Does Uncertainty Affect Saving Decisions of Colombian Households? Evidence on Precautionary Saving

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Abstract:

The aim of the paper is to test the effect of uncertainty on the consumption/saving decisions of the Colombian households searching for evidence of a precautionary motive for saving. We use two standard objective measures of income uncertainty, the income variability and the unemployment rate, and data taken from the National Budget and Expenditure Survey and the Large Integrated Household Survey. Results show evidence of a precautionary motive for saving when uncertainty is proxied by the unemployment rate. However, when measured through income variability uncertainty surprinsingly impacts positively on consumption. We explore whether this result may conceal a composition effect on our sample, given large differences on saving and non saving households. Thus, we estimate our model separately for both groups and find that, while for savers there is an important precautionary motive for saving independently of the uncertainty measure chosen, there is no evidence of any effect of uncertainty on non-savers consumption decisions. These results are robust to several segmentations of the sample by gender, age group or labour status. The paper contributes to the empirical literature on precautionary saving by providing evidence for a developing country for which, to date, there have been no studies on the effects of uncertainty on savings.

Keywords: precautionary savings, household decisions, consumer economics, uncertainty, Colombia

JEL: D12, D14, D15, O12

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1. Introduction

In this paper we test whether uncertainty exerts any role in the consumption and saving decisions of a sample of Colombian households. To the best of our knowledge, this is the first specific empirical test as regards the existence of a precautionary saving motive for this country, using standard measures of future income uncertainty.

Precautionary saving arises when, in the context of the standard consumption/saving decisions model (departing from the seminal papers of Friedman, 1957, and Ando and Modigliani, 1963), the existence of uncertainty regarding future income is taken into account. Under uncertainty, savings are not only the way for households to smooth their consumption pattern and maximize their intertemporal utility but also a buffer stock for future contingencies or unanticipated events.[1]

The earliest works on the effects of uncertainty on saving (Dreze and Modigliani, 1972; Hahn, 1970; Leland, 1968; Sandmo, 1970) lay the basis for the analysis of the precautionary saving. Because the expected marginal utility of consumption under uncertain conditions is larger than under certain conditions, greater uncertainty of future income increases the marginal utility of expected future consumption, making saving more attractive. The "extra" saving motivated by uncertainty as regards future income is labelled by Leland (1968) as "precautionary demand" for saving and it arises when the third-order derivative of the utility function is positive. So, using the standard expected utility framework, the convexity of the marginal utility, related to the concept of "prudence" (Kimball, 1990), is the theoretical condition for the existence of precautionary saving (reviews of the theoretical developments can be found in Browning and Lusardi, 1996; Attanasio and Weber, 2010; or Baiardi et al., 2019, including recent insights).

However, the development of the precautionary saving literature has taken place fundamentally at the empirical ground. Despite the large number of works for different countries, using different methodologies, micro and macro data, different uncertainty measures, etc., the empirical results on the existence and relevance of the precautionary motive for saving are not conclusive (Lugilde et al., 2019), provide an extensive review of the empirical literature).

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[1] For a simple explanation of the standard consumption theory see Attanasio (1999).

Most of the empirical studies refer to North American and European developed countries[2] (see Lugilde et al., 2019, for a review). But, although in a smaller number, the effect of uncertainty on saving decisions has also been tested for countries on different continents, both for OECD countries such as Japan (Bessho and Tobita, 2008; Murata, 2019; Niimi and Horioka, 2019), Turkey (Ceritoğlu, 2013), the set of OECD countries (Adema and Pozzi, 2015; Menegatti, 2010), and for other countries such as China (Chamon et al., 2013; Liu and Hu, 2013; Meng, 2003; and Choi et al., 2017, comparing with US), Russia (Guariglia and Kim, 2004), Taiwan (Mckenzie, 2006), India (Khanal et al., 2019; Ang, 2009, comparing with China), Pakistan (Lee and Sawada, 2010), South Africa (Berg, 2013) or the Euromediterranean countries, where some African countries are included, (Baiardi et al., 2013). However, the evidence for Latin American countries is scant, with the exception of Mexico and Chile for which, although there are no papers that directly test the effect of income uncertainty on saving decisions, some authors reach conclusions regarding the existence of precautionary savings.

In the case of Mexico, the analysis by Pourgerami (1991) "do not support the uncertainty proposition according to which random variations in measured income are expected to have positive effects on saving"(p.83). Neither Velandia and van Gameren (2016) find evidence of precautionary savings in their study on older savers. However, Paxton and Young (2011) find evidence of buffer stock savings in poor and vulnerable households, when they use a "flexible definition" of savings, where "liquid assets are a composite measure of informal and formal savings instruments that not only includes cash, but other liquid stores of value including small farm animals and stored grain"(p.600).

Some very recent works address the precautionary saving issue for Chile. Results from Acuña et al. (2020) "show that consumer confidence indicators are positively related to later consumption growth, suggesting that consumption increases after periods of high consumer confidence" (p.75) which is interpreted as contrary to the "precautionary saving". Schaap (2019) analyses how prudence influences preferences for precautionary savings of Chilean artisanal fishers. He finds no direct evidence that prudence may be a predictor for precautionary savings, neither that subjective income risk correlates with precautionary savings. However, the paper interestingly argues for the importance of precautionary savings behaviour by

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[2] Among others, for the US (Campbell and Mankiw, 1990; Carroll and Samwick, 1998; Dynan, 1993; Lusardi, 1998; Mishra et al., 2012; Mody et al., 2012); Alan (2006) for Canada; Baiardi et al. (2016) for 6 advanced countries (US, Canada, UK, Spain, Italy and France); Vanlaer et al. (2020) for 18 EU countries; Blanc et al. (2016) for the Euro-area; for the UK (Benito, 2006; Guariglia and Rossi, 2002; Miles, 1997); Piracha and Zhu (2011) for Germany; Pericoli and Ventura (2012) for Italy; Bande and Riveiro (2013), Barceló and Villanueva (2010) and Lugilde et al. (2018) for Spain.

natural resource users, a group which could become more vulnerable to large income fluctuations in the future.

Rosenzweig (2001), following the arguments from Deaton (1992), claims that in low-income countries, due to income variability and the absence of insurances and imperfect capital markets, most of the savings are "precautionary savings designed to smooth consumption"(p.41) rather than life-cycle savings. In line with the above, Paxton and Young (2011) synthesises Deaton by stating that "the combination of income volatility and borrowing constraints make more necessary for households in developing countries to build up saving as a buffer stock against income shocks"(p.600).

Then, the implications of precautionary saving as a self-insurance tool could be important in the context of developing countries. However, the empirical evidence of this type of savings has been mixed in part due to a lack of reliable household data (Lee and Sawada, 2010; Paxton and Young, 2011). In this context, conducting studies on the evidence of precautionary saving in developing countries is of the greatest significance, especially under the current situation of increasing uncertainty.[3] The aim of this paper is to carry out such an analysis for Colombia using household-level data.

With approximately 50 million people, Colombia is an OECD country with the third largest population in Latin America and the Caribbean (World Bank, 2020). It is a medium-income country characterized by high levels of poverty, inequality and poor labor market conditions. In terms of labor market indicators, it presents a marked heterogeneity characterized by high levels of informality and unemployment (García, 2017) and a vulnerable employment rate[4] of 46.9% in 2015 (Sehnbruch et al., 2020).

Since the last decade of the 20th century several works on savings were undertaken for Colombia, most of them from a macroeconomic perspective and trying to explain the fall in total savings that took place in the early nineties (Casas and Gil, 2011; Echeverry, 1996; Hernández, 2006; López, 1996; López et al., 1996; Lopez-Mejia and Ortega, 1998; Melo-Becerra et al., 2006; Montoya, 2019). With the development of new surveys and datasets[5] microeconomic approaches have been

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[3] See https://worlduncertaintyindex.com/data/ (2020)

[4] Defined as the contributing family workers and own-account workers as percentage of total employment (from World Bank Data).

[5] In Colombia, the publication of the results of the 1997 and 2003 Quality of Life Survey (ECV 1997, 2003), carried out by DANE with the support of the Central Bank, has become a valuable tool to undertake studies on the behaviour of savings at the microeconomic level (Melo-Becerra et al., 2006).

undertaken both focusing on the descriptive analysis of the household's saving behaviour and analysing the determinants of the consumption/saving decisions (Castañeda, 1999, 2002; Cifuentes and Meisterl, 2014; Granda and Hamann, 2015; Iregui-Bohórquez et al., 2016; Iregui-Bohórquez and Melo-Becerra, 2018; Melo-Becerra et al., 2006; Tovar, 2008).

Granda and Hamann (2015) address to some extent the precautionary motive for saving when they analyze the effects of informality at firm level and in the labor market on the mechanisms of wealth accumulation and distribution in Colombia. They find that people belonging to the informal sector tend to save more, which is argued on the basis that this is the way in which these people having fewer opportunities for debt can face risk and uncertainty. In the paper they conclude that essentially people save as a means to start formal activities and for precautionary reasons[6], however they do not specifically test the effect of uncertainty in saving decisions.

Previously, Castañeda (1999, 2002), addresses tangentially the precautionay saving issue, based on data from the 1984-85 and 1994-95 households income and expenditure surveys (ENIG). This author characterises the profile of Colombian saving households, testing also the Permanent Income Hypothesis (PIH hereafter) through the analysis of the relationship between saving and income vulnerability (uncertainty). Uncertainty is proxied by the unemployed status of the household head (with a significant and positive effect on saving) and by the number of income earners in the household (he assumes that more earners leads to less uncertainty, finding a negative relationship between the number of earners and the saving rate).

Also, Schneider et al. (2019) and Ibañez and Schneider (2020), in very recent studies focused on low-income households from the capital of Colombia (Bogotá), address aspects of the precautionary motive for saving. These papers deal with the relationship between risk aversion, prudence, income uncertainty and saving. To carry out such analysis, data on risk aversion and prudence at the individual level are necesary, which cannot be derived from official surveys, which are representative of an economy (as is our case and that of the above-mentioned papers using micro data). In the aforementioned papers, the analysis is based on data from a specific survey of about 650 poor individuals in Bogotá. They find evidence of precautionary savings in the sense that individuals with greater risk aversion and those more prudent increase savings when they face a greater income risk (in line

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[6] In fact, based on data from the 2010 wave of the ELCA survey, (Granda and Hamann, 2015) show that 41.6% of those surveyed saved for precautionary reasons.

with the proposal of Leland 1968 but from a different approach based on the analysis from Kőszegi and Rabin, 2009, on the relationship between uncertainty about future income and saving, because of loss aversion).

Although in the above-mentioned works the precautionary motive for saving is somewhat considered, to the best of our knowledge there are no studies specifically addressing the effect of uncertainty as regards future income on individual savings decisions in Colombia nor analysing the uncertainty measures to be used, based on nation-wide data. This paper tries to fill that gap by testing the existence of a precautionary motive for saving in Colombia using data from the National Budget and Expenditure Survey (ENPG) (2018a) and the Large Integrated Household Survey (GEIH) (2018b) of the National Department of Statistics of Colombia (DANE) and taking the variability of income and the unemployment rate as uncertainty measures.

After this introduction, the paper is organized as follows. In Section 2, the main aspects of the methodology and details on the data used in the analysis are described. Section 3 summarises the main results. Finally, Section 4 concludes.

2. Methodology and data

The existing literature on the empirical test of the existence of a precautionary motive for saving usually fits a reduced form equation to a number of covariates, depending on data availability. We also follow this line (instead of estimating an Euler equation derived from intertemporal utility maximization), but before specifying the explicit reduced form, we need to make a number of decisions beforehand.

Firstly, we need to specify the dependent variable in our model, which is largely conditioned by data availability. In our case (see below for data description), we choose total consumption expenditures, instead of some measure of household savings or wealth accumulation. This is the approach followed by (*inter alia*) Attanasio and Weber (1989), Zeldes (1989), Guiso et al. (1992), Dynan (1993), Carroll (1994), Benito (2006) or Lugilde et al. (2018).

Secondly, we must take a decision as regards the measure of future income uncertainty. Many authors (see Lugilde et al., 2018, for a survey) model income uncertainty through the estimated variability of household income. However, another strand of the literature measures future income uncertainty through the current unemployment rate of the group closest related to the household's head. This approach assumes that the main shock to household income may come through

job loss, and therefore, current unemployment would measure the likelihood of such shock. These two measures belong to the so-called objective uncertainty measures. Some datasets also provide subjective measures, which reflect the household expectations as regards the probability of continuing to perceive income in the future. Our dataset does not provide any of these subjective measures, and thus we will use income variability and the unemployment rate as measures of income uncertainty in our estimations.[7]

Thirdly, studies also differ on the type of covariates included in the estimated model. In our case, we include a number of standard independent variables that have been proposed in the literature (see below) that are available in our dataset.

Thus, our empirical model relates household consumption expenditures on household's income, a number of household's socio-demographic variables (including sex, age of the household head, marital status, wealth level and education level) and future income uncertainty. We expect the latter to impact negatively on consumption decisions, once we control for the main determinants of household expenditures, if a precautionary motive for saving exists.

The econometric model takes the form:

$$logC_i = \beta_0 + \beta_1 logY_i + \mathbf{Z'}_i\boldsymbol{\theta} + \mathbf{UNC'}_i\boldsymbol{\gamma} + v_i \tag{1}$$

where C_i is total household consumption, Y is total household income, $\mathbf{Z'}_i$ is a vector of household socio-demographic variables (see Table A1 in the Appendix for a description and definitions), while $\mathbf{UNC'}_i$ is a vector of different measures of future income uncertainty. β_0 and β_1 are scalars and $\boldsymbol{\theta}$ and $\boldsymbol{\gamma}$ are vectors of parameters to be estimated. Finally, we assume that the error term, v_i, is independently and identically (*iid)* distributed.

As regards the uncertainty measures, we consider income variability and the unemployment rate. The first measure is constructed using in-sample information from our dataset. Specifically, we use a two-step procedure to construct such measure. In the first step we estimate by OLS a model in which we regress log income for each household in the sample on the set of socio-demographic variables and a constant plus an error term (assumed to be *iid* $(0, \sigma_\varepsilon^2)$:

$$logY_i = \alpha_0 + \varphi'^{Z_i} + \varepsilon_i \tag{2}$$

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[7] Lugilde et al., (2018), also show that the relevant uncertainty measure for households may vary through the business cycle. We do not explore this possibility here, as we use a unique cross-section, but plan to pursue this research avenue in the future.

In a second stage, we fit the model, and compute the squared estimated residuals from this auxiliary regression, $\widehat{\varepsilon_i}^2 = \left(logY_i - log\widehat{Y}_i\right)^2$, as a proxy of income variability, i.e., a measure of income shocks to each household.

The second uncertainty measure is the unemployment rate of the group closest related to the household head. We use data from the Large Integrated Household Survey to compute unemployment rates by sex, wealth strata and age (using 5 years groups). This measure captures (as discussed above) the probability of losing the job, and thus proxies the likelihood of an income shock in the forthcoming future.

Following the standard procedure in the literature (see *inter alia,* Carroll, 1994; Lusardi,1997; Miles, 1997; Guariglia and Rosi, (2002); Deidda, 2013; Estrada et al., 2014; or Lugilde et al., 2018), we estimate equation (1) by OLS, using a sample of households taken from the National Household Budget Survey. We next briefly describe our datasets.

The National Household Budget Survey and the Large Integrated Household Survey (ENPH and GEIH using the Spanish acronyms respectively) are provided by the official Colombian statistical office (DANE). The ENPH is a household income and expenditure survey with a 10 years periodicity on average (currently there are three waves: 1994/1995, 2006/2007 and 2016/2017), which serves to define the typical consumption basket in the Consumption Price Index statistic, as well as the national poverty lines.[8]

We use the 2016/2017 wave, using a sample of 87,201 rural and urban households representative of Colombian population (DANE, 2018a). The survey provides data on households, individuals in the household and several expenditure patterns. From this survey we take data on household income, consumption expenditures, gender, age, household size, socioeconomic stratum, whether the household head lives with his/her spouse and the eductional attainment (see table A1 in the Appendix for definitions).

The unemploymeny rate is computed using microdata from the GEIH, which currently collects data for approximately 248,000 Colombian households. This survey gathers information at several national layers and is also representative of total Colombian population (DANE, 2018b). Using the individual data on labour market status, we computed unemployment rates by gender and for 5-years age groups. We then assign unemploytment rates to the head of household from the ENPH dataset.

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[8] This survey does not have a panel format, so it is not possible to follow household behaviour the different waves.

Two issues should me mentioned here. Firstly, given that the interviews for the ENPH were conducted between July 2016 and July 2017, we take the unemployment rate in 2016. Secondly, due to missing values and non-reported answers, we had to drop a few obsevations for which we could not assign an unemployment rate. Our final sample consists of 86,708 households. With this data, we next explore the impact of income uncertainty on the consumption decisions of this sample of households in 2017.

3. Results

3.1. General results

In this section we summarise the results of our econometric exercise, consisting in the estimation of different versions of eq. (1). As described in the previous section, our sample consists of a cross-section of 86,708 Colombian household (rural and urban) in 2017. Table A2 in the Appendix provides a brief summary of descriptive statistics of the variables involved in our estimations. All covariates in our models refer to the household head (defined as the person who takes most financial decisions in the household). Especifically we use log income, gender of the household head (male is the reference), age and age squared (in order to capture potential non-linearities in the consumption-age relationship), whether there is an spouse/couple living in the household, size of the household, the wealth level (measured through the so-called stratum, see table A1 in the Appendix for definitions), the educational attainment (measured through 6 levels, being the primary school the category of reference) and a dummy to control for rural/urban households.

As we mentioned in Section 2, we will use two different measures of future income uncertainty. The first one is an estimation of income variability (computed individually for each household), derived from the auxiliary regression model (2). Espefically, after regressing log income on a set of personal and socio-economic characteristics of the household, we compute the error from this regression, and use the squared residuals as a measure of income shocks, i.e., income variability.[9] The second one is the computed unemployment rate of the group closest to the household head characteristics.

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[9] Note that we square residuals for a twofold reason. Firstly, we avoid positive and negative values compensation. Secondly, we assign greater uncertainty to larger shocks.

Table 1 summarises our initial results. Column (1) corresponds to a baseline model, in which we regress consumption on the set of independent variables, but no account of uncertainty is taken. This baseline model provides a reasonable fit (as measured by the high value of the adjusted R^2). As expected, consumption is positively related to log income, to male household heads, the marital status, the size of the household, urban areas and shows an increasing pattern with education. The joint effect of age and age squared reveals a convex pattern, in which consumption increases with age but at a decreasing rate, which is compatible with the life-cycle/permanent income hypotheses Taken from a different perspective, saving decreases with age, and the quadratic effect, even though quantitatively small, is statistically significant. This result is present in many papers in the empirical literature on the subject (see Lusardi, 1998) and it was also found by Iregui et al. (2016) for Colombia. However, other authors that have previously analysed savings in Colombia find that savings increase with age (Castañeda, (1999), for urban households) or arrive to mixed results, depending on the income percentile under study (Cifuentes and Meisterl, 2014).

Column (2) in Table 1 summarises our results when we introduce future income uncertainty measured through income variability. This approach is similar to that found in Carroll (1994), Carroll and Samwick (1998), Guariglia and Rossi(2002), Guiso et al. (1992), Lusardi (1997) or Miles (1997). While signs and significance for all coefficients remain similar to those reported for the baseline model, the coefficient on the uncertainty variable is surprisingly positive and significant, a result that goes against the precautionary saving theory. Given that our measure of income variability is presumably imperfect and does not fully capture the notion of truly unforeseen income shocks,[10] we experiment with the alternative measure of uncertainty, i.e., the unemployment rate. Column (3) in Table 1 shows the results. While the elasticities and semi-elasticities of all the covariates remain fairly similar to those reported in the baseline model (except a modest increase in the effect of higher education and in the urban indicator variable), the coefficient on the unemployment rate shows a negative and significant value (-0.139), indicating thus that a higher unemployment rate is interpreted by households as an indication of a greater likelihood of future job loss, reducing consumption expenditures, and increasing savings, i.e., there exists a precautionary motive for saving. As an additional exercise, we explore (as in Lugilde et al., 2018, for instance) the existence of a precautionary motive for saving introducing both uncertainty

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[10] Income variability, as described in Section 2, is computed from a cross-section of households, and therefore captures current temporary shocks to individual income, but nothing guarantees that current income shocks should be related to future income shoks of the same type (temporary or permanent) or sign.

measures in the estimation. Column (4) in Table 1 summarises our results. Again, coefficients for our control variables are similar across specifications, with similar values and signs. As regards uncertainty, we find an interesting result: while the unemployment rate shows a negative and significant coefficient (-0.117) the estimated coefficient for income variability is positive and significant, with a similar value to that reported in column (2). This is indeed shocking, since it indicates that two alterantive measures of future income uncertainty are impacting differently (and in opposite directions) on consumption/saving decisions of Colombian households. This a result that deserves further investigation. We next explore this surprising result.

Table 1. Colombia, total sample households

	(1)	(2)	(3)	(4)
	lnC	lnC	lnC	lnC
lnY	0.42688***	0.47437***	0.42660***	0.47411***
	(0.00321)	(0.00332)	(0.00321)	(0.00332)
Sex	-0.08050***	-0.08153***	-0.08392***	-0.08443***
	(0.00379)	(0.00372)	(0.00394)	(0.00387)
Age	0.00396***	0.00366***	0.00312***	0.00295***
	(0.00055)	(0.00053)	(0.00059)	(0.00058)
Age2	-0.00005***	-0.00005***	-0.00004***	-0.00005***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Couple	0.16392***	0.15959***	0.16436***	0.15996***
	(0.00409)	(0.00405)	(0.00410)	(0.00405)
t_household	0.21887***	0.19862***	0.21894***	0.19869***
	(0.00190)	(0.00199)	(0.00190)	(0.00199)
Stratum	0.17364***	0.16159***	0.17618***	0.16375***
	(0.00203)	(0.00199)	(0.00221)	(0.00216)
ed_no_training	-0.06456***	-0.05925***	-0.06531***	-0.05989***
	(0.00462)	(0.00451)	(0.00462)	(0.00451)
ed_h_school	0.04330***	0.03629***	0.04319***	0.03620***
	(0.00460)	(0.00450)	(0.00460)	(0.00450)
ed_tec	0.09256***	0.07618***	0.09244***	0.07609***
	(0.00567)	(0.00562)	(0.00567)	(0.00562)
ed_bach	0.14076***	0.10275***	0.14048***	0.10252***
	(0.00670)	(0.00661)	(0.00670)	(0.00661)
ed_m_phd	0.25109***	0.19447***	0.25061***	0.19408***
	(0.01056)	(0.01035)	(0.01055)	(0.01034)
Class	0.20042***	0.18369***	0.20112***	0.18429***
	(0.00676)	(0.00677)	(0.00676)	(0.00677)
_cons	7.30725***	6.68077***	7.34318***	6.71155***
	(0.04181)	(0.04302)	(0.04314)	(0.04445)
Uncertainty measure:				
inY2		0.05975***		0.05973***
		(0.00226)		(0.00226)
un_agsx16			-0.13886***	-0.11790***
			(0.04323)	(0.04159)
r2_a	0.8118059	0.8191589	0.8118283	0.8191745
N	**86708**	**86708**	**86708**	**86708**

Notes: Coefficient estimates. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01 ** p<0.05 * p<0.10.

3.2. Efect of uncertainty on Saving and Non-saving housholds decisions

Our empirical approach for the test of the precautionary savings motive is based on the estimation of a consumption equation (against the alternative of a savings or a wealth accumulation equation). This allows to maximize the number of available information, since we can include households for which current consumption is greater than current income, and are, thus, dissaving. This is indeed the case of our sample, where there is a significant number of households for which savings are negative (40.9%). This situation is often found in household surveys in Latin America. Bebczuk et al. (2015) in a paper on 10 Latin American countries show that about 50% of surveyed households have negative savings. These authors suggest that this result is partly explained by the incorrect assessment of earned income by households, especially those involved in informal markets. This argument is also put forward by Castañeda (1999) or Tovar (2008) in their analysis of savings in Colombia. Melo et al. (2006) also remark the high incidence of households with negative savings in Colombia. They suggest that even though this could be explained by negative transitory income shocks not followed by a negative consumption adjustment, it may also be attributed to a tendency for surveyed households to report lower earnings, especially in the lowest income quintiles, which coincide with the most negative saving rates. Our results seem to confirm this description.

Theoretically, we could argue for the existence of a precautionary motive for saving for those households with negative savings, interpreting it as a reduction in indebtness when faced to an increase in uncertainty, as assumed by Guariglia and Kim (2004) in a paper for a sample of Russian households. In this work, a large number of households report negative savings, and authors find a significant effect of uncertainty on savings when the former is measured through the computed probability of losing the job. However, we believe that this implies assuming a simetry as regards the decision of saving part of the household income or borrowing extra income. This does not necessarily hold when credit restrictions, minimum consumption needs, etc., are present.

If we assume that the precautionary motive for saving refers to wealth accumulation to face future unforeseen events, i.e., positive savings, increasing or decreasing the amount of precautionary saving is a decision taken by households that save. In this line, Fisher and Anong (2012), in a paper that investigates the relationship between motives for saving with habits of saving, show that the precautionary motive increases the probability of saving (either regular or irregular) with respect to non saving. All of these reasons lead us to focus our analysis of the existence of a precautionary motive for saving among those household that save. However, given

the large share of non-saving households in our sample, we have decided not to fully discard them, but rather to analyse both groups of households (savers and non-savers) separately. The statistical description of both sub-samples can be found in Tables A2 in the Appendix. We thus estimate our consumption model for both groups of households. Results are reported in Table 2.

Table 2. Saving and non-saving households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	lnC	lnC	lnC	lnC	lnC	lnC	lnC	lnC
lnY	0.72209***	0.73758***	0.72150***	0.73696***	0.50675***	0.66517***	0.50688***	0.66556***
	(0.00409)	(0.00280)	(0.00409)	(0.00280)	(0.00573)	(0.00342)	(0.00574)	(0.00343)
Sex	-0.04862***	-0.03972***	-0.05410***	-0.04553***	-0.04938***	-0.04888***	-0.04761***	-0.04441***
	(0.00353)	(0.00338)	(0.00366)	(0.00350)	(0.00533)	(0.00462)	(0.00567)	(0.00489)
Age	0.00238***	0.00180***	0.00103*	0.00037	0.00444***	0.00344***	0.00487***	0.00451***
	(0.00052)	(0.00049)	(0.00056)	(0.00054)	(0.00076)	(0.00065)	(0.00083)	(0.00071)
Age2	-0.00003***	-0.00002***	-0.00002***	-0.00001*	-0.00005***	-0.00005***	-0.00006***	-0.00006***
	(0.00000)	(0.00000)	(0.00001)	(0.00000)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Couple	0.09267***	0.06883***	0.09406***	0.07029***	0.12944***	0.10178***	0.12940***	0.10166***
	(0.00399)	(0.00363)	(0.00400)	(0.00364)	(0.00591)	(0.00527)	(0.00591)	(0.00527)
t_household	0.10691***	0.10439***	0.10704***	0.10453***	0.19523***	0.12548***	0.19521***	0.12538***
	(0.00199)	(0.00152)	(0.00199)	(0.00152)	(0.00309)	(0.00257)	(0.00309)	(0.00258)
Stratum	0.09688***	0.09482***	0.10174***	0.09998***	0.14047***	0.09051***	0.13943***	0.08784***
	(0.00204)	(0.00180)	(0.00219)	(0.00196)	(0.00315)	(0.00238)	(0.00339)	(0.00256)
ed_no_trainin	-0.02289***	-0.01889***	-0.02417***	-0.02025***	-0.06905***	-0.05019***	-0.06874***	-0.04940***
	(0.00438)	(0.00417)	(0.00438)	(0.00418)	(0.00627)	(0.00536)	(0.00628)	(0.00537)
ed_h_school	0.02040***	0.01855***	0.02033***	0.01848***	0.04719***	0.03226***	0.04728***	0.03248***
	(0.00437)	(0.00416)	(0.00437)	(0.00416)	(0.00627)	(0.00540)	(0.00627)	(0.00540)
ed_tec	0.03501***	0.03164***	0.03494***	0.03156***	0.10784***	0.06389***	0.10790***	0.06402***
	(0.00547)	(0.00512)	(0.00546)	(0.00512)	(0.00783)	(0.00678)	(0.00783)	(0.00678)
ed_bach	0.01088*	0.00772	0.01068*	0.00750	0.23485***	0.14295***	0.23510***	0.14356***
	(0.00629)	(0.00586)	(0.00629)	(0.00586)	(0.01069)	(0.00895)	(0.01069)	(0.00896)
ed_m_phd	0.02035**	0.01194	0.01961**	0.01114	0.46197***	0.28313***	0.46237***	0.28406***
	(0.00951)	(0.00890)	(0.00949)	(0.00889)	(0.02127)	(0.01719)	(0.02127)	(0.01718)
Class	0.12323***	0.10512***	0.12461***	0.10658***	0.15076***	0.10347***	0.15050***	0.10278***
	(0.00690)	(0.00645)	(0.00691)	(0.00646)	(0.00816)	(0.00722)	(0.00816)	(0.00722)
_cons	3.17033***	3.02042***	3.23030***	3.08398***	6.54876***	4.55796***	6.53102***	4.51207***
	(0.05240)	(0.03794)	(0.05368)	(0.03906)	(0.07177)	(0.04615)	(0.07401)	(0.04783)
Uncertainty measure:								
inY2		-0.13508***		-0.13518***		0.13502***		0.13509***
		(0.00407)		(0.00406)		(0.00296)		(0.00296)
un_agsx16			-0.25666***	-0.27247***			0.06103	0.15456***
			(0.04050)	(0.03896)			(0.06258)	(0.05276)
r2_a	0.8974335	0.9051832	0.8975136	0.9052739	0.8547586	0.8914694	0.8547591	0.8914965
N	51264	51264	51264	51264	35444	35444	35444	35444

Notes: Coefficient estimates. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01 ** p<0.05 * p<0.10.

As in the previous exercise, we start by estimating a baseline model, including all of the control variables but not including measures of uncertainty. Results are reported in column (1) for savers and (5) for non-savers. The estimated coefficients suggest relevant differences as regards the impact of the main determinants of consumption/saving decisions between both groups. Firstly, income elasticity is greater for savers than for non savers (0.722 vs. 0.506). Together with the reported average income level of the first group, this could be an indication of excess of sensitivity of consumption to current income (a typical result of this strand of

empirical literature). On the other hand, we find that relative to savers, coefficients for non-savers are larger for age (0.004 vs. 0.002), living with spouse (0.129 vs. 0.093), size of the household (0.195 vs. 0.107), wealth level (0.140 vs. 0.097), urban households (0.150 vs. 0.123) and the education level, especially for higher levels. Both models provide a good fit (R^2 of 0.98 and 0.85 for savers and non savers respectively).

Following our previous approach, we next add to this baseline model our first measure of future income uncertainty, i.e., income variability. Results of the estimated models are reported in column (2) for savers, and column (6) for non-savers, in Table 2. Interestingly we find that the uncertainty measure is significant in both models, with a similar coefficient but with opposite sign: it is negative for savers and positive for non savers (-0.135 and 0.135 respectively). This result suggests that the precautionary motive for saving is relevant only for those households that show positive saving rates, but not for those that do not save at all. Greater future income uncertainty for these latter households leads them to increase current consumption, following a rather myopic behaviour. For savers, however, the impact of income uncertainty on consumption/saving is coherent with the precautionary saving motive, suggesting thus two alternative models of consumption/saving decisions among Colombian households.

We next substitute the uncertainty measure by the unemployment rate, and check whether these differences hold in this alternative model. Results are reported in columns (3) for savers and (7) for non-savers in Table 2. We now find that this uncertainty measure shows a negative (and even greater coefficient than income variability) for savers (-0.256), whereas for non-savers is non-significant. This would suggest that these non-saving households are somewhat isolated from uncertainty in the labour market, such that their consumption decisions are not affected by the jobless rate.

We finally include both measures of uncertainty simultaneously in the regression, Results are reported in column (4) for savers and (8) for non savers in Table 2. We now find that both measures show a negative and significant coefficient for savers (indication of precautionary savings) while for non-savers they show positive and significant coefficients. Again, these results indicate clear different consumption patterns and determinants for both groups, reinforcing our prior as regards the segmentation of the household sample between savers and non-savers.

A few further results should be remarked. Firstly, in the non-savers group, the inclusion of income variability in the regression increases the estimated coefficient for log income, suggesting a greater excess of sensitivity of consumption to income.

Secondly, the quadratic relationship between age and consumption is much clearer for the non-savers group, for which we find no negative impact of uncertainty, and that could be adjusting consumption to income more intensely, following the standard life-cycle/PIH model. Finally, it is worth to mention the greater impact of the education level on consumption for the non-savers. Regardless of the chosen specification, estimated coefficients are much larger for this group than for savers, especially when the uncertainty measures are included in the models.

All in all, these results could be influenced by measurement errors (especially as regards income, as discussed above) or omitted variables. Therefore, we next perform a robustness check estimating these models using different disaggregation criteria that could potentially explain the differences found in Table 2. We focus on whether there are differences across households where the head is male or female, where household head is currently working or not, whether the household head works in the formal or informal sector employment,[11] or the age group.

3.3. Robustness analysis

In general, we observe that the pattern unveiled in Table 2 is somewhat repeated in the different subsamples we have considered: the impact of uncertainty on consumption tends to be negative for savers and positive for non-savers. However, some considerations must be made.

Starting with household gender (Table 3.1 and 3.2), while the general results holds for savers (either male or female), for non-savers we find a negative and significant effect of the unemployment rate for males, but an insignificant effect of this variable for females. This result may be related to the characteristics of Colombian female participation rates. Although women's participation in the Colombian labour market has increased in recent years, there still are gaps and segmentations by sector and type of employment (Isaza Castro and Reilly, 2020; Ramoni Perazzi and Orlandoni Merli, 2017; Sehnbruch et al., 2020). Regardless of household head gender, the variability of income for non-savers exerts a positive and significant effect, reinforcing thus our full-sample result.

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[11] Note that the standard definition of informaility entails several type of job status, mainly as self-employed or running or working in small businesses (less than 5 employees), DANE, 2018b.

Table 3.1. Households with a male head. Saving (1-4) and non- saving (5-8) households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	lnC	lnC	lnC	lnC	lnC	lnC	lnC	lnC
lnY	0.70356***	0.73010***	0.70218***	0.72872***	0.55277***	0.70003***	0.55206***	0.69953***
	(0.00545)	(0.00344)	(0.00545)	(0.00343)	(0.00861)	(0.00522)	(0.00863)	(0.00522)
age	0.00280***	0.00199***	0.00016	-0.00063	0.00506***	0.00442***	0.00278**	0.00318***
	(0.00069)	(0.00066)	(0.00075)	(0.00072)	(0.00104)	(0.00087)	(0.00116)	(0.00097)
age2	-0.00003***	-0.00002***	-0.00001	0.00000	-0.00006***	-0.00006***	-0.00004***	-0.00004***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Couple	0.15239***	0.11193***	0.15273***	0.11228***	0.17644***	0.15227***	0.17525***	0.15164***
	(0.00574)	(0.00511)	(0.00573)	(0.00510)	(0.00877)	(0.00690)	(0.00872)	(0.00686)
t_household	0.10767***	0.10208***	0.10780***	0.10221***	0.16380***	0.10290***	0.16380***	0.10294***
	(0.00251)	(0.00182)	(0.00250)	(0.00182)	(0.00389)	(0.00282)	(0.00389)	(0.00281)
stratum	0.10370***	0.09845***	0.12015***	0.11480***	0.13198***	0.08460***	0.14377***	0.09101***
	(0.00265)	(0.00232)	(0.00341)	(0.00307)	(0.00442)	(0.00310)	(0.00599)	(0.00426)
ed_no_training	-0.02487***	-0.01995***	-0.02731***	-0.02238***	-0.04814***	-0.03172***	-0.04909***	-0.03225***
	(0.00576)	(0.00549)	(0.00578)	(0.00549)	(0.00808)	(0.00688)	(0.00809)	(0.00689)
ed_h_school	0.02419***	0.01988***	0.02300***	0.01869***	0.03700***	0.02463***	0.03608***	0.02414***
	(0.00557)	(0.00532)	(0.00557)	(0.00531)	(0.00794)	(0.00676)	(0.00795)	(0.00678)
ed_tec	0.04204***	0.03374***	0.03988***	0.03159***	0.09923***	0.06330***	0.09757***	0.06243***
	(0.00715)	(0.00669)	(0.00714)	(0.00670)	(0.01019)	(0.00880)	(0.01018)	(0.00880)
ed_bach	0.02723***	0.01524**	0.02332***	0.01136	0.22413***	0.13931***	0.22000***	0.13714***
	(0.00809)	(0.00740)	(0.00807)	(0.00741)	(0.01394)	(0.01101)	(0.01388)	(0.01100)
ed_m_phd	0.04101***	0.01928*	0.03468***	0.01299	0.47163***	0.28547***	0.46382***	0.28140***
	(0.01219)	(0.01126)	(0.01214)	(0.01125)	(0.02929)	(0.02343)	(0.02902)	(0.02342)
class	0.13006***	0.11273***	0.13301***	0.11567***	0.13503***	0.09269***	0.13679***	0.09368***
	(0.00827)	(0.00772)	(0.00829)	(0.00773)	(0.00982)	(0.00859)	(0.00983)	(0.00859)
_cons	3.33122***	3.05399***	3.42635***	3.14858***	5.89597***	4.01206***	5.96992***	4.05354***
	(0.06909)	(0.04690)	(0.07086)	(0.04801)	(0.10628)	(0.06788)	(0.11069)	(0.07070)
Uncertainty measure:								
inY2		-0.13272***		-0.13269***		0.14299***		0.14288***
		(0.00514)		(0.00511)		(0.00409)		(0.00409)
un_agsx16			-0.61207***	-0.60820***			-0.41630***	-0.22501**
			(0.07411)	(0.07107)			(0.13073)	(0.10404)
r2_a	0.8947945	0.9018707	0.8950485	0.9021216	0.8670704	0.9038704	0.8671821	0.9039000
N	31807	31807	31807	31807	19318	19318	19318	19318

Notes: Coefficient estimates. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01 ** p<0.05 * p<0.10.

Table 3.2. Households with a female head. Saving (1-4) and Non-saving (5-8) households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	lnC	lnC	lnC	lnC	lnC	lnC	lnC	lnC
lnY	0.74298***	0.74550***	0.74304***	0.74557***	0.45943***	0.61913***	0.45950***	0.61916***
	(0.00610)	(0.00479)	(0.00610)	(0.00479)	(0.00772)	(0.00517)	(0.00772)	(0.00517)
age	0.00142*	0.00114	0.00045	-0.00003	0.00334***	0.00196**	0.00503***	0.00328**
	(0.00079)	(0.00075)	(0.00109)	(0.00105)	(0.00111)	(0.00098)	(0.00155)	(0.00135)
age2	-0.00002***	-0.00001**	-0.00001	-0.00001	-0.00004***	-0.00004***	-0.00005***	-0.00005***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Couple	0.01452***	0.00953*	0.01460***	0.00963*	0.05774***	0.03358***	0.05747***	0.03338***
	(0.00558)	(0.00530)	(0.00558)	(0.00530)	(0.00827)	(0.00817)	(0.00828)	(0.00818)
t_household	0.10250***	0.10484***	0.10246***	0.10479***	0.22682***	0.15025***	0.22690***	0.15032***
	(0.00315)	(0.00265)	(0.00315)	(0.00265)	(0.00508)	(0.00436)	(0.00509)	(0.00436)
Stratum	0.08643***	0.08856***	0.08725***	0.08956***	0.14652***	0.09718***	0.14556***	0.09644***
	(0.00315)	(0.00285)	(0.00319)	(0.00291)	(0.00455)	(0.00370)	(0.00461)	(0.00376)
ed_no_training	-0.02189***	-0.01870***	-0.02240***	-0.01931***	-0.09442***	-0.07352***	-0.09342***	-0.07274***
	(0.00663)	(0.00638)	(0.00664)	(0.00638)	(0.00960)	(0.00828)	(0.00960)	(0.00828)
ed_h_school	0.01237*	0.01430**	0.01238*	0.01431**	0.05903***	0.04021***	0.05929***	0.04042***
	(0.00695)	(0.00664)	(0.00695)	(0.00664)	(0.00986)	(0.00866)	(0.00986)	(0.00866)
ed_tec	0.02451***	0.02705***	0.02418***	0.02665***	0.11678***	0.06411***	0.11732***	0.06453***
	(0.00838)	(0.00792)	(0.00838)	(0.00792)	(0.01192)	(0.01045)	(0.01193)	(0.01045)
ed_bach	-0.01158	-0.00441	-0.01219	-0.00515	0.24522***	0.14543***	0.24632***	0.14629***
	(0.01001)	(0.00956)	(0.01002)	(0.00958)	(0.01685)	(0.01507)	(0.01686)	(0.01511)
ed_m_phd	-0.00423	0.00144	-0.00491	0.00061	0.42713***	0.26622***	0.42793***	0.26687***
	(0.01510)	(0.01447)	(0.01510)	(0.01448)	(0.03008)	(0.02452)	(0.03007)	(0.02451)
class	0.10767***	0.08479***	0.10812***	0.08532***	0.17627***	0.12654***	0.17556***	0.12600***
	(0.01231)	(0.01160)	(0.01232)	(0.01161)	(0.01470)	(0.01333)	(0.01470)	(0.01334)
_cons	2.95016***	2.96238***	2.98987***	3.01070***	7.14530***	5.18336***	7.07498***	5.12912***
	(0.07901)	(0.06358)	(0.08438)	(0.06966)	(0.09658)	(0.07384)	(0.10417)	(0.08456)
Uncertainty measure:								
inY2		-0.13137***		-0.13141***		0.12291***		0.12289***
		(0.00816)		(0.00817)		(0.00553)		(0.00553)
un_agsx16			-0.11844	-0.14409*			0.18830	0.14589
			(0.09008)	(0.08699)			(0.12618)	(0.10988)
r2_a	0.9016883	0.9094543	0.9016921	0.9094628	0.8377520	0.8732386	0.8377672	0.8732459
N	19457	19457	19457	19457	16126	16126	16126	16126

Notes: Coefficient estimates. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01 ** p<0.05 * p<0.10.

When we consider whether the household head is employed or not, the general result holds for both employed (Table 4.1) and non-employed (Table 4.2). Regardless of whether they have a job or not, for savers both types of uncertainty measures show negative and significant coefficients, while for non-savers uncertainty exerts a positive and significant effect when measured through income variability and is not significant when we use the unemployment rate.

Table 4.1. Households with employec head. Saving (1-4) and Non-saving (5-8) households

	(1) lnC	(2) lnC	(3) lnC	(4) lnC	(5) lnC	(6) lnC	(7) lnC	(8) lnC
lnY	0.71280***	0.73474***	0.71262***	0.73454***	0.60385***	0.72691***	0.60386***	0.72692***
	(0.00460)	(0.00327)	(0.00460)	(0.00327)	(0.00886)	(0.00403)	(0.00885)	(0.00402)
sex	-0.05133***	-0.04061***	-0.05711***	-0.04792***	-0.03817***	-0.03771***	-0.04115***	-0.03685***
	(0.00430)	(0.00412)	(0.00471)	(0.00452)	(0.00613)	(0.00544)	(0.00675)	(0.00601)
age	0.00483***	0.00342***	0.00361***	0.00187**	0.00966***	0.00751***	0.00902***	0.00769***
	(0.00077)	(0.00074)	(0.00086)	(0.00083)	(0.00117)	(0.00094)	(0.00130)	(0.00107)
age2	-0.00005***	-0.00004***	-0.00004***	-0.00002***	-0.00011***	-0.00009***	-0.00010***	-0.00009***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Couple	0.10365***	0.07464***	0.10394***	0.07496***	0.12932***	0.10382***	0.12917***	0.10386***
	(0.00482)	(0.00440)	(0.00482)	(0.00440)	(0.00711)	(0.00631)	(0.00710)	(0.00632)
t_household	0.11167***	0.10690***	0.11172***	0.10695***	0.15323***	0.10007***	0.15323***	0.10006***
	(0.00232)	(0.00181)	(0.00232)	(0.00181)	(0.00417)	(0.00297)	(0.00417)	(0.00297)
stratum	0.10036***	0.09794***	0.10357***	0.10201***	0.10927***	0.07360***	0.11068***	0.07318***
	(0.00232)	(0.00211)	(0.00255)	(0.00235)	(0.00388)	(0.00268)	(0.00428)	(0.00296)
ed_no_training	-0.03080***	-0.02562***	-0.03137***	-0.02633***	-0.04613***	-0.03514***	-0.04645***	-0.03505***
	(0.00527)	(0.00499)	(0.00527)	(0.00500)	(0.00697)	(0.00613)	(0.00698)	(0.00613)
ed_h_school	0.02303***	0.01946***	0.02301***	0.01944***	0.03260***	0.02272***	0.03250***	0.02275***
	(0.00503)	(0.00475)	(0.00503)	(0.00475)	(0.00669)	(0.00589)	(0.00670)	(0.00590)
ed_tec	0.03784***	0.03161***	0.03772***	0.03145***	0.08766***	0.05119***	0.08764***	0.05119***
	(0.00613)	(0.00572)	(0.00613)	(0.00572)	(0.00845)	(0.00722)	(0.00845)	(0.00722)
ed_bach	0.01897***	0.00908	0.01865**	0.00865	0.21188***	0.11864***	0.21152***	0.11874***
	(0.00725)	(0.00670)	(0.00725)	(0.00670)	(0.01241)	(0.00976)	(0.01239)	(0.00976)
ed_m_phd	0.03712***	0.01896*	0.03634***	0.01794*	0.42008***	0.24292***	0.41936***	0.24311***
	(0.01062)	(0.00991)	(0.01061)	(0.00991)	(0.02547)	(0.01912)	(0.02543)	(0.01915)
class	0.11570***	0.09802***	0.11659***	0.09913***	0.09993***	0.07037***	0.10026***	0.07027***
	(0.00770)	(0.00718)	(0.00771)	(0.00719)	(0.00879)	(0.00774)	(0.00879)	(0.00774)
_cons	3.24521***	3.02188***	3.28932***	3.07754***	5.21252***	3.67008***	5.23445***	3.66360***
	(0.05973)	(0.04478)	(0.06173)	(0.04691)	(0.10980)	(0.05389)	(0.11349)	(0.05599)
Uncertainty measure:								
inY2		-0.13730***		-0.13748***		0.15109***		0.15111***
		(0.00509)		(0.00509)		(0.00472)		(0.00472)
un_agsx16			-0.17042***	-0.21618***			-0.08069	0.02336
			(0.05445)	(0.05254)			(0.07748)	(0.06628)
r2_a	0.8957174	0.9029633	0.8957434	0.9030069	0.8700911	0.9005776	0.8700924	0.9005739
N	37591	37591	37591	37591	23539	23539	23539	23539

Notes: Coefficient estimates. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01 ** p<0.05 * p<0.10.

Table 4.2. Households with non employed head. Saving (1-4) and Non-saving (5-8) households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	lnC	lnC	lnC	lnC	lnC	lnC	lnC	lnC
lnY	0.73882***	0.74371***	0.73867***	0.74353***	0.42813***	0.56719***	0.42804***	0.56709***
	(0.00871)	(0.00534)	(0.00871)	(0.00534)	(0.00763)	(0.00582)	(0.00764)	(0.00583)
Sex	-0.05087***	-0.04334***	-0.04787***	-0.03953***	-0.05043***	-0.03522***	-0.04899***	-0.03407***
	(0.00715)	(0.00669)	(0.00728)	(0.00682)	(0.01021)	(0.00904)	(0.01025)	(0.00904)
Age	0.00166	0.00082	0.00009	-0.00117	0.00242*	0.00005	0.00386**	0.00121
	(0.00106)	(0.00093)	(0.00124)	(0.00111)	(0.00128)	(0.00116)	(0.00155)	(0.00141)
Age2	-0.00002*	-0.00001	-0.00000	0.00001	-0.00004***	-0.00002**	-0.00005***	-0.00003**
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Couple	0.07069***	0.05312***	0.07268***	0.05560***	0.10711***	0.07972***	0.10608***	0.07890***
	(0.00738)	(0.00664)	(0.00741)	(0.00667)	(0.01032)	(0.00942)	(0.01037)	(0.00947)
t_household	0.09642***	0.09807***	0.09651***	0.09819***	0.23409***	0.16735***	0.23417***	0.16742***
	(0.00401)	(0.00279)	(0.00402)	(0.00279)	(0.00506)	(0.00474)	(0.00507)	(0.00475)
stratum	0.08798***	0.08703***	0.09219***	0.09235***	0.17747***	0.12359***	0.17489***	0.12153***
	(0.00429)	(0.00347)	(0.00456)	(0.00377)	(0.00546)	(0.00463)	(0.00573)	(0.00491)
ed_no_training	-0.01169	-0.00979	-0.01261	-0.01095	-0.10375***	-0.08251***	-0.10282***	-0.08176***
	(0.00807)	(0.00770)	(0.00808)	(0.00771)	(0.01175)	(0.01030)	(0.01175)	(0.01029)
ed_h_school	0.01252	0.01523*	0.01217	0.01480*	0.06530***	0.04792***	0.06583***	0.04835***
	(0.00894)	(0.00861)	(0.00895)	(0.00862)	(0.01303)	(0.01164)	(0.01304)	(0.01165)
ed_tec	0.02963**	0.03112***	0.02903**	0.03036**	0.12240***	0.09412***	0.12321***	0.09478***
	(0.01246)	(0.01188)	(0.01246)	(0.01187)	(0.01734)	(0.01589)	(0.01734)	(0.01588)
ed_bach	-0.01023	-0.00124	-0.01112	-0.00235	0.20034***	0.16739***	0.20173***	0.16852***
	(0.01322)	(0.01234)	(0.01323)	(0.01234)	(0.02203)	(0.01966)	(0.02203)	(0.01966)
ed_m_phd	-0.04280*	-0.03953*	-0.04436**	-0.04150*	0.40116***	0.30845***	0.40229***	0.30939***
	(0.02246)	(0.02132)	(0.02245)	(0.02130)	(0.04190)	(0.03559)	(0.04184)	(0.03554)
class	0.15204***	0.13399***	0.15275***	0.13484***	0.24307***	0.18678***	0.24298***	0.18672***
	(0.01561)	(0.01490)	(0.01562)	(0.01492)	(0.01947)	(0.01758)	(0.01946)	(0.01757)
_cons	2.93823***	2.94470***	2.99808***	3.02037***	7.50389***	5.86134***	7.45099***	5.81902***
	(0.10795)	(0.07254)	(0.11014)	(0.07575)	(0.09411)	(0.07764)	(0.09829)	(0.08214)
Uncertainty measure:								
inY2		-0.13329***		-0.13356***		0.11078***		0.11076***
		(0.00677)		(0.00675)		(0.00461)		(0.00461)
un_agsx16			-0.21182***	-0.26781***			0.16586	0.13359
			(0.07841)	(0.07592)			(0.10875)	(0.09867)
r2_a	0.9027693	0.9114787	0.9028139	0.9115549	0.8392826	0.8704509	0.8393036	0.8704624
N	13673	13673	13673	13673	11905	11905	11905	11905

Notes: Coefficient estimates. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01 ** p<0.05 * p<0.10.

The same pattern holds when the type of sector is used as a classification criterium (Table 5.1 and 5.2). As already mentioned, the relevance of the informal sector in the Colombian labour market is remarkable, which led us to take this characteristic into account when analysing saving decisions. Informality, which represents over 50% of the Colombian labor market, affects not only the labor conditions and employment security but also the health coverage and contributions to the pension system of workers at this sector (Tovar and Urrutia, 2017), been therefore expected to affect saving decisions. Our data show that the share of savers is greater among households where the head is working in the informal sector, and that the impact of uncertainty on the decisions of these households is also greater.

Granda and Hanann (2015) and Tovar and Urrutia (2017) also find that the propensity to save is higher for Colombian informal households, which is explained by the greater need to protect themselves against uncovered risks for households' heads receiving labor income from this type of sector. Regarding the results for both measures of uncertainty, both for those who are employed in the formal sector and those who are in the informal sector, the variability of income is significant and positive for non-savers and significant and negative for savers, in line with the general result. The effect of uncertainty measured by the unemployment rate is greater for those who work in the informal sector (probably because of the lower employment security aforementioned) than for those in the formal sector (which includes, for instance, public workers and workers of large corporations).

Table 5.1. Households where the head of household works in the formal sector. Saving (1-4) and Non-saving (5-8) housholds

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	lnC	lnC	lnC	lnC	lnC	lnC	lnC	lnC
lnY	0.68446***	0.71100***	0.68411***	0.71057***	0.64700***	0.77330***	0.64656***	0.77347***
	(0.00707)	(0.00708)	(0.00708)	(0.00527)	(0.01940)	(0.00847)	(0.01944)	(0.00845)
sex	-0.04325***	-0.03480***	-0.04866***	-0.04220***	-0.01272	-0.01247	-0.02301*	-0.00986
	(0.00679)	(0.00662)	(0.00773)	(0.00755)	(0.01150)	(0.00967)	(0.01317)	(0.01131)
Age	0.00426***	0.00269*	0.00296*	0.00091	0.00711***	0.00653***	0.00461	0.00716***
	(0.00150)	(0.00149)	(0.00174)	(0.00173)	(0.00255)	(0.00226)	(0.00302)	(0.00277)
Age2	-0.00005***	-0.00004**	-0.00004**	-0.00002	-0.00006**	-0.00007***	-0.00004	-0.00008**
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00003)	(0.00003)	(0.00003)	(0.00003)
Couple	0.11156***	0.08351***	0.11195***	0.08400***	0.10213***	0.07683***	0.10197***	0.07685***
	(0.00763)	(0.00712)	(0.00765)	(0.00713)	(0.01286)	(0.01042)	(0.01286)	(0.01042)
t_household	0.12814***	0.12279***	0.12824***	0.12293***	0.13432***	0.08406***	0.13456***	0.08398***
	(0.00373)	(0.00287)	(0.00373)	(0.00287)	(0.00834)	(0.00435)	(0.00836)	(0.00434)
stratum	0.11195***	0.10958***	0.11438***	0.11291***	0.09556***	0.06228***	0.09929***	0.06132***
	(0.00337)	(0.00311)	(0.00375)	(0.00350)	(0.00707)	(0.00441)	(0.00819)	(0.00502)
ed_no_training	-0.02069**	-0.01444	-0.02114**	-0.01505	-0.04512***	-0.03161**	-0.04548***	-0.03151**
	(0.01054)	(0.01015)	(0.01054)	(0.01014)	(0.01501)	(0.01310)	(0.01501)	(0.01311)
ed_h_school	0.01944**	0.01629**	0.01941**	0.01624*	0.01451	0.01123	0.01460	0.01121
	(0.00869)	(0.00830)	(0.00869)	(0.00830)	(0.01239)	(0.01065)	(0.01239)	(0.01065)
ed_tec	0.03131***	0.02529***	0.03135***	0.02535***	0.06858***	0.03677***	0.06901***	0.03664***
	(0.00962)	(0.00907)	(0.00962)	(0.00907)	(0.01421)	(0.01174)	(0.01425)	(0.01173)
ed_bach	0.02227**	0.01106	0.02231**	0.01110	0.20262***	0.10992***	0.20255***	0.10990***
	(0.01097)	(0.01017)	(0.01097)	(0.01017)	(0.01969)	(0.01527)	(0.01966)	(0.01528)
ed_m_phd	0.05041***	0.03147**	0.05011***	0.03103**	0.40680***	0.20634***	0.40586***	0.20648***
	(0.01416)	(0.01310)	(0.01416)	(0.01310)	(0.03879)	(0.02497)	(0.03863)	(0.02500)
class	0.07430***	0.06296***	0.07482***	0.06365***	0.04974***	0.04327**	0.05068***	0.04302**
	(0.01468)	(0.01435)	(0.01469)	(0.01436)	(0.01914)	(0.01720)	(0.01920)	(0.01719)
_cons	3.66806***	3.36786***	3.71292***	3.42874***	4.73604***	3.07563***	4.81631***	3.05444***
	(0.09754)	(0.07623)	(0.10231)	(0.08139)	(0.24836)	(0.12114)	(0.26522)	(0.12748)
Uncertainty measure:								
inY2		-0.12864***		-0.12884***		0.16314***		0.16322***
		(0.00827)		(0.00826)		(0.01390)		(0.01387)
un_agsx16			-0.13556	-0.18545**			-0.22032	0.05599
			(0.08392)	(0.08267)			(0.15574)	(0.12206)
r2_a	0.8742779	0.8804222	0.8742902	0.8804519	0.8563438	0.8941721	0.8563799	0.8941611
N	17280	17280	17280	17280	7214	7214	7214	7214

Notes: Coefficient estimates. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01 ** p<0.05 * p<0.10.

Table 5.2. Households where the head of household works in the informal sector. Saving (1-4) and Non-saving (5-8) households

	(1) lnC	(2) lnC	(3) lnC	(4) lnC	(5) lnC	(6) lnC	(7) lnC	(8) lnC
lnY	0.73423***	0.75624***	0.73417***	0.75620***	0.58544***	0.70842***	0.58546***	0.70842***
	(0.00630)	(0.00408)	(0.00630)	(0.00408)	(0.01016)	(0.00460)	(0.01016)	(0.00460)
sex	-0.05941***	-0.04689***	-0.06443***	-0.05296***	-0.04758***	-0.04723***	-0.04897***	-0.04699***
	(0.00554)	(0.00521)	(0.00593)	(0.00557)	(0.00725)	(0.00658)	(0.00790)	(0.00716)
Age	0.00608***	0.00489***	0.00495***	0.00351***	0.00857***	0.00676***	0.00825***	0.00681***
	(0.00096)	(0.00092)	(0.00106)	(0.00102)	(0.00136)	(0.00110)	(0.00152)	(0.00124)
Age2	-0.00006***	-0.00005***	-0.00005***	-0.00004***	-0.00010***	-0.00009***	-0.00010***	-0.00009***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00002)	(0.00001)
Couple	0.09579***	0.06503***	0.09595***	0.06520***	0.14131***	0.11491***	0.14122***	0.11492***
	(0.00623)	(0.00553)	(0.00623)	(0.00553)	(0.00852)	(0.00775)	(0.00851)	(0.00775)
t_household	0.09974***	0.09457***	0.09976***	0.09459***	0.16114***	0.10618***	0.16112***	0.10619***
	(0.00308)	(0.00227)	(0.00308)	(0.00227)	(0.00493)	(0.00367)	(0.00493)	(0.00368)
stratum	0.08688***	0.08413***	0.09037***	0.08836***	0.11544***	0.07826***	0.11618***	0.07813***
	(0.00320)	(0.00280)	(0.00350)	(0.00312)	(0.00470)	(0.00338)	(0.00510)	(0.00372)
ed_no_training	-0.03217***	-0.02735***	-0.03259***	-0.02785***	-0.04386***	-0.03519***	-0.04400***	-0.03517***
	(0.00612)	(0.00576)	(0.00613)	(0.00576)	(0.00783)	(0.00692)	(0.00784)	(0.00693)
ed_h_school	0.02431***	0.02174***	0.02445***	0.02191***	0.04016***	0.03062***	0.04013***	0.03062***
	(0.00628)	(0.00591)	(0.00628)	(0.00591)	(0.00803)	(0.00714)	(0.00803)	(0.00714)
ed_tec	0.05185***	0.04877***	0.05173***	0.04862***	0.09520***	0.06691***	0.09523***	0.06691***
	(0.00869)	(0.00800)	(0.00868)	(0.00800)	(0.01123)	(0.00986)	(0.01123)	(0.00986)
ed_bach	0.03970***	0.03340***	0.03901***	0.03257***	0.20052***	0.11522***	0.20027***	0.11526***
	(0.01069)	(0.00995)	(0.01068)	(0.00995)	(0.01684)	(0.01363)	(0.01684)	(0.01366)
ed_m_phd	0.08612***	0.07319***	0.08460***	0.07134***	0.35342***	0.23821***	0.35299***	0.23828***
	(0.02156)	(0.02091)	(0.02149)	(0.02083)	(0.03497)	(0.03193)	(0.03498)	(0.03195)
class	0.12264***	0.10551***	0.12369***	0.10677***	0.10944***	0.07697***	0.10962***	0.07694***
	(0.00919)	(0.00827)	(0.00921)	(0.00829)	(0.00977)	(0.00860)	(0.00977)	(0.00859)
_cons	2.94169***	2.72000***	2.98204***	2.76867***	5.46460***	3.93282***	5.47540***	3.93091***
	(0.08065)	(0.05589)	(0.08291)	(0.05849)	(0.12556)	(0.06101)	(0.12883)	(0.06424)
Uncertainty measure:								
inY2		-0.14567***		-0.14580***		0.14868***		0.14868***
		(0.00613)		(0.00612)		(0.00449)		(0.00449)
un_agsx16			-0.17638**	-0.21363***			-0.04204	0.00735
			(0.07344)	(0.06945)			(0.09096)	(0.08105)
r2_a	0.9070905	0.9154805	0.9071151	0.9155193	0.8678557	0.8967675	0.8678494	0.8967612
N	20311	20311	20311	20311	16325	16325	16325	16325

Notes: Coefficient estimates. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01 ** p<0.05 * p<0.10.

When we consider age groups (Table 6.1, 6.2 and 6.3) very interesting differences emerge from the analysis. First, for the youngest savers (i.e., under 30 years of age) only income variability seems to play a negative effect on consumption, while the unemployment rate is not significant (i.e., the labour market conditions do not seem to affect consumption decisions on this group). For the non-savers, on the contrary, both measures show positive and significant coefficients. For the middle age group (between 30 and 59 years of age) the general pattern is found for savers, while for non-savers we find a positive effect of income variability and a significant negative effect of the unemployment rate, but only when considered in isolation. Finally, for

older household heads, we find a smilar result than for middle age group, but with greater coefficients.

Table 6.1 Households where the head of household is under 30 years of age. Saving (1-4) and Non-saving (5-8) households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	lnC	lnC	lnC	lnC	lnC	lnC	lnC	lnC
lnY	0.70019***	0.75053***	0.69979***	0.75012***	0.38115***	0.54722***	0.38143***	0.54745***
	(0.01797)	(0.00873)	(0.01792)	(0.00873)	(0.01233)	(0.01126)	(0.01233)	(0.01136)
sex	-0.03550***	-0.02712***	-0.02053	-0.01206	-0.05157***	-0.05172***	-0.02494	-0.02651
	(0.00991)	(0.00949)	(0.01710)	(0.01520)	(0.01346)	(0.01208)	(0.02000)	(0.01770)
age	0.05514**	0.04570**	0.06159***	0.05218**	0.05465**	0.01680	0.06199**	0.02375
	(0.02179)	(0.02072)	(0.02244)	(0.02131)	(0.02465)	(0.02147)	(0.02514)	(0.02157)
age2	-0.00106**	-0.00091**	-0.00116**	-0.00101**	-0.00104**	-0.00029	-0.00112**	-0.00037
	(0.00045)	(0.00042)	(0.00045)	(0.00043)	(0.00051)	(0.00044)	(0.00052)	(0.00045)
Couple	0.07395***	0.03774***	0.07445***	0.03824***	0.12798***	0.09455***	0.12983***	0.09631***
	(0.01281)	(0.01083)	(0.01274)	(0.01083)	(0.01538)	(0.01347)	(0.01531)	(0.01343)
t_household	0.14083***	0.12419***	0.14080***	0.12415***	0.26382***	0.18636***	0.26324***	0.18584***
	(0.00893)	(0.00552)	(0.00895)	(0.00552)	(0.00827)	(0.00785)	(0.00828)	(0.00788)
stratum	0.07891***	0.07623***	0.07855***	0.07587***	0.13357***	0.09290***	0.13259***	0.09198***
	(0.00612)	(0.00543)	(0.00609)	(0.00541)	(0.00754)	(0.00665)	(0.00751)	(0.00665)
ed_no_training	-0.06175***	-0.05490***	-0.06115***	-0.05430***	-0.07846***	-0.06107***	-0.07797***	-0.06061***
	(0.01949)	(0.01865)	(0.01949)	(0.01863)	(0.02124)	(0.01826)	(0.02126)	(0.01826)
ed_h_school	0.05129***	0.04300***	0.05082***	0.04252***	0.09418***	0.07364***	0.09296***	0.07249***
	(0.01310)	(0.01238)	(0.01312)	(0.01239)	(0.01517)	(0.01341)	(0.01518)	(0.01343)
ed_tec	0.07713***	0.06183***	0.07684***	0.06154***	0.14950***	0.10129***	0.14862***	0.10047***
	(0.01648)	(0.01425)	(0.01652)	(0.01425)	(0.01812)	(0.01593)	(0.01813)	(0.01597)
ed_bach	0.06492***	0.03459*	0.06535***	0.03502*	0.31206***	0.20907***	0.31197***	0.20901***
	(0.02367)	(0.01954)	(0.02363)	(0.01953)	(0.02847)	(0.02450)	(0.02848)	(0.02452)
ed_m_phd	0.09445**	0.04530	0.09474**	0.04558	0.45301***	0.33182***	0.45382***	0.33261***
	(0.04149)	(0.03805)	(0.04148)	(0.03808)	(0.06055)	(0.04881)	(0.06038)	(0.04876)
class	0.08652***	0.07088***	0.08419***	0.06853***	0.16374***	0.12248***	0.16073***	0.11964***
	(0.01971)	(0.01858)	(0.01986)	(0.01860)	(0.02318)	(0.02061)	(0.02322)	(0.02063)
_cons	2.76763***	2.28146***	2.64569***	2.15880***	7.49631***	5.85782***	7.31055***	5.68230***
	(0.34079)	(0.26890)	(0.37168)	(0.28550)	(0.31408)	(0.28002)	(0.32988)	(0.29005)
Uncertainty measure:								
inY2		-0.16174***		-0.16174***		0.12548***		0.12545***
		(0.01093)		(0.01086)		(0.00709)		(0.00713)
un_agsx16			0.16789	0.16888			0.30689**	0.29058**
			(0.15042)	(0.13423)			(0.15478)	(0.13545)
r2_a	0.8617997	0.8757496	0.8618163	0.8757693	0.7930919	0.8410051	0.7932625	0.8411632
N	5279	5279	5279	5279	5241	5241	5241	5241

Notes: Coefficient estimates. Cluster robust standard errors in parentheses.
Significance levels: *** p<0.01 ** p<0.05 * p<0.10.

Table 6.2 Households where the head of household is between 30 and 59 years of age. Saving (1-4) and Non-saving (5-8) households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	lnC	lnC	lnC	lnC	lnC	lnC	lnC	lnC
lnY	0.71467***	0.73445***	0.71412***	0.73379***	0.51287***	0.67263***	0.51274***	0.67263***
	(0.00501)	(0.00358)	(0.00501)	(0.00358)	(0.00780)	(0.00426)	(0.00779)	(0.00425)
sex	-0.04660***	-0.03691***	-0.05779***	-0.05109***	-0.04290***	-0.04177***	-0.05592***	-0.04185***
	(0.00448)	(0.00428)	(0.00541)	(0.00517)	(0.00662)	(0.00572)	(0.00824)	(0.00704)
age	0.00726***	0.00636***	0.00506**	0.00357	0.01875***	0.01600***	0.01608***	0.01598***
	(0.00236)	(0.00229)	(0.00244)	(0.00237)	(0.00346)	(0.00301)	(0.00357)	(0.00313)
age2	-0.00009***	-0.00007***	-0.00007**	-0.00005*	-0.00021***	-0.00019***	-0.00019***	-0.00019***
	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00004)	(0.00003)	(0.00004)	(0.00004)
Couple	0.09873***	0.07241***	0.09907***	0.07279***	0.13331***	0.09606***	0.13312***	0.09606***
	(0.00512)	(0.00462)	(0.00513)	(0.00463)	(0.00754)	(0.00653)	(0.00754)	(0.00654)
t_household	0.10561***	0.10193***	0.10587***	0.10225***	0.18178***	0.11839***	0.18194***	0.11839***
	(0.00239)	(0.00188)	(0.00240)	(0.00188)	(0.00382)	(0.00304)	(0.00382)	(0.00304)
stratum	0.10068***	0.09807***	0.10625***	0.10514***	0.13529***	0.08897***	0.14104***	0.08900***
	(0.00249)	(0.00226)	(0.00297)	(0.00273)	(0.00405)	(0.00295)	(0.00481)	(0.00357)
ed_no_training	-0.03012***	-0.02552***	-0.03052***	-0.02603***	-0.05252***	-0.03947***	-0.05278***	-0.03947***
	(0.00555)	(0.00524)	(0.00555)	(0.00524)	(0.00762)	(0.00659)	(0.00762)	(0.00659)
ed_h_school	0.02054***	0.01685***	0.02068***	0.01702***	0.04662***	0.03032***	0.04677***	0.03032***
	(0.00531)	(0.00499)	(0.00530)	(0.00499)	(0.00747)	(0.00645)	(0.00747)	(0.00645)
ed_tec	0.03574***	0.02970***	0.03580***	0.02977***	0.12089***	0.06945***	0.12119***	0.06945***
	(0.00658)	(0.00612)	(0.00658)	(0.00611)	(0.00946)	(0.00818)	(0.00946)	(0.00818)
ed_bach	0.01589**	0.00809	0.01578**	0.00793	0.24577***	0.14312***	0.24504***	0.14312***
	(0.00772)	(0.00715)	(0.00772)	(0.00714)	(0.01291)	(0.01069)	(0.01288)	(0.01069)
ed_m_phd	0.03572***	0.02438**	0.03431***	0.02257**	0.47762***	0.28053***	0.47543***	0.28052***
	(0.01152)	(0.01077)	(0.01151)	(0.01076)	(0.02536)	(0.02035)	(0.02533)	(0.02038)
class	0.11915***	0.10194***	0.12041***	0.10350***	0.13290***	0.09312***	0.13400***	0.09312***
	(0.00886)	(0.00820)	(0.00888)	(0.00821)	(0.01028)	(0.00916)	(0.01030)	(0.00917)
_cons	3.19513***	2.98966***	3.27524***	3.09095***	6.20825***	4.21611***	6.29750***	4.21663***
	(0.08324)	(0.06885)	(0.08702)	(0.07234)	(0.11650)	(0.08362)	(0.12139)	(0.08744)
Uncertainty measure:								
inY2		-0.14076***		-0.14106***		0.14247***		0.14247***
		(0.00552)		(0.00550)		(0.00422)		(0.00422)
un_agsx16			-0.30303***	-0.38482***			-0.33104***	-0.00186
			(0.08007)	(0.07737)			(0.12479)	(0.10418)
r2_a	0.8881276	0.8962652	0.8881757	0.8963452	0.8377717	0.8788095	0.8378247	0.8788040
N	32053	32053	32053	32053	22157	22157	22157	22157

Notes: Coefficient estimates. Cluster robust standard errors in parentheses. Significance levels: *** $p<0.01$ ** $p<0.05$ * $p<0.10$.

Table 6.3 Households where the head of household is over 60 years old. Saving (1-4) and Non-saving (5-8) households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	lnC	lnC	lnC	lnC	lnC	lnC	lnC	lnC
lnY	0.73566***	0.74050***	0.73490***	0.73966***	0.56370***	0.70235***	0.56318***	0.70194***
	(0.00742)	(0.00519)	(0.00743)	(0.00519)	(0.01159)	(0.00571)	(0.01158)	(0.00572)
Sex	-0.05558***	-0.04742***	-0.03764***	-0.02718***	-0.06559***	-0.06471***	-0.04037***	-0.05305***
	(0.00712)	(0.00693)	(0.00902)	(0.00876)	(0.01151)	(0.00961)	(0.01395)	(0.01202)
age	-0.00386	-0.00459	-0.00779	-0.00902	-0.01867**	-0.01482*	-0.02422***	-0.01739**
	(0.00595)	(0.00561)	(0.00605)	(0.00571)	(0.00883)	(0.00765)	(0.00906)	(0.00785)
age2	0.00003	0.00003	0.00005	0.00006	0.00012*	0.00009*	0.00015**	0.00011**
	(0.00004)	(0.00004)	(0.00004)	(0.00004)	(0.00006)	(0.00005)	(0.00006)	(0.00005)
Couple	0.08826***	0.06996***	0.08904***	0.07081***	0.14563***	0.13670***	0.14684***	0.13727***
	(0.00754)	(0.00721)	(0.00753)	(0.00720)	(0.01215)	(0.01054)	(0.01215)	(0.01056)
t_household	0.10226***	0.10332***	0.10263***	0.10375***	0.18271***	0.11156***	0.18293***	0.11175***
	(0.00374)	(0.00286)	(0.00375)	(0.00286)	(0.00655)	(0.00519)	(0.00655)	(0.00519)
stratum	0.09743***	0.09580***	0.10735***	0.10698***	0.13787***	0.08510***	0.15177***	0.09159***
	(0.00428)	(0.00356)	(0.00533)	(0.00464)	(0.00699)	(0.00495)	(0.00874)	(0.00657)
ed_no_training	-0.01145	-0.00934	-0.01143	-0.00931	-0.09092***	-0.06515***	-0.09105***	-0.06524***
	(0.00806)	(0.00786)	(0.00806)	(0.00786)	(0.01374)	(0.01123)	(0.01373)	(0.01122)
ed_h_school	0.00360	0.00866	0.00427	0.00942	0.01369	-0.00039	0.01457	0.00003
	(0.01006)	(0.00977)	(0.01004)	(0.00975)	(0.01770)	(0.01475)	(0.01769)	(0.01475)
ed_tec	0.00991	0.01036	0.01061	0.01116	0.06333**	0.05329**	0.06494**	0.05405**
	(0.01455)	(0.01417)	(0.01453)	(0.01415)	(0.02560)	(0.02250)	(0.02556)	(0.02248)
ed_bach	-0.01918	-0.00907	-0.01981	-0.00977	0.14951***	0.10091***	0.14940***	0.10092***
	(0.01294)	(0.01246)	(0.01293)	(0.01245)	(0.02600)	(0.02181)	(0.02587)	(0.02175)
ed_m_phd	-0.03227*	-0.03294*	-0.03410*	-0.03500**	0.34183***	0.21657***	0.33847***	0.21517***
	(0.01818)	(0.01755)	(0.01815)	(0.01752)	(0.04537)	(0.03474)	(0.04547)	(0.03478)
class	0.14185***	0.12794***	0.14383***	0.13016***	0.16171***	0.10715***	0.16498***	0.10873***
	(0.01305)	(0.01251)	(0.01307)	(0.01252)	(0.01593)	(0.01414)	(0.01596)	(0.01419)
_cons	3.13658***	3.14249***	3.28826***	3.31348***	6.54007***	4.66188***	6.74987***	4.76122***
	(0.23779)	(0.21451)	(0.24234)	(0.21852)	(0.36082)	(0.28880)	(0.37126)	(0.29731)
Uncertainty measure:								
inY2		-0.12148***		-0.12171***		0.11975***		0.11960***
		(0.00699)		(0.00697)		(0.00576)		(0.00576)
un_agsx16			-0.38472***	-0.43366***			-0.61113***	-0.28251*
			(0.11228)	(0.10852)			(0.19183)	(0.16964)
r2_a	0.9150905	0.9212069	0.9151635	0.9213016	0.8937284	0.9200132	0.8938478	0.9200315
N	13932	13932	13932	13932	8046	8046	8046	8046

Notes: Coefficient estimates. Cluster robust standard errors in parentheses. Significance levels: *** p<0.01 ** p<0.05 * p<0.10.

In sum, from our results we conclude that there is evidence of a precautionary motive for saving among Colombian households, which is stronger and more relevant for saving households. The consumption/saving decisions of this group are sensitive to both income variability and the unemployment rate, as measured through future income uncertainty, even though the former seems to exert a lower impact than the latter. For non-savers, we found that both measures seem to exert a positive effect on consumption (opposite to the precautionary savings theory). However, this pattern for non-savers could be concealing a composition effect, since we found that different segmentations of this group of households (which is rather heterogenous as regards income level, wealth status or household composition) shows some differences with respect to the general result.

The contribution of the paper to the existing literature is, therefore, to provide a first direct test of a precautionary motive for saving in Colombia, providing insights into the relationship between consumption/saving decisions and the uncertainty measures as regards future income, and the changing relationship between these decisions and the ability to save.

4. Conclusions

The empirical literature has shown evidence of the existence of a precautionary motive for saving for a large number of countries, both developed and developing, (see Lugilde et al. 2019), but to date, only indirect evidence has been provided for Colombia. Using data from the National Household Budget Survey, this paper shows that in this country, there is also evidence of this type of saving among households. Even though we find mixed evidence when we consider all of the households in our sample, the econometric results clearly show the existence of precautionary saving when we analyse the behaviour of saving households, i.e., the subsample for which total saving is positive. For this group, uncertainty, either measured trough income variability or the unemployment rate, positively affects savings, which can be interpreted as the decision to increase saving to cover a higher risk of facing potential negative income shocks in the future.

For non-saving households, which are nearly 40% of our sample (this share is similar to other Latin American countries, Bebczuk et al., 2015), neither income variability nor the unemployment rate impact negatively on consumption decisions, but rather their effect is significantly positive (somehow, a greater variability in their income or a greater probability of not perceiving labour income in the future lead this non-saving household to expand current consumption). These non-saving households mainly correspond to the lowest income percentiles, and the lack of an

impact of uncertainty on their consumption/saving decisions is in line with the results found by Carroll et al. (2003), who show that households belonging to the lowest permanent income levels do not save for precautionary reasons, but as household income rises (and, in our case, the number of savers increase), the precautionary motive becomes significant both economically and statistically. In this paper, we do not divide the sample by income levels, but rather by saving behaviour. However, even if data show that savers rate increases with income level, given that there are savers and non-savers for each income level, we believe that our approach is more appropriate to test for precautionary savings.

The estimated models provide a good fit of the consumption behaviour of Colombian households. The included socio-demographic control variables, similar to those used in the existing literature, are significant and show the expected signs, both for the whole sample and the two subsamples of savers and non-savers, even though the model seems to provide a better fit for the saving households.

As regards the differences between these two subsamples, in addition to the dissimilar impact of uncertainty, it is worth mentioning the disparity in the impact of the education level on consumption, which is greater for non-savers, and more importantly, the impact of age. The evidence of a quadratic relationship between age and consumption is much clearer for non-savers, for which the results are compatible with the Life-Cyle Hypothesis model of consumption. In general, these results by household saving behaviour are robust to several segmentations of the sample: gender of the household head, employmeny status, type of sector of activity or age group.

All in all, the evidence found in this paper provides the first direct test of precautionary saving in Colombia, and could potentially help in the design of macroeconomic policies aimed at increasing household total savings, since it has been repeatedly argued that saving rates in Latin America are low (Cavallo and Serebrisky, 2016; Gandelman, 2015). In addition, it may help to anticipate potential adverse effects of different shocks (either micro or macroeconomic) to aggregate consumption.

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Appendix

A.1 Variables used in the consumption model of Colombian households

DEFINITION	VARIABLE	DESCRIPTION	DATABASE – ORIGIN OR TREATMENT
Income	lnY	Household income, in logarithms	ENPH
Consumption	lnC	Household consumption, in logarithms	ENPH
Sex	sex	Dummy when the reference person is female (0) or male (1)	ENPH
Age	age, age5	Age of reference person; age by five years of age	ENPH
Educational level	ed_no_training	Without formal education or after the initial stage	ENPH
	ed_primary	Primary school completed	ENPH
	ed_h_school	High school completed	ENPH
	ed_tec	tecnological	ENPH
	ed_bach	Bachelor´s degree completed	ENPH
	ed_m_phd	Master or phD completed	ENPH
Area	class	urban (1) rural (2)	ENPH
Size household	t_household	Number of people in the household	ENPH
Couple	cony_jf	Couple, spouse, partner of the reference person and living in the household	ENPH
Wealth	stratum	This is a proxy of wealth, taken according to Law 142 of 1994 (Superintendencia de Servicios Públicos Domiciliarios, 2014) the socioeconomic stratification is a classification of residential properties, four levels are taken, being 1 the lowest and 4 the highest.	ENPH
Unemployment	unemployment		ENPH; GEIH

Source: Own elaboration

A.2 Summary of the samples: total, saving households and non-saving households.

Variable	(Total sample: 86,708 obs.)				(Saving households: 51,264 obs.)				(Non-saving households: 35,444 obs.)			
	Mean	Std, Dev,	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
lnY	15.28	1.2	7.41	20.3	15.69	1.02	11.27	20.3	14.69	1.2	7.41	20.23
lnC	15.22	0.99	9.89	20.24	15.25	0.97	9.89	20.19	15.17	1.01	10.52	20.24
Sex	0.58	0.49	0	1	0.62	0.48	0	1	0.54	0.49	0	1
Age	48.61	15.82	11	107	49.67	15.59	15	102	47.07	16.03	11	107
Age2	2,614	1,637.31	121	1,1449	2,711.27	1,633.27	225	1,0404	2,473.32	1,632.92	121	1,1449
Couple	0.53	0.49	0	1	0.56	0.49	0	1	0.49	0.49	0	1
t_household	3.34	1.74	1	22	3.42	1.78	1	19	3.23	1.68	1	22
Stratum	1.97	0.93	1	4	2	0.94	1	4	1.91	0.91	1	4
ed_no_training	0.32	0.46	0	1	0.3	0.46	0	1	0.34	0.47	0	1
ed_h_school	0.26	0.44	0	1	0.25	0.43	0	1	0.27	0.44	0	1
ed_tec	0.11	0.32	0	1	0.12	0.32	0	1	0.11	0.31	0	1
ed_bach	0.09	0.29	0	1	0.11	0.32	0	1	0.06	0.25	0	1
ed_m_phd	0.03	0.18	0	1	0.05	0.21	0	1	0.01	0.13	0	1
Class	0.93	0.24	0	1	0.93	0.24	0	1	0.92	0.25	0	1

Source: Own elaboration