Understanding Domestic Saving in Latin America and the Caribbean:

The Case of Mexico

Miguel Székely
Pamela Mendoza
Jonathan Karver

Inter-American Development Bank
Department of Research and Chief Economist

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Miguel Székely*
Pamela Mendoza*
Jonathan Karver**

* Centro de Estudios Educativos y Sociales (CEES)
** Inter-American Development Banik

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Abstract[1]

This study addresses why Mexico continues to show below-average economic growth rates in spite of displaying systematically higher domestic savings than other countries in the region. Using the wealth of relevant databases available for the country, the paper finds that a possible explanation is that household savings account for a majority of domestic savings, and that the main instrument used for savings is durable goods, which implies that savings are not directly injected into the financial system for fueling productive investment. The construction of a synthetic panel from household survey data shows that household savings in Mexico have a clear age-increasing trend and have been growing across generations during the past 30 years; it is thus probable that rates will increase in years to come. However, if those savings continue to elude the financial system, their influence on economic growth may remain limited.

JEL classifications: D14, E22
Keywords: Savings, Household surveys, Growth

1. Introduction

At the aggregate level, the study of the dynamics of domestic saving is highly relevant for understanding economic development because of their role in determining the capacity of economies to finance investment. At the micro level, when there are credit market imperfections, the capabilities of economic agents for saving is crucial for ameliorating the effect of unexpected shocks, for accumulating assets for further investment and income generation, and for transferring consumption over time.

In the 1960s, low saving rates were actually considered a serious constraint in developing countries, which on average registered rates of 12 per cent, versus the average of a 21 percent rate in high-income countries. Nevertheless, due at least in part to the demographic changes that have occurred around the world in the past decades (see, for instance, Behrman, Duryea and Székely, 2002), the global distribution of savings has shifted in important ways. By the end of the first decade of the 2000s, the developing world's saving rate had reached almost 30 per cent and its contribution to global saving was 42 per cent—although these trends were mainly driven by China.[2] The extent to which these changes will trigger sustained high rates of economic growth in the developing world, however, is still to be confirmed.

The objective of the present study is to characterize and improve our understanding of domestic saving in Mexico, which is a relevant case for several reasons. First, as shown in Section 2 below, the country's gross saving rates as a share of GDP have generally followed the region's overall trends during the 2000s, so understanding the evolution and dynamics of this country may suggest expected movements in saving rates for the region as well. Second, Mexico's gross domestic saving rates have since the mid-1980s generally been above the Latin America and the Caribbean average, and even more so in recent years. In contrast to these high savings rates, however, the country's GDP growth rates were below the regional average for practically all years of the 2000s (see CEPAL, 2013). This is puzzling because, even though there is disagreement on whether savings cause growth, there is a fairly broad consensus that higher saving—perhaps due to higher incomes—generates a virtuous circle with more economic opportunities and faster development by providing means to finance investment. This nonetheless does not seem to be the case in Mexico, which begs the question of why this is so.

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[2] Data from World Development Indicators, 2014.

Evidently, the domestic saving rate of a country is determined simultaneously by a number of factors. These include: i) demographic trends; ii) income growth and how growth is distributed across generations; iii) the age profile of earnings for different cohorts in the population; iv) pension and old-age living arrangements; v) asset markets and intertemporal trade-offs available to individuals; vi) individual preferences and their heterogeneity—including aversion to uncertainty and precautionary motives; and vii) future growth expectations, among other considerations.

Moreover, such factors may affect the government, firms, and households—which are the main entities generating saving—in different ways. Interestingly, the literature on saving usually concentrates on the relationship between macroeconomic variables and domestic savings, which include all three components aggregated, and a micro-oriented approach has developed in parallel with studies that try to explain household behavior by linking savings with personal characteristics and some context indicators. A comprehensive approach examining the three components separately and aggregated at the same time is much less common.[3]

In order to provide a comprehensive view of the dynamics of savings, in our case we follow a micro-macro approach by exploiting the richness of data available for the country, which includes household surveys with individual and household-level data on income and consumption, data on firms that allow estimating saving rates in this sector, as well as aggregate data for measuring public saving rates.

The central question we pose for the research is whether disaggregating domestic saving into its public sector, corporate sector, and household components, and identifying their patterns, motives and possible drivers, can shed light on the aforementioned apparent contradiction of relatively high domestic saving rates and lower economic growth with respect to the average

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[3] The life cycle and permanent income models are useful to frame how economic growth and demographic changes affect households' saving behavior. Even after more than 50 years from their initial formulation (Modigliani and Brumberg, 1954; Friedman, 1957), these models remain the standard against which alternatives are considered (Attanasio and Weber, 2010). These models have set off two strands in the literature dealing with saving. Macroeconomic studies (Poterba, 1994; Loayza, Schimidt-Hebbel and Servén, 2000; and Modigliani and Cao, 2004) include, together with aggregate demographic variables, macroeconomic factors—such as financial sector development, social insurance, social expenditures, and taxation—to explain cross-country variations in saving behavior. Microeconomic studies—the second strand—consider more closely microeconomic determinants such as age-income profiles, labor force participation, and household composition (Chamon and Prasad, 2010). Amongst these microeconomic studies, quite a few focus on differences across socioeconomic groups within a given country (Attanasio and Székely, 1999, 2001; Attanasio and Weber, 2010; and Deaton and Paxson, 2000). In fact, microeconomic theory posits that people facing different life-cycle earnings profiles—such as those with different human capital endowments—will have different incentives to save. Empirical evidence corroborates this prediction. Ultimately, growth, the demographic transition, inequality, and saving interact in complex ways at the micro level.

Latin American country. The answer to this question is certainly of interest for Mexico, but it could also be relevant for other countries in the region.

The document is organized in seven sections, including this introduction. Section 2 briefly reviews the results and approaches of other studies analyzing savings in Mexico through a micro approach, in order to show what is already known about the topic. Section 3 addresses the evolution of aggregate domestic savings for the country and identifies its main components over time. Section 4 presents a view of the evolution of public savings, as well as an exercise to characterize in more detail one of its components. Section 5 turns to firms' savings by characterizing their evolution and exploring a series of databases to delve into their composition. Section 6 analyzes household saving by using several different data sources. Section 7 presents the central conclusions and the policy implications of the study.

2. Previous Studies of Saving at the Micro Level in Mexico

Surprisingly, in spite of the wealth of data for Mexico, the research on the determinants of saving for the country is quite limited. Some of the first analysis on household saving include Székely (1998), and Attanasio, and Székely (1999, 2001). Attanasio and Székely (1999) quantify the level of household saving directly from household survey data for the first time, and they use it to explore the relationship between saving behavior and long-term investment decisions by controlling for cohort effects, changes in family structure, and differences along the income distribution. They also characterize the life cycle pattern of savings, as well as the evolution of the transitory and permanent components of income, which are related to the capacity of households to cushion the negative economic shocks observed in the country during the years from 1984 to 1996.

Attanasio and Székely (2001) compare the evolution of household saving in Mexico, Peru, Thailand and Taiwan by using synthetic cohort techniques. They find considerable disparities in the level and growth rate of household saving between Mexico and Peru, on the one hand, and Taiwan and Thailand on the other, and identify that younger generations in the East Asian countries are saving much more than their counterparts in Latin America, relative to older generations. They relate these differences to disparities in income growth, lower fertility rates, and family structure—with more elderly individuals living in extended households in Latin America—and a more advanced demographic transition in Thailand and Taiwan. Additionally,

they argue that the two specific Latin American countries analyzed were subject to severe shocks during the period under analysis—which provides a context for the use of savings accumulated in the past—while in East Asia savings were able to build up smoothly in a context that is favorable to the accumulation of resources.

Another result is that in Mexico practically all the household savings are generated by the richest 20 percent of the population, while in East Asia savings are much more widespread. Thus, differences in the capacity of Mexican households to save across the income distribution account for an important part of the difference in total household saving.

An interesting finding of the Attanasio and Székely study is that a common feature across the countries analyzed is that there is no conclusive evidence of negative saving or even declining saving in the last part of the life cycle.

The study by Székely (1998) corroborates the high concentration of savings among the richest households in Mexico. Additionally, the author documents that the main savings instruments for Mexican households are the purchase of durable goods, credit granted to third parties, insurance mechanisms, asset acquisitions (mainly through housing) and cash deposits in the financial sector. Similar conclusions are presented by Bernal (2007) who uses more recent data to explore general savings for the poor in Mexico, based specially on their asset acquisition patterns.

Another relevant study is Montes and Villagómez (2002), who explore the association between household size and saving in Mexico. The authors find that in general, households with fewer children save more, in part due to the effect of larger household sizes on female labor supply, and also due, on the one hand to the fact that poorer households have more children with greater consumption needs, and on the other, because children are expected to provide old age security. The authors also explore the relationship between savings levels and household structure, and in particular, the way in which extended households with older and younger generations that co-reside in the same unit may address the lack of access to pensions at older ages.

Finally, arecent study that focuses specifically on the connection between savings and pension arrangements is Villagómez and Hernández (2010), who use information from individual accounts in the registry of the National Council for the System of Savings for Retirement (CONSAR) to relate household income and savings to the participation in the scheme

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associated with social security. The authors conclude that the introduction of the new system, managed by the CONSAR through the 1997 reform to the pensions system, has increased overall household savings, although only slightly. This contradicts the findings by Aguila (2005), who finds that the pension reform in Mexico led to higher consumption, which crowded out savings.

Analysis on aggregate saving rates is even harder to find. Some examples are Arrau and Oks (1992), Calderon (1996), Sinha and Sinha (1998), Villagómez (1993, 1997, 1998), Garrido (1996), Katz (1992), Amozurrutia, (1989), and Villagómez, and Zamudio (1997), all of which are dated in the past century, and which focus on quantifying the level of saving in the country. The most recent papers are from Aportela (2001) and Fuentes and Villagómez (2001), which are also from more than a decade ago, and Hoyo, Peña and Tuesta (2013) and Villagómez and Hernández (2010), both of which only tangentially refer to savings and are more related to financial market access and the structure of the pension system, respectively.

In sum, the evidence on the patterns of savings in Mexico, and their determinants, is limited in spite of the relevance of the topic and of the availability of data to explore its causes further. Thus, we aim to fill at least to some extent this gap in the literature using more recent data and empirical methods, and a comprehensive view for the country.

3. The Evolution of Domestic Saving in Mexico

3.1 Introduction

This section presents the aggregate savings trends in Mexico during the past three decades and justifies the importance of focusing on the question of why high savings have co-existed with lower-than-expected economic growth performance.

3.2 General Trends: High Savings and Low Investment

In order to provide a context for our analysis, Figure 1 shows domestic savings rates as a share of Gross Domestic Product (GDP) for Mexico and for the average Latin America and the Caribbean (LAC) country between 1980 and 2012 (the data are from the World Development Indicators, 2014). As mentioned in the introduction, a first relevant feature is that, especially for the decade of the 2000s, the rate for Mexico closely tracks the regional average, with a correlation coefficient of practically 90 per cent for these years. A second and perhaps more important feature is that, during the course of the 32 years plotted in the figure—with the sole exception of

the 1988-1995 years—domestic savings for the country are higher. On average, Mexico's gross domestic saving is about 7 per cent above the average for the region during the past three decades, and interestingly, while the savings gap widened in the course of 32 years (Mexico's and LAC's respective averages were very similar around 1980), growth performance has varied in favor of LAC.

If savings reflect to at least some extent a country's capacity to finance investment through its own resources—and Mexico has systematically registered higher savings rates than the average of the region—one would expect based on the data in Figure 1 that, all else being equal, the country would also have fared better in terms of economic growth. This, however, is not the case. According to data from the World Development Indicators, 2014, Mexico's per capita GDP grew by 1.1 per cent on average each year during the 1980-2012 period, which is about 20 per cent lower than the growth in the regional average for the same years.

Figure 1.

Source: World Development Indicators, The World Bank, 2014.
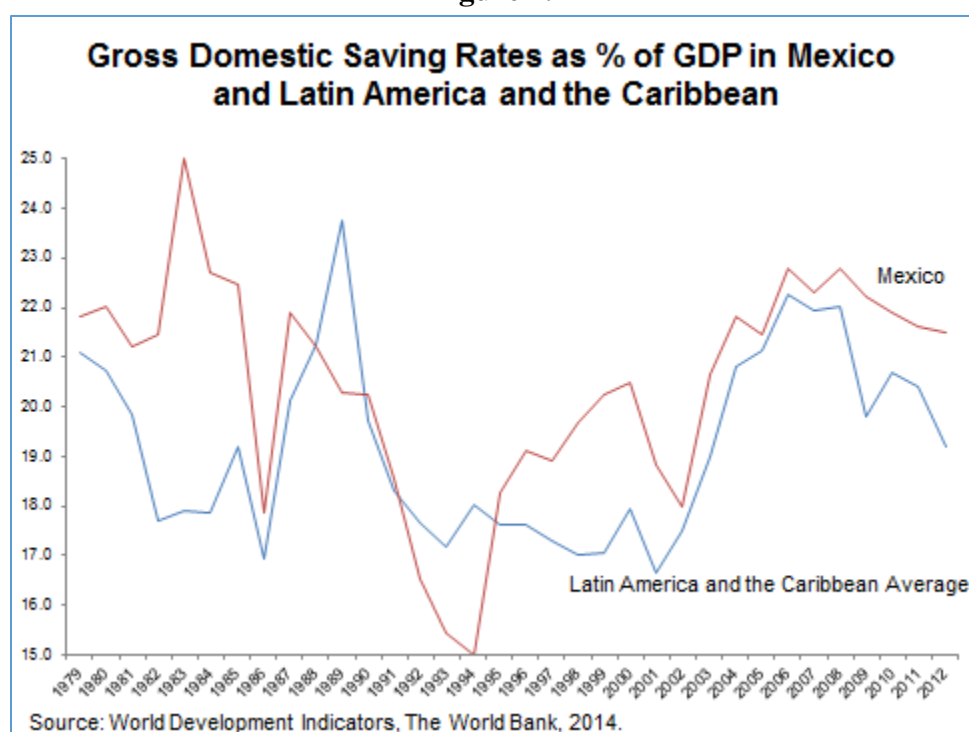
Although economic growth is evidently determined by a series of factors, of which saving is but one, it is still puzzling that over a relatively long period the mismatch prevails. One possible explanation is that savings are in fact being translated into investment, but investment is

relatively unproductive and therefore does not generate the expected growth. A second possibility is that savings are not directly translated into productive investment to the extent expected. Thus, even if investment is productive, its productivity is lower than the savings rates suggest, resulting in lower growth.

Figure 2 sheds some light on this by plotting the changes in gross domestic savings and investment, respectively, as a share of GDP in Mexico for the period 1980-2012. This leads us to take the second of the hypotheses above as the main guiding question for the present study. The figure shows that between 1980 and 1992, and during the 1994-2012 period domestic savings grew considerably faster than investment, to the extent that by 2012 savings rates had reached their 1980 level, while investment was 20 per cent below that observed 32 years before.

Figure 2.

Source: World Development Indicators, The World Bank, 2014.
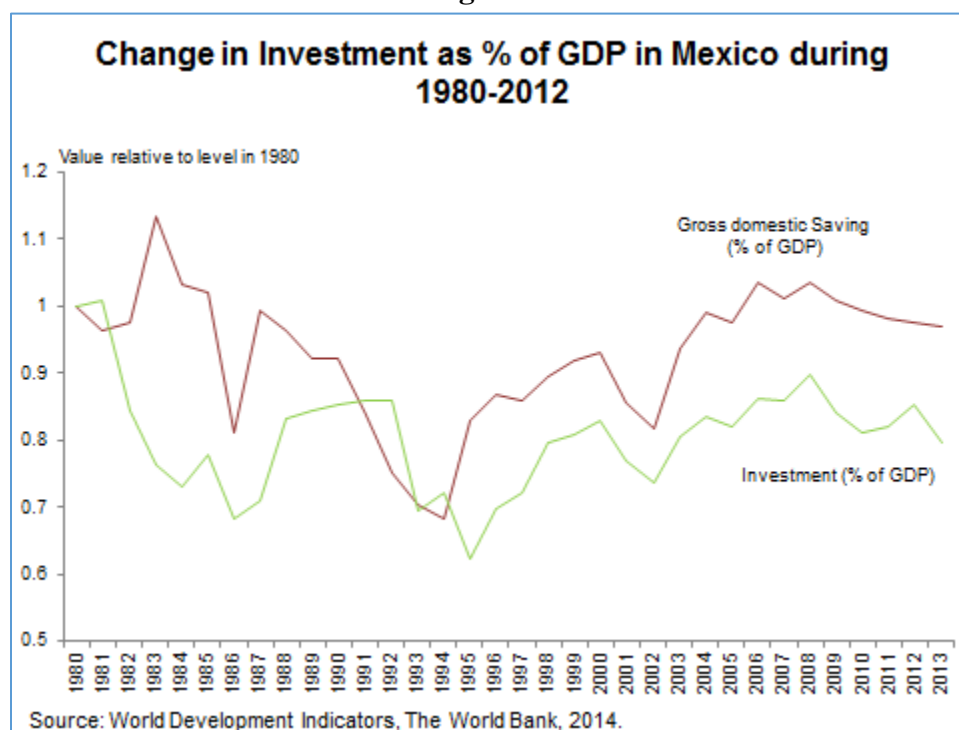
The National Accounts System (NAS) of Mexico by the national statistical office, INEGI,[4] provides data for identifying the relative importance of the public sector, firms and households for the level and evolution of aggregate savings shown in Figure 1. In particular, the NAS provides information on savings from non-financial institutions, financial institutions, the

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[4] Instituto Nacional de Estadística y Geografía.

public sector, households, and the non-profit sector. The non-financial sector is defined as the productive sector that generates goods and services to be traded in the market, while financial institutions are those that trade financial instruments, offer financial intermediation services, and manage stocks and assets.

The government sector includes operations by the federal, state and municipal governments, as well as the savings from social security institutions—which, among other elements, manage the public pension systems of the country. The household sector includes the savings by individuals and by individuals organized in households with others, and it also includes family firms that are not part of the non-financial sector, since they are owned by family members only. This sector also includes individuals that reside in hospitals and retirement homes. Finally, non-profit organizations include institutions that provide goods and services to households through mechanisms that are alternatives to the market economy.

The NAS provides two different measures of savings: gross and net. Gross savings include the consumption of fixed capital, while net savings discount them from the estimation. For calculating savings for each of the institutional sectors of the economy, three different accounts are created in each case, as listed below.

1. Current account: these accounts include the value of production by sector, the primary and secondary distribution of income and consumption, as well as the use of incomes, with savings resulting as a residual. Incomes are obtained by adding the value of production and income generation, primary and secondary incomes (after tax), and income in kind. Incomes are compared with the value of consumption to obtain the measure of savings.

2. Accumulation accounts: these accounts register all variations in financial assets and liabilities, as well as changes in the value of all other assets. The result is interpreted as the change in net worth over time;

3. Balance account: this account registers the value of net worth including financial and non-financial assets, recording the value of all liabilities from one year to another.

Figure 3.

Domestic savings in Mexico as a share of Gross Domestic Product 1993-2012

Share of GDP

Source: CEES calculations using data from INEGI.
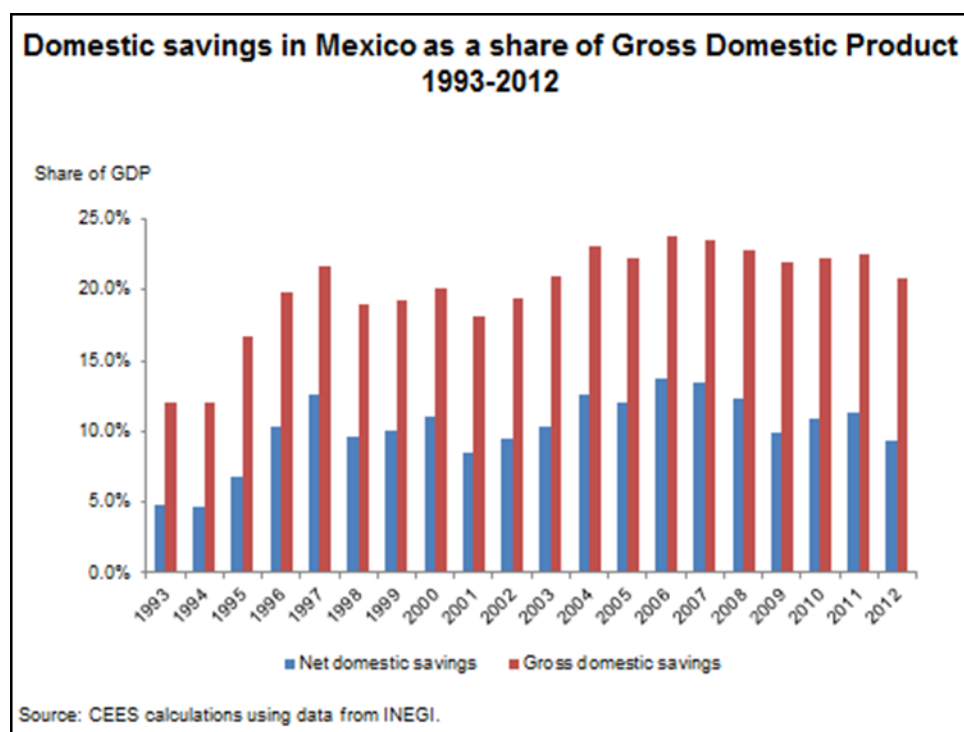
The share of savings in GDP under these definitions is plotted in Figure 3, illustrating a considerable 90 per cent rise in net savings from 4.9 to 9.3 per cent, while gross savings almost doubled, from 12.1 to 20.8 per cent between 1993 and 2012. The pattern observed is of increases up to 1997, with a U shape trend during the course of the next 10 years, with the year 2001 as the lowest point in the subperiod. Both savings rates peak in 2006-2007, reaching 13 and 23 per cent, respectively, in those years. Declines are observed between 2007 and 2009, which are the years of the international financial crisis, with slight improvements thereafter.

A breakdown of savings by institutional sector is presented in Figure 4. Interestingly, the composition of savings has varied quite significantly during the two decades under analysis. The main change is that while in 1993 the household sector accounted for around 35 per cent of total domestic saving, it reaches around 55 per cent in 2012. The relative share of all other institutional sectors declines during the period. The greatest reduction is observed in the government savings component, which declines from almost 25 to 11 per cent of the total value. Financial institutions increase their relative importance somewhat from 5 to around 8 per cent, while non-financial corporations decline in share from 23 to around 18 per cent.

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Nonprofit organizations represent a reduced proportion of total savings of between 1 and 3 per cent. Interestingly, the three sectors that would be expected to translate more directly their savings into investment, which are the public sector financial and non-financial institutions, reduce their combined share of overall domestic savings from 63 to 37 percent during the period.

Figure 4.

Composition of domestic savings by sector of origin in Mexico, 1993-2012

Source: CEES calculations using data from INEGI.
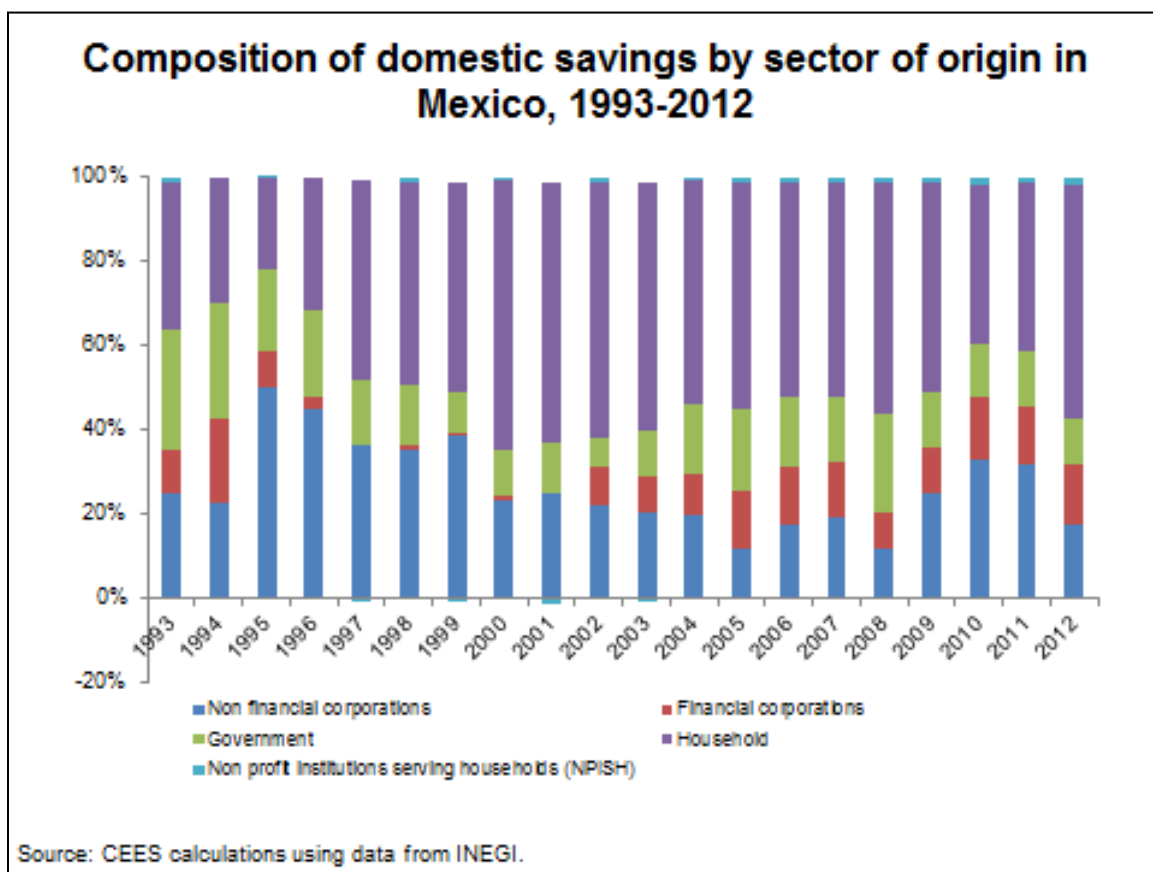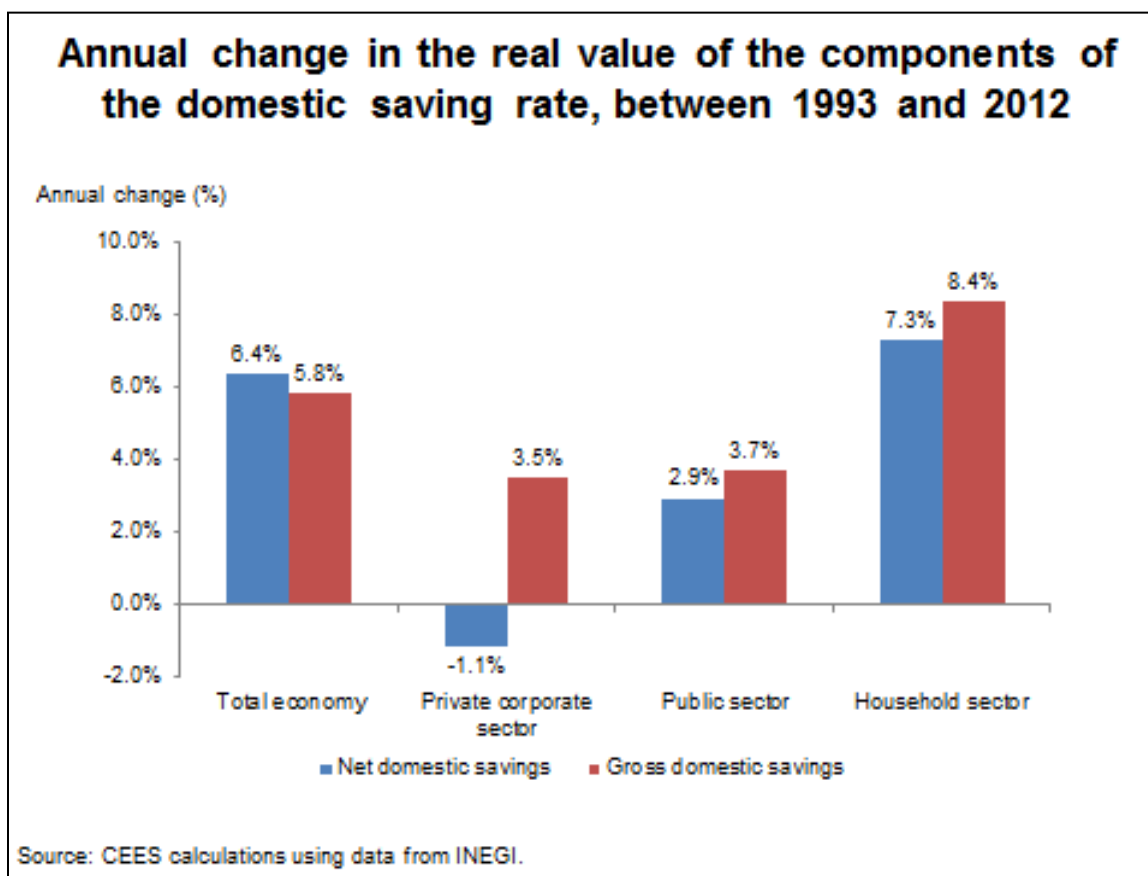
Figure 5.

Figure 5 presents the rate of change in the relative weight of each of the above components, grouping the corporate (financial and non-financial) sector in a single category. The sector with the greatest increase is the household sector (with average increases of 8.4 and 7.3 percent in gross and net savings, respectively), followed by the government sector, with average increases of about one third of what is observed for households. The corporate sector registers only minor increases in gross savings during the period.

The remaining of the paper analyzes each of the components separately. In particular, we present a more detailed analysis of the household sector due to its relative importance.

4. Public Saving in Mexico

This section analyzes the public component of domestic savings, which as illustrated above, has generated between 25 and 11 per cent of total domestic saving in the past 20 years, with a declining trend.

Following Bennett, Schmidt-Hebbel and Soto (1999, 2000) we disaggregate public savings into savings from public enterprises (financial and non-financial), from the central government, and from local governments. The NAS has provided this breakdown since 1993. The sources of information from which the government savings account is constructed include the Public Account of the Government, the Financial Statements of financial and non-financial government enterprises, the official budget approved by Congress every year, and the Income account approved by Congress yearly. This applies to the Federal, State, and Municipal governments, respectively.

Figure 6.

Gross and net public savings as share of GDP in Mexico 1993-2012

Source: CEES calculations using data from INEGI.
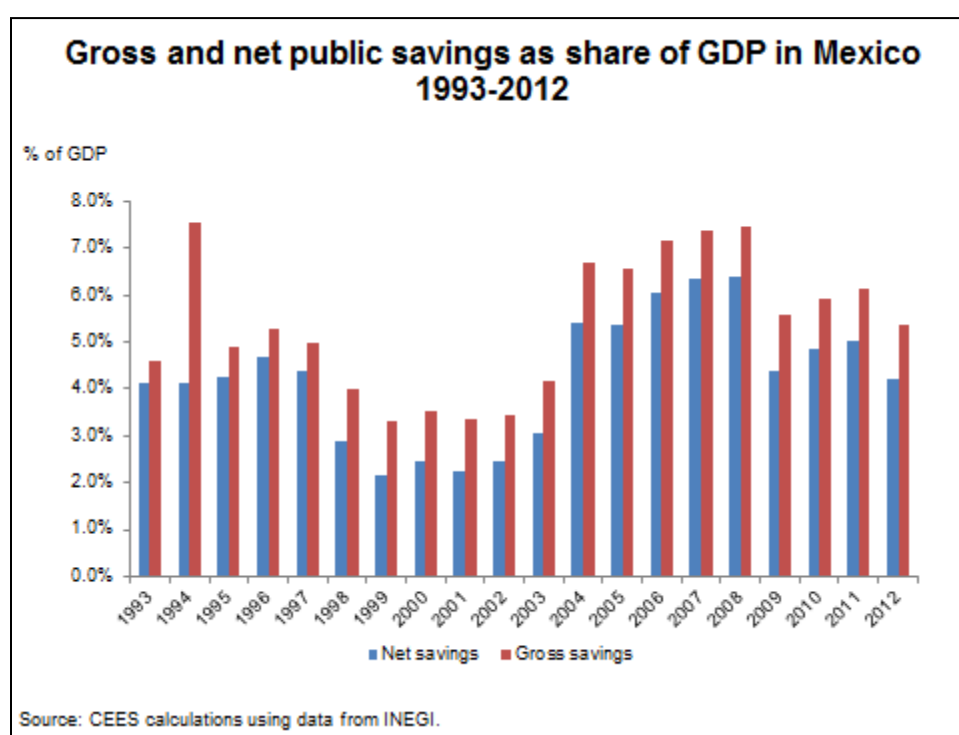
Figure 6 presents the evolution of public savings as a share of GDP for the period with available data. As can be seen, gross and net public savings follow a similar trend, the only exception being 1994, which coincides with the large adjustment in government expenditures in response to that year's financial crisis. Overall, the trend followed by the public savings rate is similar to the evolution of total domestic savings in Figure 3. The difference is a faster increase in public savings after the year 2001, but also a more pronounced decline after 2007.

Figure 7 presents a breakdown of the public sector by category. Throughout the period, the greatest source of public savings is from the central government account, where practically

60 per cent of those savings are generated. The importance of this source has fluctuated markedly in the course of the two decades under analysis, reaching its highest value of more than 80 per cent of public savings in 2005 and its lowest point in 1999, when it accounted for only 20 per cent of public savings.

Figure 7.

Source: CEES calculations using data from INEGI.
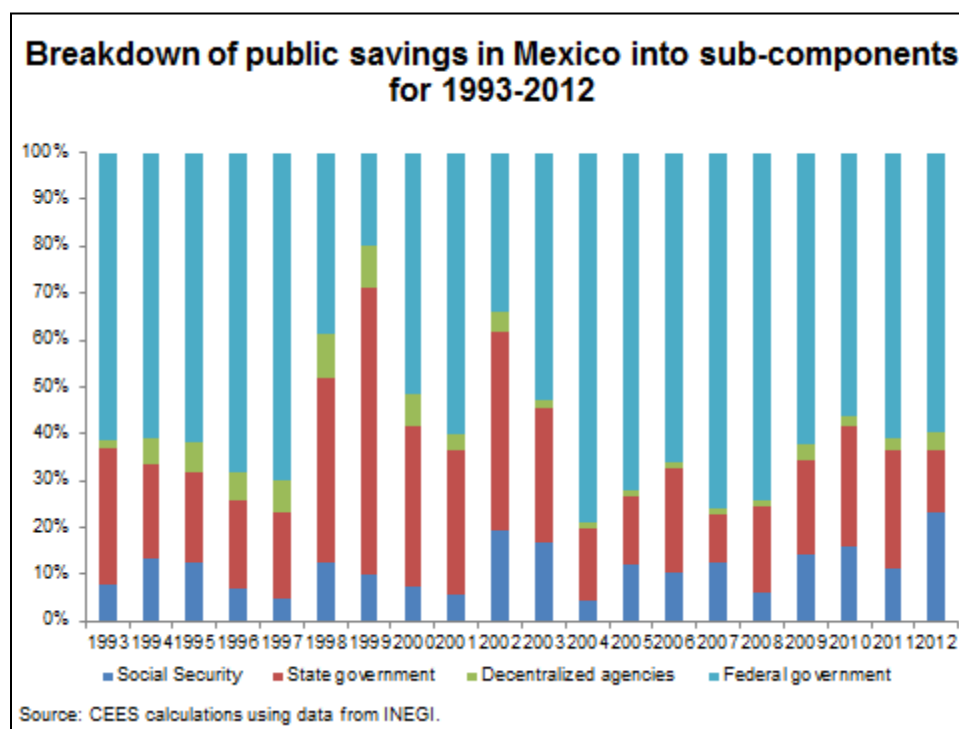
Interestingly, there is a negative relationship with the evolution of savings from local governments, and there actually seems to be a crowding out effect between both sources, with local government savings peaking in importance in 1999 at levels of 60 per cent and declining to around 10 per cent in 2007. After 2009 the relative share of local governments in public savings fluctuated between around 15 percent and almost 30 percent.

Savings from the public social security system have also varied considerably. Their maximum share is observed in the year 2012, when they reached about 25 per cent of total public savings, and a minimum of around 5 per cent in 2001. As expected, fluctuations in this category and central government savings account tend to compensate each other, which suggests that social security resources could act as a buffer to cushion contractions in the government´s accounts.

5. Evolution and Composition of Corporate Savings

5.1 Description

This section explores firms' savings in more detail. We start in Figure 8 by plotting the trend in corporate private savings for 1993 to 2012. At least two differences arise as compared to the trend in national domestic savings. The first is that there is only a slight increase between 2001 and 2007, while this last year is the point where savings rates peak in the country. The second is that, as opposed to the average trend, there is a sharp decline between 2011 and 2012. This result is not expected, since these last years are years of the recovery of economic growth after the financial crisis experienced during 2008-2009.

Figure 8.
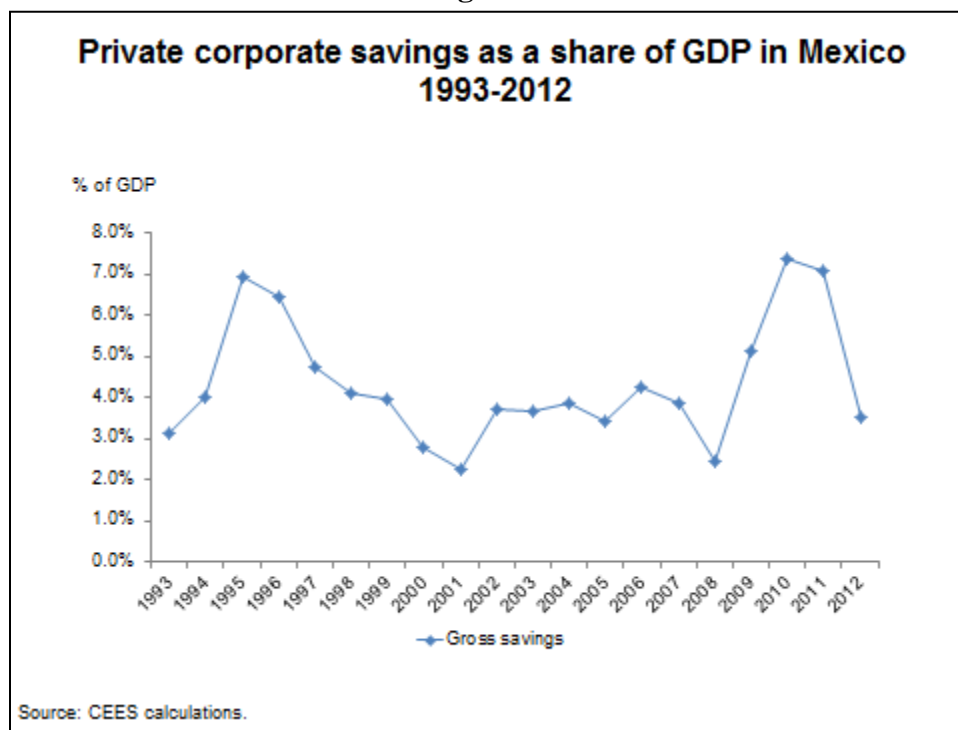
A first step in exploring in a general way the composition of corporate savings rates is to use the data in the Economic Censuses, conducted by INEGI, available for 1999, 2004 and 2009; census data for 2014 were not available at the time our research was conducted. The censuses provide data on incomes and expenditures that allow for estimating savings rates in each case. Additionally, these datasets gather characteristics of all firms that participate in the market of

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goods and services and contain information to identify the geographic location of each unit, including, for instance, different measures of the size of the firm.

Table 1 presents a first description of the relation between firm savings and some measures of size in order to offer a broad idea of the association between these variables. According to the data, the correlation between number of individuals employed and the rate of firm savings is positive, although decreasing between 1999 and 2009 (first column in the table). There is, however, a positive association between savings and the total value of production, which reaches 92 per cent in 2009. There is also a positive correlation with respect to the value of fixed assets, which is decreasing over time.

Table 1. Correlation between Firm Savings and Local Economic Indicators

Year	Employees per firm	Total production	Fixed capital formation	Net sales	Value of fixed assets
1999	0.9266	0.9795	n.d.	n.d.	0.9238
2004	0.6277	0.8781	0.1241	0.1372	0.7188
2009	0.5877	0.9260	n.d.	n.d.	0.6808
TOTAL	0.5988	0.9166	n.d.	n.d.	0.7046

Source: Authors' calculations based on Economic Census.

Table 2 classifies firms by sector of activity and presents similar correlations by pooling the data for all years. In the case of the correlation between corporate savings and the number of employees in the firm, there is a strong positive correlation of around 80 per cent or higher in all cases, with the exception of the Electricity, Water and Gas sector, which also presents a low association with the value of production and of assets. One possible explanation is that this sector is largely made up of public firms, with little participation by the private sector. The correlations are high for all other sectors, with levels of over 90 percent in the case of the relation between savings and the value of production, and with the value of fixed assets, respectively. The only exception is that in the case of the Transport sector the correlation between savings and the value of fixed assets is around 60 per cent.

**Table 2. Correlation between Firm Savings and Local Economic Indicators
by Sector of Activity, 1999-2009**

SECTOR	Number of employees	Value of production	Value of fixed assets
Agriculture	n.d.	n.d.	n.d.
Trade	0.9511	0.9984	0.9716
Construction	0.9281	0.9763	0.9071
Electricity, gas, water	0.2722	0.2328	0.4680
Manufacturing	0.8114	0.9069	0.8685
Mining	0.7979	0.9996	0.8781
Financial Services	0.9757	n.d.	0.9587
Private Services	0.8473	0.9966	0.9446
Transport	0.8479	0.9370	0.6043

Source: Authors' calculations based on Economic Census.

For the Manufacturing sector in particular, a closer look can be taken through the Monthly Survey on the Manufacturing Industry (*Encuesta Mensual de la Industria Manufacturera*), which contains statistical information on the economic behavior of the firms in the aforementioned sector, which generates approximately 37 per cent of GDP. The data are used for estimating economic growth rates, and they are an input for a variety of economic activity indicators, including sales, production, and productivity levels, among others. The survey contains a detailed account of each firm's income and expenditure items, from which savings levels can be calculated.

For the purposes of this work, we construct a consistent series of firm savings in the manufacturing sector for the period 2007-2013 in order to identify several changes in savings patterns. Although there are data for constructing an alternative series beginning in 2005, but changes in definitions make pre-2007 data non-comparable.

Table 3. Percentage Change in Firms' Savings, 2007-2013

	2007	2008	2009	2010	2011	2012	2013
Manufacturing Firms' saving rate	2.06%	3.55%	-0.11%	3.11%	3.61%	4.67%	5.29%

Source: Authors' calculations based on the Monthly Survey on the Manufacturing Industry.

According to our calculations from the different rounds of the survey in Table 3, the change in manufacturing firms' savings rates has notably increased from 2.06 per cent in 2007 to 5.29 per cent in 2013 (with a drop in 2009 to negative rates). The trend is somewhat similar to the evolution of corporate savings rates in Figure 8, although in the case of the Manufacturing sector the decline in 2012 is not observed.

Table 4. Correlation between Firm Savings Rates in the Manufacturing Sector and Size of Firm, 2007-2013

	2007	2008	2009	2010	2011	2012	2013
Personnel employed	0.5335	0.5612	0.5785	0.5714	0.6202	0.5707	0.4171
Hours worked	0.5205	0.5617	0.5459	0.5485	0.6163	0.5632	0.4052
Production value	0.3989	0.4744	0.391	0.3851	0.4251	0.3828	0.4331

Source: Authors' calculations based on the Monthly Survey on the Manufacturing Industry.

Table 4 presents correlations of manufacturing firms' savings rates that are similar to those obtained from the Economic Census for more recent years. Similarly to the previous results, there is a positive correlation between the personnel empoloyed in each unit and its savings rates. The correlation remains at similar levels throughout the following six years, with a peak in 2011, and reaches a value of 0.41 in 2013. Similar trends are observed with respect to the number of hours worked by workers in the firm. The correlation with respect to the value of production is also around 40 per cent throughout, with increases in 2008 and 2011.

These correlations suggest that, in general, larger firms tend to save more than smaller ones. This is not what would be expected, since larger firms tend to have more access to credit and would therefore be able to rely on external resources to invest. Conversely, the result suggests that smaller firms tend to save less, which again would not be an expected result if access to credit is inversely related to size, as would be expected.

The following section uses additional data for determining the relation between savings rates and a series of additional firm characteristics.

5.2 Savings in Microenterprises and Small Firms

According to INEGI (2011) 95.5 per cent of all firms in Mexico are either micro or small firms with less than 10 workers. In order to explore this portion of the corporate sector in more detail we use the National Survey of Microenterprises. These data are derived from a special module of the National Employment Survey held quarterly by INEGI, which is applied to individuals who own a business with less than 5 employees, and which represent 89.6 per cent of all the firms in the country. Therefore, although this data is informative on the lower spectrum of the distribution of firms—which, as suggested by the correlations above, tend to save relatively less than the largest firms—it covers the vast majority of firms.

In order to explore some factors associated with firms' savings decisions, we process the data from the 2002, 2008, 2010 and 2012 rounds of the survey to estimate savings rates by unit of activity, and we correlate this measure with firm characteristics provided by the database. The results of the estimation, presented in Table 5, are quite interesting. For the two variables representing the size of the firm—number of employees and amount of resources invested—we find a positive correlation of between 23 and 31 per cent, indicating that the largest microenterprises generally save more. This result is consisten with that observed from the Economic Census presented before. In contrast, the correlation with respect to indicators of the stability of the firm—years years of business operation and time spent on the business—although positive, are of about half the value.

Table 5. Correlation between Firm Savings Rate and Firm Characteristics

Variable	2002		2008		2010		2012	
Size of the firm								
Number of employees	0.2977	*	0.2542	*	0. 3058	*	0.2359	*
Investment	-		0.3073	*	0.296	*	0.3134	*
Stability of the firm								
Years of business operation	0.0046	*	0.0118	*	0.0148	*	0.0159	*
Time spent on the business	0.2781		0.1018	*	0.1556	*	0.1553	*
Indicators of formality								
Social security	-		0.7316	*	0.1235	*	0.3463	
Fixed establishment	0.4379	*	0.7368	*	0.6724	*	0.6634	*
Employee Training	0.397		0.673	*	0.6463	*	0.6812	*
Access to credit and social programs								
Access to Social programs	-		0.2464	*	0.1109		0.2207	
Access to a Loan	0.3952	*	0.4149	*	0.41	*	0.4212	*

Source: Authors' calculations based on Microenterprise Survey.

The correlations are highest for the variables that proxy for the level of formality of the firm: i) payments to the social security system, ii) whether the firm is a fixed establishment, and iii) whether the firm provides training to its employees (a compulsory benefit in formal firms). These relatively strong correlations can perhaps be driven by the association between the firm's income (which is higher in this group of firms) and the capacity to save.

Finally, we also include two variables that are critical due to their relationship with public policy decisions. The first is access to social programs, which at first glance could be thought to reduce the need for savings since they can act as a buffer to income shocks. The positive sign of the correlation therefore might be capturing the income effect that can be associated with programs' benefits.

The second is the positive association between savings and access to loans, which would seem to be a counterintuitive result, since access to credit in theory would make savings less

necessary. However, the survey does not make it possible to determine whether access to a loan is from the formal or the informal financial market and therefore the value of the interest rate associated with credit. If credit is available but expensive, and access to loans is related to the income level of the firm, it is possible that the positive association is capturing the income-savings capacity relation to a greater extent.

In sum, according to the data available there seems to be a positive correlation between firm savings and firm size, level of formality, and access to loans. Interestingly, all three dimensions can at least to some extent be influenced by policy decisions.

6. Household Saving in Mexico

As shown in Section 3 above, the majority of domestic savings in Mexico are held by the household sector. This section explores this component in some detail.

For households, three sets of surveys exist in Mexico for estimating savings rates at the micro level with high degrees of precision. The first is the National Household Income and Expenditure Survey (ENIGH), which is available for 1984, 1989, and biannually since 1992 through 2012 with a comparable design. The survey permits the estimation of household saving through a very detailed account of all household income and expenditure items. Additionally, the survey includes information on investment, credit acquired, loans granted, and access to some financial sector instruments; these variables can be associated with a large set of household and individual socioeconomic characteristics as well as household assets, housing conditions, and access to services, among other features. Apart from allowing for the analysis of household saving through a set of data snapshots, this also allows for a cohort analysis that follows individuals and their savings decisions over the life cycle, as will be explained below.

A second source of valuable information is the recent National Survey on Financial Inclusion 2012 (*Encuesta Nacional de Inclusión Financiera*). This survey is focused on identifying the financial instruments to which households have access, and it includes a section specifically on household savings, with a list of savings categories—including formal and informal savings—that help respondents account for all kinds of savings and asset accumulation operations. The survey also includes data on savings patterns of different forms, access and use of financial services, informal and formal credit acquired, formal and informal loans granted, knowledge about services and instruments that banks and other financial institutions offer, and

other characteristics. This allows us to explore in detail the connection between household savings and access to financial services.

Finally, a third source is the National Survey for the Standard of Living of Households (*Encuesta Nacional sobre el Nivel de Vida de los Hogares*), available for 2002 and with a panel follow up in 2005-2006. The attractiveness of this particular survey is that its panel design follows the same individuals over time including national and international migrants, which reduces attrition considerably. This survey also includes data on savings, asset and credit acquisition, loans granted, income, public transfers, and participation in social programs, as well as a list of socioeconomic and household conditions data, with which different hypothesis about the determinants of *changes* in savings can be tested, although for a fairly short period of seven years.

In what follows we use each of these three sources of data to characterize the evolution and determinants of household saving in more detail.

6.1 Household Savings: An Analysis from the Income and Expenditure Survey

6.1.1 Description and Methodology

One advantage of the ENIGH surveys for Mexico is that they capture both labor and non-labor monetary and non-monetary income at the individual and household level. Expenditures (or consumption) are also registered at a considerable level of detail. Household saving is defined as the difference between these two measures in a given period of time. Given our interest in dynamic savings trends at the national level in Mexico, we seek to capture household level savings for the same or similar households over an extended period of time to understand: i) how household savings trends have changed over the years, and ii) how these trends change over the life cycle of representative household members.

The ENIGH is a nationally representative household survey in Mexico with the purpose of capturing detailed information on household income and expenditures, in both cases allowing the disaggregation of income type (income from labor, income from rents, non-monetary income, etc.) and expenditure type (durables and non-durables, non-monetary expenditure, etc.). As such, it provides an ideal source of information to evaluate household savings trends, as estimates of household saving will be compatible over time both in their definition and representativeness. While the representativeness of these surveys and their in-depth retrieval of

income and expenditure data would in theory provide estimates that are compatible with national accounts data, this is not necessarily the case because the under-reporting of income and expenditures is widespread.

The level of household saving can be defined simply as the difference between disposable (after-tax) income and consumption expenditure in any given period of time. While the definition of savings levels is straightforward, the level of detail needed from a household survey to capture this measure is more complicated. Nonetheless, the ENIGH captures both income and expenditures in such a way that we can easily create measures of disposable income and consumption expenditure over time at the household level. In what follows we provide a detailed explanation of how we define household saving over time, and the various measures of saving that can be captured from the ENIGH survey.

Disposable household income is simply the sum of income from work (wages, salaries, overtime, bonuses, etc.), rents, capital gains and transfers, among other sources, for all members of the household. This includes both monetary and non-monetary (gifts, etc.) income and is aggregated at the household level. The ENIGH captures each of these measures of income directly for all individuals in the household, which simplifies the creation of a measure of total household income. Financial earnings from savings accounts, loans provided to others, and several other figures are not included in total household income. These measures of income can be captured, however, and we use them directly to define household savings in terms of the change in household assets.

Household consumption expenditure involves a more precise definition to distinguish between expenditures in durable and non-durable goods. We make use of this distinction since it can be argued that expenditures on durable goods (e.g., vehicles and machinery) represent in and of themselves a form of saving. The ENIGH surveys capture item-level consumption, which allows us to aggregate individual and household consumption on food and beverages, transportation, clothing, home improvement, education and health services, and other expenditures into a total measure of household consumption.

The distinction between durable and non-durable expenditures allows us to define different measures of saving that could vary depending on how we define consumption goods or services and investment goods or services. Considering that consumption of durable goods (and services) could represent a form of saving, we consider two broad measures of household saving:

i) disposable income minus total household expenditures and ii) disposable income minus household consumption of non-durable goods and services. The latter can further be modified to exclude spending on education and health, since these can be considered long-term investments and thus a form of saving. We will estimate saving according to the second measure, both with and without the inclusion of spending on education and health.

Beyond these two main measures of saving (the difference between disposable income and total household expenditures, and between expenditures on non-durables), the method of aggregating or averaging across households in each survey year also varies depending on how we would like to define savings; for example, as a savings *rate* or a savings *level*. The benefit of using a savings rate is that this measure is comparable over time without the need to deflate monetary values of income or expenditures. The benefit of using the level of savings is that it allows us to aggregate across the economy as a whole and establish comparable monetary values of savings over time. For most of our analysis, we use the savings rate, rather than the savings level. That is, we aggregate or average across households in the same survey year and divide the savings level by total disposable income in each survey year separately. The ENIGH provides values of income and expenditures that are deflated to yearly values, which makes the process of aggregating or average across households straightforward.

The three methods of defining the savings rate that we consider throughout this analysis are: i) the average (weighted) savings rate, which is simply the weighted mean of household savings rates across the sample, or:

$$\sum_{n=1}^{N} \frac{y-c}{y}\left(\frac{1}{N}\right)$$

where y is total household disposable income, c is total household expenditures, and N is the total number of households; ii) the median (weighted) savings rate; and iii) the aggregated (weighted) savings rate, which is defined by:

$$\frac{\sum_{n=1}^{N} y - \sum_{n=1}^{N} c}{\sum_{n=1}^{N} y}$$

In practice, even when the mean savings rate is weighted, it is typically negative, which is why we make use of both the median savings rate and the aggregate savings rate. In theory, the

aggregate savings rate defined in iii) should be equivalent to the household savings rate defined by using total disposable income and household consumption from National Accounts data. However, since both income and expenditures tend to be underreported in surveys, the savings rate will be slightly different (we can adjust household income and expenditure to reflect this, and we explain this adjustment later).

One limitation of the ENIGH surveys is that total household expenditure does not include interest payments from loans (whether on real estate, loans from third parties, or credit card payment). The ENIGH captures the total payment made, which does not distinguish between the principal and the interest paid in a given period of time. Since total expenditure should not include the amount spend to cover the principal on a loan, but rather only the interest paid, we follow Székely's (1998) solution to capture interest payments and include this in the measure of total expenditures. As is laid out in Székely (1998), debt payments can be defined by:

$$E = (i)(D) + (\frac{D}{N})$$

where E represents the total amount paid towards a debt, i is the nominal interest rate, D is the value of the debt, and N is the number of years in which the principal is paid, under the assumption that the same proportion of the principal is paid every year. With some simple algebraic manipulations, we can observe that:

$$\frac{(i)(D)}{E} = \frac{(i)(D)}{(i)(D) + \frac{D}{N}} = \frac{(i)(N)}{(i)(n) + 1}$$

With the above expression, using an equilibrium interest rate that is generalizable to all types of credit, we can distinguish between interest payments and debt reduction payments in the ENIGH fairly easily. To obtain the amount paid in interest, we distinguish between the amount paid in interest (subindex i) and the amount paid to repay the loan (subindex m):

$$L_B = L_B{}^i + L_B{}^M$$
$$L_T = L_T{}^i + L_T{}^M$$
$$L_C = L_C{}^i + L_C{}^M$$

where the sum of $L_B{}^i$, $L_T{}^i$, and $L_C{}^i$ represent the total of household interest payments from real estate, loans, and credit, respectively (see Székely, 1998a, for a more in-depth explanation). While we use both interest and debt reduction payments in our calculations, our primary concern is being able to include interest payments in our measures of total household consumption.

Beyond calculating the savings rate as the residual between income and household expenditure, we can also calculate a more direct savings rate using the wealth of disaggregated information on the monthly acquisition of financial and physical assets (less financial liabilities). Following Székely (1998a), for every household we can define financial saving as the monthly change in assets (financial and physical) and liabilities as a proportion of monthly income. Specifically, for every household we define:

$$\frac{\left(A_f + A_p\right) - L_f}{y}$$

where A_f, A_p, and L_f are approximations of the net change in financial assets, physical assets, and financial liabilities, respectively, considering the revaluation of assets and liabilities, and the depreciation of physical assets. Our definition of the net change in financial assets includes (as positive values) contributions life insurance plans, savings deposits, loans to others, and capital gains from inheritances, lotteries, etc. and includes (as negative values) the withdrawal of savings to cover an expenditure and debts charged to others. Meanwhile, our definition of net change in physical assets includes (as positive values) the purchase of property/land, machinery, the spending that increases the value of these assets, and the purchase of other durable goods, and (as negative values) the sale of property/land, machinery, and other durable goods. Lastly, the net change in financial liabilities enters as a positive value subtracted from the total value of assets, and is defined as the loans obtained by the household minus debt reduction payments for real estate, loan debt, and credit card debt. This of course means that if loans obtained by the household are less than all debt payments (principal paid in the reference month), L_f is negative and is thus added to the total household financial and physical assets. Similar to the definitions above, we define the mean, median, and aggregate financial savings rates using the same summation approaches, and disaggregate by its components.

6.1.2 Estimates of Household Saving in Mexico

Given the various definitions of savings rates that can be considered with the information above, we exploit the wealth of expenditure and financial information in the ENIGH surveys to see how consistent these measures are over time. Tables 6-8 below provide an extensive list of savings rates, defining household expenditures both with and without the consumption of durables, and

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defining savings directly through the classification of the change in financial assets over time. These tables display the mean, median, and aggregate savings rate for a variety of savings measures across time, respectively.

The right panel in Figure 9 summarizes the evolution of the three measures of savings computed, for the aggregate savings definition. The trend in the three cases is the same, and it can be compared with the left panel, which shows household savings as a share of GDP. Interestingly, during the 1998-2008 period, with few exceptions (such as the 2004 drop in the right panel), both sources coincide in a slight upward trend, which is more pronounced for the ENIGH source. Both sources also coincide with a drop in 2010, although the National Accounts data (left panel) registers a slight increase in 2012 that is only shared (in the right panel) by the basic definition of savings (s=y-c). The main conclusion is that with the exceptions mentioned, the trends in both cases are consistent.[5] Thus, the analysis of household savings through micro data seems to be informative of the evolution of overall domestic savings in the country.

Figure 9.

Source: CEES calculations using data from INEGI.

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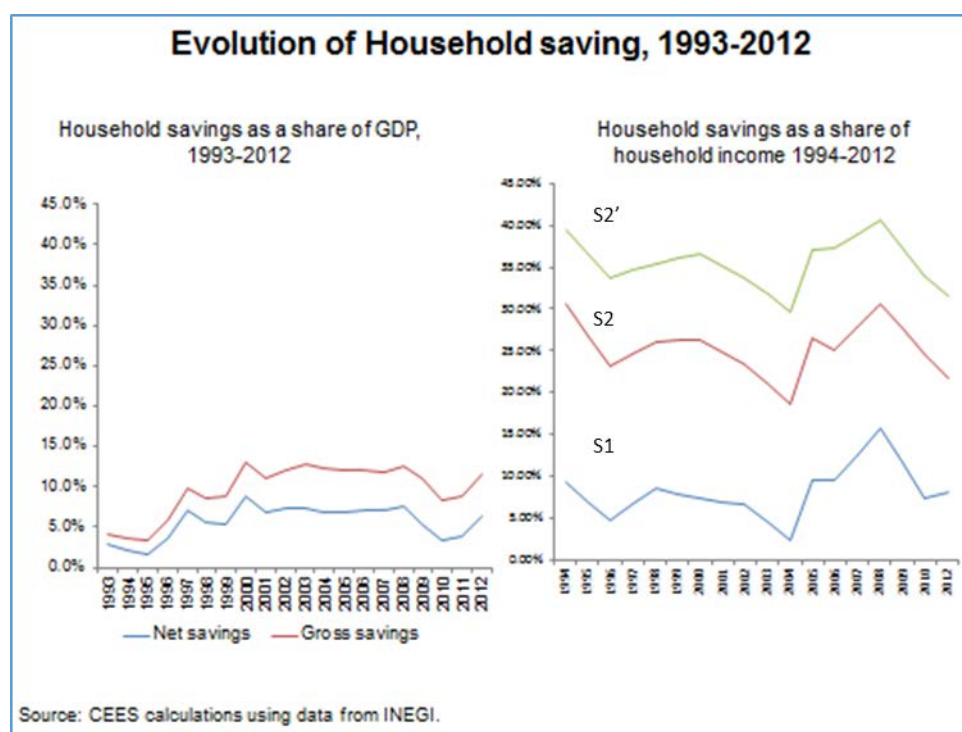
[5] The correlation coefficent between net and gross savings from the NA and aggregate savings calculated form the ENIGH data is of 0.67 and 0.76, respectively. The correlation when considering the savings definition considering non-durable consumption is of 0.69 and 0.82, respectively.

As shown in the left panel of Figure 9, the evolution of household savings at the national level presents important differences as compared to the evolution of corporate savings in Figure 8. In the case of households, there is a continuous increasing trend between 1993 and the year 2000 from 4 to around 12 per cent of GDP. Instead of showing a U shape trend like national domestic savings, household savings remains fairly stable at around 12 percent all the way through 2008. As in the rest of the economy, there is a decline between 2008 and 2010, but an increase thereafter (which also contrasts with the sharp decline in the savings rate of the corporate sector).

Additionally, the right panel of Figure 9 includes the measure of financial savings as reference. In general terms they follow the same aggregate pattern, with the exception that the financial savings measure registers a decline in 2008 rather than an increase as in the other definitions (and an increase in 2010). The similarities are important because they mean that focusing on the financial savings indicator, which can be disaggregated by component, is informative of the general evolution of savings in the 20-year period considered.

If we focus first on the average (weighted) savings rate (Table 6), we see that effectively, the rate is negative in most years if we consider all household consumption, but positive if we include expenditure on durables as a form of saving. Both median and national aggregate savings (Table 7 and 8) are positive across definitions and years. Focusing on the aggregate savings rate (Table 8) we can see that household saving as a proportion of national income (defining consumption as the total of all household expenditures) has fluctuated substantially between 1984 and 2012, reporting the lowest rate in 2004 (2.3 percent of income) and the highest in 2008 (15.7 percent of total income). Once consumption excludes the purchase of durable goods and expenditures on health and education, the savings rate reaches one third of total household income. In addition to providing basic estimates of the savings rate considering various definitions of total household consumption, we calculate the basic savings rate considering all household consumption and the savings rate considering consumption of non-durables, adjusted for differences between aggregate income and consumption from the ENIGH in relation to the National Accounts. This adjustment factor is defined for both total income and total consumption for every year we estimate saving. The adjustment is defined for income and consumption as $\frac{Total\ HH\ income\ in\ National\ Accounts}{Total\ HH\ income\ in\ ENIGH}$ and $\frac{Total\ HH\ consumption\ in\ National\ Accounts}{Total\ HH\ consumption\ in\ ENIGH}$, respectively (once weights have been applied to the summation in the denominator), and each is applied to the

ENIGH aggregates to define the adjusted savings rate.[6] This adjustment factor is used mainly to address the systematic underreporting of income in the ENIGH relative to the national accounts (see Székely, 1998a). This of course provides substantially larger estimates of the savings rate using any of the three aggregation methods.

As we discussed in the previous subsection, we can also estimate the financial savings rate using each of the aggregation methods, given the wealth of information on financial and physical asset acquisition available in the ENIGH. Financial saving is decomposed into the net acquisition of fixed assets (including depreciation), net debt payments (debt reduction payments made to others minus debt reduction payments received from others, excluding interest), contributions to life insurance plans, net loan acquisition (loans made to others minus loans received by others), net savings deposits (deposits minus withdrawals), and the net purchase of durable goods. Not surprisingly, financial saving (in the aggregate) is driven mainly by the purchase of durable goods (13 percent, or nearly three-quarters of financial saving in 2012) and to a lesser extent net savings deposits (4 percent, or just above one fifth of financial saving in 2012).

We can also evaluate trends in savings by different subgroups of the population. Table 9 provides the distribution of the median saving rate by characteristics of the household head and shows that there are important differences in some cases. For instance, savings rates tend to be higher in households where the head has a higher education level and where the the head is employed.

Figure 10 illustrates the relative importance of savings mechansim for Mexican households by using the measure of financial savings as reference for the measure equivalent to aggregate savings. The main source of savings according to this definition is the purchase of durable goods, where rates oscillate around 15 per cent of income through most of the 2000s decade. This is by far the most important savings component. The net savings in deposits follows, with fluctuations around 5 per cent during the same decade. The net acquisition of fixed assets, the payment of life insurance and the net acquisition of debt all register low values throughout. The net loan acquisition is negative and fluctuates around -2 per cent.

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[6] The aggregate household income and aggregate household consumption are each multiplied by their respective adjustment factor prior to calculating the savings rate.

This is an important finding, which could be linked to the central question of this document, which asks why—with relatively high savings rates—Mexico underperforms in economic growth with respect to the rest of its region. The data show that the majority of savings by households are not injected into the financial system as resources that could be used for investment (only a minority of savings are deposits), but rather they are used to purchase final goods. They do not necessarily fuel the internal market since at least a portion of them could be transactions across individuals rather than through the formal market, and a portion could be imports produced elsewhere, which generate value through the trading sector, but not necessarily in other sectors that use employment and local resources more intensively.

Table 6. Estimates for Household Saving in Mexico 1984-2012 (% of total disposable income)

Measure of savings	1984	1989	1992	1994	1996	1998	2000	2002	2004	2005	2006	2008	2010	2012
							Weighted mean							
Direct estimates														
$S_1 = y - c$	-6.2%	-7.9%	-4.0%	-0.8%	-7.3%	-7.0%	-1.8%	-0.7%	-8.6%	-2.4%	0.2%	-0.5%	-9.2%	-6.0%
$S_2 = y - c_{nd}$	6.5%	9.4%	15.4%	18.8%	9.9%	9.1%	13.8%	13.6%	5.9%	12.9%	14.3%	15.2%	9.1%	8.0%
$S_2' = y - c_{nd}2$	14.2%	17.6%	23.8%	26.5%	19.7%	18.3%	23.5%	22.8%	15.9%	23.6%	25.1%	24.1%	17.6%	16.9%
Corrected estimate (S3), total expenditures	24.4%	8.8%	10.6%	10.5%	15.2%	10.4%	17.5%	17.2%	16.8%	14.7%	18.7%	10.9%	11.2%	11.6%
Corrected estimate (S3), expenditure on non-durables	25.1%	10.4%	12.7%	12.9%	16.5%	12.7%	18.8%	19.7%	20.8%	18.3%	23.5%	16.5%	16.9%	18.0%
Financial saving and its components (S4)	19.7%	19.4%	19.4%	21.7%	18.4%	17.5%	17.0%	14.5%	16.4%	16.3%	16.3%	15.7%	18.1%	14.0%
i) Net aquisition of fixed assets	0.6%	-0.4%	0.2%	0.6%	0.4%	0.1%	0.1%	0.2%	0.2%	0.0%	-0.1%	-0.1%	-0.8%	-0.5%
ii) Net debt payments	0.2%	0.6%	0.7%	0.9%	0.6%	0.5%	0.4%	0.5%	1.0%	1.2%	1.5%	1.2%	1.0%	1.2%
iii) Life insurance payments	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
iv) Net loan acquisition	0.0%	0.0%	-2.2%	-1.1%	-2.0%	-1.2%	-1.3%	-1.2%	-1.1%	-1.8%	-1.3%	-1.1%	-1.2%	-1.3%
v) Net savings deposits	6.2%	2.1%	1.5%	1.9%	2.7%	2.3%	2.5%	1.0%	2.0%	1.9%	2.4%	0.3%	1.2%	1.2%
vi) Purchase of durable goods	12.7%	17.1%	19.2%	19.3%	16.9%	15.9%	15.3%	14.0%	14.1%	15.0%	13.7%	15.4%	17.8%	13.3%
Estimate of non-financial saving														
i) Original estimate (S2-S4)	-13.2%	-10.0%	-4.0%	-2.9%	-8.5%	-8.4%	-3.2%	-0.9%	-10.5%	-3.4%	-2.0%	-0.5%	-9.0%	-6.0%
ii) Corrected estimate (S3-S4)	4.7%	-10.6%	-8.8%	-11.2%	-3.2%	-7.1%	0.5%	2.7%	0.4%	-1.6%	2.4%	-4.8%	-6.9%	-2.4%

Source: Authors' calculations from the ENIGH (INEGI) 1984-2012. The calculation of S3 applies an ajustment factor based on national accounts data. Total expenditures (c or c_{nd}) always includes interest payments from loan repayments

1. S_1 is the savings rate considering total income and total expenditure

2. S_2' is the savings rate considering total expenditures on non-durables excluding spending on education and health (that is, these expenditures enter as a form of saving)

Table 7. Estimates for Household Saving in Mexico 1984-2012 (% of total disposable income)

	1984	1989	1992	1994	1996	1998	2000	2002	2004	2005	2006	2008	2010	2012
Measure of savings							Median							
Direct estimates														
$S_1 = y - c$	3.2%	4.4%	2.6%	5.0%	-0.6%	1.3%	4.8%	5.2%	0.7%	7.3%	7.8%	6.9%	5.0%	4.7%
$S_2 = y - c_{nd}$	15.2%	19.8%	21.4%	23.4%	15.7%	16.8%	18.8%	18.9%	14.6%	21.7%	21.4%	23.2%	22.3%	18.2%
$S_2' = y - c_{nd'}^2$	21.5%	27.0%	29.4%	30.8%	24.3%	25.3%	28.0%	28.1%	23.7%	31.4%	31.8%	31.7%	29.9%	25.3%
Corrected estimate (S_3), total expenditures	31.1%	19.2%	16.3%	15.6%	20.6%	17.3%	22.9%	22.0%	24.0%	22.9%	24.9%	17.4%	22.8%	20.5%
Corrected estimate (S_3), expenditure on non-durables	32.0%	20.6%	18.9%	17.9%	21.8%	20.2%	23.5%	24.6%	28.1%	26.6%	29.8%	24.4%	29.1%	27.1%
Financial saving and its components (S_4)	10.8%	13.4%	16.8%	18.1%	15.9%	15.0%	14.0%	12.5%	13.6%	14.0%	13.7%	13.3%	16.5%	12.3%
vi) Purchase of durable goods	8.2%	12.1%	15.4%	15.5%	13.7%	12.2%	11.2%	11.2%	10.7%	11.4%	10.7%	12.2%	14.5%	10.8%
Estimate of non-financial saving														
i) Original estimate (S_2-S_4)	4.4%	6.4%	4.6%	5.4%	-0.2%	1.9%	4.8%	6.5%	1.0%	7.7%	7.6%	9.9%	5.8%	5.8%
ii) Corrected estimate (S_3-S_4)	21.2%	7.2%	2.1%	-0.2%	6.0%	5.2%	9.5%	12.2%	14.5%	12.5%	16.1%	11.1%	12.5%	14.8%

Source: Authors' calculations from the ENIGH (INEGI) 1984-2012. The calculation of S_3 applies an ajustment factor based on national accounts data. Total expenditures (c or c_{nd}) always includes interest payments from loan repayments

1. S_1 is the savings rate considering total income and total expenditure

2. S_2' is the savings rate considering total expenditures on non-durables excluding spending on education and health (that is, these expenditures enter as a form of saving)

Table 8. Estimates for Household Saving in Mexico 1984-2012 (% of total disposable income)

Measure of savings	1984	1989	1992	1994	1996	1998	2000	2002	2004	2005	2006	2008	2010	2012
	National Aggregate[1,2]													
Direct estimates														
$S_1 = y - c$	3.5%	6.2%	6.5%	9.2%	4.6%	8.5%	7.3%	6.6%	2.3%	9.4%	9.6%	15.7%	7.4%	8.1%
$S_2 = y - c_{nd}$	19.3%	26.0%	28.9%	30.6%	23.1%	26.0%	26.4%	23.5%	18.6%	26.5%	25.1%	30.7%	24.5%	21.7%
$S_2' = y - c_{nd'}$[3]	27.3%	34.5%	37.9%	39.5%	33.8%	35.4%	36.6%	33.8%	29.7%	37.1%	37.2%	40.6%	34.0%	31.6%
Corrected estimate (S_3), total expenditures	31.4%	20.7%	19.7%	19.4%	24.6%	23.4%	24.8%	23.2%	25.2%	24.6%	26.3%	25.2%	24.7%	23.3%
Corrected estimate (S_3), expenditure on non-durables	35.3%	26.8%	26.6%	25.6%	28.8%	28.9%	30.7%	28.8%	31.5%	31.0%	33.2%	31.8%	31.1%	30.2%
Financial saving and its components (S_4)	25.5%	24.4%	25.5%	28.2%	27.2%	24.0%	25.2%	18.2%	22.4%	24.1%	22.7%	17.0%	21.4%	17.5%
i) Net acquisition of fixed assets	1.8%	0.2%	1.5%	0.8%	0.6%	0.5%	0.9%	0.5%	0.7%	0.8%	0.2%	0.0%	0.1%	-0.2%
ii) Net debt payments	0.8%	1.4%	2.1%	2.5%	1.3%	1.1%	1.0%	1.2%	2.1%	2.8%	3.3%	2.4%	2.1%	2.3%
iii) Life insurance payments	0.1%	0.2%	0.1%	0.1%	0.1%	0.2%	0.0%	0.0%	0.1%	0.0%	0.1%	0.1%	0.1%	0.1%
iv) Net loan acquisition	0.0%	0.0%	-2.6%	-0.9%	-1.1%	-0.7%	-1.0%	-1.3%	-0.7%	-1.1%	-1.0%	-1.0%	-0.9%	-1.0%
v) Net savings deposits	7.4%	3.3%	2.8%	5.0%	8.6%	6.1%	5.6%	1.3%	4.5%	4.8%	5.0%	0.8%	3.4%	3.6%
vi) Purchase of durable goods	15.5%	19.4%	21.5%	20.8%	17.8%	16.8%	18.6%	16.5%	15.8%	16.8%	15.2%	14.6%	16.7%	12.8%
Estimate of non-financial saving														
i) Original estimate (S_2-S_4)	-6.2%	1.6%	3.4%	2.4%	-4.1%	2.0%	1.2%	5.3%	-3.8%	2.4%	2.4%	13.7%	3.1%	4.2%
ii) Corrected estimate (S_3-S_4)	5.9%	-3.7%	-5.8%	-8.8%	-2.6%	-0.6%	-0.4%	5.0%	2.8%	0.5%	3.6%	8.2%	3.3%	5.8%

Source: Authors' calculations from the ENIGH (INEGI) 1984-2012. The calculation of S_3 applies an ajustment factor based on national accounts data. Total expenditures (c or c_{nd}) always includes interest payments from loan repayments

1. This definition considers the total weighted income at the survey level and the total weighted expenditure at the survey level to define the aggregate savings rate

2. The INEGI aggregate considers as the savings rate the difference between the total disposable income and total expenditures as defined by INEGI.

3. S_2' is the savings rate considering total expenditures on non-durables excluding spending on education and health (that is, these expenditures enter as a form of saving)

Table 9. Estimates of Household Savings by Characteristics of the Head of Household, 1984-2012
(median savings rate)

Subgroup	1984	1989	1992	1994	1996	1998	2000	2002	2004	2005	2006	2008	2010	2012
Urban	3.44%	4.69%	3.18%	5.36%	-0.38%	1.97%	5.70%	5.22%	1.25%	8.16%	8.42%	8.12%	5.75%	5.61%
Rural	2.71%	3.37%	0.11%	3.73%	-1.35%	-1.00%	1.14%	4.53%	-2.24%	3.44%	5.46%	0.70%	1.77%	0.01%
2 or less members	3.31%	4.16%	2.00%	3.76%	1.14%	1.56%	2.69%	3.54%	0.31%	4.59%	5.37%	5.80%	2.28%	3.12%
3 to 4 members	3.03%	3.99%	2.93%	6.86%	-1.58%	2.00%	5.82%	4.99%	-0.43%	6.96%	8.01%	6.61%	5.07%	5.60%
5 to 7 members	2.33%	2.45%	1.87%	3.04%	-1.24%	0.76%	5.54%	5.57%	1.22%	9.10%	8.23%	7.19%	6.60%	3.21%
Female head	3.29%	1.70%	1.10%	2.50%	-0.31%	0.76%	2.12%	3.29%	-1.87%	4.45%	6.53%	5.77%	3.31%	2.75%
Male head	3.17%	4.82%	2.89%	5.88%	-0.68%	1.60%	5.76%	5.55%	1.64%	8.14%	8.30%	7.47%	5.57%	5.23%
25-30 years of age (head)	-0.59%	2.56%	2.43%	3.16%	-1.34%	1.58%	1.91%	3.03%	-5.07%	6.29%	6.20%	2.68%	0.80%	0.46%
36-40 years of age (head)	3.17%	2.24%	0.83%	4.10%	-2.37%	-0.64%	4.13%	1.65%	-4.99%	3.77%	3.72%	0.95%	0.90%	0.44%
41-45 years of age (head)	0.79%	0.78%	1.68%	4.50%	-0.64%	1.13%	3.41%	4.27%	-0.03%	7.37%	7.46%	5.39%	5.04%	4.16%
51-55 years of age (head)	5.29%	5.33%	4.95%	7.71%	1.93%	2.27%	7.45%	7.15%	2.47%	11.07%	10.32%	12.34%	7.81%	8.62%
56-60 years of age (head)	6.77%	8.05%	6.48%	11.31%	1.35%	5.73%	7.70%	8.21%	5.25%	8.98%	12.91%	13.57%	8.50%	11.29%
Household head with primary schooling	3.56%	3.09%	0.37%	4.55%	1.95%	-0.77%	4.80%	4.72%	0.62%	7.62%	9.53%	7.85%	5.32%	4.90%
Household head with lower secondary schooling	-0.33%	3.15%	4.23%	4.46%	1.58%	-0.79%	4.38%	2.41%	-2.19%	6.13%	5.80%	4.45%	4.05%	4.53%

Household head with upper secondary schooling	0.71%	1.66%	5.65%	7.80%	0.15%	3.12%	7.68%	3.66%	-1.28%	7.69%	6.05%	5.58%	3.12%	4.85%
Household head with university education	-1.51%	3.12%	6.96%	10.81%	4.56%	9.02%	8.68%	8.12%	0.38%	8.03%	9.23%	10.24%	8.37%	7.06%
Household head employed	3.09%	4.14%	2.62%	4.94%	-0.89%	1.14%	5.11%	4.94%	0.24%	7.33%	7.95%	6.88%	4.75%	4.53%
Household head unemployed	9.23%	-5.85%	11.76%	9.15%	-2.49%	-2.54%	5.90%	1.52%	1.48%	8.81%	10.68%	3.77%	0.15%	2.46%
Household head subordinate	2.41%	4.42%	2.57%	6.04%	-1.01%	1.27%	4.82%	5.46%	0.41%	8.32%	8.48%	8.05%	6.58%	7.01%
Household head self-employed	5.34%	3.76%	0.85%	1.49%	-1.80%	-1.25%	4.60%	3.70%	1.19%	-4.02%	5.86%	1.17%	0.21%	-4.20%
Household head employer	3.75%	3.30%	7.21%	13.11%	3.01%	8.95%	9.67%	5.67%	5.72%	5.99%	7.93%	5.62%	-2.40%	0.00%

Source: ENIGH 1984-2012 (INEGI).

Figure 10.

Distribution of household saving by component, 1984-2012
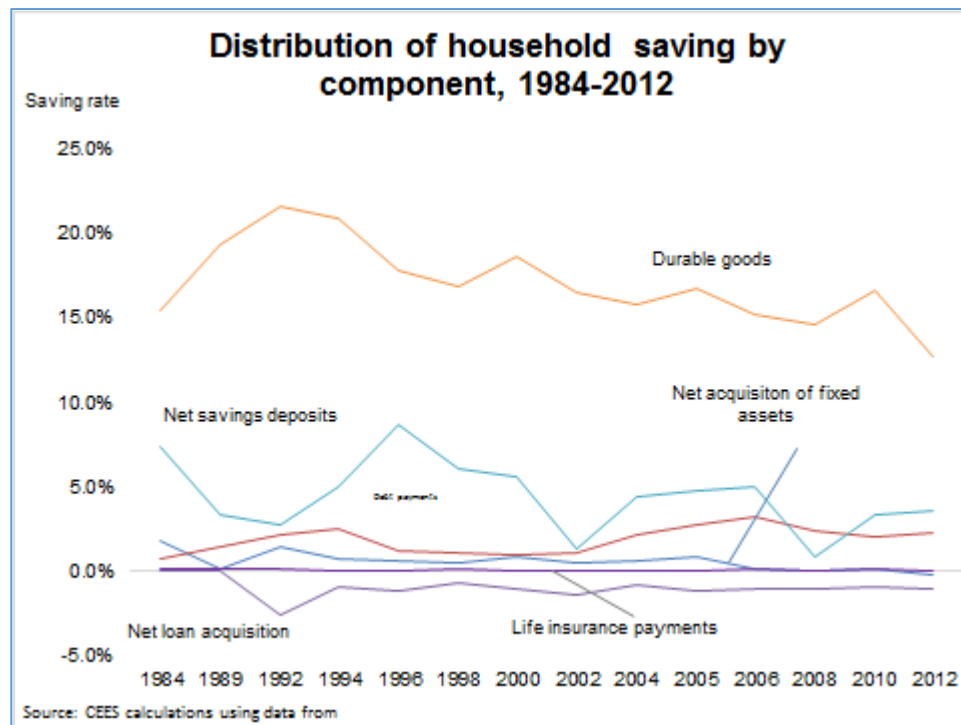
The use of financial instruments by Mexican households in theory could be either a matter of choice, or a matter of access to the financial system. Later in the text we show some data that may be indicative of the preference for different alternatives (from the Financial Inclusion Survey), and for exploring further whether access is a relevant issue, we process the data from the National Dictionary of Economic Units 2013 and from the National Banking Comission 2013, which provide the geographic location of all financial insitutions by locality (which is equivalent to the neighborhood level) and municipality, respectively. Since the ENIGH also identifies the locality and municipality where each household in the sample is located, we create a geographic identifier that allows linking both data sources to create a variable of financial access by household, using the 2012 round of the survey. Specifically, we identify the presence of a bank branch in each locality (from the first data base), as well as the number of financial institutions by municipality (from the second).

Figure 11.

% of households with access to the financial system in their locality, by decile in 2012
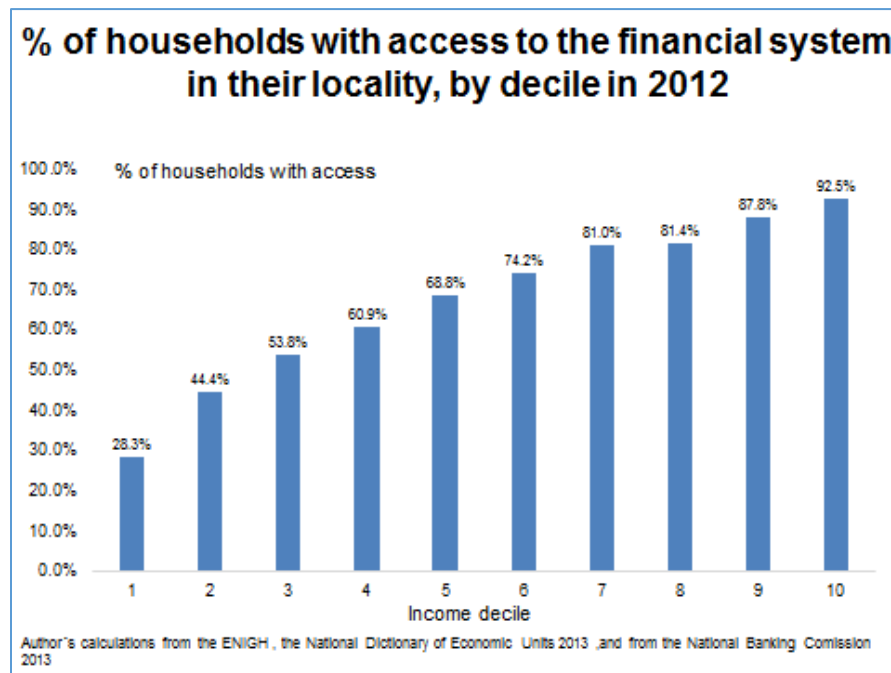
All in all, we find that for 67 percent of Mexican households there is presence of a banking institution in the locality of residence; conversely one out of three households live in a locality without those services. However, there are large differences across the income distribution. Figure 11 shows that 28.3, 44.4, and 53.8 percent of households in the first three deciles of the income distribution, respectively, live in a locality with presence of the banking system, while the shares are of between 60 and 74.2 percent in the middle secrtion of the distribution in deciles 4 to 6, and of 81.4, 87.8 and 92.8 percent, respectively, for households in the richest deciles. The data therefore show that there are large differences in access to the financial system as measured by the physical presence of financial institutions by geographic area.

The data from the National Commission of Banking include identifiers at the municipality level only, which can be considered a less restrictive measure of access than localities (each municipality can include several localities, although they vary considerably in size and effective access). These data also consider a wide range of financial institutions including banks, credit unions, microfinance institutions, and banking correspondents. According

to our results, of the 2,456 municipalities that are considered in the database (which represent more than 98 percent of the total), 1,244 (more than half) do not have presence of any financial institution, 14.1 per cent of municipalities have one institution, 12 percent register two institutions, and the remaining municipalities (23.2 per cent) register three or more institutions. The full distribution of financial institutions is shown in Figure 12, which clearly illustrates that access to the financial system in Mexico is far from widespread and generalized.
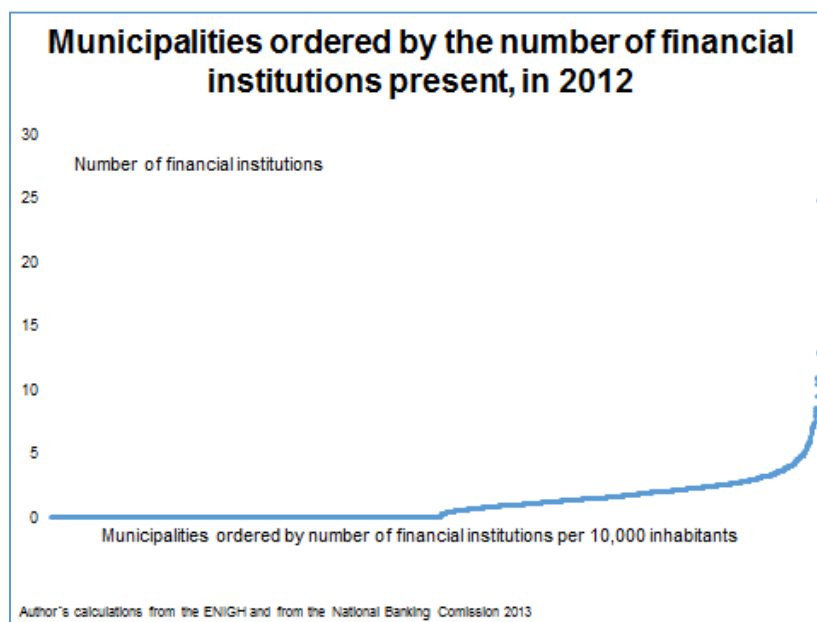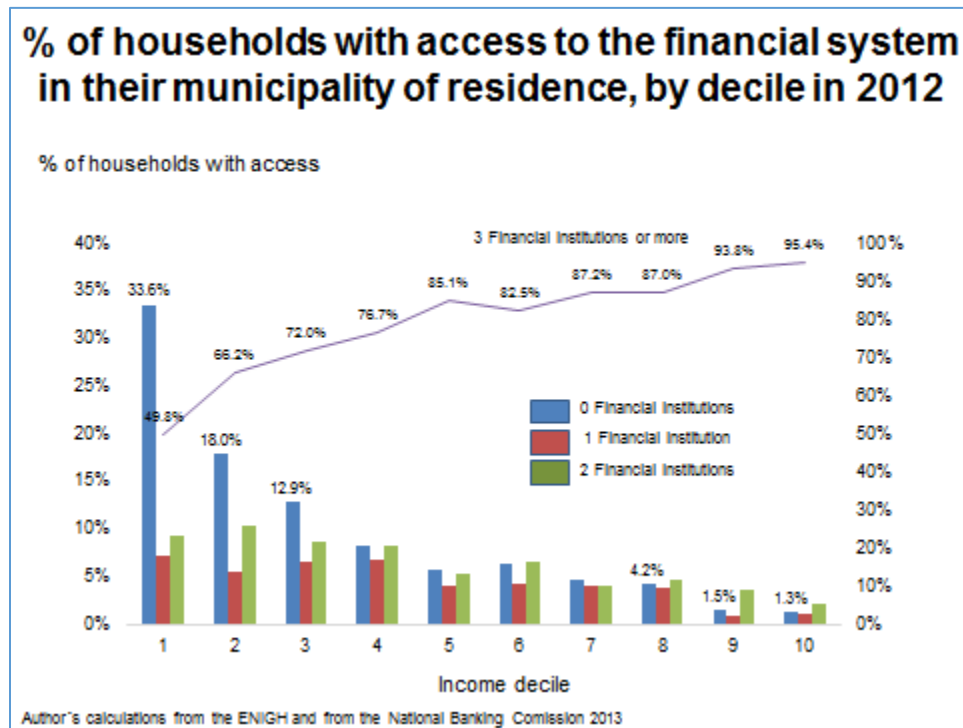
Figure 12.

Figure 13 links the presence of financial institutions from the same database to each household, by using the municipality of residence as identifier and also reveals considerable differences across the income distribution. While among the poorest househlds the proportion living in a municipality with no financial institution is 33 percent, the share is negligible in the richest deciles. Conversely, while around 50 and 66 percent of the poorest households live in a municipality where there are three or more financial institutions, the share is above 90 percent for the richest 20 percent.

The evidence from these databases supports the view that access to the financial system might be related to the type of instruments used by Mexican households to save. Under the

assumption that saving throught the financial system is more efficient and provides greater security, among other advantages, the hypothesis is that greater *access* to these services should be related to greater *use*, and therefore, different strategies in financial behaviors should be observed.

Figure 13.

% of households with access to the financial system in their municipality of residence, by decile in 2012

Author´s calculations from the ENIGH and from the National Banking Comission 2013

Interestingly, along with differences in access, there are also large differences in savings in Mexico along the income distribution. As shown in Table 10, which uses the median savings rate, while median savings rates oscillate between 30 and 42 percent in the 10th decile between 1984 and 2012, they barely reach 12 percent in the first three deciles, with negative rates among the poorest 10 percent of households. Moreover, inequality in savings has increased over time, with declines in savings rates among the lowest deciles in recent years. It should be noted, however, that in these estimates all transitory incomes are included, so they do not necessarily reflect longer-term savings (the decomposition by education groups presented later is more informative of long-term trends in this respect).

Table 10. Estimates of Household Savings by Household Income Decile, 1984-2012 (median savings rate)

Subgroup	1984	1989	1992	1994	1996	1998	2000	2002	2004	2005	2006	2008	2010	2012
Total	15.2%	19.8%	21.4%	23.4%	15.7%	16.8%	18.8%	19.9%	19.6%	23.2%	23.0%	23.8%	22.7%	18.8%
												-	-	-
Decile 1	4.1%	-2.8%	6.9%	4.8%	3.8%	-0.4%	2.4%	8.1%	-3.8%	-3.0%	-1.4%	15.5%	15.2%	17.5%
Decile 2	5.0%	6.6%	9.5%	13.6%	4.9%	3.6%	6.3%	7.3%	8.5%	7.7%	9.4%	5.3%	5.3%	-1.2%
Decile 3	6.6%	12.0%	10.4%	13.3%	7.9%	7.3%	10.7%	10.1%	11.0%	13.3%	13.5%	12.9%	12.8%	2.5%
Decile 4	15.4%	14.4%	14.9%	16.0%	7.0%	8.2%	13.0%	12.9%	17.4%	16.9%	17.0%	18.2%	16.0%	11.9%
Decile 5	13.1%	19.2%	15.0%	16.4%	12.4%	11.8%	11.4%	14.8%	18.3%	19.9%	21.2%	21.3%	21.8%	16.4%
Decile 6	14.3%	18.7%	20.1%	21.5%	12.6%	17.5%	19.3%	20.8%	23.1%	24.1%	23.8%	25.1%	23.7%	17.9%
Decile 7	15.6%	23.6%	25.2%	26.2%	18.3%	18.3%	21.4%	19.7%	24.8%	27.5%	27.5%	31.6%	26.2%	22.8%
Decile 8	18.0%	26.9%	26.7%	27.8%	19.2%	22.7%	23.2%	26.6%	29.1%	31.2%	30.2%	34.9%	30.6%	25.5%
Decile 9	25.1%	33.9%	30.0%	33.9%	24.3%	28.6%	30.4%	29.9%	29.5%	35.3%	32.3%	39.2%	33.9%	29.6%
Decile 10	31.2%	41.7%	39.3%	42.3%	35.7%	39.5%	37.8%	36.1%	35.6%	41.1%	39.1%	48.6%	39.7%	39.4%

6.2 Cohort Analysis with the ENIGH Surveys

So far, our analysis has been static in terms of observing the population in snapshots of data. However, savings are intrinsically dynamic phenomena that require a different approach. Given that savings can only be adequately defined at the household, and not individual, level, the focus of our analysis in this respect is on the heads of household, who for the most part have the majority of the responsibility for determining the level of household savings. We group individuals by their age at the time of the survey, or more appropriately, their year of birth. The purpose of defining cohorts is two-fold: to make clear our population of interest at any given point in time, and to use cohort averages over time to represent a pseudo (or synthetic) panel. We define cohorts over a wide range of age groups and for a few age groups at a time to evaluate dynamic trends in household level saving.

We make use of a broad range of cohorts from 18 to 80 years of age, where 18 years of age represents our starting point since this typically exemplifies the exit age from school and into the workforce, and thus the first stage of lifetime savings. The literature suggest that savings follow an inverted U shape over the life cycle of individuals, and we would expect that at the household level, the same trend would be observed if we use as a point of reference the heads of household.

The use of synthetic panels for analyzing the dynamics of household saving were first suggested by Browning, Deaton and Irish (1985)[7] and were put into practice by Attanasio (1993) and subsequent studies. For our application we create a pseudo panel of household heads for the period 1984-2012 using repeated cross-sections, and averaging over individuals with the same year of birth to create consistent indicators of a similar group over time. This procedure can be as efficient as using real panel data, since in theory the surveys used are nationally representative in a given period of time, and this strategy likely reduces idiosyncratic measurement error and heterogeneity (Attanasio and Banks, 1998) in addition to avoiding attrition bias common to panel analysis. We follow average trends of a cohort in each period, assuming that the composition of each cohort stays fixed over time.

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[7] Also see Deaton (1985) and Moffitt (1993).

The definition of an average cohort depends on the analysis under consideration: Attanasio (1993) defines each cohort by considering household heads born between 1910 and 1959 to evaluate savings trends between 1980 and 1990, dividing cohorts into five-year, year of birth intervals. This captures individuals who are at any point in time no older than 80 and no younger than 21. We initially propose expanding the age range slightly to include individuals as young as 18 (typically when youth are considered "adults," especially in developing countries). We also propose defining individuals in three, rather than five-year, year of birth intervals to capture a greater amount of inter-cohort variation over time.[8]

To adequately exploit data from 1984 to 2012, we define a sub-sample of individuals born between 1904 and 1994. In 1980, for example, an individual born in 1904 would be 80 years of age, whereas in 2012 an individual born in 1994 would be 18 years of age. We then define cohorts in three year, year of birth intervals, beginning in the period 1903-1905 and ending in the period 1993-1995, resulting in a total of 31 year of birth cohorts. From these 31 unique year of birth cohorts, we then define the median age of each cohort in each period, which is subsequently used in the life cycle analysis to define and average across individuals in a given cohort. Specifically, we define year of birth cohorts such that the median age of those born between 1903-1905 is 80 in 1984, and the median age of those born between 1993-1995 in 2012 is 18.

Given that we are interested in evaluating the life cycle from 18-80 years of age (which represents a very wide range), some of the younger cohorts will not exist in earlier years, and some of the oldest cohorts will not exist in the most recent years. That is, in any given survey year *t*, we drop all individuals with a *median* age below 18 or greater than 80 (for the sake of clarity, we drop based on the median age and not the real age, thus giving us a sample of individuals from 18-80 years of age in any given year). Given the parameters we consider for our sample, we define the median age in any given survey year *t* as:

$$Age = t - c$$

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[8] In practice, however, we report results using the traditional three-year cohorts and a smaller age range (focusing mostly on the ages between 25 and 65) as we found that using shorter cohort periods and wider age ranges made our estimates (and graphical output) very sensitive to changes in parameter or model specifications. Results using the five year cohorts and expanded age ranges are available upon request.

where c is the median year of birth of each cohort. Since the cohort definition is homogenous across time, the median age for a given cohort will always be the same in a given survey year t. Once we define cell means, we plot these against the median age for each cohort and survey year.

Figure 14.

Cohort trajectories of household savings rates

Source: CEES calculations using data from INEGI.

Cohort trajectories by using the three definitions of household saving are presented in Figure 14, where the measures S_2 and S_2 clearly show a positive trend with the age of the household head, while the evolution of S_1 is flatter. However, these trends are consequence of several different factors acting simulteneusly, and in what follows we try to disentangle them for identifying possible implications for the future.

6.2.1 Defining Cells and Cell Size

Given the definition of each cohort in survey year t, the composition and size of each cell can be defined theoretically as

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$$\sum_{1}^{c} c \sum_{t=0}^{T} t$$

However, since not every cohort exists in every survey year (given our median age restrictions), the real cell size is smaller. Since we are interested in cell means (which represent the average savings rate per age cohort[9]), we first consider our indicator of interest as a function of cohort tendencies (what Attanasio calls a measure of location) and an error term, which allows us to decompose the variability of savings for each household head in a given year-cohort. For each individual (household head) i with a median age a in cohort c in time t, we consider the following (taken from Attanasio, 1993):

$$X_t^{aci} = \delta_t^c + \varepsilon_t^{aci} \tag{1}$$

where δ represents cell means (which we can also define as cell medians), and ε is a random error (deviations from δ) with the assumption that $E[\varepsilon] = 0$.[10] In our estimation methodology, cell means are adjusted by cell size, such that cohorts with a larger N are weighted appropriately. While our indicators (X's) are continuous, they are not censored and thus unrestricted over the age profile we are considering. As such, we can estimate the δ as simple weighted averages of the household savings rate.[11] While our results consider both mean and median savings rate, in what follows we describe the methodology considering the mean savings rate for simplification (though our results use the median, which is more common in similar empirical applications).

6.2.2 Using Polynomials to Capture Age, Cohort and Time Effects

While (1) above allows us to capture an average trajectory over time (with a minimal amount of noise), it alone does not allow us to disentangle age, cohort, and time effects. These effects are important to capture since repeated snapshots of a given indicator over time might mislead us into believing a trajectory in household savings is straightforward and easy to identify when in

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[9] In the methodology that follows, we assume that our indicator of interest is the weighted mean. However, we also apply the same methodology to the median savings rate and the aggregated mean savings rate.

[10] For now, we make this assumption since our benchmark analysis uses OLS rather than maximum likelihood estimation methods.

[11] Some surveys that capture income are top-coded, especially those capturing a large proportion of the population, since they could plausibly eliminate the confidentiality of their subjects. This is not the case in the ENIGH. See Attanasio (1993) for more information.

reality it is more complex. Since we do not observe a given cohort over their entire life cycle (or at the very least, from the age of 18 through the age of 80), having postulated a typical age profile of savings (which is well documented in the literature), we can consider any deviations in savings in the aggregate as cohort effects, since they capture differences across cohorts that cannot be accounted for by differences in age. These deviations could also be considered a combination of age and time effects, since what makes a group of individuals different in terms of savings, other than their age, is the time period in which they are being considered.

To identify each effect separately we can start by assuming that the δ_t^c represent cohort means for any one of our savings indicators (we consider three main indicators in our analysis, defined in the results section), such that these means can be expressed as polynomials in age, year of birth (cohort) and survey year, as outlined in Attanasio (1993). Without making any assumptions about the structure of the δ_t^c, we cannot identify age, cohort, or time effects since the input variables are linearly dependent upon one another (since age = time – median year of birth of cohort). However, if we define the polynomials of age, cohort, and time, we can identify the change in the indicators of interest. We can thus estimate these effects if we assume the cell means are a function of three distinct polynomials in age, cohort and time (with constant α_0):

$$\delta_t^c = \alpha_0 + \hat{\alpha}_1 a + \alpha_2 a^2 + \alpha_3 a^3 + \alpha_1 a + \hat{\beta}_1 t + \beta_2 t^2 + \beta_3 t^3 + \hat{\gamma}_1 c + \gamma_2 c^2 + \gamma_3 c^3 + \varepsilon_t^c \tag{2}$$

Though it is not possible to identify the coefficients on the linear terms separately ($\hat{\alpha}$, $\hat{\beta}$, $\hat{\gamma}$), we can estimate the same equation by substituting the coefficients on the linear terms:

$$\delta_t^c = \alpha_0 + \alpha_1 a + \alpha_2 a^2 + \alpha_3 a^3 + \beta_2 t^2 + \beta_3 t^3 + \gamma_1 c + \gamma_2 c^2 + \gamma_3 c^3 + \varepsilon_t^c \tag{3}$$

where $\alpha_1 = \hat{\alpha}_1 + \hat{\beta}_1$ & $\gamma_1 = \hat{\gamma}_1 + \hat{\beta}_1$

By taking the first differences of (3), we arrive at an equation that can be estimated to determine the shape of the age profile.

$$\Delta\delta_t^c = \alpha_1 + \alpha_2 \Delta a^2 + \alpha_3 \Delta a^3 + \beta_2 \Delta t^2 + \beta_3 \Delta t^3 \tag{4}$$

While it is possible to estimate (3) and (4) with additional variables to account for within-cohort heterogeneity (within each cohort-year cell), we estimate the model without controls. This

could potentially lead to biased estimates of household level savings (the cell means, δ), but we assume that this heterogeneity would not greatly affect the shape of our age profile for savings (although it is straightforward to run our analysis controlling for these groups directly).

We can plausibly estimate (4) using Ordinary Least Squares (OLS) and standard OLS standard errors. Following Attanasio (1993), rather than estimating (4) above directly, we smooth the cell means (which are essentially individual line plots per cohort) by regressing these cell means on a fifth order polynomial in age, c-1 dummies for each cohort, and t-1 dummies for each survey year, the latter constrained to sum up to zero and to be orthogonal to a linear (time) trend (see below). That is, we estimate the following equation at the cohort-year level:

$$\delta_t^{c=} \ \alpha_1 a + \alpha_2 a^2 + \alpha_3 a^3 + \alpha_4 a^4 + \alpha_5 a^5 + \gamma \mathbf{C} + \boldsymbol{\beta}\boldsymbol{\tau} + \varepsilon_t^c \tag{5}$$

where $\mathbf{C}$ represents a vector of c-1 dummies (γ a vector of coefficients) and $\boldsymbol{\tau}$ represents a vector of k-1 constrained survey year dummies (where we exclude the most recent year) with its corresponding vector of coefficients $\boldsymbol{\beta}$ (where k represents the total number of survey years). Since the interpretation on the constant (α_0) is ambiguous in (4), we estimate effects without it and, as pointed out by Attanasio (1993), we can plausibly identify the shape, but not the position, of the age profile.[12] The specific modification of each survey year (t) dummy can be explained arithmetically by:

$$\tau_t = ((t_t\text{-}t_T) - (\frac{t_{dist}}{2} * t_{T\text{-}1}))$$

for each year t where the sub-index T represents the most recent survey year available (in the case of the ENIGH, 2012) and *dist* is the "distance" in years between year t and the most recent year (t_T), which we divide by two. The smoothed profiles, as stressed by Attanasio (1993), assume that year effects are identical across cohorts. This would imply that all trends in the means can be interpreted as being the result of age and cohort effects.

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[12] In practice, we treat the youngest cohort as our intercept, which establishes the "starting point" for the age profile.

6.2.3 Graphical Interpretation of Age, Cohort and Time Effects

In estimating (5) above (using the fifth order polynomial in age, and *c*-1 and k-1 dummies for cohorts and survey years, respectively), we then plot the predicted values of our indicators using age, cohort, and time against the median age, cohort, and survey year (respectively) to identify separately the age, cohort, and time profiles for savings rates. We can also estimate age and time effects isolated from cohort effects by dropping the *c*-1 cohort dummies from (5). We smooth out the profiles to obtain a single curve with the age, cohort, and time effects on the y-axis and the median age, cohort, and survey year on the x-axis. Our interest is in the effect on each savings measure across age or cohort, or over time.

6.2.4 Life Cycle Results

Figures 15-17 present the graphical results estimating the life cycle profiles using the median savings rate, where the consumption of durables is considered a form of saving in itself for the entire sample per age cohort. We choose median savings rates over aggregate savings rates because the former provide a smoother picture of savings over the life cycle with less noise than the mean or aggregate savings rate. Moreover, the literature on the life cycle model of savings tends to favor the use of the median savings rate. As we mentioned in the previous section, though our initial estimations included the use of three-year cohort intervals and household head ages ranging from 18-80, we constrain our graphical analysis to five-year cohort intervals and focus primarily on household heads between the ages of 25 and 65. Our justification for doing so is that, since we are not actually capturing individual savings, and the number of household heads lower than 25 and greater than 65 is low, the shorter age (and thus cohort) range will provide us with more reliable estimates. One additional constraint was the inclusion of data from the survey year for 2012. In the vast majority of specifications we considered for the age profiles, the inclusion of 2012 created a substantial amount of noise in all our the results, very likely due to a slightly different definition of savings used for this year for which we were not able to account.

Once we have restricted our sample in terms of the composition of the cohorts, the age range and survey year range used in our estimations, we find very straightforward and expected

results. As can be observed in Figure 15 below, the age effect is positive and increasing with age. While the levelling off of the age effect is not as strong as we would expect once heads of household reach retirement age, the expectation is that the effect would become flat along the x-axis and rapidly decrease as heads of household reach 80 years of age. What is interesting about Figure 15 is that the inverted U profile only appears moderately, where it would appear the steepest slope appears between the ages of 40 and 55, signaling a relatively late transition into higher savings.

Figure 15. Age Effect, Median Savings Rate
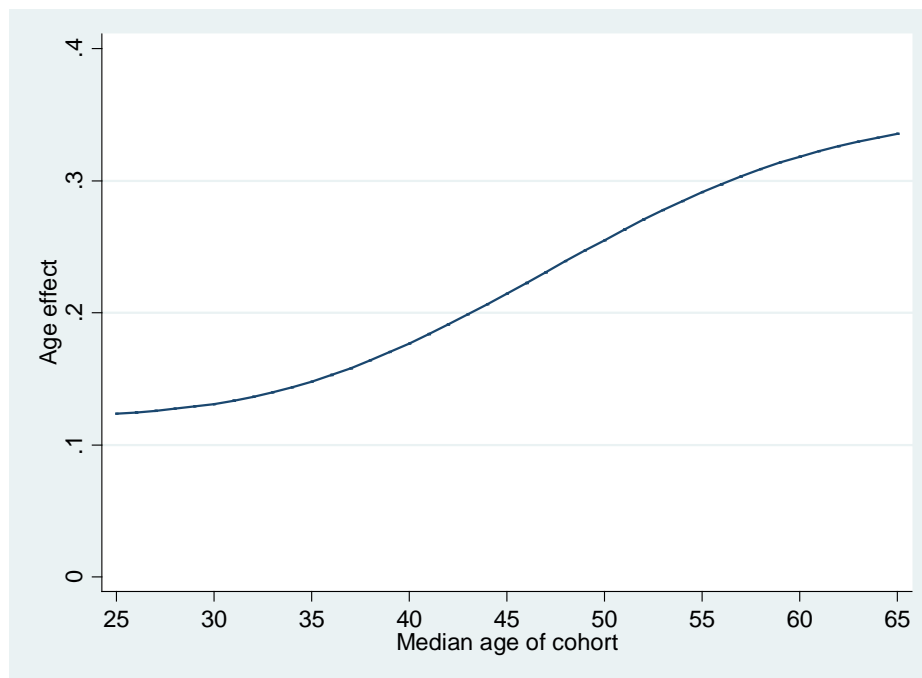
Figure 16. Cohort Effect, Median Savings Rate
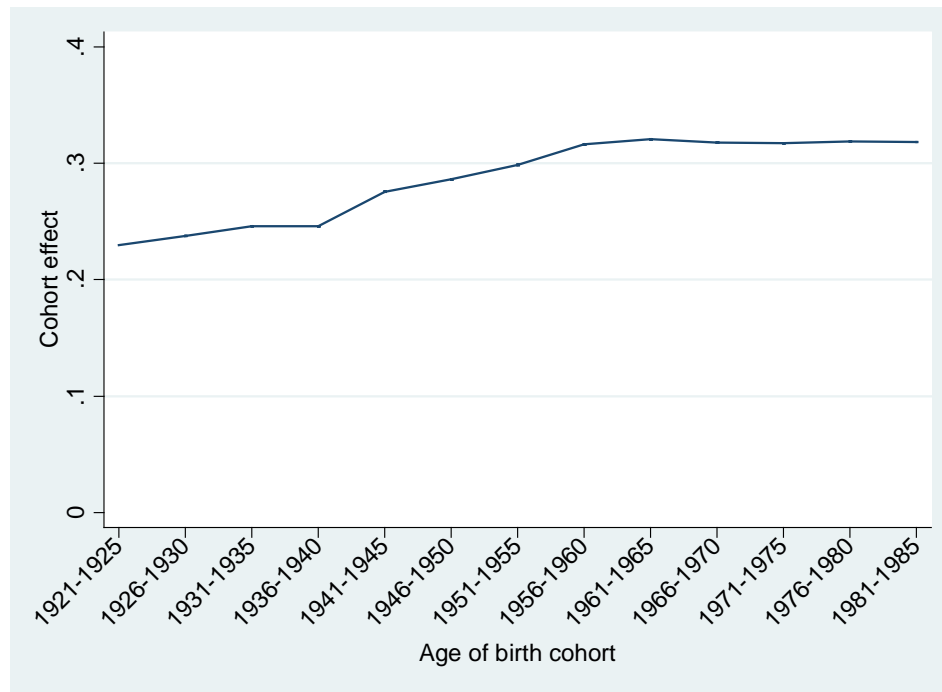
In terms of the cohort effect (Figure 16), we see a positive and marginally increasing effect as we move in the direction of younger cohorts (here, the graphical interpretation is backwards from the age effect). The interpretation of a positive and increasing cohort effect is that newer generations would tend to save more because of increased access to finance schemes and perhaps an increased awareness of the need to save for retirement (consistent with the growth of various pensions programs in Mexico). While the growth in the cohort effect is not as smooth as the age effect, we see particularly important jumps for the cohorts born between 1940 and 1960, which through the 26-year period would be in middle adulthood and early retirement age.

As for the time effect (Figure 17 below), we observe trends mostly consistent with macroeconomic shocks to the Mexican economy, which would have affected savings trends for all households, regardless of age or cohort. For example, after 1984 there is a positive trend in saving up until the early 1990s. At this point, we see the trend reversed by 1994, signaling a strong impact of the Peso Crisis of late 1994. According to the time effects, savings did not

observe a positive exogenous shock (in fact, another negative shock can be observed after 2000) until 2005, when the time effect became positive again though remained flat through the remainder of the period, with no noticeable effect of the 2008 global recession.

Figure 17. Time Effect, Median Savings Rate
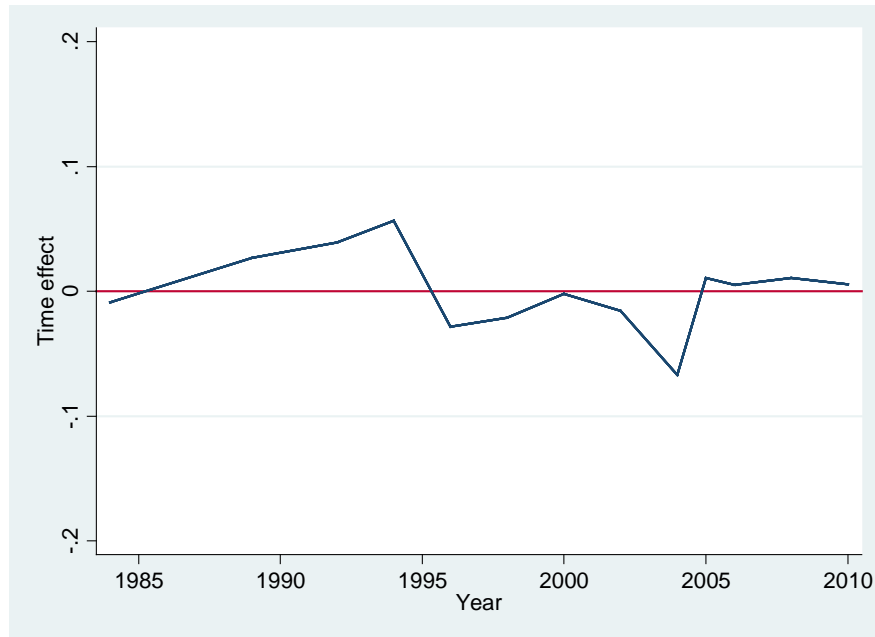
The central conclusion derived from these estimates is that if only age and cohort effects were to be observed in the future years, it would be expected that household saving rates in Mexico, and thus, overall domestic savings, would increase. On the one hand, as the population continues to age, the age-profile suggests that households will continue to save more. Additionally, if the new generations entering adulthood continue with the trends of the past several generations, there will be an additional saving-increasing trend.

6.2.5 Analysis by Groups

Figures 18-19 present the same profiles but distinguishing between the gender of the household head. Interesting results emerge once we consider male and female heads of household separately. Generally speaking, the age, cohort and time effects are more pronounced for female heads of household as compared to male heads of household. For example, the age effect is much

more pronounced for women than for men, and the sharp, positive trend displayed in the curve occurs earlier for women (around the age of 30) than for men (around the age of 40). As it relates to a noticeable inflection point, whereas it would appear the age effect continues to increase beyond the age of 65 for men, this is not the case for women, where the age effect drops off around the age of 63.
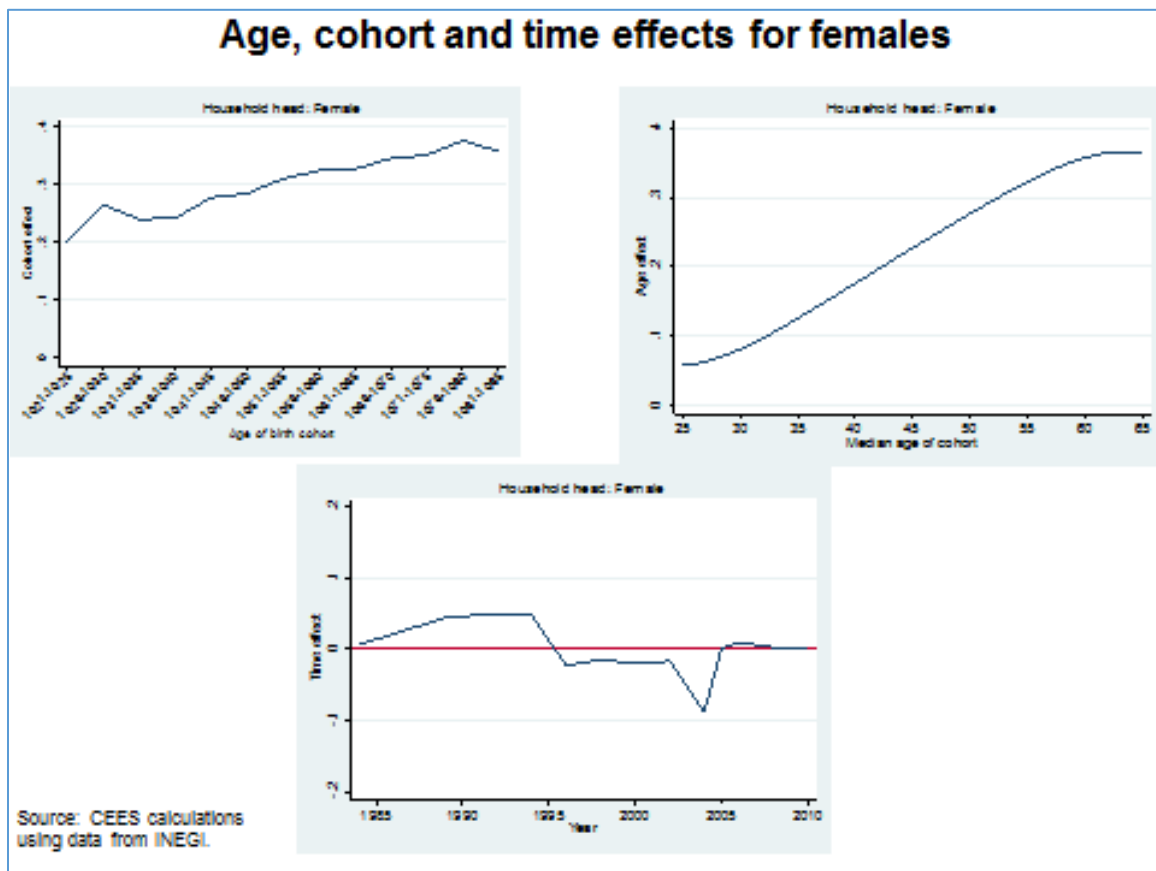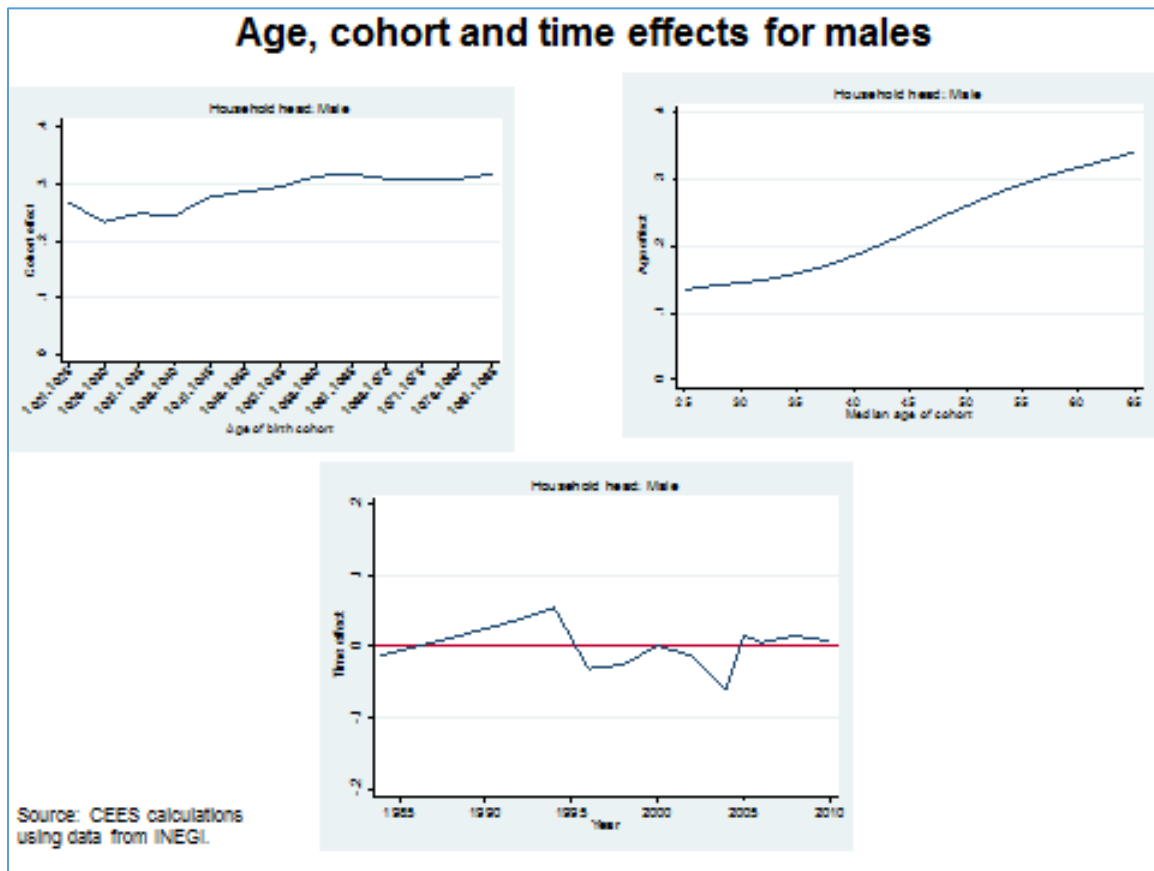
Figure 18. Age, Cohort and Time Effects for Females

Source: CEES calculations using data from INEGI.

Figure 19. Age, Cohort and Time Effects for Males

Source: CEES calculations using data from INEGI.

The cohort effects by gender also provide some interesting results. Whereas the cohort effect drops off for men after the earliest cohort, only increasing beginning with the generation born around 1940, the trend for women is mostly the opposite for these earlier generations. While both male and female heads of household observed a positive and increasing effect through younger generations, it appears that this generational effect is more pronounced for women as we consider younger generations.

In terms of time effects, trends by gender seem to mirror the general trends for the country as a whole. The jumps are slightly less pronounced for female heads of household than their male counterparts, but both appear to experience the same exogenous shocks with a similar magnitude throughout the period.

As for the differences across schooling levels, Figure 20 presents savings profiles by segments of completed education for the head of household: no schooling, primary or less, secondary, and tertiary. While most trends follow the general patterns described above (of positive and increasing age effects along the x-axis), the shapes of the profiles differ considerably. For example, for those heads of household with no schooling, the age effect approaches zero starting at the age of 25 and then increases gradually at around the age of 33. Relative to more educated heads of household, the age effect appears quite muted and levels off at retirement age. Meanwhile, for those with some schooling through high school-level studies, the trend is strictly increasing, though with an approximately exponential pattern for those with secondary and a slight s-curve pattern for those with primary or less.

Perhaps the most dramatic trend can be observed for heads of household with tertiary studies. Here, we observe three inflection points in the age profile: one occurring around the age of 33 (after increasing sharply beginning at the age of 25), the second less dramatic though beginning a positive trend around the age of 45, and the last inflection point just before retirement.

Cohort effects by levels of education follow mirrored trends for younger generations, but varying trends for the oldest generations on our sample (Figure 21). While the cohort effect is mostly increasing by generation for those with no schooling, household heads with primary or less display a sharp drop in the cohort effect until those born in the 1930s, whereas heads with secondary or more display the opposite trend. Cohort effects, not surprisingly, are strongest for those with tertiary education, which again could reflect greater access (though not for all socioeconomic groups) over time, permitting younger generations to save more.
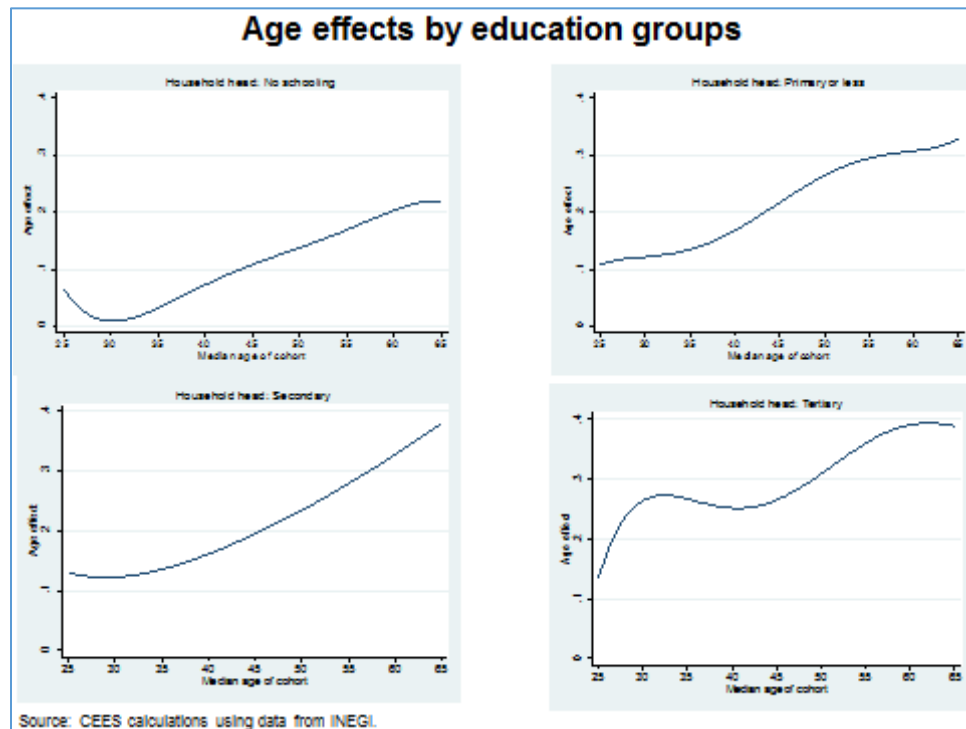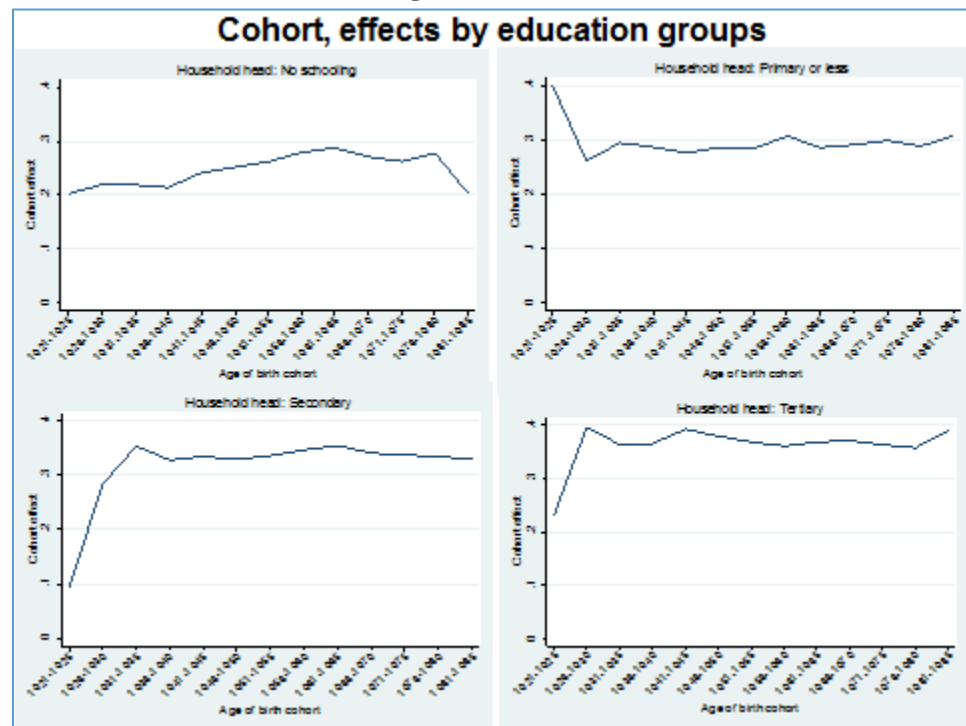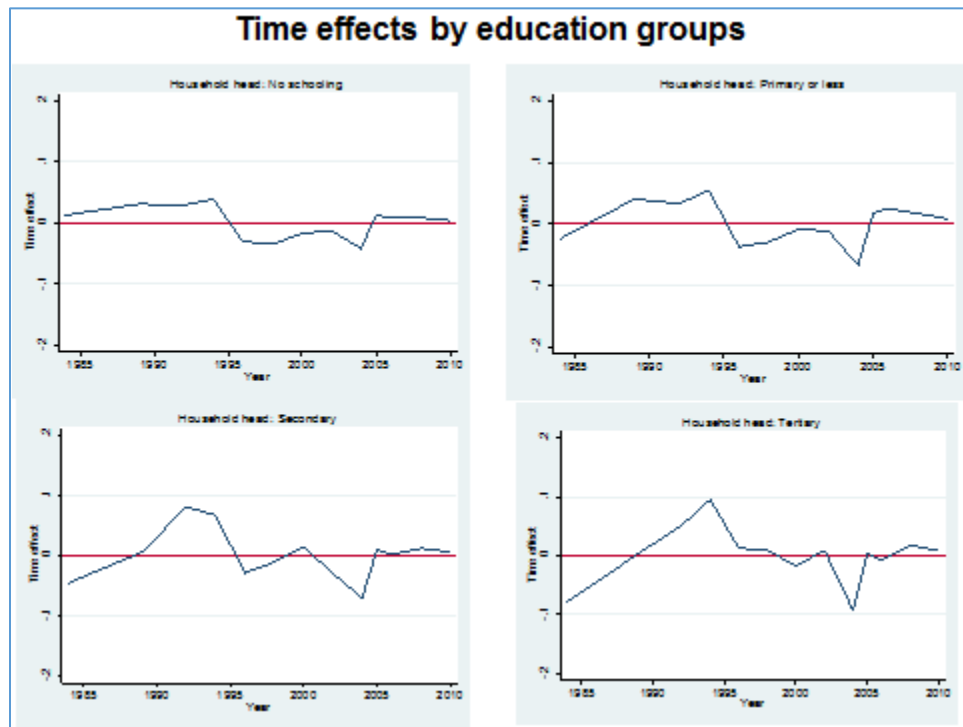
Figure 20.

Figure 21.

Figure 22.

Lastly, Figure 22 shows the time effects by level of education of the household head. Consistent with the age and cohort profiles, those with lower levels of education seem to display a less volatile trend in savings over time. For those with no schooling or less than secondary, the exogenous shocks appear less sharp than for household heads with secondary or more schooling. Household heads with tertiary studies appear to have been the most greatly affected by exogenous conditions, especially in the wake of the 1994 Peso crisis.

The conclusion derived from this last disaggregation is that if schooling levels in Mexico continue to increase and the proportion attaining higher education increases, among those that become household heads, the age and cohort effects identified above will most probably accelerate, and with them the savings rates for the household sector as a whole. Furthermore, since the household sector is the main driver of domestic savings, it is possible that these trends will impact the overall levels for the country.

6.3 A View from the Financial Inclusion Survey

The Financial Inclusion Survey (FIS) 2012 is a complementary source of data for dwelving more into the analysis of househols daving. This is a nationally representative survey with 6,113 observations that applies questionnaires to adults 18 to 70 years of age. Forty-six per cent are males, 80 percent are located in urban areas, and 21 percent have higher education. Among all participants in the survey, 40 percent declared that during the previous months they registered savings, defined as the residual between their income and all expenses.

The age pattern of those declaring savings is presented in Figure 23, where a slight inverted U pattern is observed with lower shares of households that save at ages 18-25 and 56-60.

The savings pattern by education of the head of the household is mostly consistent with what is found in other sources of data (such as the ENIGH). Specifically, while 62.2 per cent of household heads with higher education declare that they saved during the past months, the proportion is around 20 per cent among those that attained at most primary education, and increases almost linearly for other education levels (see Figure 24).

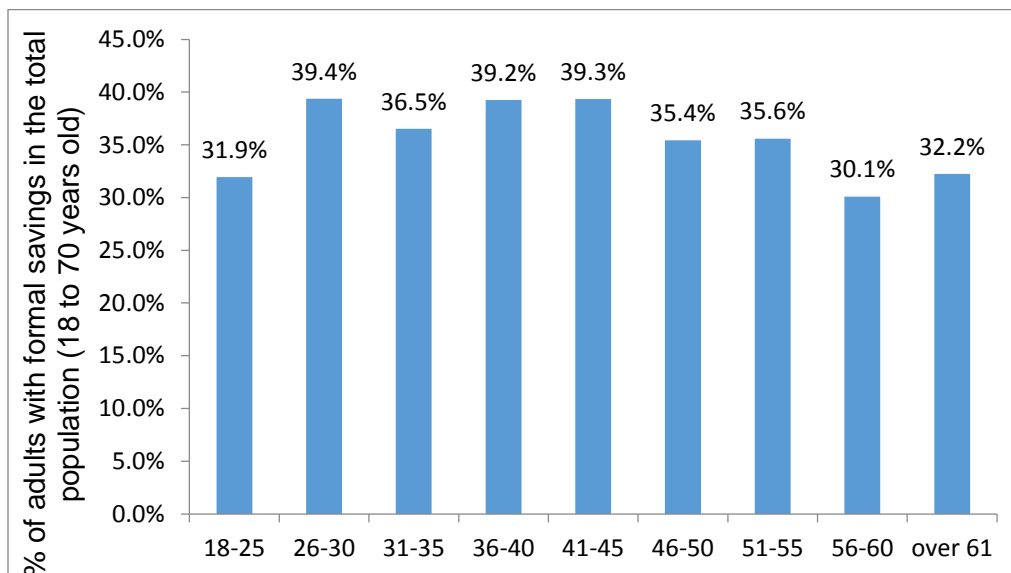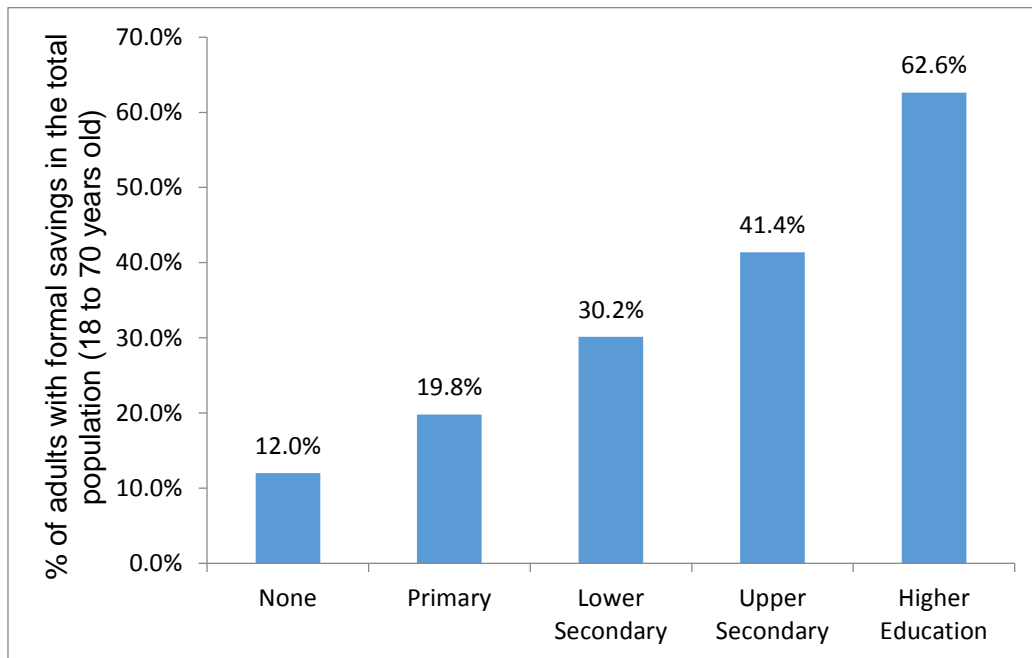**Figure 23. Percentage of Households Reporting Savings in Recent Months**

Figure 24. Percentage of Households That Report Saving, by Education of the Head

An interesting feature of the FIS is that it asks about the type of formal financial instrument most used (Figure 25). The data show that two-thirds of male household heads and about half of female household heads save through their payroll account, which is related to the deductions made in formal sector jobs for savings for retirement, among other purposes, and is characterized as "forced savings" in the sense that the resources are retained by the employer and deposited directly in the individualized savings account. The second most used source is savings accounts, with 43 and 50 per cent for females and males, respectively. Checking accounts, fixed-term deposits, and investment funds are much used financial instruments.

The use of payroll deductions as a means of savings is an important piece of information because alternative sources such as the ENIGH do not provide data on this, since the survey concentrates on registering disposable income. However, the limitation of the FIS is that it is not possible to know the amount of resources saved through this mechanism.

Figure 25.Financial Instruments That Respondents Report Having Used for Saving
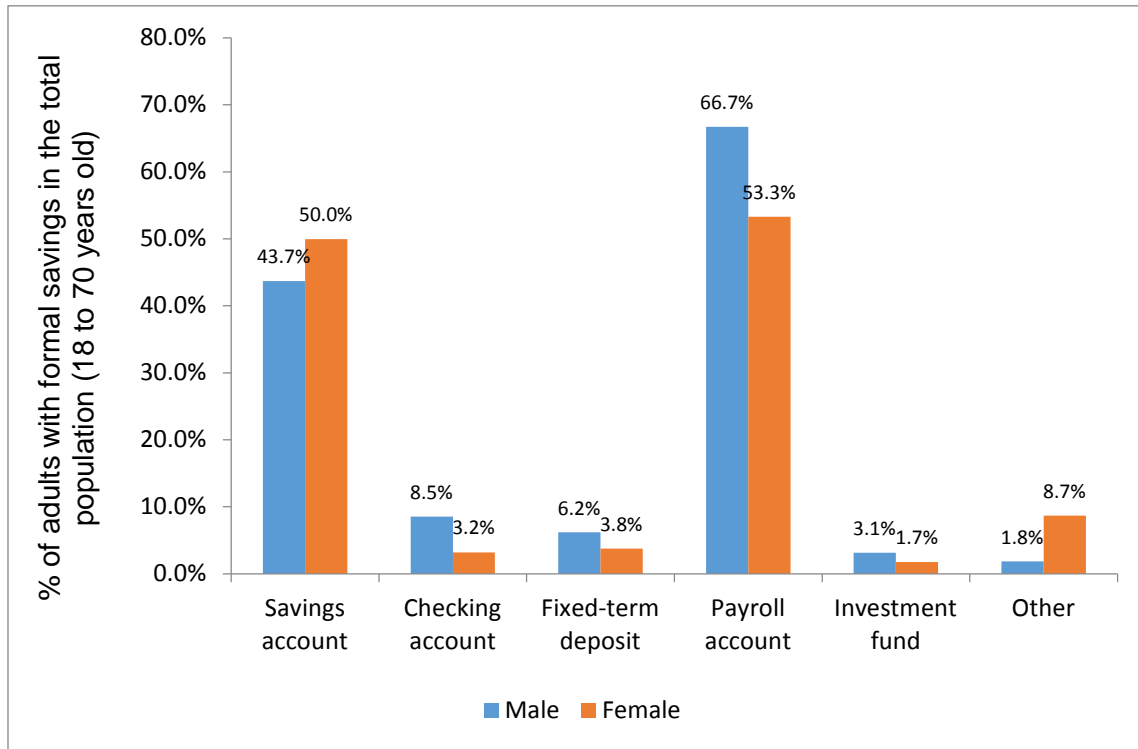

A key feature of the FIS, which is important for the objectives of the present research, is that it explicitly asks about respondents' motive for saving. As shown in Figure 26, practically 39 percent declare that they save for unexpected emergencies, 29 percent save for personal expenses, and 25 mention that they save for education and health expenditures. Only 16 per cent save for renovating or improving their housing, while 7.6 percent do so for launching or expanding a business, and 1.5 percent save for retirement. This is consistent with the finding from the ENIGH that a large proportion of saving from households is related to consumption of durable goods, which could fall in the categories of education, health, or personal expenses, and that only a small share is devoted to investment.

While it is not possible from these data to estimate the equivalent savings volumes related to each of these motives, the fact that only 7.6 percent of households declare an investement motive reinforces the view that perhaps an element behind the apparent disconnection between high savings and low growth in Mexico is the *use* of savings. The fact that only 1.5 percent

report saving for retirement is also an important finding, although it is possible that this proportion is considerably downward biased since a large part of the "forced" savings declared as a savings instrument in Figure 25 actually refers to investment in pension funds. Thus, it is likely that respondents do not consider that allocation as an investment for retirement in the same way that they register the savings motive in Figure 26.

Actually, 28 percent of respondents, when asked the question separately, report having an individual account for retirement. This figure coincides broadly with data from other sources indicating that more than 60 percent of Mexican employment is in the informal sector where, among other features, no access to formal pensions for retirement is available.

Figure 26. Reported Motives for Saving
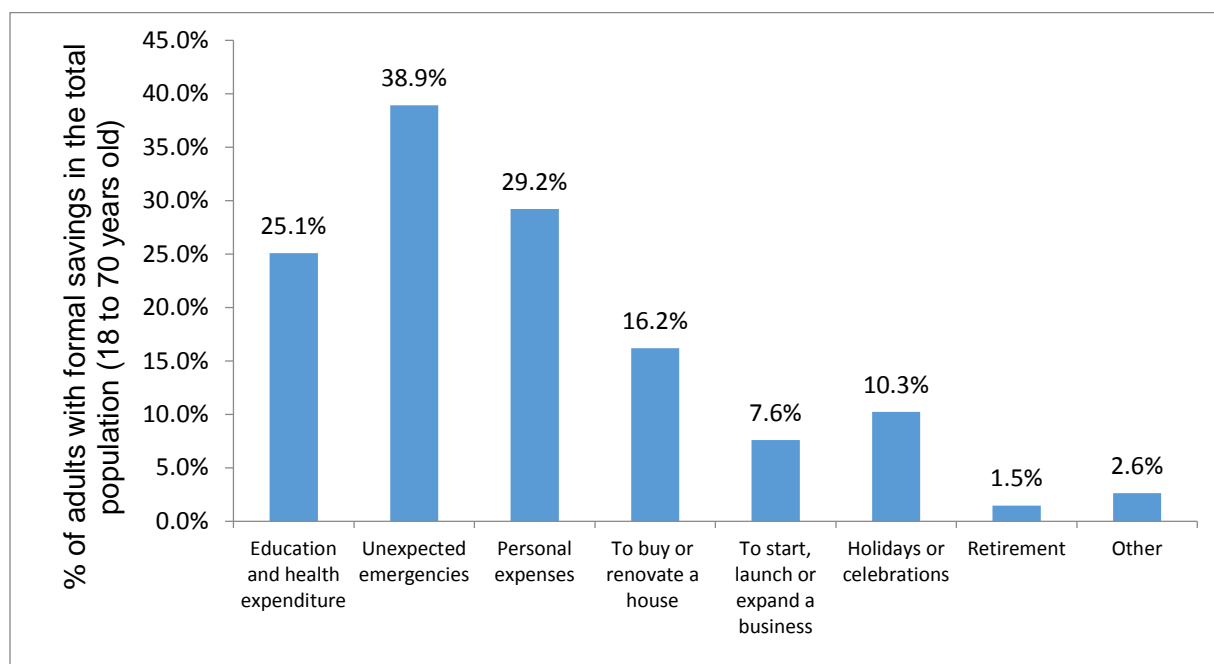
The FIS also captures in some detail the use of informal financial instruments for saving that are complementary to those shown before. In this regard, the most important result is that the most commonly used method is "keeping savings at home" (for 44.5 percent of households), while 21.8 per cent prefer informal group savings (*tandas*) as mechanisms, and around 10 per

cent prefer to lend money, save by giving their money to relatives or friends, or deposit their resources in informal savings schemes, respectively (see Figure 27).

Figure 27.
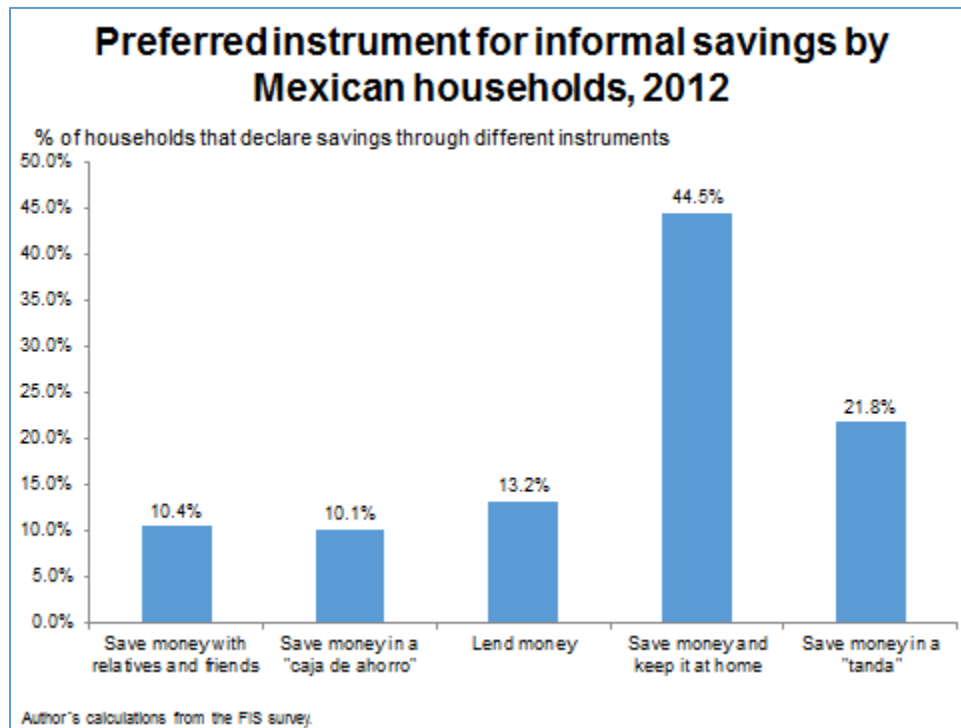
Twenty-seven percent of households reported using formal credit mechanisms, and among them half use credit cards as a means for accessing resources. The fact that 73 percent of the population reports not having access to formal credit mechanisms is quite striking.

Among users of formal credit, another interesting result is that their principal motive for indebtness is housing renovation or purchase, followed by use for personal expenses and unexpected emergencies. Only 19.5 per cent access credit for investment in a business.

Additionally, interesting differences arise with respect to the 40 percent of households that report having access to informal credit mechanisms; the results imply that 67 percent of households have access to some kind of credit, and therefore 33 per cent do not. The main sources of informal credit are relatives and friends. One third of those accessing informal credit do so for personal expenses, and about 28 percent access credit for financing education and

health expenses, while 18 percent use informal credit for unexpected expenses. Only 7 percent ask for a loan from informal sources for investment for expanding or starting a business.

In sum, the FIS provides additional interesting information on savings, among which perhaps the most relevant has to do with savings motives and savings mechanisms. The extremely low shares of households declaring that they save to invest in a business coincides with the conclusions from the ENIGH that pointed to the consumption of durables as the main savings channel, while the relatively limited use of savings accounts in the formal sector also coincides with the view that the resources saved by households do not necessarily translate to a large extent into finance for investment in the rest of the economy.

6.4 A Dynamic Analysis of Savings Using Panel Data

A third source of information for analyzing householed savings is the the National Survey on the Welfare Level of Households (Encuesta Nacional sobre el Nivel de Vida de los Hogares, ENNVIH), which is a true panel that was developed in the country for following socioeconomic characteristics. The data permit computing savings rates across households, which is the central interest of the present study. The panel follows a representative sample of the Mexican population in three rounds in 2002, 2005-06 and 2009. An additional round for 2012 was undertaken, but its results had not been made public at the time of writing (Appendix 1 provides a general description of the survey). An attractive feature of this dataset is the low level of attrition, which reached less than 10 percent during the course of its first seven years of application. To our knowledge the present study is the first to exploit the data for analyzing savings. The main drawback, however, as compared to the ENIGH data used for constructing pseudo-panels, is that the timing allows observing only a small window of seven years along the life cycle.

By processing the three rounds of the ENNVIH we find that 35, 27 and 31 percent of households, respectively, declared some form of savings in the years 2002, 2005 and 2009, and interestingly the panel permits identifying changes in savings behavior related to other dimensions. For instance, Figure 28 presents a scatter plot for the periods 2002-2006 and 2006-2009, where changes in household income are correlated with changes in savings patterns.

According to our results there seems to be little correspondence between both variables, at least during these periods of observation. While the year 2009 is an atypical year in terms of a general downturn in economic conditions, it is still of interest to observe that households that increased their savings the most are not neccesarily those that registered larger income raises. It must be borne in mind that the panel allows following the exact same households over time.

Figure 28.

Changes in income and changes in savings from the ENVVIH survey
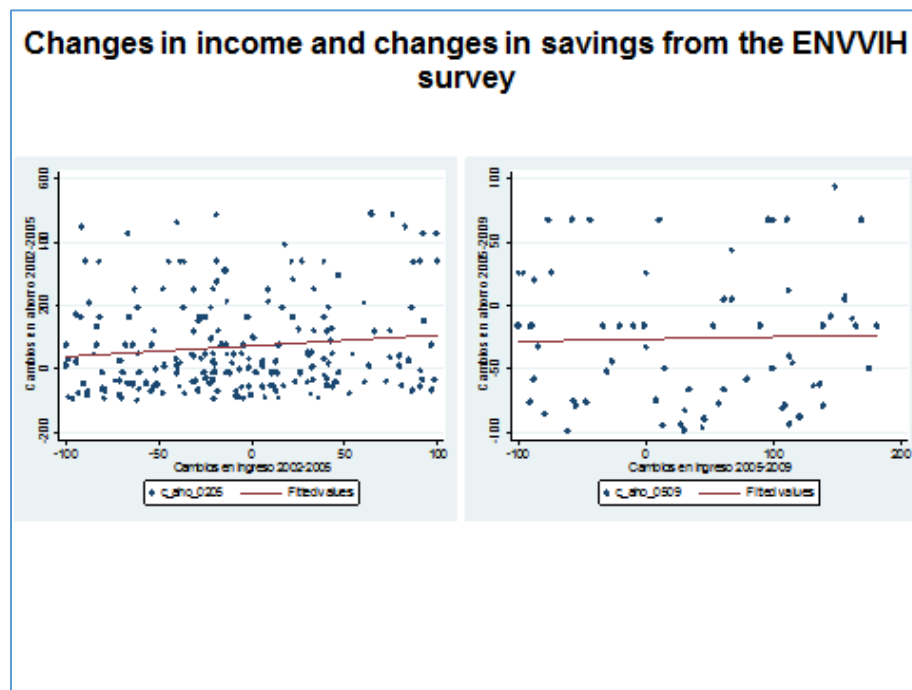
When looking at changes in employment status, however, interesting differences are found. As shown in Figure 29, when during the full 2002-2009 period there is a shift from the formal to the informal sector, and savings rates tend to decline for the same household, while shifts from informal to formal employment are related to higher savings. This is consistent with strategies that on the one hand use past savings when entering a more unstable environment (which is presumably the case in informal activities), and on the other accumulate savings when in more stable and favorable condition, as would be thought to prevail in the formal sector.

The data in the ENVVIH allow for a more detailed statistical exploration of the dynamics of savings by exploiting its panel component. Table 11 presents the results from four estimations,

where we intend to report with more statistical confidence the various results obtained from the other micro-data sources used in previous sections.[13]

Figure 29.
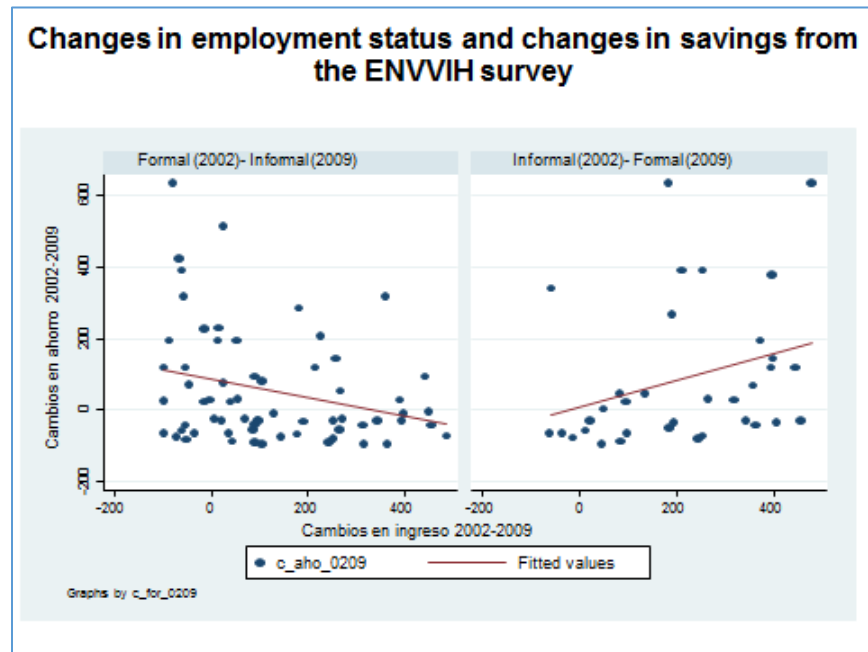
The model we specify intends to distinguish the association between changes in household savings rates over time (as declared directly in the survey by households) and a series of household characteristics and status. First we include the change in the age of the household head and its squared value to capture in some way the age effect illustrated in Figure 15 above. We include changes in education levels to confirm whether the schooling patterns identified with the synthetic cohort techniques using the ENIGH are confirmed through a true dynamic analysis. As a way of exploring in some more detail the association between changes in savings and contingencies and future prospects we include the data on labor market transitions from unemployment to employment and within formal and informal jobs during the 2002-2009 years. This is of interest because of the result discussed above that an important reported motive for household savings from the FIS is addressing unexpected contingencies.

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[13] It must still be acknowledged, however, that practically any estimation using information on household surveys such as the ENVVIH is subject to some endogeneity. Thus, while our results are indicative of probable relations, they should not be interpreted as causality.

A critical value for this study is the relation between savings and access to the financial market, which the ENVVIH can inform on through the question of whether the household has access to loans. Finally, since we are able to trace household composition it is also possible to verify whether changes in savings are related to increases in the older age dependency ratios, where a shift to retirement by household members would be expected to be accompanied by dissaving according to the life cycle theory. It should be borne in mind, however, that the window of observation is only of seven years for this sample.

Table 11. Panel Estimation of Changes in Household Saving over Time

VARIABLES	(1) Corrected Std errors	(2) Fixed effects++	(3) Random effects	(4) PCSD
Age	-0.774***	-1.411**	-0.181	1.291
	(0.018)	(0.539)	(0.563)	(1.264)
Age-squared	0.009***	0.020**	0.003	-0.016
	(0.000)	(0.007)	(0.008)	(0.015)
Years of schooling	0.001	0.050	0.207*	-0.033
	(0.004)	(0.215)	(0.118)	(0.212)
Transition unemployed to Employed	1.539***	1.814***	-1.649	2.814
	(0.027)	(0.309)	(1.403)	(2.239)
Transition formal to informal	-0.876***	-0.746	1.094	-2.002
	(0.023)	(0.795)	(1.099)	(1.749)
Transition informal to formal	0.266***	5.442***	3.545	-1.372
	(0.030)	(1.905)	(2.473)	(2.246)
Access to loans	-0.483***	-1.136***	-0.030	-0.971
	(0.020)	(0.456)	(1.451)	(2.438)
Dependency ratio above 65	-0.683***	-1.773**	-0.712	0.673
	(0.019)	(0.809)	(0.575)	(0.808)
Constant	0.740***	-0.982*	0.325	1.560
	(0.027)	(0.533)	(1.777)	(1.839)
Number of Observations	4,306	4,306	4,306	4,306
R^2	0.14	0.11	0.051	0.08

Robust standard errors in parentheses. ++ Fixed effects preferred model.

*** $p<0.01$, ** $p<0.05$, * $p<0.10$

The four regressions we present are differences-in-differences estimations that exploit the panel feature of the data. The first is estimated by OLS differences-in-differences corrected standard errors, household fixed effects, random effects, and Panel Corrected Standard Errors. The Hausmann test identifies the fixed effects model as preferred to the random effects, and we focus on this model since the introduction of household fixed effects would also be expected to be more precise than the other two estimations by controlling for household time-invariant characteristics. We include all results to show that important differences do arise in the different approaches, which reinforces the idea that the results should be interpreted with caution, more as associations in the data, than as causal relationships.

The first result is that the age profile derived from the estimation is of the expected U shape, and interestingly, changes in the age of the household head appear to be strongly and significantly related to changes in the household savings rate. In the case of the education variable, the association is positive, but not statistically significant. This is also an expected result, since after age 18 few household heads remain in school and are able to increase their years of education. The result reinforces the view that the differences in savings patterns across education levels that were identified through the synthetic cohort panel estimations with the ENIGH are not really associated with the dynamics of the household along its life cycle, but instead with cross-generational effects.

The variables capturing the association with labor market transitions are all significant and quite aligned to what could be expected. For instance, transitions of the same household from unemployment to employment or from the informal to the formal sector are associated with increases in household savings, while shifts from formality to informality are related to reductions in savings. This is consistent with the view that savings are a buffer mechanism for households, which was already documented from the FIS.

Interestingly, greater access to loans is associated with lower savings and the relation is statistically significant. This result is aligned with standard theory arguing that more access to credit makes savings less necessary, but it is also at odds with one of the results discussed previously that some households use the financial system for saving. Since as shown above,

however, households also declare relying importantly on informal savings mechanisms (in the FIS) it is possible that the first of these forces prevails.

Finally, the estimations show that increases in the share of elderly individuals in the household with respect to working age population members is inversely related to savings, as would be expected. This in turn is consistent with the slight hump shape obered in Figure 15 precisely in the transition from 60 to 65 years of age of the household head. The result suggests that savings tend to decline when household members enter retirement age, but they do not necessarily confirm the life cycle theory argument that the resources for financing the dissavings were accumulated during prime age and with the objective of funding future household needs.

7. Conclusions and Policy Implications

The present study addresses the question of why Mexico continues to show below-LAC average economic growth rates in spite of also showing systematically higher domestic savings. If savings are at least to some extent a means for financing development, the fact that this pattern has prevailed for practically two decades is quite surprising.

The value added of this document is to break down domestic savings into its institutional components of public, corporate and household sectors and to search for possible explanations from analyzing each of them separately. This separation is actually quite important because it reveals that household savings account for a majority of the country's domestic savings, and their relative importance has been expanding. While in 1993 about 35 percent of domestic savings in Mexico belonged to households, 20 years later the share of this sector was close to 60 percent. The corporate sector is the second most important player with around 26 per cent, while government savings account for only about 8 percent of the total. This suggests that better understanding household saving and identifying its main drivers is a large part of the equation and should be examined in more detail.

Corporate sector savings also merit attention since they account for a quarter of total domestic savings. In this case, we process two complementary data sources to provide some additional information to the aggregate trends. From the analysis of the 1999, 2004 and 2009 Economic Censuses and the yearly Manufacturing Sector Surveys for 2007 through 2013 the

main conclusion is that savings at the firm level are highly correlated with firm size and with being in the formal sector of the economy. Unfortunately for those interested in promoting greater savings in the corporate sector, a vast majority of firms in the country are neither of large size (95 per cent of firms have less than 10 workers and 85 per cent have 5 workers or less) nor in the formal sector, where only about one of every three firms operate. This justifies a closer look at small firms, for which Mexico actually has a good database through the Microenterprise Survey.

Interestingly, the analysis of this other source confirms the high correlation between size and formality and firm savings. The data additionally show a positive correlation between firm savings and access to social programs, and access to credit. Access to social programs might be an indication that such benefits have an important income effect that may allow small firms to accumulate some assets over time. In the case of credit, this variable might be signaling access to deposit mechanisms in the financial sector that make savings for small firms more viable.

These results are in general indicative of the need for promoting higher formality and greater investment opportunities for financing the expansion of small firms, both of which are in the realm of general development policies that are desirable for promoting savings but also for many other reasons including, for instance, enhancing productivity levels. Thus, as such, they hardly constitute a policy recommendation.

However, the positive correlation with social programs and access to credit for small firms is suggestive that expanding benefits and financial access in this sector could in fact promote savings, which could be used for investment, insurance, or other investment needs that could strengthen firms' prospects. Since our results are only suggestive of a positive correlation, this issue merits closer analysis for determining the potential of these mechanisms as a source for fueling higher savings in small firms.

The household sector's importance as a source of domestic savings for the country coincides with the existence of rich data sources that permit examining it in close detail and from different perspectives. The use of the national household income and expenditure survey, a recent survey of financial access and use, and a true panel covering the years 2002-2009 that

includes information for estimating household savings rates, opens a series of avenues for futher research and offers interesting insights for addressing the question posed in this paper.

The main conclusions derived from the combination of these data are the following:

1. The main instrument used by households for savings—using a definition of financial savings as measure—is durable goods. This is an important result since it suggests that one of the reasons for the apparent inconsistency between savings and growth in Mexico could be that savings are not directly injected in the financial system as source for investment. Actually, according to data in the ENIGH survey, net savings deposits in 2012 only accounted for about 4 per cent of household savings.

2. Household savings are highly concentrated in the richest 10 percent of the population. If savings are related to the capacity for accumulating assets over time, the fact that the differences between savings rates in the poorest and richest households has expanded over time might be indicative of future prevalent income inequalities.

3. Household savings in Mexico have a clear age-increasing trend and have been growing across generations during the past 30 years, as determined by estimating age, time and cohort effects through synthetic panel techniques. Since the Mexican population will most likely continue its aging process and there are few reasons to expect a reversal of cohort effects, the expectation would be an increasing trend in household saving in future years derived from these structural aspects. However, even with these underlying long-term trends savings rates have declined abruptly in the country in years of economic downturn. If similar shocks arise in the future, the increasing savings trend might be ameliorated or counteracted.

4. Age and cohort effects are stronger the higher the education level of the household. From this it would follow that an acceleration of education progress in the country could also contribute to enhancing the age and generationally related positive trends mentioned above.

5. From the Financial Inclusion Survey we determine that motives for savings mostly involve cushioning unexpected emergencies, coveringpersonal expenses—including, for instance, durable goods—and for financing education and health expenditures. Only 7.6 percent of households report that they save for investing in expanding or launching a business. Although this cannot be taken as irrefutable evidence of the link between savings and economic growth, it adds to the hypothesis that the *way* in which households save and the *instruments* they employ for doing so are not the traditional mechanisms that would be expected to fuel investment for generating economic activity in the country.

6. The relatively low use of formal credit markets and a relatively greater use of informal credit mechanisms add to the speculation that even though household savings are driving overall domestic savings in the country they do not necessarily imply that financing resources are available for investment.

7. From the ENVVIH panel we are able to distinguish highly suggestive correlations between savings and a series of variables that reinforce the above conclusion. For instance, our results show that household savings tend to increase when there is a shift from unemployment to employment status and when transiting from the informal from the formal sector. The converse is the case when the change is from formal to informal activities, since savings rates decline in general during these shifts. This behavior is in line with insurance against shocks motives.

8. For households, increased access to credit is related to declines in savings—as opposed to the case of firms, where the reverse is true. This might be indicative of the important role that access to the financial system may have in providing households with resources for addressing contingencies and other uses.

9. Finally, there is evidence that savings decline in households when a larger share of their members enter retirement age, which corresponds to traditional

life cycle behavior at advanced ages. However this does not necessarily imply that the main motive for saving is old age security (the window of observation of the life cycle by using these data is of only seven years), and actually the FIS survey reveals that only a small share of households report savings for this purpose.

In sum, our analysis suggests that there are promising avenues for future research for confirming the hypothesis that it is the *way* and the *instruments* through which households save, rather than savings capacity, that could be behind the question addressed in this paper. The conclusion opens questions such as whether this is due to the absence of productive investment opportunities, or due to limited efficient financial intermediation mechanisms. In the case of the latter, the policy implications are quite direct: providing Mexican households with attractive financial instruments for their savings through the expansion of the financial system could help close the gap between relatively high domestic saving and relatively low economic growth.

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Appendix 1.Description of Databases

Censo Económico

Los Censos Económicos constituyen un método estadístico de generación de datos, el cual permite distinguir a varios niveles geográficos y sectoriales a los establecimientos productores de bienes, comercializadores de mercancías y prestadores de servicios. Están integrados por varios proyectos que corresponden a los distintos sectores de la actividad económica. Para cada levantamiento censal se utilizan cuestionarios diferenciados. Se llevan a cabo cada cinco años, años en los que terminan en 4 y en 9, el primer Censo Económico se realizó en 1930.

En general, se utilizan 28 cuestionarios, los temas comunes son los siguientes: inicio de actividades, total de días trabajados, personal dependiente de la razón social, personal no dependiente de la razón social, remuneraciones, gastos por consumo de bienes y servicios, gastos no derivados de la actividad, ingresos por suministros de bienes y servicios, ingresos no derivados de la actividad, existencias, activos fijos, innovación e investigación, entre otros.

Asimismo, el Censo Económico ofrece información sobre los siguientes sectores de actividad económica: manufacturero, de la construcción, comercial, de los transportes, correos y almacenamiento, del sector de la información, del financiero y de seguros, del sector de servicios inmobiliarios, así como de los sectores de servicios profesionales, servicios educativos, servicios de salud, servicios de esparcimiento, y otros servicios. La temática de cada categoría es específica tanto del año en el que se levanta el Censo Económico como de la actividad económica.

La información en los Censos utiliza el Sistema de Clasificación Industrial de América del Norte, SCIAN México, clasificador elaborado por los socios del Tratado de Libre Comercio (TLC) de América del Norte. El SCIAN consta de cinco niveles de desagregación; sector, subsector, rama, subrama y clase de actividad económica. Para asignar a una unidad económica una categoría dentro de la clasificación se tuvo que determinar la actividad principal que realizaba.

Los resultados principales se publican en la página del Instituto Nacional de Estadística y Geografía (Inegi), éstos se encuentran agrupados a distintos niveles geográficos y sectoriales. Sólo se encuentran disponibles los microdatos de los Censos Económicos de los años 1999, 2004 y 2009, su uso es a través del Laboratorio de Microdatos del Inegi.

Encuesta Mensual de la Industria Manufacturera

La Encuesta Mensual de la Industria Manufacturera (EMIN) permite conocer el comportamiento de las principales variables económicas del sector manufacturero del país. Asimismo, esta encuesta se utiliza como insumo para la generación del Producto Interno Bruto y otros indicadores económicos como el empleo, la producción, la productividad, entre otros.

Se presentan dos series disponibles de esta encuesta, una de 2005 a 2010 y otra de 2007 en adelante. La primera serie, de 2005 a 2010, se le conocía con el nombre de Encuesta Industrial Mensual Ampliada (EIMA) e incluía 230 clases de actividad y contaba con 7,238 establecimientos, esta serie se basaba en el Sistema de Clasificación Industrial de América del Norte (SCIAN) versión 2002 para clasificar la actividad económica.

Por otro lado, la segunda serie de datos, de 2007 en adelante, se le conoce como la Encuesta Mensual de la Industria Manufacturera (EMIN), para la cual se utilizó el SCIAN versión 2007. Adicionalmente, se incluyen 240 clases de actividad económica y 11, 406 establecimientos.

La población objetivo de esta encuesta son los establecimientos manufactureros, se incluyen aquellos dedicados a la maquila de exportación, así como los de petroquímica básica. La cobertura temática que abarca esta encuesta se refieres al personal ocupado, personal ocupado dependiente de la razón social, personal ocupado suministrados por otra razón social, remuneraciones, ingresos por maquila, submaquila y remanufactura, valor de la producción de los productos elaborados y valor de ventas de los productos elaborados.

A nivel entidad, la EMIM cuenta con información de las principales características económicas para los estados de Baja California Sur, Campeche, Colima, Chiapas, Guerrero, Nayarit, Oaxaca, Quintana Roo, Tabasco y Zacatecas. Asimismo, se puede disponer de información a nivel subsector para las entidades de Aguascalientes, Baja California, Coahuila de Zaragoza, Chihuahua, Distrito Federal, Durango, Guanajuato, Hidalgo, Jalisco, Estado de México, Michoacán, Morelos, Nuevo León, Puebla, Querétaro de Arteaga, San Luis Potosí, Sonora, Tamaulipas y Veracruz.

Los resultados principales se publican en la página del Instituto Nacional de Estadística y Geografía (Inegi), éstos se encuentran agrupados a distintos niveles geográficos y sectoriales. Sólo se encuentran disponibles los microdatos de las series 2005 a 2010 y 2007 a 2013 de la EMIN, su uso es a través del Laboratorio de Microdatos del Inegi.

Encuesta Nacional de Micronegocios

El principal objetivo de la Encuesta Nacional de Micronegocios (ENAMIN) es generar información estadística sobre las principales características de recursos productivos, organización, monto y distribución de gastos e ingresos de los Micronegocios.

Esta encuesta constituye una submuestra de la Encuesta Nacional de Ocupación y Empleo (ENOE) y con base en las entrevistas en hogares se localizó y seleccionó a las unidades económicas que se podrían incorporar a la ENAMIN.

Esta encuesta se levanta cada dos años y está disponible a partir del año 1992, no existe encuesta para los años 2004 y 2006. Para este análisis sólo se utilizaron los años 2002, 2008, 2010 y 2012, porque las encuestas de los años anteriores a 2002 no incluyen la misma cobertura temático que los años más recientes.

Se define como micronegocio, a las unidades económicas de hasta 6 personas, incluyendo al dueño, en actividades como industria extractiva y de construcción, comercio, servicios y transporte; y a las unidades de hasta 16 personas en el sector manufacturero.

La cobertura de esta encuesta es a nivel nacional, y la población objetivo son los dueños de los micronegocios. Entre los principales temas que cubre la ENAMIN se encuentran los siguientes, características del dueño, como son, la ocupación y rama de actividad, motivos de la microactividad, antecedentes laborales y migratorios, expectativas para el negocio. Otro tema son las características del dueño y del personal ocupado, las cuales se refieren a la información sociodemográfica, posición en el trabajo, tipo de contrato, horas trabajadas, ingresos mensuales, capacitación laboral.

Adicionalmente, la ENAMIN incluye información referente al negocio como la disponibilidad de local, antigüedad, financiamiento, tipo de contabilidad, equipamiento, valor de las existencias, gastos, ingresos, proveedores, clientes, problemas de operación, entre otros.

Encuesta Nacional de Ingreso y Gasto de los Hogares (ENIGH)

La ENIGH es una encuesta representativa a nivel nacional y rural-urbano, con una periodicidad de cada dos años. El principal propósito de la ENIGH es recaudar información estadística acerca de los ingresos y gastos de los hogares mexicanos en un periodo de tiempo dado. Por lo tanto, cuenta con módulos detallados de ingresos monetarios y no monetarios, transferencias, y gastos de cada hogar.

Aunque el propósito de la ENIGH no es capturar tendencias laborales o escolares de la población mexicana, cuenta con módulos extensos para capturar tendencias socio-demográficas a nivel individual y hogar.

A partir de 1992 se realiza con una periodicidad bienal con excepción de 2005, ya que fue un levantamiento extraordinario. Se tiene información disponible para 1984, 1989, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2005, 2006, 2008, 2010 y 2012.

Los resultados de la ENIGH son representativos a nivel nacional y, en algunos años, para los ámbitos rural y urbano. Asimismo, con base en la ampliación de la muestra en algunas entidades federativas, también es posible generar información con representatividad estatal para algunos años.

La población objetivo de la ENIGH la constituyen los hogares que residen en viviendas particulares dentro del territorio nacional. Los principales temas que cubre esta encuesta se refieren al ingreso corriente total (monetario y no monetario) de los hogares, al gasto corriente monetario de los hogares, a las percepciones financieras y de capital de los hogares y sus integrantes, erogaciones financieras y de capital de los hogares, características de la vivienda, residentes e identificación de hogares en la vivienda, características sociodemográficas de los residentes de la vivienda, condición de actividad y características ocupacionales de los integrantes del hogar de 12 y más años y por último al equipamiento del hogar y servicios.

Encuesta Nacional de Inclusión Financiera

La Encuesta Nacional de Inclusión Financiera (ENIF) 2012 proporciona información que permite el diseño de políticas públicas en materia de uso y acceso a servicios y productos financieros, la cobertura de la encuesta es nacional y su periodicidad no está determinada.

La ENIF es la primera encuesta llevada a cabo con esta temática, fue desarrollada por la Comisión Nacional Bancaria y de Valores, en colaboración con el Instituto Nacional de Estadística y Geografía (INEGI), para contar con una medición representativa a nivel nacional sobre temas de acceso y uso de servicios financieros.

A partir de la ENIF, se puede caracterizar a los usuarios de servicios financieros y obtener información relevante sobre las barreras al acceso y utilización de productos financieros. La

información se esta encuesta se planea utilizar como línea basal para brindar una medición oficial sobre el nivel de inclusión financiera en el país.

La cobertura de la encuesta es a nivel nacional e incluye información para la población entre 18 a 70 años. Los principales temas que se incluyen en la ENIF son: características sociodemográficas de los integrantes del hogar, características sociodemográficas del integrante seleccionado, administración de los gastos, ahorro informal y formal, crédito informal y formal, seguros, cuenta de ahorro para el retiro, remesas, uso de canales financieros, entre otros.

Encuesta Nacional de Niveles de Vida de los Hogares

La Encuesta Nacional sobre Niveles de Vida de los Hogares (ENNViH) es una base de datos de naturaleza multitemática y de corte longitudinal que recoge en un solo instrumento información amplia sobre indicadores socioeconómicos, demográficos y de salud de la población mexicana. La línea basal (ENNViH-1) se llevó a cabo en el año 2002. El segundo levantamiento (ENNViH-2) entre el año 2005-2006 con una tasa de re-contacto del 90 por ciento a nivel hogar. Y el tercer levantamiento se realizó durante el periodo 2009 a 2012.

Los cuestionarios que conforman la encuesta de hogares están divididos en 11 libros. A su vez cada libro está divido en secciones. Los libros C, I y II recolectan información a nivel hogar. Los libros IIIA y IIIB recolectan información de los adultos miembros del hogar (15 años o más). El libro IV recolecta información de las mujeres en edad reproductiva de 14 y 49 años de edad. El libro V contiene información de los miembros del hogar menores de 15 años. Finalmente, el libro Proxy contiene información referente a libros IIIA, IIIB y IV, sobre los miembros del hogar de 15 años y más que no pudieron ser entrevistados en persona, debido a que no se encontraban durante la entrevista.

Para este análisis sólo se incluyeron a los hogares que formaron parte desde la línea basal y se utilizaron los factores de expansión longitudinales. Una de las principales razones por las cuales no se presenta el análisis descriptivo utilizando las bases completas del segundo y tercer levantamiento es porque al momento de realizar este estudio, los factores de expansión para el tercer levantamiento no se encontraban disponibles.

Ingreso Corriente

El ingreso corriente total se obtuvo mediante la suma del ingreso monetario y del ingreso no monetario. El ingreso corriente monetario está conformado por las remuneraciones al trabajo, como son los sueldos y salarios, las comisiones, horas extras, incentivos, aguinaldo, ingreso secundario, entre otros; los ingresos por negocios propios, los cuales incluyen los negocios industriales, comerciales, producción agrícola, etc.; los ingresos por renta de propiedad; transferencias a nivel individual y del hogar. Para calcular el ingreso corriente no monetario se incluyen los siguientes rubros, el autoconsumo, el pago en especie y los regalos. La ENNViH considera en conjunto estos rubros de ingresos no monetarios.

Para calcular estos rubros se recurrió a los diferentes libros que integran cada uno de los levantamientos de la ENNViH para poder tener una estimación lo más completa del ingreso corriente total.

Los libros que se utilizaron fueron los que se refieren a los ingresos agrícolas, renta de la propiedad y negocios no agrícolas, transferencias públicos y privadas y remuneraciones al trabajo.

Todos los valores del ingreso se expresaron en pesos del mes de agosto del año principal de levantamiento, es decir a partir del mes en el cual se llevó la entrevista, se definieron los distintos deflactores para expresar las cifras en pesos de agosto de 2005. Por ejemplo, el segundo levantamiento de la ENNViH se llevó a cabo durante los años 2005, 2006 y 2007, así que se definieron los respectivos deflactores para estos tres años y así expresar el ingreso corriente en pesos del mes de agosto del año 2005.

La ENNViH no es la mejor encuesta para capturar los ingresos de los hogares en México; sin embargo la mayoría de los rubros de ingreso de la Encuesta Nacional de Ingreso y Gasto de los Hogares (ENIGH) están considerados en la ENNViH, aunque no estén medidos de la misma manera, como es el caso del ingreso no monetario.

Asimismo, como se mencionó anteriormente, la ENNViH tiene un diseño longitudinal lo que permite realizar un análisis a través del tiempo. Y además de contar con información de ingreso y gasto, posee información sobre diferentes tipos de ahorro, monto de los ahorros e instituciones o lugar donde los tienen; este tipo de información no se encuentra disponible en otras encuestas del país.

Deflactores ahorro

Para deflactar los montos de ahorro y de ingreso corriente total se utilizó el Índice Nacional de Precios al Consumidor (INPC),[14] dependiendo el año de levantamiento de la encuesta. Todas las cifras se expresaron en pesos del año 2005. El ahorro de deflactó a pesos del 2005 utilizando el promedio del INPC para el año del levantamiento, es decir, si la encuesta se levantó en 2002, se tomó el promedio anual del INPC de 2002 y 2005, para generar el factor y expresar las cifras en pesos del 2005.

Para el ingreso corriente total, se realizó el mismo proceso, sólo que en lugar de tomar el promedio anual, sólo se tomó en cuenta el INPC del mes de agosto. Esto se debe porque al generar el ingreso corriente, se expresó en pesos del mes de agosto del año principal del levantamiento.

Proporción de ahorro entre ingreso

El ahorro monetario que se incluye en la ENNViH, se refiere al monto ahorrado que el individuo tiene al momento de la entrevista. Por esta razón, para expresar el ahorro como proporción del ingreso, se decidió hacer el ingreso mensual anual. De esta manera, el ahorro declarado se dividió entre el ingreso anual para obtener las tasas de ahorro que se utilizan en las secciones V y VI.

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[14] Información obtenida a partir del Instituto Nacional de Estadística y Geografía (INEGI).