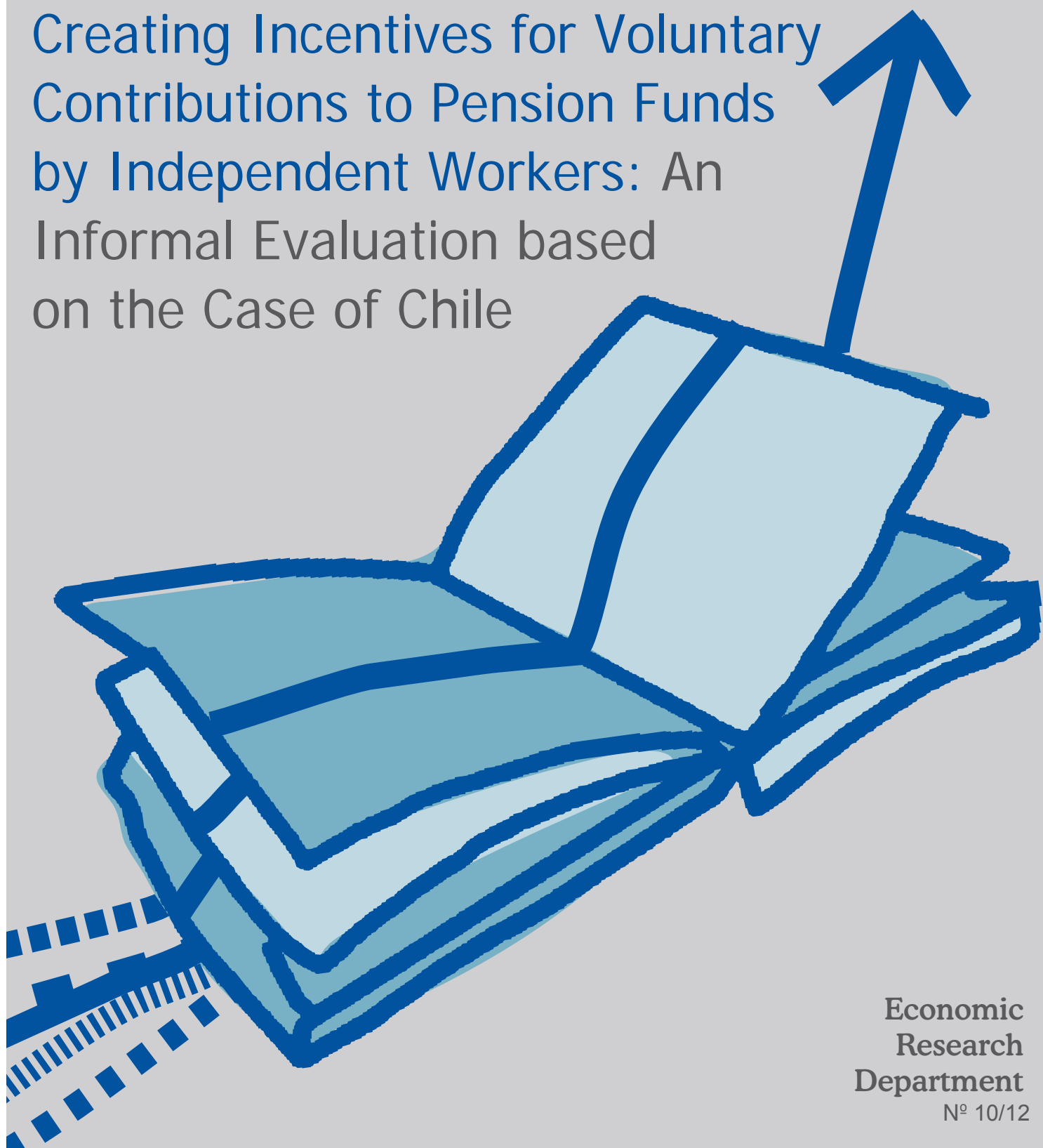**BBVA**

WORKING **Papers**

Creating Incentives for Voluntary
Contributions to Pension Funds
by Independent Workers: An
Informal Evaluation based
on the Case of Chile

Creating incentives for voluntary contributions to pension funds by independent workers: an informal evaluation based on the case of Chile[1,2]

Eduardo Fuentes Corripio [3]

Abstract

This study aims to establish the statistical probability that workers who are not contributing to pension funds might do so, provided with the right incentives to. Chile was used as a case study for this purpose. First, voluntary savings schemes were reviewed and compared with similar systems in the region. Based on this information, an analysis has been carried out on a number of surveys, focusing particularly on social protection, so as to examine the relationship the groups of non-contributing workers have to the systems, thereby determining what conditions might give them an incentive to save. A probit binary choice model has been used for this, as it obtains the probabilities of the different saving cohorts. With the results it is possible to conclude that workers will have grater incentive to save if it gives them access to education (in a broad sense), health services and housing. These results therefore present a challenge for the main actors in the industry (governments and pension fund managers) to explore the design of new retirement savings products associated with the benefits that the workers prefer, and thereby extending the coverage provided by the pension systems.

Introduction

One of the greatest problems facing the pension systems in Latin America is without doubt their low level of coverage. There has been much debate on the causes of this problem. Although some attribute the explanation to the design of private pension funds, research has made it increasingly clear that the core reasons are to be found in structural aspects of the countries involved. Indeed, elements such as the high level of informal workers, the rigidity of labor markets, low income levels, and high poverty levels end up becoming restrictive variables that give significant groups of workers serious difficulties with saving.

A number of alternatives have been sought to solve the problem. Among those most debated in various countries, and one which has been incorporated into the latest pension reform in Chile, is that which makes it mandatory for independent workers to contribute to funds. This initiative basically makes all these workers equal, irrespective of their employment conditions, with regard to the obligation of paying into the pension system. Nevertheless, the effectiveness of the regulation and its impact on the level of coverage of the system remains to be seen, given the structural restrictions mentioned above.

Another element to take into account is that within the non-contributing group of workers, mainly independent workers, there are a number of differentiating characteristics that suggest the enactment of measures that are strictly coercive may not have much impact. For example, Cardoso and Leiva (2007) identify a number of categories of independent workers. For instance, there are (i) *genuine independent* workers, whose activity yields income that is a mix of work and capital income, and who include small retailers, small farmers, taxi drivers, independent professionals, etc; (ii) *temporarily independent* workers, who are forced to engage in an activity as independent workers temporarily after losing their job as salaried workers; (iii) those "*temporary workers*", whose activities have a strong seasonal component, with sporadic contributions being made, and who include young people, the elderly and homemakers; (iv) "*workers with multiple jobs*" who are in the service industry, and work for various employers in the course of the week and (v) "*dependent workers using a fee system*" who maintain relationships with established companies.

Given this classification, it can be easily deduced that there are limits connected to the nature of working conditions that will make it difficult for the authorities to control and supervise contribution by these workers to the mandatory system. As can be seen on other occasions when states determine actions that have to be complied with by society, the most important factor for citizens to decide to observe legislation is a comparison of the benefits they can obtain given the costs involved. These benefits are the attractive aspects, signs, or economic incentives for workers to end up making the decision on a voluntary basis, in this case to contribute to a pension plan.

Given the above, it will be important to determine what factors will cause workers to decide to contribute voluntarily to the pension system, so as to enlist them for a long-term period of contribution and so that they may create a fund that will provide them with a pension. The identification of these incentive factors should be among the essential elements for the creation of a pension "product" that is attractive for these workers.

It has to be remembered that a significant group of workers who do not participate in the pension system do not enjoy the conditions necessary to save. This is normally due to their socioeconomic conditions (income level and family obligations among others), which prevent them from having the resources required to save. These resources are used instead for the consumption of goods and services that they consider necessary. However, upon analyzing the research, one finds that under certain circumstances it is possible to generate attitudes toward saving in the margin where pension funds may be seen as attractive for workers. This, as we shall see in the study, will depend on whether pension funds can become associated with savings schemes that may become part of these workers' basic needs, such as schemes geared to the education of family members, housing, and health services.

The study contains four sections: First, it reviews voluntary savings schemes, with special attention to the case of Chile, the country on which we focus our statistical experiments later in the study. In the second part, we offer a comparative informal evaluation of the various voluntary savings systems in other Latin American countries, particularly Colombia, Mexico and Peru. In the third research section we concentrate on the problem of independent workers and the difficulties involved with voluntary contributions. To this end we undertake analyzing them using surveys, taking into account their different socioeconomic characteristics. In the fourth section, the study is focused on reviewing the factors that could influence voluntary savings by independent workers. It includes an econometric estimate of these factors. The model used is a probit binary choice model, where the dependent variable will have a value of 1 if the independent worker contributes to the retirement system and 0 if he does not. This methodology makes it possible to identify the probability that certain variables will influence the workers' intention to save. Such variables could become elements to be considered in the design of pension funds. Finally, in conclusion, there is an overview of the principal lessons from the research.

1. The development of voluntary saving schemes in the Chilean pension system.

A wide-ranging structural reform of the existing pay-as-you-go pension system was enacted in Chile in 1981. The system introduced is based on obligatory defined contributions to individual capitalized accounts, which are administered by private sole-objective firms known as PFA (pension fund administrators). At the time of the reform, the system was made mandatory for salaried workers entering the labor market for the first time and voluntary for those participating in the old system as well as for independent workers. Those who opted to change to the individual capitalization system cannot return to the old system, so the latter is gradually being phased out.

Workers must contribute monthly around 10% of their salary (up to a maximum amount), which is deposited into their accounts. They also have to allocate an additional percentage of their gross income to cover the fees for the service provided by the Administrator and the Survival and Disability insurance (SIS) (the latter has been paid by the employer since 2009). The average value of the Administrator's fees in March 2010 was 1.64% of taxable income and 1.87% for the commission of SIS. At the end of his working life, the worker obtains a pension whose amount depends on how much has been accumulated into his individual capitalization account.

The system also had a joint contribution element, in which the government (using general revenues) guaranteed a minimum pension to those meeting certain requirements, the most important of which was proof of having made contributions for 240 months.

It is also possible to make voluntary contributions to the capitalization account over and above the mandatory contribution. The aim is that whoever wants to increase the amount of his pension or retire early may do so. The government provides tax incentives and, starting in 2009, financial assistance to incentivize these savings.

In this pension system, the government plays a subsidiary role. It oversees the proper operation of the system, which among other things includes paying in contributions to individual accounts, correct and timely payment of pensions, and compliance with the regulations on investments made by the funds.

In 2008, new structural reforms to the pension system were enacted. The main change was the incorporation of a non-contributory joint payment pillar funded from the country's general revenues. This pillar guarantees a decent pension to all individuals who cannot themselves pay the minimum established amount. The Chilean pension system was thus constructed on three pillars: pillar 1

(solidarity), pillar 2 (mandatory contribution), and pillar 3 (voluntary contribution).

Other important changes introduced by the last reform include making contributions mandatory for independent workers, putting up the Survival and Disability Insurance (SIS) to auction, and auctioning portfolios of new contributors.

1.1. Voluntary Pension Savings (APV)

Voluntary Pension Savings (APV) is a mechanism for making voluntary contributions to the individual capitalization account which exceed the mandatory contribution. The main aim of this type of savings is to improve future pension amounts. This third voluntary pillar is based on tax credits and incentives to stimulate savings by individuals so that they accumulate greater amounts in their individual accounts. It began at the same time as the individual capitalization system in 1981, although it did not take off until after the legal reforms of March 2002.

Decree DL 3500 regulates the Chilean pension system. Currently there are three types of APVs: agreed upon deposits, voluntary contributions, and the collective voluntary pension savings (APVC). There is also a form of voluntary savings that may be invested in one of five pension funds administered by the PFA (a maximum of two types of funds). However, this type of fund is not designed for retirement pensions and so is not a part of the pension funds or of the third pillar.

Agreed upon deposits are a method of unlimited savings that can only be withdrawn at retirement. The amount of the contributions is agreed between the employer and the worker and as they do not come from the worker's income they are no subject to taxation. This type of saving represents a tax benefit for the company as it is accepted as a necessary expense for the production of income, and it thus reduces the corporate income tax payable. The worker benefits because, as indicated, these contributions are tax free until the moment they are withdrawn; and because, as income on retirement is typically lower than during active life, the tax bracket applicable to this income is lower. In short, the government assistance consists of the lower tax paid by the individual while saving minus the tax paid on retirement (when he or she withdraws the savings).

Voluntary contributions are payments into the capitalization account that either dependent or independent workers may make. In this case, the worker makes the contribution and it is possible to make withdrawals during active life on payment of the corresponding tax and a penalty for early withdrawal that varies between 3% and 5%. There have tax benefits of up to UF 50 (Chilean unit of

account) monthly or UF 600 yearly. There are two types of this kind of APV. Participants may contribute using either option:

- **APV A**: This was introduced with the 2008 reform, and seeks to incentivize pillar 3 among the middle-income sector. The contribution is made once income tax is paid and the government grants an assistance amounting to 15% of the amount saved annually subject to a set limit. If the participant withdraws the funds instead of using them for retirement, the government subsidy is lost. This government contribution makes it possible to incentivize voluntary pension savings in sectors exempt from income tax or that pay a reduced marginal rate of tax, when other tax incentives are not sufficiently attractive.

- **APV B**: This is the classic form of voluntary pension saving, consisting of contributions that the worker discounts from his taxable income. Once retired, the participant may withdraw up to 1,200 UTM (Monthly Tax Unit) as a freely available excess (amount that is freely available tax-free) in amounts of up to 200 UTM per year, or make a single withdrawal of 800 UTM in one year. If after having withdrawn this amount, the participant makes further withdrawals from the APV he or she will have to pay a one-off tax at the time of withdrawal, corresponding to:

$$T = \frac{(TCM - TSM)}{M}$$

Where:
   T: one-off tax to be paid for the withdrawal made.
   TCM: amount of income tax that the individual would have to pay for his income level added to the amount withdrawn.
   TSM: amount of income tax that the individual would pay if no withdrawals were made.
   M: amount of the withdrawal.

   If the participant decides to withdraw from his APV before retirement, he or she will have to pay the one-off tax described above plus an early withdrawal penalty of between 3% and 5%. The penalty will depend on the income-tax bracket that the individual falls under at the time of making the withdrawal, as follows:

$$T = 0.03 + 1.1 * \frac{(TCM - TSM)}{M}$$

The collective voluntary pension savings scheme was introduced with the 2008 reform with the aim of strengthening the third pillar of the Chilean pension system. In this scheme, employers offer their workers (all of them, they cannot discriminate) savings plans into which both the worker and

employer contribute. The employer can offset the contributions to the APVC as a necessary expense for the production of income. Contributions are subject to the same limit as those established for the individual APV and the tax benefits to the workers are equivalent. These contributions may fall under either the two tax regimes mentioned above: those corresponding to APV A or APV B. As in the individual APV, once one of these options is selected, the worker will always have the opportunity to switch to the other for future contributions.

The main aspects of the 2002 reform were:

- Savings were granted liquidity: contributions voluntarily made by the worker can be withdrawn at any time, under the tax conditions indicated by Law.
- Administrators were given more alternatives: before, only pension fund administrators (PFAs in Chile) could offer voluntary pension saving (APV), now new actors can join the system. In addition to the PFAs, institutions that can offer and manage APVs are as follows: investment fund administrators, mutual fund administrators, housing fund administrators, life insurance companies, banks, brokers, and any other entity authorized by the Chilean Securities and Insurance Superintendent
- Provision of further alternatives for investment: in addition to the alternatives proposed by the new actors, this reform created multi-funds. There are five different types of funds. They differ in their risk exposure, which is reflected in the maximum and minimum levels of equities in which they can be invested.
- New tax incentives: the tax benefit are extended to independent workers. The maximum APV amount subject to tax benefits has been increased from UF 48 to UF 50 (units of account) monthly.
- Charging for the administration of voluntary contributions is now allowed, which gives an incentive on the supply side to promote this type of savings.

After these reforms the APV market has begun to grow steadily.

APV is a useful tool to improve pensions in general, but there are situations in which it is a critical complement to achieve adequate replacement rates.

Income above the wage base. As we can see in Table 1, a person who has contributed all his working life at the wage base of UF 60 will receive a pension of about UF 50, regardless if how much above the base he earns. If the individual had an income of UF 120 and has an APV of 10% of the income over the wage base, i.e. voluntarily contributes UF 6, his retirement fund will increase to about UF 102, equivalent to a replacement rate of 85%.

Table 1: Replacement rate for workers with income exceeding the wage base (60UF) and voluntary savings for the 10% of income above the base.

Estimated Replacement Rate.		
	WITHOUT APV	WITH APV
Gross monthly income UF 60	84%	---
Gross monthly income UF 120	42%	85%
Gross monthly income UF 240	21%	82%

Source: Private PFA. The case of a person starting to work at the age of 25 who retires at the age of 65, without children who are disabled or under 24 years of age. In addition we assume he has an average annual real rate of return of 5.5%, a contribution density of 100% and chooses the "APV B" type.

Low regularity in mandatory contributions. As shown in Table 2, if a worker has a low contribution density, i.e. if he has not contributed for all of his active life, the replacement rate that he has access to at retirement is relatively low. For example, a worker whose income is under the wage base and who contributed for 65% of his working life will have a pension of about 59% of the salary he received during his working life, if he had no APV. If this individual contributes to an APV 2.5% of his gross salary that he receives during the periods in which he pays in mandatory contributions, his replacement rate increases to 74%.

Table 2: Replacement rate for workers at various contribution densities and without voluntary contributions. Voluntarily contribute 2.5% of wages during the months that they make mandatory contributions.

Estimated monthly pension. Pension as percentage of earnings from work.		
	WITHOUT APV	WITH APV
33% contribution density	30%	37%
65% contribution density	59%	74%
98% contribution density	89%	111%

Source PFA Provida. This case is a person with a monthly income of UF 30 who starts working at 24 and retires at 65, without children who are disabled or under 24 years of age. In addition we assume an average annual real rate of return of 5.5% and the 15% government credit (in the "APV A" type).

Women or people who wish to receive their pension early. Those workers who decide to retire before the age of 65, or in the case of women who have the right to retire from the age of 60, will have their

replacement rates reduced. In these cases, contributing to an APV during working life will allow the worker to retire early without dramatically compromising his standard of living in old age. For example, a worker with a monthly income of CLP 400,000 per month will have to contribute voluntarily some CLP 10,682 per month to an APV in order to obtain the same pension if he retires at 60 as he would have received had he retired at 65.

1.2 Determinants of voluntary pension saving

Gallego and Butelmann (2001) estimate the determinants of voluntary saving in Chile. The authors carry out a multivariate analysis for which they use microeconomic information from two cross sections (1988 and 1996-1997). Their results support the idea that savings are linked to the accumulation of assets to soften consumption over time, and the theories of the life cycle and permanent income. This is because over 60% of the variation in the savings rate is explained by age and transitory household income. In addition, they find that wealth, human capital, and the size and composition of the household determine people's decision to save. Finally, they obtain evidence that institutional aspects such as access to credit and the pension saving system would have effects on saving according to the macroeconomic context.

Bravo et al. (2008) estimate the joint probability that an individual contributes to an APV, is aware of this type of saving, and is a participant in the pension system, for which they develop a probability model with a double selection bias (contribution to the pension system and awareness of the APV) that they resolve for the greatest possible plausibility. Using the Social Protection Survey of 2006 they estimate the joint probability of being a participant in the system, being aware of the APV and contributing to the APV. Comparing this methodology with models that do not take this problem into account or control it only partially, they find that if no correction is made for selection bias, the marginal effects are overestimated. In addition, they consider two models, one that only controls for selection bias of being a participant of the system and the other only for being aware of the APV. The authors conclude that while the selection bias involved with being aware of APV is relevant, that of being a participant in the pension system has no major impact on the results. The main results are that income, age, and having life insurance or not determine whether or not the person contributes to an APV. It is significant that the life expectancy of the individuals has no bearing on whether they contribute to an APV.

Medrano (2007) investigates the determinants for participation in the pension system under various scenarios, for which she estimates the sensitivity of contributors to legislative changes to the system. She uses three alternative estimation models: i) the participation model based on a segmented labor

market; cross-section data are used to see whether the introduction of legislative changes impacts the decision to participate in the formal market; ii) aggregate evolution of participation with time series; iii) participation using panel data from the period 1997 to 2003. She finds that the increase of benefits increases participation in the system. However, when these benefits mean greater costs, the final effect will depend on relative effects; while the reduction of fees, the incorporation of multi-funds or the APV increase participation, unemployment insurance did not have an effect.

Eguiluz and Mastrángelo (2004) investigate at a conceptual level the impact on competition in the financial market of the legal changes introduced in 2002 to the APV, for which they compare fees, transfers, and returns of the various sectors authorized to operate in this market. They find no effects in the fees charged by the PFA; in the mutual funds sector there is a slight decrease, but nevertheless there is a lower administration fee for APV than other types of saving in this sector. In addition, they find that there is a greater level of transfers within the sector, and lower between sectors. This point could be explained by the inertia of the participants or by lack of information; however, they do not address this question.

2. A review of voluntary saving schemes in Latin America.

2.1 Colombia

Voluntary pension saving in Colombia is called *Fondos de Pensiones de Jubilación e Invalidez* (Retirement and Disability Pension Funds) and was created in 1987 under Decree 2513. Originally the funds could be administered by insurance companies, trust companies and banks through their fiduciary sections. In 1991, this function was extended to the Retirement and Dismissal Fund Administrators. However, it should be noted that all companies must be authorized by the Columbian Financial Superintendent as an administrator of voluntary funds. There are two main forms of voluntary saving: one is saving through the mandatory pension funds; and the other is through the family of mutual funds offered by the PFAs and the fiduciary funds, plus the defined-contribution plans offered by employers.[4]

Although voluntary pension funds in Colombia aim to be additional savings for old age, because of their features it cannot be said that a third voluntary pillar really exists in Colombia. In fact, the requirements for withdrawal of voluntary savings are not related to age or length of time in the system. Thus assets deposited as voluntary pensions may be withdrawn without restriction. In other

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4 Valdés (2007).p.40.

words participants may, without retiring, withdraw all or part of their contributions and returns. In the case of voluntary saving in the mandatory pension funds, a notice of six months is required before the withdrawal, while in the other case no notice is required.

Current incentive policy

Saving voluntarily enjoys a **tax benefit** in terms of withholding at the source and income tax. The voluntary contributions are not part of the base on which the withholding is applied at the source and are considered as an income that is not part of earnings or occasional gain, up to a sum that, added to the value of the mandatory contributions of the worker, does not exceed thirty percent (30%) of income from wages or taxable income for the year. The contributions, returns on them, and the pension obtained from them, are subject to the above tax exemption, if they are kept in the fund for a minimum of 5 years[5]. There is nevertheless an exception to this rule, i.e. when the withdrawal of the voluntary pension funds is for the purchase of a home[6]. In the case of home purchase it is possible to withdraw the funds before 5 years and receive a tax exemption if certain conditions are met which are designed to ensure that the funds will be indeed used for the purchase of a home (see Appendix 1).

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5 Article Four, Law 488 of 1998.

6 Law 1111 of 2006 introduced some modifications to the Tax Charter. Article 67 of this reform establishes that early withdrawals (less than five years counted from the deposit date) of voluntary contributions into private pension funds destined for housing purchases whether financed or not are exempted from contingent withholdings and withholdings from the source of the returns.

It should also be noted that in the case of voluntary pensions, as in the case of pensions in general, the law offers protection in that these funds are not subject to seizure. According to the law the only case in which seizure may take place is seizure for alimony payments or of debts owing to cooperatives.
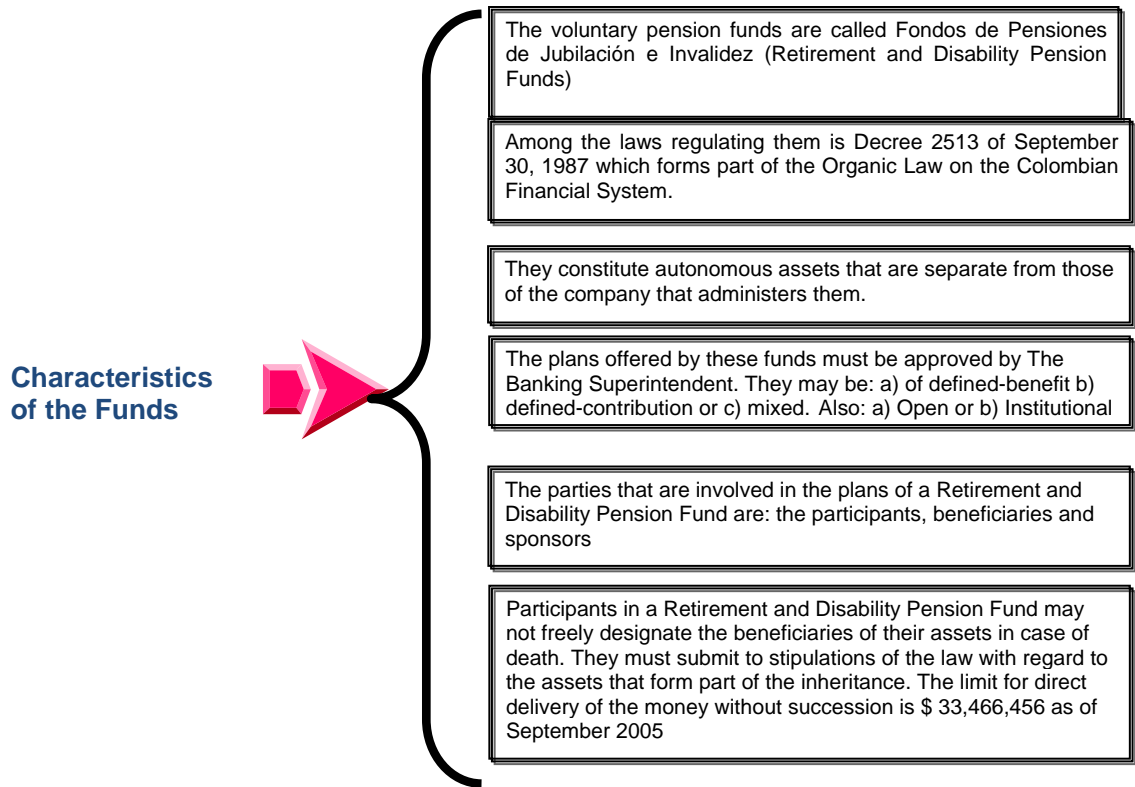
Characteristics of voluntary saving (see Chart 1)

As mentioned above, voluntary pensions are regulated by legislation, including Decree 2513 of September 30, 1987. As with mandatory pension funds, voluntary pension funds constitute autonomous assets separate from the equity of the company that administers them. In terms of their structure, they can be divided according to three types of **agents**:

– **The participants**: the people in whose interest the plan has been created.

– **The beneficiaries**: natural persons who have the right to receive the benefits established under the plan.

– **The sponsors**: companies, firms, trade unions, associations or professional groups that participate in the creation of the plan and who make contributions in the name of their workers or members.

According to the law, there may be 3 types of voluntary pension plans: Defined-benefit, Defined-contribution and Mixed. From other points of view, the plans may be open (i.e. those plans which any natural person may join) or institutional (plans to which only the workers or members of the sponsoring entities may belong).

Chart 1: Main characteristics of voluntary pension funds.

Characteristics of the Funds

The voluntary pension funds are called Fondos de Pensiones de Jubilación e Invalidez (Retirement and Disability Pension Funds)

Among the laws regulating them is Decree 2513 of September 30, 1987 which forms part of the Organic Law on the Colombian Financial System.

They constitute autonomous assets that are separate from those of the company that administers them.

The plans offered by these funds must be approved by The Banking Superintendent. They may be: a) of defined-benefit b) defined-contribution or c) mixed. Also: a) Open or b) Institutional

The parties that are involved in the plans of a Retirement and Disability Pension Fund are: the participants, beneficiaries and sponsors

Participants in a Retirement and Disability Pension Fund may not freely designate the beneficiaries of their assets in case of death. They must submit to stipulations of the law with regard to the assets that form part of the inheritance. The limit for direct delivery of the money without succession is $ 33,466,456 as of September 2005

Source: Horizonte.

An important characteristic of voluntary saving is its great flexibility. Indeed, not only is there a wide range of investment[7] portfolios adjusted to different risk profiles, profitability and liquidity, but the saver may also keep his assets in the funds of various administrators. Voluntary savings can also, as mentioned above, be deposited in mandatory pension funds.

Coverage and development of voluntary saving

In December 2009 the number of contributors to voluntary pension funds in Colombia[8] was some 553,600, of whom 52.3% were men and 47.7% women. The total number of participants is equivalent to 9.3% of all contributors in the

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7 In the case of Horizonte there are currently 9 investment portfolios.
8 Not including participants in voluntary pensions in mandatory pension funds, given that the financial regulator does not publish this breakdown. In addition, according to Asofondos, the level of this type of voluntary savings is very low.

mandatory pension system and 3.6% of its participants. With regards to the characterization[9] of the participants of the voluntary pension funds by level of income, one can see that the majority are at a level of income of 2 times minimum wages or less (57.8% of the total participants) (see Chart 2). In addition, the majority of the participants are aged between 30 and 49, with 56.6% in that age range. With regards to labor's dependence on participation, 74.4% are dependent workers and 25.6% are independent.

<div align="center">**Chart 2:**</div>

**Breakdown of voluntary retirement plan participants according to age and income level**
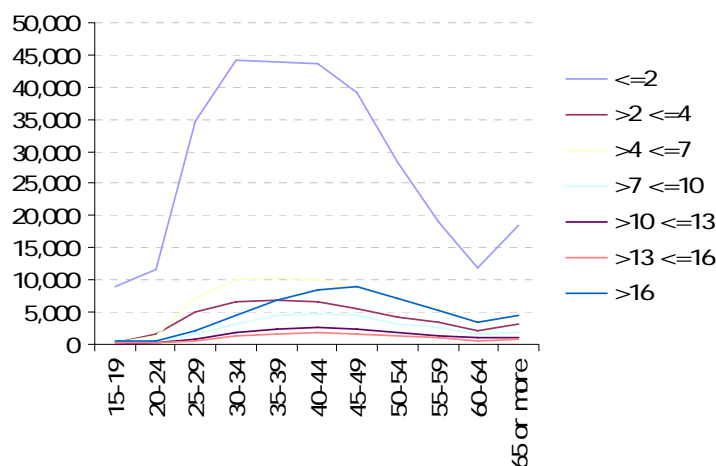
As of December 2009, 66.4% of the participants maintained their assets in funds administered by PFAs and 28.6% in funds administered by fiduciary companies. It should be noted that the fund with the greatest number of participants is Fondo Protección, with 19.1% of the participants, followed by Fidudavivienda Dafuturo, with 21.8%. In addition, 77% of the participants of the system are in funds administered by the five administrators with the most participants.

In December 2009 the value of the funds was COP 9,500 billion, equivalent to 11.9% of the value of the mandatory pension funds and twice the value of dismissal funds. From the information provided by the Financial Superintendent it can be seen that currently (December 2009) there are 18 pension funds. Of these funds, 85.8% are administered by PFAs. It should be noted that the same source indicates that in 1995 there were only 8 funds. As far as their historic development is concerned, it can be seen that these funds grew considerably between 1995 and 2009, by 76.6%, from COP 100 billion in 1995 to COP 9,500 billion in 2009, with both figures given at 2009 values (see Chart 3).

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9 This characterization is based on data from December 2008

Value of voluntary retirement plans

(2009 pesos)
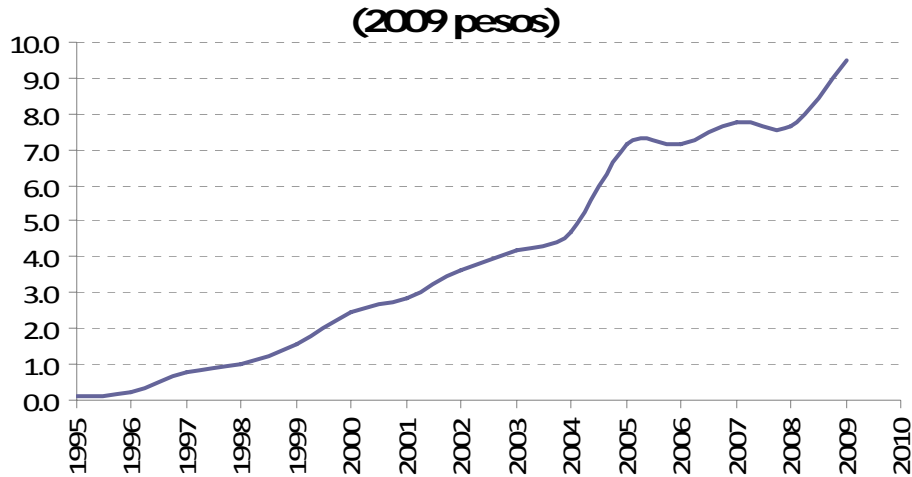
2.2 Mexico

In Mexico the Retirement Savings System (SAR) allows contributors to make voluntary contributions to their individual account in addition to those that are mandatory to the Pension Systems of the Mexican Institute of Social Security (IMSS) and more recently the Civil Service Institute for Security and Social Services (ISSSTE).

Upon asking account holders if they are interested in making voluntary contributions they appear to be aware of the possibility of this option, but in practice only a few are using the individual accounts in their Afore as voluntary savings vehicles. These are the results of the last "National Survey On Quality in Service to Afore Clients" undertaken by the National Commission for the Protection and Defense of Users of Financial Services (Condusef) in 2008, which highlights the following points:[10]

- 9 out of 10 of those surveyed knows what the money saved in his Afore is for.
- 8 out of 10 of those surveyed considers that the returns on his Afore are good.
- 90% of those interviewed know about voluntary contributions
- 62% are interested in using this mechanism

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10 Available at www.condusef.gob.mx/PDF-s/**encuestas**/2009/qta_**afores**.pdf

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- 5% of those surveyed use their individual account in the Afore as an instrument for voluntary savings.

A voluntary contribution is any quantity of money that the account holder decides to deposit in his individual account in a voluntary manner so as to increase its balance, with the aim of improving the pension he receives at the end of his working life or undertaking personal projects in the short or long term.

Voluntary savings can be undertaken in four possible sub-accounts of an individual account:
- Voluntary contributions (short term)
- Complementary retirement contributions (does not apply to independent workers).
- Long-term savings contributions
- Mutual savings contributions (only in the case of workers who are participants in the ISSSTE)[11]

The above distinction between sub-accounts is subject to any possible tax benefits in keeping with the investment horizon and the fact that SAR coordinates the pension plans of two different social security institutions: IMSS (private sector workers) and ISSSTE (public sector workers).

The way that voluntary contributions are made generally is by going to an Afore branch and making a deposit at the cash window. Some administrators allow for the contributions to be made online.

Formal workers may request their employer to discount the desired savings amount from their paycheck.

Current incentives policy

It should be noted that voluntary savings are not only possible for workers contributing to the IMSS or ISSSTE and who have an individual Afore account. Starting in August 2005 it is also available for independent workers. To be eligible, independent workers must open an individual savings account in the Afore of their choice and make their contributions for retirement. In this case, the contributions are not subject to either a minimum or maximum contribution.

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11 In 2007, the reform to the Law governing the Civil Service Institute for Security and Social Services included "mutual savings" to increase retirement funds. These savings are made up of two contributions: one optional contribution of the public sector worker who has 2% taken off his basic salary that is credited to a sub-account of mutual savings; and a transfer from facilities and/or entities in the public sector in which he or she works, equivalent to 3.25 pesos for each peso saved up to a maximum of 6.5% of the worker's basic salary.

These amounts can also benefit from tax incentives, but there is a penalty for early withdrawal.

There are both tax and other forms of incentives for voluntary savings:

- Tax

There are two tax incentives for voluntary savings. According to Article 176 section V of the income tax law (LISR), in Afore entities, complementary retirement contributions and voluntary contributions made in the respective sub-accounts of an individual account may be tax deductible according to the following rule: the amount of the deduction will be up to 10% of accumulated income of the taxpayer in the current tax year, but the contributions may not exceed the equivalent of 5 times the minimum wage in the geographical area of the contributors as an annual sum (approximately MXN 104,000).[12] When the income invested in these sub-accounts and their returns are withdrawn before the maintenance requirements are met for the payment of a pension, the withdrawal is considered as accumulated income for the taxpayer. According to Article 218 of the income tax law, deposits, payments of premiums, or acquisitions of shares by investment companies may be deducted from the taxable base of the taxpayer, if they are deposited in insurance institutions or others that constitute special personal accounts for savings. The amount of these deposits, payments or acquisitions may not exceed the equivalent of MXN 152,000 in the calendar year in course, including all items. In this case, the contributor may not withdraw his contributions or returns before a period of five years.

The tax benefit of this measure is double: first, it reduces the taxable base and second, it makes it possible to defer the payment of taxes given that deposits, premiums, or acquisitions as well as their returns will be considered as accumulated income of the taxpayer in the calendar year in which they are received into or withdrawn from the special savings account. However, the rate of the applicable tax shall never be greater than that applicable when deposits, payments, or acquisitions are made.

– Access to mortgage lending

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12 Also subject to this deduction are contributions to personal pension funds administered by insurance companies, credit institutions, brokerages, or companies operating investment concerns when the plan is tied to an individual account and when the contributions have the sole purpose of being used by the account holder when he reaches the age of 65 or complies with the disability requirements stipulated in the social security legislation.

In August 2006, the National Commission on the Retirement Savings System and the Federal Mortgage Company initiated the AHORRASHFORE program to facilitate access to home mortgages through voluntary savings.

According to these bodies, the program is available for all the workers in the country but because of its characteristics it may be particularly attractive for: workers who are self-employed and who, in general, do not have access to mortgages from commercial banks; "inactive" workers who have contributed to the IMSS but who no longer do so; and "mixed" participants in the IMSS, i.e. those who contribute to the system with a "base" salary, but who usually have additional income that cannot be verified (waiters, messengers, porters, etc). To date, official statistics do not indicate to what extent this voluntary savings program has been taken advantage for the purpose of pre-financing a home.

– **Other benefits**

CONSAR-FONACOT Agreement

CONSAR and the Fund for the Promotion and Guarantee of Consumption by Workers (FONACOT), signed a collaboration agreement in November 2004 for an indefinite period to encourage voluntary savings by workers so that they may obtain a better pension while being able to increase their credit rating with FONACOT.

Through the CONSAR-FONACOT agreement, FONACOT may extend the repayment terms of its loans by up to 36 months to those who are paying into voluntary savings schemes in their Afore, thus increasing the total amount loaned by 25%.

Fees (Article 79 of the SAR Law)

According to Article 79 of the SAR Law, the Afores must provide incentives in the fees to the workers for maintaining their contributions with the aim of promoting voluntary savings.

Changing levels of voluntary savings in the SAR

Although affected by economic conditions, contributions for voluntary savings in Afores have registered a steady growth. Between December 1998 and 2009, the average annual rate of growth of voluntary savings grew by an annual average of 43.9%.

Voluntary savings in Siefore plans
Millions of pesos
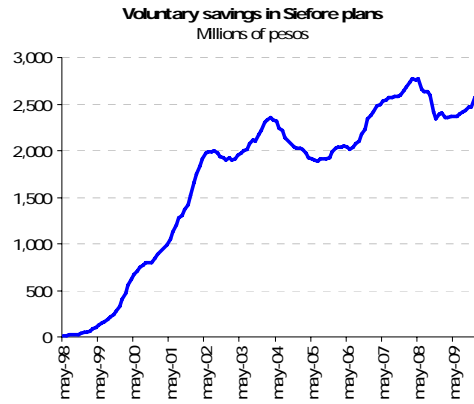
However, a closer look at the levels of contributions to voluntary savings reveals a certain stagnation in their growth since 2000. As the logarithmic scale of Chart 5 illustrates, the curve (growth rate) of contributions to voluntary savings is much flatter than that of mandatory savings.

Chart 5:

Siefore plan savings
Millions of pesos, logarithmic scale
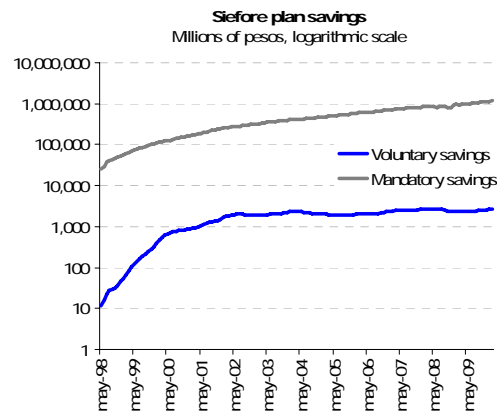
The slower growth in voluntary savings compared with mandatory savings results in a low participation of voluntary savings within the SAR. Chart 6 shows how the level of voluntary savings as a percentage of mandatory savings and of the total of resources administered by the Afores has fallen after reaching its highest level in 2002.

Voluntary Siefore plan savings
% of total mandatory savings and resources
managed by Afore plans

Source: BBVA with Consar data

In practice, there have never been as many alternatives for making voluntary savings as for mandatory savings. For instance, Chart 7 reveals that 2007 was the year with the highest number of Afores allowing voluntary savings contributions (7 out of 21) whereas today only 5 out of 14 Afores offer this possibility.
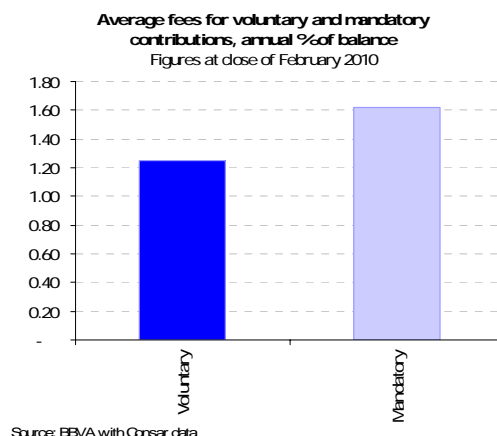
Chart 7:

**Number of Afore plans with Siefore plan availability,
mandatory and voluntary contributions**

Source: BBVA with Consar data
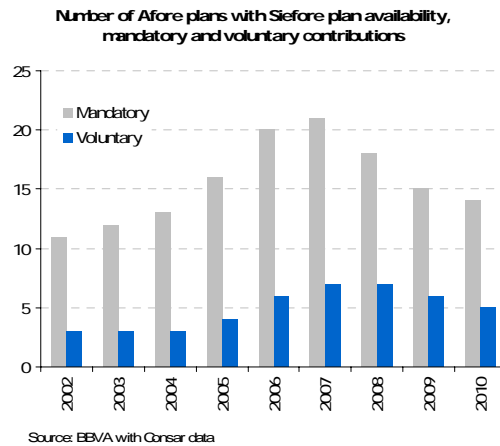
The above restriction in the range of voluntary savings available does not seem to be accompanied by growing prices (fees). Evidence suggests that Afores that have been on the market longer did not charge fees for the administration of these funds for many years. At the same time, competition in the industry, such as in the case of fees for mandatory contributions, has led Afores with higher than average fees to lower them. As a result, these fees are now within the range of 1.0% to 1.5% of the annual balance.

In fact, fees for voluntary savings are lower than for mandatory savings, which should constitute an incentive for voluntary savings.

Chart 8:

Average fees for voluntary and mandatory contributions, annual % of balance
Figures at close of February 2010

Source: BBVA with Consar data

In addition, as can be seen in opinion surveys, returns in the Siefore voluntary savings entities are very competitive compared to those achieved by the Siefore mandatory savings entities. In particular, Table 3 shows that Siefore voluntary savings plans are on average very similar to the returns of the Basic Siefore plan 2.

Table 3:

Siefore plans with mandatory (SBs) and voluntary (APV) saving
Nominal return at 36 months

Siefore	Dec-03	Dec-04	Dec-05	Dec-06	Dec-07	Dec-08	Dec-09	Feb-10
APV*	13.15	7.86	8.39	9.17	9.78	7.70	6.73	7.43
SB1			9.49	9.78	9.58	7.83	7.46	8.07
SB2	13.16	9.53	9.68	10.62	10.40	6.65	6.48	6.98
SB3						6.20	6.52	7.07
SB4						5.62	6.50	7.10
SB5						5.08	6.33	6.96

*/Simple average for all voluntary contribution types: voluntary, long-term, and retirement supplement
Source: BBVA Bancomer with Consar data

In turn, voluntarily savings with Siefore entities not only represents an option with competitive returns but also a relatively safe one, with careful administration of risks. Compared to the mandatory savings Siefores, voluntary Siefores show on average a lower value at risk (VaR) as well as lower exposure to long-term fixed-income instruments as shown in Table 4.

Siefore plan sensitivity indicators
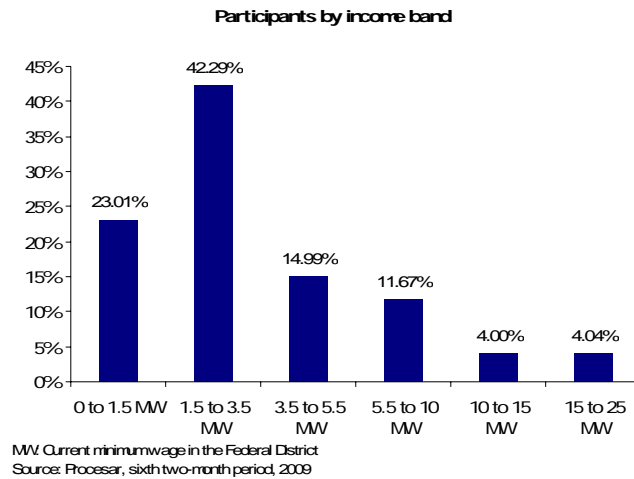Figures at close of February 2010

SIEFORE	VaR (Percentages)	WAM (Days)
Mandatory savings	0.9722	3,762
Voluntary savings	0.3101	1,507
SYSTEM	0.9664	3,742

VaR – Value at Risk.
WAM - Weighted average maturity.
Source: BBVA with Consar data

Without a doubt, there is great potential for increasing voluntary savings in Mexico and strengthen the pensions of SAR participants. However, it is important to consider that boosting voluntary savings could require actions that go beyond the scope of the Afore sector, given that although there is currently a copious range of incentives for this type of saving and that the returns, costs, and risks offered by the industry for investments of this type are competitive, the truth is that voluntary saving by Mexicans is low, which is partially explained by the contributors' low capacity to generate income. For example, chart **9** shows that almost **66%** of the participants have an income level of below 3.5 times the minimum wage.

Chart 9:

Participants by income band

MW. Current minimum wage in the Federal District
Source: Procesar, sixth two-month period, 2009

2.3. Peru

In Peru, the voluntary pillar arose with the Private Pension System (SPP). This was created in December 1992[13], by Law No. 25897 and is based on individual capitalization of the participants' contributions. From the date of its creation it has worked alongside the National Pension System (SNP), run by the Office of Pension Standards (ONP) which at the time was experiencing a period of major financial imbalance. Unlike the public system, the SPP is based on the individual capitalization of participants' contributions, which are held in an Individual Capitalization Account (CIC) by the Pension Fund Administrators (PFAs), entities regulated by the Superintendent of Banks, Insurance, and PFAs (SBS). Article 30 of the aforementioned law established that contributions made by participants could be either mandatory or voluntary. There are two points to consider in voluntary contributions: first, if the participant pays contributions that are more than 20% in excess of the insurable income, this excess will not be unseizable; and second, voluntary contributions by the employer are unseizable in any case.

Greater clarity was achieved in 1998, with the publication of the regulation of the Single Consolidated Text of the Law on the Private System of Administration of Pension Funds. The text stipulates that participants could make voluntary contributions of two types: for purposes of receiving a pension or not. Contributions for pensions are not unseizable and can only be withdrawn at retirement, while contributions that are not for pensions may be seized and can be withdrawn either partially or completely (both the contributions and the return on the investment of the PFA) up to three times per year. It should be noted that one of the requirements for the PFAs to be able to receive voluntary contributions from participants not earmarked for pensions is that these participants must have been contributing five years to the SPP or be at least 50 years old. The only requirement for making contributions to a pension is for it to be a participant in the SPP.

Subsequently, in 2003, Supreme Decree No. 004-98 EF added to the preceding regulation that the Individual Capitalization Account (CIC) for voluntary contributions has to distinguish between sub-accounts in order to separate voluntary contributions made by participants that are not for pensions from voluntary contributions that are for pensions. Another stipulation was that the workers who are participants and have an Individual Capitalization Account of mandatory contributions with a PFA may have an Individual Capitalization Account of voluntary contributions with another PFA. At the same time a new voluntary savings mechanism was introduced by which savings made by workers would be complemented by their respective employers. This was done under the Voluntary Fund of Legal Persons, which the law defines as: "A fund constituted

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13 In August 1993, the AFPs started to operate in the Peruvian SPP.

with the independent and non-seizeable assets of an employer and which is administered by a PFA so that the latter's resources are applied to the mandatory-contribution Individual Capitalization Accounts of the employers' workers, in accordance with the conditions established in the Plan that set it up." However, this tool is not regulated either in terms of its rules or its labor and tax aspects, and it is not offered within the SPP.

Currently the four PFAs in the Peruvian market provide the service of administration of voluntary contributions for participants who make mandatory contributions to the same PFA, as well as to a different administrator. Voluntary contributions may be maintained in any of the three types of funds offered by the Peruvian multi-fund system of the SPP.

Finally, it should be noted that the National Pension System (SNP), through the Office of Pension Standards (ONP) also has an optional savings scheme in which insured parties can make voluntary contributions in one of two ways (i) optional independent, which is for natural persons who are engaged in an independent economic activity and (ii) optional continuation, for those mandatory insured persons who stop working for any employer and decide to continue to make these contributions. The ONP introduced this scheme in April 2000 (through Administrative Resolution No. 047-2000). Unlike the Private Pension System (SPP), where contributions do not have to be made with a given frequency, nor are the amounts specified, in the pay-as-you-go system there are certain requirements that have to be met if the voluntary contributions are to be considered valid: (i) the contributions must be made to the to the SNP for 13% of the insurable income declared; (ii) there must be no late payments for 12 consecutive months; (iii) the insured party may not be insured by obligation and (iv) must not belong to a PFA, given that payments may not be made to both systems at the same time. It is important to note that the average rate of inscription of optional insured parties over the last seven years in the SNP has remained steady at around 10,000 per year.

Current incentives policy

The importance of voluntary savings in the SPP comes from the fact that it is a complementary source of savings for participants. The participant's personal fund increases and upon retirement he can enjoy a better pension for his old age, or he can retire early. Taking into account these advantages, both the SBS and the PFA have taken measures to encourage a greater number of participants to make voluntary contributions, especially those earmarked for pension savings. The benefits that voluntary pension savings have are as follows:

- *Attractive fee structure.* These vary according to the PFA, the type of fund (the fee increases in proportion to the increase of the risk in the

fund administered, which means that a Type 1 fund charges a lower commission) and whether or not the contributor is a participant in the same PFA. Those participants who pay both mandatory and voluntary contributions to the same PFA are given better treatment.

- *Tax benefit.* Voluntary contributions for pensions made through the PFAs have a tax benefit, which is not the case for contributions that are not for pensions. The returns on voluntary contributions that are not for pensions were exempt from the payment of income tax up to December 31, 2009. At the beginning of this year the regulation on capital gains tax was published, which annulled the existing exemption. As of January 2010, capital gains originated, among others items, from voluntary contributions made by participants to PFAs that are not for pensions are now taxable. Until now the government has proposed that the PFAs themselves should be the agents that withhold the tax when the participant fully or partially withdraws his earnings from his voluntary non-pension savings.

Changing levels in voluntary savings

The balance of voluntary savings, which includes voluntary pension and non-pension contributions as well as the returns generated, has been increasing in recent months after falling sharply in 2008 due to the international financial crisis. This fall includes both the decrease in returns registered by the fund as well as the lower contributions made in a context of uncertainty on the Peruvian securities market and the depth of the crisis in the global economy. According to figures from the SBS, in January 2010 the total balance was PEN 560m, a similar figure to that registered in September 2008, and only 0.9% of the pension funds administered by the PFAs.
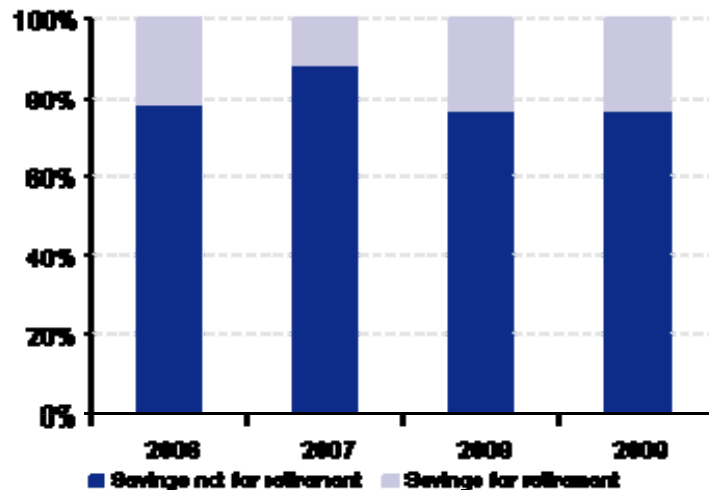
Chart 10: Balance of voluntary pension savings
(Millions of PEN)
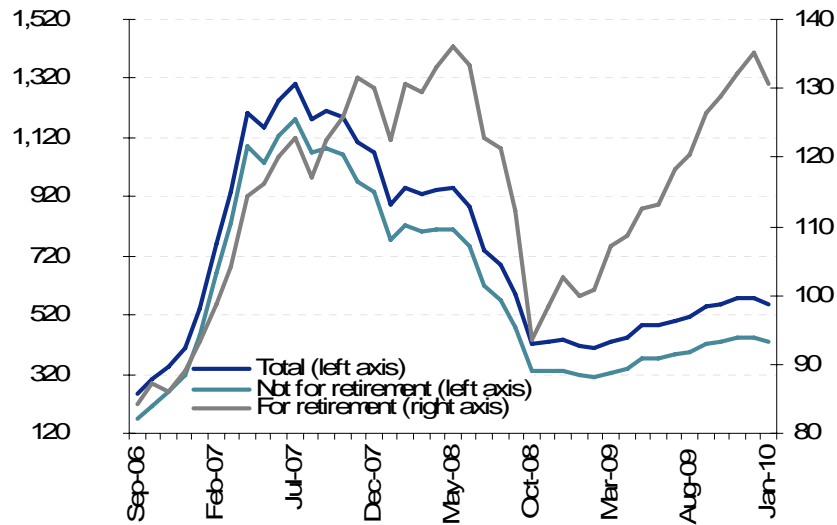
Source: Superintendent of Banks, Insurance, and PFAs, January 2010

However, it is important to note that a significant part (approximately 80%) of the balance of voluntary pension savings is made up of what are really non-pension savings, thus reducing pension savings to a small percentage. This can be seen in Chart 11.

Chart 11: Balance of voluntary pension savings
(Millions of PEN)

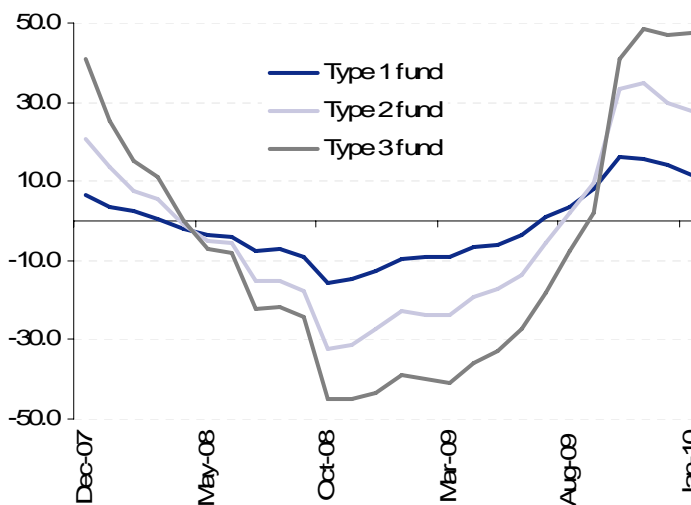Source: Superintendent of Banks, Insurance, and PFAs, January 2010

With regard to the returns on both types of voluntary savings, we can see in Charts 12 and 13 that these are quite similar, although the balance of the pension savings has grown better over recent months, with levels of returns being slightly better than non-pension savings. As can be expected, by type of fund, the more conservative fund (Type 1 fund) saw a smaller drop in performance during the global crisis, although the aggressive fund (Type 3) is recovering faster, in line with the strong stock market performance in recent months.

Chart 12: Returns on voluntary pension contributions
(Real annual)
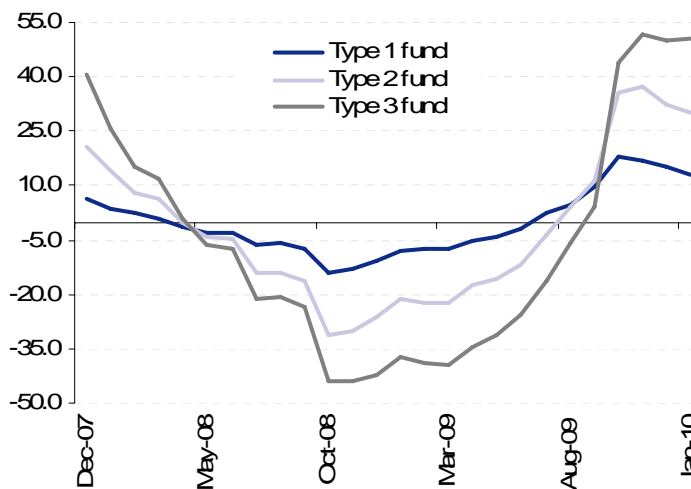
Source: Superintendent of Banks, Insurance, and PFAs, January 2010

Chart 13: Returns on voluntary pension contributions
(Real annual)

Source: Superintendent of Banks, Insurance, and PFAs, January 2010

3. Socioeconomic factors impacting voluntary savings of independent workers in Chile and incentivizing contributions

This section presents a statistical analysis of the various socioeconomic conditions of Chilean workers, with a focus on independent workers. The aim is to understand the different approaches possible, based on financial conditions, attitudes, and preferences, towards pension savings plans.

3.1. Socioeconomic characteristics of the independent workers in Chile.

Description of Independent Workers: Social Protection Survey 2004 – Data and definitions

The data comes from the second edition corresponding to the Social Protection Survey 2004. This survey was conducted for the first time in 2002 and most recently in 2006. It is the result of a partnership between the Undersecretary of Social Security, the University of Pennsylvania and the University of Chile.

Information was collected in a single questionnaire concerning the employment and social protection history of the subjects, with detailed information from them in the areas of education, health, social security, work qualifications, wealth and assets, family history and information about their households. These surveys represent the first panel study in Chile on a representative sample of individuals.

We begin with a description of independent workers. The following is a comparison of independent workers with dependent workers in the economy. The following criterion was used to classify workers as independent: those active workers whose current employment falls under the "self-employed worker" type, as well as those who in their current work deliver invoices for fees.

Using the above definition, the group of independent workers, according to the HLSS 2004, has been defined as shown in the following table:

Table 5: Independent Workers by Occupational Category

| Category	Dependent		Independent	
	Number	Percentage	Number	Percentage
Employer	240,582	4.1%	77,362	4.5%
Self-employed	1,089,791	18.5%	1,350,752	78.6%
Public-sector employee	562,170	9.6%	37,225	2.2%
Private-sector employee	3,603,264	61.3%	247,477	14.4%
Domestic service	355,437	6.0%	5,950	0.3%
Unpaid family member.	24,358	0.4%		
Armed forces and police	6,936	0.1%		
Total	5,882,538	100%	1,718,766	100%

Source: Social Protection Survey, 2004.

Of the total number of workers in 2004, the social protection enquiry indicates that 23% declare that they are independent. These results are similar to those in the latest INE employment survey which indicated that for the October-December rolling quarter, some 24% of the workers were in the independent category.

For their part, some 78.6% of the independent workers belong to the self-employed worker category. This group is mainly composed of retailers and salespersons who represent approximately 25% of this population, and of small farmers and seasonal workers, who represent 8%.

With regards to the income of independent workers, the monthly average is lower than the average taxable income of those who contribute to PFAs and lower than that of the working population as a whole. Average income[14] for independent workers is CLP 198,778 while the average taxable income of the population contributing to PFAs was CLP 341,298 in December 2004. It should be noted that this average is biased, given that income in declared contributions is limited by the maximum amount of base income of UF 60 (Chilean unit of account). The average income of the contributing population according to HLSS 2004 was CLP 352,060. This average is also biased as a result of possible deliberate under-reporting of income. The following chart shows the distribution of income of independent workers (see Chart 14).

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14 The income of these workers was calculated considering income from their main job, income from a secondary job, and the withdrawal of profits from business.

Chart 14: Distribution of income, independent workers

Deposit distribution

Total deposits in thousands
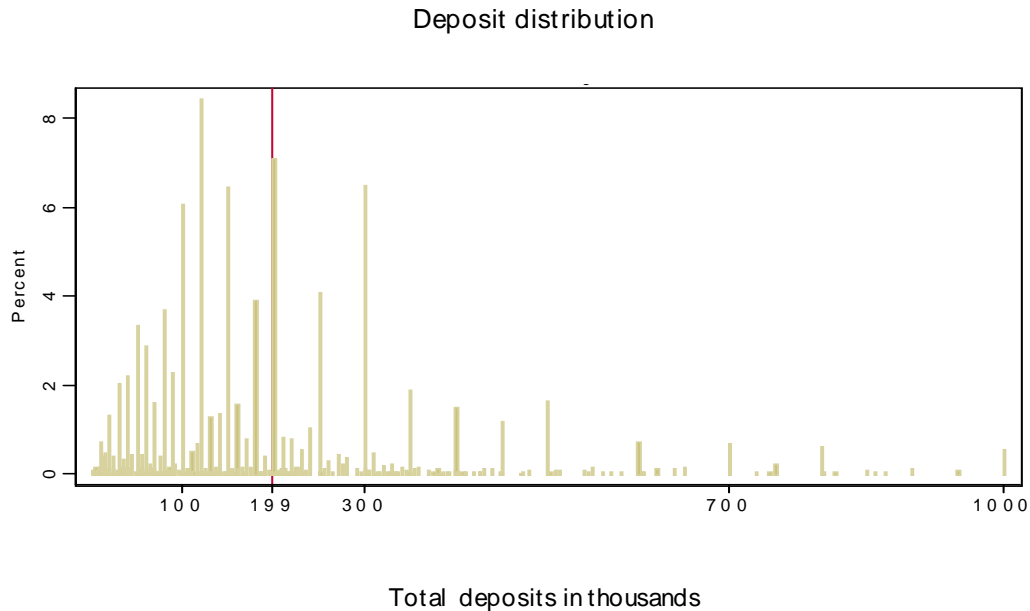
Source: Social Protection Survey, 2004.

The new pension reform law makes it mandatory for this group to contribute. Statistics obtained from HLSS 2004 show that **66.4%** of this population are participants in the Pension System. However, upon asking this segment of the population if it was now contributing to the Pension System, only **23%** of independent workers answered affirmatively. The detailed statistics are in Table 6. It should be noted that according to figures from the Superintendent of PFAs, the percentage of independent workers that contributes is much lower. This is due to the manner in which independent workers are classified (according to their status at the time they become participants) and is an error which must be rectified.

Table 6: Independent Workers by contributions to the Pension System.

Pension System	Number	Percentage
Yes, PFA	349,559	20.3%
Yes, INP (Chilean Institute of Pension Standards)	35,563	2.1%
Yes, CAPREDENA (Chilean Military Pension Fund System)	934	0.1%
Yes, DIPRECA (Police Pension Fund System)	704	0.0%
Yes, other administrator	4,595	0.3%
Yes, don't know where they contributed	2,132	0.1%
Didn't contribute	1,287,357	74.9%
Don't know	37,922	2.2%
Total	1,718,766	100%

Source: Social Protection Survey, 2004.

Main characteristics of independent contributing and non-contributing workers.

This section shows characteristics for the independent workers group, divided into those who contribute and those who do not. This distinction was made by considering the population whose last reported job in HLSS 2004 was of the independent type. Within this group, a division was made between those who in this last job were independent and contributing from those who were not.

The main aim of this section is to classify independent workers according to: job category, education level, income level, age, marital status, economic sector and gender, among other factors. These characteristics will enable us to show the main differences between independent workers who contribute and those who do not.

As stated earlier, independent workers are distributed among the different occupational categories. Below, we indicate how these workers are distributed in each occupational category, according to whether they contribute or not (see Table 7).

Table 7: Contributing and non-contributing independent workers by occupational category

Occupational category	Don't contribute	Contribute	Don't know	Total
Employer	42,374	34,988	0	77,362
	55%	45%	0%	100%
Self-employed	1,095,975	222,328	32,449	1,350,752
	81%	16%	2%	100%
Public-sector employee	15,984	20,350	891	37,225
	43%	55%	2%	100%
Private-sector employee	132,301	110,594	4,582	247,477
	53%	45%	2%	100%
Domestic service	723	5,227	0	5,950
	12%	88%	0%	100%
Total	1,287,357	393,487	37,922	1,718,766
	75%	23%	2%	100%

Source: Social Protection Survey, 2004.

As we can see, by occupation category, the bulk of those who are not contributing are in the self-employed category, while domestic service and employers show higher contribution levels. The HLLS 2004 study also allows us to distinguish between sectors of activity and occupation or profession of the independent workers. The following tables show a classification of this segment of the population. The classification used by the survey, in the case of the sector of economic activity, is the International Standard Industrial Classification (ISIC). For occupations or professions, the international standard occupational classification used is that of the ILO.

Table 8: Sector of activity and occupations of independent contributing and non-contributing workers.

Sector of economic activity

	Non-Contrib.	Contribute	Total
Retail/wholesale commerce	411,679 78.8%	110,675 21.2%	522,354 31.1%
Social & community services	211,449 71.4%	84,515 28.6%	295,964 17.6%
Agriculture, hunting, forestry	183,634 84.0%	34,974 16.0%	218,608 13.0%
Industrial manufacturing	168,582 79.1%	44,501 20.9%	213,083 12.7%
Construction	133,341 77.5%	38,659 22.5%	172,000 10.2%
Transport & communication	96,053 68.9%	43,422 31.1%	139,475 8.3%
Financial Establishment	65,743 72.6%	24,774 27.4%	90,517 5.4%
Mine & Quarry exploitation	5,116 79.6%	1,311 20.4%	6,427 0.4%
Electricity, gas & water	1,478 39.1%	2,301 60.9%	3,779 0.2%
Activities, not well specified	10,282 55.2%	8,355 44.8%	18,637 1.1%
Total	**1,287,357**	**393,487**	**1,680,844**

Occupation or Profession

	Non-Contrib.	Contribute	Total
Workers, clerks	311,823 81.0%	73,183 19.0%	385,006 22.9%
Agricultural workers	157,837 86.4%	24,845 13.6%	182,682 10.9%
Executives	142,640 72.4%	54,505 27.6%	197,145 11.7%
Non-qualif. workers	184,959 82.0%	40,603 18.0%	225,562 13.4%
Service workers	229,949 75.8%	73,406 24.2%	303,355 18.0%
Builders & operators	81,073 69.6%	35,376 30.4%	116,449 6.9%
Professionals	60,792 67.0%	29,992 33.0%	90,784 5.4%
Scientists	52,363 65.2%	27,890 34.8%	80,253 4.8%
Office workers	52,986 64.5%	29,183 35.5%	82,169 4.9%
Non-specified trade	12,935 74.2%	4,504 25.8%	17,439 1.0%
Total	**1,287,357**	**393,487**	**1,680,844**

Source: In-house, based on the Social Protection Survey, 2004.

The above tables indicate that the majority of independent workers work in the sectors of trade (31%), and community and social services (17.6%). Trade includes wholesale and retail activity. Communal and social services include public administration and personal and home services such as domestic service, among others. The sector of activity with the greatest proportion of independent contributing workers is that of electricity and water supply (61%) and transport, storage and communications (31%) (see graphs, Annex 2).

With regard to the occupation or profession of independent workers, the majority occupy positions of laborers or craftsmen (22.9%), belonging to various sectors of the economy such as construction and industry. Another significant proportion work in agriculture, livestock, and fishing (10.9%). As to the proportion of contributing independent workers, the office employee category represents 35.5% and the scientific professionals category represents 34.8% (see charts, Appendix A2).

Another interesting statistics is the division of independent workers according to age groups. According to Chart 2 independent workers are mainly in the group with ages between 36 and 55. Those aged 26 to 55 are more likely to be contributors, while the extremes – of both the younger and older populations –

have lower contribution levels. Furthermore, this pattern is repeated when the population is divided according to contributor age (see Chart 15).

Chart 15: **Contributing and non-contributing independent workers by age bracket**
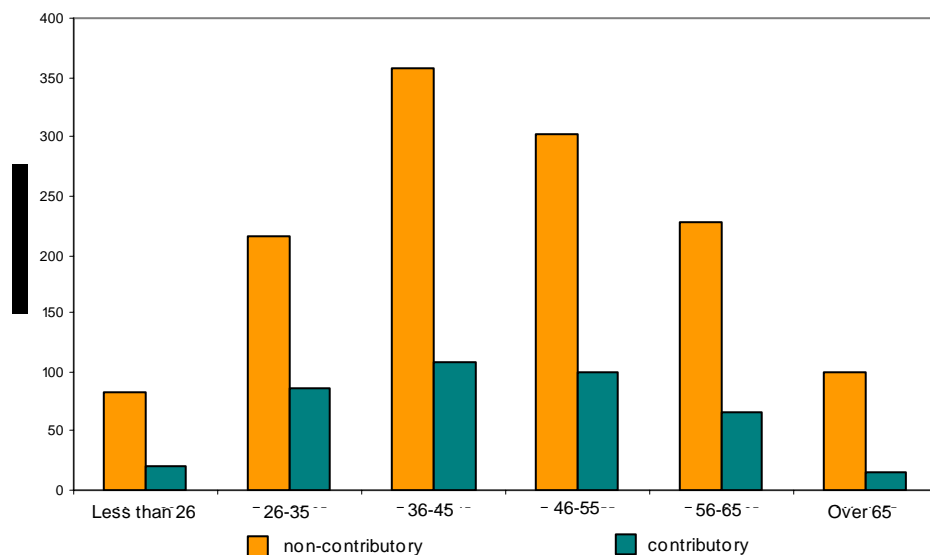
Source: Social Protection Survey, 2004.

A possible explanation for this behavior could be that between the ages of 26 and 55 there is greater concern about saving for old age. In addition, people in that age are at their most economically active. At younger ages there is more misinformation with respect to the need to save for old age, or a preference for income for immediate spending. Those at a more advanced age are predominantly at the stage of ceasing to save, as well as being less active economically.

With regard to the educational level of the independent worker population, it was categorized according to the educational level reached and the previously defined age groups. Table 9 clearly shows that the educational level influences the proportion of workers who contribute and do not contribute.

The worker group with a higher educational level (complete or incomplete higher education) constitutes a higher proportion of contributors than lower-educated groups (no education, basic education, medium-level education) (see Table 9). Again, within these groups, there is a greater proportion of contributors among those in the middle-age bracket and a lower proportion of contributors

among those at the extreme age brackets. It should be noted that this pattern is repeated when the information is broken down by the gender of the contributor.

The above trend could be explained because people with high educational levels have greater incomes and therefore have greater possibilities of allocating part of their current income to retirement savings. The population with a higher education level is also better informed, which implies that they would have more information with respect to the importance of allocating part of their present income to retirement savings.

Table 9: **Contributing and non-contributing independent workers by educational level and age bracket**

	Less than 26		26-35 years		36-45 years		46-55 years		56-65 years		Over que 65		Total	
	No contr.	Contibute	No contr.	Contibute	No contr.	Contibute	No contr.	Contibute	No contr.	Contibute	No contr.	Contibute	No contr.	Contibute
Without education	0	0	1.481	0	1.886	0	6.260	541	10.920	0	8.953	1.617	29.500	2.158
	0%	0%	5%	0%	6%	0%	21%	25%	37%	0%	30%	75%	93%	7%
Primary incomplete	2,992	656	27.531	3.997	76.488	8.810	85.806	12.545	72.980	16.021	33.790	3.234	299.587	45.263
	1%	1%	9%	9%	26%	19%	29%	28%	24%	35%	11%	7%	87%	13%
Primary complete	4,243	1.216	26.048	8.008	61.328	12.539	49.319	11.880	43.099	9.489	21.593	2.924	205.630	46.056
	2%	3%	13%	17%	30%	27%	24%	26%	21%	21%	11%	6%	82%	18%
Secondary incomplete	9,359	1.039	43.139	8.981	67.802	18.465	68.029	20.619	53.896	16.259	13.461	2.448	255.686	67.811
	4%	2%	17%	13%	27%	27%	27%	30%	21%	24%	5%	4%	79%	21%
Secondary complete	32,973	8.041	56.423	32.763	100.502	33.577	59.472	28.600	28.709	10.193	14.847	2.172	292.926	115.346
	11%	7%	19%	28%	34%	29%	20%	25%	10%	9%	5%	2%	72%	28%
Some Technical	7,985	3.566	16.092	11.030	23.040	6.544	4.617	3.078	2.387	1.843	1.163	0	55.284	26.061
	14%	14%	29%	42%	42%	25%	8%	12%	4%	7%	2%	0%	68%	32%
Highly Technical	2,236	1.006	13.146	7.499	8.070	5.213	6.227	4.220	3.645	1.147	0	0	33.324	19.085
	7%	5%	39%	39%	24%	27%	19%	22%	11%	6%	0%	0%	64%	36%
Some University	13.862	4.244	14.042	6.082	10.310	8.965	15.109	7.507	2.604	4.681	2.299	0	58.226	31.479
	24%	13%	24%	19%	18%	28%	26%	24%	4%	15%	4%	0%	65%	35%
University graduate	8.862	0	17.044	8.281	6.387	9.683	6.284	7.261	9.534	6.124	1.662	2.152	49.773	33.501
	18%	0%	34%	25%	13%	29%	13%	22%	19%	18%	3%	6%	60%	40%
Postgraduate	0	0	1.002	0	2.213	3.159	0	2.223	0	0	1.996	0	5.211	5.382
	0%	0%	19%	0%	42%	59%	0%	41%	0%	0%	38%	0%	49%	51%
Total	82.512	19.768	215.948	86.641	358.026	106.955	301.123	98.474	227.774	65.757	99.764	14.547	1.285.147	392.142
	6%	5%	17%	22%	28%	27%	23%	25%	18%	17%	8%	4%	77%	23%

Source: Social Protection Survey, 2004.

The above results are confirmed when looking at the proportion of contributors and non-contributors broken down by income. These results are given in Table 10.

Contributing and non-contributing independent workers broken down by income bracket

Income bracket in thousands of pesos	No contrib.	Contributory	Total
Less than 100	532,134	70,075	602,209
	88 %	12 %	35 %
Between 100-200	425,349	135,593	574,129
	74 %	24 %	34 %
Between 200-300	183,749	83,194	270,642
	68 %	31 %	16 %
Between 300-400	62,096	30,313	92,409
	67 %	33 %	16 %
Between 400-500	29,007	27,497	57,034
	51 %	48 %	3 %
Between 500-700	26,596	13,202	39,798
	67 %	33 %	2 %
Between 700-1,000	13,284	16,767	30,743
	43 %	55 %	2 %
More than 1,000	14,007	16,383	30,390
	46 %	54 %	2 %
Total	**1,286,222**	**393,024**	**1,697,354**

Source: Social Protection Survey, 2004.

The above table shows that the greater the income, the greater the proportion of workers contribute to the pension system. The contrary is true of workers with lower incomes, whose proportion of non-contributors is greater.

The analysis leads to the conclusion that independent workers who contribute into the system are those with higher levels of education, greater incomes, and aged 26 to 55. There is no difference in the behavior of men and women, and no difference either when we separate the population according to marital status.

## 3.2. Financing the old age of independent workers

The main income of elderly adults in the population is their retirement pension. The National Socio-Economic Survey (CASEN) 2003 data indicate that, in the case of men, 54% of their total income comes from their retirement pension. The figure for women is 77%.

In the case of independent workers, HLSS 2004 data indicates that only 23% of them were contributing to the pension system. Considering that pensions represent a high percentage of the total income of the elderly population, this

low percentage of contributing independent workers leads to the following question: how will this group finance its spending in old age?

A possible answer to the preceding question is found in the data from HLSS 2004. The following chart shows statistics for independent workers regarding how they plan to finance their spending during old age (see Chart 16).

Chart 16: **Contributing and non-contributing independent workers by financing of old age**
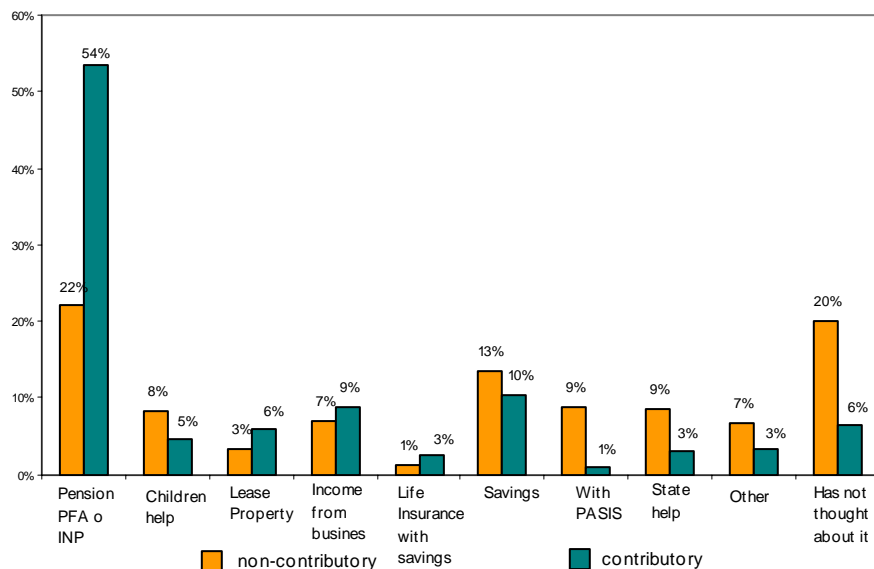
Source: Social Protection Survey, 2004.

The majority of contributing independent workers aim to finance their retirement with PFA or INP pensions (54%). In second place comes savings (10%), followed by income from business (9%). Only 6% of this group still has not thought about how to finance retirement.

Independent workers who do not contribute also indicate as the main finance mechanism for their old age the PFA or INP pensions (22%), with savings mentioned in second place (13%). However, a high percentage of this group, 20%, has still not thought about how to finance retirement.

Table 11 provides details, by age group, of the main sources of financing for old age indicated in the preceding chart. We can see that for non-contributing independent workers, a greater proportion among those in the younger age groups and those who are over 65 plan to finance their old age with plans from the PFA or INP. It is worth noting that these age groups contain a greater proportion of independent workers who are not contributing in the Pension

System. In the case of contributing independent workers, the majority, regardless of their age, aim to finance their retirement with PFA or INP pensions.

Most of those who still have not thought about financing their retirement are concentrated in the age bracket between 26 and 55, in the case of non-contributing workers, and in the age brackets under 26 and between 36 and 45 in the case of contributing workers (see Table 11).

Table 11: Main Sources of financing for old age, by age bracket.

Age bracket	AFP or INP		Their Savings		Has not thought about it		Total	
	No Contrib.	Contributing	No Contrib.	Contributing	No Contrib.	Contributing	No Contrib.	Contributing
Less than 26	30,347	14,601	21,562	1,869	24,333	2,724	76,242	19,194
	40%	76%	28%	10%	32%	14%	100%	100%
26-35	60,684	62,500	65,098	19,055	67,909	9,111	193,691	90,666
	31%	69%	34%	21%	35%	10%	100%	100%
36-45	84,927	81,043	56,455	13,916	96,143	14,809	237,515	109,768
	36%	74%	24%	13%	40%	13%	100%	100%
46-55	69,337	81,168	36,922	12,030	86,794	5,879	193,123	99,077
	36%	82%	19%	12%	45%	6%	100%	100%
56-65	69,514	52,285	26,782	8,437	41,480	3,840	137,776	64,562
	50%	81%	19%	13%	30%	6%	100%	100%
Over 65	45,411	13,163	10,401	3,686	8,524	496	64,336	17,345
	71%	76%	16%	21%	13%	3%	100%	100%

Source: Social Protection Survey, 2004.

Both contributing and non-contributing independent workers indicate PFA and INP pensions as the main finance mechanism for their retirement. Nevertheless, we should consider whether the pensions they would receive would be sufficient to finance their spending in old age. To evaluate the amounts that these people would receive, it is necessary to know their current income and the contribution densities of each bracket. The following chart shows that independent workers who contribute have, on average, total monthly incomes of approximately CLP 304,183, while independent workers who do not contribute have average monthly incomes of CLP 180,624. The income distribution of independent workers who do not contribute presents a greater proportion of people below the average wage than the income distribution of independent workers who contribute.

Chart 17: Income distribution, contributing and non-contributing independent workers
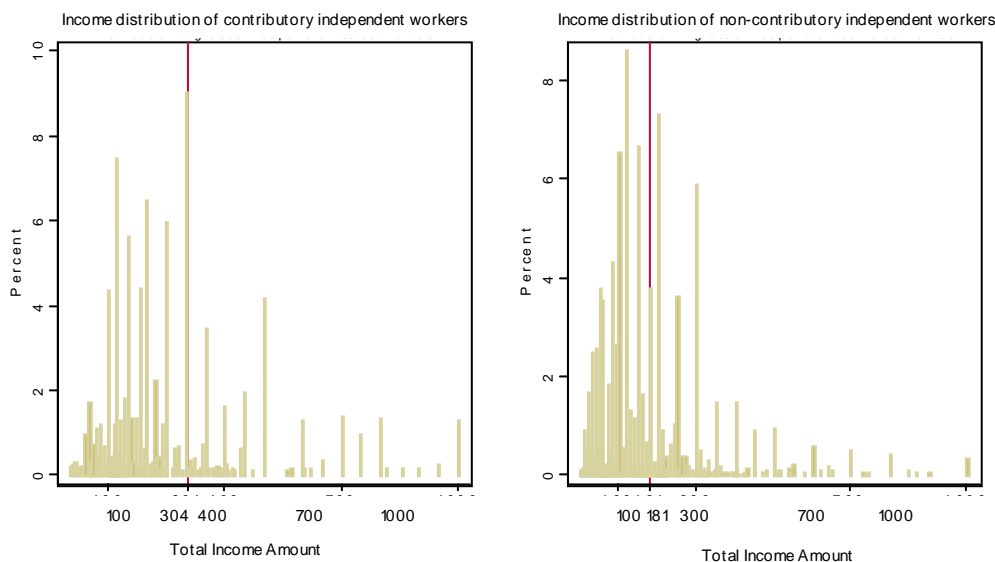
Source: Social Protection Survey, 2004.

The average income of male and female independent workers also differs according to whether the worker contributes to the pension system. As happens in the salaried workers segment, women with independent jobs earn less than men. Average income data for each independent worker category are summarized in the following table (see Table 12).

Table 12: Average income of contributing and non-contributing independent workers by gender

Independent workers	Average Income Men	Average Income Women
Don't contribute	195,606	148,536
Contribute	324,999	261,414

Source: Social Protection Survey, 2004.

With regard to the contribution densities[15] of this group, Table 13 indicates that, on average, independent workers who are contributing in their current job present greater contribution densities than those who are not contributing.

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15 Contribution densities are defined as months of contributions, contributions to the PFAs, that economically active persons make during their active lives, divided by the number of months that these persons are economically active.

Table 13: Contribution density of independent workers by percentile and gender

		Densities					
Independent workers		10th percentile	25th percentile	50th percentile	75th percentile	99th percentile	Average
Men	Don't contribute	0%	11%	42%	77%	100%	46%
	Contribute	8%	35%	72%	100%	100%	64%
Women	Don't contribute	1%	7%	30%	59%	100%	36%
	Contribute	6%	29%	53%	93%	100%	56%

Source: Social Protection Survey, 2004.

Table 13 indicates that for both male and female non-contributing independent workers the average contribution densities (46% in the case of men and 36% in the case of women) are lower than the average contribution densities of the population that participate in the Pension System[16] (59.8% for men and 43.8% for women). With regard to the contribution densities of independent workers, once again the tendency is for contribution densities for men to be greater than the contribution densities for women. The average contribution densities of contributing independent workers are greater than the average participating population.

The low average income figures of this non-contributing population, together with its low contribution densities suggest low pensions for this group and a high probability of becoming beneficiaries of the Welfare Pension System proposed in the planned Pension Reform.

Another of the financing mechanisms for retirement proposed for contributing and non-contributing independent workers is through their own savings. Here an important question is whether this segment would have the necessary resources in the future to finance its retirement using this mechanism. To answer this question it would be necessary to know whether the families have sufficient wealth, assets, and/or savings to finance their old age.

Below, Table 14 shows the average value of the assets and capital goods owned by this segment. The segment of independent workers with savings or investments does not exceed 10% in most cases. In addition, the average value reported for each type of savings or investment would be insufficient to finance the costs of retirement, given that it is a low amount in what would not be permanent funds. In addition, more than 75% of independent workers own their own home. Of these, 17% of contributing independent workers and 13% of non-contributing independent workers are still paying for it. Similarly, as seen in the above case, under 15% of this segment declares that they own any of the assets described (see Table 14).

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16 Source: Arenas de Mesa, Berhman and Bravo (2004)

Table 14: Assets and capital goods of independent workers. Average amount.

Type of savings or investment	Not Contribuiting		Contributing	
	% of pop with savings	Average value of savings, in thousands	% of pop with savings	Average value of savings, in thousands
Bank account	12.4	628	18.4	1.127
Home savings	7.3	332	6.9	536
Other savings	1.5	547	1.3	397
APV	1.1	1,217	2.7	684
Certificate of Deposit	1	3,613	1.6	2,414
Mutual Funds	0.8	2,737	1.4	15,796
Savings in AFP 2 account	0.7	1,806	1.1	127,530
Bonds	0.4	3,272	0.6	86
Savings in AFV (Administrator of home savings)	0.4	3272	0.6	86
Third party loan	0.1	880	0.2	2,500

Type of savings or investment	Not Contribuiting		Contributing	
	% of pop with savings	Average value of savings, in thousands	% of pop with savings	Average value of savings, in thousands
Cars or vans	23	2,973	41.51	46,747
Other house	11	28,843	15.99	30,141
Machinery or equipm	7	1779	7.07	9,774
Animals and/or land	5	1,016	2.97	1,268
Agricultural facilities	4	46,956	3.03	19,333
Trucks or utility vehi	2	2,359	3.8	3,752
Other vehicles	1	4,590	2.06	13,687
Motorcycles	1	828	0.75	822
Other	0.71	3296	0.56	5,748

Source: Social Protection Survey, 2004.

3.3. Perceptions of Chilean workers regarding contributing to the pension system

As we have already said, 77% of independent workers do not contribute to the pension system. Using data from HLSS 2004, we will demonstrate in this section the reasons that they do not contribute to the system, as well as what the system should provide to incentivize this group to contribute.

One of the questions asked in the HLSS survey aimed to find the reasons for independent workers not contributing to the pension system (see Table 15).

Table 15: Independent workers, reasons for not contributing

Reasons given for never having contributed

Reasons	Number	Percentage
Not obligated	350,620	36.7
Can't reach money	227,102	23.7
Don't understand system	97,536	10.2
Don't trust PFAs	72,238	7.6
Other reason	208,895	21.8
Total	**956,391**	**100**

Reasons given for not contributing currently

Reasons	Number	Percentage
Not obligated	950,734	73.9
Company financial problems	197,282	15.3
Work condition imposed by employer	48,149	3.7
Doesn't know how/not sure	47,025	3.7
Mutual agreement b/w employer & worker	29,871	2.3
Work condition demanded by employee	14,296	1.1
Total	**1,287,357**	**100**

*These figures represent the sum of the three main reasons given

The above table seems to indicate that the most important argument given for not having ever contributed and for not contributing currently is that contribution is not mandatory. Another important reason apparently is money problems and company financial problems. These results indicate that making contributions mandatory for these workers is fundamental in order to provide them with coverage by the System. In addition, the introduction of information mechanisms turns out to be important.

Asked if they would be willing to contribute to the system if it entitled them to other benefits, only 23% of this group answered affirmatively. Among the benefits[17] mentioned that could incentivize this contribution are: health (39%), housing (27%), and education (26%). Only 4% mention tax benefits. Likewise, when contributors are asked about their willingness to contribute an amount exceeding the legal requirement, and thereby access other types of benefits, the answer is no different, with 27% of the contributing population willing to do so. Of these, 35% indicate that health benefits would be an incentive to making an additional contribution, while 39% mention education and 25% housing. Only 3% mention tax benefits.

Currently, tax benefits are only available for workers making voluntary pension contributions (APV). However, tax benefits are only mentioned by between 3% and 4% when it comes to incentives for contribution (mandatory or voluntary), i.e. it would be insufficient to incentivize savings of the population by simply assigning tax benefits, which we can see are not valued particularly highly by independent workers. But there are clear incentives in the areas of health and housing. The PFA and Preventive Health Institutions (Isapres) could offer joint benefits to capture this segment, which isn't obligated to contribute for healthcare either. Furthermore, those citing housing aid might consider having a savings plan for old age a relevant option.

In addition to the above mechanisms, various public policy measures could be introduced apart from making contributions mandatory for independent workers. This is because, as previously mentioned, the mandatory nature of contributions for independent workers does not imply that the totality of this group would contribute to the system, mainly because many of these workers are informal (only 37% of independent workers deliver invoices stipulating the fees for the services they have rendered). In other words, the latter segment would be identified as contributing by the Chilean tax authority (SII) at the time they submitted their income tax returns. However, there would be no clear mechanism to collect taxes from the rest of this category. The current system

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17 These percentages were calculated by taking into account the sum of three preferences named by the interviewed workers.

only makes it possible to identify independent workers who make their tax declarations through the SII.

This argument implies that it is of utmost importance to know the reasons why this group does not contribute and to understand its characteristics. The government could use this knowledge to introduce public policies aimed at motivating its participation by way of incentives going beyond mere obligation.

With the above in mind, econometric calculations outlined below offer an opportunity to understand the probability that an independent worker, given his characteristics, will contribute or not to the pension system. This analysis will be of assistance in deciding on other public policy measures.

4. How to create incentives for independent workers to save voluntarily in the pension system. A probabilistic analysis

4.1 The model

The model used is a probit binary choice model, in which the dependent variable will have a value of 1 if the independent worker contributes to the retirement system and 0 if he does not. However, this model is corrected for selection bias using Heckman's method in two steps, given that the decision to be or not to be an independent worker generates bias in the estimates. Consequently the secondary equation estimates the probability that the worker will be independent.

$Y{contribute}$

The explanatory and/or independent variables in the model are constituted by a vector of characteristics of alternative savings methods, characteristics of the individual, characteristics of the household, and characteristics of the work. The algebraic model is defined as follows:

$$Ycontribute = \beta_0 + \beta_1 * X^c + \beta_2 * X^h + \beta_3 * X^t + \mu$$

Description of variables

$Y_{contribute}$ = 1 if the worker contributes, 0 if not

X^A = monetary value of durable goods (sum of: vehicles, land, homes, among others), monetary value of capital goods (sum of savings accounts, investments, deposits, among others), dummy that takes the value of one if the principal residence is paid for, dummy that takes the value of one if the individual has

access to loans through banks and/or financial institutions and/or commercial companies.

X^c =years of education, age and age squared, gender dummy, healthcare contributor dummy

X^h =number of children in the home under 6 years, number of children in the home under 18 years and over 6 and marital status dummy where 1 is if lives with partner.

X^t = current job (variable dummy for each type of job), type of work (permanent, temporary; fixed term, by task or service, other. Dummy for each type of work, monthly income, dummy for whether has employment contract or not in current job.

For a better analysis of the change in probability of the independent worker with respect to contributing or not in the system, when one of the characteristics covered by the variables changes, the curves are shown of the coefficients that accompany the independent variables in the model. When interpreting it, it will therefore be necessary to take into consideration what the marginal effects indicate the probability of a change in the independent variables. In the case of dummy variables, the effect of the curve implies a change in value in the dummy variable from 0 to 1.

The main aim of the study is to analyze which characteristics are statistically significant concerning independent workers and what influence these variables have in the probability that these workers will contribute or not. The central aim is to identify these important characteristics in the independent contributor segment so as to take them into account in the development of public policies designed to increase coverage of this sector. As mentioned before, the mandatory nature of contributing for this group is not sufficient as a mechanism to increase coverage, to the extent that many of them are informal workers and that there are no current regulatory mechanisms to check if they are in fact making contributions.

The data was extracted from the Social Protection Survey, 2004, given that this is the only complete source of information for the purposes of this type of analysis of the pension system.

4.2 Results

Using the study by Cardoso and Leiva (2007a) as a foundation, the estimated model is a probit model in which the dependent dichotomic variable is contribution or non-contribution to the retirement system by the independent worker. Variables used: constituted by a vector of characteristics of alternative savings methods, characteristics of the individual, characteristics of the household, and characteristics of the job.

A secondary equation was used to determine the probability of being an independent worker. This considers variables such as:

- Characteristics of the household: number of children in the household under 6 years
- Number of children in the home under 18 and over 6
- Marital status dummy, own paid-up home dummy.
- Characteristics of the individual: years of education, years of work experience in months.
- Risk mitigation measures: insurance dummy, healthcare contributor dummy.

Six models have been estimated for this purpose. They are summarized in the following table:

Table 16:
Secondary equation: estimated models

Variables explicativas	Model 1 Coef	P-value	Model 2 Coef	P-value	Model 3 Coef	P-value	Model 4 Coef	P-value	Model 5 Coef	P-value	Model 6 Coef	P-value
Dummy for sex, male=1	0.178*	0.000	0.180*	0.000	0.182*	0.000	0.188*	0.000	0.178*	0.000	0.177*	0.000
Dummy for civil status, married or in a relationship=1	-0.020	0.562	-0.018	0.599	-0.015	0.665	-0.013	0.716	-0.020	0.557	-0.021	0.541
Years of education	-0.026*	0.000	-0.026*	0.000	-0.026*	0.000	-0.026*	0.000	-0.026*	0.000	-0.025*	0.000
Dummy for life insurance with savings=1	0.121	0.299	0.187	0.108	0.121	0.284	0.146	0.174	0.126	0.272		
Number of Children under 6	-0.033	0.160	-0.038	0.108	-0.035	0.112	-0.034	0.101	-0.033	0.155	-0.029	0.230
Number of Children in the house	-0.031*	0.036	-0.029*	0.046	-0.034*	0.013	-0.032*	0.013	-0.030*	0.038	-0.028**	0.055
Months of experience	0.001*	0.000	0.001*	0.000	0.001*	0.000	0.001*	0.000	0.001*	0.000	0.001*	0.000
Constant	-0.797*	0.000	-0.787*	0.000	-0.777*	0.000	-0.759*	0.000	-0.793*	0.000	-0.805*	0.000
rho (***)	-0.883*	0.000	-0.891*	0.000	-0.914*	0.000	-0.940*	0.000	-0.897*	0.000	-0.862*	0.000

Analyzing the results of the preceding table, we can see that the probability of being an independent worker increases among men and among those with less work experience. The probability of being an independent worker diminishes with factors such as years of education and increases in the number of children in the home, also in this case with a confidence level of 5%.

We now move on to the analysis of the main equation, whose results are shown in Tables 17 and 18. In these, it can be seen that the dy/dx variable indicates the change in probability of contributing as a consequence of a marginal change in the explanatory variables. We show below the results of models 1, 2, and 6.

Table 17:

Results of the main equation

	Model 1		Model 2	
Explicative Variables	**dy/dx**	**P-value**	**dy/dx**	**P-value**
	0.003	0.499	0.005	0.292
Log total of bb durables, dummy bracket income per capita 1	-0.001	0.782	0.002	0.752
Log total of bb durables, dummy bracket income per capita 2	0.000	0.974	0.004	0.466
Log total of bb durables, dummy bracket income per capita 3	-0.004*	0.035	-0.004*	0.047
Log total of bb capital, dummy bracket income per capita 1	0.002	0.115	0.002	0.098
Log total of bb capital, dummy bracket income per capita 2	-0.005*	0.041	-0.005*	0.047
Log total of bb capital, dummy bracket income per capita 3	0.014	0.241	0.018	0.140
Financial Dummy	0.000	0.749	-0.001	0.695
Log total cost of child education, dummy traunch income per capita 1	0.003*	0.050	0.003**	0.087
Log total cost of child education, dummy traunch income per capita 2	0.006*	0.023	0.006*	0.018
Log total cost of child education, dummy traunch income per capita 3	-0.233*	0.000		
Dummy health system afiliate, free=1			0.170*	0.000
Dummy health system afiliate, private=1	-0.037**	0.096		
Dummy health system afiliate, public paid=2	-0.260*	0.000		
Dummy no health system =1	-0.001	0.665	-0.003	0.365
Log total house income per capita	0.053*	0.000	0.070*	0.000
Dummy formal worker=1	0.009	0.440	0.003	0.804
Dummy for sex, male=1	-0.017	0.253	-0.022	0.133
Age in years	-0.002*	0.000	-0.002*	0.000
Dummy permanent job=1	0.005*	0.004	0.008*	0.000
Dummy civil state, married or in a relationship=1	0.039*	0.015	0.041*	0.010
	-0.016	0.266	-0.008	0.560
Pseudo R2	**56%**		**50%**	
N° Obs	**8,226**			
N° Obs not censored	**1,885**			

Results of the main equation

Explicative Variables	Model 6	
	dy/dx	P-value
Log total of durable bb	0.000	0.95
Log total of capital bb	0.001	0.299
Log total cost to educate children	.002*	0.049
Dummy for financial access=1	0.013	0.286
Dummy health system afiliate, free=1	-0.246*	0
Dummy health system afiliate, private=1	-0.036	0.128
Dummy no health system =1	-0.275*	0
Log total house income per capita	-0.005**	0.09
Dummy formal worker=1	0.056*	0.001
Dummy house paid=1	0.012	0.317
Dummy for sex, male=1	-0.014	0.38
Age in years	-0.002*	0
Years of Education	0.004*	0.012
Dummy permanent job=1	0.040*	0.019
Dummy civil state, married or in a relationship=1	-0.018	0.225
Pseudo R2	52%	
Number of Observations	8,226	
Number of Observations not censored	1,885	

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*Significant at a 5% confidence level **Significant at a 10% confidence level Notes: (a) dy/dx indicates the change in the probability of contributing as a consequence of a marginal change in the explanatory variables. (Evaluated at the average) (b) Probit model with selection bias correction (Heckman) and heteroscedasticity.

There are various elements to take into account when reviewing the workers' socioeconomic conditions. It is important to note that the mandatory nature of contribution is not sufficient to solve coverage problems and pension amounts, given that only 49% of independent workers are in formal employment and can therefore be subject to control mechanisms. Furthermore, independent workers are heterogeneous by level of income and have preferences for various types of alternative savings, depending on their level of income. For instance, those with low incomes prefer to save for housing, while those with high incomes prefer greater liquidity.

Thus we can see that an increase of 1% in alternative savings (capital goods or financial savings) decreases the probability of contributing. This is an extremely important finding, as it means that at present, saving for pensions cannot compete with the decision to direct earnings toward the objective of obtaining a home. This latter point would lead one to think that instead of setting the retirement saving system against these other saving alternatives for independent

workers, alternatives should be sought so that these two objectives may complement one another.

These alternative savings are supported by a range of incentives for the independent worker. Above all, as seen in the estimated equation, it is associated with benefits such as healthcare, housing and education. For example, in the estimated models for children's education, when the income section is not controlled for, the variable is significant, implying that an increase in spending on the children's education increases the probability of contributing to the pension system for medium and high income sectors. It is important to note that access to housing and education are in many cases related to one's ability to receive a bank loan. Thus it is important to highlight the interaction and activity of the financial system as a whole as an important variable.

A similar situation can be seen in the case of healthcare. There is a link between healthcare and pensions. There is a positive correlation between contributing to the public healthcare system and the public pension system. However, healthcare contribution to private entities decreases the probability of contributing for pensions.

Other relevant elements can be seen in the years of education of the independent worker, a factor which increases the probability of contributing to the system by between 0.4% and 0.9%. The permanent work dummy variable also increases the probability of contributing to the pension system. In terms of gender, the results indicate that being a man decreases one's probability of contributing to the system. And, as expected, the formal worker paying his taxes normally to the state, also usually pays his pension contributions, according to the specified models. With regard to the age variable, it can be seen that between the ages of 26 and 65 the probability of contributing increases, which is in keeping with the lifecycle theory. Coefficients increase, i.e. the probability of contributing to pension funds increases as we advance through the age groups. A maximum 20% increase in probability is reached in the 46 to 55 age bracket. There is a decrease in the last economically active age bracket of workers between 56 and 65 years old.

In conclusion, we can say that although contributions to the system have to be made obligatory, such a measure must be complemented with the creation of specific incentives destined to increase the probability that independent workers will contribute to the pension system. The most effective could be measures that promote household access to credit or facilitate the supply of certain basic services (education, health, etc.).

5. Conclusions and policy recommendations

The study makes it possible to conclude that under current conditions, the pensions for independent workers would be insufficient to guarantee a decent level of income in old age. Although making contributions obligatory seems necessary to guarantee a sufficient pension, it is still necessary to establish incentives for contributions according to the preferences of this type of worker for alternative savings systems, in order to decrease the rate of contribution evasion.

Our study has shown that independent workers have the following characteristics:

Low coverage. The coverage of the system with regard to the total of workers who are actively contributing is 56%. However, statistics from the Social Protection Survey, 2004[18], indicate that 66.4% of this population participated in the system. Nevertheless, only 23% of this segment was making contributions as independent workers when the survey was held. What is more, according to figures from the PFA Superintendent, the percentage of independent workers who contribute is even lower (5%)[19].

Low contribution densities, mainly women. Workers who are contributing at present in the system have contribution densities averaging 52%,[20] while the corresponding figure for independent workers is similar, at 47%. This problem reveals a high level of differentiation when independent and dependent workers are compared along gender lines and their contributions to the system. Both dependent women workers (43.8%) and independent women workers who do not contribute actively (36%) have contribution densities to the pension system that are somewhat inferior to those for men (59.8% for dependent workers and 46% for independent non-contributing workers, respectively). With regard to the contribution densities of independent workers who are contributing in their last job, once more men present higher contribution densities than women.

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18 The Social Protection Study was carried out in partnership between the Undersecretary of Social Prevention, the University of Pennsylvania and the University of Chile. Information collected on employment and retirement histories of the subjects provides statistics in the areas of education, health, social security, work qualifications, wealth and assets, family history and information about the household. The first edition was carried out in 2002.

19 This is because of the way that workers are classified, given that even when an independent worker becomes a dependent worker within the contributing period, the contributions continue to be accounted for according to the status declared at the time he joined the plan.

20 Source: Arenas de Mesa, Berhman and Bravo (2004)

Income levels relatively lower than the rest of the population. With regard to the income level of independent workers, the average[21] was CLP 198,778, while the average income base of the population contributing to PFAs was CLP 341,298 in December 2004[22]. The average income of the contributing population according to the EPS 2004 was CLP 352,060. In addition, the average income of this type of worker varies according to gender and contributions to the pension system. As is the case with salaried workers, the income gap favors men. Furthermore, people who contribute tend to have a higher average income than those who decide not to.

Contributions concentrated among young people and adults with low educational levels. Broken down by age of contributing and non-contributing independent workers, those aged 26 to 55 have a higher proportion of contributors, while at the extremes the younger populations or those at a more advanced age have lower proportions of contributors. With regard to education, we can see that workers with the highest educational level (higher education, whether completed or not) have a greater percentage of contributors than those with a lower educational level (no education, basic education or medium-level education).

Highly concentrated in the trade and service sectors. Among the main characteristics of this segment of the population we find: i) sector of activity: 31% of independent workers are found in the trade sector and 18% in community and social services (public administration and domestic service, among others); ii) occupation or profession: laborers and craftsmen represent 22.9% of all independent workers; agricultural workers and seamen represent 10.9%. With respect to the characteristics of contributing and non-contributing independent workers by job category, the data indicates that the bulk of those who are not contributing are in the self-employed worker category, while domestic service and employers show greater contribution levels.

The result: low or nonexistent pensions. Making contributions obligatory is justified as a means to this end, but only partially. What are also needed are elements that provide incentives for independent workers to contribute.

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21 The income of these workers was calculated considering income from their main job, income from a secondary job, and the withdrawal of profits from business. Data from the EPS, 2004.
22 This data is subject to a downward bias given that the income in the declared contributions is limited to a maximum of UF 60 (Chilean account units) of base income.

According to data by the Social Protection Study, 2004, only 37% of the independent workers submitted invoices setting out the fees for the services they had rendered. In other words, 63% opted consciously to **evade payment of taxes** in spite of the existence of control mechanisms that presumably are similar to those that would be introduced to oblige contribution to the pension system. It is therefore very possible that in spite of what may be established by law, there is a significant number of people who will decide not to comply with the regulations that require them to contribute.

This study has identified a series of characteristics that increase the probability that independent workers will contribute independently of the legal compliance mechanisms established by the state. For example, the study proves that access to services that have a secondary function as a savings mechanism is crucial to promote voluntary contribution to the system. Thus many families prefer to invest in services such as children's education or the provision of healthcare, in addition to saving on goods that can give them liquidity in case of need. This suggests another interesting conclusion from the study: the probability that an independent worker will contribute increases with his access to bank credit. Therefore, the development of the financial system should be one of the main objectives if we want to increase voluntary contributions.

In conclusion, we can say that although contributions to the system have to be made obligatory, such a measure must be complemented by the creation of specific incentives destined to increase the probability that independent workers will contribute to the pension system. The most effective could be measures that promote household access to credit or facilitate the supply of certain basic services (education, health, etc.).

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