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Centro de Estudios
Distributivos, Laborales y Sociales

Maestría en Economía
Facultad de Ciencias Económicas

UNIVERSIDAD NACIONAL DE LA PLATA

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Understanding the Determinants of Household Saving: Micro Evidence for Latin America

Documento de Trabajo Nro. 189
Octubre, 2015

ISSN 1853-0168

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CEDLAS-UNLP

August, 2015

Abstract

This study centers on the household saving rate in Latin America by constructing a new database from 27 household surveys in 10 countries. At the statistical level, about half of the households present negative saving. This fact, coupled with the discrepancy with national accounts data, suggests some degree of income underreporting and/or consumption overreporting. The estimations highlight the overriding positive role of income in shaping saving decisions. Many other controls prove to be significant as well. In terms of household saving promotion, our paper leaves little room for optimism.

JEL Codes: D91, E21

Keywords: Household Saving, Latin America, Microdata

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We would thank Orazio Attanasio, Eduardo Cavallo, Peter Montiel, Klaus Schmidt-Hebbel as well as Miguel Székely, Verónica Frisancho and Néstor Gandelman and other participants for their constructive and insightful comments at the IDB Research Network Workshops held in Washington DC in July 2014 and April 2015. Andrés César and Cynthia Marchionni provided superb research assistance. All remaining errors are ours.

Introduction

An extensive literature has examined the aggregate determinants of the private saving rate around the globe and in Latin America in particular (see Loayza, Schmidt-Hebbel and Serven, 2000, and IDB, 2013). This active field of research, while having enriched the understanding of this complex and vital economic outcome, falls short of being bulletproof. By its very nature, macroeconomic variables cannot accurately inform about the ultimate factors behind why and how much households save.[1]

However, despite the apparent advantages of the microdata approach, little was known until very recently about household saving decisions in Latin America. Among the handful of existing contributions, we can mention Butelmann and Gallego (2000) for Chile and Sandoval-Hernandez (2013) for Mexico and Gandelman (2014a,b) for nine economies in the region. Attanasio and Szekely (2000) construct synthetic cohorts to compare household saving behavior between two Latin American countries (Peru and Mexico) and two East Asian economies (Thailand and Taiwan).

To broaden our knowledge about this subject, the present study exploits household-level data from Latin American national surveys on income and expenditure. At the end of the day, the goal is to pinpoint socioeconomic and other factors that may constrain the ability of Latin American households to save as well as drawing policy recommendations. Given the stated scope of our research, the main

[1] A given macroeconomic regressor may lend itself to more than just one interpretation. For example, the real interest rate is thought to capture intertemporal substitution effects, but may also proxy for aggregate risk and for the degree of financial development, blurring any meaningful inference from the empirical findings.

contribution does not lie in methodological innovations but largely in conducting a comprehensive cross-country saving analysis for the Latin American region, covering ten economies and twenty-seven surveys in selected years for the 1990s, 2000s and 2010s.

Our approach consists of pooling household-level data from all those surveys, adding country and time effects, for a total number of about 392,000 usable observations. This implies that we will not pay much attention to individual country- and time-specific saving behavior, a choice justified by (i) the practical difficulty to present and assess in a reader-friendly way evidence from such a large set of countries and years; and (ii) the fact that Gandelman (2014a,b) undertakes, for a similar dataset, a country-by-country descriptive, but not econometric, analysis of a some major issues tackled in our paper.

The paper is organized in three sections. Section 1 briefly reviews the theoretical support for the subsequent empirical analysis of household saving decisions. Section 2 describes the data and Section 3 presents the econometric results. A closing section discusses the conclusions and policy implications.

1. Literature Review

This section sets the groundwork for the statistical assessment of the various drivers of the household saving rate. As standard in this field, we will frame our analysis within the canonical permanent income (Friedman, 1957) and the life cycle (Modigliani and Brumberg, 1954) models. While these models have forcefully posited the intertemporal smoothing motive for consumption, subsequent refinements highlighted

the major role played by borrowing constraints (see Campbell and Mankiw, 1990, and Deaton, 1991) and precaution in the face of uncertainty (see Kimball, 1990, and Lusardi, 1998) in shaping consumption and saving decisions. Our regressors are conventional empirical counterparties for the theoretical drivers underlying the above theories. In what follows, we list and discuss the proposed list of explanatory variables and succinctly summarize the available evidence for Latin America.

Household head education qualifies as a reasonable proxy for expected future income. Within the permanent income formulation, the saving rate should not be responsive to permanent income but to gaps between current and permanent income. Nevertheless, schooling levels may have a bearing on saving on its own, as educated individuals may display a lower time preference (more patience), and so a clearer inclination to save – in fact, the very decision to study and delay the entry into the labor force reveals such kind of pro-saving behavior. Gandelman (2014b), for a number of economies in the region, Sandoval-Hernandez (2013), for Mexico, and Butelmann and Gallego (2001), for Chile, find mixed evidence regarding the education-saving nexus, with several countries and years where the household saving rate drops with educational levels.

In order to further investigate wealth effects on consumption, a house ownership dummy variable will be included in the analysis (see Peltonen, Sousa and Vansteenkiste, 2009, and Butelmann and Gallego, 2001, who both find a positive effect). Home ownership, though, lends itself to several and conflicting effects on saving, namely: (i) Once having become home owners, households may diminish their saving vis-à-vis non-home owners. Securing a roof and getting rid of a monthly rent may induce households to save less, especially if they do not have an outstanding

mortgage on the property; (b) Having saved for some time to buy, as opposed to renting, hints at a frugal attitude by household members and a higher saving rate; and (c) Real state can serve as collateral when tapping the credit market, and thus may loosen financial constraints and then the household's saving effort.

Two contrasting views have been put forward in the pension and saving literature (see Engen and Gale, 1999). On the one hand, under the standard life cycle model, compulsory social security contributions substitute for voluntary saving. If the anticipated pension benefits are comparable to the gross return of voluntary saving, pension system participation should not change permanent income, and thus neither should change saving decisions. On the other hand, social security membership may increase saving for myopic individuals who do not abide by the permanent income consumption rule and, as a result, do not save at all (or enough) on their own to provide for retirement. A dummy variable will capture this effect, distinguishing contributing from non-contributing workers.[2] Compounding this theoretical ambiguity, a modified life cycle approach would add new and disparate arguments: (i) If faced with borrowing constraints, individuals may not be able to increase consumption in response to the inception of a pension system; (ii) If an early retirement option is open to the worker, he/she may decide to save more to finance a longer retirement period; and (iii) If pension benefits resolve the uncertainty linked to earnings and longevity risk, voluntary saving for precautionary reasons may fall. Yet, if the pension system –be it public or private- suffers from a lack of credibility –workers are uncertain as to whether they will actually receive, once retired, the benefits he/she is

[2] Unfortunately, for countries having both systems in place, household surveys do not inquire about the regime (pay-as-you-go or capitalization) the worker contributes to.

entitled to-, this last effect may be partly neutralized.

A most sensitive issue in running a household saving regression is whether current income should be included within the set of explanatory variables. In the face of solid international evidence of a high correlation between current income and saving rates (see Bozio et al., 2011), many authors claim that current income is an endogenous variable and hence that the estimated coefficient would be biased upward, overstating the intrinsic saving-income link (see Attanasio, 1994, and Dynan, Skinner and Zeldes, 2004). They usually invoke two reasons: (i) Consumption smoothing implies a positive correlation between current income and saving rates due to transitory shocks (people compensate for temporarily high (low) income with more (less) saving and vice versa); and (ii) Measurement error in income will translate into measurement error of the same sign in saving (since income appears on both sides of the equation). In order to circumvent these pitfalls, empirical studies have either deleted current income from the regressors list or have instrumented it with proxies for permanent income, such as education or consumption. By applying the latter approach, a number of papers have confirmed that the rich do in general save more than the poor (see, among others, Dynan, Skinner and Zeldes, 2004, for the US, and Gandelman, 2014b, for several Latin American countries).

In spite of such sound arguments, there are still some compelling reasons for not writing off the saving-current income link as economically meaningless, namely: (a) At odds with the permanent income theory, current income may indeed be a major driver of consumption and saving for financially constrained or myopic individuals (see for example Campbell and Mankiw, 1990); (b) Higher current income may also be

associated to higher saving rates under Stone-Geary preferences -and thus a subsistence income threshold beyond which saving takes place- or as postulated in the neo-Keynesian models of Lewis, Kaldor and Pasinetti – where entrepreneurs save but workers do not- (see Ogaki, Ostry and Reinhart, 1996, Schmidt-Hebbel, 2000, and Achury, Hubar and Koulovatianos (2012)). Along these lines, in the macro field, empirical research has identified the level of per capita GDP as a significant explanatory variable (see Loayza, Schmidt-Hebbel and Servén, 2000); (c) Unfortunately, measurement errors and transitory income shocks are not directly observable, so there is no clarity as to the actual size of the coefficient bias. Relatedly, the above endogeneity argument assumes that income and expenditure measurement errors are independent of each other, which is an empirical matter;[3] (d) If current income turns out to be a relevant regressor, its exclusion on the grounds of endogeneity bias would give rise to a different sort of endogeneity bias, that is, omitted variable bias. For instance, it is well-known that the age-income and the education-income profiles are increasing up to some point. By excluding current income, the age and education coefficients may be overestimated; and (e) Last but not least, policy prescriptions can be quite different. If one believes that saving decisions have more to do with permanent than current income, saving policy measures affecting the former (but not necessarily the latter) -like fostering education levels, reducing interest rates or infusing optimism on economic prospects- would raise the

[3] Similarly, as opposed to current income, permanent income is also unobservable, as it encompasses discounted expected flows of income. In this light, it is difficult to ascertain how good a proxy education or other variables are. For instance, on top of being unobservable, perceptions of permanent income can be time-varying (see Heymann, 2007), while most standard proxies are time-invariant. On a related note, measurement error stems from the fact that Y (income) is part of the residual measurement of saving as Y-C, where C is consumption expenditure. However, if the saving rate is defined as (Y-C)/Y, the direction and size of the bias becomes even less clear. Defining the saving rate as (Y-C)/C overcomes such an ambiguity.

average saving rate. Conversely, the conviction that current income plays a leading role would render such advice much less appealing. In light of the above controversy, the subsequent econometric work will take a step back and revisit this issue by running and comparing specifications involving both current income and an instrumental variable, as well as excluding income.

As put forward by the life cycle model, the saving rate should be highest among working adults vis-à-vis individuals at both tails of the age distribution. Since the nexus between saving and age is likely to be concave, age and age squared will enter the equation. Likewise, the old dependency ratio (individuals aged 65 and older to those between 15 and 64 years old) and the young dependency ratio (individuals under 15 to those between 15 and 64 years old) will be part of the control set. The evidence, nevertheless, is not utterly conclusive regarding this prediction. For instance, Dynan, Skinner and Zeldes (2004) do not find evidence of dissaving among the elderly in the US, and neither does World Bank (2011) for Brazil. Gandelman (2014a) observes that household heads above 60 display higher saving rates than those aged 40-49 in several Latin American countries. Similar finding is shown for Mexico by Sandoval-Hernandez (2013) for a number of surveys in the 1984-2010 period.

An extended version of the very life cycle model can accommodate this factual ambiguity, by incorporating longevity and health risks as well as bequest motives among the elderly. In turn, Mody, Ohnsorge and Sandri (2012) argue that the young dependency ratio may not decrease but increase the saving rate whenever parents seek to build a buffer stock to

provide for future education and health expenditures for their children.[4] All in all, the issue must be settled on empirical grounds.

By stifling the ability to finance a wedge between desired current consumption and income, borrowing constraints may increase the household saving rate. The presence of financial constraints is not easily observable, but some insight can be gained by noticing that people with access to formal lending (including credit cards) or to income sources other than salaries and transfers (such as remittances or rents) are a priori less likely to suffer such constraints. The estimates produced by Sandoval-Hernandez (2013) with Mexican data lend support to the above claims, while Butelmann and Gallego (2001) report conflicting findings for different Chilean survey years.

Precautionary saving may appear whenever households decide to build a buffer stock to face a more volatile income in the future (for a given expected future income). Among other possible proxies, self-employment is a priori associated to larger income risk. The reception of government transfers (such as subsidies and pensions) as well as remittances from relatives and friends living overseas would have the opposite effect. Household location may also have to do with saving behavior in this regard. As claimed, among others, by Loayza, Schmidt-Hebbel and Serven (2000), urban households may have a lower saving rate, as consumption opportunities are much broader and accessible than in rural areas. Also, income risks in rural areas are not as diversifiable as in big cities, which may induce a higher saving rate in the former than in the

[4] Gandelman (2014b) argues that just looking at the age of the household heads, as customary in most studies, and not at that of other income-earning members may distort the analysis of the age-saving relationship.

latter. Sandoval-Hernandez (2013) obtains results consistent with this hypothesis.

Other frictions can hinder the saving process. For example, the above theories take as granted the access to financial instruments meeting the needs of households with desired positive saving. This is not always the case. For instance, rural families or those living in marginal areas may not have easy access to bank facilities, a major impediment at the time of investing their saving. To test this aspect, a dummy with value 1 for rural families and for those who report possessing a bank account will be incorporated on the right-hand side.

Let us notice that the effect of some regressors may be conditioned by some other variables in the control set, a feature that can be fruitfully addressed via interaction terms. In particular, we are interested in the joint effects of the dependency ratio, the education level and the age of the household head with household income level.

To close this section, in light of the variety of theoretical and empirical effects described above, the overall reading of the literature provides, with few exceptions, little guidance as to what to expect from our estimations.

2. Data

This section describes the main trends in the saving rate and its main correlates across the available national household surveys. The SEDLAC database, administered by CEDLAS (Centro de Estudios Distributivos, Laborales y Sociales) is the most comprehensive source of household survey data for LAC countries. However, to date, household survey

collection and analysis around the world has placed the largest effort on the income modules vis-à-vis the expenditure side.[5] That being said, we have put together a new and homogeneous database merging expenditure and other socioeconomic household characteristics for ten Latin American countries spanning selected years since the 1990s, comprising the following twenty-seven household surveys:

Table 2.1

Household Survey Coverage

Country	Years
Argentina	2004-2012
Brazil	2003-2009
Colombia	1997-2003-2011
Ecuador	1999-2006
El Salvador	1998-2004-2010
Guatemala	2000-2006-2011
Mexico	1994-2000-2010
Nicaragua	1998-2005-2009
Panama	1997-2003-2008
Peru	1997-2003-2010

This list is dictated by the quest for broad regional coverage (countries in South, Central and North America), economic development heterogeneity and time variation. As it is obvious, data availability proves to be a major constraint, as expenditure surveys do not exist for several countries or are not conducted on an annual basis.

[5] Incidentally, this may explain, as noticed above, the worldwide relative scarcity of micro-level research on consumption and saving.

Our variable of interest is the household saving rate, defined as disposable income minus consumption expenditure as a ratio of disposable income. Since we are concerned with household decisions, disposable income is measured as gross household income (from labor and other sources) net of taxes and retirement contributions, the latter being subtracted because of their compulsory rather than voluntary nature. Besides this standard saving rate, which will be the basis for our econometric work, we have calculated the following alternative measures: (a) Saving to consumption, which is a monotonic transformation of the traditional saving-to-income ratio, but is not affected by low or zero income.[6]; (b) The same saving/income and saving/consumption ratios augmented by durables, health and education expenditures. Details on methodological and measurement aspects are included in an unreported annex available from the authors upon request.

Tables 2.2 to 2.5 show the above four measures for each survey under analysis. Each table reports the aggregate rate (sum of saving to sum of income or consumption over all households in the survey) as well as the mean and the median household saving rate. The values display an enormous dispersion across countries, years and measures. Measure-wise, the mean is dramatically different from the aggregate rate, while the latter lies closer to the median. Mean household saving rates are strongly negative in most cases (24 of the 27 surveys). Even medians are negative, for the usual saving-to-income measure, in 6 cases. This all points to a noteworthy phenomenon: the prevalence of negative saving in a vast number of households. According to Table 2.2, an average of 45% of

[6] Out of the total number of households in the dataset, just 0.4% reports zero income and none negative income.

households across the region has negative saving, with a maximum of 65% (El Salvador 2004) and a minimum of 13% (Guatemala 2000). Since negative saving implies a financing gap, these figures call for more granular data on financing choices and decisions, which are plainly omitted in most national household surveys. As will be seen shortly, just a handful of surveys include some questions on the use of banking and credit, but even in these cases no questions are asked, when applicable, about the excess of expenditures over income, and the ways such deficit is taken care of.[7]

To summarize the information contained in Tables 2.2-2.5, Table 2.6 shows some statistics on the aggregate saving rate. The regional mean of the saving-to-income ratio is 13.1%, which goes up to 29.3% after including durables, health and education expenses. The median is quite similar (12.7% and 28.1%), but these values hide a significant variation across surveys, ranging, for the standard saving rate, from -33% to +63%. This range is even more pronounced for the saving/consumption measure.

As mentioned earlier, measuring saving by means of household data has, unlike national accounts saving, the advantage of providing details on the saving behavior and the socioeconomic profile of each interviewed family.

[7] Browning and Lusardi (1996) and Verbina (2003) confirm that negative saving rates are common among the lower percentiles of the income distribution for a number of countries. This issue is not observed solely in Latin America, but also in more developed economies. For instance, Alves and Cardoso (2010) points out that 90% of the Portuguese household saving is generated by 20% of the households, and that the 30% of total households have negative saving rates (-60% of disposable income for the first saving decile). For Ireland in 1999/2000, Moreno-Badia (2006) reports a national accounts-based household saving rate of 9.4% and a household survey-based value of 3%. Moreover, she computes a saving rate of -6% and -2% for the first and second income quartile, which rises to 14% for the fourth quartile.

But since conventional saving rates are calculated from national accounts rather than household surveys, it is convenient to compare them. Unfortunately, a large number of countries lack institutional sector accounts separating household and business saving. Taking advantage of a recent dataset assembled by Bebczuk and Cavallo (2014), Table 2.7 compares both measures for a small set of countries and years with available information. Sizable differences are seen in either direction and for several surveys, such as Brazil 2009 (20.3% according to the household survey and 4.5% to national accounts) and Mexico 2000 (3.5% and 9.2%).[8]

Accurately measured, both sources should yield the same results, but this is obviously not the case. While discrepancies are admissible, the wedge is eye-catching. Ravallion (2000) discusses at length the contrast between social indicators measured via household surveys or national accounts. Differences can be traced to many factors, inter alia, sample coverage (wider for national accounts), data sources (mostly supply-side in national accounts and demand-side in surveys), methodology (consumption measured as a residual -and thus absorbing any existing measurement errors- in national accounts, and directly measured in surveys) and the treatment of certain items (imputed rents, own-account consumption, financial services, and so on). In addition, a pervasive problem with household surveys is the limited coverage of and the income underreporting of income by well-off families. In turn, potentially misleading saving and consumption data can result from recall

[8] Let us say that these differences are not exclusive of Latin America and extend to developed countries as well. For instance, NZIER (2007) notices for New Zealand that the average household saving rate for 1984-2001 was -7.3% of disposable income according to national accounts and +7.5% according to the micro data collected by the Household Economic Survey. For the case of Portugal in 2005-2006, Alves and Cardoso (2010) inform a household saving rate of 20% based on household surveys and one of 8% as calculated in the national accounts.

expenditure surveys, such as the ones being exploited here (see Battistin, 2003, and Browning, Crossley and Winter, 2014).

The underreporting issue is reflected in Table 2.8, where per capita consumption is compared between household survey level and its national accounts counterpart.[9] In all cases, household surveys record a smaller per capita consumption, with a difference of between 8% (Panama 2008) and 63% (El Salvador 2010), and a mean of 40%. This indicates that either the sample is tilted towards lower income households and/or that there exists a major underreporting bias, which should not be ignored at the time of drawing conclusions from the data.

In line with our approach of merging the observations from all surveys into a large dataset of some 392,000 households across all countries and surveys, we describe next some salient features of the data. Since the conclusions are similar based on either denominator (income or consumption), the following tables use the standard saving rate. Table 2.9 portraits the age-income profile of the median saving rate. From the first column, it can be noticed that the saving rate increases with age. Even though it is somewhat reasonable that households with a young head save less than their middle-aged peers, it is more startling that the saving rate of older household heads is the highest among all age groups, especially for heads aged 71 and up. In turn, the last row of the same Table 2.9 shows the median saving rate by income quintile.[10] In line with

[9] Bhalla (2002) reports, for a broad sample of developing countries in 1998, that the ratio of consumption per capita as measured in household surveys to the same variable as measured by national accounts amounts to 76.5%. For the industrialized world, this number is 63.2%. Per capita income cannot strictly be compared because, in view of the lack of institutional sector accounts, national accounts aggregates do not allow to isolate household income.

[10] The income quintile corresponds to the one the household pertains to in its own

previous evidence, the saving rate is strongly correlated with current income, moving from -47.3% for the first quintile to 23.4% for the fifth. The positive saving-income shows up at all age groups, while the positive saving-age pattern is exclusively explained by the three superior quintiles.[11] According to Table 2.10, the saving rate grows with the education level of the head, with a median saving rate of 6.1% for those with primary education going up to 9.1% and 11.9% for those with secondary and tertiary education, respectively.

Table 2.12 revisits the apparent saving-income connection by examining the saving-expenditure profile. If, as postulated by the permanent income theory, household expenditure is less influenced by transitory shocks and thus more stable than income, there should be little to no relationship between saving and expenditure. Far from that, high expenditure households save distinctly less than low expenditure households. The asymmetry is most evident when comparing the first and the last expenditure quintiles, whose median saving rates are 15.8% and -25.4%, respectively. The same pattern is detected not only for the whole sample but for each age group as well. This means that measurement errors are likely to contaminate both income and expenditure, that is, higher saving households might overstate income and/or understate expenditure. In turn, the fact that saving rates rise (fall) with income (expenditure) casts some doubt about the lack of correlation between income and expenditure measurement errors, as assumed in the income endogeneity story

country, no in the overall income distribution for the full dataset.

[11] A possible rationale for the increase of the saving rate with age for higher income households is the perception among the latter, unlike those pertaining to lower income brackets, of an expected upward income trend through their lifetime horizon, coupled with a more ostensive bequest motive for saving. This is consistent with the rising saving rate with age for heads with secondary and tertiary education, but the opposite for those having reached primary education (see Table 2.11).

outlined in Section 1. Specifically, if these two errors are negatively correlated, as suggested by the previous analysis, the income coefficient bias should lessen to some extent.

3. Econometric Results

This section reports and assesses the main econometric findings. After pooling all household surveys and adding country and time effects, median regressions (see Attanasio, 1993) of the saving rate are run on an array of household characteristics. As discussed in Section 1, theory offers poor guidance in defining the expected sign on each variable, as sometimes contradictory effects can be derived depending on modeling assumptions. For the sake of brevity, and building on the conceptual arguments already presented in Section 1 and the references therein, the present section focuses solely on documenting the new findings.

Regressions can be classified into two groups, one containing the baseline specification, and another incorporating to such core estimation a number of additional correlates. The baseline results (Table 3.1) were put to and passed a number of robustness tests, including keeping only the last available survey (Table 3.2), excluding outliers (Table 3.3), keeping only the countries usually thought to have the most consistent surveys over time (Argentina, Brazil, Colombia, Mexico and Peru, Table 3.4), replacing the saving/disposable income by the saving/consumption ratio (Table 3.5), and taking health and education expenses as saving (Table 3.6). Furthermore, we instrumented income by education years of the household head (Table 3.7) and by home and car ownership (Table 3.8). The main results are summarized next:

a. Current income presents a positive and significant coefficient throughout all regressions.
b. When instrumented by household head education (see Table 3.4) and by house and car ownership (Table 3.5), income remains highly significant, albeit the estimate goes down by about half.[12]
c. Age has a positive but decreasing effect on saving in our baseline regressions.[13] However, the age coefficient becomes significantly negative when adopting an income-based definition for the dependency ratio, deeming this result as fragile.
d. Households with female heads tend to save less.
e. The age-defined dependency ratio (total, old and young) bears a positive sign when controlling for current income, which turns negative for total and young dependency when current income is dropped. The old dependency ratio remains positive even after the latter change. The same results are found when current income is instrumented. Conversely, the income-based dependency ratio (dependents to income earners) presents a negative and robust estimate all along.
f. Higher levels of household head education (those with 8-13 and more than 13 years of schooling, relative to those with less than 8) diminish the saving rate when controlling for income, but increase it otherwise. The likely correlation between current income and education may be behind this result. A possible interpretation of the negative sign would be that, once controlled for current income, highly educated heads envisage an upward lifetime income trend, which would boost

[12] We try these two different instruments not only for robustness but also because using education as an instrument prevents us from assessing the direct effect of education on saving. Instrumenting by asset ownership overcomes this issue.
[13] Given that the square of age enters with a negative sign, the first column of Table 3.1 implies that saving peaks for household heads aged 68.

consumption and depress saving.[14]

g. The above results are largely invariant to subsampling (by keeping only the last available survey for each country and, by doing that, cutting down the total sample from some 392,000 to 167,000 observations –see Table 3.2) and to scaling saving by expenditure instead of income (Table 3.5).[15]

In relation to the core regression augmented with additional variables and interaction terms, Tables 3.9 and 3.10 indicate that:[16]

a. A higher proportion of government transfers and of remittances in overall household income reduces the saving rate, revealing that these sources of income appear to discourage saving.[17]
b. Households with a formal head (meaning that he/she contributes to social security) save more. The saving rate also increases for formal workers affiliated to capitalization schemes.[18,19] Against the

[14] The fragility of these and other coefficients cannot be attributed to multicolinearity issues. First, multicolinearity may affect the coefficient's precision (and thus the statistical significance), but not revert them to a well-estimated value with the opposite sign. Second, the correlations among these baseline regressors are quite low: the median correlation coefficient is -0.004, with a maximum of 0.31 and a minimum of -0.21.

[15] The main results largely hold in unreported regressions comprising only positive saving observations as well as when considering health and education expenses as saving.

[16] These variables are entered one by one because of concerns about multicolinearity. Several of these additional regressors do indeed lose significance when running the full specification.

[17] Both transfers and remittances are included as part of disposable income, so these income sources appear on both sides of the regression, which may bias the estimated coefficient upward. Reassuringly, the coefficient turns out to significantly negative. In any case, for the whole sample, the correlation with income is very low (0.13 for transfers and -4% for remittances).

[18] Since, in countries with a mixed pension model, household surveys do not inform about the pension system to which the worker is affiliated, the Capitalization dummy takes value 1 for surveys at which time a full capitalization system was in effect. For the sample at hand, these surveys are El Salvador (1994, 2004 and 2010) and Mexico (2000 and 2010). However, even with limitation, it is still possible to distinguish the above full capitalization experiences from the rest (PAYG -in Guatemala, Nicaragua and Panama- and hybrid -in Colombia, Ecuador and Peru-).

background of studies for advanced countries unveiling a crowding-out effect between voluntary saving and mandatory pension saving (see, for instance, Attanasio and Brugiavini, 2003, and Attanasio and Rohwedder, 2003), this crowding-in effect is consistent with the scarce evidence for Latin America (as produced by Sandoval-Hernandez, 2012, on Mexico, and Coronado, 1998, on Chile).[20]

c. Self-employment diminishes the saving rate.
d. Access to financial instruments also reduces the saving rate. This is true for credit instruments (loans) as well as payment (having a bank account) and hybrid ones (credit cards).
e. Homeownership is associated with a higher saving rate.
f. Urban households save less than rural ones.
g. The higher the level of health and education expenses, the lower the saving rate, implying some degree of offset between standard saving and this kind of expenses, thus meaning that the latter are considered a form of saving.[21]

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[19] In principle, when including an interaction variable, all constitutive terms must be included as well. Otherwise the estimated coefficients would be biased and inconsistent. However, this ceases to be true whenever the effect of one of those terms is nil if the other variable is zero (see Brambor, Clark and Golder, 2006). In the present case, Capitalization is a subset of Participation, which implies that when Participation is zero, then Capitalization is also zero by construction, warranting the exclusion of Capitalization on its own. Reassuringly, when Capitalization is included, this conclusion does not change (see columns 4 and 5, Table 3.5a). Incidentally, to claim a positive effect of capitalization on saving, we need to consider the joint effect of being formal and contributing to the pension fund system (in the regression, the sum of the coefficients on Capitalization and Capitalization * Formal). This sum is 0.015 and it was tested to be statistically significant at 1%.

[20] Recall that the crowding-out hypothesis assumes that individuals behave according to the pure frictionless permanent income model. Departures from such model, such as borrowing constraints (limiting the ability to increase consumption) or behavioral traits (such as the so-called recognition effect, in the sense of greater awareness of the importance of saving for retirement) may give rise to a different effect.

[21] Since health and education expense items appear to be a substitute of conventional saving, this lends support to the importance of computing broader measures of saving, as proposed in the literature and showed in Section 2 of this document.

h. Based on the specifications from Table 3.6, the positive effect of age –which appears only when controlling for age vis-à-vis income dependency- is attenuated at higher income levels.
i. All forms of the dependency ratio (by age –total, old, and young- and by income) display a negative effect but this response weakens as income rises.
j. As income goes up, the effect of education becomes more negative (for those with 8-13 years of education) or less positive (for those with more than 13 years of education).
k. The negative effect of education lessens with the age of the household head. This is at odds with the prior that young and highly educated individuals should be less prone to save, as their income is expected to grow more vis-à-vis older individuals with the same education level.

Conclusions and Policy Implications

This study has investigated the main patterns and drivers of the household saving rate in Latin America by exploiting and pooling a broad dataset of official household surveys for 10 Latin American countries and 27 surveys covering selected years from the 1990s, 2000s and 2010s.

On the statistical side, we document a wide dispersion of saving rates across countries and periods and equally huge differences between aggregate, mean and median saving rates. Furthermore, almost half of the households display negative saving. Underlying these figures, there is a strong suspicion of income underreporting and/or consumption overreporting. The apparent gap between household survey and national accounts measures of saving and income call for refinements and cross-

validation of household survey information, so as to turn it into a more reliable data source for policy and academic purposes.

Many variables were tested in explaining saving that proved to be statistically and economically significant. A number of robustness checks, including subsampling as well as outlier exclusion, were conducted and passed by most regressors, meaning that signs, point estimates and statistical significances were maintained even after radical changes in sample size and composition. The estimations highlight the overriding positive role of income in shaping saving decisions. This occurs when entering current income and also, albeit with a lower but still high coefficient, after instrumenting this potentially endogenous variable. For the baseline specification, in addition to income, the most robust variables were female household head (negative effect), the dependency ratio by income (negative) and, to a lesser extent, the age of the household head (positive but decreasing).

However, while robust to sample changes, some variables appeared to be fragile to the inclusion of income on the right-hand side, to the extent that they revert their sign while remaining statistically significant. For example, secondary and tertiary education were negative when controlling for current income and positive when income was instrumented or just deleted. Similarly, the overall dependency ratio positive in the former case (controlling for current income) and negative in the latter (income instrumented or excluded). The old dependency ratio, which is mostly positive and significant, ceases to be significant when income is instrument by asset ownership.

Among the additional variables tested in our exercises, government transfers, remittances, self-employment, capitalization pension systems, access to financial services, urban location, and health and education expenses seem to diminish saving, whereas labor formality and homeownership have the opposite effect.

Our work provides some useful lessons in connection with the level of household saving and the design of public policies in this field. One natural question is whether one may be able to pass any verdict on the adequacy of saving based on the paper's findings. Saving adequacy, of course, can be approached from two different –and not necessarily consistent- angles: the macro (how much saving do we need to sustain a certain economic growth rate?) and the micro (how much saving do households need to smooth their consumption across time and states of nature?). If anything, our analysis deals with the latter aspect.

Saving statistics and regressions like the ones presented in this document do not inform per se about optimality and constraints in the saving decision process. Much could be learned in this direction by polling households firsthand about their views and perceptions as well as by using structural models to quantify saving and investment needs for sustainable growth or household-based models to forecast saving needs, based on household composition, life expectancy, risks and access to credit, among other factors. At any rate, our analysis can be used as an input in that diagnosis but not as the ultimate tool to evaluate saving optimality.

Nevertheless, it should not escape us that, unlike borrowing, saving decisions face no major constraints: a household may find it hard to obtain

a loan, but nobody can prevent such household from putting aside money for future consumption.[22] At most, surplus households may be unable to find instruments in which to save, provided they refuse to save in cash and look for bank or capital market instruments. At first glance, this seems a minor problem, with little impact on aggregate saving: for one, bank facilities do typically exist in high income, and thus high saving, areas. In any case, the availability of such instruments is endogenous: if there is a critical mass of saving to be intermediated, financial businesses will be established nearby those locations to take and manage cash deposits.

Just to be clear, we do not claim that observed household saving rates are optimal in that they are high enough to meet the consumption smoothing goal for each and every household. Instead, we contend that households are already choosing the saving level that maximizes their utility, given the economic, social, demographic and institutional environment they face.[23]

What if authorities assess that household saving is low from either a micro or macro point of view? Is there any room for public policies in light of our results? The answer is disheartening here. Most explanatory variables are beyond the realm of government control (as household characteristics including the number of dependents, the gender of the head, and

[22] It is true, at any rate, that some individuals display behavioral biases leading them to save too little. Financial education may help in this regard, but a major impact on aggregate saving is unlikely to result from these initiatives. If household behavior is difficult to be modified, one needs to take it as an additional hard constraint in the determination of the saving rate.

[23] Some households may exhibit myopia or other bounded rationality traits, leading them not to save enough for the future. But the way they process information and make decisions is another hard constraint to be internalized in evaluating the optimality of saving. In fact, the departure from full intertemporal utility maximization is the ultimate reason why social security is compulsory and not voluntary.

household location) or may be affected by state policies only in the long-run (such as education, labor formality, the generosity of government transfers, and the structure of the pension system). The central role of income suggests that economic growth is likely to deliver much more fruitful and fast effects on saving rates than any government intervention.[24] Moreover, even if the government may reshape directly or indirectly some factors driving saving decisions, it is important to take note that saving promotion may be a legitimate macro or micro policy goal, pro-saving measures may entail trade-offs. For example, limiting access to financial instruments just to promote saving would be a thoroughly misguided advice. In general, changing the incentive structure of the private sector to encourage more saving may as well change other household decisions (labor, education, fertility), with indeterminate overall effects on social well-being. In any case, pursuing a more aggressive policy to enhance labor formality and social security inclusion seems at first glance a pro-saving policy without visible negative side effects.

Last but not least, if governments aim to increase aggregate saving, a targeted policy is strongly recommended. According to our data, *all* saving is generated by the highest income quintile. Saving policies directed to increase the saving rate of lower income households may have beneficial micro effects but little to none macro effects.

[24] These conclusions are akin to those found in macroeconomic saving studies, which assert that little can do authorities to modify private saving decisions and thus that the most effective pro-saving tool is the promotion of government saving (due to partial Ricardian Equivalence) and, se.condly, that saving is caused by economic growth, and not the other way around.

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Table 2.2
Saving Rate (Saving to Income) in Latin America

Country	Year	Aggregate	Mean	Median	% of households with negative saving
Argentina	2004	10.3	-25.0	8.5	44.2
	2012	15.5	-12.8	16.4	38.6
Brazil	2003	14.9	-16.4	5.4	45.4
	2009	20.3	-3.1	14.6	36.7
Colombia	1997	-0.9	-216.9	-9.7	55.9
	2003	6.3	-34.0	3.1	47.5
	2011	12.7	-33.3	5.2	46.4
Guatemala	2000	16.5	-28.5	61.0	13.2
	2006	23.4	-17.1	17.0	38.5
	2011	12.0	-80.2	-7.3	55.4
Ecuador	1999	62.7	-42.8	61.2	14.8
	2006	7.2	-15.1	1.7	47.5
El Salvador	1998	3.5	-257.0	-26.2	60.4
	2004	-32.7	-189.1	-57.4	65.2
	2010	28.9	4.7	30.6	31.7
Panama	1997	12.7	-169.4	0.8	49.5
	2003	14.1	-154.8	4.7	46.9
	2008	18.3	-45.2	10.6	42.3
Peru	1997	9.1	-37.2	-4.0	53.0
	2003	21.9	-6.2	2.5	47.4
	2010	23.7	1.2	11.6	37.1
Mexico	1994	8.0	-28.5	2.2	47.1
	2000	3.5	-26.5	0.5	49.3
	2010	3.6	-33.0	0.5	49.8
Nicaragua	1998	4.4	-83.1	-12.6	58.7
	2005	16.1	-264.6	5.6	45.8
	2009	17.5	-47.1	7.7	44.5

Table 2.3
Saving Rate (Saving to Consumption) in Latin America

Country	Year	Aggregate	Mean	Median	% of households with negative saving
Argentina	2004	11.5	31.1	8.8	44.2
	2012	18.3	47.9	19.4	38.6
Brazil	2003	17.5	22.5	5.7	45.4
	2009	25.5	34.4	17.2	36.7
Colombia	1997	-0.9	16.7	-8.8	55.9
	2003	6.7	18.4	3.0	47.5
	2011	14.5	20.7	5.3	46.4
Guatemala	2000	19.8	262.5	156.1	13.2
	2006	30.6	44.7	20.5	38.5
	2011	13.6	9.8	-6.9	55.4
Ecuador	1999	168.1	231.2	157.9	14.8
	2006	7.7	14.3	1.7	47.5
El Salvador	1998	3.7	448.3	-23.5	60.4
	2004	-24.7	36.7	-37.4	65.2
	2010	40.6	101.5	44.0	31.7
Panama	1997	14.5	14.6	0.6	49.5
	2003	16.4	17.8	4.7	46.9
	2008	22.4	28.5	11.3	42.3
Peru	1997	10.0	9.0	-3.9	53.0
	2003	28.1	15.7	2.5	47.4
	2010	31.0	26.8	13.1	37.1
Mexico	1994	8.7	7.6	2.0	47.1
	2000	3.6	5.7	0.4	49.3
	2010	3.7	10.1	0.2	49.8
Nicaragua	1998	4.6	10.5	-11.3	58.7
	2005	19.2	24.0	5.9	45.8
	2009	21.2	24.9	8.3	44.5

Table 2.4
Saving Rate
(Saving to Income, including durables, health and education)
in Latin America

Country	Year	Aggregate	Mean	Median	% of households with negative saving
Argentina	2004	25.5	-7.0	21.7	33.1
	2012	28.4	3.4	28.8	29.5
Brazil	2003	28.1	-0.6	18.7	34.0
	2009	32.8	12.1	27.8	25.6
Colombia	1997	23.3	-162.5	15.8	39.0
	2003	16.2	-21.5	11.9	40.2
	2011	22.4	-20.8	13.3	39.2
Guatemala	2000	25.9	-12.1	65.8	10.2
	2006	33.2	-5.0	27.1	31.0
	2011	22.5	-64.3	2.5	48.2
Ecuador	1999	70.2	-13.4	70.4	11.2
	2006	61.3	-3.1	11.0	34.1
El Salvador	1998	25.3	-161.3	6.9	48.5
	2004	-19.9	-165.1	-43.5	61.9
	2010	40.2	18.0	43.0	25.4
Panama	1997	40.5	-97.0	29.0	34.1
	2003	42.3	-97.6	28.0	33.1
	2008	37.4	-16.0	28.8	28.4
Peru	1997	14.9	-29.3	1.7	48.8
	2003	32.8	5.8	13.8	34.7
	2010	35.0	13.4	22.6	25.7
Mexico	1994	26.9	-2.6	19.5	27.0
	2000	23.5	-0.0	19.7	26.9
	2010	21.2	-9.0	16.4	35.1
Nicaragua	1998	19.2	-60.4	1.9	49.3
	2005	30.3	-192.9	18.9	34.5
	2009	32.4	-22.2	22.2	33.1

Table 2.5
Saving Rate
(Saving to Consumption, including durables, health and education)
in Latin America

Country	Year	Aggregate	Mean	Median	% of households with negative saving
Argentina	2004	28.4	44.6	23.5	33.1
	2012	33.6	61.1	34.3	29.5
Brazil	2003	33.0	36.3	19.9	34.0
	2009	41.1	49.3	32.6	25.6
Colombia	1997	23.1	38.8	14.2	39.0
	2003	17.3	27.0	11.7	40.2
	2011	25.6	28.9	13.7	39.2
Guatemala	2000	31.1	275.0	167.2	10.2
	2006	43.4	55.9	32.7	31.0
	2011	25.6	19.1	2.3	48.2
Ecuador	1999	188.2	252.4	182.0	11.2
	2006	66.0	23.5	11.4	34.1
El Salvador	1998	26.3	464.3	2.3	48.5
	2004	-15.0	50.5	-28.5	61.9
	2010	56.5	119.4	62.2	25.4
Panama	1997	46.3	41.1	27.4	34.1
	2003	49.3	42.5	29.5	33.1
	2008	45.7	48.4	30.7	28.4
Peru	1997	16.3	14.4	1.6	48.8
	2003	42.0	26.7	14.2	34.7
	2010	45.8	39.2	25.5	25.7
Mexico	1994	29.2	26.2	20.0	27.0
	2000	24.3	25.4	19.5	26.9
	2010	21.9	25.8	16.0	35.1
Nicaragua	1998	20.0	23.2	1.5	49.3
	2005	36.1	39.0	20.2	34.5
	2009	39.2	41.3	24.0	33.1

Table 2.6
Aggregate Saving Rate in Latin America:
Summary Table across Countries and Surveys

Statistics/Saving Measure	**Saving/ Income**	**Saving/Income,** *including Durables, Education and Health*	**Saving/ Consumption**	**Saving/Consumption,** *including Durables, Education and Health*
Mean	13.1	29.3	19.8	38.5
Median	12.7	28.1	14.5	33.0
Standard Deviation	15.1	15.7	32.2	33.7
Max	62.7	70.2	168.1	188.2
Min	-32.7	-19.9	-24.7	-15.0

Table 2.7
Household Saving Rate in Latin America:
Household Surveys versus National Accounts

Country	**Year**	**Aggregate Saving Rate**	
		Household Survey	**National Accounts**
Brazil	2003	14.9	5.6
	2009	20.3	4.5
Colombia	2003	6.3	6.4
	2011	12.7	6.6
Ecuador	2006	14.2	5.7
Guatemala	2011	11.9	4.4
Mexico	2000	3.5	9.2
	2010	3.6	7.4

Table 2.8
Annual Per Capita Consumption in Latin America:
Household Surveys versus National Accounts (in US$)

Country	Year	Household Survey	National Accounts	Difference (%)
Brazil	2003	1,487	1,882	-21%
	2009	3,653	5,117	-29%
Colombia	2003	1,097	1,554	-29%
	2011	3,100	4,363	-29%
Ecuador	2006	1,606	2,202	-27%
El Salvador	2010	1,189	3,200	-63%
Guatemala	2011	1,390	2,765	-50%
Mexico	2000	2,068	4,480	-54%
	2010	2,529	5,980	-58%
Nicaragua	2009	682	1,170	-42%
Panama	2008	3,136	3,417	-8%
Peru	2003	724	1,609	-55%
	2010	1,451	3,249	-55%

Table 2.9
Age-Income Profiles and Median Saving Rates in Latin America

Age group	Total Sample	First Income Quintile	Second	Third	Fourth	Fifth
21-25	3.6	-36.1	-8.1	3.7	14.1	20.3
26-30	7.8	-42.2	-9.1	6.8	14.7	21.1
31-35	9.6	-45.8	-8.0	5.9	14.4	22.5
36-40	9.9	-50.2	-10.3	3.3	15.2	24.4
41-45	11.0	-49.5	-9.9	6.6	14.6	24.6
46-50	13.2	-75.8	-12.5	5.3	16.5	25.8
51-55	13.2	-73.1	-12.6	5.3	15.7	22.4
56-60	13.5	-110.5	-27.8	4.7	14.4	27.0
61-65	12.5	-126.4	-16.2	3.1	14.2	27.1
65-70	12.9	-91.7	-42.6	11.6	11.7	26.0
71-75	15.2	-119.4	-27.0	8.9	18.5	27.8
75-80	16.6	-153.8	-30.0	12.8	20.2	22.7
Total (21-80)	*9.0*	*-47.3*	*-9.8*	*5.4*	*14.8*	*23.4*

Table 2.10
Age-Education Profiles and Median Saving Rates in Latin America

Age group	Total Sample	Education = 1	Education = 2	Education = 3
21-25	3.6	5.1	3.5	2.5
26-30	7.8	6.8	7.9	8.7
31-35	9.6	6.1	9.8	12.9
36-40	9.9	7.2	9.9	17.1
41-45	11.0	6.9	11.2	15.1
46-50	13.2	9.6	13.3	24.0
51-55	13.2	5.2	14.3	19.5
56-60	13.5	4.1	14.0	24.9
61-65	12.5	2.2	15.2	16.3
65-70	12.9	5.1	14.6	23.5
71-75	15.2	0.3	20.1	20.8
75-80	16.6	9.5	22.7	16.6
Total (21-80)	*9.0*	*6.1*	*9.1*	*11.9*

Note: Education =1, primary schooling (complete or not), Education =2, secondary schooling (complete or not), Education =3, tertiary schooling (complete or not).

Table 2.11
Age-Expenditure Profiles and Median Saving Rates in Latin America

Age group	Total Sample	First Expenditure Quintile	Second	Third	Fourth	Fifth
21-25	3.6	21.0	9.7	2.5	-1.8	-9.8
26-30	7.8	22.9	12.7	7.6	5.9	-1.5
31-35	9.6	22.9	11.2	10.1	7.3	3.2
36-40	9.9	22.3	11.8	7.6	8.4	6.5
41-45	11.0	24.3	15.3	9.2	7.5	5.3
46-50	13.2	25.0	14.9	9.7	8.7	11.8
51-55	13.2	23.4	16.0	8.6	11.1	9.0
56-60	13.5	22.4	13.6	9.4	3.1	15.3
61-65	12.5	19.2	12.2	6.4	13.0	-2.4
65-70	12.9	28.4	2.4	2.8	-1.1	-0.2
71-75	15.2	26.7	8.8	3.6	8.2	-18.0
75-80	16.6	36.9	3.2	-4.3	-11.5	-3.1
Total (21-80)	*9.0*	*23.5*	*12.0*	*7.3*	*5.3*	*1.1*

Table 3.1
Baseline Median Regressions
Household Saving Rate (Saving/Income)
All Countries and Surveys

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
HH Head Age	0.0068***	0.0062***	-0.0011**	0.0077***	0.0074***	0.0030***
	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Squared HH Head Age	-0.0001***	-0.0000***	0.0000***	-0.0000***	-0.0000***	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Female HH Head	-0.0618***	-0.0604***	-0.0441***	-0.0539***	-0.0502***	-0.0462***
	(0.0021)	(0.0022)	(0.0026)	(0.0023)	(0.0023)	(0.0027)
Dependency Ratio (by age)	0.0182***			-0.0560***		
	(0.0013)			(0.0014)		
Young Dependency Ratio (by age)		0.0139***			-0.0802***	
		(0.0015)			(0.0016)	
Old Dependency Ratio (by age)		0.0150***			0.0160***	
		(0.0034)			(0.0037)	
Dependency Ratio (by income)			-0.2837***			-0.3143***
			(0.0037)			(0.0038)
8-13 years education, HH Head	-0.0693***	-0.0688***	-0.0591***	0.0661***	0.0593***	0.0678***
	(0.0024)	(0.0025)	(0.0028)	(0.0025)	(0.0026)	(0.0029)
>13 years education, HH Head	-0.1552***	-0.1520***	-0.1082***	0.1241***	0.1149***	0.1423***
	(0.0033)	(0.0033)	(0.0039)	(0.0033)	(0.0034)	(0.0038)
Log pc HH Income (USD PPP2005)	0.1945***	0.1904***	0.1780***			
	(0.0007)	(0.0007)	(0.0008)			
Constant	-1.0179***	-0.9878***	-0.5837***	-0.0535***	-0.0153	0.2308***
	(0.0101)	(0.0103)	(0.0126)	(0.0101)	(0.0105)	(0.0124)
Observations	**392,263**	**384,777**	**292,318**	**392,281**	**384,795**	**292,320**

Regressions span a maximum of 10 LA countries and 27 household surveys (see text for further details on sample composition).

The estimation includes unreported country and time dummies.

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.2
Baseline Median Regressions
Household Saving Rate (Saving/Income)
All Countries, Last Available Survey Only

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
HH Head Age	0.00707***	0.00575***	-0.00232***	0.00945***	0.00928***	0.00594***
	(0.000484)	(0.000508)	(0.000624)	(0.000495)	(0.000546)	(0.000656)
Square HH Head Age	-7.18e-05***	-5.09e-05***	1.29e-05**	-5.16e-05***	-5.86e-05***	-2.13e-05***
	(4.65e-06)	(5.04e-06)	(6.19e-06)	(4.76e-06)	(5.41e-06)	(6.52e-06)
Female HH Head	-0.0647***	-0.0653***	-0.0281***	-0.0671***	-0.0620***	-0.0555***
	(0.00299)	(0.00307)	(0.00374)	(0.00306)	(0.00330)	(0.00394)
Dependency Ratio (by age)	0.0719***			-0.0507***		
	(0.00206)			(0.00201)		
Young Dependency Ratio (by age)		0.0855***			-0.0771***	
		(0.00246)			(0.00249)	
Old Dependency Ratio (by age)		0.0221***			0.0263***	
		(0.00481)			(0.00517)	
Dependency Ratio (by income)			-0.235***			-0.267***
			(0.00546)			(0.00574)
8-13 years education, HH Head	-0.155***	-0.155***	-0.165***	0.0441***	0.0380***	0.0413***
	(0.00351)	(0.00358)	(0.00414)	(0.00342)	(0.00367)	(0.00415)
>13 years education, HH Head	-0.328***	-0.330***	-0.321***	0.105***	0.0935***	0.118***
	(0.00491)	(0.00502)	(0.00594)	(0.00448)	(0.00481)	(0.00557)
Log pc HH Income (USD PPP2005)	0.320***	0.322***	0.328***			
	(0.00162)	(0.00169)	(0.00198)			
Constant	-1.572***	-1.572***	-1.184***	-0.174***	-0.136***	-3.10e-05
	(0.0148)	(0.0154)	(0.0182)	(0.0135)	(0.0146)	(0.0178)
Observations	**167,247**	**164,691**	**121,272**	**167,247**	**164,691**	**121,272**

Regressions span 10 LA countries and 27 household surveys (see text for further details on sample composition).
The estimation includes unreported country and time dummies.
Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.3
Baseline Median Regressions
Household Saving Rate (Saving/Income)
All Countries, Excluding Outliers

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
HH Head Age	0.0067***	0.0053***	-0.0034***	0.0080***	0.0077***	0.0032***
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Squared HH Head Age	-0.0001***	-0.0000***	0.0000***	-0.0000***	-0.0000***	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Female HH Head	-0.0643***	-0.0637***	-0.0356***	-0.0557***	-0.0523***	-0.0463***
	(0.0022)	(0.0021)	(0.0025)	(0.0024)	(0.0023)	(0.0027)
Dependency Ratio (by age)	0.0568***			-0.0540***		
	(0.0014)			(0.0014)		
Young Dependency Ratio (by age)		0.0625***			-0.0791***	
		(0.0015)			(0.0015)	
Old Dependency Ratio (by age)		0.0165***			0.0180***	
		(0.0034)			(0.0036)	
Dependency Ratio (by income)			-0.2751***			-0.3202***
			(0.0035)			(0.0038)
8-13 years education, HH Head	-0.1341***	-0.1343***	-0.1377***	0.0677***	0.0602***	0.0690***
	(0.0026)	(0.0025)	(0.0027)	(0.0026)	(0.0025)	(0.0028)
>13 years education, HH Head	-0.2942***	-0.2926***	-0.2753***	0.1272***	0.1180***	0.1463***
	(0.0035)	(0.0034)	(0.0038)	(0.0034)	(0.0033)	(0.0038)
Log pc HH Income (USD PPP2005)	0.2917***	0.2904***	0.2943***			
	(0.0009)	(0.0009)	(0.0011)			
Constant	-1.3943***	-1.3727***	-0.9406***	-0.1411***	-0.0997***	0.1428***
	(0.0106)	(0.0104)	(0.0121)	(0.0105)	(0.0102)	(0.0123)
Observations	**384,707**	**377,644**	**286,732**	**384,723**	**377,660**	**286,734**

Regressions span a maximum of 10 LA countries and 27 household surveys (see text for further details on sample composition).

The estimation includes unreported country and time dummies.

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.4
Baseline Median Regressions
Household Saving Rate (Saving/Income)
Data for Argentina, Brazil, Colombia, Mexico and Peru

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
HH Head Age	0.0075***	0.0053***	-0.0026***	0.0084***	0.0074***	0.0039***
	(0.0004)	(0.0004)	(0.0005)	(0.0004)	(0.0004)	(0.0005)
Squared HH Head Age	-0.0001***	-0.0000***	0.0000***	-0.0000***	-0.0000***	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Female HH Head	-0.0625***	-0.0614***	-0.0332***	-0.0608***	-0.0559***	-0.0478***
	(0.0023)	(0.0023)	(0.0028)	(0.0024)	(0.0024)	(0.0030)
Dependency Ratio (by age)	0.0645***			-0.0359***		
	(0.0015)			(0.0016)		
Young Dependency Ratio (by age)		0.0729***			-0.0581***	
		(0.0018)			(0.0018)	
Old Dependency Ratio (by age)		0.0104***			0.0131***	
		(0.0036)			(0.0038)	
Dependency Ratio (by income)			-0.2141***			-0.2444***
			(0.0040)			(0.0042)
8-13 years education, HH Head	-0.1305***	-0.1315***	-0.1321***	0.0485***	0.0419***	0.0446***
	(0.0027)	(0.0027)	(0.0031)	(0.0027)	(0.0027)	(0.0031)
>13 years education, HH Head	-0.2749***	-0.2740***	-0.2522***	0.0999***	0.0915***	0.1099***
	(0.0036)	(0.0037)	(0.0043)	(0.0034)	(0.0034)	(0.0040)
Log pc HH Income (USD PPP2005)	0.2545***	0.2537***	0.2500***			
	(0.0012)	(0.0012)	(0.0014)			
Constant	-1.3147***	-1.2869***	-0.8637***	-0.1609***	-0.1173***	0.0461***
	(0.0117)	(0.0122)	(0.0140)	(0.0112)	(0.0114)	(0.0141)
Observations	**266,314**	**262,754**	**196,534**	**266,329**	**262,769**	**196,536**

Regressions span a maximum of 10 LA countries and 27 household surveys (see text for further details on sample composition).

The estimation includes unreported country and time dummies.

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.5
Baseline Median Regressions
Household Saving Rate (Saving/Consumption)
All Countries and Surveys

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
HH Head Age	0.7206***	0.5886***	-0.1374***	0.8332***	0.7745***	0.2782***
	(0.0345)	(0.0369)	(0.0393)	(0.0404)	(0.0416)	(0.0452)
Squared HH Head Age	-0.0061***	-0.0042***	0.0014***	-0.0042***	-0.0042***	0.0005
	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0005)
Female HH Head	-7.2833***	-7.2116***	-4.5800***	-5.8446***	-5.3257***	-4.7588***
	(0.2183)	(0.2271)	(0.2424)	(0.2562)	(0.2561)	(0.2790)
Dependency Ratio (by age)	4.6312***			-5.3038***		
	(0.1342)			(0.1539)		
Young Dependency Ratio (by age)		5.0361***			-7.3140***	
		(0.1574)			(0.1724)	
Old Dependency Ratio (by age)		1.1883***			1.6317***	
		(0.3578)			(0.4040)	
Dependency Ratio (by income)			-24.7491***			-32.6178***
			(0.3448)			(0.3957)
8-13 years education, HH Head	-10.7476***	-10.9347***	-11.1135***	7.2497***	6.5895***	7.1434***
	(0.2510)	(0.2590)	(0.2632)	(0.2878)	(0.2855)	(0.2949)
>13 years education, HH Head	-22.5170***	-22.6888***	-20.3393***	14.3954***	13.5055***	15.8093***
	(0.3370)	(0.3478)	(0.3607)	(0.3737)	(0.3710)	(0.3926)
Log pc HH Income (USD PPP2005)	26.2332***	26.2707***	25.5163***			
	(0.0741)	(0.0775)	(0.0789)			
Constant	-123.2417***	-121.7798***	-80.4093***	-6.9888***	-2.8812**	24.9647***
	(1.0384)	(1.0872)	(1.1697)	(1.1409)	(1.1432)	(1.2792)
Observations	**392,078**	**384,620**	**292,194**	**393,859**	**386,240**	**292,222**

Regressions span a maximum of 10 LA countries and 27 household surveys (see text for further details on sample composition).

The estimation includes unreported country and time dummies.

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.6
Baseline Median Regressions
Household Saving Rate (Saving/Income)
Health and Education Expenses as Saving
All Countries and Surveys

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
HH Head Age	0.0053***	0.0045***	-0.0011***	0.0058***	0.0054***	0.0025***
	(0.0003)	(0.0003)	(0.0004)	(0.0003)	(0.0003)	(0.0004)
Squared HH Head Age	-0.0000***	-0.0000***	0.0000***	-0.0000***	-0.0000***	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Female HH Head	-0.0509***	-0.0499***	-0.0336***	-0.0431***	-0.0404***	-0.0364***
	(0.0019)	(0.0020)	(0.0023)	(0.0020)	(0.0019)	(0.0024)
Dependency Ratio (by age)	0.0198***			-0.0451***		
	(0.0012)			(0.0012)		
Young Dependency Ratio (by age)		0.0176***			-0.0641***	
		(0.0014)			(0.0013)	
Old Dependency Ratio (by age)		0.0103***			0.0095***	
		(0.0031)			(0.0031)	
Dependency Ratio (by income)			-0.2486***			-0.2779***
			(0.0032)			(0.0034)
8-13 years education, HH Head	-0.0498***	-0.0494***	-0.0445***	0.0700***	0.0652***	0.0725***
	(0.0022)	(0.0022)	(0.0025)	(0.0022)	(0.0022)	(0.0025)
>13 years education, HH Head	-0.1057***	-0.1022***	-0.0682***	0.1443***	0.1378***	0.1631***
	(0.0029)	(0.0030)	(0.0034)	(0.0029)	(0.0028)	(0.0033)
Log pc HH Income (USD PPP2005)	0.1738***	0.1704***	0.1649***			
	(0.0006)	(0.0007)	(0.0007)			
Constant	-0.7339***	-0.7048***	-0.4072***	0.1330***	0.1636***	0.3420***
	(0.0089)	(0.0094)	(0.0110)	(0.0088)	(0.0087)	(0.0109)
Observations	**392,257**	**384,771**	**292,313**	**392,275**	**384,789**	**292,315**

Regressions span a maximum of 10 LA countries and 27 household surveys (see text for further details on sample composition).

The estimation includes unreported country and time dummies.

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.7
Baseline Median Regressions
Household Saving Rate (Saving/Income)
All Countries and Surveys
IV (HH Education) Estimation

Variables	*(1)*	*(2)*	*(3)*
HH Head Age	0.0065***	0.0060***	0.0006
	(0.0002)	*(0.0001)*	*(0.0006)*
Square HH Head Age	-0.0000***	-0.0000***	0.0000
	(0.0000)	*(0.0000)*	*(0.0000)*
Female HH Head	-0.0508***	-0.0496***	-0.0358***
	(0.0021)	*(0.0015)*	*(0.0035)*
Dependency Ratio (by age)	-0.0254***		
	(0.0017)		
Young Dependency Ratio (by age)		-0.0418***	
		(0.0027)	
Old Dependency Ratio (by age)		0.0092***	
		(0.0004)	
Dependency Ratio (by income)			-0.2881***
			(0.0028)
IV - Log pc HH Income (USD PPP2005) [▪]	0.0875***	0.0826***	0.0940***
	(0.0010)	*(0.0015)*	*(0.0019)*
Constant	-0.5879***	-0.5384***	-0.3086***
	(0.0112)	*(0.0084)*	*(0.0188)*
Observations	**434,158**	**423,887**	**326,226**
Hausman test			
Chi2	**1598.64**	**170.19**	**-11.62**
Prob>Chi2	**0.0000**	**0.0000**	**0.0088**

Table 3.8
Baseline Median Regressions
Household Saving Rate (Saving/Income)
All Countries and Surveys
IV (Home and Car Ownership) Estimation

Variables	*(1)*	*(2)*	*(3)*
HH Head Age	0.0071***	0.0059***	-0.0001
	(0.0001)	*(0.0006)*	*(0.0004)*
Square HH Head Age	-0.0000***	-0.0000***	0.0000**
	(0.0000)	*(0.0000)*	*(0.0000)*
Female HH Head	-0.0501***	-0.0480***	-0.0371***
	(0.0025)	*(0.0043)*	*(0.0027)*
Dependency Ratio (by age)	-0.0396***		
	(0.0020)		
Young Dependency Ratio (by age)		-0.0586***	
		(0.0025)	
Old Dependency Ratio (by age)		-0.0028	
		(0.0033)	
Dependency Ratio (by income)			-0.3841***
			(0.0056)
8-13 years education, HH Head	0.0398***	0.0353***	*0.0304****
	(0.0038)	(0.0039)	*(0.0007)*
>13 years education, HH Head	0.0597***	0.0570***	*0.0690****
	(0.0059)	(0.0078)	*(0.0047)*
IV - Log pc HH Income (USD PPP2005) [▪]	0.0630***	0.0581***	0.0688***
	(0.0027)	*(0.0057)*	*(0.0058)*
Constant	-0.4862***	-0.4178***	-0.1179***
	(0.0146)	*(0.0279)*	*(0.0365)*
Observations	**265,677**	**255,651**	**211,189**
Hausman test			
Chi2	**2906.53**	**-294.46**	**-1145.44**
Prob>Chi2	**0.0000**	**0.0000**	**0.0000**

Regressions span a maximum of 10 countries and 27 household surveys.

Estimation includes unreported country and time dummies.

[▪] Instrumented by homeowner and the household own a car

Bootstrapped standard errors in second stage, with 1,000 replications.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.9 (a)
Median Regressions with Additional Regressors
Household Saving Rate (Saving/Income)
All Countries and Surveys

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
HH Head Age	-0.0012**	-0.0006	-0.0006	-0.0007	-0.0009	-0.0002
	(0.0005)	*(0.0005)*	*(0.0006)*	*(0.0006)*	*(0.0007)*	*(0.0004)*
Squared HH Head Age	0.0000***	0.0000**	0.0000**	0.0000***	0.0000***	0.0000**
	(0.0000)	*(0.0000)*	*(0.0000)*	*(0.0000)*	*(0.0000)*	*(0.0000)*
Female HH Head	-0.0638***	-0.0475***	-0.0650***	-0.0649***	-0.0631***	-0.0478***
	(0.0033)	*(0.0036)*	*(0.0042)*	*(0.0041)*	*(0.0045)*	*(0.0026)*
8-13 years education, HH Head	-0.0418***	0.0026	-0.0240***	-0.0237***	-0.0244***	-0.0662***
	(0.0037)	*(0.0037)*	*(0.0044)*	*(0.0044)*	*(0.0048)*	*(0.0028)*
>13 years education, HH Head	-0.0713***	0.0318***	-0.0408***	-0.0401***	-0.0368***	-0.1173***
	(0.0047)	*(0.0053)*	*(0.0062)*	*(0.0061)*	*(0.0066)*	*(0.0038)*
Dependency Ratio (by income)	-0.4115***	-0.3812***	-0.4067***	-0.4052***	-0.4058***	-0.2806***
	(0.0048)	*(0.0050)*	*(0.0058)*	*(0.0057)*	*(0.0063)*	*(0.0036)*
Log pc HH Income (USD PPP2005)	0.1396***	0.1285***	0.1257***	0.1262***	0.1236***	0.1773***
	(0.0010)	*(0.0009)*	*(0.0011)*	*(0.0011)*	*(0.0012)*	*(0.0008)*
Gov transfers (% HH income)	-1.0903***					
	(0.0186)					
Remittances (% HH income))		-0.3101***				
		(0.0013)				
Formal HH Head (legal)			0.0949***	0.1118***	0.1184***	
			(0.0046)	*(0.0054)*	*(0.0060)*	
Formal Head * Full capitalization				-0.0477***	-0.0666***	
				(0.0084)	*(0.0095)*	
Full Capitalization					0.0813***	
					(0.0102)	
Self-Employed HH Head						-0.1928***
						(0.0068)
Constant	-0.3040***	-0.7740***	-0.4223***	-0.4279***	-0.4121***	-0.5860***
	(0.0157)	*(0.0166)*	*(0.0195)*	*(0.0193)*	*(0.0210)*	*(0.0123)*
Observations	**200,789**	**151,771**	**134,920**	**134,920**	**134,920**	**292,318**

Regressions span 10 LA countries and 27 household surveys (see text for further details on sample composition).

The estimation includes unreported country and time dummies.

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.9 (b)
Median Regressions with Additional Regressors
Household Saving Rate (Saving/Income)
All Countries and Surveys

Variables	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
HH Head Age	-0.0016**	-0.0015*	0.0011*	-0.0021***	-0.0008	0.0053***
	(0.0007)	*(0.0008)*	*(0.0007)*	*(0.0004)*	*(0.0005)*	*(0.0006)*
Squared HH Head Age	0.0000***	0.0000*	0.0000	0.0000***	0.0000**	-0.0000***
	(0.0000)	*(0.0000)*	*(0.0000)*	*(0.0000)*	*(0.0000)*	*(0.0000)*
Female HH Head	-0.0434***	-0.0144***	-0.0511***	-0.0424***	-0.0503***	-0.0423***
	(0.0049)	*(0.0050)*	*(0.0042)*	*(0.0024)*	*(0.0032)*	*(0.0034)*
8-13 years education, HH Head	0.0343***	-0.0933***	0.0076*	-0.0547***	-0.0185***	-0.0040
	(0.0051)	*(0.0053)*	*(0.0043)*	*(0.0027)*	*(0.0036)*	*(0.0036)*
>13 years education, HH Head	0.0780***	-0.1322***	0.0402***	-0.1019***	-0.0523***	0.0195***
	(0.0072)	*(0.0085)*	*(0.0059)*	*(0.0036)*	*(0.0046)*	*(0.0047)*
Dependency Ratio (by income)	-0.2970***	-0.0995***	-0.3014***	-0.2853***	-0.3752***	-0.3703***
	(0.0067)	*(0.0072)*	*(0.0058)*	*(0.0035)*	*(0.0045)*	*(0.0050)*
Log pc HH Income (USD PPP2005)	0.0891***	0.2585***	0.0995***	0.1743***	0.1653***	0.3041***
	(0.0010)	*(0.0027)*	*(0.0010)*	*(0.0008)*	*(0.0009)*	*(0.0015)*
Has a Loan	-0.1430***					
	(0.0062)					
Holds a bank account		-0.3553***				
		(0.0139)				
Has a credit card or loan			-0.1331***			
			(0.0063)			
Homeowner				0.0351***		
				(0.0024)		
Urban					-0.0633***	
					(0.0032)	
Health expenses (log USD PPP2005)						-0.0912***
						(0.0009)
Educ. expenses (log USD PPP2005)						-0.0811***
						(0.0009)
Constant	-0.0597***	-1.1930***	-0.3713***	-0.5631***	-0.4374***	-1.2078***
	(0.0213)	(0.0247)	(0.0182)	(0.0118)	(0.0149)	(0.0185)
Observations	**76,797**	**60,247**	**103,724**	**285,881**	**216,915**	**135,793**

Regressions span 10 LA countries and 27 household surveys (see text for further details on sample composition).

The estimation includes unreported country and time dummies.

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table 3.10
Median Regressions with Income Interactions
Household Saving Rate (Saving/Income)
All Countries and Surveys

Variables	(1)	(2)	(3)	(4)	(5)
HH Head Age	0.00803***	0.00689***	0.00601***	-0.00153***	0.00641***
	(0.000393)	*(0.000335)*	*(0.000353)*	*(0.000420)*	*(0.000347)*
HH Head Age* Log (pc Income)	-0.000370***				
	(3.84e-05)				
Square HH Head Age	-4.47e-05***	-5.61e-05***	-4.33e-05***	2.03e-05***	-4.85e-05***
	(3.50e-06)	*(3.25e-06)*	*(3.55e-06)*	*(4.18e-06)*	*(3.49e-06)*
Female HH Head	-0.0606***	-0.0608***	-0.0609***	-0.0460***	-0.0615***
	(0.00214)	*(0.00212)*	*(0.00217)*	*(0.00259)*	*(0.00213)*
Dependency Ratio (by age)		-0.114***			
		(0.00381)			
Dependency Ratio (by age)* Log (pc Income)		0.0267***			
		(0.000739)			
Young Dependency Ratio (by age)	0.0150***		-0.159***		0.0158***
	(0.00148)		*(0.00409)*		*(0.00148)*
Young Dependency Ratio (by age)* Log (pc Income)			0.0361***		
			(0.000808)		
Old Dependency Ratio (by age)	0.0147***		-0.0428***		0.0154***
	(0.00337)		*(0.0107)*		*(0.00336)*
Old Dependency Ratio (by age)* Log (pc Income)			0.0102***		
			(0.00186)		
Dependency Ratio (by income)				-1.208***	
				(0.0124)	
Dependency Ratio (by income)* Log (pc Income)				0.178***	
				(0.00234)	
8-13 years of education, HH Head	-0.0692***	-0.0715***	-0.0717***	-0.0614***	-0.0291***
	(0.00244)	*(0.00244)*	*(0.00248)*	*(0.00281)*	*(0.00844)*
8-13 years of education, HH Head * Log (pc Income)					-0.00805***
					(0.00150)
> 13 years of education, HH Head	-0.153***	-0.156***	-0.153***	-0.117***	0.163***
	(0.00328)	*(0.00328)*	*(0.00333)*	*(0.00385)*	*(0.0115)*
> 13 years of education, HH Head * Log (pc Income)					-0.0519***
					(0.00181)
Log pc HH Income (USD PPP2005)	0.208***	0.181***	0.175***	0.0732***	0.203***
	(0.00194)	*(0.000895)*	*(0.000918)*	*(0.00167)*	*(0.000865)*
Constant	-1.081***	-0.940***	-0.903***	-0.0141	-1.065***
	(0.0136)	*(0.0104)*	*(0.0107)*	*(0.0147)*	*(0.0106)*
Observations	**384,777**	**392,263**	**384,777**	**292,318**	**384,777**

Regressions span 10 LA countries and 27 household surveys (see text for further details on sample composition).
The estimation includes unreported country and time dummies.
Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1