Measuring the coverage gap

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1. Introduction

The inability of most pension systems to reach significant swaths of the population in developing countries is currently recognized as one of their main flaws (Gill, et al 2003; Holzmann and Hinz, 2005). As a reflection of this concern, the World Bank has devoted considerable efforts in recent years to the measurement of coverage around the world, gathering data, checking its quality and designing appropriate indicators (Palacios and Pallares-Miralles, 2000; Rofman and Lucchetti, 2006; among others). Measurement is important not only to raise awareness about the coverage issue, but also to improve the diagnostic and the design of policy options. Building stronger information systems within the pension schemes will not only contribute to improve the diagnostics of the incomplete coverage; it will also be part of the solution.

The literature has used different data sources to measure coverage. Household surveys and data provided by the social security administrations are the most common sources. While most statistical institutes currently provide the micro data of the surveys (i.e. information corresponding to each individual in the sample), the administrative data is mostly provided at the aggregate level. Only in recent years, a few social security administrations have begun to provide micro data from work history records.

Data can be characterized also by the number of times each individual is interviewed. It is cross sectional if there is one observation by individual and longitudinal if there are two or more observations by individual. Most surveys only interview persons once and contain only contemporary information. Other surveys interview the same person more than once. Work history records of the social security administrations are longitudinal data sets.

The literature has used different methods to measure the coverage of pension systems as well. The choice of methodology is often dictated by data. With aggregate data, the percentage of the population covered is a natural indicator. Working with cross section micro data sets, coverage is usually measured using a binary variable that takes value one for individuals that are covered and zero for those who are uncovered. This variable has been used to estimate the probability that an individual has to contribute. Longitudinal data has allowed researchers to compute the

percentage of time that each individual is covered, an indicator that has come to be known as the "density of contributions". More recently, this type of data has been used to analyze the dynamics of coverage, looking at the transitions between contributing and not contributing.

We describe and assess alternative data sources and methods to measure coverage in sections 2 and 3. In section 4, we summarize the main empirical findings. These sections draw extensively on results in Rofman and Lucchetti (2006), Bucheli, Forteza and Rossi (2007) and Pallares-Miralles (2008). We conclude in section 5, with an assessment of the main challenges.

2. Data sources

There are two main sources of information that can be used to measure coverage: (i) administrative data, and (ii) household surveys. Both have some advantages, as well as some disadvantages. One of the main advantages of using administrative data to compute coverage is that it is the same information that administrations use to manage the system. Unlike survey data, administrative data does not rely on surveys respondents recall or understanding of their current status in social security, but on their true status according to the administration. Some administrative data, usually aggregate data, is easy to collect from annual reports or other institutional documents. For example, most pension agencies and social security institutions release annual data on membership, which can be used to monitoring coverage trends over time.

On the downside, administrative records usually do not provide detailed information about socio-demographic characteristics of the population. In addition, records may have some problems of availability and quality. In countries with multiple pension systems, it is common that records are readily available for the largest national schemes, but less accessible for smaller schemes. In countries where pension systems are very fragmented accessing all the data is even more complicated. Once the data from several schemes has been collected, there may be problems of aggregation due to the overlap of beneficiaries. The quality of the information provided by social security administrations is often an issue. Many pension systems are affected by the existence of incorrect records or duplications.[1] Additional problems are corruption, evasion, and abuse of the pension systems which sometimes make the records quite unreliable.

Household surveys collect data that can be used to estimate coverage coupled with some socio-demographic and economic characteristics of the individuals. This additional information that is usually absent in administrative records is very important to characterize individuals who lack

[1] Too often the information provided in annual bulletins is not consistent with the individual records provided by statistical or actuarial departments in the same institution.

adequate coverage. However, a number of consistency and definition problems affect longitudinal and cross-national comparability. The problems arise from differences in coverage (some surveys are national, other are urban only), phrasing the questions (some surveys ask about affiliation in pension schemes, others about actual contributions; in some cases individuals are asked if they are pensioners, in others they are asked about sources of income, including pensions). In some cases, interviewed individuals are not representative of all individuals.

The estimations of coverage presented in this document are based on a variety of data sources. Much of the information was provided by national agencies and social security institutions. Other information was taken from household surveys. We also benefited from data collection efforts done by several international organizations.[2]

3. Methods

Once the data are available and reliable, there are still further limitations for measuring coverage. Those are the conceptual and methodological challenges. Very often, when discussing pension coverage, reference is made to those individuals who are receiving a pension or retirement benefit. But in earnings-related pension systems, it is also important to look at the phase in which individuals accrue pension rights.[3] More generally, we are interested in knowing to what extent people who have not yet reached the pensionable age will be entitled to a pension when they reach that age. The most serious conceptual and methodological problems arise when considering coverage among active workers, since the definition of this status is not always clear. However other problems also arise when trying to measure coverage of the elderly.

a) Coverage of the active population

The most common indicator of social security coverage before retirement is the percentage of the labor force that is contributing to a pension scheme. Several concepts have to be carefully considered to correctly measure coverage of the labor force, particularly when comparisons across countries and time are made. First, the *labor force* is not equally defined in all countries.

[2] ADB (Asian Development Bank), EUROSTAT, the International Labor Organization (ILO), the International Social Security Association (ISSA), and Social Security Administration of the US (SSA), the Organization for Economic Co-operation and Development (OECD), the IMF (International Monetary Fund), and WHO (World Health Organization).

[3] We prefer to talk about coverage of "earnings-related pension systems" rather than "contributory pension systems", because various schemes in the world are non contributory but still workers accrue rights depending on earnings. This is relatively common among civil servants and some specific professions.

Some do not include rural areas; 'family workers' may or may not be included; the unemployed not looking for work are not computed as part of the labor force in most countries, but they are included in some countries; there are also differences in age limits used in measuring the economically active population; differences in the treatment of emigrants[4]; and certainly different ways of defining "informal labor force".

Second, the numerator in the coverage index can be the number of *affiliates*, *contributors* or *active members*. *Affiliates* are those individuals enrolled in pension institutions, even if they are not currently contributing and/or accruing pension rights. *Contributors* are individuals who are actively contributing to the system. *Active members* are individuals who are accruing pension rights while they work, even if they do not contribute. The estimation of coverage varies widely depending on the concept used.

The main reason to use the number of *affiliates* to compute coverage of the labor force is that this information is usually readily available. Even those pension systems with the most deficient administrations are generally capable of estimating the number of workers enrolled. However, this indicator poses serious problems, since many individuals enrolled in the systems are not actually eligible to receive benefits. Many, if not most, of the social security institutions in developing countries have "dormant accounts" of workers who at some point contributed to the system, but who are not currently doing so because they are unemployed, inactive or joined the informal sector. The records of pension institutions also tend to exaggerate the number of actual affiliates, as erroneous or duplicate records are rarely corrected. One phenomenon very often observed, particularly in developing countries, is the high mobility of the individuals among different status of non-activity (unemployment, informal employment, and formal employment). The bottom line is that many social security institutions have in their records individuals that will never receive a pension. Using number of affiliates to measure coverage may consequently be very misleading.

Several authors use the number of current *contributors* rather than *affiliates*, to avoid the overestimation that may arise when the number of *affiliates* is used. However, some pension schemes do not require contributions to recognize pension rights. In these cases, a measure of coverage based on contributors might underestimate the total number of workers protected by the scheme. This problem can be overcome using the number of *active members* to compute coverage of the labor force. This definition includes both contributors and those among the non-contributors who are nevertheless accruing pension rights in an earnings-related pension scheme.

[4] In countries with high percentage of emigrant workers the coverage rate (defined as percentage of labor force) varies enormously depending on whether emigrants are included in the labor force.

As an indicator of social protection of individuals who have not reached the pensionable age, the rate of coverage of the labor force has the obvious limitation that it does not provide information about the population that does not belong to the labor force. This population may be covered by non-contributory programs, informal networks or simply rely on their own savings, but the standard indicator of labor force participation in the social security system is silent about their status. Unfortunately, the available information about coverage of the non-elderly non-labor population is very limited. For this reason, we will follow the usual practice of focusing on coverage of the labor force.

Useful as they are, snapshot indicators like the rate of coverage of the labor force do not suffice to characterize incomplete coverage of the active population because they do not capture the dynamics of this phenomenon. Being covered is usually a temporary status among the active population. Individuals do not contribute all along their adult life either because they are not active all the time or because they are unemployed, working in uncovered jobs or evading contributions. Pension entitlements depend on the histories of contribution rather than on the contribution status in a specific moment.

Two approaches have been used in the literature to describe and analyze the individual histories of contribution. The first one looks at the proportion of time that individuals spend contributing. This is called the "density of contribution", which is a direct estimator of the probability of contributing. Indirect estimators can be drawn from econometric models in which the probability of contributing can be computed from the observed patterns of the contribution status.

The second approach looks at the probabilities of making transitions between states. The statistical literature known as survival analysis offers several methods to estimate these probabilities. One possibility is to compute the rates of transition directly as the proportion of individuals in the state that make a transition in each period.[5] It is also possible to fit parametric statistical models of the probability of making a transition.

b) Coverage of the elderly

As earlier mentioned, measuring coverage of the elderly poses fewer difficulties than measuring coverage for the economically active population, since instead of measuring the accrual of rights

[5] The Kaplan-Meier estimation is an example of this non-parametric approach.

to a potential benefit, the indicators are based on the number of individuals actually receiving benefits. However, this measure has some limitations as well. For instance, some elderly individuals may qualify for retirement benefits but prefer to continue working. Others may not want to apply for a retirement benefit for which they are entitled because they have enough alternative resources. Some authors might argue that spouses or dependent relatives of benefit recipients should be included as "covered". Others might include only the recipients.

The following main concepts have to be carefully considered when measuring coverage of the elderly, particularly when doing comparisons across countries and time. First, it is important to notice that there are different *types of beneficiaries.* Most of the mandatory pension programs in the world provide not only old-age pensions but also disability, survivorship, and even other type of pensions.[6]

Second, in various pension systems in the world individuals have the right to receive several pensions. In some cases the pensions are provided by the same institution, in others the individual can have pensions from various institutions. This fact complicates the measurement of coverage when using administrative records.

Third, some countries have non-contributory pension schemes. These are usually focused on the elderly needs and the benefits are assigned to all elderly (in universal models) or those who need assistance (in means-tested targeted models). Recipients of non-contributory pensions should be included as covered, but in various countries such information is not available or it is unclear.

Finally, some pension systems in the world only provide lump-sum payments. Some authors argue that beneficiaries of these payments are covered, while others argue that only recipients of regular payments should be considered as covered. Our preferred definition of coverage of the elderly includes those individuals that are regularly receiving a pension because lump-sum payments do not exactly provide old-age income security since individuals tend to spend these lump-sum transfers too fast.

We are interested in knowing the percentage of the population above certain age who are receiving pensions. This indicator can usually be computed from household surveys. Administrative data is often less useful because the number of beneficiaries is not usually provided by age. It is always possible to measure coverage of the elderly dividing the total number of beneficiaries by the number of people above a certain age, but this could be

[6] In many countries other pensions are provided by the same pension scheme to parents, siblings, unmarried daughters and others.

misleading because many beneficiaries are not really elderly. Indeed, the variation of ages among disabled and survivors is very wide and even in the case of old-age pensions there could be significant numbers of relatively young beneficiaries because of early retirement.

When using "administrative data" as the main source to measure coverage of the elderly, careful consideration should also be given to various factors that might lead to an overestimation of the coverage rates. In some cases, for instance, pensions are being paid to people who have emigrated from the country and are thus not included in the population base. Also some social security administrations do not receive an automatic notification when a pensioner dies. Fraud, intentional or through error, may also contribute to the overestimation of elderly coverage.

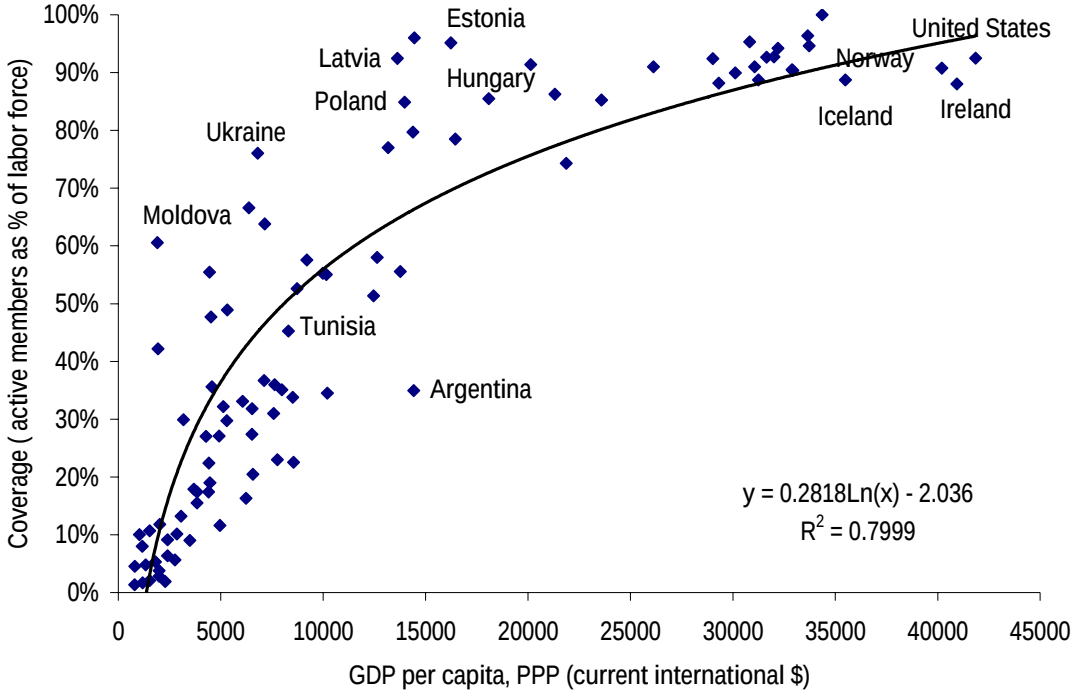
4. Results/discussion

a) Coverage of the labor force

About 25 percent of the labor force is currently accruing pension rights in the world. This average hides plenty of variation both between and within countries. Countries with higher GDP per capita tend to have higher coverage of the labor force (Figure 1).[7] This relationship is probably capturing several factors; including better enforcement capacity in high income countries and higher capacity to contribute. Deviations from the line show the importance of countries' idiosyncrasies coming from history and political options. For example, former socialist countries have higher coverage than expected according to their per capita GDP.

[7] A simple regression of coverage on GDP per capita, as the one presented in Figure 1, explains as much as 80 percent of total variation in coverage across countries.

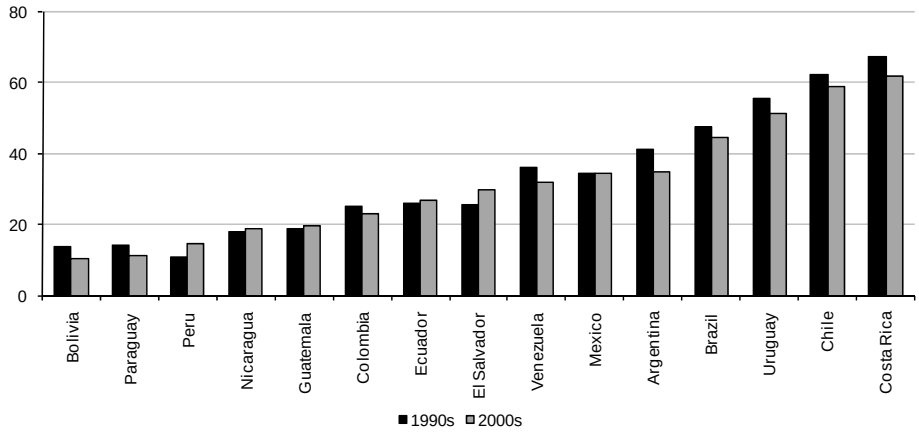
Figure 1: Relationship between coverage of the active population and GDP per capita



Source: "International patterns of pension provision II" , 2008.

Latin America is one of the regions in which more efforts have been devoted to the measurement and modeling of coverage (Rofman and Lucchetti 2006). It is not that the region has particularly low coverage rates. In fact, coverage of the labor force in Latin America is not very different from expected according to its income per capita. But this means that the labor force is only very partially protected in the region: nearly half of the countries have coverage rates below 30 percent (Figure 2). The long tradition of several of its social security institutions and the profound reforms that several countries implemented between the 80s and 2000s were not enough to overcome this situation. Furthermore, there are no general signs of improvement in recent years and some countries are actually reducing coverage.

Figure 2: Coverage Rates of the Economically Active Population in Latin America



Note: Argentina 1995 - 2004; Bolivia 1999 - 2002; Brasil 1995 - 2002; Chile 1996 - 2003; Colombia 1996 - 1999; Costa Rica 1995 - 2004; Ecuador 2000 - 2004; Guatemala 1998 - 2000; Mexico 1998 - 2002; Nicaragua 1998 - 2001; Paraguay 1999 - 2004; Peru 1999- 2003; El Salvador 1995 - 2003; Uruguay 1995 - 2004; Venezuela 1995 - 2004.

Source: Rofman and Lucchetti (2006).

Coverage is naturally higher among the employed than among the active population as a whole, but significant swaths of the employed remain unprotected in Latin America. Salaried workers have much higher coverage rates than the self employed. In turn, salaried workers working in small firms exhibit much lower coverage rates than workers working in large firms. And again, recent trends show no improvement and even some decline of coverage among the unemployed, the self employed and salaried workers in small firms.

Coverage of the labor force varies widely depending on the sector of activity. Agriculture and construction often show comparatively low coverage rates in Latin America. While manufacturing traditionally presented comparatively high rates of coverage, there have been steady declines in recent years in most countries. Not surprisingly, the public sector shows higher rates of coverage than the private sector and yet, in Argentina, Bolivia and Peru, less than 80 percent of public sector workers are covered by social security.

Particularly worrisome is the fact that in Latin America coverage is especially low among the less educated and among low income workers. These coverage gaps tend to be larger in countries with lower average coverage.

Incomplete coverage seems to be associated with highly fragmented histories of contribution. Because of this, a significant proportion of workers may not accumulate the required number of years of contribution to access to benefits. Berstein, Larrain and Pino (2006) estimate that most of the contributors to the Chilean pension system who do not accumulate funds enough to self-finance a pension above the minimum pension guarantee will not comply with the twenty years of contribution required to access to this benefit. Indeed, about half of the retirees will not get a pension above the minimum, but only about two percent will be eligible for the guarantee. This study challenged the previously dominant view that many workers would be receiving the minimum pension guarantee because of insufficient accumulation in their savings accounts. This important result contributed to the design of the reform that was passed by the Chilean parliament in January 2008 and that, among other things, eliminated the requisite of having contributed twenty years to access to pension subsidies.

Bucheli, Forteza and Rossi (2007) report some distinctive patterns of the transitions between contributing and not contributing to the main social security program in Uruguay. First, the transition rates decline with duration in any of the two states. In other words, the chances of remaining contributing rise as individuals spend time contributing, but also the chances of staying out of the system rise as individuals spend time not contributing. Therefore, history and luck during the first periods seem to be crucial for the fate of the working career. Second, low income workers face higher risk of stopping contribution and lower chances of starting contribution than high income workers. This is consistent with the lower density of contributions observed among low income workers. Third, young workers are more mobile than mature workers. They face higher risk of leaving the state contributing but also of leaving the state not contributing. Third, economic downturns raise the risk that private workers stop contributing and reduce the chances that they start contributing.

Using the estimated transition rates, Bucheli, Forteza and Rossi (2007) project that only 25 percent of contributors to the main pension scheme of Uruguay will comply with the 35 years of contribution that are required to access to an ordinary pension at the normal retirement age. The risk of not satisfying this requisite is higher the lower is the worker's income. For example, a man working in the private sector has almost 68 percent chance of reaching the 35 years of contribution at 60 years if he belongs to the richest quintile, but less than 1 percent chance if he belongs to the poorest quintile. These gloom projections seem to be at odds with the currently high proportion of elderly receiving pensions in Uruguay, but the limited ability of the administration to enforce the eligibility conditions explains the puzzle. Lacking work history records, the social security administration is in a weak position to enforce the 35 years of contribution. However, this condition is likely to become increasingly binding in the coming

years as the social security administration began to keep records of contributions in 1996. The results in this study have become an important input in the social security dialogue that the government launched in 2007 to assess options for reform.

b) Coverage of the elderly

Less than 20 percent of the elderly in the world are covered by pensions. Coverage varies widely across countries (Figure 3). Low income countries tend to have lower coverage rates than middle and high income countries (Figure 4). This is true not only for contributory but also for non-contributory pensions. In fact, many low income countries do not even have social pensions (Figure 5).

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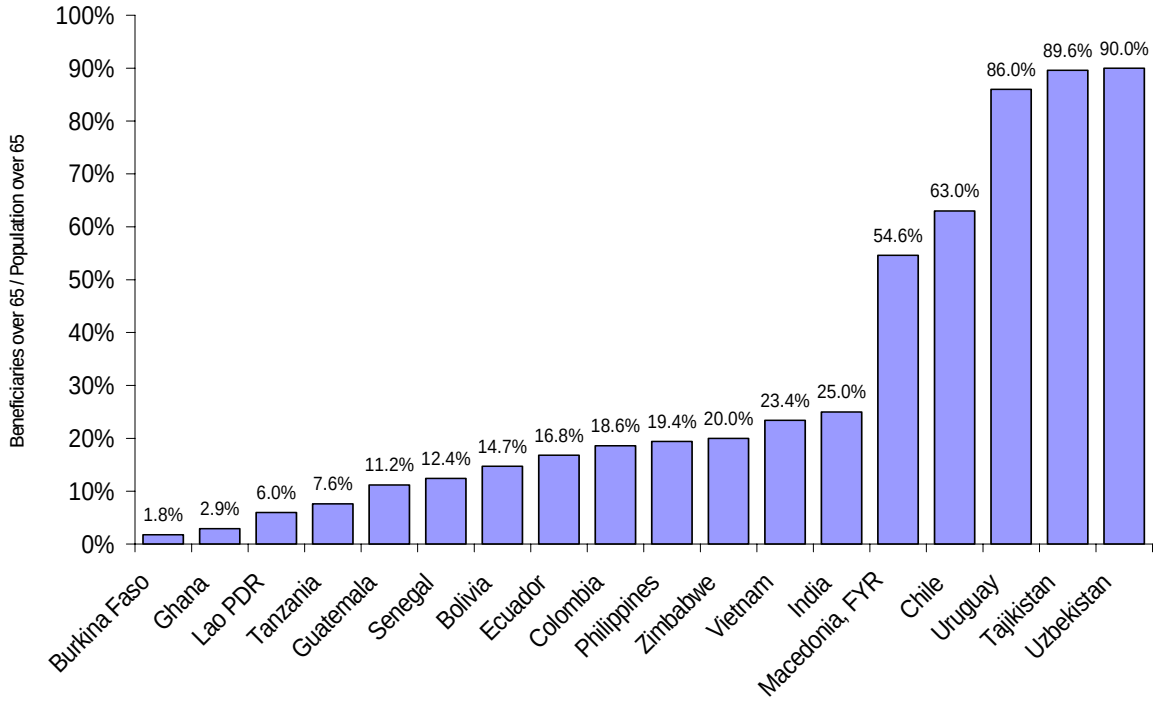
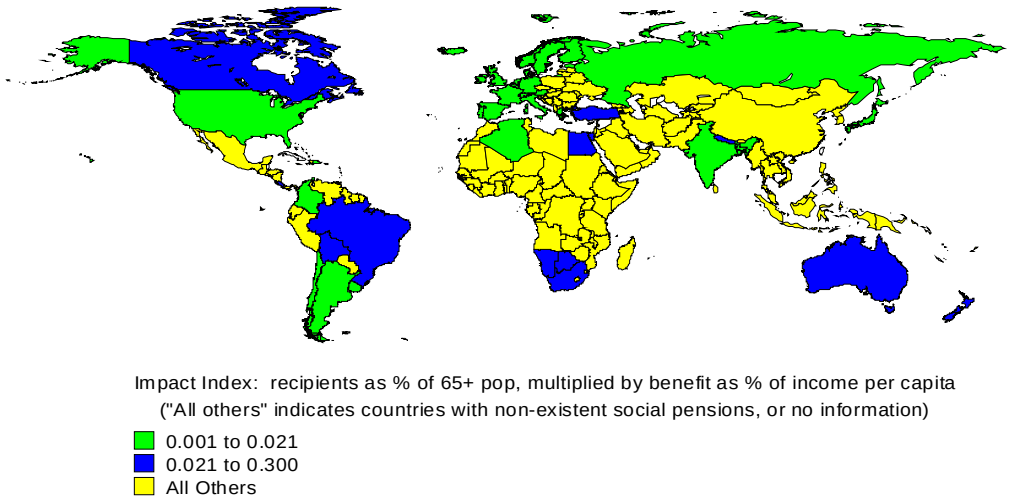
Figure 3 Percentage of population over 65 receiving benefits



Source: "International patterns of pension provision II" , 2008

Figure 4 Relationship between coverage of the elderly and GDP per capita (to be added soon ..)..

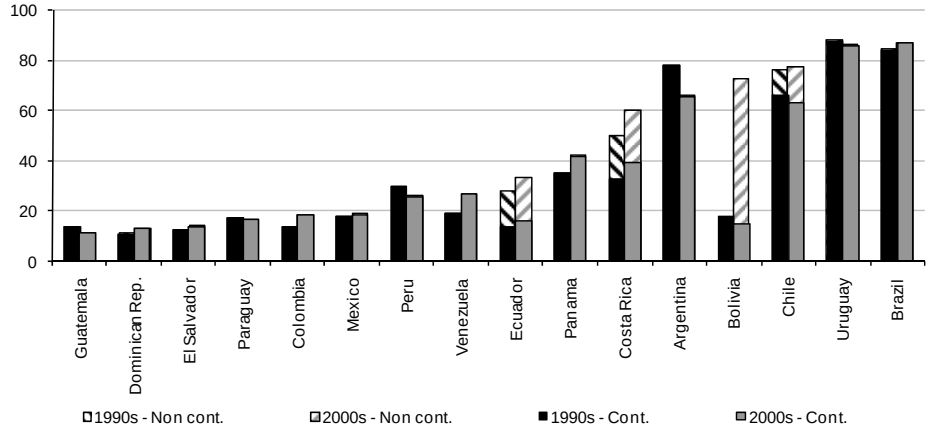
Figure 5 Social pensions in the world



Source:

About 55 percent of the population aged 65 and above are receiving a pension in Latin America. There is much heterogeneity in the region, with rates of elderly coverage ranging from about 15 percent in Guatemala to more than 80 percent in Brazil and Uruguay (Figure 6). Rofman and Lucchetti (2006) classify countries in three groups according to the protection they provide to income in old age: (i) those that offer low protection to everyone (Guatemala, Dominican Republic, El Salvador, Ecuador, Paraguay, and Mexico), (ii) those that protect mainly the rich (Colombia, Peru, Venezuela, and Panama), and (iii) those that protect fairly everyone (Costa Rica, Argentina, Bolivia, Chile, Uruguay, and Brazil).

Figure 6 Coverage Rates of the Elderly in Latin America and the Caribbean



Note: Argentina 1995 - 2004; Bolivia 1996 - 2002; Brasil 1995 - 2002; Chile 1996 - 2003; Colombia 1995 - 1999; Costa Rica 1995 - 2004; Ecuador 2000 - 2004; Guatemala 1998 - 2000; Mexico 1996 - 2002; Nicaragua 19998 - 2001; Panama 1995 - 2003; Paraguay 1999 - 2004; Peru 1998- 2002; El Salvador 1997 - 2003; Uruguay 1995 - 2004; Venezuela 1995 - 2004.

Source: Rofman and Lucchetti (2006).

In most countries in Latin America, elderly coverage tends to increase with income per capita and with the education level. The most vulnerable groups are often barely covered. Furthermore, a decline in coverage among the poorest groups seems to be taking place in recent years. As a result, some of the countries that currently protect most of the population seem to be moving to protect only the rich. The coverage rates tend to increase with age and the gap in coverage between age groups is increasing over time in countries with larger coverage. As expected, most beneficiaries are urban residents and coverage is much lower in rural than in urban areas. Women tend to have lower coverage rates: in many countries, coverage rates for elderly men are twice as large as those for elderly women.

Over the last decade, there have been no clear signs of improvement in most countries in Latin America and in a few countries there has been a decline in the proportion of elderly covered. Bolivia is a remarkable exception, as the rate of coverage rose from less than 20 percent in mid 1990s to more than 70 percent in mid 2000s due to the introduction of a non-contributory pension (see box 1).[8]

Box 1: A few countries managed to expand social security coverage in old age…

Bolivia introduced a structural reform of its pension scheme in 1996. The traditional PAYG

[8] Non-contributory pensions have a significant impact on total pension coverage of the elderly in at least some countries in the region. Only in Bolivia, Ecuador, Chile, and Costa Rica the household surveys distinguish between contributory and non-contributory pensions. In these cases, non-contributory pensions represent 58, 17, 14, and 21 percent of the elderly respectively.

program was closed, and all active workers were transferred to a newly created savings account system. One of the most original ingredients of this reform was the introduction of a universal basic pension to be paid to all citizens aged 65 and above. This new basic pension, called "Bonosol", was non-contributory but it was nevertheless supposed to be fully funded. The government transferred part of the stock of the privatized public enterprises to finance the system. When the program was launched, this fund was estimated to be 22 percent of annual GDP. The program paid a pension that by that time was US$ 250 per year.

The Bonosol presented several weaknesses from its inception. One problem was that the dividends were not enough to pay the pensions that had been promised. Because of this, in 1998 the benefit was drastically reduced to about a quarter of its original value. The original benefit was reinstalled in 2002 and part of the Bonosol began to be paid with savings accumulated in the individual accounts. Sustainability is therefore a key issue in this program. A second problem of the Bonosol was with the identification of beneficiaries and fraud. While about 28 percent of the elderly reported in 2002 that they were not receiving the benefits they were entitled to, the number of beneficiaries reported by the administration was larger than the number of potential beneficiaries in the country (Rofman, 2005).

The Bonosol had a significant impact on pension coverage in old age. Rofman and Lucchetti (2006) show that coverage raised between the mid 1990s and 2000s by more than 50 percentage points. Unfortunately, the significant flaws in the implementation of the program may risk its sustainability or scope.

An example from another region to be added soon…

5. Conclusions

Pension systems are not currently reaching most of the vulnerable people in the world. Less than 20 percent of the elderly are covered and only about 25 percent of the labor force is contributing and/or accruing pension rights. On top of that, coverage of the active population tends to be lower the lower is the country's per capita GDP and, within countries, it tends to be lower among the less educated, who typically have lower earnings. Coverage of mandatory pension systems is particularly low in South Asia and Sub-Saharan Africa where less than 10 percent of the labor force is covered.

Many active workers who participate in contributory programs have significant interruptions in their spells of contribution. These workers often get bad deals from social security as they contribute several years, but not enough to receive full benefits. The situation is especially

worrisome as highly fragmented histories of contribution seem to be highly prevalent among low income workers.

There are no clear signs of improvement in most countries and there is some evidence of declining coverage in some regions and groups of the population. The former socialist countries are the clearest example: even though they still provide comparatively wide social protection, coverage has been steadily declining in recent years. In the nineties, some Latin American countries experienced reductions in coverage that went hand in hand with partial deregulations of labor markets and the expansion of self employment. It is also possible that in some countries, particularly those that only recently organized the work history records, the increasing ability of the administrations to control the fulfillment of the contributions requirements will leave many contributors with either a diminished or even no contributory pension.

Low coverage is indicative of significant institutional weaknesses. In most developing countries legal coverage is almost universal, but effective coverage is far from being so. The big gap between legal and effective coverage highlights the low capacity of the administrations to enforce social security laws. In this context, the pension system itself becomes informal and the rule of law is partially substituted by discretionary decisions. Weak information systems are usually key ingredients of informal pension systems.

One of the most significant and frequent information flaws in contributory pension schemes is the lack of records of contributions. With no records, the administrations cannot verify that the eligibility conditions are fulfilled or compute the accrued benefit. This has macro and micro implications. At the macro level, the estimation of the contingent liabilities of the pension system becomes highly uncertain. The government loses the capacity to adjust parameters on due time and the pension system generates macro instability. At the micro level, participants in the pension system do not know what benefit they are going to get. The system becomes unreliable. As the recent literature on “tax morale” shows, citizens are less willing to contribute when they feel that the system is unreliable and unfair. Therefore, weak information systems are likely to compound the low coverage problem.

References

Berstein, Solange, Guillermo Larraín, and Francisco Pino. 2006. "Chilean Pension Reform: Coverage Facts and Policy Alternatives." *Economía*, 6:2, pp. 227-79.

Bucheli, Marisa, Alvaro Forteza, and Ianina Rossi. 2007. "Work history and the access to contributory pensions. The case of Uruguay." dECON-UDELAR.

Gill, Indermit, Truman Packard, and Juan Yermo. 2003. *Keeping the Promise of Old Age Income Security in Latin America*. Washington: World Bank.

Holzmann, Robert and Richard Hinz. 2005. *Old Age Income Support in the 21st Century: an International Perspective on Pension Systems and Reform*: The World Bank.

Pallares-Miralles (2008)

Rofman, Rafael, 2005, El Sistema de Pensiones. Bolivia Policy Notes. The World Bank.

Rofman, Rafael and Leonardo Lucchetti. 2006. "Social Security in Latin America: Concepts and Measurements of Coverage." *Social Protection Discussion Papers*: Washington DC.