I. THEORETICAL ANALYSIS OF THE LIFE CYCLE FRAMEWORK INCLUDING SOCIAL SECURITY

Theoretical backgrounds based on the “life cycle hypothesis” were generally resorted to in order to analyze the impact of social security systems upon savings. The idea, originally due to Modigliani and Brumberg and later summarized and extended in the paper by Ando and Modigliani [1963], basically states that an individual consumer’s utility is a function of his own aggregate consumption in the current and future periods. As is to be expected, the approach emphasizes that individuals maximize their consumption subject to their budget constraint; that is, subject to their lifetime resources, which in turn are the sum of current and discounted future earnings and current net worth.

In simple graphical terms\(^1\), and assuming a consumer whose life lasts two periods: a working period in which he earns wages and/or other incomes and a second one in which he retires from working and ceases having incomes, the situation is represented in the figure 1 below:

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\(^1\) This diagrammatical analysis highly relies on Feldstein [1974].
While $Y_0$ and $C_0$, on the horizontal axis, respectively stand for the individual’s earnings and consumption in period 0, $Y_1$ and $C_1$ in turn represent income and consumption in period 1. Assuming that the individual only receives earnings during his working life ($Y_{0,a}$), and that there is neither social security taxes nor pension benefits, ($C_{0,a}$) will indicate the desired level of current consumption resulting from the tangency between the utility function and the budget line; the individual’s saving decision in the pre retirement period – amounting to ($Y_{0,a} - C_{0,a}$) and resulting from the rate of interest implied by the slope of the budget line and the current income and consumption- allows him to enjoy a level of consumption equal to ($C_{1,a}$) in period 1.

Figure 1 also permits to analyze how the introduction of social security regimes, whose benefits are financed by collecting social security taxes, affects individual’s savings. The collection of a tax immediately causes the current disposable income to reduce by the amount of the payroll tax, in this case ($Y_{0,a} - Y_{0,b}$) and savings to dwindle also to a new level equal to ($Y_{0,b} - C_{0,a}$); nevertheless, the equilibrium position indicated in E still holds as, by keeping unaltered the original budget line and its slope, benefits paid in the second period (out of capitalized taxes) will still guarantee the consumption level ($C_{1,a}$). The assertion of savings’ reduction seems thus to be correct and based on the following two accounts: the reduction of disposable income and the ultra rational idea that payroll taxes are perfectly substituting the impact of private saving fall upon future consumption.

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2 As will be shown, results more clearly depict the case of unfunded PAYG regimes.
The implication that social security regimes always have a negative impact upon savings has not however gone unchallenged in the related literature, as soon as one departs from the framework of analysis provided by simpler versions of the life cycle model. Feldstein [1974] himself quoted authors’ yielding empirical evidence on that people covered by fully funded regimes save even more than those uncovered individuals, based on a ‘recognition effect’\(^3\) emerging when people entering a private pension plan realize the benefits of saving for their old age (educational effect) and change their utility function, or a ‘goal gradient hypothesis’\(^4\) whereby efforts are intensified the closer people are to set goals.

Nevertheless, the dual effect of social security systems upon saving levels has appropriately been analyzed by Feldstein [1974], as shown in Figure 2 below, whose crucial contribution was to extend the traditional life cycle model in order to allow for endogenous retirement ages.

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\(^3\) First stated by Cagan [1965].  
\(^4\) See Katona [1964, p. 4].
As can be seen, the parallel displacement $AN$ of the budget line denotes the fact that the individual decides not to retire at the age of 65 and earns also incomes in period 1\(^5\); the situation regarding consumption and saving will now be $C_{0,c}$ and $(Y_{0,a} - C_{0,c})$ respectively whereas $E'$ indicates now the new equilibrium position. By assuming that a social security system is introduced, forcing the individual to retire at the age of 65, it is easily noticed that the situation reverts to point B in Figure 2 since the social security tax reduces period 0’s disposable income and the compulsory retirement makes no possible to have earnings in period 1.

Since the situation indicated by B means that E is still the equilibrium position for consumption, the resulting saving level $(Y_{0,b} - C_{0,a})$ will in this case be larger than $(Y_{0,a} - C_{0,c})$ showing what Feldstein termed as the dual effect of social security; that is, when individuals retire at the age of 65, social security taxes have the unambiguous effect of reducing saving while for those working beyond 65 social security systems may induce early retirement and the effect of benefits upon savings will in this case be ambiguous.

A very interesting theoretical analysis of the impact of voluntary and mandatory fully funded pension schemes was in turn provided by Bailliu and Reisen (op.cit.) who extended the traditional life-cycle model by allowing for the possibility of heterogeneous individuals, in terms of their saving capacity and of liquidity restraints.

By modifying figure 1 above, for homogeneous individuals, a scenario with low and high income earners\(^6\) is presented in figure 3 in which hypotheses of limited and unlimited tax exempt pensions, and taxable and tax exempt returns, are successively considered in order to assess the impact of fully funded pension funds upon savings:

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\(^5\) As Feldstein [1974] stressed it, N stands for the individual’s initial position with incomes in the second period in addition to keeping the same earnings in period one (point A).

\(^6\) Needless to emphasize, the implication of having heterogeneous agents is that low income persons save little or lesser than high income ones.
Figure 3 above exhibits several modifications relative to the case shown earlier and developed by Feldstein: in the first place, while the budget line AD stands –as before- for disposable income, the new kinked line AF resulting from introducing a fully funded system with pension contributions only untaxed up to a determined amount depicts how untaxed returns raise income more steeply for low savers (AL₃ line) whereas tax exempt
incomes for high savers is indicated by the parallel displacement of the budget line over the section L3F.

If a voluntary pension fund regime, with untaxed contributions limited up to AG, is established, low savers’ final decision on consumption and saving will result from substitution and income effects: on the basis of the former one, a displacement over the broken line parallel to the new budget constraint will take place between L0 and L1, influenced by the higher rate of interest implicit in A L3 whereas the income effect will be in turn responsible for the motion towards L2. The outcome clearly shows that the impact of voluntary pension fund systems upon savings, when there exists a limit to low savers’ untaxed contributions, falls short of being unambiguous: in the case drawn, the income effect prevailed over the substitution effect, consumption increased from C0, a to C’, a and saving consequently shrank; should substitution effects had succeeded in stimulating savings, consumption would have ended somewhere to the left of C0, a. As, by keeping unchanged the interest rate in the budget line relevant section, high savers’ decision will only be influenced by the income effect (H0 to H1) and consumption and savings will increase and fall respectively for what, and given their relatively higher economic weight, the overall result will undoubtedly be a saving net fall.

Voluntary funded pension regimes hold however the chance of promoting savings when limits on untaxed contributions are abolished or not set, as indicated by the broken section L3H of the budget line; in such a case, substitution effects may influence both the behaviour of low and high savers, and prevail over income effects, making a net increase in savings a likely result.

Figure 3 permits also to show Bailliu and Reisen’s assertion that savings unambiguously grow when a mandatory pension fund system, with taxable returns, is resorted to as the chosen social security regime. When contributions to the fund are mandatory low savers will displace from position L0 to L3, if pensions are tax exempted and to L4 if they are not; in either case, the new consumption level will be C”, a and the saving level will be greater than the ones implied by L0 or L2 over the respective budget lines. In terms of total net savings, compulsory pension funds with taxable returns are a good option as the mentioned low savers’ increase in savings will not be impaired by the behaviour of high savers who, in not having the influence of income effects, will choose to stay in H0.

In furthering the analysis of pension funds’ impact upon aggregate savings, Bailliu and Reisin (op.cit.) introduced the case in which liquidity constraints strengthen mandatory pension funds’ capability of increasing private savings, as shown by figure 4 below:

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7 Let it be noticed that L0 corresponds with the equilibrium situation depicted by point E in figures 1 and 2.
8 Nevertheless, Bailliu and Reisin (op. cit.) contend that, in this case, increases in private savings will be compensated by decreases in government savings and the net result is still an unknown.
Figure 4 depicts a mandatory pension fund, with taxable returns, in which liquidity constraints are highlighted by the dotted line passing through L₃ whose slope, higher than AL₃, stands for low savers’ borrowing costs. If the regime forces the individual to place himself at L₄, as indicated above when pensions are taxed, he could only move to consumption level C’₀,a > C’’₀,a (corresponding to position L₂ over the budget line) only by resorting to borrowing against pensions assets, which is precisely averted by loans’ interest rates being much higher than the rate of return implicit in the budget line⁹. In sum, and as pointed out by the authors, stimulated and high private savings require liquidity constraints to remain as tight as possible.

⁹ It is to be noticed that only to the extent that the borrowing cost line flattens, in the direction of the budget line, income and substitution effects will reinforce one other to stimulating higher consumption.
It is here worth quoting than Bailliu-Reisin´s arguments had been raised earlier by Blinder [1982] who, in analyzing the relationship between pension funds and savings, concluded that borrowing constraints would increase savings should the pensions impose binding capital markets constraints, as portrayed in figure 5 below:

Thus, $E_1$ depicts the endowment point, corresponding to incomes $Y_0$ and $Y_1$ respectively whereas $A$ indicates that –with no pensions- the optima consumption levels $C_0$ and $C_1$; a mandatory pension will lead to a corner solution like $E_2$ which will in turn force the highest saving level, as consumption falls to $\gamma_0$ in period 0 while it climbs up to $\gamma_1$ in the next period.

Blinder also made the interesting point that while expansions in private pensions, in the presence of capital market imperfections, will raise savings, social security systems of the PAYG system will likely not as –based on the Modigliani Miller Theorem’s implications- saving in the latter case is solely aimed at financing consumption on retirement for what, and with no borrowing restraints, while private (funded) pension plans
will not have any effect upon savings social security taxes in unfunded regimes will in fact reduce savings, as shown above with Feldstein`s developments.

II. THE USE OF DEFINED BENEFIT AND DEFINED CONTRIBUTION PENSION REGIMES BY SELECTED LATIN AMERICAN COUNTRIES

As Boadway and Cuff (2005) pointed out, contributory pension schemes basically aim at ensuring –through some coercion- that income earners save out of their incomes, as the presumption exists that otherwise this may not happen voluntarily. In this regard, the implied government intervention spreads over a range of matters such as regulation of alternative regimes, coverage, employees and employers´ contributions, legal requirements for acceding to benefits, pension payments’ form, public and private participation, composition of fund assets, schemes´ administrative arrangements and so on.

Needless to emphasize, a major feature characterizing pension regimes is whether they are funded or unfunded. In the first case, pension benefits are paid out of a fund resources stemming from the accumulation of past or current contributions whose size, determined on the basis of correct actuarial procedures\(^\text{10}\), should permit to meet future liabilities; unfunded regimes, such as PAYG, rely on the contrary on the explicit principle of intergenerational solidarity in so far as all active labour´s current contributions are devoted to finance benefits paid to individuals that, let alone compliance of legal requirements, have reached the retirement age.

In either case, pension regimes face may fall in the categories of defined-contribution or defined-benefit depending on whether workers are subject to predetermined contributions or benefits. A defined-contribution regime implies that labour periodically (monthly) pay a predetermined percentage of earnings and therefore their pension payments will result from the accumulated contributions plus the expected investment yields whereas in the second case workers will accede –on retirement- to predetermined benefit levels based on income earned during working life\(^\text{11}\). Let it be noticed that different risk levels are involved for the parties depending on the favoured variant; thus, individuals undertake more risk under defined-contribution as the size of their pension benefits is highly related to the rate of return of accumulated contributions; contrariwise, pension benefit providers (either public or private) are more exposed to risks given the liability imposed on them by the defined-benefit system. A worth mentioning point refers to the impact of inflationary risk that may hurt defined-benefits unless these are indexed and also individual accounts in defined-contribution plans that may have eroded their future values due to the negative impact of inflationary situations caused by government policies.

\(^{10}\) Boadway and Cuff (2005, p. 101) pointed out the fact that actuarial fairness of fully funded regimes could refer to the accounts of each individual contributor but also to the regime as an aggregate but not for all persons.

\(^{11}\) There are several variants for computing the ratio of pension benefits to income earned: income of the last years before retirement, the highest earning years or a combination of both.
Finally, defined-contribution or defined-benefit systems resort to various forms of financing the most common being employees or employers’ contribution or a combination of both which are normally levied as a fixed percentage of wages. Nevertheless, and particularly in Latin American countries, pension systems are seen to permanently increase their dependence on budgetary tax resources (mainly Value Added and Income Tax); reasons for that should mainly be sought at the large share of informal labour as well as the marked contributors’ tax infidelity, particularly in the group of self employed workers. The need to resort to fiscal resources—other than contributions—is also explained by important social policies of inclusion and poverty checking whereby governments set transfer programmes aimed at the elderly with no incomes.

Apart from characterizing different pension systems, a far more important policy matter with (which a number of specialists have deal with\(^{12}\)) refers to the economic effects of contributory pension regimes upon labour supply and demand, individual and aggregate savings and capital market furthering\(^{13}\). In this connection, labour supply may dwindle due to payroll taxes and their negative impact on wage incomes unless, and as Boadway and Cuff (2005) pointed out, benefits are directly related to contributions and these have an upper limit above which there is a nil marginal tax rate effect; a corollary of this is that while provident funds and pension plans are not expected to have an important effect upon labour supply, this conclusion is not straightaway applicable to public defined-benefit regimes. The impact of pension regimes on retirement age is not a linear one: thus, the possibility of early retirement pensions will dwindle the labour supply to the extent that the pension size is higher than the opportunity cost of staying (i.e additional contributions); on the other side, the retirement age will not be affected should actuarially well designed regimes operate. Also, the idea prevails that human capital accumulation will unlikely be affected by payroll schemes but would be favoured by provident funds from which individuals could draw resources for financing their training. Finally, labour mobility would not generally be prevented if public pensions (such as PAYG) and provident funds grant their benefits at an individual level. Although subjects such as workers’ mobility and cost of hiring somehow impact upon labour demand, the outstanding point here refers to employment effects of fully flexible labour markets versus those in which wage rigidities are important, as in the first case elasticities of demand and supply will determine how contributions will be absorbed both by employees and employers whereas if wage rigidities prevent shifting the tax burden to employees, employers may refrain from hiring more labour.

Latin American countries, based on the European tradition of unfunded schemes and defined-benefits, traditionally run PAYG regimes; however, and for reasons mentioned in the next section, they started to explore different alternatives in the last part of the 20 century and to experiencing advances as well as noticeable setbacks. In this connection, the ensuing Table 1 shows the performance of eight selected Latin American emerging


\(^{13}\) The economic impact of funded and unfunded regimes upon individual and aggregate saving and the capital market is dealt with in the next section.
countries that have resorted to one of the ensuing four variants for running their pension systems:

1. **A Single System**: In this case, affiliation is mandatory for all workers and contributions are channeled to the PAYG regime or to individual capitalization accounts in order to be administered by private firms or public bodies (pension fund administrators).

2. **Integrated Mixed System**: PAYG and individual capitalization regimes coexist and workers’ contributions are distributed between both regimes as it is legally determined.

3. **Mixed System in Competence**: individual capitalization and PAYG compete for affiliations and contributions are totally directed to the regime chosen by employees.

4. **Others**: It refers to the case in which pillar 1 is mandatory and other options are open for pillar 2.

### TABLE 1: OPERATING PENSION SYSTEMS

<table>
<thead>
<tr>
<th>COUNTRIES</th>
<th>YEAR</th>
<th>SINGLE SYSTEM</th>
<th>MIXED INTEGRATED SYSTEM</th>
<th>MIXED IN COMPETITION</th>
<th>OTHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>1994</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td></td>
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<td></td>
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<tr>
<td>Bolivia</td>
<td>1997</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brasil</td>
<td>1991</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td>1981</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colombia</td>
<td>1993</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>México</td>
<td>1997</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perú</td>
<td>1993</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Uruguay</td>
<td>1995</td>
<td>X</td>
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<td></td>
</tr>
</tbody>
</table>

Argentina introduced in 1994 a mixed in competition system whereby labour and self employed workers could chose between the PAYG regime and individual capitalization accounts administered by private pension fund administrators. As of 2008, the system was suspended and the country returned to a single PAYG variant. Bolivia, for its part, somehow experienced a similar change the difference being that the mixed in competition scheme created in 1997 evolved into a capitalization regime in which workers’ contributions started to be administered by a governmental body.

The mixed in competition regime (similar to those in Argentina and Bolivia) persists Colombia and Perú whereas Uruguay adopted in 1995 a mixed integrated system whereby labour’s contributions are mandatory sent to the PAYG regime, when salaries do not exceed a fixed legal floor and to the individual capitalization accounts when salaries range between minima and maxima salary incomes. Contributions corresponding to salaries exceeding the compulsory upper limit can be voluntarily sent to the capitalization regime.
Finally Chile, in 1981, and México in 1997 are the only two countries in the group considered that have a single mandatory system based on individual capitalization accounts.

III. WHY INDIVIDUAL CAPITALIZATION ACCOUNTS BECAME AN ALTERNATIVE TO PAYG REGIMES IN LATIN AMERICA

As of the eighties and later in the nineties, in the 20 century, several countries in Latin America began to assess the convenience of substituting existing PAYG earning related pension schemes (as it happened with Chile’s pioneering reforms) or adding (as in Argentina) privately managed fully funded pension systems –based on individual capitalization accounts- leaving on contributors hands’ (labour and self employed workers) the decision over the preferred system.

In some cases, the switch took place all of a sudden following bankruptcy situations faced by PAYG regimes, whose causes could be traced back to sharp inflationary processes and economic and demographic unbalances dwindling to unbearable levels the workers/retirees ratio and increasing existing pension regimes´ deficits; the massive incorporation of beneficiaries (specially self employed) through ad-hoc plans amounting to a bail out and the channeling of pension resources to general fiscal revenues, in order to deal with the important deficits originated by a growing public spending and the difficulties in tax collection and budgetary financing, must also be accounted for at the moment of explaining the crisis of unfunded pension schemes.

Nevertheless, it needs to be acknowledged that a widespread fall in saving rates occurring by the time in many Latin American countries, must also be acknowledged as an important motivation underlying substantial changes in pension systems, as the idea prevailed that the accumulation of pension fund assets would definitely encourage aggregate savings (Bailliu and Reisen, 1997) and contribute also to enlarge domestic capital stock markets (Reisen, 1997; Raddatz and Schmukler, 2008).

The economic appeal that individual capitalization schemes had upon policy makers, specially for their assumedly expected positive impact upon saving rates, must however be revised in the light of the very often ambiguous results found in the literature devoted to the analysis of several countries’ recent experience. Thus, while some analysts of the micro and macroeconomic performance of pension systems concluded that fully funded pension schemes definitely contributed to enhancing private saving in countries like Chile and Singapore others found running counter evidences for Malaysia (see for instance Corsetti and Schmidt-Hebbel [1996], Morandé, [1996] and Faruqee and Husain [1994]).

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14 Section III was taken from E. Rezk, M. Irace and V. Rica (2009).
15 Those programmes, known as “moratorias”, permitted contributors to enjoy the benefits after a limited number of years of contribution (smaller than the 35 legally required).
16 The paper by Raddatz and Schmukler is a particularly interesting one as the authors aim at shedding light on the very interesting debate of how pension funds affect capital markets development.
In the context of the American economy, Feldstein (1974) also analyzed the impact upon individuals´ decision on saving of introducing social security systems; by resorting to a life cycle model, his econometric estimations showed that social security funds depressed personal savings. 

Nevertheless, Feldstein also explored the implications of using an “extended life cycle model”, allowing people to continue working after the age of 65 and in which the net impact of social security regimes upon aggregate savings fell short of being unambiguous.

It is to be noticed that the existing theoretical controversy with regard to the real impact of individual capitalization upon saving rates and capital formation is related to the Life Cycle Model’s nature, whose conclusions sensitively react to changes in assumptions held, but also to the type of pension system referred to. Bailliu and Reisen’s paper [1997] is in this regard worth mentioning as these authors also stressed the ambiguity of pension fund assets’ effect upon saving depending for instance on whether there were taxed returns or liquidity constraints, for what they concluded that the sign of the relation between pension fund assets and saving was a matter of empirical resolution.

In dealing with the matter, Boadway and Cuff (2005) reflected the existing ambiguity in respect of the real effect of mandatory regimes upon aggregate saving, whose increase was deemed necessary to boost investment and, in turn, the growth rate. The analysis, built upon a dynamic version of the life-cycle model acknowledged in the first place that the financing form chosen for pensions could affect the saving rate either by affecting the average wealth of individuals in the pension regime or by respectively redistributing wealth among individuals in the same group (intragenerational transfers) or between different age groups (intergenerational transfers). The conclusion was that a fully funded scheme will not induce changes in the saving rate (and in turn in aggregate saving) unless a very high contribution rate is resorted to whereas an unfunded pay as you go system would decrease aggregate savings.

The empirical treatment of the subject also posed interesting challenges, as shown by econometric attempts forced to dealing with the problem of a scarce number of degrees of freedom, this being explained by the relatively short existence of main fully funded pension regimes in the world and the consequent recourse to statistical series yielding information only for a limited number of periods. Grouping data for a set of countries and estimating coefficients by means of a fixed effect panel data model, in order to reflect included countries’ specificities, became therefore an alternative to sort out the mentioned difficulty.

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17 Mainly based on the rational of a PAYG system, the idea was that the need of counting with savings for future consumption was averted by retirees´ guaranteed benefits financed through previously collected social security taxes.

18 The situation becomes more complex when one intends to assess the impact of pension regimes upon individual saving as the outcome may depend on the type of assumptions held. In this regard, individuals may naturally be low savers, wages may not be flexible enough, individuals may be affected by the uncertainty of pension fund returns, individuals may save for reasons other than to smooth consumption, savings may be affected by pension plans that affect the decision to retire, etc.

19 See the empirical treatment carried out by Rezk et al (2009).
IV. FEATURES AND PERFORMANCE OF PRIVATE CAPITALIZATION REGIMES IN THE MAIN LATIN AMERICAN EMERGING ECONOMIES

The review of fully funded pension regimes in all the eight countries chosen\(^{20}\), as well as the analysis of determined features regarding their investment portfolio structure and of some other related indicators is intended to shed some light on individual capitalization’ performance in the Region following something more than two decades since it came into being\(^{21}\).

A first feature deserving a comment is the relative size and evolution of pension fund assets, in terms of gross domestic product. As graph 1 depicts for the period 1996-2006, the increasing paths show also differences in magnitude once countries are individually considered; thus, while the ratio reached more than 50% for Chile, it reached between 10% for the rest of the countries by the end of the period. Two main reasons can be accounted for in explaining differences in percentages: in the first place, individual capitalization started much earlier in Chile for what the regime exhibits more maturity\(^{22}\); in the second place, individual capitalization is mandatory in Chile and Mexico whereas PAYG regimes in Argentina, Colombia and Peru have not been eliminated and compete with the former as people are allowed to choose. Uruguay presents in turn an interesting situation as inclusion in either of the two regimes depends on individuals’ scale of income or wages\(^{23}\).

Graph 2, that depicts the evolution of funds (in terms of gross domestic products) beyond 2006 and up to 2012, permits to arrive at the conclusion that pension funds kept increasing their participation with figures of 10% to almost 20% of product, with the exception of Chile that remained in 60%. Due to changes in their pension systems in 2008 and 2010 respectively, Argentina\(^{24}\) and Bolivia are not represented in the graph; Brazil is – as mentioned above- a particular case as individual capitalization operates at the second pillar and close funds range between 17% and 20% of the product.

\(^{20}\) Argentina, Bolivia, Brasil, Chile, Colombia, México, Perú and Uruguay.
\(^{21}\) Except for Chile, where the system dates from 1981.
\(^{22}\) Nevertheless, the assets’ yearly percentage growth is higher in the other five countries as suggested by Bailliu and Reisin (op.cit. page 23) due to the fact that, by being more recent, they have greater contributors/retirees ratios.
\(^{23}\) People can however express their decision to be included in one of them.
\(^{24}\) As is publicly known the Argentine Congress, following a project received from the Executive Branch, enacted in November 2008 a law that stopping the privately managed fully funded pension scheme based on individual capitalization. From that moment on, the ANSES (Social Security National Administration) already managing the PAYG regime, took over exclusive responsibility for the collection of all social security taxes and the payment of pension benefits and for the management of the Sustainability Guarantee Fund composed at the time of the assets of the former capitalization system.
Graph 1: Pension fund assets in percent of GDP

Graph 2: Pension Fund Assets in Percentage of GDP
A matter discussed above referred to the impact of funded pension systems upon aggregate saving formation, taken for granted that unfunded system founded on the theoretical framework of the Life-Cycle Model is not expected to increase but rather decrease it. With respect to this, the following graphical display helps to visualize whether individual capitalization regimes implemented since the eighties in Argentina, Chile, Colombia, México, Perú and Uruguay were conducive to increasing aggregate saving in the period 1996-200625.

Figures in Graph 3 show that in all countries pension fund assets clearly dragged aggregate savings, the effect being more visible generally as of the fifth year of the regime implementation; the exception is constituted by Chile and Uruguay which seem to reveal a negative relationship between both plots. Argentina is in particular a worth quoting case as aggregate private saving kept stable between 1997 and 2000 although gross domestic product shrank in these years as a consequence of an industrial recession lasting until 2001; it can be inferred therefore that the sustained growth shown by pension funds somehow helped to compensate a fall in savings that would otherwise happened following the reduction of income.

As for the supposedly paradoxical Chilean case, the explanation can again be sought in that, due to the earlier regime implementation, the effect must have been stronger in the eighties when restrictions on foreign investment by the new pension funds existed26. In short, the stagnation and consequent small fall in aggregate savings in percent of gross

25 Graphs were taken from Rezk et al (2009) who also backed the graphical analysis with an econometric estimation of a panel data model one of whose purposes was to gather evidence about the role of fully funded regimes in enhancing aggregate saving.
26 While Fontaine (1996) recalled that until 1989 Chilean regulations banned any international diversification of pension funds, Reisen (1997) in turn asserted that this restriction was crucial in explaining why the Chilean domestic capital market grew in size and depth despite an internal climate of debt crisis and uncertainty.
domestic product must be looked at in the light of the banning lift in foreign investment, which is in turn confirmed by the diagram showing the latter’s incidence in portfolios.

In seeking next an explanation for the Uruguayan case, the saving plot´s pattern must somehow be reflecting a feature of the implemented system which notwithstanding the fact that it is mandatory for certain wage earner groups, inclusion by default is based on the individuals´ income scale.
GRAPH 3
Pension fund assets and aggregate private savings in percent of GDP, by country
The variations and lack of similarities in portfolio structures, as shown by graphs 4 and 5 below, are the best examples of differences, in many cases significant ones, that can be found in national legislation concerning how pension fund assets can be invested. In particular, and even if it is taken for granted that public bonds will always be important part of portfolios, countries often place a limit to their share in investment composition. Despite this, countries have somehow managed to find shortcuts to the mentioned limitations, as it is particularly noticeable in the case of Argentina, whose legislation banned pension funds to invest in public bonds beyond 50% of the whole portfolio. Fiscal matters and the restructuring of public debt must be borne in mind when the excessive government bonds’ participation in pension funds is analyzed in Argentina; in particular, severe credit restrictions preventing the access to foreign and domestic financing led the authorities to resort to pension funds which became forced lenders.

Worth quoting changes are however revealed by graph 4, when comparing the situation while Argentina had the funded regime (2007-2008) with the one in which PAYG was reinstated and the Sustainability Guarantee Fund managed (2012-2013). In the first place, the section embodying investment in public bonds gradually increased up to 63% of total but the two following sections (corporate and financial assets) shrank and investment in foreign bonds disappeared and other assets in turn reduced drastically its share within the portfolio. In change, the governmental body managing the Fund (ANSES) started to finance a number of public projects included under the label of ‘productive projects and infrastructure’ whose participation reaches 14% of the portfolio.

As for the rest of countries (Graph 5), Chile and Peru exhibit public bonds’ lesser shares but while in the former the evolution shows a downturn trend there is a slight increase in participation in the latter country. The cases of Bolivia and Mexico are also noticeable in that public bonds participation in portfolios is practically overwhelming; Uruguay, in turn, stabilized participations of public bonds in around 55% after experiencing shares as high as 90% in 2006 – 2007 whereas Colombia reflects in turn the average situation of 45%-50%.

The participation of other portfolio components fell short of being a stable one, or similar among countries, throughout the period considered. In general, there has been a tendency, on the part of pension funds and except for Uruguay, to increase investment in foreign assets shares although at a slow rhythm. Chile is however the worth stressing case here as, following the end of the initial banning over pension funds’ international diversification of portfolios, foreign assets started to climb reaching to around 40% of all applications. Investment in foreign bonds is also important in Peruvian pension funds and of lesser relevance in Colombia and México.

Financial investments by pension funds both exhibited an irregular performance among countries as well as a marked cyclical behavior in the period; except for the case of

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27 See National Legislation in the Appendix to this paper.
28 Investment of Mexican pension funds in government bonds represented more than 90% in 1997, although they later stabilized in around 70%-80% for the rest of the period; the opposite took place in Uruguay as the initial participation rounding 60%-80% climbed to 80%-90% by the end of the considered period.
Chile where they have had a very stable share within the portfolio, with moderate variations within a 25%-30% interval, investment in financial assets showed marked cyclical variations in several countries although their participation is still important in Argentina, Bolivia, Perú and Bolivia whereas their importance is minor in the cases of Colombia and Mexico. Similar conclusions can in general be drawn for the case of equities, although in this case Colombia and Peru were the only countries in which the latter´s participation kept stable around 35% total pension fund´s portfolios and they are also noticeable in Chile.

GRAPH 4

GRAPH 5
Structure of Fund Portfolios in some Latin American Countries (2010)
While figures in Table 2, column 3, replicate the situation already shown by the Graph 2 above, it is interesting to notice what the column 4 indicates with respect to pension assets’ real returns: in all cases, the average real return was positive and ranging between 6% and 10% per year. The Argentine case is also included in the table as, despite having stopped the individual capitalization regime in 2008, a Sustainability Guarantee Fund was created to which funds of the former Pension Fund Private Administrators were channeled.

**TABLE 2: ADMINISTERED PENSIONASSETS – YEAR 2012**

<table>
<thead>
<tr>
<th>Million dollars</th>
<th>Share of GDP</th>
<th>Average Annual Real Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>50,500</td>
<td>15.0%</td>
</tr>
<tr>
<td>Brasil</td>
<td>232,373</td>
<td>17.0%</td>
</tr>
<tr>
<td>Bolivia</td>
<td>7,875</td>
<td>29.2%</td>
</tr>
<tr>
<td>Chile</td>
<td>159,190</td>
<td>58.5%</td>
</tr>
<tr>
<td>Colombia</td>
<td>71,205</td>
<td>18.8%</td>
</tr>
<tr>
<td>México</td>
<td>143,898</td>
<td>10.3%</td>
</tr>
<tr>
<td>Perú</td>
<td>35,547</td>
<td>19.2%</td>
</tr>
</tbody>
</table>

1. Figures for the Argentine are for 2013 and correspond to the Sustainability Guarantee Fund.
2. Brazilian figures are for 2007 and they correspond to closed pension funds; open funds represented 3%-4% of GDP
3. As of the year each country started the regime.

V. IS THE REGION NOW EXPERIENCING A SET BACK TOWARDS NONFUNDED PAYG REGIMES?

As Table 1 indicated it, two countries (Argentina and Bolivia) reverted from fully funded pension regimes to totally or partially PAYG systems in 2008 and 2010, respectively. Even the leading country, Chile, had a thorough revision in 2008 whereby a modification of its pension regime took place and an unfunded non contributory system was introduced financed out of general revenues; the revision also stated that individual capitalization beneficiaries would be supplemented had they not reached a minimum level for their retirement benefits. Furthermore, countries like Brazil or others, like Colombia and Perú in which individual capitalization schemes are a key component of the pension systems found necessary to implement non contributory pensions for individuals above 65 years with no incomes.

The response to the question posed by the headline to this section may not possible be straightforward, as distinct macro and microeconomic reasons such as sustainability and fairness might have been behind the changes; nevertheless, the information on coverage in the ensuing tables 3 and 4 offers clear hints for understanding why this is today still an important political issue in the region, let alone the socio economic implications:
TABLE 3
EMPLOYED INDIVIDUALS, OVER 15, EFFECTIVELY CONTRIBUTING TO PAYG OR INDIVIDUAL CAPITALIZATION REGIMES

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Civil Servants</th>
<th>Private Sector Workers</th>
<th>Self Employed Workers</th>
<th>Pension earners over 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>68.7%</td>
<td>92.6%</td>
<td>77.2%</td>
<td>32.7%</td>
<td>90.7%</td>
</tr>
<tr>
<td>Bolivia</td>
<td>32.4%</td>
<td>74.6%</td>
<td>32.5%</td>
<td>2.1%</td>
<td>91.0%</td>
</tr>
<tr>
<td>Brasil</td>
<td>75.9%</td>
<td>93.6%</td>
<td>84.0%</td>
<td>24.3%</td>
<td>84.7%</td>
</tr>
<tr>
<td>Chile</td>
<td>81.7%</td>
<td>86.0%</td>
<td>86.5%</td>
<td>26.3%</td>
<td>84.2%</td>
</tr>
<tr>
<td>Colombia</td>
<td>57.2%</td>
<td>97.2%</td>
<td>77.2%</td>
<td>10.5%</td>
<td>44.0%</td>
</tr>
<tr>
<td>México</td>
<td>41.3%</td>
<td>69.2%</td>
<td>59.3%</td>
<td>…</td>
<td>44.0%</td>
</tr>
<tr>
<td>Perú</td>
<td>50.4%</td>
<td>89.0%</td>
<td>59.5%</td>
<td>14.0%</td>
<td>25.4%</td>
</tr>
<tr>
<td>Uruguay</td>
<td>84.7%</td>
<td>99.9%</td>
<td>91.5%</td>
<td>39.4%</td>
<td>85.6%</td>
</tr>
<tr>
<td><strong>Latin America</strong></td>
<td><strong>55.4%</strong></td>
<td><strong>90.4%</strong></td>
<td><strong>65.5%</strong></td>
<td><strong>12.4%</strong></td>
<td><strong>41.9%</strong></td>
</tr>
</tbody>
</table>


TABLE 4
PENSION FUNDS’ GROSS AND EFFECTIVE CONTRIBUTORS - YEAR 2010

<table>
<thead>
<tr>
<th></th>
<th>Registered</th>
<th>Effectively Contributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina¹</td>
<td>10,972,000</td>
<td>40.9%</td>
</tr>
<tr>
<td>Brazil</td>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>Bolivia</td>
<td>515,159</td>
<td>39.3%</td>
</tr>
<tr>
<td>Chile</td>
<td>4,487,843</td>
<td>51.7%</td>
</tr>
<tr>
<td>Colombia</td>
<td>4,080,088</td>
<td>45.3%</td>
</tr>
<tr>
<td>México</td>
<td>13,440,855</td>
<td>33.0%</td>
</tr>
<tr>
<td>Perú</td>
<td>1,923,466</td>
<td>42.4%</td>
</tr>
<tr>
<td>Uruguay</td>
<td>624,093</td>
<td>65.5%</td>
</tr>
</tbody>
</table>

¹.Figures for the Argentine correspond to 2008, as the regime was stopped that year.

The first two facts deserving being stressed from Table 3 above is that only 55% of workers in the region are in average actually contributing to any pension regime and that this percentage is not also even throughout countries analyzed as figures as low as 32% (for Bolivia) find their counterpart in Uruguay with almost 85%. The second result is the striking evidence that, while the average for regional affiliation is substantially high
regarding civil servants (90%), almost 40% of private labour and 90% of self employed workers are not included in any pension scheme. Needless to emphasize, the explanation must be sought at the existence and size of the informal economy and consequently of labour markets, which is particularly noticeable in Bolivia, México and Perú (for the case of private workers) and generalized to all countries with respect to self employed workers. Despite the pessimism that figures in previous columns transpire, the last column of table 3 clearly shows that the situation in most of the selected countries is much better than the regional average, situation explained by strong national social policies oriented to widening the coverage of the elder (as is particularly the case of Argentina and its ample moratoria) or to enabling people over 65 to accede to non contributive income (as Dignity Rents in Bolivia, or pensions financed out general revenues in Chile)\textsuperscript{29}.

The question as to why individual capitalization accounts did not become the solution envisaged when the system was first implemented, in the eighties in Chile, is somehow responded with the figures of table 4 shedding light in the marked discrepancy between those individuals registered and those effectively complying with their payment of contributions, the latter hardly reaching the fifty per cent of registered in fully funded regimes. Needless to say, this feature is not unrelated to the weakest tax compliance of affiliated self employed workers who, in many cases, carry out their economic activities in the informal sector.

The major role of, or reliance on, fully funded private systems has been challenged several times, let alone the most extreme cases of Argentine and Bolivian. It has already been said that the leading country in this field, Chile, underwent in 2008 a revision of its regime the result of which was some important modifications and the introduction of a non contributory regime for the poor without income or pension coverage. The discussion seems not to be over in this country as the government that recently took power announced the setting up of a committee of national international experts for assessing the system and proposing changes in the light of the low pensions earned by the retired.

In a very interesting article in which Bertranou et al (2009) wondered whether Latin American countries were actually moving away from individual capitalization accounts these authors, after emphasizing that fear of fiscal unbalances´ consequences and badly managed PAYG regimes counted at the outset for countries to resort to pensions based on individual accounts, pointed out however that three main issues could not appropriately be dealt with by fully funded schemes; that is, a low level of coverage, the contraction of social nets and some imperfection in regulatory frameworks.

These authors´ first assertion is clearly reflected not only by figures in table 4 but also but the bars of the ensuing graph 6 in which coverage rates\textsuperscript{30} for the seven countries\textsuperscript{31}  

\textsuperscript{29} Colombia, México and Perú stand as an exception as they have lower coverage of the elder.

\textsuperscript{30} For the purpose of the analysis, the coverage rate is defined as the quotient between contributors and economically active population.

\textsuperscript{31} Needless to say, Argentina is only represented by the 'before' bar as individual accounts were stopped at 2008. Brazil is not represented either as the main PAYG is still the main pension system, although there is an important development of individual accounts at firms´ level (closed funds) and also some others run by subnational governments.
are measured for two points in time: the moment before the countries adopted a fully funded scheme (also called first round of reforms) and the year 2002, depicted in the graph as after.

### GRAPH 6
**LATIN AMERICAN COUNTRIES: COVERAGE RATES PREVIOUS TO FULLY FUNDED SCHEMES (BEFORE) AND IN 2002 (AFTER)**

The underlying rationale behind what Bertranou et al (2009) called the First Round of Reforms was the idea that defined contribution schemes were going to enhance not only the level of coverage, but also tax compliance, given to the fact that individuals would not only find a stronger connection between contributions and benefits but also because they would regard contribution payments as a save instead of a tax; nevertheless, and supporting the evidence given by table 4, the above graph 6 clearly shows that the rate of coverage fell in all countries considered once fully funded schemes started to operate. The main reasons for this to happen was already mentioned above; that is, the structure of labour markets in which informality is by no means a minor feature\(^\text{32}\), apart from other features such as important unemployment levels.

A second important reason why fully funded regimes fell short of fulfilling expectations was that, contrariwise to PAYG systems, they did not solve the problem of

---

\(^{32}\) As expected, this is also a consequence of a stretching informal economy that prevails in many sectors of activity.
inter and intra generational solidarity for what public intervention had to be called upon in order to handle, via non contributory regimes, the situation of the elder with no incomes.  

A third worth emphasizing matter was that, after an initial enthusiasm with fully funded schemes, a feeling of disappointment grew among retirees when they realised that the quantum of their benefits was by far much smaller than originally expected, as rates of return resulted negatively affected by the excessive burden of items such as fees, insurance premia and other costs detracted from their original contributions.

A last but by no means less important matter referred to imperfect regulation, one of whose flaws was a marked degree of weakness due to political interference with the investment of funds. Argentina was a clear example in this matter, as pension administrators suffered an enormous pressure to take public bonds, which ended in 2009 with their total seizure.

In sum, the most reasonable answer to the question posed at the beginning of this section should be that many Latin American countries managed to legally enact –and operate- sophisticated fully funded pension regimes that not only relieved governments in a moment of fiscally strained fiscal budgets but also served the purpose of enhancing aggregate saving and of furthering financial markets. Nevertheless, the experience of almost two decades of fully funded regimes clearly showed that important changes were indispensable should countries intend to continue running pension systems based on individual capitalization accounts.

VI. CAN PENSIONS´ INDIVIDUAL ACCOUNTS AND PAYG REGIMES COEXIST IN LATIN AMERICAN EMERGING COUNTRIES?

Although many experts have pointed out that the use fully funded schemes en Latin American countries gathered political rejection and experienced contraction, the prevailing idea is that fully funded and unfunded regimes can and should coexist for what, as Bertranou et al (2009) suggested, individual accounts should be improved while accepting –at the same time- that PAYG and non contributory regimes may successfully accompany properly designed and run defined-contribution schemes as the former could better meet solidarity, equity and distributional goals.

Given that the performance of any pension regime, or combination of pension regimes, must be judged for the efficacy in reaching expected levels of coverage, equity

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33 After individual capitalization accounts were implemented, different countries (i.e. Bolivia, Chile, Colombia) had to strengthen their social security nets with non contributory pensions.
34 The authorities blamed the world crisis of 2008 and 2009, as being responsible for the country’s fiscal problems and the transmission of their negative effects to the pension system.
35 It must also be pointed out that private pension systems counted in general with approval within the countries where they were implemented. Argentina is a clear example of this: the government did away with the regime in 2008 notwithstanding the fact that –the year before- the option of allowing those individuals in capitalization accounts to return to the PAYG systems was rejected by more than 80% of affiliates.
and efficiency as well as for its success in guaranteeing long run financial sustainability, any social security economic policy must necessary address a set of matters which, for the sake of illustration are listed below:

1. Non contributory pensions will be necessary, on grounds of distributional, solidarity and equity goals, to work in connection to programmes aimed at checking poverty and structural unemployment.

2. Coverage and tax compliance needs to be expanded, both in fully funded and unfunded regimes, one obvious sector to aim at is in this regard that of self employed workers.

3. Individual capitalization may be improved and turned more attractive in various ways: as for instance by reducing administrative and commercial costs for allowing rates of return to increase and by offering a more varied portfolio composition both in term of financial instruments and of levels of risk.

4. Competition between fully funded and unfunded regimes, by permitting affiliates to switch from one to another, could at the end be favourable in terms of efficiency.

5. Financial sustainability of PAYG regimes may be deepened by resorting to ad-hoc reserve funds, as for instance the Sustainability Guarantee Fund in Argentina.
REFERENCES:


ANNEX

ARGENTINA:

As of 2008, the whole Pension Scheme was restated by finishing the Mixed Integrated System and returning to the previous state-managed PAYG Regime. There is a minimum legal pension (assumedly falling in line with the minimum legal wage) whereas the nominal value of pensions are updated twice a year using an ad-hoc index for social security.

Retirement Age: 65 for male and 60 for female.
Contributions: individuals paid 11% and employers 16%.
Benefits: pensions for the elderly, disability and death pensions.

PAYG’S FINANCING SOURCES

Social Security Taxes: (58%)

<table>
<thead>
<tr>
<th>Source</th>
<th>Contribution</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employers’ contribution on wages</td>
<td>16%</td>
<td>(4.9% pib)</td>
</tr>
<tr>
<td>Employees’ contribution on wages</td>
<td>11%</td>
<td>(3.4% pib)</td>
</tr>
</tbody>
</table>

Tax revenues: (42%)

<table>
<thead>
<tr>
<th>Source</th>
<th>Contribution</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfers from VAT yield</td>
<td>11%</td>
<td>(1.0% pib)</td>
</tr>
<tr>
<td>Transfers from Income Tax yield¹</td>
<td>20%</td>
<td>(1.2% pib)</td>
</tr>
<tr>
<td>Transfers from taxes on petrol and gas</td>
<td>21%</td>
<td>(0.25% pib)</td>
</tr>
<tr>
<td>Transfers from the simplified regime for small taxpayers</td>
<td>70%</td>
<td>(0.12% pib)</td>
</tr>
<tr>
<td>Internal taxes on diesel cars</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Revenue sharing regime (coparticipación)</td>
<td>15%</td>
<td>(3.2% pib)</td>
</tr>
</tbody>
</table>

1. Plus $ 120,000,000 per year

THE PAYG’S SUSTAINABILITY GUARANTEE FUND
(as of 2008)

SOURCES

1. PAGY’s proven available annual resources (that is, net of liabilities represented by the year’s quantum of pensions and benefits).
2. Financial resources transferred from the previous individual capitalization system.
3. Returns on carried out investments.
4. Any other budgetary transfer from the central government.
ACCUMULATION LIMITS AND USE

1. Fund’s accumulated resources can not exceed the amount of the annually authorized spending in pensions and benefits.
2. The Fund may be used to finance pension expenditures whenever contingencies come about preventing PAYG’S annual budgetary obligations to be met.

CRITERIA AND GUIDELINES TO INVEST

Based on criteria of safety, profitability and transparency, fund’s resources may be invested in:

- Public debt bonds
- Domestic and foreign bonds, stocks and securities of acknowledged Solvency
- Fixed term deposits
- Any other habitual investment in instruments of financial markets
- Economic projects and infrastructure

BOLIVIA:

CONTRIBUTIVE REGIME (DEFINED CONTRIBUTION)

Pensions for the elderly financed with employees’ contributions and the Fund for the Elderly (composed of transferred accumulated balances from the previous individual capitalization regime).

Employees’ contributions: 12.71% (10% of wages or income, 0.50% for the Solidarity Fund, 1.71% risk premium, 0.50% administration).

Required conditions: a minimum age of 58 for men and 55 for women and no less than 120 contributions that can finance a pension higher than the solidarity pension corresponding to the years of contribution.

SEMI CONTRIBUTIVE REGIME

Solidarity pensions for the elderly financed with employees’ contributions, the Solidarity National Contribution (additional tax for higher income earners), 3% employers’ contributions, a 0.50% solidarity contribution by the insured and 20% of risk premia.

Required conditions: a minimum age of 58 and no less than 120 contributions.

NON CONTRIBUTIVE REGIME
Dignity Pensions for individuals over 60 years (or more) with or without contributions to the Contributive or Semi Contributive Regimes.

The Long Run Social Security Managing Body administers:
The PREVISIONAL SAVING FUND (workers’ individual saving accounts)
The FUND FOR THE ELDERLY (already retired’s accumulated balances)
The SOLIDARITY FUND (for the financing of Solidarity Pensions)

INVESTMENT GUIDELINES

Only financial institutions’ public bids
Focus on productive firms
Maximum 10% per bond issuer
Maximum funds’ revenue allocation in foreign investment: 50%
Maximum funds’ revenue allocation in unqualified small firms: 5%

BRASIL:

The 1988 Constitution ruled that key parameters should be met, with regards to Pensions, Health and Social Assistance, as for instance:
- Universal coverage (including self employed workers).
- Lowest benefits linked to the minimum legal wage.
- Indexation of pension benefits to the minimum legal wage.
- Pension benefits extended to the rural population.
- Selectivity and distributive features: individual needs should determine social services and benefits.
- Equitable financing share.
- Diversity of financing bases in order that contributions may fall upon various sectors and salary types.
- Administration bodies with participation of the government, employers, workers and the retired.

Social Security General Regime (RGPS)
- PAYG (retirement age: 60 and 55 for male and female respectively)
  Urban and rural systems

Social Security Specific Regimes (RPPS)
- PAYG (retirement age: 60 and 55 for male and female respectively)
  Including federal, state and municipal civil servants and the military

Supplementary Social Security (PS)
- Capitalization (Including open and closed funds)

Social Welfare Regime
- Non contributive pensions granted to the elderly under the poverty line
CHILE:

A fully funded mandatory single capitalization system replaced in 1981 the PAYG regime. Individuals may have voluntary contributions.

Contributions: 12.37% (10% to the capitalization account, 1.04% to finance disability and death premia, 1.33% to finance operation costs by pension fund associations. Employers do not contribute.

Benefits: pensions for the elderly, disability and death pensions.

Perception of benefits: Immediate annuities, temporal rents combined with differed annuities, programmed retirement.

Minimum pension guaranteed to individuals showing contribution during 20 years, minimum pension guaranteed to those whose accumulated funds fall short of minimum required for the benefit.

Welfare type pensions to individuals under the poverty line.

Recognition Government bond for those coming from the PAYG system.

A thorough revision and modification of the regime took place in 2008 whereby an unfunded non contributory regime was introduced, financed out of general revenues.

It was also stated that individual capitalization beneficiaries would be supplemented had they not reached an minimum level for their retirement benefits.

For individual capitalization, there exist five categories depending on the maximum and minimum levels each fund can invest in equities.

<table>
<thead>
<tr>
<th>FUND</th>
<th>MAXIMUM LIMIT</th>
<th>MINIMUM LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>80%</td>
<td>40%</td>
</tr>
<tr>
<td>B</td>
<td>60%</td>
<td>25%</td>
</tr>
<tr>
<td>C</td>
<td>40%</td>
<td>15%</td>
</tr>
<tr>
<td>D</td>
<td>20%</td>
<td>5%</td>
</tr>
<tr>
<td>E</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable Rent</th>
<th>Government Bonds</th>
<th>Investment Funds and National Mutuals</th>
<th>Deposits and financial institution Bonds</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>E: More conservative: 0%/5%</td>
<td>50%/80%</td>
<td>5%</td>
<td>80%</td>
<td>15%/35%</td>
</tr>
<tr>
<td>D: Conservative 5%/20%</td>
<td>40%/70%</td>
<td>10%</td>
<td>70%</td>
<td>20%/45%</td>
</tr>
</tbody>
</table>
COLOMBIA:

Mixed in competence dual regime legislated in 1993:
Average Premium Regime (PAYG) runned by COLPENSIONES and the Individual Capitalization scheme (RAIS) operated by Pension Fund Administrators (AFP). Labour and self employed workers have the possibility of changing regime.
Retirement Requirements; 62 for male and 57 for female, contributions for a minimum of 1275 weeks (24.5 years).
Contributions to the RPM: 16%, (12% to finance pensions and 4% to defray the system’s administrative costs. Employers 75%, employees 25%.
Contributions to the capitalization system: 16.5% in the case of workers (12% to the individual capitalization account,1.6% as a fee for pension associations,1.4% to the insurance premium and 1.5% for the Minimum Pension Guarantee Fund; self employed workers contribute 16.5%. Voluntary contributions are permitted.

MEXICO:

The Social Insurance Law replaced in 1997 the PAYG System by a mandatory Individual Capitalization Regime. Voluntary contributions are allowed. Workers may choose between two investment funds specialized in pension funds (SIEFORE, Multifund System).
Contributions: 6.5% (5.3% goes to the individual capitalization accounts and 1.2% to fees perceived by the AFORES).

The State adds to social accounts a social quota (solidarity contribution) of 5.5% of salaries. Retirement requirements: (2014-2015) 53 for men (contributing period 30 years) and 51 women (contributing period 28 years), increasing gradually to 60 and 58, respectively, in 2028.

There is also a pension for the elderly (above 60 years of age and a minimum of 10 years of contributions)

Basic 1 SIEFORE

Assets invested in domestic and foreign fixed interest securities
International permitted bonds and securities from government and qualified firms.

Basic 2 SIEFORE

Investment in equities is also permitted up to a maximum participation of 15% of total. Basic SB3, SB4 and SB4 created in 2008 raised equities participation to 20%, 25% and 40% respectively.

PERU:

Mixed in competence system started in June 1993.
Contributions to the PAYG System: 13% of salaries.
Retirement requirements: 65 years of age and 20 years of contribution, minimum.
Contributions to the fully funded pension regime: 13.12% (10% goes to individual capitalization accounts and the rest is distributed between the insurance premium and pension fund associations´ fees. Individuals can have voluntary additional contributions.
Pension perceptions´ possibilities: programmed retirement, family annuities, temporal rents, temporal rents with differed annuities.

As of 2005 there exists a multifund scheme for mandatory defined contribution pension plans

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Equities</th>
<th>Derivatives</th>
<th>Short Term Securities</th>
<th>Fixed Interest Securities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>10%</td>
<td>10%</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td>Type 2</td>
<td>45%</td>
<td>10%</td>
<td>30%</td>
<td>75%</td>
</tr>
<tr>
<td>Type 3</td>
<td>80%</td>
<td>20%</td>
<td>30%</td>
<td>70%</td>
</tr>
</tbody>
</table>
Funds and Investment Limits

<table>
<thead>
<tr>
<th>Type</th>
<th>Variable Rent</th>
<th>Fixed Rent</th>
<th>Derivatives</th>
<th>Fixed -Term Deposits</th>
<th>Foreign Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Preservation</td>
<td>10%</td>
<td>100%</td>
<td>10%</td>
<td>40%</td>
<td>36%</td>
</tr>
<tr>
<td>2: Mixed¹</td>
<td>45%</td>
<td>75%</td>
<td>10%</td>
<td>30%</td>
<td>36%</td>
</tr>
<tr>
<td>3: Growth</td>
<td>80%</td>
<td>70%</td>
<td>20%</td>
<td>30%</td>
<td>36%</td>
</tr>
</tbody>
</table>

1. It embodies 90% of affiliates.

URUGUAY:

The mixed integrated systems started operations in 1996.

Affiliation to the corresponding regime is determined in function of three salary levels:
1. Retirement Regime for Intergenerational Solidarity (PAYG): for monthly incomes equal or smaller than 5,000 uruguayan pesos.
   A recent modification allowed workers earning up to 5,000 uruguayan pesos to allot 50% to the individual capitalization system.
2. Individual Capitalization System: monthly incomes above 5,000 till 15,000 uruguayan pesos.
3. Voluntary Individual Capitalization Regime: for all individuals, for amounts exceeding compulsory upper limits.

Contributions to the PAYG system: 15% of earned salaries.
Contributions to the Individual Capitalization Regime: 15% (12.16% goes to individual accounts, 1.854% corresponds to the administrator’s fee, 0.988% covers the insurance premium).
Employers’ contribution (7.5%) totally goes to the PAYG regime.
Pension fund assets managed by Prevision Save Funds Administration
Bank of Social Previsión administers PAYGO
The Central Bank supervises the Individual Capitalization Scheme.

Pension benefits (PAYG) depend on the retirement age and years of contribution:
Replacement Rate
30 ≤ n ≤ 35; 60 ≤ age ≤ 65 → 60%
35 ≤ n ≤ 40; 60 ≤ age ≤ 65 → 65%
≤ 40; 60 ≤ age ≤ 65 → 70%
≤ 40; 65 ≤ age ≤ 70 → 75%
≤ 40; 70 ≤ age → 80%
Minimum pension benefit: 85% of minimum legal wage
Maximum pension benefit: 7 times the minimum legal wage (15 times for multiple affiliations)
Contributive pensions exist for individuals of 70, or above, and contributions for at least 15 years). Relief pensions are granted to individuals over 70 without income and contributions.