BBVA | RESEARCH

Perspectives for pension coverage in Peru

Results from a macro actuarial model

Based on the working paper “A model for the Peruvian pension system” (Javier Alonso, Rosario Sanchez and David Tuesta, 2012)

David Tuesta

Broadening Participation in Savings for Old Age: Challenges and Alternatives

Lacea-Lames 2012, Universidad del Pacifico

Lima, November 3, 2012

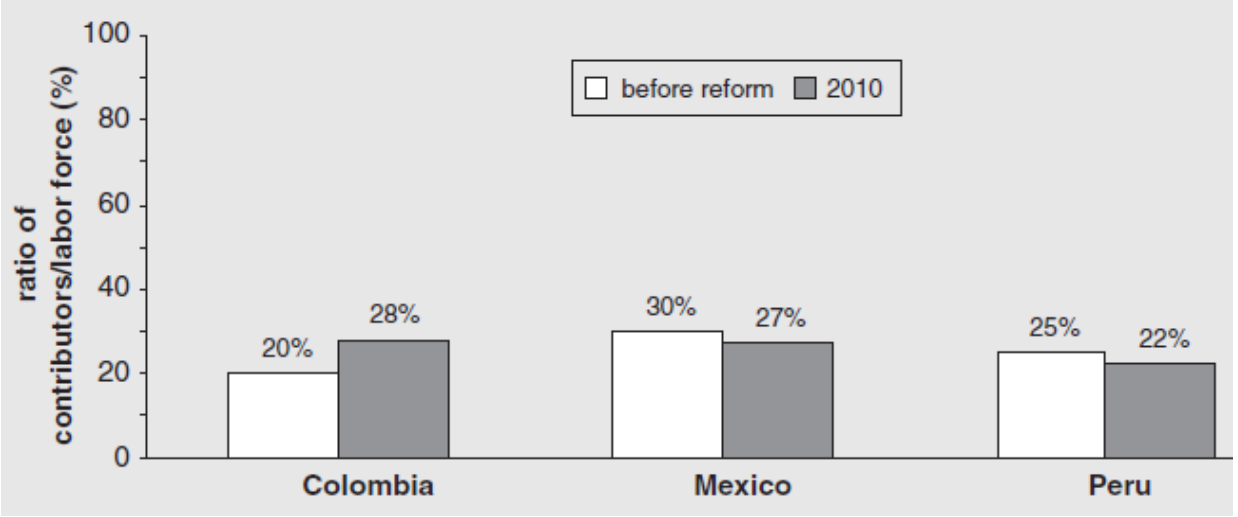
Contents

1. **The starting point**
2. Main aspects of the model
3. What do we see in the following decades?
4. he 2012 Peruvian pension reform
5. Final comments

After the reform of the nineties

Pension participation before and after DC pension reforms

Source: Carranza, Melguizo and Tuesta (2012)



- The introduction of a DC component as a fundamental pillar of a pension system was part of the **stabilization program** during the nineties. This reform has provided **fiscal sustainability,** increased national **savings**, developed **capital markets,** strengthened **economic growth fundamentals** and is a **good savings mechanism for the retirement period for those who participate**.
- Notwithstanding, **after almost 20 years** the pension reform **has not been enough** to overcome the enormous challenges imposed by **complicated structural failures** that are behind the problem of a high **informal economy**, that **limits the possibility to increase pension participation**.

Contents

1. The starting point
2. **Main aspects of the model**
3. What do we see in the following decades?
4. he 2012 Peruvian pension reform
5. Final comments

The model: general description

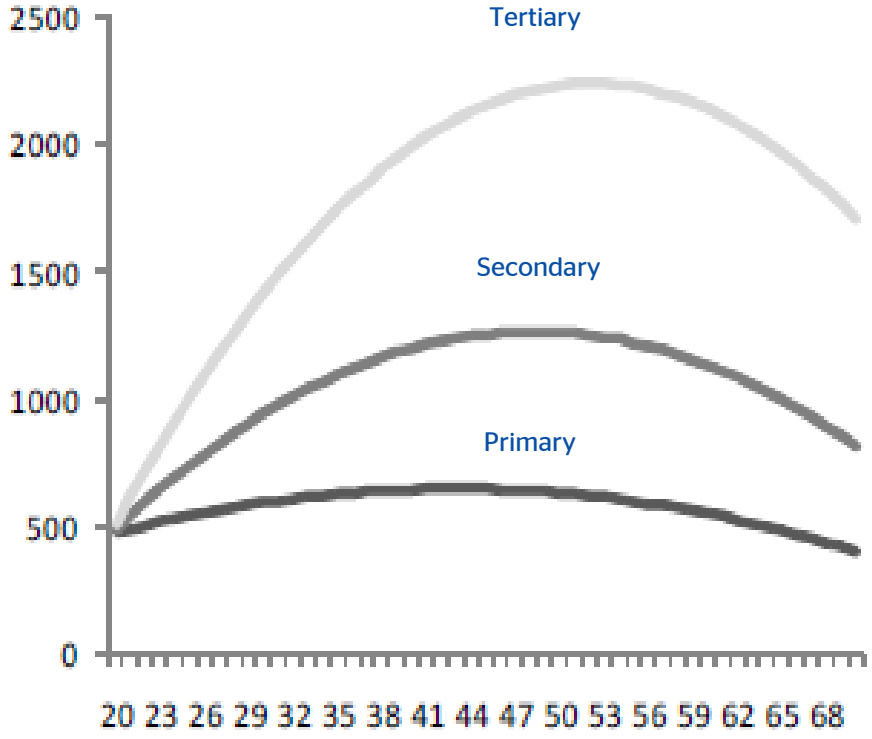
- An **accounting generational model** (Auerbach et al, 1991; 1994). Economic agents behave following the past. Useful and practical perspective when the **model** wants to introduce **more heterogeneity and focus in specific policy issues** (e.g. most difficult to model heterogeneity using overlapping generational with dynamic general equilibrium). It **follows other similar developments** (World Bank- Prost and European Comission Model)
- It considers **60 types of representative individuals** in each age point of the pyramid of population. People is classified according to **age, sex, educational attainment, and income deciles**. Each classification is **conditioned to the likelihood to contribute** (regularly, irregularly or not contribution) and its **labor condition** (salary worker, self employed and inactive), which **finally determines its contribution density**
- **Generational transition** dynamics in the model is **captured** mainly by the estimates of future **demographical** changes and the role of **educational** attainment (Alonso, 2003)
- **Modular arrangements.** Information is obtained from detailed **ONP, AFP Horizonte and Enaho-INEI** data bases, that totals **3.8 million individuals** for approximately **40 variables**. All the information is processed in GAUSS
- **Forecasted scenario through 2050**

Contents

1. The starting point
2. Main aspects of the model
3. **What do we see in the following decades?**
4. The 2012 Peruvian pension reform
5. Final comments

Socioeconomic conditions of pension participants-2010

Income level by education-Men (Soles)



DC pensions - How do workers participate? (%)

By gender	Men	Women	Total
Regular contributor	59,9	58,2	59,3
Irregular contributor	21,6	22	21,8
Zero contribution	18,4	19,8	18,9
Total	**100**	**100**	**100**

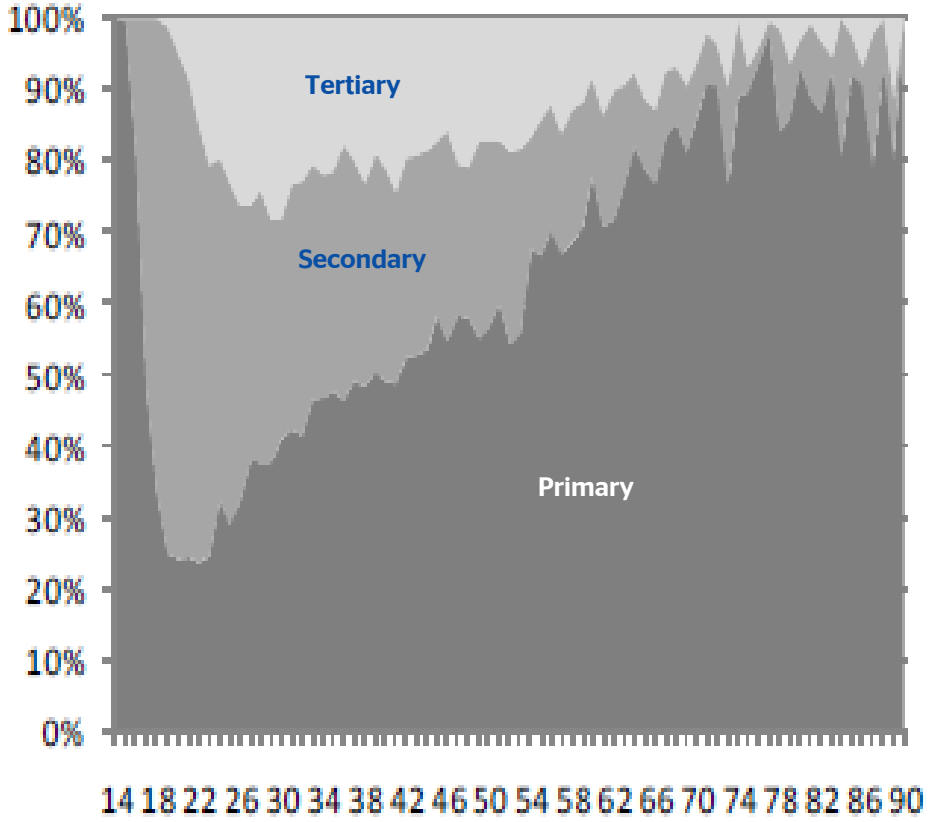
DB pensions - How do workers participate? (%)

By gender	Men	Women	Total
Regular contributor	50,4	54,8	52,2
Irregular contributor	15,3	14,5	15
Zero contribution	34,3	30,7	32,9
Total	**100**	**100**	**100**

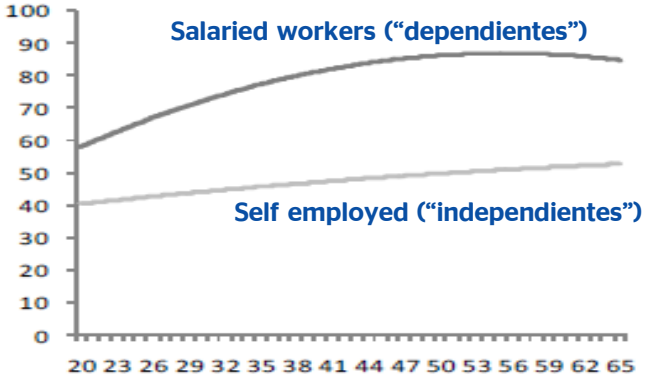
Socioeconomic conditions of pension participants-2010

Income structure by education and age group-Women

(%)

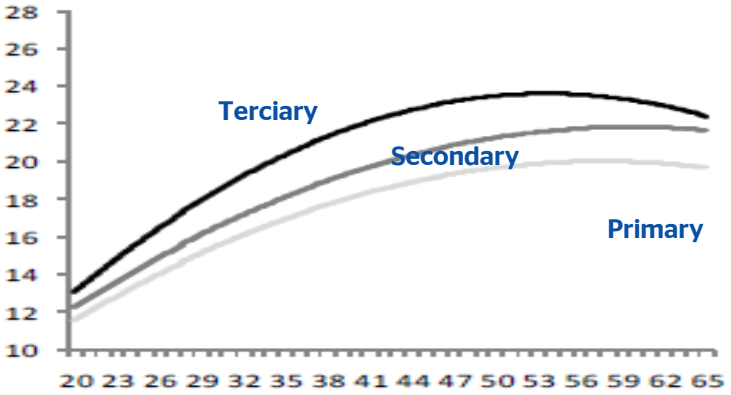


Contribution density of regular contributors by type of contract (polonomic trend %)



Contribution density of Irregular contributors by education

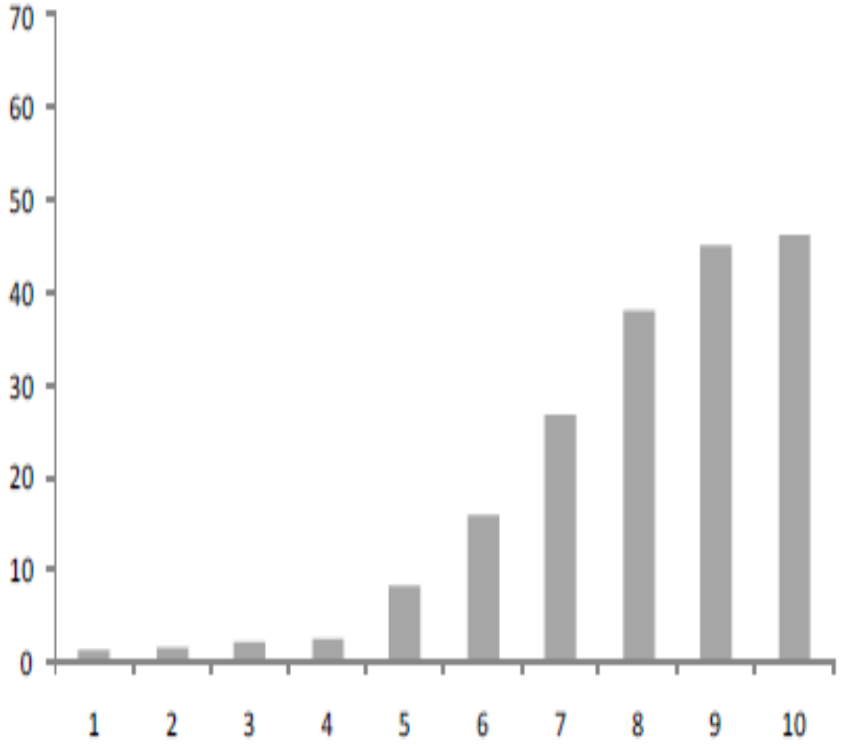
(polinomic trend %)



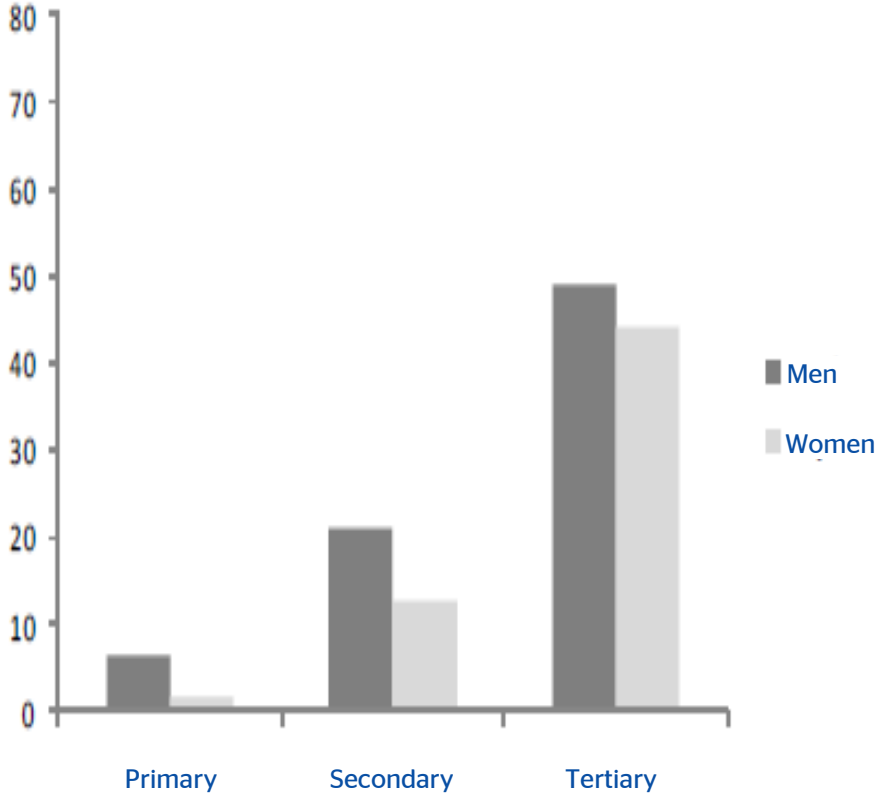
Pension coverage according to socioeconomic conditions-2010

Regular contributors by deciles

(as a % of Labor Force)

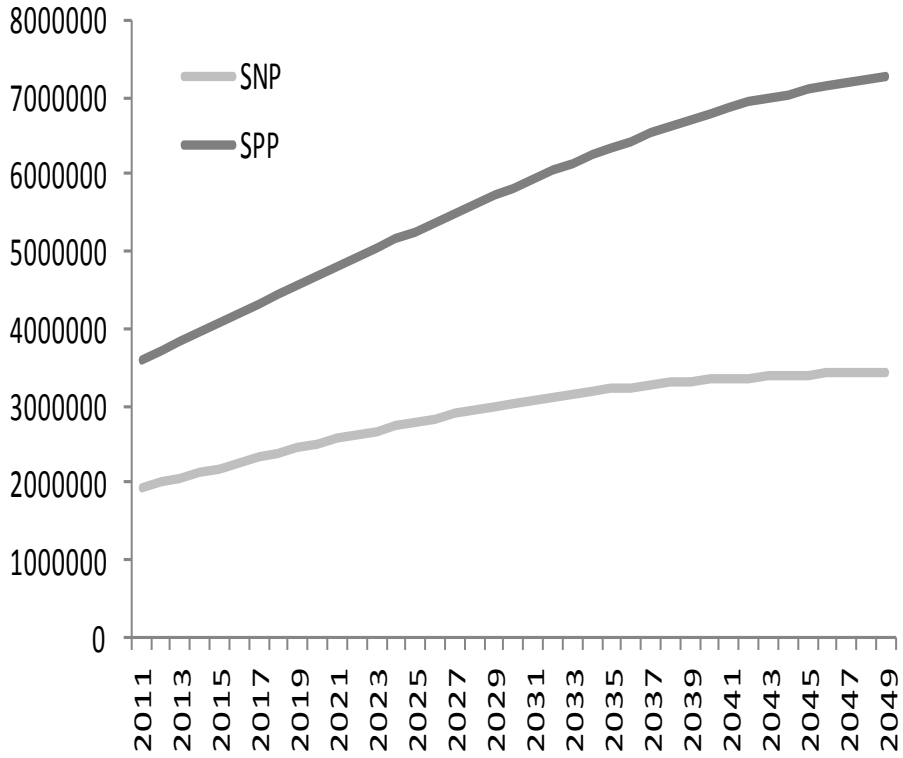


Regular contributors as a % of Labor Force

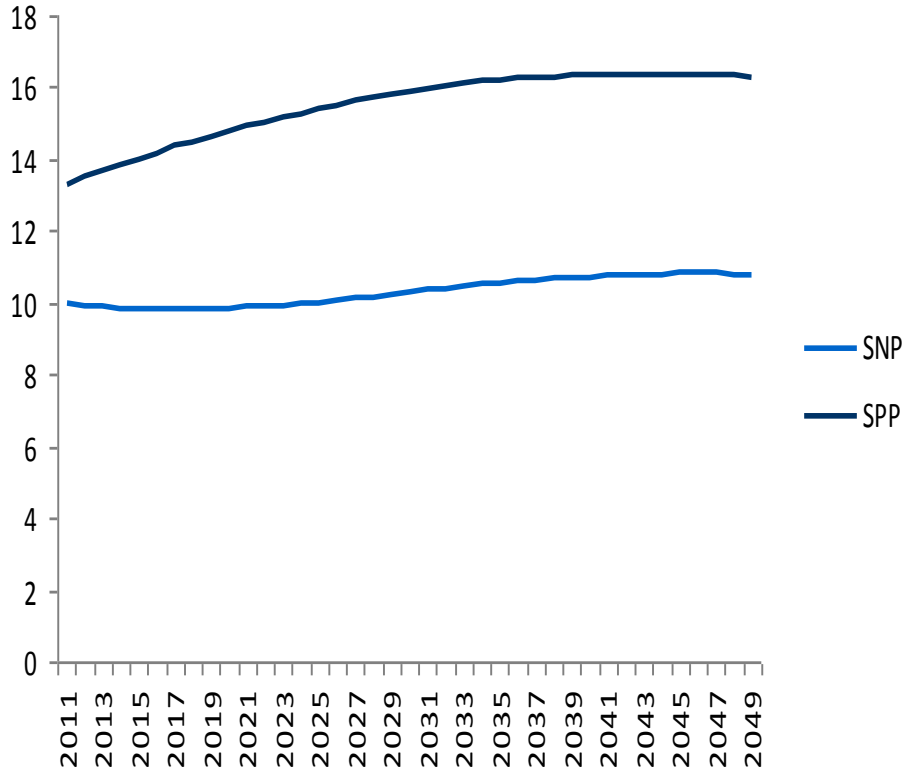


Forecasting coverage ratios

Number of contributors

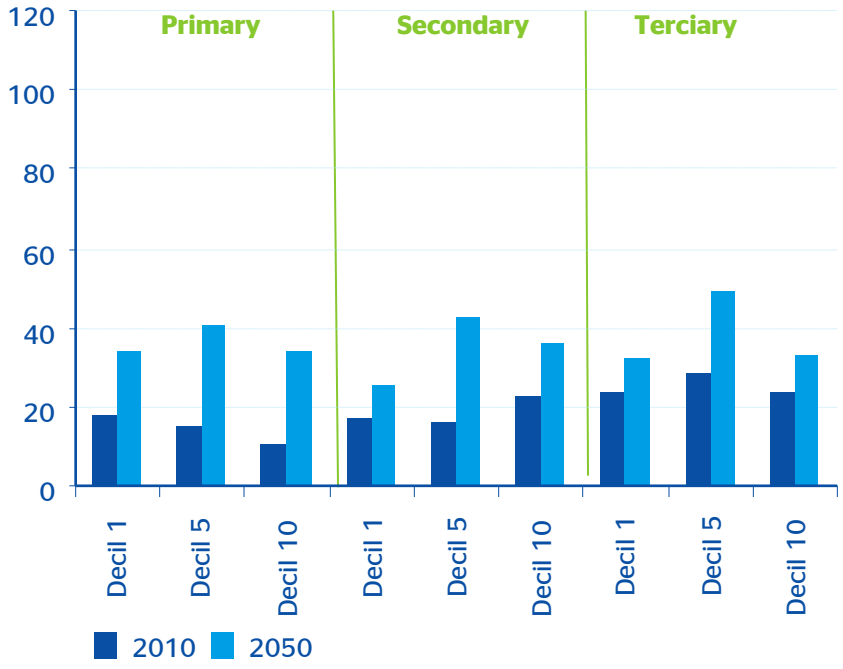


Contributors (Regular) as % of Labor force

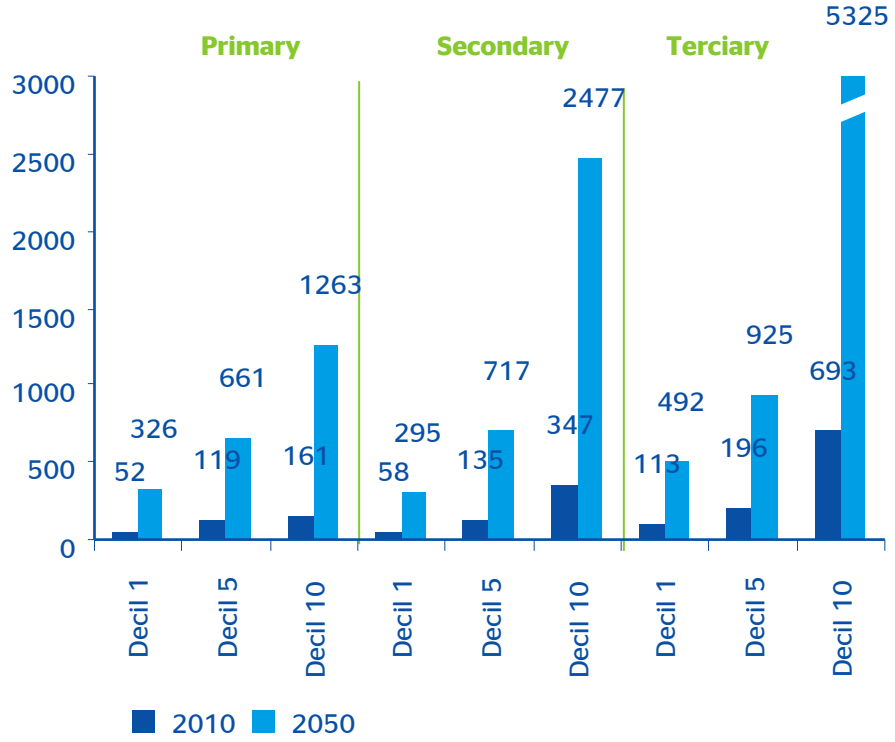


DC Replacement rates-forecasts

DC Replacement Rates. Men
Without Bonds (%)



DC- Pensions – Men
Without bonds (Soles 2010)



Contents

1. The starting point
2. Main aspects of the model
3. What do we see in the following decades?
4. **The 2012 Peruvian pension reform**
5. Final comments

2012 Pension Reform

- Basically **focused on reforming the private component (c**urrent **political economy** dynamics)
- **Fees regulation** has got the **most relevant focus** in the reform, by introducing a **gradual shift to an AUM base** and an **auction process scheme**
- Interesting approach to the problem of low coverage:
  - **Social Pension System** for **micro enterprise** workers: (i) matching contribution scheme; (ii) the **government matches till 4%** of **minimum salary** for workers who gain less of 1,5 times the minimum salary
  - **Mandatory contribution for self workers**: (i) **gradual contribution** till 1,5 times the minimum wage and (ii) **general contribution rate** applies for **higher income** workers
- **Institutional** approach for future contribution rate changes ("**pensional rule**"): (i) periodical **assessment process to modify the contribution rate** (according to life expectancy, returns and contribution density); (ii) performed by an **independent** organization **every 7 years**

2012 Pension Reform: things to follow up

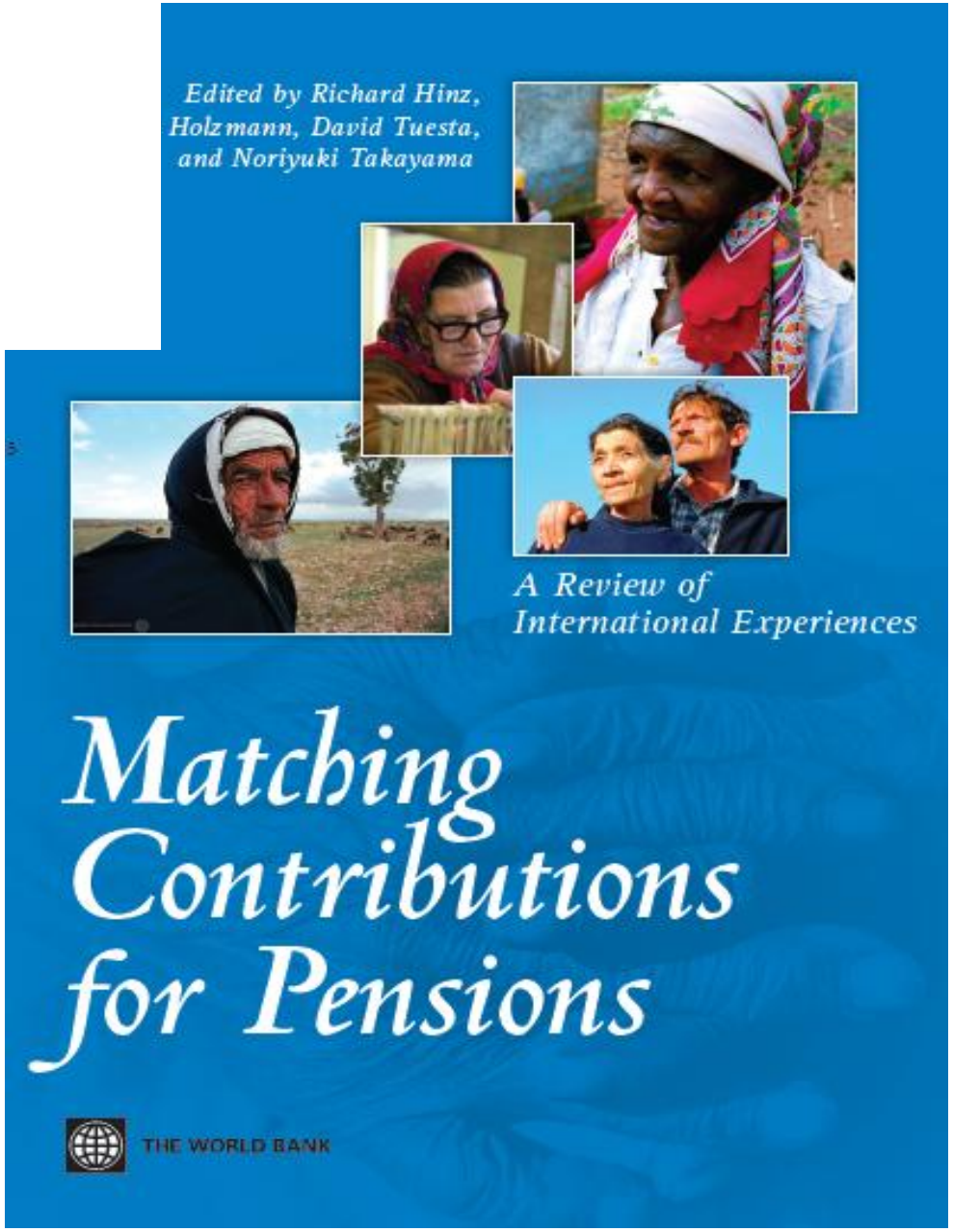
- The **success** of the **Social Pension System** will depend on key factors: **(i) how strong is the incentive** for the worker to contribute (there is not a previous pilot program to assess this); **(ii)** what are the **incentives for employer** to accept workers decision to contribute; **(iii) operational aspects** (formal requirements) for employers, employees and government (**how easy it will be to contribute**?); **(iv) Priority and dissemination programs** (launch of the new scheme, program dissemination, training and information, contact points for an extremely sparse population)
- Similar challenges for **self employed mandatory contribution**, in terms of **incentives** and **enforcement**
- It is **important to tackle structural problems** that affect the presence of the third highest **informal economy** in the world (World Bank, 2011). A pension reform needs to be accompanied with important structural reforms in the **labor markets** and in the **institutional** side
- **Pending**: it is necessary to tackle in the near future the problem of the **distortions** generated by the **coexistence of public DB scheme and the private DC scheme**. A closure of the public DB system? Perhaps, it is better to have a **public system more focused on solidarity objectives** (non contributory pensions for the most needed)

Contents

1. The starting point
2. Main aspects of the model
3. What do we see in the following decades?
4. The 2012 Peruvian pension reform
5. **Final comments**

A long way to go

- The results of the **model show a big challenge in terms of** for **pension participation**. Although there is a **relative improvement in participation**, as a consequence of the coming up of **more educated generations**, the **results continue to be very low**
- For better results it is required to implement a **two step solution**: **(i)** first to introduce adequate pension **reforms that encourage participation and a better operational functioning** (that helps contributors, employers and government to obey the law; **(ii)** to continue spurring **more structural reforms** that reduce the problem of the informal economy
- In this regard, the **2012 pension reform is in the right way** but this is dealing solely with one side of the problem. **The second step, focused on more structural reforms, is needed**
- Regarding this issue, the performance of the new **Social Pension System** and the **mandatory requirement for self worker contributions** will depend on how the law tackles the main conditionals **to make stronger the incentives to contribute**
- It is important to consider in future provisions how to reduce the current **distortions generated by the coexistence of a private DC pension fund and a public DB pension fund**, as well as, the importance to **provide an adequate non contributory pillar focused on the most needed**


Edited by Richard Hinz,
Holzmann, David Tuesta,
and Noriyuki Takayama
A Review of
International Experiences
Matching
Contributions
for Pensions
THE WORLD BANK

Thank you

david.tuesta@bbva.com
www.bbvaresearch.com

Basic equations (1)

Enrolled workers ($AFIL^{t}_{s,y,e}$) and **contributors** ($COTIZ^{t}_{s,y,e}$).

$$AFIL^{t}_{s,y,e} = PEACU^{t}_{s,y,e} \times Tafil^{t}_{s,y,e}$$

$$COTIZ^{t}_{s,y,e} = AFIL^{t}_{s,y,e} \times Tcotiz^{t}_{s,y,e}$$

Where $AFIL^{t}_{s,y,e}$ are the **enrolled workers** in an specific year (t) and according to gender (s), age (y) and educational attainment (e). $PEACU^{t}_{s,y,e}$ is the **PEA pyramid** distributed by the likelihood of obtaining an **specific educational level** (primary, secondary, tertiary); $Tafil^{t}_{s,y,e}$ is the **likelihood to be enrolled** in the system; $COTIZ^{t}_{s,y,e}$ are those who **contribute regularly**; and $Tcotiz^{t}_{s,y,e}$ is the **likelihood to contribute regularly**

These equation structures are repeated according to the likelihood to be enrolled and contributing to the DB public pension system (**SNP**) or the DC private pension system (**SPP**), and the likelihood to receive a **Recognition Bond** or not

One important feature of the model is that it assumes that **successive generations who get enrolled** in the pension system will achieve the **same educational attainment of those who are now 25 years old**, following similar profiles of participation

Basic equations (2)

Pension calculation depends on contributing to **SPP** or **SNP**.

In the case of **SPP**, the model needs to calculate for each representative the **total contributions to the system** ($APORRCB^{t}_{s,y,e,l}$), the **total balance** ($SALDORCB^{t}_{s,y,e,l}$) and the **number of retired workers getting a pension (** $ALTASPP^{t}_{s,y,e,l}$ **).** All this for an specific year (t) and according to gender (s), age (y) and educational attainment (e), income decile (r) and labor condition (l)

$$\left(APORRCB^{t}_{s,y,e,l}\right) = CSPPCB^{t}_{s,y,e,l} \times W^{t}_{s,y,e,l} \times DCOT^{t}_{s,y,e,l}\left(pdep^{t}_{s,y,e,l}, pind^{t}_{s,y,e,l}, ppar^{t}_{s,y,e,l}\right) \times ta$$

Basic equations (3)

Where $APORRCB^{t}_{s,y,e,l}$ are the **total regular contributions;** $CSPPCB^{t}_{s,y,e,l}$ are those who **contribute regularly to SPP**, $W^{t}_{s,y,e,l}$ is the **salary**, $DCOT^{t}_{s,y,e,l}(pdep^{t}_{s,y,e,l}, pind^{t}_{s,y,e,l}, ppar^{t}_{s,y,e,l})$ is the **contribution density** depending of the likelihood to be self employed, salaried worker or unemployed; and ta is the **contribution rate**

$$\left(SALDORCB^{t}_{s,y,e,l}\right) = SALDORCB^{t-1}_{s,y,e,l} \times (1+i) + APORRCB^{t}_{s,y,e,l}$$

Where $SALDORCB^{t}_{s,y,e,l}$ is the **total balance** and i is the system rate of return

$$ALTASPP^{t}_{s,y,e,l} = COTIZSPP^{t}_{s,y,e,l} * Raltspp^{t}_{s,y}$$

Where $ALTASPP^{t}_{s,y,e,l}$ are **those who get retired**; and $Raltspp^{t}_{s,y}$ is the **likelihood that a contributor get retired**

All this information is then incorporated in a **typical formula for calculating annuities**. **SNP pensions are calculated following the specific rules of a DB scheme**

Basic equations (3)

The dynamic and projections of the model relies on **demographic and labor force forecasts from CELADE**, the assumption of a **dynamic transition based on educational attainment** and a **macroeconomic scenario**. This is based on a **Solow's standard growth model**

$$Y(t) = A(t)K^{\alpha}(t)L(t)^{1-\alpha}$$

$$K_t = sY(t) + K_{t-1}(1-\delta)$$

The key element herein is to **find a function to update the salary to apply for the future generations**

.

Returns are assumed as exogenous

$$r_t K_t + w_t L_t = F(A, K, L)$$

$$w_t = \frac{F(A, K, L)}{L} - r\frac{K}{L}$$

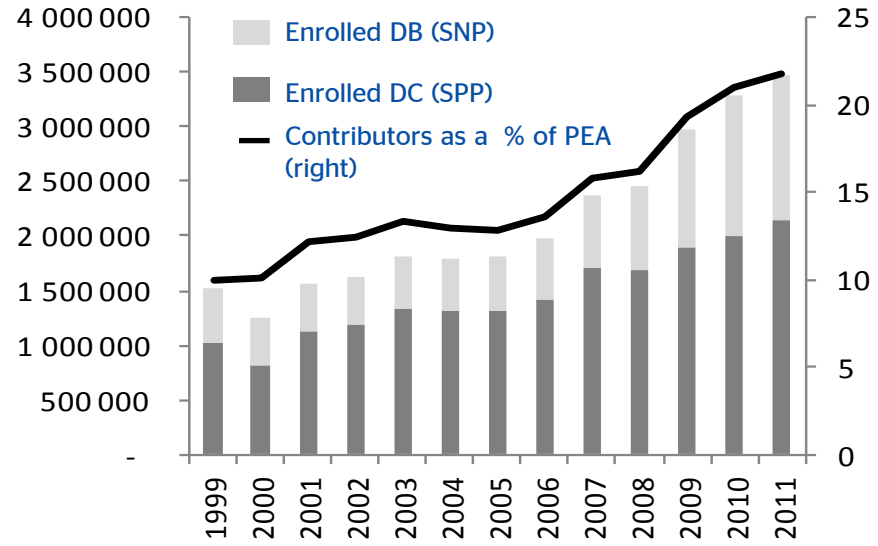
$$\Delta w = \frac{w_t - w_{t-1}}{w_t}$$

Low rates of pension participation

Pension labor participation

(Number of contributors and as a % of labor force)

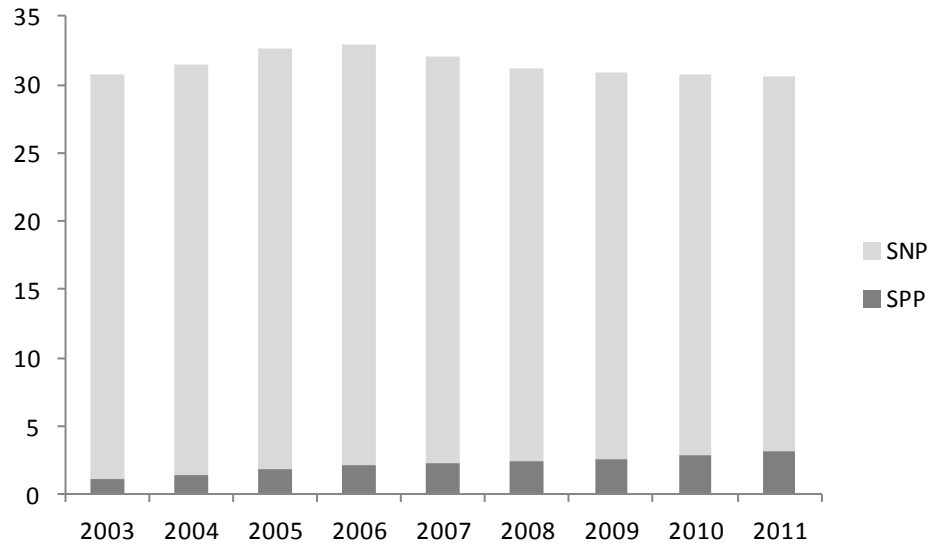
Source: SBS, ONP



Old age coverage

(Nº of retired workers as a % of people older than 65 y)

Source: SBS, ONP

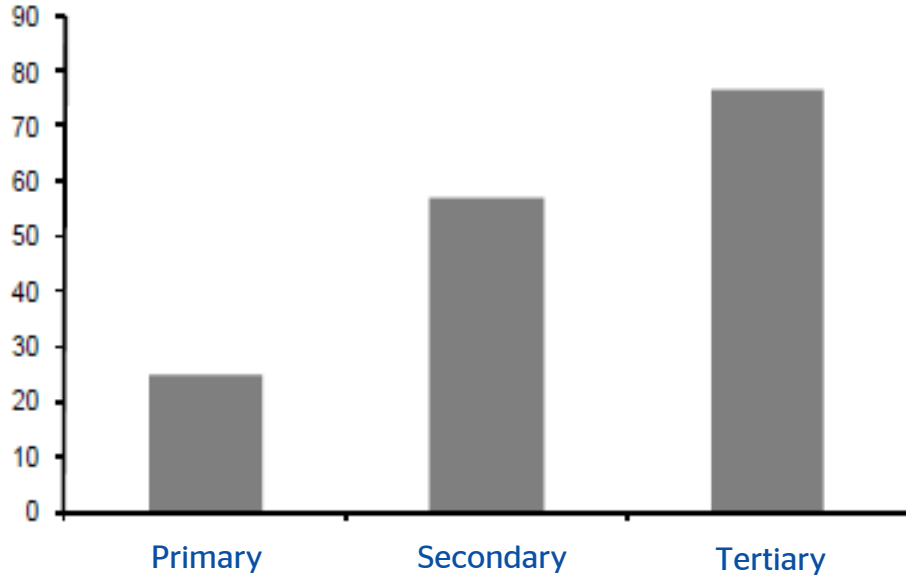


- The number of **contributors** to the pension system has been increasing close to **3,5 million (enrolled workers are 7,4 million).** It represents **22% as a percentage of the labor force**.
- During the **last 5 years** we have been observing an **steeper slope** on pension participation
- **Old age coverage** is **low but higher than pension labor participation**, explained in part by the **still reduced population of people older than 65** years old, something that is going **to change dramatically** in **coming years** as part of the **longevity process**

Old age coverage according to socioeconomic conditions-2010

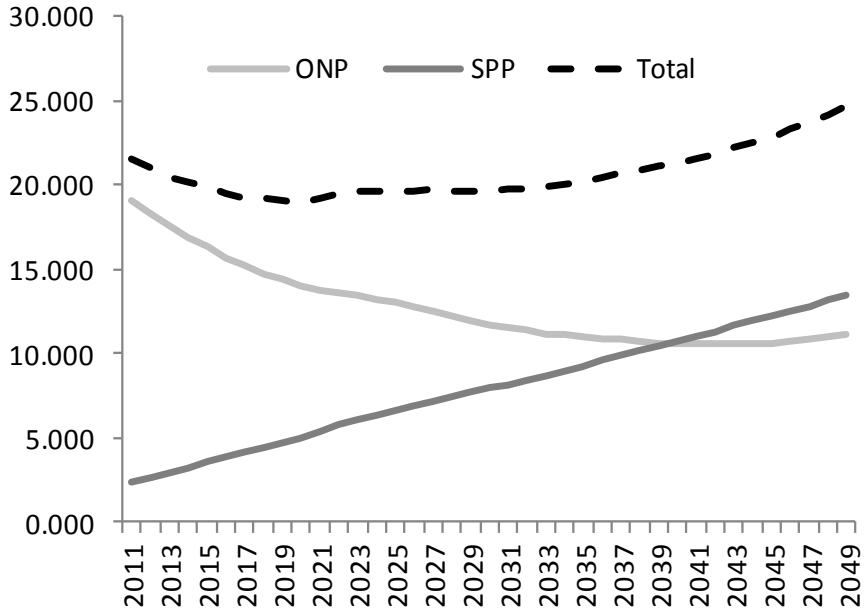
Old age coverage - Men

(pensioners as a % of older than 65y)



Old age coverage

(as a % of population older than 65 y)



A pension system with many challenges

- **Socioeconomic** factors affect the way **workers contribute** to the pension system. Conditioned to structural conditions/failures.
- (i) Higher **income**, (ii) longer **working careers**, (iii) **salaried** type contracts and (iv) **educational attainment** affect contribution density and **pension participation**.
- H**igher educational attainment of Peruvian younger generations** will impact on **more participation in the long term**. **But labor coverage will continue to be low.**
- **Future Replacement rates** will be affected by a (ii) downward trend scenario for rate of returns; (ii) higher life expectancy; (iii) contribution rate
- **Parametric adjustments?**