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Savings under formal and informal conditions

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Abstract

This study analyzes different individual's factors that impact savings conditions, based on two innovative surveys performed by the Inter-American Development Bank (IDB) for the cities of Lima and Mexico D.F. The aim of this research is fourfold: first, to understand how different individual's conditions affect savings decisions; second, to identify particular individual characteristics that define different informal workers and their relationship with savings; third, to understand those factors that remain important beyond individual's formal or informal characteristics; and forth, to consider some policy recommendations. Besides confirming some results found in previous studies about savings' determinants, our research reveals the importance of how particular conditions of informal workers impact negatively on the likelihood of savings. Moreover, we found that beyond formal and informal conditions of workers there are other factors more related with the economic theory of self-confidence and motivation that impacts positively on savings decisions. These findings could have relevant extensions for policy recommendation to be taken into account.

Keywords: savings, financial inclusion, informal markets, Latin America

JEL: D14, D83, J46, G21

1 The problem of savings from an individual's perspective

According to World Bank's estimates, there are still around 2.5 billion people in the world who do not have a bank account. These statistics show that only around 50% of adults (people aged 15 and above) in the world have at least one bank account in the formal financial system. However, this percentage of individuals with a bank account varies considerably between developed and developing countries. In developing countries, banking penetration rates are far below the average. In Africa, the percentage of adults with a bank account is 20%, and in Latin America 39%.

The economic literature has discussed thoroughly on the importance of saving. The importance to know the barriers that block individual savings -also known as financial inclusion- is explained for the growing evidence on the relationship of savings with poverty alleviation and welfare. Some authors have concluded that the lack of using financial services could lead to the poverty trap and to an increase in the inequality gap (Banerjee and Newman, 1993; Galor and Seira, 1993; Aghion and Bolton, 1997; Beck, Demirgüç-Kunt and Levine, 2007). In addition, empirical evidence suggests that the use of financial instruments increases savings (Aportela, 1999; Ashraf et al., 2010) and consumption (Dupas and Robinson, 2009; Ashraf et al., 2010b).

From a macroeconomic point of view, the influential article of Goldsmith (1969), demonstrating the relationship between financial and economic development, has generated increasing interest (De Gregorio and Guidotti, 1995; Demetriades and Hussein, 1996; Arestis and Demetriades, 1997; Khan, 2001; Calderon and Lui, 2003; and Christopoulos and Tsonias, 2004, among others). In despite of the large number of theoretical and empirical works that stands for the relationship of economic growth and financial development, some authors claim that in order to gain a better understanding of the topic, we need to look beyond this relationship. Hence, the literature has also found evidence of a large number of non-macroeconomic factors that determine how financial services are available for individuals. For example, many authors have found the importance of some barriers or markets failures that make some individuals find difficult to save. Problems such as asymmetric information (Razin et al., 1997; Tesar and Werner, 1994), financial literacy (Lusardi and Mitchell, 2009), lack of competition in the markets (Allen and Gale, 2004), labor conditions –such as working in the informal economy- (Bosch et. al, 2013), as well as personal factors such as motivation or self-confidence (Benabou and Tirole, 2003), are found as elements blocking families' participation in the financial system.

Among the aforementioned factors affecting savings, in the case of Latin America, it is a particular worrisome the problem of the informal economy. Depending on how this is measured, informality could represent around 40% of Latin American economies (Elgin and Oztunali, 2012). There are extreme cases such as in Peru, where informality amounts 60%. Mexico, on the other hand, which is one of the biggest economies in this region, has an informal economy amounting 30%. This situation of informality is particularly interesting in the case of the financial system where, according to Hoyo et al. (2013), at least 35% of the adult population saves in non-formal financial institutions and only 6% of them do it in banks.

This study aims to contribute to the literature on the determinants of savings in Latin American, taking advantage of two innovative 2008 surveys of the Inter-American Development Bank (IDB) for the cities of Lima and Mexico D.F. The goal of our research is fourfold: first, to understand how different individual's conditions affect savings decisions; second, to identify particular individual characteristics that define different informal workers and their relationship with savings; third, to understand those factors that remain important beyond individual's formal or informal relationships; and forth, to consider some policy recommendations according to the achieved results.

Next, we briefly describe the data used in this research and the cluster analysis performed to define different informal workers. In the third section we describe the Probit methodology. The fourth section discusses the results obtained. Lastly, we conclude by summarizing the main results and discuss some policy recommendations.

2 Data and cluster analysis for informality profiles

In 2008 the IDB took the challenge to develop the survey called "Expanding Household Social Security (EHSS)" for Lima and Mexico DF. The objective of the survey was to gather information regarding the social, economic, labor and perceptions of safety of workers between 25 and 55 years old.

The survey provides a comprehensive detail of the occupation of individuals and their relationship with the social security system. The survey asked questions to households about knowledge and assessment of the social security system, the use of alternative or informal social protection strategies and the participation in social programs. The EHSS also collected additional data that helps us to reveal individuals' socio- economic conditions such as: their financial knowledge, financial inclusion, risk aversion preferences, exposure to exogenous shocks, and inter-temporal preferences of households and individuals. The statistical definition of the sample selected for the survey, allows inferences to the urban population between 25 and 55 years of Lima and Mexico City.

As mentioned in the previous section, one of the aspects that we want to analyze is the relevance of individual's informality conditions on savings decisions. Considering that not all the socio-economic characteristics of individuals participating in the informal economy are the same and the fact that informality is a heterogeneous phenomenon with different types of workers participating, we use a cluster analysis. This methodology is based on a multivariate method that identifies associations between N individuals characterized by the information provided by Xj variables (j = 1,2, ... , n) in order to classify them into homogeneous groups generated by the methodology itself. This is a technique that allows us to explore a data set before applying statistical models. The result is a classification of individuals into groups similar to each other and far from the other groups generated. Ratings can be made using measures of similarity or divergence.

There are two relevant clustering techniques: 'non-hierarchical cluster' and 'hierarchical cluster'. Non-hierarchical cluster is characterized by defining in first term the number of groups created. Meanwhile hierarchical cluster are constructed from successive partitions and can be of divisive-type or agglomeration-type. The cluster by agglomeration-type start treating each individual as a cluster and during the process they are successively merging, according to the similarity among them in order to form a group of several related individuals. The difference between various methods of hierarchical cluster is based on how we establish the distance among the groups created:

- Nearest neighbor or single linkage: it is determined by the minimum distance among an object and a cluster of other object .

- Furthest neighbor or complete linkage: it sets the distance between clusters with the distance among the farthest individuals.

- Centroid method: the distance between the centroids of each group is used as the distance among conglomerates.

- Median method: Similar to the centroid method but assigning equal weight to all groups created in order to allow that small groups do not lose importance in the analysis.

- Ward method: Set groups such that the sum of the squares of the deviations from the mean of each variable is minimal.

- Average linkage: it agglomerates the groups according to the average distance between individuals in each group.

For this study, we consider the latter as the preferred method because it does not alter the initial metric, it is not sensitive to outliers (as it happens with the others) and it is a robust method for multiple situations (Kaufman and Rousseeuw, 1990). The estimation procedure was performed in Stata. Once the socio-economic and labor characteristics were transformed as dummy variables (taking values 0 or 1), selected clusters were calculated by the method of average linkage using the Euclidean distance. The stopping rules used were the Pseudo -F or Calinski's rule (Calinski and Harabasz, 1974) and the Pseudo -t or Duda –Hart's test (Duda and Hart, 1973). Besides, in order to have a larger sample, we joined the data bases of both cities and two types of cluster analysis were estimated, thus the consistency and relevance of the used variables were verified. The following table summarizes the results:

Table 2.1
Results of the cluster analysus for Lima and Mexico DF

	Cluster 1	Cluster 2
Number of variables	30	22
Variables	Gender, education, sector of work, occupational status, firm size, informality of the company, parent education, marital status, savings, credit, bank account ownership, responsiveness to shock, head of household earnings , other income, job satisfaction, asset holdings.	Gender, education, sector of work, occupational status, firm size, informality of the company, civil state, savings, credit, bank account holdings, the household head, labor income, job satisfaction.
Calinsky	2	2
Duda-Hart	3	3
No. of defined clusters	2	3
Cluster's distribution	59.95%, 40%	55.5%,33.19%,11.28%

Source: author's cluster analysis

The cluster analysis allows us to identify two groups of informal workers with contrasting characteristics. We can define Group 1 as informal workers with less advantaged economic conditions. Workers in this group are individuals mainly in the poorest quintiles, with a higher percentage of women and with individuals having less educational attainment. In contrast, Group 2 is composed by individuals working in the informal sector with a higher percentage belonging to the richest quintiles, with higher educational attainment, with more financial and real estate assets, with a higher percentage of women that achieved secondary education and with a higher percentage of individuals that are heads of the family.

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Figure 2.1
Personal characteristics of two type of informal workers in Lima and Mexico DF
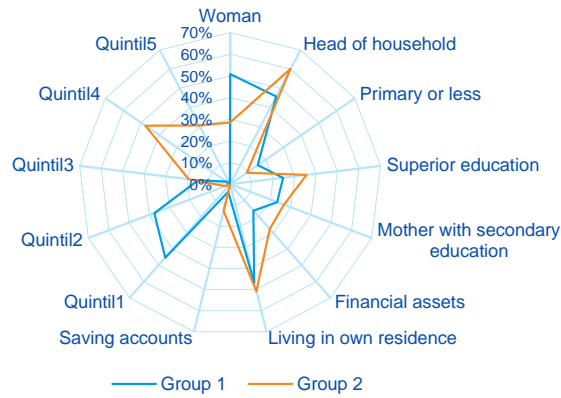
Source: author's cluster analysis

3 Methodology

The Probit model is often used in order to determine the likelihood of whether an individual with certain characteristics do not belong to the group under study. Probit models are binary classification where the dependent variable is dichotomous and takes values of 1 if it meets the used attribute and 0 otherwise. In social sciences, these binary dependent variable models are commonly used, for instance, to analyze decision making.

In this case, it is assumed that an unobserved variable (latent) must pass a threshold in order that a dependent variable takes the value of 1. Since the estimation cannot be done by OLS regressions, given that the dependent variable is unobservable, Maximum Likelihood estimation is used, assuming a particular distribution of errors. When errors are considered normally distributed, a Probit model is defined.

With this specification, the dependent dichotomous variable has the probability that

Pr (y = 1 | x) or Pr (y = 0 | x)

This probability depends on the values of the specified control variables such as socio-economic and geographical variables, which are represented by a linear combination. The model is specified as follows

Pr (y = 1 | x) = Pr (y * >) = F (x) x_i β.

In this analysis, probit models take as dependent variable y_i and the holding of some kind of savings (1 if the informal worker saves and 0 otherwise). The focus of study, in this case, is the worker. We assume that the decision to save depends on a latent variable y^*, which is determined by a set of exogenous variables , collected in the vector x', of the form:

$$y_i^* = x_i'\beta + u_i$$
$$y_i = 1 \text{ si } y_i^* > 0 \; ; \; y_i = 0 \text{ si } y_i^* \leq 0$$

where the subscript *i* represents the individuals, the vector represents the model parameters and *u* is an error term normally distributed with mean 0 and variance 1 .

A critical threshold y_i is assumed. So, if y_i^* is greater than y_i, it is considered that an individual saves. The threshold y_i^*, as well as y_i, is not observable; however, assuming that it is normally distributed with the same mean and variance, it is possible to estimate the parameters of the model and obtain information about y_i.

$$P_i = P(y_i = 1|x') = P(y_i \leq y_i^*) = P(Z_i \leq \beta x_i') = F(\beta x_i')$$

Where Z is a normal standard variable, $Z \sim N(0, \sigma^2)$ and $F = \left(\frac{1}{\sqrt{2\pi}}\right) \int_{-\infty}^{\beta x_i'} e^{-Z^2/2} dz,$ is the cumulated normal distribution function.

In this type of models it is not possible to directly interpret the estimates of the parameters β, since there are nonlinear models. Therefore, considering the different estimated coefficients in the models, we calculate the marginal effects on the latent variable. The interpretation of these marginal effects is similar to that obtained in linear regression models, where the coefficients represent the change in the probability of having savings when

a variable xj belonging to the vector of exogenous x' changes keeping hold other factors fixed, since $E(y^*|x') = x'\beta$.

Our endogenous variable is savings. We consider savings in their different forms; those in formal institutions (banks or pension systems) or in non-formal institutions (or other alternatives). Our exogenous variables are a set of individual characteristics considered in the surveys. With respect of informal workers, we define them as those who do not contribute to social security. We consider in the regression the two types of informal workers obtained by the cluster analysis (see details in Appendix 1). We perform different probit regressions depending on the formal or informal condition of the individuals.

4 Results

As discussed in the previous sections, savings could be conditioned by different individual's socioeconomic characteristics. In Tables 2 and 3, we present the estimates of the Probit model regressions, describing the effect of the exogenous variables on the probability to save in formal or non-informal financial institutions, depending on the relationship that individuals have with the informal economy, namely, if they are formal or informal workers. In the case of the model that focuses on informal workers, we discern the effect of being a particular type of informal worker, according to the cluster analysis we described. That is to say, we want to know how to belong to the 'Informal Group 1' or to the 'Informal Group 2' affects worker's ability to save.

As we mentioned at the beginning of this document, our goals in this research is fourfold: (1) to understand how different individual's conditions affect savings decisions; (2) identify particular individual characteristics that define different informal workers and their relationship with savings; (3) to understand those factors that remain important beyond individual's formal or informal relationships; (4) to consider some policy recommendations according to the achieved results. Let's discuss how these goals are achieved.

4.1 Which individual's conditions are relevant for savings' decisions?

For our analysis, we use significant correlations to determine those factors that could affect the probability of individuals to save. Table 2 shows the estimates for total savings, that is to say, savings in formal financial institutions and other alternatives (e.g. family savings, other social schemes). Table 3 provides information only for savings in formal financial institutions.

As observed in both tables, most of these variables are significant at conventional levels and most of them have the expected sign. To have a larger number of children and fewer years of education appear as significant factors that reduce the likelihood of using financial products. These results are in line with those of Allen et al. (2012) and Camara et al. (2014). However, it is interesting to mention that in the case of being a woman, this does not have a significant impact in diminishing savings participation, as it is usually observed in other studies as those mentioned in this paragraph. The only situation where being a woman has significant effect is when we consider the total sample in the case of formal banking (reducing the likelihood in 2,5%). This conclusion seems to tell us that being a woman does not affect her decision to save in non-formal banking schemes, because they are probably more familiar with them than with banking products. Hoyo et.al (2014) arrives to similar results for the case of Mexico.

In the case of incomes, we obtained different results depending on the sample breakdown. When we consider all kind of saving products (formal or non-formal), earning less than 20 dollars and between 20-50 dollars per day do not affect the likelihood to save in the case of informal workers. The situation seems to change in the case of formal banking products, when being an informal worker earning less than 20 dollars or earning 20-50 dollars per day reduce the likelihood to save. Probably, this is related with the fact that some banks ask minimum deposits to open an account that exceed individual's personal budget (Camara et. al 2014). Following Lusardi and Mitchell (2009) the impact of financial knowledge or financial literacy in financial savings tends not to have a straightforward relationship and depends on different conditions. Hence, our estimations show that having financial knowledge has higher significant effects, increasing the likelihood to save, when we analyze the complete sample.

Other interesting fact is the role of firm size where individuals participate in the labor market. Smaller enterprises tend to be less affected by economic shocks which make workers belonging to these firms difficult to build a capacity to save (Bosch et.al. 2013). Hence, as expected, working in firms with less than 5 employees, affect negatively the likelihood to save, except in the case of formal workers. It is also interesting to mention the importance of holding monetary and non-monetary assets, which has a positive effect by increasing the likelihood to save in the case of informal savings. As it was found in Hoyo et al. (2013) the increase in the wealth of individuals tends to reinforce their relationship non with the formal banking but with informal alternatives of savings.

4.2 Different type of informal workers and savings' decisions

One interesting finding of the analysis is the different impact that being an informal worker has on savings decisions. Previously we have seem how socioeconomic conditions impact differently if an individual is formal and informal worker or if their decisions on savings are related to formal or non-formal financial institutions. Notwithstanding, other scope of analysis is to understand if there are particular condition inside the group of informal workers that differentiate each other's.

In section 2 we performed a cluster analysis that defined two types of informal workers. Group 1 identifies those with particular socioeconomic conditions in terms of income, education, gender, labor conditions, etc., that apparently define a more vulnerable collective with respect of informal workers in Group 2. Indeed, Table 2 and Table 3 shows that belong to the Informal Group 1 reduces the likelihood to save with respect of workers in Group 2. First, as we found previously, informal workers are not a single and homogenous group but one that have particular characteristics. Second, there are some informal workers with particular conditions that impact negatively their likelihood to save. Third, this means that if a policy intervention is designed for informal workers, it would be wise to differentiate as we will discuss later on.

4.3 Relevant factors remain important under formal or informal conditions: motivation and savings

There is an interesting literature on the effect of how motivation and self-confidence affects the results. Individuals tend to perform better in different aspects of life when they are motivated by extrinsic or intrinsic conditions (Benabou and Tirole, 2003) or when they have positive expectations or self-confidence (Haines, 1979; Frey, 1997; Segal, 2008; Brown and Lahey, 2014). Following this framework, our regression analysis found striking positive effects on savings from individual's confidence in the future and when individuals are more satisfying with their labor conditions. When individuals have a positive confidence in the future, the likelihood to save is highly significant in all the performed regressions, with increases between 2 and 11%.The same happens in the case of the satisfaction with labor conditions, that increases the likelihood to save between 2 and 17% depending on the sample.

Table 4.1
Regression Analysis for Total Savings (Savings in Formal and Non Formal Financial Institutions)

	INFORMAL WORKERS				TOTAL POPULATION			
	Coef	Error Est	P	Sigf	Coef	Error Est	P	Sigf
Informal-Group 1	-0,1406501	0,0211	0,00	***				
Woman	0,0282034	0,02016	0,16		-0,0256005	0,01984	0,20	
Head of household	-0,018031	0,02133	0,40		-0,0324631	0,02145	0,13	
Married or partnership	0,0522458	0,01962	0,01	***	0,0763378	0,0201	0,00	***
Age	0,017387	0,01009	0,09	*	0,021529	0,00973	0,03	**
Age squared	-0,0002109	0,00013	0,10	*	-0,0002318	0,00012	0,06	*
Number of children	-0,0225566	0,00681	0,00	***	-0,0265617	0,00713	0,00	***
Age the first day of work	-0,0052477	0,00226	0,02	**	2,12E-06	0,00226	1,00	
Primary education or less	-0,1429323	0,02782	0,00	***	-0,2402644	0,03155	0,00	***
Secondary education	-0,0818144	0,0208	0,00	***	-0,1333462	0,01969	0,00	***
Self employed	0,0240904	0,02922	0,41		-0,0527549	0,03071	0,09	*
Employer	0,0502501	0,04593	0,27		-0,0159954	0,04606	0,73	
One employee firm	-0,0948256	0,04356	0,03	**	-0,3806094	0,0349	0,00	***
Firms 2-5 workers	-0,0694794	0,039	0,08	*	-0,3548051	0,02954	0,00	***
Firms 6-50 workers	-0,0814952	0,03499	0,02	**	-0,2161266	0,02714	0,00	***
Informal firm	-0,004166	0,02528	0,87		-0,0679396	0,02443	0,01	***
Labor satisfaction	0,1226644	0,0154	0,00	***	0,1701451	0,01582	0,00	***
Financial knowledge	0,0595374	0,01157	0,00	***	0,0609227	0,01151	0,00	***
Confidence in the future	0,1053052	0,01893	0,00	***	0,0947775	0,0199	0,00	***
House owner	-0,0143785	0,01783	0,42		0,0126358	0,01777	0,48	
Monetary and non-monetary assets	0,0998276	0,02454	0,00	***	0,0950729	0,02389	0,00	***
Income- less than 10USD per day (PPA)	-0,0605477	0,05375	0,26		-0,2718394	0,04468	0,00	***
Income 10 - 50 USD per dady (PPA)	-0,0737216	0,05134	0,15		-0,1681178	0,04208	0,00	***
Months working in the firm	0,0003034	0,0003	0,31		0,0013198	0,00031	0,00	***
Observations	5899				8660			
Wald chi2(24)	420,04				1142,88			
Prob>chi2	0				0			
Pseudo r2	0,1035				0,2182			

Source: author's statistical analysis

Table 4.2
Regression Analysis for Savings in Formal Banking Institutions

	Informal workers				Formal workers				Total Sample			
	Coef	St. Error	P	Sigf	Coef	St. Error	P	Sigf	Coef	St. Error	P	Sigf
Informal-Group 1	-0,0578699	0,01197	0,00	***								
Woman	0,001808	0,00982	0,85		-0,0848354	0,03253	0,01	***	-0,035724	0,01132	0,00	***
Head of household	0,0011322	0,00983	0,91		-0,0251749	0,03558	0,48		-0,010492	0,01218	0,39	
Married or partnership	0,0115501	0,00839	0,17		-0,1026385	0,03352	0	***	-0,006482	0,01118	0,56	
Age	0,0065189	0,00483	0,18		0,0005911	0,01558	0,97		0,006247	0,00581	0,28	
Age squared	-0,0000643	0,00006	0,29		0,0000238	0,00019	0,9		-4,79E-05	0,00007	0,52	
Number of children	-0,0082505	0,00313	0,01	***	-0,0130847	0,01341	0,33		-0,012415	0,00416	0,00	***
Age the first day of work	-0,0006885	0,00097	0,48		0,0031272	0,00398	0,43		0,001291	0,00131	0,32	
Primary education or less	-0,0515616	0,00972	0,00	***	0,0953165	0,09591	0,32		-0,079294	0,01656	0,00	***
Secondary education	-0,0556079	0,01017	0,00	***	-0,007904	0,03238	0,81		-0,063887	0,01155	0,00	***
Self employed	0,0256895	0,0148	0,08	*	-0,0825465	0,09872	0,4		0,007453	0,02085	0,72	
Employer	0,0108687	0,02304	0,64		-0,0261115	0,12199	0,83		0,002806	0,02959	0,92	
One employee firm	-0,0619366	0,02184	0,01	***	-0,0919272	0,10186	0,37		-0,146751	0,0193	0,00	***
Firms 2-5 workers	-0,0304643	0,01708	0,07	*	-0,0898997	0,05491	0,1		-0,101327	0,01409	0,00	***
Firms 6-50 workers	-0,0284394	0,01339	0,03	**	-0,0413608	0,02893	0,15		-0,05357	0,01162	0,00	***
Informal firm	-0,0159829	0,01252	0,20		-0,0530975	0,04269	0,21		-0,046564	0,01481	0,00	***
Labor satisfaction	0,0152624	0,00682	0,03	**	0,081845	0,02666	0	***	0,048921	0,00872	0,00	***
Financial knowledge	0,0116878	0,00627	0,06	*	0,0036221	0,0206	0,86		0,016171	0,00729	0,03	**
Confidence in the future	0,0235323	0,00907	0,01	***	0,1143937	0,03457	0	***	0,046331	0,01128	0,00	***
House owner	0,003662	0,00822	0,66		-0,0465748	0,029	0,11		-0,001114	0,01033	0,91	
Monetary and non-monetary assets	0,0062332	0,01102	0,57		0,0301355	0,05413	0,58		0,009087	0,01568	0,56	
Income- less than 10USD per day (PPA)	-0,0463871	0,01706	0,01	***	-0,0641551	0,05996	0,29		-0,094035	0,01739	0,00	***
Income 10 - 50 USD per dady (PPA)	-0,0603885	0,02266	0,01	***	-0,0079525	0,04207	0,85		-0,048805	0,02112	0,02	**
Months working in the firm	0,0000549	0,00012	0,65		-0,0011506	0,00041	0,01	***	-2,64E-05	0,00015	0,86	
Observations	5899				2711				8660			
Wald chi2(24)	254,55				85,25				689,5			
Prob>chi2	0				0				0			
Pseudo r2	0,1167				0,0389				0,1572			

Source: author's statistical analysis

5 Concluding remarks and policy implications

How to improve savings conditions in Latin America is a challenging subject on the agendas of researchers, policymakers, regulators and financial institutions. This is particularly important in developing countries and emerging markets, where banking penetration rates are relatively low. In addition to the macroeconomic determinants, the link between individual characteristics and savings is also important.

This study offers an approach to the link between savings and individual characteristics in the case of the cities of Lima and Mexico DF taking advantage of innovative surveys performed by the IDB. We make sample breakdowns in order to understand different perspectives of savings conditions depending on the formal-informal characteristic of the workers and the formal or non-formal way of savings. In order to better understand the characteristics of the informal workers, we performed a cluster analysis that identifies different types of informal workers.

Besides other relevant social conditions such as income, gender and education, our analysis revealed other interesting effects that stand out from the crowd. First, we found the importance of particular characteristic of informal workers. We found a group of informal workers with worse socioeconomic conditions that impact negatively on savings decisions. Secondly, the study found highly positive significant results of motivational factors, represented by the effects of variables such as confidence in the future and the satisfaction with labor conditions.

These results could reveal, or at least anticipate, some aspects to take into account from economic policy perspective. In a context where many Latin American policy makers are designing public subsidies or incentives to spur long-term savings (Carranza et al., 2012; Bosch et al. 2013) it is important to be attentive to the heterogeneous characteristics of this collective. For instance, the effect of monetary subsidies could affect differently to more affluent (Group 2) or less affluent (Group 1) informal workers. It is possible that oversight policies to combat informality, for example, work better with more affluent informal workers. The reduction of labor costs, could also have different impact on informal workers, depending on productivity conditions of each group in relative terms to the policy intervention.

In the case of motivational factors, there is a broad field to analyze and make experiments in order to design intelligent public policy interventions that foster individual's savings. These should discern between the appropriateness of extrinsic or intrinsic motivation (Benabou and Tirole 2003). For example monetary subsidies, that is considered an extrinsic motivation, could spoil the good action of intrinsic motivation. Working in intrinsic motivational interventions seems to produce interesting results according to Brown and Lahey (2014) when individuals are exposed to achievable goals of savings.

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Appendix 1

Table A.1
Description of the variables used from the surveys

Variables	Definition
Informality	Dummy: 0 if contribute to pension system 1 the contrary
Savings in financial institutions (a)	Dummy:1 if the individual has savings account, shares, or bonds in financial institutions, 0 the contrary
Formal savings in financial institutions or pension schemes (b)	Dummy : 1 if savings in financial institutions or in pension plans, or claim to have contributed to the pension system ever , 0 otherwise
Total savings	Dummy : 1 if the formal savings (b) or states that you have money left after covering their expenses or participate in a course or meeting. 0 otherwise .
Woman	Dummy : 1 if female, 0 if male
Head of household	Dummy : 1 if the household head , 0 if other household members
Partner	Dummy : 1 if married or living with a partner, 0 if single, widowed or divorced ..
Age	Fulfilled years
Number of children	Number of children
Educational attainment	Dummy : Primary : 1 if I reach primary or less , 0 if you have higher level Secondary : 1 if I reach secondary level, 0 if it has another level. Superior : 1 if I reach the next level , 0 on another level.
Age when started to work	Age when started to work
Self employee	Dummy: 1 if said to be independent or self-employed 0 otherwise
Worker in firm with one employee	Dummy: 1 if said work alone in the company you are employed 0 otherwise
Worker in firm with 2-5 employees	Dummy: 1 if responded that the company you work for has 2 to 5 workers 0 otherwise
Worker in firms with 6-50 workers	Dummy: 1 if the company responded that it is linked having 6 to 50 employees and 0 otherwise
Worker in firms with 6-50 workers	Dummy: 1 if the company responded that it is linked having 6 to 50 employees and 0 otherwise
Informal firm	Dummy: 1 if the company or business is not registered as a corporation or is not accounting, 0 otherwise
Labor satisfaction	Level of satisfaction with the current job: 1 if you are dissatisfied, 2 if you are satisfied or3 if very satisfied
Financial knowledge	Dummy: 1 if you have basic knowledge of interest rates and 0 otherwise
Confidence in the future	Do you believe that in 10 years the economic situation will be better?
Living in own-house	Dummy: 1 if living in own house fully paid, 0 otherwise
Monetary and non-monetary assets	Dummy; 1 if has property (in addition to the main residence), financial assets or companies, 0 otherwise
Months spent in the current job	Months spent in the work performed at the time of the survey
Daily income less than 10 USD	Dummy: 1 if the individual receives no labor income and labor less than $ 10 per day adjusted for PPP. 0 otherwise.
Daily income between 10 and 50 USD	Dummy: 1 if the individual receives no labor income and labor between 10 and 50 USD daily corrected by PPA. 0 otherwise

Source: author's elaboration

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