total monthly contributors, which in the 12 months to November 2017 averaged 5.7 million, are registered in the individual accounts of 10.4 million affiliates to the AFP system, which cover 73% of the population older than 16 years of age, and more than 98% of the population in the 30-55 year age segment (CAPSP, 2015; SUBPREV-CENDA, 2015; CENDA, 2015, 2017d).

[3] Payroll has a very high statistical correlation with GDP, and explains almost all its variations when measured in statistical regressions as an independent variable against GDP. In the case of Chile, there is a 0.9997 statistical correlation between the total number of monthly contributors and the monthly GDP estimate, IMACEC, published by the central bank, both measured as 12-month moving

estimate of the number of work hours dedicated to the production of goods and services that are sold in the market, and which consequently add value to GDP (CAPSP, 2015; SUBPREV-CENDA, 2015; CENDA, 2015; CENDA, 2017b).

Payroll growth follows the cyclical path of the economy in impressive synchrony at slightly slower rates than GDP, but much faster than total population, and also faster than the segment above 16 years of age. As economies develop and modernise an increasing proportion of the population is able to find formal jobs, following recurrent economic ups and downs so closely that the proportion of payroll with respect to population 16 and older is considered one of the best indicators of economic cycles (Authers, 2007, CENDA, 2017b).[4]

The faster long-term growth rate of persons on payroll, compared to the population in general and the working age population, is, of course, important for the sustainability of occupational second pillar, PAYG pension schemes, because contributions depend directly upon payroll (CAPSP, 2015, CENDA, 2015, 2017b). As a consequence, the long-term sustainability rule for such schemes turns out to be quite simple and elegant, and could be enunciated as follows:

“If GDP grows at a slightly faster rate than the number of elderly people, PAYG schemes can sustainably deliver pensions that grow at the same rate as wages, without changes in basic parameters: contribution rates; retirement age; and the proportion of elderly in the non-

averages. The statistical regression between these variables shows that contributions as an independent variable explain the variations in IMACEC as a dependent variable almost entirely, with a determination coefficient (R^2) of 0.995 with 104 monthly observations since December 2008. Considering yearly averages for nonfarm payroll and GDP from 1948 to 2016 in the case of the US, the correlation between these variables is 0.98 and the determination coefficient (R^2) is 0.96 in the case of the statistical regression with payroll as an independent variable.

[4] In the case of the US, payroll followed an upward cyclical path from 42.2% of the population aged 16 or over in 1948, to a peak of 62.2% in 1999, and then oscillated down to 54.8% by the end of the turbulent noughties. Since 2010 it has recovered again to more than 57% in 2017. In the case of Chile, this proportion grew fast during the nineties, from 26.2% in 1992 to a peak of 31.5% in mid-1998, a level that would not be achieved again until mid-2005. After that, payroll grew again quickly until 2011 —when copper prices peaked — and then slowed down gradually and finally stalled, growing very slowly since 2014, and contracting slightly during the last year after peaking again at 40.33% in January 2017 (CENDA, 2017b).

contributory first pension pillar. If GDP grows slower than the number of elderly people during long periods, a combination of changes in basic parameters can re-establish equilibrium. Short-term imbalances, such as may occur during recessions, may be covered by a reasonable reserve fund accumulated during good economic years" (CENDA, 2017d).

3. Analysis of the crisis

The roots of the global pensions crisis, which mainly affects the savings-based component of pension systems which grew disproportionately during the decades preceding the recent financial crisis, a tendency which in itself is much to blame for the pensions crisis, can be categorised with four, interacting, factors:

1) long-term trends such as ageing, the surge in productivity, and long-term patterns of financial crisis and declines in interest rates;

2) faults in design and actuarial integrity;

3) pitfalls in the nature of private financial markets;

4) politico-economic constraints and obstacles. We shall discuss these in turn in this chapter.

Long-term trends

Pension schemes, in general, must adapt to long-term trends, first and foremost to the demographic transition that affects modernising societies as they transition from traditional peasant to advanced urban economies.

Economic development is a second long-term trend that must be considered regarding the sustainability of pension schemes, which interacts with the underlying urbanisation and

demographic transition, increasing productivity dramatically, both in terms of value and in terms of the quantity of goods and services produced, improving the livelihood of populations, and human development in general, for all age segments of the population.

The interaction between demographic transition and economic development is complex. In early stages, the former increases the burden of exploding young populations while the physical and economic productivity of the latter is still low.

In a second moment, societies receive a huge ‘demographic bonus’ as the relative size of the working-age population increases dramatically, and economies also achieve peak growth rates, in part for the same reason, and mainly from a huge increase in the proportion of work dedicated to producing goods and services that are sold in the market and which consequently add value to GDP, especially in the case of peasants who migrate to cities, and women who enter the salaried workforce.

In a third moment, younger segments decrease in proportion, while the elderly segment increases, but higher physical and economic productivity more than compensates for the stalling or declining proportion of working age segments, and advanced societies achieve dramatically improved livelihoods and human development with reduced working hours, even if they have to allocate a growing proportion of their output to their older kin.

Notwithstanding the above, the urbanisation-modernisation process also generates myriad, recurrent, conflicts and crisis of all kinds, which affect each individual society and humanity as a whole, as the 20th Century ‘Age of Extremes’ illustrates dramatically (Hobsbawm, 1997). The different timings, speeds, and moments in which the process described above has been coursing for the past three centuries, across different countries and regions, is in itself a source of constant conflicts.

In the case of demographic transition, however, the fact that roughly half of humanity is still traversing the stages of early or full demographic transition, compensates in part for the

effects of the same process in mature, advanced, urban societies (Riesco (ed), 2007, 2012, 2014; CAPSP, 2015; SUBPERV-CENDA, 2015; CENDA, 2015, 2017d).

Finally, the mix of savings-based and PAYG pension schemes is affected by the return and volatility of financial markets, which also follow long-term trends (NBER, 2017). Sometimes they provide high but volatile returns, in other periods respectable and stable returns on investment during decades, for example after World War Two, when macroeconomic policy adhered to Keynesian principles. In other periods, such as now, financial markets collapse or traverse decades of low yields.

After the crisis, the latter long-term trend has moved, decisively and everywhere, against the savings-based component of pension schemes, meanwhile the former has also affected PAYG pension schemes, mostly in developed countries where the elderly have already become a significant proportion of the population.

The challenge of ‘ageing’ populations

The term ‘ageing’, applied to societies, has been used as a threatening word to describe increases in life expectancy, the greatest achievement of modern societies, in order to convince citizens to accept a continued reduction of benefits, and successive increases in contributions and subsidies related to the pension system. Usually, the argument is greatly exaggerated through biased projections which “provide an estimate of the discounted value of the cost of some hated item of expenditure if its current provision were continued into the indefinite future” (Kay, 2012).

The increase in average lifespan and the relative size of the elderly population is part of a wider phenomenon called demographic transition, which all societies experience during urbanisation and modernisation. It is a complex phenomenon that determines birth and mortality rates, population growth rates, the proportions of younger, working-age, and elder, segments of the population and, consequently, total dependency rations and elderly dependency ratios.

These parameters suffer dramatic changes throughout the process, as a result of which populations initially explode and then stall and decline, in different moments for each age segment, and the proportion of passive relative to active population — defined as the total dependency ratio — initially increases, then decreases dramatically, and finally increases moderately, and faster in the case of the elderly dependency ratio (Riesco (ed), 2007, 2012, 2014; CAPSP, 2015; SUBPERV-CENDA, 2015; CENDA, 2015, 2017d).

Throughout history, everyone who has been able to work has needed to sustain other people who could not, mostly very young children, and very few elderly people. The burden of a dependency ratio of roughly 100% was the secular moral obligation in all civilised pre-modern societies. That was the case in Chile, for example, until the beginning of the 20th Century, and still is in large regions of the world at the dawn of the 21st Century. This rule has changed dramatically in the past three centuries as nations have traversed the difficult adjustment to the modern era, one after another, with increasing speed and magnitude (Riesco, 2014).

During the early decades of urbanisation and demographic transition, the population explodes, as women continue to bear as many children as traditionally demanded by peasant culture, while improved sanitary conditions drastically reduce infant mortality. In the case of Chile, for example, the total dependency ratio initially increased and, measured as a proportion of persons aged 0-14 and aged 65 and over per 100 persons aged 15-64, peaked at 120% or even higher around 1970 (Riesco, 2014).

However, some decades later, population growth and total dependency ratio decrease rapidly, as the massive young urban population joins the workforce, while women drastically reduce the number of their children. As a consequence, societies benefit from a ‘demographic bonus’, and the total dependency ratio falls to a minimum of 50% or even lower at the end of the full transition phase (Riesco (ed), 2007, 2012, 2014; CAPSP, 2015; SUBPERV-CENDA, 2015; CENDA, 2015, 2017d), which is the present situation in Chile, for

example, where the total dependency ratio reached a historical minimum of 46% in the 2017 census (INE, 2018).

Finally, during advanced phases of transition, population growth stalls and even decreases, and dependency ratios slowly increase again. However, even in mature urban societies the burden on active workers never again reaches the secular, pre-modern, 100% level, much less the maximum burden experienced during early transition (Table 1, Riesco (ed), 2007; Riesco, 2014; CENDA, 2015).

Considering the world population as a whole, half of which still lives and works as traditional peasantry but is urbanising at a historically unprecedented speed, one could say the world population is still in the phase of full demographic transition, and the global dependency ratio is still falling, as is presently the case even in middle-income countries like Chile, as noted earlier, and humanity will continue benefiting from a demographic bonus for a good part of the 21st Century. The global active workforce, considered as the population between 15 and 64 years of age, is still growing faster than the combined children, adolescent, and elderly population, so the burden of the latter over the former will continue to decrease, for most of the century (Table 1, Riesco (ed), 2007; Riesco, 2014; CENDA, 2015).

A tiny portion of the growing working-age population, in countries enduring early and full demographic transition, should be more than enough to stabilise the dependency ratio in countries already enjoying advanced demographic transition, and in the mature urbanised modern world, this will require a new approach to migration.

In a January 2017 report to the Commission on Population and Development, the United Nations Secretary-General highlights the end of the global rise in the proportion of working-age populations (considered as those aged 25 to 64 years of age), at the same time that “total labour force participation rates have been falling at the world scale and in some of the major economies of the world, including China, India, Japan and the United States” (United Nations, 2017, para 37).

The age segment considered to define the working-age population in this report is more restrictive than the usual 15-64 or 20-64 years of age segments, which continue to rise globally and even in middle-income countries as shown in the case of Chile. On the other hand, the fall in total labour force participation is probably a cyclical phenomenon to be expected in the wake of the financial crisis rather than a long-term tendency, which clearly points in the opposite direction.

However, even considering these restrictive definitions, the report acknowledges that, globally, the share of the so defined working-age population is projected to remain relatively stable through 2050, remaining stable or declining in most regions but increasing in Africa, which has a much younger population.

In Europe and North America, the working-age population is ageing, with an increasing number of workers past the age of 50 or 60. This prospect raises questions about the social challenge of supporting an older population. Population ageing raises serious concerns for policymakers and the public. It augurs difficulties in maintaining public pension and healthcare systems. In advanced urban societies, as elsewhere, the savings-based component of pension schemes has collapsed as a consequence of the crisis, but even PAYG pension schemes in the occupational pillar need gradual changes in the basic parameters: contribution rates, retirement age, and the proportion of elderly in first pillar, non-contributive, systems (CENDA, 2017d).

In the case of Asia, Latin America, and the Caribbean, the situation is different. After decades of large increases in the relative share of the working-age population, there will be a declining trend in this share (defining working age as 25-64 years of age) after 2020 (United Nations, 2017, para 40). However, even if the elderly portion of the population is growing at a faster rate than the working age population, the elderly still represent relatively small numbers, so the actual number of the former increases much slower than the latter.

In a middle-income country such as Chile, for example, the 2017 census measured the population older than 65 years of age as still only 11% of the population, and although it is

increasing at a very fast rate of 3.35% per year, the number has risen by only 778,831 since the 2002 census, and those aged 0-14 have actually decreased in number by -0.65% per year and -404,123 people in the same period. Meanwhile, the population aged 15-64 has increased by 1.25% per year but their actual number has swelled by 2,043,518 in the same period. As a result, the proportion of the population in the working age segment (15 to 64) has continued to increase from 66.2% in 2002 to 68.6% in 2017 (INE, 2018).

The key indicator in the economic analysis for ageing populations is the dependency ratio. The standard total dependency ratio is represented in Table 1 as the ratio of the number of people aged 0-19 and aged older than 65 per 100 persons aged 20 to 64, which results in higher proportions than those mentioned above in the Chilean case. However, between 2015 and 2030, global projections suggest that the global dependency ratio defined in this way will increase slightly from 73.5 to 75.7. However, the differences between developed and developing countries are quite stark. Developed countries will experience a significant increase from 65.1 to 80.1 while developing countries as a group will see a stable ratio of circa 75, and less developed countries excluding China will experience a significant demographic bonus, with dependency ratios falling from 85.6 to 78.9 (see Table 1).

Table 1: Total dependency ratios by country grouping (proportion of persons aged 0-19 and aged 65 and over per 100 persons aged 20-64)

Country or area	Total dependency ratio (persons aged 0-19 and aged 65 or over per 100 persons aged 20-64)		Potential support ratio (persons aged 20-64 per person aged 65 or over)		Pension coverage (per cent of persons of statutory pensionable age)	Labour force participation of persons aged 65 years or over (percentage)		Statutory retirement age (years)	
						2015		latest available	
	2015	2030	2015	2030	2010	Males	Females	Males	Females
World	73.5	75.7	7.0	4.9	..	30.2	14.4	..	..
More developed regions	65.1	80.1	3.4	2.4	..	16.8	9.4	..	..
Less developed regions	75.4	75.0	9.0	5.9	..	37.3	17.5	..	..
Least developed countries	118.5	100.4	12.8	11.5	..	59.1	34.5	..	..
Other less developed countries	69.2	70.1	8.6	5.4	..	..	..	..	..
Less developed regions, excluding China	85.6	78.9	10.0	7.2	..	..	..	..	..
High-income countries	64.8	78.0	3.7	2.6	..	18.2	9.5	..	..
Middle-income countries	70.8	71.0	8.7	5.6	..	35.3	15.9	..	..
Upper-middle-income countries	56.8	64.6	7.4	4.2	..	67.2	45.2	..	..
Lower-middle-income countries	84.2	75.9	10.4	7.6	..	..	..	..	..
Low-income countries	131.1	110.5	12.7	12.5	..	..	..	..	..
Sub-Saharan Africa	131.3	113.9	14.0	13.6	..	..	..	..	..

Source: United Nations (2015a).

The rise in the elderly dependency ratio became steeper after the mid-2000s, a trend that will only moderate after 2050. Globally, pension systems will be under pressure to support larger proportions of the local population, but due to the parallel and larger decrease in younger population segments, the share of the working age population will continue to increase or remain relatively stable at the same time, as shown in the UN report referred to above.

Even in more developed regions, measured as a proportion of population aged 20-64 years of age, total dependency ratios are and will remain lower by the end of the present century than the secular 100 per cent ratio that humanity has experienced for millennia, before urbanisation, and much lower when compared with the peak dependency ratios achieved in the early stages of demographic transition, which in the case of Chile, for example, peaked at over 120 per cent in 1970 even when measured as a proportion of the larger 15-64 years of age segment of the population (Riesco, 2014, 2015).

The elderly dependency ratio, meaning the proportion of people aged 65 or older set against the working age population, has been growing steadily and according to some projections will peak at roughly 1:2 in more developed countries during the second half of the century. However, as the elderly represent a minor part of the global population, their increasing number is compensated for by a larger reduction in younger people, and working-age population segments will continue to increase faster, resulting in a larger or fairly stable relative share total population for the working age population.

Working longer in other jobs after retiring from the original workplace is a common individual response to inadequate pensions. “Among those over 65 engaged in work, 48 per cent in the US and 57 per cent in the EU-15 were independent workers” (Sickinger, 2017, p.1). There are some positive aspects for seniors or retirees to restarting or continuing to work, such as the possibility of staying active, both physically and mentally, and regaining access to the social side of work. “However not all seniors prolong their working years by choice. For many, it is out of economic necessity because they simply cannot afford to retire and must rely on the extra income from independent work to survive” (Ibid).

Economic development and the increasing proportion of the population accounted for by payroll

In parallel to normal global demographic transition, increasing productivity due to modernisation constantly reduces the amount of work needed to provide improved livelihoods for the entire population, including the elderly. As a result, in more developed economies, where the demographic bonus was exhausted many decades ago, the elderly already represent one-fifth or more of the total population, and the potential support ratio of the working age population set against the elderly is down to 3:1 or less, work weeks are shorter and goods and services immensely more plentiful for every age segment than ever before.

Chile is a good example of the above (CENDA, 2017d). Presently the country is enjoying the best demographic condition in its history. The average family's lunch table has six members of working age, one elder, and two children. Six work to feed three besides themselves, so the dependency ratio is less than 50%. In 2050, according to the most conservative demographic projection, two workers will feed one elderly family member, and half of all families will have one child while the other half will have none, so the total dependency ratio will have increased to 75%. This proportion will remain well below the secular rate of 100% until the end of the century.

In 1970, however, when peasants were migrating in huge numbers and President Allende was elected, the average lunch table had twelve workers feeding one elderly member, and 14 children! The latter were so numerous that they needed a second table, called the '*mesa del pellejo* (the skinny table)'. Twelve had to feed fifteen besides themselves; the dependency ratio had reached its historical peak of 125%.

When productivity is considered, prior high dependency ratios seem even heavier burdens, because work used to be much harder. Wheat, for example, was cut by hand using sickles, bound in packs called '*gavillas*', transported by ox-driven carts to a stationary harvester machine that poured the grain into 80-kilogram bags, bags which were sewed by hand and lifted into trucks for eventual transportation to the mill. Tens of peasants worked from sunrise to sunset, performing the same task that is now performed by one mechanic driving a combine harvester. In one morning the grain will be cut, threshed, and loaded into the truck for transportation to the mill.

Physical productivity increases fastest with urbanisation and modernisation, but economic productivity measured as per capita Gross Domestic Product (GDP) increases very fast as well. In Chile, for example, the urbanisation process increased the proportion of the urban population from half of the total in 1930 to 87% in 2006, and in the same period, the population saw a four-fold increase and GDP saw a fourteen-fold increase (Riesco (Ed.), 2007).

The key to augmented economic productivity is the increase in the occupied salaried workforce, measured by payroll numbers, which grow much faster than population and slightly slower than GDP. Monthly series of GDP and payroll correlate very closely, and the determination coefficient (R^2) of statistical regressions between them show that the latter, non-farm payroll in the case of the US, explains more than 96% of the movements of the former from 1948 to 2017, and more than 99% in the case of Chile from 1995 to 2017, using contributors to AFP as an estimate of payroll in this case. This should not come as a surprise, because payroll is a very good estimate of working hours dedicated to the production of goods and services that are sold in the market and, consequently, which add value to GDP (CENDA, 2015, 2017b).

In the case of the US, the proportion of nonfarm payroll has increased in the long term, from 43% of the population aged 16 and over in 1948, to a historical maximum of 62% in 1999. This ratio is perhaps the best indicator of the cyclical movement of the economy, and always peaks before the onset of an economic recession (Authers, 2017). During the turbulent 2000's it oscillated down to 54.1% in 2011, and has since recovered to more than 57% in 2017. This should be considered regarding long-term trends of labour participation in relation to the UN report referred to above, because in every recession this proportion is reduced, but it then recovers and surpasses the previous high point, even though this takes longer during 'secular crises' (Authers, 2009).

In the case of middle-income countries, the proportion of payroll workers as against the population aged 16 and over is also increasing rapidly; in the case of Chile, from less than 30% in 1995 to over 40% in 2017, closely following the cyclical path of GDP growth. In the case of women, this proportion has increased dramatically, from 18.6% in 1995 to over 33% in 2017. In fact, the faster secular rise in women's payroll has sustained the continued overall increase in the proportion of payroll workers relative to the 16-plus aged population in the Chilean economy in recent years, because this proportion has been falling for men since mid-2013, following the fall of copper prices (CENDA, 2017b).

In this historical perspective, fears about 'ageing' appear quite exaggerated. Modern societies have enormously increased their capacity to provide decent livelihoods for their populations, including their elderly, and public PAYG pension schemes have proved once and again, practically and theoretically, as argued in this paper, that they are the best way (Samuelson, 1954) to comply with the moral commitment of each generation of modern citizens to sustaining the growing elderly proportion of their population.

Scourge of low-returns on financial assets

The 2007-08 subprime crisis introduced a regime of very low interest rates, which has lasted for a decade. This has created a hole in pension assets in addition to the heavy losses sustained during the crisis, and a recovery from this situation is of immediate concern. However, over the long term, interest rates on bonds have been falling and are the origin of the inadequate growth in pension funds. Over the long term, bond returns have been falling since the 1980s. Changes in bond yields are highly dependent on inflation and growth-inflation expectations, suggesting that both factors have been falling since 1980. In 1981, the ten-year US Treasury yield was 16%; in 2016, it was in the vicinity of 1.5%.

In case of inflation expectations, the prevailing economic framework since the 1980s, associated with the Thatcher-Reagan model, has strongly emphasised the curbing of inflation. In this framework, inflationary pressures originate from many factors. First, there are public deficits to avoid the accumulating government debt which would depress bond prices. In the United States, public deficits have continued to rise, but have been compelled mostly by tax cuts oriented towards capital and wealthy citizens; this has led to severe restrictions on public spending, including sequestration, where any proposed increase in spending on any item must be offset by corresponding decreases in spending in elsewhere. These restrictions have not been severe enough to reduce the public deficit.

It is ironic that the 1980s began with the 'Volcker shock' in which the Federal Reserve under Paul Volcker raised interest rates to 20% overnight as a signal of the fierce determination of US authorities to control inflation. This sudden change had an enormous impact on the

developing world, in the form a debt and payments crisis, leading to a lost decade in terms of economic progress.

A second set of factors have to do with the cost of enterprise operations – notably labour costs but also the cost of production inputs. The last two and a half decades have seen median wages in the United States stagnate, in the context of overall economic growth. Consistent with the dominant economic model, this trend has been associated with the overseas relocation of jobs to lower-wage countries; it has also involved a persistent reduction in unionisation and a reduction in benefits for labour.

Until the 2000s, commodity prices were stagnant or falling downwards from the high prices of the oil shock in the mid-1970s. There was a brief and spectacular rise in commodity prices in the mid-2000s, which came down to earth with the onset of the 2007-08 crisis, then recovered and peaked at the end of 2010 to fall once more (the price of copper went down by half, for example). Partial recoveries, such as the one experienced during 2017, have been experienced since. A similar pattern was observed when advanced economies began their recovery from the turbulent 1970s (CENDA, 2017e).

The second main factor behind falling yields is growth expectations. First, lower inflation is normally associated with lower growth expectations, through the inhibition of private investment by the mechanism of stagnant or lower product prices. Second, there are strong demographic factors at work that are consistent with lower growth expectations in the context of the private wealth-led model, which is the dominant framework.

The fall in the working population reduces production. A study at the Federal Reserve suggests that shifting demographics could account for a 1.25% fall in the natural rate of growth of the US economy since 1980 (Gagnon, Johannsen and Lopez-Salido, 2016, p. 28) and this is consistent with the slowdown in aggregate investment in the US economy. The authors interpret their finding to imply that ‘low interest rates, low output growth, and low investment rates are here to stay, suggesting that the US economy has entered a new

normal.' Other developed countries are subject to the same demographic pressures, with some, like Japan, at an even more severe level.

In the most recent period, even lower yields have been inflicted by the selected policy response to the great recession by authorities in North Atlantic economies. As part of the rescue of the private financial sector, US and European authorities have allowed their balance sheets to grow explosively in the last seven years in a policy of buying bonds, the policy of quantitative easing. This has provided abundant liquidity to financial markets and kept bond prices high (thus depressing yields).

The failure of this policy to restart private sector investment in new real sector projects has kept financial prices high, but investment rates low. In developed economies, the rate of growth in non-residential private investment is at an unprecedented low, despite the provision of liquidity. The impact of low investment rates has been a successive downgrading of global potential GDP, which feeds into and confirms expectations of lower growth rates in the future.

A caution must, however, be injected at this point, that a sudden and precipitous attempt to normalise monetary policy by raising the interest rate or tightening credit could itself be a trigger for a new financial crisis.

Faults in design and actuarial integrity

Alarm bells over the viability of pension systems based on pension funds are ringing all over in the financial journals. These alarms are being sounded based on a framework comparing the liabilities of pension plans versus their assets. The natural consequence of this analysis is that pension obligations must be scaled back to restore their viability. In the UK, "Calls for the government to urgently 'do something' seem to boil down to allowing companies to break their pension promises, by giving lower annual inflation increases or no increases at all" (Ralfe, 2016). For both public and private pensions, scaling back would include raising the

retirement age, but also a reduction in other benefits. On the asset side, there have been suggestions to raise contributions during working years.

Based on standard calculations, which also take into account projected returns on asset accumulations – which are adverse, as discussed in the previous section – pension obligations are outstripping assets.

Among developed countries, there is a wide range of estimates about unfunded public liabilities in savings-based, funded, pension schemes.

The liability gap is particularly severe in pension systems in local governments. In addition to Detroit, Puerto Rico – itself undergoing a debt restructuring – and Chicago are notable for acute difficulties. In 2016 the governor's office of the US state of Illinois sounded a warning about the drastic impact of a change in the assumed rate of return for the Teachers' Retirement System (Bullock, 2016). The impact could reduce benefits or lead to hundreds of millions of dollars of additional taxes on state residents.

On average, funded US pension plans assume 7.6% rates of return, lower than the pre-crisis 8%, but extremely optimistic as against the prevailing interest rates of around 2% for US treasury bills. There is a widening gap between public pension fund assumptions and the actual treasury rate. In the UK, one of the impacts of the Brexit decision has similarly lowered market rates, implying unfunded liabilities of $5-6 trillion versus the estimate of $1-2 trillion before the decision. It is almost certain that without a drastic change in public policies, an era of low interest rates has just begun.

However, the crisis mainly affects the savings-based, funded, component of pension systems, because to counter these long-term trends in the future would require huge increases in pension systems' main parameters: present contribution rates, retirement ages, and the proportion of pensions financed by the first pillar, non-contributive, public system. In the case of the PAYG component of pension systems, which is by far the most important component in all main pension systems, the fall in funds and yields as a result of the financial

crisis has a smaller effect because funding depends mainly on current contributions. These were also affected by the crisis because of stagnant or slower growth rates in payroll numbers and wages, but these are not catastrophic and are easier to counter through very moderate changes in the main parameters.

As a result, the pension systems which have a highly funded, savings-based, component were the most affected by the crisis, especially the Chilean AFP system, which depends entirely on a funded scheme, which has been confronted by huge mass mobilisations throughout the past year, demanding 'No more AFP'. The Chilean case has a special status among the pension systems of developing countries. It is the model that World Bank staff, often with the assistance of consultants from New Zealand, advocated and provided assistance for in developing countries.

In 1979, Chile converted its various public sector-mediated PAYG pension systems into a consolidated system, and in 1981 into an exclusively savings-based, defined contribution system based on individual accounts inside private pension funds. It is a useful source of examples for design issues and debates. It was implemented as an explicit application of the Thatcher-Reagan economic model as self-described by Jose Pinera E. who led the reform: "It is not possible to create a pension system such as the one that has been created here, without being convinced at the same time of the need to found a new strategy of economic and social development, based on the freedom of markets, on the individual and on the economic protagonists that create wealth. The social security reform was part of a global model which sought to drastically reduce the size of the state and to eliminate monopolies, both in businesses and in trade unions" (Acuña and Iglesias, 2001, p. 4).

The Chilean system is an explicit effort to base the second, occupational, pension pillar, exclusively in savings. There are six AFPs operating in the market, a number that the group says denotes insufficient competition and excessive concentration of market power. The Chilean private pension funds are called 'AFPs' from the abbreviation of '*Administradoras de Fondos de Pensiones*' ('pension fund management companies').

The retirement accounts are individual accounts, and legally the companies are the management companies of individual accounts. AFPs manage the retirement savings of individuals because in the Chilean system there are no more employer contributions – only the mandated 10% of salary collected from employees, which rises to 12.75% of wages when administration fees (currently 1.34% of wages) and disability insurance are considered (CENDA, 2017b). There are currently six AFPs, three of which are managed by American companies (Principal Financial Group, Prudential Financial, and MetLife). Regional firms, BTG Pactual from Brazil and Grupo Sura (a Colombian conglomerate), make up two more of the six. The sixth company is a private company.

Pitfalls in the nature of private markets

Pension assets from all three pillars — which in the case of the first and second pillars are reserve funds of lesser importance regarding pension expenses, because the non-contributive first pillar depends mostly upon general taxation, and PAYG-based second pillars depend mostly upon current payroll contributions — were originally invested mainly in domestic financial markets, but now to a large extent also in international financial instruments.

The conventional view is that pension assets should be invested in long-term government bonds which are normally the most secure investment. In industrialised economies, long-term government bonds exist to satisfy this conventional approach. In many developing countries, the presence of pension funds has been a tool to establish local financial markets and to provide the resources for government investment in long-term projects such as infrastructure. However, the high return assumptions relative to actual returns have created enormous pressure on pension fund managers to put their portfolio in riskier, higher-return financial holdings.

The current economic situation can be logically viewed as an immense opportunity for pension funds to thrive. There are enormous financing needs to which pension accumulations can be channelled.

In the context of the global community's common objective of poverty eradication and sustainable development, the United Nations (2015b, paragraph 31) has classified financing needs in terms of those addressing: (a) basic needs related to eradicating poverty and hunger, improving health and education, providing access to affordable energy and promoting gender equality; (b) national sustainable development investment financing needs, such as for infrastructure, rural development, adaptation and climate resilient development, and energy; and (c) global public goods, including the protection of the global environment and the combating of climate change and its impact.

The same report estimated the additional financing need globally to be in the order of trillions of dollars every year. There has been a proliferation of estimates of global financing requirements, many estimating the need at around $3-6 trillion per year.

In the wake of the normal global level of investment of about $22 trillion per year, the additional requirement is both large and small by comparison to current total investment needs. It is large in the sense that at the high end, it represents almost a 30% increase in investment. It is small in the sense that much new investment can result from a redirecting of investment into the social purposes listed in the previous paragraphs if prices and government policies are aligned for these purposes.

It is also small in the sense that the 'new normal' of low-interest rates should provide the space to mobilise private funding in alternatives which provide higher rates of return in the long-term. Thus, the sense in which the requirements are small heavily depends on the ability of states, acting individually and in concert, because private funds are now famously able to move across national jurisdictions with the click of a mouse to channel existing financing to globally agreed priorities. The 'new normal' will only come to pass if the public sector continues to operate within the 1980s model of private wealth-led investment.

A lot of new infrastructure and poverty-reducing projects can be undertaken at the 'new normal'low-interest financing cost if the public sector will only restore its leading role in addressing social objectives. Pension funds, whose source of funding is long-term, are anxiously searching for safer ground, looking for long-term investments to 'de-risk' their portfolios (Montes, 2014), but this will only happen if public authorities shift decisively away from the prevailing model of private finance.

Although most of the projects to be funded will be in developing countries, there are also important infrastructure needs in developed countries. Decades of financial deregulation have in fact made it impossible for both developed and developing countries to receive the kind of long-term funding for the infrastructure they need. "Financial institutions have gotten out of the business of evaluating the risks of proposed projects. Instead, they seek to 'package' these projects into bonds which can be sold to savings pools, including pension funds" (Montes, 2014, p. 7).

'Short-termism' is a way of life among the managers of savings pools – including pension funds – because performance is measured on the basis of quarterly results. What is created is the pattern, from quarter to quarter, of individual fund managers (along with their 'herd' of fund managers) hopping from financial asset to financial asset in an effort to maximise their returns.

Volatility and short-termism now characterise the financial sectors of both developed and developing countries. A UN study says "In the United States, for example, the average holding period for stocks fell from about eight years in the 1960s, when investors were more long-term oriented, to approximately six months in 2010" (United Nations, 2014).

The same study points to "misaligned incentives, such as short-term oriented compensation packages" that "present impediments to long-term stable investment." In 2014, the G20 proposed that pension fund managers begin to think of infrastructure investment in developing countries as a new 'asset class'.

Pension fund manager behaviour raises the question of whether these managers have the technical capacity to analyse the risks associated with directing their money into less liquid, more long-term infrastructure projects. “Because of limited technical capacity, much of the new pension interest in infrastructure is being channelled through private equity and hedge funds, the most agile operators in today’s financial markets” (Montes, 2014, p. 7). With their fee structure (4% cent management and 20% performance fees), hedge fund managers are “licking their chops” over the “discovery” of a new “asset class.”

In order to attract investment and restore soundness to their public finances, countries are also being advised to remove and reduce regulations on capital movements. The argument is that infrastructure projects need to attract large financing flows and therefore removing regulations is essential to persuading the private sector to increase investment. However, the premise is defective. Prices in major markets have been soaring despite low investment rates in real activities. The high level of profits is being propped up by an increase in the buying of financial assets by central banks as part of quantitative easing and self-fulfilling speculation in capital gains.

Pension funds, therefore, do not have a reliable outlet for their assets in financial markets. In 2007-08, there were massive losses, particularly in private pension funds, with the collapse that triggered the great recession. There is increasing talk of another financial crash, but pension fund managers have no choice – unless they want to directly invest in actual economic projects – but to hold their funds in the market.

The reality is that financial systems in developed countries are sitting on a pool of money which – instead of being channelled to creating new wealth in the form of new economic activities, new facilities, and upgraded infrastructure – is being applied to the trading of financial assets and computer entries representing claims on *existing* wealth. For US companies particularly, instead of being invested in creating new jobs, cash is applied to stock which increases the value of existing financial assets ‘in the market’. This can also be

used for buying other companies, a transaction which does not represent an increase in society's overall capacity, but only a transfer of ownership.

Politico-economic constraints and obstacles

However, all the aforementioned considerations regarding alternative –or better – investment opportunities for pensions funds must be qualified by an issue of the utmost importance from a moral, social, and political point of view: These funds are mostly the result of the continuous accumulation of a significant portion of current wages; they are the result of mandatory, or state-induced, forced savings schemes, which apply predominantly or only to lower-income earners.

As a consequence, these funds cannot be diverted in any way to the benefit of upper-income groups, whether financial operators or recipients of investment funds, without resulting in a regressive distribution of income. These funds are mainly the result of the 'Modigliani effect', named after the late Nobel laureate Franco Modigliani, which is the generation an ever-increasing fund accumulated when any group of savers' numbers and/or incomes are growing, even if each one of them entirely withdraws his or her savings in the latter part of their lives (Modigliani-Brumberg, 1954).

The reform of pension systems is an ongoing evolutionary process. However, the current status of most pension systems indicates that at this juncture making adjustments and imposing adjustments on the working class could prove grossly inadequate. Among the most often-mentioned reforms is the raising of the retirement age and increases in the scale of employee contributions. The proposed adjustments are themselves very difficult to achieve politically but the current state of the global economy and the level of inequality that has been produced by its growth since the 1980s suggest that small alterations are impossible given the nature of the state of financial markets.

What will have to be addressed by many societies is a fundamental restructuring of how pensions are defined and operated. Of course, if these reforms are not achieved on time,

reforms will occur by default with the costs borne by workers and employees through the loss of savings and retirement support.

There is a broadly shared view among analysts and financial market operators that widespread reform is needed. However, the changes that have been attempted so far have had to wrestle with a view that pension systems themselves are simply not an appropriate element of a capitalist economy. These objections hark back to when pensions were begun as a way of expanding coverage beyond those in military service.

When social security was debated in the United States in 1936, prominent Republicans in the House and Senate attempted to delete the provisions creating the old-age pension system. Congressional Research Service (2001, p. 4) characterised the position of the objectors (referring to the chapters of the social security bill by the number of their titles) this way:

They said they preferred to rely solely on the assistance (i.e., charity/welfare) approach to help the aged. They argued that the payroll tax/insurance mechanism of the old-age benefits provisions might be unconstitutional and that it would impose a heavy tax burden on businesses that would retard economic development. Members of the minority stated, in the Ways and Means Committee's report to the House, that the old-age benefits program (Title II) and the method by which the money was to be raised to pay for the program (Title VIII) established a "bureaucracy in the field of insurance in competition with private business." They contended further that the program would "destroy old-age retirement systems set up by private industries, which in most instances provide more liberal benefits than are contemplated under Title I.

There were at least two dimensions to these objections. The first was the extent to which retirees should be dependent on the voluntary goodwill of the rest of society to support them after their working years, versus the question of whether adequate income during old age is a right. The second was the role of the state in representing society versus the role of private provision, especially whether the state was constitutionally empowered to mandate

contributions. A third possible dimension, although related to the second, was the question of bureaucracy versus markets.

The difficulties of pension systems have induced many changes in coverage and in the regulation of private systems so that one can say they are already causing change to happen while avoiding more basic changes. The expanding coverage of pension systems reflects both a changing view of who in society is qualified for social support and what kinds of support those in need should receive. Political contests have played a role in the expansion of coverage, particularly in subnational public pension systems.

Trends in the extension of coverage have varied by country. This is particularly evident in the different levels of contingent liabilities of governments on pensions. The soundness of these burdens hinges heavily on whether economies can grow fast enough and whether society can engineer a more redistributive method of building pension funds by relying more on contributions from the wealthy. The process of politicians currying favour with the employee constituency through the expansion of coverage has been much discussed. Less discussed is that the financial sector plays a large role in the funding of political contests; the sector has an undue influence on policy positions and resists more redistributive contribution approaches.

Caution is necessary regarding these arguments. Countries which top lists of government pension liabilities tend to have relatively large elderly populations, who receive relatively generous pension benefits, in proportion to GDP. This should not be taken at face value, as a sort of government liability, simply because in all these countries current payroll contributions are able to sustain these benefits with a surplus, in a PAYG scheme. As John Kay says, “it is possible to calculate enormous measures of unfunded obligations, and it doesn’t matter. The value of these obligations is offset by the implied commitments of future generations” (Kay, 2012).

In the private sector in the US, one can point to at least two major changes. The first is the trend started during the Reagan administration of giving owners of companies the ability to utilise pension assets for the use of the companies themselves, instead of being passively invested in a company pension fund. This accommodation was hoped to cause a positive impact on the expansion of company operations, which would also redound to the good of the workers to whom the funds were obligated.

This financial accommodation has not achieved a positive image in the public eye, justifying one analyst's characterisation of it as a "retirement heist" (Schultz, 2011). Many of the expansion-motivated applications have not been successful or have been overly costly and their benefits were to the advantage of management. Companies in difficulties have 'raided' these funds to backstop their borrowing. Then, in the event of bankruptcy, workers have lost their expected retirement savings.

The second major change in the US is the growth and eventual retreat of individual retirement accounts. The Reagan administration was clearly suspicious of publicly mandated contributions, a stance harking back to the original debates over social security and a stance promoted by all subsequent Republican administrations (and not resisted by Democratic administrations).

Individual retirement accounts enabled a rapid growth in the volume of transactions in the US financial sector. Trading within the sector eventually brought about the ruinous dot-com bubble that burst in 2001 and the subprime mortgage bubble that burst in 2007-08. The pillar three savings of employees became the sandbox for deregulation, innovation, and speculation, providing fantastic incomes and bonuses for bankers and financial companies. The bursting of the last bubble saw large swathes of the working population losing around half of their savings in financial assets.

4. The social and economic impact of the pensions crisis

The central argument of this paper is that the financial crisis caused a serious crisis of funded, savings-based, pension schemes which had surged since the 1980s, and which not only have been incapable of providing adequate pension benefits, but have also resulted in a regressive transferral of income from workers to the financial industry and private companies.

Because of inadequate pension programmes, and mainly because funded, savings-based pension schemes have become more important, millions of workers around the world are facing dire poverty when they stop working, a common situation that seemed to have been overcome in the 20th Century.

Funded pension systems – both public and private – are in a precarious state in the developed world. Moreover, funded public pension programmes are failing in many subnational areas in the developed world. In many parts of the developing world, pensions systems have been privatised, from their original public nature, motivated by belief in the tenets of the dominant economic model of free-market economics associated with Margaret Thatcher and Ronald Reagan in the 1980s.

In the developing world, pension programmes are in a weak state because of slow and volatile economic development and development reversals experienced in countries that have fallen victim to balance-of-payments crises.

Low interest rates and anaemic economic growth create a self-reinforcing environment of inadequacy in retirement asset accumulation. In the UK, it is estimated that workers are under-saving for retirement by £11 billion per year (Cumbo, 2016). A nationwide poll in the UK indicated that only 16% of savers were putting away enough to maintain their standard of living upon retirement.

In the United States, “nearly 40 million working age households — 45% of the total — had no retirement savings whatsoever in 2013, whether an employer sponsored 401(k) plan or an individual retirement account (IRA)” (Wigglesworth and Jopson, 2016), and would thus be completely dependent on the social security system upon retirement, which on average provides for only 35% of the typical household’s pre-retirement income (Rhee and Boivie, 2013). Implicit in this kind of argument is the need for individuals to increase their activities in pillar 3 pensions, which imposes its own instability and vulnerability in the loss of principal for the individual saver because of the failings of the private financial sector. In the US almost 80% of households have savings of less than 100% of their annual income.

After the bankruptcy of Lehman Brothers in September 2008, one-third of the AFP pension fund and half of its more risky portfolios were wiped out in a few months, undermining the founding myth that money creates money on its own, supposedly propelling financial markets to grow faster in the long run than underlying economies, employed workforces, and their respective salaries, which in turn have soundly sustained pay-as-you-go schemes in almost every country in the world, and for well over a century in the most advanced economies.

5. Proposals for reform and recommendations

The increased incidence of failing pension systems based on funded, savings-based schemes has sparked reform struggles in both developed and developing countries. These reforms have instigated intense political conflict in some societies. They have also created much uncertainty in the national economies involved. In this last section, we review these efforts and propose a set of recommendations.

The Chilean pension system has often been associated with the ‘gold standard’ of worldwide pension systems. As a system associated with individual and privately managed accounts with more than 10 million affiliates that currently cover an overwhelming majority of the

working age population and over 98% of those aged 30-55 years old, $160 billion in assets, and benefits to over a million retirees, it has often been thought of as ‘best in class’ by pension experts (Mitchell, 2015). The ‘Chilean Model’ became the inspiration for pension system reforms in Argentina (1994), Bolivia (1997), Colombia (1993), Costa Rica (1995), the Dominican Republic (2003), El Salvador (1998), Mexico (1997), Panama (2008), Peru (1993), and Uruguay (1996).

In response to widespread discontent that would soon be expressed in public demonstrations, President Michelle Bachelet appointed a pension reform commission, which presented its results in September 2015. The outcome of the commission has itself been mired in controversy regarding whether its recommendations are sufficient to guarantee the sustainability of the system and whether more fundamental changes are required for the system to embody the kind of social protections desired by Chilean society.

However, for the first time, an official report to the president proposed the total or partial elimination of the AFP system and the rebuilding of a public pension system based on a PAYG scheme, in two of three equally weighted alternatives (CAPSP, 2015). A few months after the report was presented to the president, millions took to the streets to express their preference, ‘No more AFP’.

Like other pension systems solely operated on savings-based market principles, the Chilean system was brought down by the 2007-08 crisis. In a few months in 2008, the crisis wiped out one-third of the AFP pension fund and half of its riskier portfolios, undermining its founding myth that money creates money on its own, supposedly allowing financial markets to grow faster in the long run than underlying economies. Financial magic could not sustain the growing number of elderly people in contemporary urbanised societies.

Instead, as has been the case ever since the increase in human productivity made it possible to remain alive in old age instead of bravely walking away to die in the cold as had been common in ‘primitive’ times, the sustenance of elderly people in these kinds of societies had

been reached through the hard work of their younger kin, who have always cared for them (Riesco, 2014). As John Kay (2012) says in the first of his summarised principles, “The only bread fit to eat is bread baked today”.

The failings of the Chilean system exemplify the underlying problems of savings-based, funded pension systems around the world. With variations of the degree of problems, there are widespread vulnerabilities on the sustainability of funded pension systems in both developed and developing countries.

Switzerland has also sought to reform its pension system, which had also elicited international admiration. Being based on three pillars, Switzerland’s pension system’s difficulties, for example, are not as extreme as Chile’s, but extensive reforms seem to be in order. Many observers consider the Swiss system the healthiest in Europe. Swiss pensions are seen as generous among advanced economies. On average, retirees receive the equivalent of 11.2% of gross domestic product under public and private schemes, compared to the OECD 2013 average of 9.3% (Atkins, 2017).

The first pillar, the state pension, began in 1890 and is Switzerland’s oldest form of social insurance (Kay, 2010). The second pillar is the occupational pension plan, based on contributions to funds over a lifetime of work. The second pillar is less vulnerable to demographic trends. However, at the current low interest rates, the second pillar is actually more expensive. In 2015, it generated CHF 5.8 billion ($6 billion) in interest income, but CHF 3.8 billion of that was eaten away by asset management costs and CHF 0.9 billion went to cover the costs of administering the pension funds. As a result, one franc for every seven francs “in the retirement system disappears” (Bieler, 2017, p. 2).

On 24 September 2017, Swiss voters rejected the government-proposed reforms of the first pillar which were meant to stabilise the pillar until 2030 to cover the deficits seen in the last few years (Atkins, 2017). The proposed reforms included raising the retirement age for women from 64 to 65 (the same as for men), increasing contributions, and raising the value-added tax rate by 0.3 percentage points to 8.3% from 2021.

The proposed programme was rejected by both sides of the political spectrum. Conservatives were dissatisfied that the proposed increase in contributions was a time-bound repair and thus inadequate. Voters from the left complained about the increase in the retirement age for women and the complexity of the reforms.

The Swiss outcome highlights a basic point that minor changes can prove insufficient. It provides a strong signal that while immediate reforms could involve small steps, even such small steps will require effort in order to make progress.

The most important reforms have taken place in countries like Poland, Hungary, Russia, Romania, and Bulgaria, in Europe, and in Argentina, Bolivia, and Peru, in South America. These countries had implemented World Bank recommendations, establishing Chilean style, forced savings-based, funded, pension schemes, with portions of worker contributions previously used to pay pensions to their retired elder kin.

In all of these countries, these schemes have been totally or partially scrapped after the financial crisis, and contributions have returned to their original purpose. In all of these cases, the fiscal argument — every country that established Chilean style schemes created huge fiscal deficits, which ended up with the absurd fiscal policy of increasing public debt to 'save' the second largest stream of tax revenue, in financial markets — was the main reason why governments of widely different political leanings, from left to extreme right, made this decision (Oręziak, 2010, Kryzak, 2018, Turnovo, 2017, Alexe, 2018).

Understanding pension systems as society's challenge

Evidently, only active workers can sustain their elderly (Kay, 2012). Different pension schemes are essentially methods of calculating how much bread and work will be allocated to the elderly and how they will be collected and distributed. The evolution of the Chilean pension scheme ('AFP') illustrates how this kind of scheme is not a good answer to the problem.

The Chilean case proves that workers cannot depend on their own savings to obtain a decent pension

The Chilean system continuously reduces the living standards of the elderly and discriminates against women. Chilean AFP retirees, who in December 2016 numbered about 1.2 million, are increasing in number by 10,000 every month, and already number half of total pensioners in an overall population of 17.5 million, have been discovering that the generous pensions they were promised three decades ago were a mirage.

On the other hand, the system has accumulated a pension fund that is roughly equivalent to the country's GDP, which is administered by private companies with large profits, and invested in financial markets. This fund will accumulate forever, subject to the uncertainties of financial markets, even if each individual affiliates receive back most of their savings.

One could be very tempted to characterise the Chilean pension scheme as perfect financial market Ponzi scam, financed by forced contributions on salaries, huge public subsidies, and diminishing pensions that discriminate against women.

Chilean AFP pensions are very low, averaging 29% of contributors' wages in 2016. Moreover, this proportion has decreased rapidly, down from 40% a decade ago, in part because workers with higher wages and savings represented a higher proportion of the early pensioners of the system, and also because pensions are designed to diminish automatically from time to time, in inverse proportion to the increase in average life expectancy of pensioners. Meanwhile, real inflation-adjusted wages have grown significantly (CENDA, 2017b).

Women fared even worse than men, being the only group whose pensions are calculated by a different life expectancy table, which is a form of discrimination. They do live a few years longer on average, and have the right to retire a few years earlier, than the average elderly person, but other groups, such as high-income segments of the population, for

example, live even longer after retirement and do not see their pensions reduced for this reason (CENDA, 2011).

Average AFP pensions would be even lower — only 17% of contributors' wages on average, in 2016 — were it not for the huge cash subsidies that the state has been compelled to contribute as a complement. In 2016 this covered 41% of the pension bill paid by the AFP, meaning that 41% of AFP pensions are financed by cash subsidies. In addition to these direct cash subsidies, the state expends roughly the same amount as the overall cost of AFP pensions in non-contributory pensions that presently cover half of Chile's elderly civilian population.

The Chilean AFP system thus seems to offer definite proof that savings-based schemes are incapable of offering decent pensions in real-world labour market conditions, at least in a developing country like Chile, even during a period like 1981-2017 that enjoyed one of the most extraordinary rates of return in global financial markets on record (NBER, 2017). In effect, Chilean workers saved an average of 14% of their wages during this whole period, during which real returns of the AFP fund averaged more than 8% per year, and even under these favourable conditions, by retirement they had managed to accumulate a fund that returned a pension of only 17% of current contributors' wages, on average (CENDA, 2017b).

The main reasons for this catastrophic failure of a purely savings-based scheme to provide decent pensions in Chile were, in order of importance (SUBPREV-CENDA, 2015, CENDA, 2017b):

1) A precarious labour market, where the probability of having a formal job and thus contributing to the system in any given month is only 40% for an average person older than 16 years of age, in 2017. Two decades ago the same probability was only 30%, and for women, these probabilities were 33% and 18%, respectively;

2) Low wages and consequently low contributions during the initial years, i.e., the years that benefit most from highly compounded financial returns;

3) The high cost of administration, as only 10% of wages have been registered as savings, when contributions averaged more than 14% of wages during this period; the rest was spent on ‘administration fees’, which averaged more than 2% and are currently 1.35% of wages, and the rest paid for disability insurance, managed by the same private companies.

The usual culprit for pension problems, so-called ‘ageing’, had very low incidence in the Chilean case, because average life expectancy is still fairly low in comparison with advanced economies; the elderly still make up just 11% of total population (INE, 2017). Chile is enjoying its highest ever demographic bonus with a total dependency ratio lower than 50%, and the proportion of contributors to pensioners is almost 5:1 in the AFP system (CENDA, 2017b).

The savings-based Chilean AFP system has been incapable of providing decent pensions up to now. Will it provide them in future? Some factors appear favourable. Following a secular cyclical path, the labour market is becoming more formal, payroll contributors will probably continue to grow slightly less than GDP but much faster than total population, and as a proportion of population older than 16 years of age, they have followed and will probably continue to follow the secular tendency of growth that has been experienced by all modernising economies — in the US, for example, the probability of being on the payroll and contributing to social security has increased from around 40% in 1948 to around 60% today (CENDA 2017b) — especially in the case of women. Wage growth will probably slow down, so the slope of wage growth along working life will probably be shallower than it has been during the past three decades, and the relative deterioration of pensions as against wages will be less pronounced.

Other factors, however, will shape things for the worse. The rate of return in financial markets will probably be much lower than the average of 8% per year enjoyed by the AFP system in the previous three decades. ‘Ageing’ will also be a more significant factor, so funds accumulated at retirement will have to sustain longer lives.

Considering all these factors, estimates of the contribution rate required by a person joining the Chilean labour force today to receive a decent pension – worth two-thirds of wages at retirement – are in the order of 25% of wages on average, and 35% of wages for women (CENDA, 2017d). Such rates double and triple the current 12.75% contribution rate, and are not viable from a political or economic point of view, especially considering that a huge increase in current rates would not improve current pensions, but would rather generate a huge additional volume of savings diverted to financial markets and likely never to return.

Chilean style, forced savings-based pension schemes transfer huge resources from salaries to financial markets

The so-called 'individual capitalisation' scheme has revealed its real nature. It is a forced savings scheme designed to transfer an ever-increasing net cash surplus from salaries to financial markets, month after month, never to be returned.

Forced monthly contributions easily double the total amount paid by the Chilean AFP pension system, including those paid by related insurance companies. In addition, state cash subsidies cover almost half of what is paid. As a result, the net surplus between contributions plus cash subsidies minus pensions paid, amounts to about three of every four pesos in forced contributions.[5]

[5] In December 2016 for example, an average month, forced contributions from 5.7 million salaried workers with an average salary of 700,000 Chilean pesos (CLP, about $1,000), and a contribution rate for pensions of 12.79%, amounted to 519,571 million CLP (about $740 million). In the same month, the privatised AFP system, which includes insurance companies that offer lifelong annuities, paid out 1.19 million in pension payouts with an average amount of 208,000 CLP (about $291), totalling CLP 247,777 million (about $354 million). That is, forced contributions exceeded pensions paid by more than double. In addition, that same month, the state transferred cash subsidies totaling CLP 102.934 million (about $147 million) to the AFP and insurance companies, as pension supplements, including 69,374 million CLP in 'recognition bonds' for pensioners who belonged to the old system before 1981, and 33,561 million CLP in 'Solidarity Pension Supplements'. These cash subsidies financed 42% of pensions paid that same month. Considering these figures, the net surplus (forced contributions plus cash subsidies-pensions paid) transferred to the AFP system amounted to 374,728 million CLP that month (about $535 million) (CENDA, 2017b).

This net surplus is appropriated every month by the pension system and will never be returned because a significant proportion of pensions are paid by state subsidies and only a small part of the contributions forcibly collected that same month. The existing pension system is like a perfect Ponzi scam, where ever diminishing benefits are paid from ever increasing new contributions enforced by the state, which also forbids massive withdrawals, and the net difference is appropriated forever by privately owned funds.

About 40% of the net cash surplus is immediately pocketed by the administrators, in the form of 'administration fees' charged by the funds and mainly in the form of net 'unique insurance premiums' charged by related insurance companies that provide 'lifelong' annuities. The net amount pocketed in this way by administrators is roughly equal to the net contribution of the AFP to pensions, which cover 59% of the total amount paid in pensions by this system; the remaining 41% is covered by direct cash subsidies, as noted earlier (CENDA, 2017b).[6]

A major part of the remaining cash surplus is immediately transferred to ten or so of the largest business conglomerates operating in Chile, which presently hold about half of the funds invested in the country in the form of loans and equity. Another half of the funds are invested abroad in international financial markets.

The 'Modigliani effect' in forced savings schemes

Payroll tax is not only one of the two or three largest items of tax collection in any country, it is also one of the most stable and predictable sources of public finance, albeit with an important moral restriction: Being financed almost exclusively by wage earners, payroll-tax should not be employed in any manner whereby it could be diverted to high-income segments of society who are not subject to this tax at the same rate as wage earners.[7] That

[6] In the twelve months to October 2017, for example, "administration fees" and "unique insurance premiums" added up to 1.77 trillion CP, meanwhile the net contribution of AFP and insurance companies to pensions paid by this system was 1.95 trillion CP (CENDA 2017b).

[7] As has been mentioned, the maximum amount of taxable earnings for US Social Security contributions was $127,200. In the case of Chile, full forced contributions to the AFP system apply

is precisely what happens in forced savings schemes invested in financial markets, and not only because private administrators and operators, which are amongst the highest earners in contemporary societies, benefit from forced savings schemes' large fees.

In addition, and due to the 'Modigliani effect', the scheme creates an ever-growing fund, of course, subject to the volatility of financial markets, that will never be returned to workers even if each one individual receives back most of their savings.

The ongoing pension debate in Chile has already acknowledged that, as is quite evident, the huge accumulated net surplus in the monthly cash flow between contributions and subsidies minus pensions paid will never be returned, at least while the surplus remains positive, which will certainly be the case during the present century (CENDA, 2017d).

However, supporters of the system rightly argue that each individual worker, in fact, receives back most of his or her savings, minus AFP commissions. In effect, as is usual in Ponzi scams, the system carries detailed individual accounts that duly register each affiliate's net contributions after AFP 'administration fees', plus earnings. After retirement, most of the accumulated individual fund should be returned entirely to its owner in the form of pensions, again minus administration fees, and subject to the volatility of financial markets.

However, in his lifetime consumption model, the economist Franco Modigliani demonstrated that a group of persons whose number and/or earnings are increasing, which save during their active working lives and then spend their savings after retirement, i.e., each of them saves zero in present value, will nevertheless generate an ever increasing mass of aggregate savings (Modigliani-Brumberg, 1954, Modigliani, 2005, Deaton, 2005, Engel, 2014).[8]

only to salaries below 2.1 million CP (about 3,230 US dollars), which is the salary of a qualified copper worker, for example. Higher salaries, for example, the general manager of an AFP that earn ten times as much, pays the same amount, resulting in a contribution rate of 1/10 of a copper worker.

[8] The 'Modigliani effect' in forced savings schemes can be visualised if payroll contributions are viewed as an inverted pyramid, where the height represents time, and the area of the base, which is

In this way, due to the 'Modigliani effect', affiliates as a whole generate a fund that accumulates forever even if at the same time each one of them receives back most of their savings, subject to financial market uncertainties. This is a virtuous mechanism when applied to a voluntary group of savers, especially when their income originates not from salaries but from profits or rents. Each one of them saves zero in present value, but collectively they create an ever-growing investment fund.

However, when enforced upon wage earners, and only upon them, it becomes an institutionalised method for extracting a portion of wages and transferring a huge current cash surplus to financial markets, never to be returned due to the 'Modigliani effect'. In the Chilean case, the net amount transferred in the 12 months up to October 2017 represents 8.9% of wages, and 2.67% of GDP (CENDA, 2017b).

In terms of income distribution, this is certainly regressive, but even more seriously, it involves a serious moral issue. It is a flagrant violation of the basic social contract of any civilised society, which establishes the intangibility of wages or, more generally, the part of the annual workload and goods and services produced required to provide for the livelihoods of workers and their families, including the elderly population. In all civilised societies, salaries or their equivalent are sacred, and they should not be diverted to any purpose other than providing a decent livelihood for workers and their families, including the elderly population.

Many economists justify enforcing savings on workers, on the grounds that it will increase national savings with virtuous effects on the economy, employment, and wages, and hence benefit workers. However, they don't question the fact that national savings in a strict sense — the part of GDP that needs to be set apart for investment i.e., to replace and renovate

always on top, is continuously enlarged because one of its sides represent the number of contributors, and the other side represents wages, and both grow most of the time. In any given month, contributions are proportional to the (growing) area of the base of the pyramid. Meanwhile, withdrawals are proportional to lower sections of the inverted pyramid, with much smaller areas. Modigliani proved that the increase in the area of the base of this inverted pyramid is the sole condition for accumulated savings to grow, even if the net savings of each individual participant is zero in present value.

productive infrastructure, installations, machinery, inventory, etc., and to finance new business, in order for the economy to sustain its pace and grow — are an exclusive responsibility of employers, and should be financed by profits or rents, and not by workers' salaries, as in individual companies.

A more recent argument is that the rate of return of financial markets and other assets would be higher than GDP growth in the very long term, which would provide a better means of ensuring pension sustainability than PAYG schemes. Even Thomas Piketty's (2013-4) findings in this field are being used to justify the Chilean AFP system, something that the author probably would not appreciate.

Recent research finds a similar trend for different kinds of assets in several countries, from 1870 to 2015, but also shows the extreme volatility of these returns, and their underperformance over long periods (NBER, 2017). Regardless of the fact that all these results may be biased because the current financial crisis has not resulted in a fall in the price of assets of similar magnitudes as those experienced in past secular crises (something that may yet happen), it seems clear that such a tendency is not sustainable in the very long run, because it would mean that sometime in the future all added value would end up in the hands of the owners of financial (and other) assets.

The absurd fiscal practice of increasing public debt to subsidise pensions while 'saving' the second most important tax in financial markets

Less than a fifth of the Chilean AFP pension fund is invested in national government bonds, which seems pretty absurd, because on the one hand the government takes loans from the pension system and on the other hand it transfers to financial markets most worker pension contributions, which are the second most important tax after VAT, paying hefty

“administration fees” and interests for this “service” (CAPSP, 2015; SUBPREV-CENDA, 2015; CENDA, 2017b).

Even more absurdly, the amount of direct cash subsidies and expenses in civilian pensions is the largest item in the government budget. These include cash subsidies to complement AFP pensions, the significant number of remaining pensions from the old PAYG system that the government has paid almost entirely out of the budget since 1981, and the non-contributive pensions from the first pillar — half of current civilian pensioners receive one of these two kinds of non-contributive pensions — all of which add up to two-thirds of the total cost of civilian pensions, including 41% of AFP pensions (CENDA, 2017b).

During the 12 months to October 2017, government expenditure on these civilian pension subsidies added up to $6 billion, which was entirely financed by an increase in public debt of the same amount. In the same period, the net surplus in the monthly cash flow between contributions and subsidies minus pensions paid amounted to $7.1 billion.

This is an absurd situation: increasing public debt with the financial markets, while at the same time ‘saving’ most of the second-largest tax item, pension payroll contributions, in the same private markets.

It must be emphasised that precisely this fiscal argument was decisive for European governments that have scrapped Chilean style pension schemes in the wake of the great recession. The most important cases were Poland and Hungary, which scrapped the savings-based private pillar – almost entirely in the first case, and totally in the second case (Oręziak, 2010). In Latin America, Argentina and Bolivia have also terminated, and Peru severely maimed, their own Chilean style private pension schemes (CENDA, 2015).

In 2014, Russia introduced a moratorium on 6% of a total 22% of wages paid by employers as pension contributions, which from 2002 had been diverted to Chilean style private pension fund administrators (NPFs), private non-state pension funds (NPFs), state-owned Vnesheconombank (VEB), or to private asset managers, for the first-pillar Pension Fund of

the Russian Federation (PFR). Recently, the moratorium was extended to 2020. The moratorium, which has been extended each subsequent year, sent the full social security amount to PFR (Kryzak, 2018).

Since January 2016, Bulgarians can opt-out of the mandatory, privately administered, additional payment insurance that the country had introduced in 2000, and return their funds from Private Funds back into social security. Turnovo (2017) quotes Lubomir Christoff, the CEO of the Institute of Certified Financial Consultants, located in Delaware, US., who estimates that the average return of private-owned funds is between 60% for the maximum salary and 38% for the lower salary, compared to the pension citizens would receive if all the money was invested in social security. In Romania, in January 2018, the contribution rate to the second (private) pension pillar was reduced from 5.1% to 3.75% of salary (Alexe, 2018).

Lessons learned and recommendations

Could the biggest social gain of the 20th Century turn on itself?

The descent and possible rebirth of the Chilean pension system reveals the trials and possibilities of pension systems in the 21st Century. Following the Chilean model, pension systems around the world have moved decisively towards a private, savings-based approach, as opposed to an original idea of a community commitment to those members of society who survive past their working years, a commitment that is explicitly embedded in PAYG schemes.

However, in the wake of the great recession, several countries have been terminating, suspending, or reducing, their Chilean style private, savings-based, privately administered, pension schemes, and returning to PAYG schemes (Oręziak, 2010, Kryzak, 2018, Turnovo, 2017, Alexe, 2018). In Chile itself, the termination of the AFP forced savings scheme, and the reestablishment of a public pension system based on the PAYG scheme is supported

today by the overwhelming majority of the Chilean population, including all of the organised labour movement, and increasingly by the political system.

This was one of the main issues in Chile's 2017 parliamentary and presidential elections, and even though the president elect is in favour of preserving the AFP system, for the first time the majority of the new parliament will be composed of MPs who explicitly ran on the promise of deep reforms to the AFP system, including around 40% of MPs who explicitly ran under the slogan 'No more AFP'.[9]

These shifts were more pronounced in developing countries that had fallen more deeply under the spell of market-determined economic outcomes even as their own democratic progress was incomplete. Developed countries where democratic processes have taken root more firmly did not make the same pronounced modification but have made the movement nevertheless. In advanced economies, as documented above, previously widespread defined benefit plans provided by large private employers and government agencies have crumbled or are under considerable existential threat.

In developed countries, the establishment of society-wide pension systems went hand-in-hand with significant a democratisation of societies and an expansion of rights for working classes. Could the different lens through which pension systems are viewed today – emphasising the return on working years' savings for pensioners – also reflect a loss of democratic rights by these classes in advanced economies and a hardening of the social control by propertied classes?

[9] Regardless of the clearly stated popular demand to terminate AFP, and ceding to pressures from financial markets, as a result of last minute negotiations the Bachelet government presented a reform proposal that gradually increases pension contributions by 5%, from the current 12.75% to 17.75%, an increase that is destined to be entirely saved in financial markets, although this increase would be disbursed by employers and administered by a new state 'entity', and during a transition period 1% of the increase would be used to improve current pensions in a temporary PAYG scheme. However, there is no chance that this project will become law during the present government and parliament, which end in March 2018.

The dominant new view of pension systems corresponds to the dominant view of finance as the decisive component of today's global economy. This dominance is already being seen as the cause of global instability and the main source of the anaemic non-financial investment and lack of vitality in advanced economies (for example, on the US economy, see Lazonick, 2013, 2017a, and 2017b). Pension savings, including those from the savings of workers and labour unions, have to operate in this environment and are seen as passive victims.

Reform of private financial markets towards effective re-regulation will restore their ability to play a positive role in economic performance and social progress. While not to be desired, the required reforms might only become politically feasible if another dislocating global crisis – such as the Great Depression – occurs.

There are two main lessons that the pension story offers:

1. Pension systems must represent society's commitment to a dignified life for all its citizens through their whole life. This will require society to design an effective mix of market and public redistribution systems that will provide a secure commitment for retirees' incomes.

It is not suitable to provide a specific set of recommendations suitable for all societies. But the present system, which relies solely on savings and financial returns, has proven not only inadequate but unjust, except with respect to already highly privileged segments of society. The revival of pay-as-you-go systems and the rebuilding of the role of taxation in the pension system, particularly in the first two pillars of pension systems, will be critical and unavoidable in most societies.

2. Pension systems should not be the site of legalised discrimination against poorer segments of society, nor be a means of protecting the privileges of wealth through the operation of financial markets. In the case of Chile, and other places such the United States, the financial sector was furnished with financial resources for the drawing of generous salaries and speculation.

Financial markets should be re-regulated and strengthened to benefit and expand real investment in output and growth, instead of privileging speculation and short-term returns.

The original regulation of financial markets drew on the lessons of the Great Depression in the 1930s but these have been reversed in the name of private sector development and globalisation. These gambles on greater instability from unregulated finance have not proved to increase employment, improve job security, or reduce poverty, except in those places, such as China, where the state had a dominant economic position.

Such regulation will require expanded international cooperation so that countries do not undermine the stability of each other's markets or undercut regulations and standards.

Preventing the disintegration of the greatest social gain of the 20th Century requires substantial effort. This will require political mobilisation and a restoration of access to democratic processes for the majority of the population. This also will require the bolstering of international coordination and cooperation.

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