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Determinants of Saving for Old Age around the World

Asli Demirgüç-Kunt
World Bank

Leora Klapper
World Bank

George A. Panos
University of Glasgow

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Determinants of Saving for Old Age around the World

Abstract

Countries around the world face a retirement crisis brought on by ageing populations, declining birthrates, and fiscal shortfalls. As a result, policymakers increasingly seek to understand retirement savings patterns—a crucial component of the safety net for the elderly. Drawing on the 2014 Global Findex database, which provides individual-level data on the use of financial products in more than 140 countries, we examine how adults save for old age. We find that about 25% of adults worldwide save for old age, with rates exceeding 35% in high-income OECD economies and the East Asia and Pacific region. On average, men are slightly more likely than women to save for this purpose, but the gender gap is deeper in developing countries. Worldwide, saving for old age is more common among older adults, more educated adults, and adults who own accounts. Adults in countries with English or German legal origin, and with high savings rates, are also more likely to save for old age. We also find that measures to increase trust in the financial system—such as deposit insurance—lead to higher rates of saving for old age. Finally, we find no evidence of substitution between pension system provisions and contribution rates with saving for old age.

Keywords

Saving, old age, financial inclusion

Comments

Retirement System Risk Management

Implications of the New Regulatory Order

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Olivia S. Mitchell, Raimond Maurer, and J. Michael Orszag

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Determinants of Saving for Old Age around the World

Asli Demirgüç-Kunt, Leora Klapper, and Georgios A. Panos

Programs catering to the financial well-being of the elderly are experiencing strains around the world. The depletion of public coffers during the financial crisis has left governments struggling to cope with rising retirement costs triggered by aging populations, low birthrates, and weakened informal safety nets (Ellis et al. 2014). That this crisis threatens both the elderly and the young is well-established; it also endangers future generations, who will shoulder a disproportionate share of the costs of caring for older generations directly or indirectly (Gratton 1996; Fridson 2015).

Despite rising interest in the safety net for elderly people, there is limited information on the determinants of both formal and informal voluntary saving for old age. Drawing on new microeconomic data, this chapter offers a detailed descriptive analysis of old age saving around the world and across geographic regions. It also features an empirical analysis of the determinants of old age saving, using detailed individual characteristics, country macroeconomic characteristics, and country pension system characteristics. To our knowledge, this is the first study examining old age saving around the world using detailed global micro-data.

The 2014 Global Findex data reveal how and why adults save and borrow, and it also sheds light on their financial resilience to unexpected shocks (Demirgüç-Kunt et al. 2015). In 2014, 56 percent of adults around the world reported having saved money in the past 12 months. Adults in high-income OECD economies, as well as in East Asia and the Pacific, were the most likely to have done so, with 71 percent reporting that they had saved, followed by 60 percent of adults in Sub-Saharan Africa. In other regions, the figure stood at between 30 and 40 percent. The 2014 Global Findex survey also asked about three specific reasons for saving. While marked differences emerge across regions, almost 25 percent of adults worldwide reported having saved for old age in the past year. A similar share reported saving for education expenses, while 14 percent reported saving to start, expand, or operate a business. The percentage of adults saving for old age also varies considerably across economies: 39.7 percent in high-income OECD countries (hereafter

OECD[HI]); 36.6 percent in East Asia and the Pacific (hereafter EAP); 11.8 percent in Europe and Central Asia (hereafter ECA); 10.6 percent in Latin America and the Caribbean (hereafter LAC); 9.8 percent in Sub-Saharan Africa; 9.1 percent in South Asia; and 7.0 percent in the Middle East and North Africa (hereafter MENA).

Our findings show a small gender gap in saving for old age, though it is larger in developing countries, as well as large differences based on education and employment status. All regions other than EAP exhibit patterns of higher old age saving among those with higher education. In every region, employed adults are far more likely to save for old age than unemployed adults, with the exception of South Asia. In terms of the age distribution, saving for old age rises sharply in the 36–45 age group, with delayed occurrence taking place in LAC, MENA, South Asia, and Sub-Saharan Africa. Large income disparities are also evident, with the richest centile being much more likely to save for old age, and the bottom centile far less likely.

Adults who have accounts at a financial institution or a mobile money account are about 40 to 50 percent more likely to save for old age than adults lacking such an account. Furthermore, our empirical estimates find a strong significant relationship between the probability of saving for old age and financial inclusion, a country's generic saving propensity, legal origin, and education. Residents of countries with English legal origin are more likely to save for old age, with an effect equal to 15 to 20 percent, versus countries with French legal origin. Residents of countries with higher generic saving rates are much more likely to save for old age, echoing Chen (2013), who proposed a strong cultural component shaping the propensity to save. Moreover, there is a positive relationship with GDP per capita, while interest rates and deposit insurance have insignificant effects. In addition, we find evidence that institutional arrangements enabling greater trust in the financial system, in terms of the safety net/moral hazard index based on deposit insurance, are conducive to increasing rates of old age saving (Demirgüç-Kunt et al. 2014).

Finally, the results of our empirical analysis show a moderate negative association with the size of pension benefits, a positive relationship with pension coverage, and a positive link to contributions and contribution ratios. It is also the case that a higher housing affordability index is positively related to old age saving in the majority of regions, with the exception of Sub-Saharan Africa, where the impact is insignificant. We interpret the latter findings to be in line with Poterba et al. (1995), who suggested little substitution between pension system provisions and contribution rates (and other forms of financial saving in the case of housing affordability) and saving for old age.

The next section reviews the existing literature, and the following one describes the data and presents the descriptive statistics for saving for old

age around the world. Then we present the empirical analysis of old age saving, in terms of empirical strategy and estimation results with sets of individual, macroeconomic, and pension-system characteristics.

Review of Existing Literature

Research has long shown that retirees suffer from a variety of economic hardships even in developed economies with relatively strong pension systems. In their study of the United States, Bernheim et al. (2001) show that consumption dropped rapidly at the time of retirement and decreased even more post-retirement. Using UK data, Bardasi et al. (2000) reported that, on average, economic wellbeing declined sharply in the years preceding retirement, and continued to do so through retirement,[1] with women facing a swifter decline than men. Among adults in Germany, satisfaction with current household income decreased substantially on retirement, while satisfaction with free time increased, according to Bonsang and Klein (2011). Retirement had an overall negative effect on life satisfaction, with larger effects for involuntary retirement, and insignificant effects for voluntary retirement.

High levels of poverty among the elderly compound the negative economic consequences of retirement. In the US, Clark and Quinn (1999) reported that the elderly remain disproportionally represented among the near poor. Also, certain older Americans still face substantial risk of economic deprivation, even though their average economic wellbeing has significantly improved compared to older generations (Sabelhaus and Manchester 1995). Crystal and Shea (1990) also showed that elderly resources were distributed even more unequally than the rest of the population.

A number of studies has examined post-recession policy responses to these challenges. Galasso (2008) ran simulations based on the political determinants of social security contribution rates and retirement ages, and he concluded that the retirement age is likely to increase in each country, regardless of political constraints. However, according to Andersen (2008), indexing benefits and retirement ages to longevity did not ensure financial viability of the social security system. Recognizing this, Poterba (2014) suggested that individuals bear a larger share of the responsibility for determining their retirement security.[2]

According to Papke (2004), allowing participants a choice of investment options may increase their retirement savings. However, Lusardi (2003) reported that little is known about how households make saving plans and how they collect information to make savings decisions. A survey of households by the Board of Governors of the Federal Reserve System (2014) found that almost half of respondents had given little or no thought to

retirement savings. Among those who had, many either did not plan to retire, expected to keep working into retirement to pay for expenses, or did not know how they would pay for their retirement.[3] Nearly a third had no retirement savings or pension. These retirement planning challenges had been exacerbated by the recession, which resulted in many respondents delaying their planned retirement.[4]

Firms have also shifted from defined benefit (DB) pensions to defined contribution (DC) pensions, where employees have to decide how much money to put into their retirement funds and how to allocate their pension wealth. But DC plans have their critics, who draw on the behavioral economics and finance literature.[5] For instance, Banks and Oldfield (2007) reported that the elderly suffer from greater cognitive, gender, and education gaps than other groups. As a result, they are less likely to have savings accounts, own shares in a company, or have private pensions. Lusardi and Mitchell (2011, 2014) reported that financial literacy is a significant determinant of retirement planning for all age groups, with elderly people suffering from the highest levels of financial illiteracy.

Recent research by Chen (2013) identified a cultural component in saving and retirement planning behavior, such that speakers of languages that grammatically associate the future and the present save more and retire with more wealth. In addition, Duflo and Saez (2002) reported that peer effects drive retirement plan participation decisions. Duflo and Saez (2003) presented quasi-experimental evidence that an individual's decision about how much to save for retirement was affected by small changes in his environment and that network effects influence participation decisions. Instead of education, Benartzi and Thaler (2007) proposed a method of influencing decisions about retirement saving plans based on the principles of 'automatic enrollment.' This involved implementing acute auto-enrollment, sensible default options, and opportunities to increase savings rates and rebalance portfolios automatically. Such design features help less sophisticated investors while maintaining flexibility for more knowledgeable participants.

Financial security for the elderly and economic growth are best served when governments adopt three pillars of old age security:[6] (1) a publicly managed pension system with mandatory participation and the limited goal of reducing poverty among the elderly; (2) a privately managed mandatory savings system; and (3) voluntary savings. The first pillar caters to redistribution, the second and third cover savings, and all three co-insure against the many risks of old age.[7] Spreading the insurance function across all three pillars creates greater income security for the old and provides greater insurance than any single pillar system. Valdés-Prieto (2002a, 2002b) reviewed the potential costs and benefits of 'three-pillar' programs, defined as those that use incentives to promote voluntary old age saving. Among the benefits

of voluntary saving are the relative ease of accessing and mobilizing funds, and the prevention of potential labor market distortions. Yet voluntary savings programs may produce social costs, particularly when they involve fiscal incentives.[8]

To develop measures to improve the financial well-being of the elderly and incorporate an element of self-control in retirement planning, policymakers must first understand worldwide retirement savings patterns. In the next sections, we evaluate these patterns using a binary measure of saving for old age, which captures whether an individual has saved for old age during the last year. Data limitations prevent us from measuring the volume of savings for old age. Nonetheless, examining savings behavior reveals a rich picture of results to inform policy design.

Who Saves for Old Age?

The data

We use data from the Global Findex database, which illustrates how people save, borrow, make payments, and manage risk.[9] It is the world's most comprehensive dataset providing consistent measures of financial service usage across economies and over time. The data were collected in partnership with Gallup, Inc. and the Bill and Melinda Gates Foundation. The survey was carried out over the 2014 calendar year as part of the Gallup World Poll, which since 2005 has continually conducted surveys of approximately 1,000 people in each of more than 160 economies and in over 140 languages, using randomly selected, nationally representative samples.[10]

Descriptive statistics

Our analysis employs a representative sample of 143 economies and 147,692 individuals, age 18 and older.[11] We use a binary variable (0/1) of the response to the question: 'In the past 12 months, have you saved for old age?' Figure 7.1 presents a global map,[12] and Figure 7.2 shows the percentage of adults who saved any money for old age during the last year by regional classification. The weighted global figure for saving for old age around the world is 24.8 percent. The top performers are Thailand, where 59.2 percent of the population saves for old age, Germany (55.1 percent), Malaysia (54.0 percent), Canada (51.7 percent), and New Zealand (51.5 percent). The bottom performers in terms of saving for old age are Niger (0.9 percent), Georgia (0.9 percent), the Republic of Yemen (1.4 percent), Jordan (1.9 percent), and Armenia (2.1 percent). The top performing
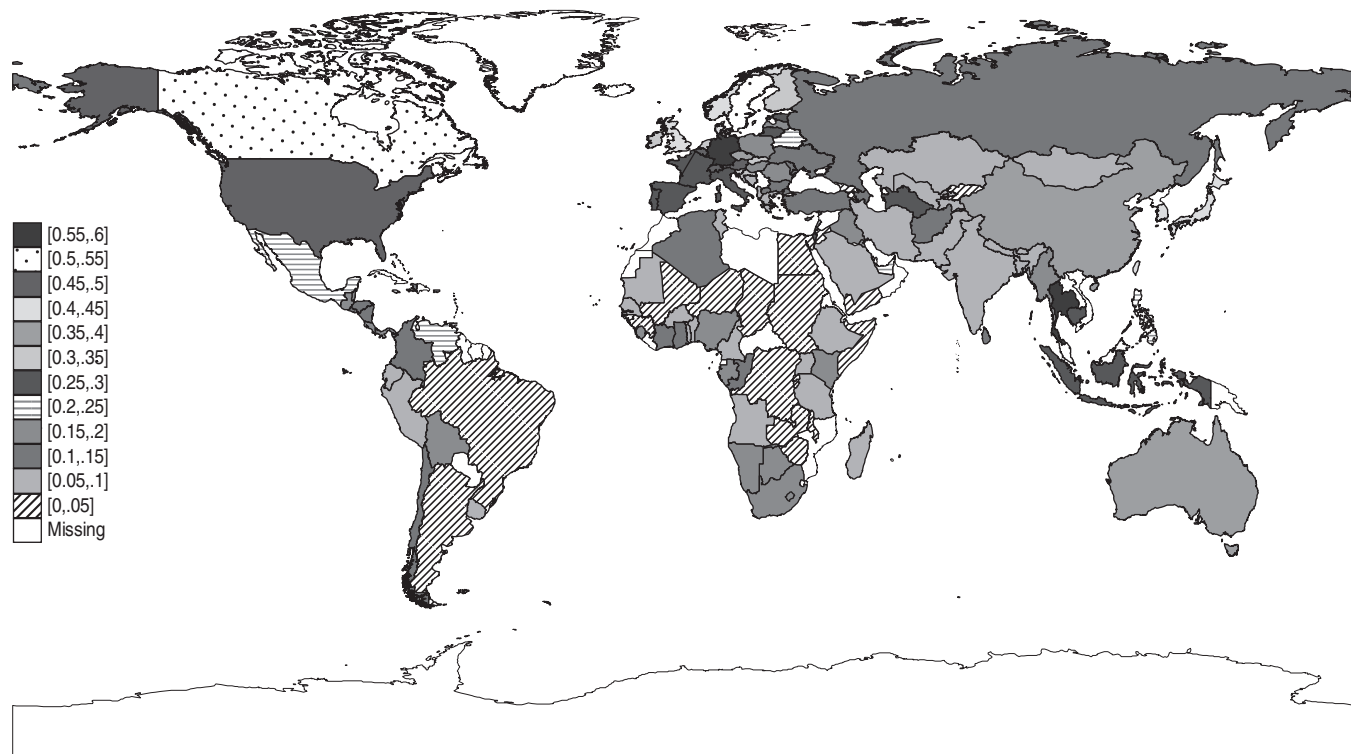
Figure 7.1 Saving for old age around the world

Note: Global FINDEX data 2015 − Weighted averages.

Source: Derived from Demirgüç-Kunt et al. (2015).

Figure 7.2 Saving rates (%) for old age around the world by financial inclusion status and region

Source: Adapted from Demirgüç-Kunt et al. (2015).

region is OECD[HI], though an interesting outlier is Greece amidst the debt-crisis, with 9.3 percent of the population saving for old age.

The bars in Figure 7.2 further distinguish between saving for old age and financial inclusion status, in terms of having an account at a bank or formal financial institution. It can be seen that 84.7 percent of the individuals who save for old age around the world are financially included, with the remaining 15.3 percent being financially excluded. The low figures in certain regions such as ECA and MENA could be indicative of the usage of alternative means of old age saving, such as livestock, gold, and stuffing money under the mattress. It could also be indicative of less liquid means of saving for old age, like home ownership.

Figure 7.3 presents the gender distribution of old age saving around the world and by region. The global gender gap in terms of saving for old age is in the magnitude of 2.5 percentage points (10.5 percent), with 26 percent of men saving versus 23.5 percent of women, globally. Notably, this is lower than the 9 percentage point gap in account ownership around the world. The gap is largest in South Asia and smallest in EAP, which also has the highest absolute old age saving rates.

Figure 7.4 presents educational gaps in terms of saving for old age. The global education gap is wider between tertiary and secondary education, compared to the respective gap between secondary and primary education
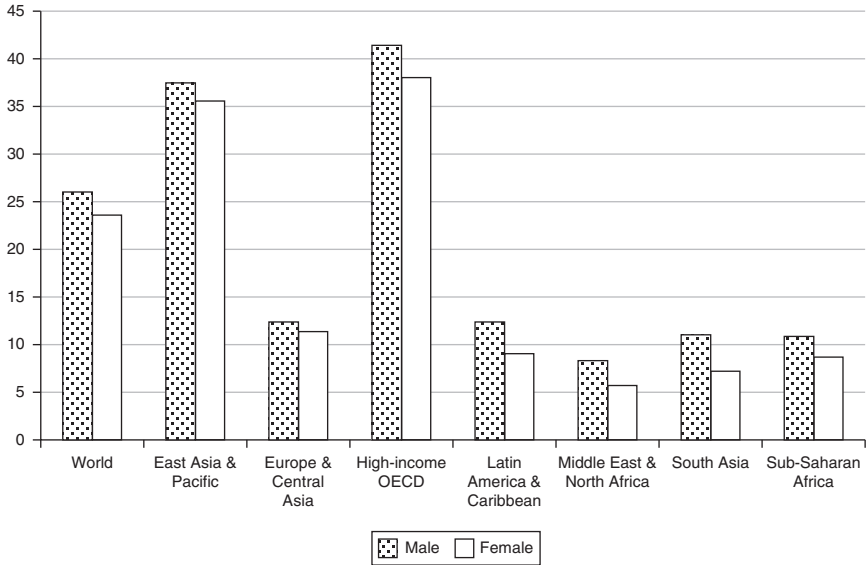
Figure 7.3 Saving rates (%) for old age around the world by gender and region
Source: Adapted from Demirgüç-Kunt et al. (2015).
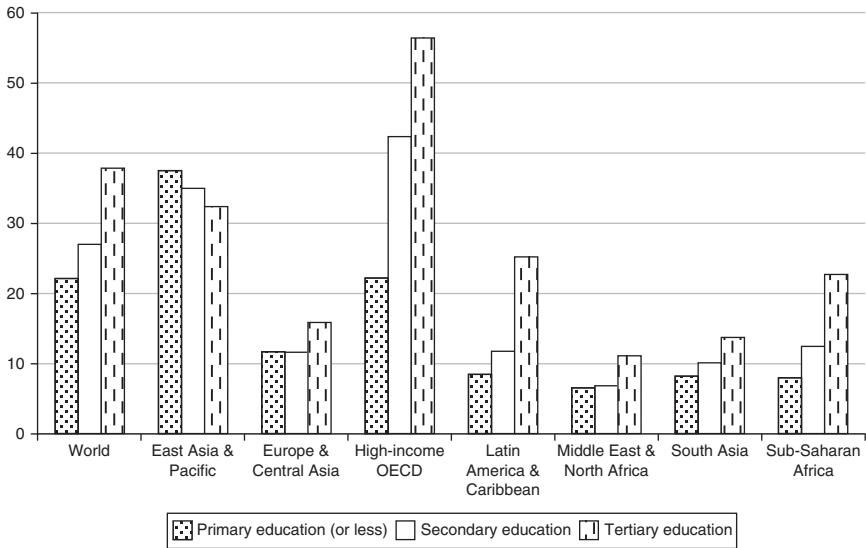
Figure 7.4 Saving rates (%) for old age around the world by educational attainment and region
Source: Demirgüç-Kunt et al. (2015); http://www.worldbank.org/globalfindex.

(or less). Specifically, 37.9 percent of individuals with tertiary education save for retirement, compared to 27 percent of individuals with secondary education and 22.2 percent of individuals with primary education or less. The old age saving gap seems to be much wider between the tertiary and secondary education groups, compared to the gap between secondary and primary education or less. The pattern is remarkably strong in LAC, in which 25.3 percent of individuals with tertiary education save for old age, compared to 11.9 percent and 8.6 percent of individuals with secondary and primary education or less, respectively.

Figure 7.5 presents the age distribution of old age saving around the world. We distinguish between six groups, age 18–25, 26–35, 36–45, 46–55, 56–65, and 65+. The 2014 Global Findex data indicate that 10.1 percent of individuals aged 18–25 save for old age, a figure that rises to 21 percent for those aged 26–35 and to 31 percent for those aged 36–45. Of the group aged 46–55, 33.3 percent save for old age and so do another 36.9 percent of the 56–65 group. The figure for those aged 65+ is close to that for the 56–65 group, at 36.5 percent. In EAP, the proportion of people saving for old age at age 26–35 is 31.9 percent, compared to half that, 16.3 percent, at age 18–25. In comparison, in ECA, the tiny figure of 3.6 percent at age 18–25 rises to 6.2 percent at age 26–35 and 8.2 percent at 36–45. A jump to 14.2 percent of the population occurs at age 45–55, with a further 20.8 percent of
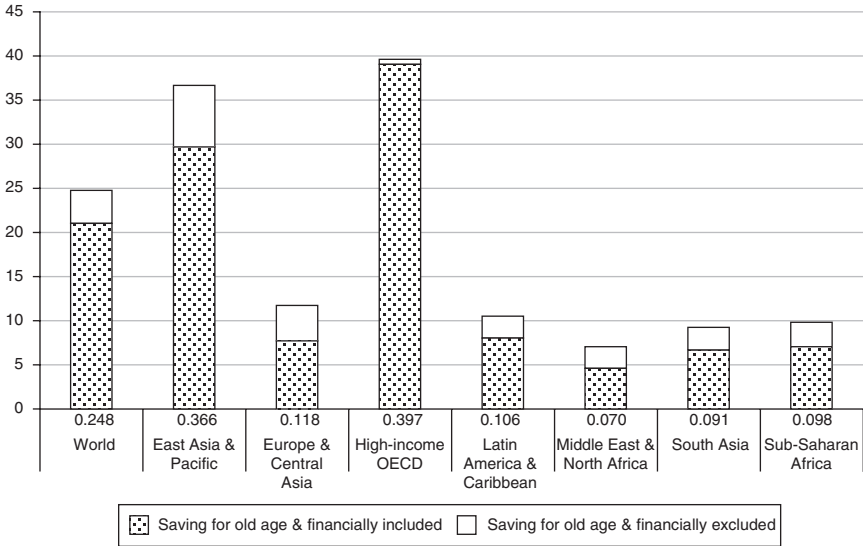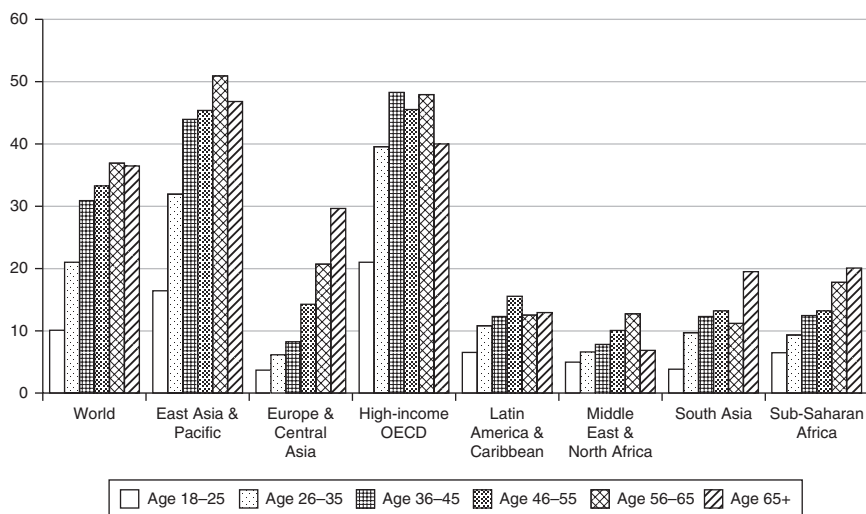

Figure 7.5 Saving rates (%) for old age around the world by age and region

Note: Global FINDEX data 2015 − Weighted averages.

Source: Derived from Demirgüç-Kunt et al. (2015).

the age group 56–65 saving for old age. The ECA figure is the highest for the 65+ group, at 29.6 percent, indicating that saving for old age peaks late.

In OECD^{HI}, the proportion of the population saving for old age rises sharply to 39.6 percent at age 26–35 and to 48.2 percent at age 36–45. The figures remain at 45.6 percent and 48 percent for ages 46–55 and 56–65, respectively. The figure for the 65+ age group is 40 percent. Notably, figures for the other four groups of countries—LAC, MENA, South Asia, and Sub-Saharan Africa—are strikingly low and remain so across the early age groups.

Aside from age patterns, we also have data by marital and family status around the world and for the regions of interest. Figure 7.6 shows that 12.6 percent of singles save for old age, compared to 29.3 percent of married people and 25.9 percent of those who are widowed/divorced/separated. Concerning family status, 21.2 percent of individuals with children younger than 15 save for old age, compared to 29.7 percent of individuals with no children younger than 15. Across all regions, married groups are more likely to save for old age.
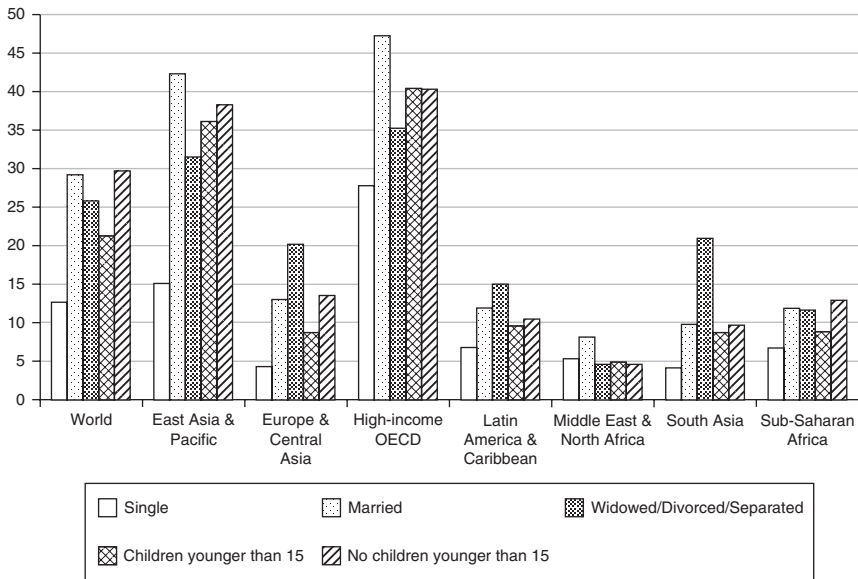
Figure 7.6 Saving rates (%) for old age around the world by family status and region

Note: Weighted averages. The figures at the top of the bars report the magnitude of the difference between: (a) single and married individuals in red (in both percentage points and as a percentage in the parenthesis), and (b) individuals with children younger than 15 and those with no children younger than 15.

Source: Adapted from Demirgüç-Kunt et al. (2015).
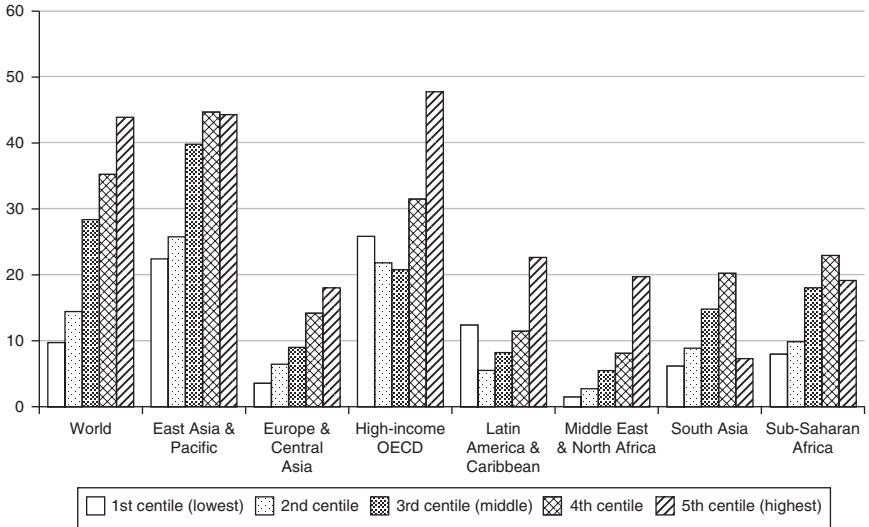
Figure 7.7 Saving rates (%) for old age around the world by household income per capita (global ranking) and region

Note: Global FINDEX data 2015 – Weighted averages.

Source: Adapted from Demirgüç-Kunt et al. (2015).

Next we examine the distribution of saving for old age by real (PPP-divided) household income per capita centile. The centiles presented in Figure 7.7 are for the global distribution of household-income-per-capita (not by country). As expected, the results show considerable inequality in the degree of financial preparedness for old age. Globally, 9.7 percent of individuals in the bottom income centile save for old age, compared to 14.4 percent in the second centile, 28.3 percent in the third income centile, 35.3 percent in the fourth centile, and 43.9 percent in the top income centile. In OECD[HI] countries, old age saving rates are very high for the fourth and fifth income centiles. The figures for EAP and ECA also show considerably higher saving rates for old age, after the third income centile. Income inequality appears to have the most significant impact on saving for old age in LAC and MENA, with low rates of old age saving in the first four income centiles, and large measures for the top income centile.

Figure 7.8 depicts fitted lines from a fifth order local polynomial regression of old age saving on log GDP per capita in Panel A,[13] and household income per capita percentile (by country) in Panel B. Panel A indicates a positive and mildly concave relationship between real GDP-per-capita levels of US$400 and $3,000, corresponding to rates of old age saving of between 8 and 17 percent, respectively. The relationship then becomes steeply

Panel A. Local (5th order) polynomial regressions on log(GDP per capita)
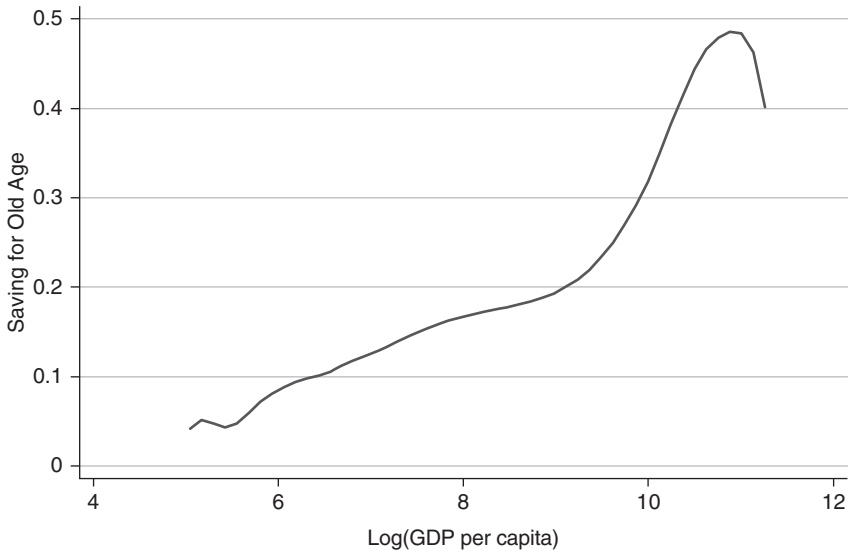
Panel B. Local (5th order) polynomial regressions on real (PPP-divided) equivalized household income percentile (ranking by country)
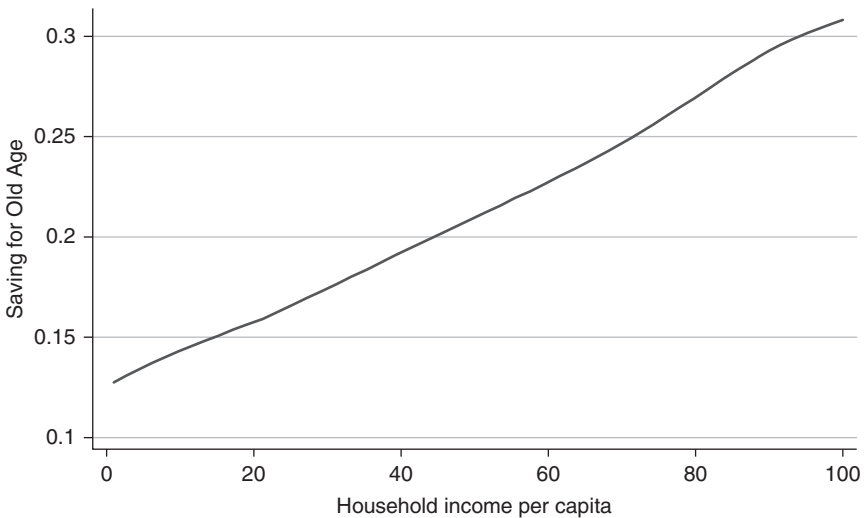
Figure 7.8 Probability of saving for old age by income

Source: Authors' calculations using Global FINDEX data 2015.

convex, with the maximum occurring at real GDP per capita levels of around $50,000, and rates of old age saving just under 50 percent. The rates of saving for old age then drop for GDP per capita above $50,000, to between 40 and 48 percent. By comparison, Panel B depicts a more or less linear relationship between old age saving and household income per capita percentile across countries. The rates of saving for old age are around 13 percent at the bottom household-income-per-capita percentile, to around 30 percent at the 97th percentile.

Finally, we differentiate saving patterns for old age across different labor market groups—self-employed, wage employed, unemployed, and out of the workforce—in Figure 7.9. There are striking differences between employed adults versus adults out of the workforce. The weighted global figures for old age saving by labor market status are 33 percent for those in paid employment, 27.4 percent for the self-employed, 17.1 percent for those out of workforce, and 11.2 percent for the unemployed.
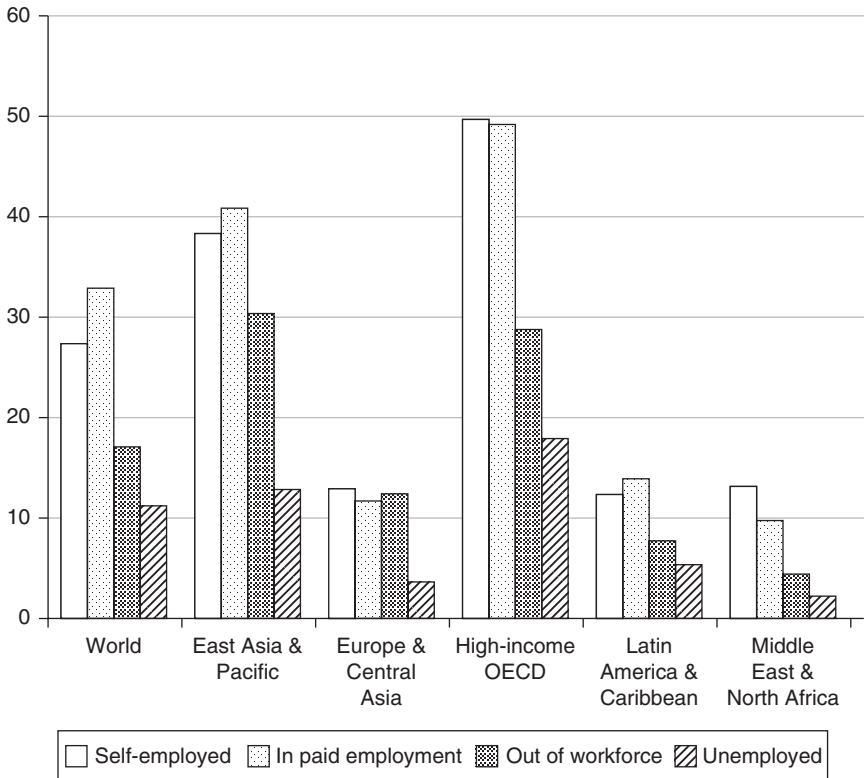
Figure 7.9 Saving for old age around the world by labor market status and region
Source: Authors' calculations using Global FINDEX data 2015 – weighted averages.

Empirical Analysis

Our empirical analysis entails several stages. First we regress the probability of saving for old age on a rich set of individual characteristics. These include gender, urban/rural region of residence, age (five groups), education (three groups), marital status (three groups), having financially dependent children, household-income-per-capita-centile (by country), and labor market status (four groups). In the primary specifications we incorporate region-fixed effects (eight groups), while we also estimate specifications with country-fixed effects for robustness (143 groups).[14]

Second, in extended models, we also include control variables for financial inclusion (owning an account at a bank or formal financial institution), having an outstanding housing loan (as a proxy for home ownership), and generic savings by country (having any savings during the last year, as a proxy for cultural factors shaping the propensity to save). We also estimate multinomial models of old age saving by financial inclusion status, and type of savings (formal versus informal/semi-formal).[15]

Third, we expand the models to incorporate country-level macroeconomic characteristics. From the World Development Indicators (WDI), we gather measures for the logarithm of life expectancy, the logarithm of per capita GDP (2011 PPP-constant levels), GDP per capita growth, the real interest rate (e.g., James and Song 2001), and the WDI legal rights index. In additional specifications, we also include control variables for legal origin (La Porta et al. 2008), the housing-affordability index (as a proxy for potential home ownership),[16] and indicators for explicit deposit insurance and the safety net/moral hazard index (Demirgüç-Kunt et al. 2014).

Fourth, we incorporate variables accounting for country pension-system characteristics, in addition to the individual and macroeconomic variables. We utilize two sources of data to capture features of pension systems. Several are derived from the Pension Watch/HelpAge's Social Pensions Database:[17] the logarithm of the benefit (in PPP international dollars), the benefit as a percentage of GDP per capita, the benefit as a percentage of the $1.25 per day poverty line, the percentage of the population over 60 covered by pension schemes, the cost of pension spending as a percentage of the country's GDP, and the logarithm of the age of eligibility. Others come from the World Bank Pensions database,[18] including the percentage contribution rate and the ratio of employer/employee contributions.

Results and analysis

Our comparison of individuals who save for old age versus those who do not[19] suggests that individuals who do save for old age are more likely to be males, reside in an urban region, have tertiary or secondary education, and

to be in the older age groups. They are less likely to be in the age range 18–35, to be single or never married, to have children aged under 15, and to have primary education or less. Savers are also higher income and employed, and less likely to be self-employed, unemployed, or inactive. Old age savers are also more likely to be financially included and to have an outstanding mortgage. They tend to reside in countries with higher generic savings rates and in countries with higher GDP per capita. They reside in countries with lower GDP growth rates, higher legal rights index, and lower real interest rates. Savers for old age are less likely to be found in countries with French legal origin and more likely to be found in countries with English or German legal origin. Residents of countries that offer some form of explicit deposit insurance scheme are more likely to save for old age, as are individuals in countries with a higher safety net/moral hazard index. Old age savers are also found in countries with higher life expectancy, higher age of benefit eligibility, higher benefits, higher coverage, and higher pension costs. Finally, they are more likely to be residents of countries with higher contribution rates and lower employer/employee contribution ratios.

Table 7.1 presents estimates for the determinants of the probability of saving for old age around the world. The list of explanatory variables incorporates individual characteristics. All regressions show marginal effects from probit regressions, with robust standard errors in brackets, clustered at the country level. Estimates are weighted using country-level weights. The results reveal a gender gap in savings for old age of 3.7 percent, based on the predicted probability of the model and the specification with the full set of control variables (column 4). The magnitude of the gap remains similar when incorporating country-fixed effects in column 5. The difference between urban and rural regions in saving for old age is insignificant in all specifications. The results also reveal a significant education gap in saving for old age. Individuals with tertiary education are 18.5 percent more likely to save for old age, compared to individuals with primary education or less. Moreover, individuals with secondary education are roughly 11.1 percent more likely to save for old age, compared to those with primary education or less.

Table 7.1 also shows large age differentials. For example, in column 4, individuals older than 65 are 85.1 percent more likely to save for old age, compared to the reference group age 18–25. The relative magnitudes are 77.2 percent for those age 56–65, 53.4 percent for those age 46–55, 41.8 percent for those age 36–45, and 21.8 percent for individuals aged 26–35. Married individuals are roughly 13.7 percent more likely to save for old age, while those having children under the age of 15 are somewhat more likely to save for old age (4.8 percent). Moreover, individuals in the top income centile (fifth) by country are 20.1 percent more likely to save for old age,

TABLE 7.1. Saving for old age and financial inclusion, probit regressions

	(1)	(2)	(3)	(4)	(5)
Male	0.009***	0.007**	0.006*	0.007**	0.007**
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Urban region	0.001	−0.004	−0.004	−0.003	−0.005
	[0.007]	[0.006]	[0.006]	[0.005]	[0.004]
Education: Tertiary	0.046***	0.037***	0.035***	0.035***	0.039***
	[0.006]	[0.006]	[0.006]	[0.005]	[0.005]
Education: Secondary	0.054***	0.032***	0.030***	0.021***	0.026***
	[0.008]	[0.006]	[0.006]	[0.005]	[0.005]
Education: Primary or less	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]
Age: 65 or more	0.179***	0.160***	0.162***	0.161***	0.159***
	[0.013]	[0.013]	[0.013]	[0.012]	[0.012]
Age: 56 to 65	0.164***	0.149***	0.147***	0.146***	0.141***
	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]
Age: 46 to 55	0.118***	0.105***	0.101***	0.101***	0.097***
	[0.010]	[0.010]	[0.010]	[0.009]	[0.009]
Age: 36 to 45	0.098***	0.084***	0.079***	0.079***	0.075***
	[0.010]	[0.010]	[0.010]	[0.009]	[0.009]
Age: 26 to 35	0.052***	0.040***	0.037***	0.038***	0.036***
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
Age: 18 to 25	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]
Married	0.031***	0.028***	0.023***	0.026***	0.029***
	[0.006]	[0.005]	[0.005]	[0.005]	[0.004]
Widowed/divorced/separated	0.004	0.004	0.002	0.01	0.016***
	[0.008]	[0.007]	[0.007]	[0.006]	[0.006]
Single	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]
Has children under 15	−0.001	0.006	0.003	0.009*	0.009**
	[0.006]	[0.006]	[0.006]	[0.005]	[0.005]
Household income per capita	0.040***	0.034***	0.033***	0.038***	0.036***
centile by country:	[0.006]	[0.006]	[0.005]	[0.005]	[0.005]
4th centile	0.019***	0.016***	0.016***	0.018***	0.017***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]
3rd centile	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]
2nd centile	−0.030***	−0.028***	−0.027***	−0.028***	−0.027***
	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]
bottom centile	−0.051***	−0.048***	−0.046***	−0.049***	−0.046***
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
Self-employed	0.053***	0.048***	0.046***	0.046***	0.050***
	[0.007]	[0.007]	[0.007]	[0.006]	[0.005]
Wage employed	0.079***	0.061***	0.057***	0.058***	0.059***
	[0.010]	[0.010]	[0.009]	[0.007]	[0.006]
Unemployed	−0.024**	−0.026**	−0.025**	−0.017*	−0.016**
	[0.011]	[0.011]	[0.011]	[0.009]	[0.008]
Out of workforce	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]
Has any account	−	0.120***	0.115***	0.101***	0.108***
		[0.009]	[0.009]	[0.007]	[0.006]
Outstanding mortgage	−	−	0.052***	0.043***	0.045***
			[0.007]	[0.006]	[0.005]

Saved any money last year	−	−	−	0.463***	−
[country average]				[0.040]	
Country FE	−	−	−	−	+
Predicted probability	0.1891	0.1892	0.1892	0.1891	0.1891
No. of observations	147,690	147,690	147,690	147,690	147,690
Pseudo R^2	0.150	0.168	0.171	0.195	0.214
Log-likelihood	−61,069.5	−59,769.9	−59,562.6	−57,870.6	−56,473.4
LR χ^2	1,922.4***	1,948.3***	2,116.5***	3,593.3***	5,195.2***

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Authors' calculations from Global FINDEX data 2015—weighted averages.

compared to those in the third income centile. Individuals in the fourth income centile are 9.5 percent more likely to save for old age, compared to individuals in the third. Individuals in the second and bottom (first) income centile are 14.8 percent and 25.9 percent less likely to save for old age, compared to those in the third income centile.[20]

With respect to occupational groups, self-employed individuals are 24.3 percent more likely to be old age savers compared to the inactive group. Individuals in paid employment are about 30.7 percent more likely, while the unemployed are roughly 9 percent less likely to save for old age compared to the inactive. Financially included individuals around the world are about 53.4 percent more likely to be old age savers, while individuals who have an outstanding mortgage are roughly 22.9 percent more likely. Hence, having a mortgage for home ownership, as an alternative means of old age security, does not appear to reduce the probability of saving for old age, in our global sample.[21]

Country-specific generic savings rates have very large effects on the probability of an individual saving for old age. This supports other researchers' suggestions that cultural factors affect the individuals' attention to future events (Chen 2013). The magnitudes of the estimates do not differ substantially when excluding the group older than 65 years old in column 5, or when incorporating country-specific fixed effects (excluding the country-specific generic savings variable).

Table 7.2 presents estimates from multinomial probit models for old age savings, distinguishing by the individual state of financial inclusion, and the type of saving: formal versus informal. Results in columns A1–A3 report marginal effects for individuals who: (1) save for old age and have an account at a bank or another financial institution; (2) save for old age but do not have an account at a formal financial institution (i.e., save in some other way, such as gold, other assets, or in the home); and (3) do not save for old age. Results confirm that men are more likely to save for old age in general, by 4.4 percent (6.6) more among the financially included (excluded). Educated and urban residents are both more likely to be

TABLE 7.2. Saving for old age (OA) and financial inclusion, multinomial probit regressions

	(A) SavingOA & financial inclusion			(B) SavingOA & type of savings		
	(1) FIncl	(2) FExcl	(3) NoSavingOA	(1) FormalS	(2) InformalS	(3) NoSavingOA
Male	0.007***	0.002*	−0.009***	0.005***	−0.001	−0.004**
	[0.002]	[0.001]	[0.002]	[0.002]	[0.001]	[0.002]
Urban region	0.007***	−0.005***	−0.001	0.004**	0.002**	−0.006***
	[0.002]	[0.001]	[0.002]	[0.002]	[0.001]	[0.002]
Education: Tertiary	0.045***	−0.009***	−0.037***	0.040***	0.003**	−0.043***
	[0.003]	[0.002]	[0.003]	[0.002]	[0.001]	[0.003]
Education: Secondary	0.070***	−0.010***	−0.060***	0.052***	0.008***	−0.060***
	[0.003]	[0.001]	[0.003]	[0.003]	[0.001]	[0.003]
Age: 65 or more	0.155***	0.028***	−0.182***	0.111***	0.018***	−0.129***
	[0.005]	[0.002]	[0.005]	[0.004]	[0.002]	[0.005]
Age: 56 to 65	0.149***	0.018***	−0.166***	0.112***	0.014***	−0.127***
	[0.004]	[0.002]	[0.005]	[0.004]	[0.002]	[0.004]
age: 46 to 55	0.111***	0.008***	−0.119***	0.087***	0.011***	−0.098***
	[0.004]	[0.002]	[0.005]	[0.004]	[0.002]	[0.004]
Age: 36 to 45	0.099***	0.001	−0.101***	0.077***	0.009***	−0.087***
	[0.004]	[0.002]	[0.004]	[0.004]	[0.002]	[0.004]
Age: 26 to 35	0.057***	−0.002	−0.055***	0.043***	0.006***	−0.048***
	[0.004]	[0.002]	[0.004]	[0.004]	[0.002]	[0.004]
Married	0.028***	0.003	−0.031***	0.022***	0.004***	−0.026***
	[0.003]	[0.002]	[0.003]	[0.003]	[0.001]	[0.003]
Widowed/divorced/separated	−0.001	0.005**	−0.003	−0.007**	0.004**	0.003
	[0.004]	[0.002]	[0.005]	[0.004]	[0.002]	[0.004]
Has children under 15	−0.007***	0.004***	0.003	0.001	0.003***	−0.004*
	[0.003]	[0.001]	[0.003]	[0.002]	[0.001]	[0.003]
Household income per capita centile by county:	0.035***	0.003	−0.038***	0.026***	0.009***	−0.034***
	[0.003]	[0.002]	[0.004]	[0.003]	[0.001]	[0.003]
4th centile	0.014***	0.004**	−0.018***	0.012***	0.006***	−0.017***
	[0.003]	[0.002]	[0.004]	[0.003]	[0.001]	[0.003]
2nd centile	−0.029***	−0.001	0.030***	−0.024***	−0.005***	0.029***
	[0.003]	[0.002]	[0.004]	[0.003]	[0.002]	[0.003]
bottom centile	−0.048***	−0.004**	0.051***	−0.045***	−0.009***	0.054***
	[0.004]	[0.002]	[0.004]	[0.003]	[0.002]	[0.004]
Self-employed	0.043***	0.009***	−0.052***	0.031***	0.013***	−0.044***
	[0.003]	[0.001]	[0.003]	[0.003]	[0.001]	[0.003]
In paid employment	0.077***	−0.001	−0.076***	0.053***	0.017***	−0.069***
	[0.003]	[0.001]	[0.003]	[0.002]	[0.001]	[0.003]
Unemployed	−0.024***	−0.001	0.025***	−0.031***	−0.001	0.032***
	[0.006]	[0.003]	[0.006]	[0.005]	[0.002]	[0.005]
Predicted probability	0.1587	0.0303	0.8110	0.1042	0.0942	0.8016
No. of observations	147,690			137,511		
F-statistic	−70,074.8			−49,240.6		
LR χ^2	17,431.1***			14,947.7***		

Note: Marginal effects from multinomial probit regressions are presented, along with robust standard errors in brackets. Standard errors are clustered at the country level. Asterisks denote the following levels of significance: * p < 0.10, ** p < 0.05, *** p < 0.01

Source: Authors' calculations from Global FINDEX data 2015—weighted averages.

financially included and save for old age. Older persons and married individuals are also more likely to save for old age and be financially included, while the financially excluded do so only after their mid-40s. Columns B1–B3 report estimates for individuals who respectively: (1) save for old age and have saved in the past 12 months using an account at a formal financial institution; (2) save for old age and have saved in the past 12 months informally or semi-formally, using an informal savings club or person outside the family (without saving at a formal financial institution); and (3) do not save for old age. Results show that men are 4.8 percent more likely to save for old age formally. The widowed/divorced/separated and those with children aged under 15 are more likely to save for old age informally and semi-formally, with the magnitude of the effects being 4.2 and 3.2 percent respectively. Individuals with missing income information are the income group most likely to save for old age informally, and they are less likely to do so using an account at a formal financial institution.

Table 7.3 reports estimates from models that incorporate macroeconomic country-level variables. Here we see that people living in countries having English legal origins are between 18.5 and 29.6 percent more likely to save for old age, compared to regions having French legal origin. Those from countries with other legal origin (Scandinavian or socialist) are more likely to save for old age, compared to regions with French or German legal origin, and the effects are of similar magnitude to the English legal origin effect. GDP per capita is positively associated with the probability of saving for old age, with a one standard deviation increase raising the probability by about 20 percent. All remaining macroeconomic variables have insignificant impacts on saving for old age for the pooled group of countries, with the notable exception of the safety net/moral hazard index, which is positively associated with the probability of saving for old age: a one standard deviation increase raises the probability by 4.6 percent. We interpret this last result as supportive of the view that an institutional environment enabling greater trust in the financial system also encourages old age saving.

When we incorporated country pension-system characteristics to the model (Table 7.4), we found that more generous pension schemes are generally insignificantly (and negatively) correlated with old age saving. Yet higher contribution rates and employer/employee ratios are both significantly positively related to the probability of saving for old age. The latter result is intuitive, but we interpret the former as consistent with Poterba et al. (1995) who suggest little substitution between regular retirement savings and other forms of conventional financial saving.

Since effects by region of the main variables may vary across country groups, Table 7.5 presents estimates by region for the determinants of saving for old age around the world. Here we see that greater life expectancy is positively associated with the probability of saving for old age in OECD[HI],

TABLE 7.3. Saving for old age and country macroeconomic characteristics, probit regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log of life expectancy	−0.002	−0.071	−0.004	−0.015	0.003	0.009	0.011	0.040
German legal origin	0.004	0.003	0.003	0.001	−0.001	−0.002	−0.001	−0.003
	[0.019]	[0.018]	[0.018]	[0.018]	[0.018]	[0.019]	[0.020]	[0.018]
Other legal origin	0.041**	0.051***	0.049***	0.046***	0.045***	0.045***	0.045***	0.046***
	[0.020]	[0.017]	[0.017]	[0.017]	[0.017]	[0.017]	[0.017]	[0.016]
Log(GDP per capita)	—	0.039***	0.039***	0.041***	0.043***	0.041***	0.041***	0.040***
- PPP constant 2011		[0.010]	[0.009]	[0.009]	[0.010]	[0.011]	[0.011]	[0.010]
GDP per capita growth	—	—	0.005	0.005	0.004	0.004	0.004	0.005
			[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
WDI Legal Rights Index	—	—	—	0.002	0.002	0.002	0.002	0.001
				[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Housing affordability index	—	—	—	—	−0.002	−0.002	−0.002	−0.004
					[0.009]	[0.009]	[0.009]	[0.009]
Missing affordability index	—	—	—	—	0.014	0.015	0.015	0.01
					[0.027]	[0.026]	[0.028]	[0.026]
Real interest rate	—	—	—	—	—	−0.001	−0.001	−0.001
						[0.001]	[0.001]	[0.001]
Deposit insurance dummy	—	—	—	—	—	—	0.003	—
							[0.018]	
Moral hazard index	—	—	—	—	—	—	—	0.008**
								[0.004]
Has any account	0.110***	0.099***	0.101***	0.101***	0.102***	0.102***	0.102***	0.100***
	[0.009]	[0.009]	[0.008]	[0.008]	[0.009]	[0.009]	[0.009]	[0.009]
Outstanding mortgage	0.049***	0.046***	0.046***	0.045***	0.045***	0.046***	0.046***	0.046***
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]
Individual characteristics	+	+	+	+	+	+	+	+
Predicted probability	0.1892	0.1896	0.1895	0.1895	0.1895	0.1895	0.1895	0.1732
No. of observations	147,690	141,655	141,655	141,655	141,655	141,655	141,655	85,817
Pseudo R^2	0.175	0.180	0.180	0.181	0.181	0.181	0.181	0.192
Log-likelihood	−59,296.8	−56,621.9	−56,558.2	−56,547.0	−56,534.5	−56,530.1	−56,529.5	−39,463.8

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations from Global FINDEX data 2015—weighted averages.

TABLE 7.4. Saving for old age and country pension-system characteristics: probit regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log benefit in PPP US$	−0.004	–	–	−0.046***	−0.005	−0.009	−0.002	−0.009**
	[0.003]			[0.017]	[0.004]	[0.011]	[0.003]	[0.004]
Benefit as % of GDP per capita	–	−0.095	–	–	–	–	–	–
		[0.086]						
Benefit as % of the $1.25/day poverty line	–	–	−0.001	–	–	–	–	–
			[0.001]					
Cost of pension spending as % GDP	–	–	–	−0.003	–	–	–	–
				[0.006]				
% population over 60 covered	–	–	–	–	0.029	0.027	0.043*	0.052**
					[0.023]	[0.023]	[0.025]	[0.024]
Log age of eligibility	–	–	–	–	–	0.004	–	–
						[0.011]		
Contribution rate %	–	–	–	–	–	–	0.172**	–
							[0.067]	
Employer/employee contribution ratio	–	–	–	–	–	–	–	0.006***
								[0.002]
Has any account	0.102***	0.107***	0.102***	0.130***	0.102***	0.102***	0.111***	0.116***
	[0.009]	[0.009]	[0.009]	[0.011]	[0.009]	[0.009]	[0.009]	[0.008]
Outstanding mortgage	0.048***	0.049***	0.049***	0.061***	0.048***	0.048***	0.050***	0.045***
	[0.007]	[0.006]	[0.007]	[0.009]	[0.007]	[0.007]	[0.007]	[0.006]
Predicted probability	0.1873	0.1874	0.1873	0.2501	0.1874	0.1874	0.1898	0.1879
No. of observations	133,146	133,146	133,146	57,345	133,146	133,146	106,929	133,146
Pseudo R^2	0.187	0.185	0.187	0.173	0.188	0.188	0.192	0.186
Log-likelihood	−52,368.4	−52,533.6	−52,381.0	−26,895.4	−52,348.3	−52,345.7	−41,992.8	−54,728.1

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Authors' calculations from Global FINDEX data 2015—weighted averages.

TABLE 7.5. Saving for old age and regional differences, probit regressions

	EAP	ECA	OECD^{HI}	LAC	MENA	South Asia	Sub-Saharan Africa
	(1)	(2)	(4)	(5)	(6)	(7)	(8)
Log of life expectancy	−3.724***	−1.739***	1.987***	0.862***	−2.489***	0.268**	0.038
	[0.208]	[0.359]	[0.750]	[0.328]	[0.112]	[0.118]	[0.061]
English legal origin	−0.127***	–	−0.076	−0.153***	–	−0.128***	0.015
	[0.021]		[0.057]	[0.047]		[0.011]	[0.013]
German legal origin	0.621***	−0.088***	0.066	–	–	–	–
	[0.034]	[0.021]	[0.043]				
Other legal origin	–	−0.052	0.016	–	−0.062***	–	0.007
		[0.045]	[0.038]		[0.013]		[0.011]
Log(GDP per capita)	−0.277***	0.046**	0.042	−0.038*	1.142***	−0.001	0.027***
- PPP constant 2011	[0.013]	[0.020]	[0.060]	[0.021]	[0.035]	[0.012]	[0.005]
GDP per capita growth	−0.143***	−0.012**	0.008	−0.002	0.021***	−0.022***	0.008***
	[0.009]	[0.006]	[0.014]	[0.002]	[0.006]	[0.003]	[0.001]
WDI legal rights index	0.005***	−0.007**	0.018***	0.013***	0.141***	−0.011***	−0.002
	[0.002]	[0.003]	[0.007]	[0.002]	[0.018]	[0.003]	[0.003]
Real interest rate	–	−0.009***	0.001	−0.001	−0.028***	–	0.001
		[0.002]	[0.009]	[0.001]	[0.001]		[0.001]
Housing affordability index	0.583***	0.133***	0.039*	0.113***	0.619***	0.037***	0.001
	[0.017]	[0.036]	[0.020]	[0.014]	[0.088]	[0.010]	[0.010]
Outstanding mortgage	0.035***	0.016	0.052***	0.033***	0.022	0.058	0.054***
	[0.012]	[0.012]	[0.012]	[0.012]	[0.014]	[0.038]	[0.008]
Has any account	0.138***	0.056***	0.101***	0.115***	0.051***	0.087***	0.096***
	[0.023]	[0.007]	[0.021]	[0.008]	[0.006]	[0.015]	[0.006]
Male	−0.003	0.006	0.008	0.026***	−0.006	−0.007	0.006
	[0.010]	[0.004]	[0.007]	[0.007]	[0.011]	[0.016]	[0.004]
Urban region	−0.040**	0.004	−0.029***	−0.002	0.005	0.011	0.013**
	[0.020]	[0.007]	[0.010]	[0.009]	[0.007]	[0.016]	[0.006]
Education: Tertiary	0.014	0.032***	0.058***	0.032***	0.028***	0.013	0.033***
	[0.042]	[0.012]	[0.009]	[0.012]	[0.006]	[0.012]	[0.009]
Education: Secondary	0.026*	0.001	0.065***	0.025***	−0.001	0.024*	0.014**
	[0.015]	[0.011]	[0.014]	[0.009]	[0.003]	[0.012]	[0.006]
Age: 65 or more	0.267***	0.175***	0.206***	0.101***	0.083***	0.096***	0.099***
	[0.063]	[0.026]	[0.031]	[0.024]	[0.011]	[0.013]	[0.011]
Age: 56 to 65	0.251***	0.132***	0.228***	0.087***	0.083***	0.073***	0.078***
	[0.077]	[0.029]	[0.026]	[0.017]	[0.008]	[0.018]	[0.011]

Age: 46 to 55	0.189***	0.078***	0.169***	0.071***	0.054***	0.052***	0.049***
	[0.051]	[0.026]	[0.023]	[0.016]	[0.004]	[0.015]	[0.011]
Age: 36 to 45	0.156***	0.037	0.145***	0.061***	0.024*	0.054***	0.027***
	[0.055]	[0.026]	[0.024]	[0.015]	[0.013]	[0.011]	[0.008]
Age: 26 to 35	0.071**	−0.003	0.079***	0.033**	0.001	0.028	0.01
	[0.032]	[0.019]	[0.021]	[0.014]	[0.010]	[0.018]	[0.008]
Married	0.066***	0.040***	0.055***	0.014*	−0.004	0.027***	0.023***
	[0.023]	[0.009]	[0.011]	[0.008]	[0.013]	[0.010]	[0.007]
Widowed/divorced/separated	0.005	0.034***	−0.009	0.021	−0.013*	0.064***	0.017**
	[0.029]	[0.010]	[0.013]	[0.020]	[0.008]	[0.023]	[0.008]
Single	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]
Has children under 15	0.030**	−0.023	0.025***	−0.004	0.019	0.006	0.008*
	[0.012]	[0.015]	[0.009]	[0.008]	[0.013]	[0.011]	[0.005]
Household income per capita centile by country:	0.016**	0.024**	0.050***	0.049***	0.024***	0.02	0.040***
	[0.007]	[0.012]	[0.013]	[0.010]	[0.004]	[0.015]	[0.006]
4th centile	−0.006	0.007	0.030**	0.027**	0.013**	0.003	0.024***
	[0.004]	[0.011]	[0.014]	[0.013]	[0.006]	[0.009]	[0.006]
2nd centile	−0.087***	0.001	−0.056***	−0.019**	−0.016**	−0.017*	0.001
	[0.018]	[0.013]	[0.012]	[0.009]	[0.007]	[0.010]	[0.008]
bottom centile	−0.143***	−0.025**	−0.083***	−0.010	−0.033***	−0.030***	−0.01
	[0.036]	[0.012]	[0.012]	[0.011]	[0.013]	[0.010]	[0.007]
Self-employed	0.059***	0.025**	0.104***	0.043***	0.043***	0.038***	0.029***
	[0.023]	[0.013]	[0.019]	[0.007]	[0.010]	[0.012]	[0.006]
In paid employment	0.073***	0.002	0.124***	0.040**	0.025***	0.067***	0.061***
	[0.016]	[0.010]	[0.013]	[0.016]	[0.008]	[0.014]	[0.008]
Unemployed	−0.019	−0.003	−0.039*	−0.014	−0.028*	0.060**	−0.016*
	[0.057]	[0.020]	[0.021]	[0.012]	[0.017]	[0.024]	[0.009]
Out of workforce	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]	[Ref.]
Predicted probability	0.3470	0.1129	0.3627	0.1399	0.0667	0.0916	0.0901
No. of observations	11,184	21,040	30,119	15,536	9,069	9,132	33,042
Pseudo R^2	0.139	0.153	0.115	0.128	0.170	0.133	0.216
Log-likelihood	−6,505.2	−6,281.5	−17,458.3	−5,485.0	−1,844.9	−2,426.4	−7,844.8

Note: * p<0.10, ** p<0.05, *** p<0.01.

Source: Authors' calculations from Global FINDEX data 2015—weighted averages.

LAC, and South Asia. The effect is much higher in OECD^{HI}, but it is negative in EAP, ECA, and MENA. Higher GDP per capita and higher per capita growth both are positively linked to saving for old age in the MENA and Sub-Saharan Africa, but there is no significant effect in OECD^{HI} countries. (It is mixed in the remaining regions.) The probability of old age saving is higher in countries with higher legal-rights indexes in EAP, OECD^{HI}, LAC, and MENA. Higher real interest rates are positively linked to old age saving in Sub-Saharan Africa, but negatively in ECA. A greater housing affordability index is positively related to saving for old age in the majority of regions, with the exception of Sub-Saharan Africa, where there is no association.

We also examine additional factors associated with old age saving around the world, by region. Our results (see Table 7A.3, in the Appendix) indicate that deposit insurance schemes are positively related to saving for old age in ECA but negatively related in MENA. Moreover, higher benefits are only negatively related to saving for old age in MENA countries. Contribution rates are negatively related to saving for old age only in EAP. In sum, our results largely confirm the view of limited substitutability between regular retirement savings and other forms of conventional financial saving.

Conclusion

The looming worldwide retirement crisis has policymakers scrambling to better understand how adults prepare financially for old age. This chapter offers the first detailed global inquiry into patterns of old age saving around the world and across country groups, drawing on new and rich micro-data. We find that 24.8 percent of individuals around the world save for old age, with large regional differences: rates are above 35 percent in OECD^{HI} and EAP, 11.8 percent in ECA, 10.6 percent in LAC, and below 10 percent in Sub-Saharan Africa, South Asia, and MENA. We also found a small gender gap in saving for old age overall, which is larger in developing counties. Most regions exhibit patterns of higher saving for old age among those with higher education, with EAP standing out as the sole exception. In every region except South Asia, employed adults are more likely to save for old age than unemployed adults. Saving for old age also rises sharply among the 36–45 age group. Our findings also reveal large income disparities: adults in the top income centiles are far more likely, while the lowest income are much less likely, to save for old age. Adults who have an account at a bank or a financial institution are about 40 to 50 percent more likely to save for old age.

On the country level, we also uncover a significant and positive relationship between old age saving and the country's generic saving propensity, English legal origin, and GDP per capita. Institutional arrangements also

help when they enable greater trust in the financial system. Finally, we find a significantly positive relationship between the probability of saving for old age and pension coverage, the size of contributions, and contribution ratios. More affordable housing is positively related to saving for old age everywhere except Sub-Saharan Africa. We interpret this as evidence suggesting little substitution between pension system provisions and contribution rates, other forms of financial saving, and saving for old age.

Appendix

TABLE 7A.1. Summary statistics by region

	Units	EAP	ECA	OECD[HI]	LAC	MENA	South Asia	Sub-Saharan Africa
Male	(%)	49.2	47.7	48.5	48.6	49.8	50.3	49.2
Urban region	(%)	31.4	35.7	44.7	38.7	62.0	14.9	23.1
Education: Tertiary	(%)	10.2	13.9	21.1	12.2	8.1	3.4	3.0
Education: Secondary	(%)	49.3	72.2	82.5	63.2	53.1	37.1	34.3
Education: Primary or less	(%)	50.4	27.3	15.8	36.5	46.7	62.9	65.3
Age: 65+	(%)	7.0	11.9	17.5	8.2	3.8	5.9	5.0
Age: 56 to 65	(%)	11.1	12.7	15.6	9.0	7.3	9.5	6.6
Age: 46 to 55	(%)	16.0	16.1	17.6	13.0	11.9	11.1	10.3
Age: 36 to 45	(%)	20.8	17.5	17.2	17.3	17.5	16.6	16.4
Age: 26 to 35	(%)	21.8	18.3	15.7	22.5	23.9	23.4	24.7
Age: 18 to 25	(%)	17.5	16.3	12.0	22.0	26.9	25.3	25.9
Married	(%)	69.5	60.3	57.6	51.8	54.3	67.8	51.3
Widowed/divorced/ separated	(%)	5.7	13.3	12.9	10.3	4.6	6.4	10.6
Single	(%)	24.8	26.4	29.6	38.0	41.1	25.8	38.1
Has children under 15	(%)	48.9	40.4	28.8	38.9	45.9	69.6	66.3
HH income per capita centile by country:	(%)	13.2	12.6	15.0	10.8	10.9	15.0	12.0
4th centile	(%)	18.5	15.2	16.9	12.0	13.7	17.6	15.1
3rd centile	(%)	19.9	17.5	18.7	13.2	15.0	20.0	17.5
2nd centile	(%)	18.5	18.9	20.8	14.6	18.1	22.2	19.7
bottom centile	(%)	22.6	21.6	25.2	16.0	20.2	25.2	21.1
missing centile	(%)	7.3	14.3	3.4	33.3	22.2	0.0	14.7
Self-employed	(%)	38.8	17.7	10.5	23.1	16.7	27.9	38.8
Employed	(%)	28.9	32.2	45.3	30.2	21.5	19.1	18.2
Unemployed	(%)	29.9	43.2	38.7	37.8	51.0	48.0	34.0
Inactive	(%)	2.5	6.9	5.6	8.9	10.7	5.0	8.9
Has any account	(%)	62.4	45.8	93.5	44.5	33.0	40.6	30.0
	(%)	67.0	37.1	70.1	47.4	38.6	39.1	58.0

TABLE 7A.1. Continued

		EAP	ECA	OECD[HI]	LAC	MENA	South Asia	Sub-Saharan Africa
Any savings last year (country average)								
Outstanding mortgage	(%)	9.9	11.2	27.6	10.4	9.6	5.4	5.2
Log (GDP per capita—PPP divided)		9.15	9.23	10.51	9.15	9.22	8.37	7.89
GDP per capita growth		6.47	4.42	0.76	3.65	1.71	5.27	5.22
WDR legal rights index		4.43	5.90	5.87	4.49	1.23	5.54	5.15
Legal origin: English	(%)	14.6	0.0	20.0	6.1	0.0	89.1	38.2
Legal origin: French	(%)	29.2	71.3	30.1	93.9	89.0	11.0	55.9
Legal origin: German	(%)	48.8	24.0	26.6	0.0	0.0	0.0	0.0
Legal origin: Other	(%)	7.4	4.8	23.3	0.0	11.0	0.0	5.9
Real interest rate		3.96	8.10	1.12	5.56	3.94	5.08	5.09
Missing real interest rate	(%)	15.9	19.0	59.9	12.1	22.7	11.5	55.9
Deposit insurance	(%)	47.2	95.3	90.0	69.7	44.1	77.9	32.4
Safety net/moral hazard index[‡]		0.59	0.81	1.07	−2.32	−0.07	−0.52	−0.34
Life expectancy		72.68	72.50	80.68	74.16	72.19	67.66	57.90
Benefit in PPP US$[‡]		34.13	86.84	614.85	144.21	62.00	9.25	95.86
Benefit as % of GDP per capita[‡]	(%)	4.2	11.7	20.3	13.5	21.0	4.7	14.9
Benefit as % of $1.25/day pov. line[‡]	(%)	90.0	228.6	1,617.2	379.2	162.0	24.9	252.1
Cost of pension spending as % GDP[‡]	(%)	0.09	1.07	1.48	0.27	0.06	0.10	0.70
% population 60+ covered[‡]	(%)	31.1	33.4	30.6	25.4	10.0	20.7	65.5
Age of eligibility[‡]		62.29	62.16	64.85	64.38	60.00	62.77	62.14
Employer/employee contribution ratio[‡]		1.91	7.63	1.94	2.70	3.33	3.03	4.01
% contribution rate	(%)	16.9	26.6	28.3	23.0	24.0	26.6	16.9

Note: Variables marked with the symbol (‡) have missing observations. For region definitions, see text.

Source: Authors' calculations from Global FINDEX data 2015—weighted averages.

TABLE 7A.2. Summary statistics by old age (OA) saving status

	(1)	(2)	(3)	(4)	
	All countries	SavingOA	Not SavingOA	Diff.	[Sig.]
#of Observations	147,692	30,395	117,297		
Male	49.0%	52.3%	48.3%	0.0397	***
Urban region	37.3%	41.8%	36.2%	0.0561	***
Education: Tertiary	12.4%	21.8%	10.2%	0.1160	***
Education: Secondary	59.9%	73.0%	56.9%	0.1614	***
Education: Primary or less	39.4%	26.2%	42.5%	−0.1626	***
Age: 65+	9.8%	14.6%	8.7%	0.0590	***
Age: 56 to 65	10.7%	16.8%	9.2%	0.0756	***
Age: 46 to 55	14.1%	19.1%	13.0%	0.0610	***
Age: 36 to 45	17.5%	20.7%	16.8%	0.0387	***
Age: 26 to 35	21.0%	17.8%	21.8%	−0.0399	***
Age: 18 to 25	19.4%	9.3%	21.8%	−0.1241	***
Married	57.7%	68.8%	55.1%	0.1370	***
Widowed/divorced/separated	10.5%	11.4%	10.3%	0.0116	***
Single	31.8%	19.8%	34.6%	−0.1486	***
Has children under 15	45.6%	36.8%	47.7%	−0.1094	***
Household income per capita centile:	12.8%	18.6%	11.5%	0.0711	***
4th centile	15.4%	19.4%	14.4%	0.0493	***
3rd centile	17.3%	18.9%	16.9%	0.0203	***
2nd centile	18.9%	16.4%	19.5%	−0.0312	***
bottom centile	21.4%	15.6%	22.8%	−0.0715	***
missing centile	14.2%	11.1%	15.0%	−0.0380	***
Self-employed	23.3%	22.3%	23.5%	−0.0114	***
Employed	30.1%	43.5%	26.9%	0.1657	***
Unemployed	39.8%	31.3%	41.8%	−0.1053	***
Inactive	6.9%	2.9%	7.8%	−0.0490	***
Has any account	55.5%	83.9%	48.8%	0.3509	***
Any savings last year (country average)	54.6%	64.4%	52.3%	0.1212	***
Outstanding mortgage	13.2%	25.0%	10.5%	0.1453	***
Log(GDP per capita—PPP divided)	9.22	9.80	9.08	0.7150	***
GDP per capita growth	3.75	3.22	3.88	−0.6596	***
WDR legal rights index	5.00	5.39	4.91	0.4846	***
Legal origin: English	24.4%	27.4%	23.7%	0.0366	***
Legal origin: French	52.8%	37.1%	56.4%	0.0412	***
Legal origin: German	14.7%	22.5%	12.9%	0.0963	***
Legal origin: other	8.1%	13.0%	7.0%	−0.1926	***
Real interest rate	4.34	3.15	4.62	−1.4614	***
Deposit insurance	66.5%	73.3%	64.9%	−0.0014	**
Moral hazard index‡	0.17	0.71	0.03	0.6808	***
Life expectancy	71.11	75.11	70.19	4.9177	***
Benefit in PPP US$‡	256.36	353.02	227.06	125.9557	***
Benefit as % of GDP per capita‡	13.7%	14.3%	13.5%	0.0075	***
Benefit as % of $1.25 a day pov. line‡	674.4%	928.6%	597.3%	331.3	***
Cost of pension spending as % GDP‡	0.68%	0.89%	0.61%	0.2808	***
% population 60+ covered‡	31.1%	34.1%	30.1%	0.0403	***
Age of eligibility‡	63.52	63.59	63.50	0.0960	***
Employer/employee contribution ratio‡	3.42	2.94	3.53	−0.5902	***
% contribution rate‡	23.5%	24.6%	23.3%	0.0136	***

Note: Weighted averages in columns 1–3. Weighted mean differences in column 4 and levels of significance of the differences are from a t-test for weighted mean differences with unequal variances produced using the parmby and metaparm commands in Stata. Variables marked with the symbol (‡) have missing observations. Asterisks denote the following levels of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations from Global FINDEX data 2015—weighted averages.

TABLE 7A.3. Additional models of saving for old age and regional differences, probit regressions

	EAP	ECA	OECD[HI]	LAC	MENA	South Asia	Sub-Saharan Africa
Panel A: Saving for old age by region and deposit insurance							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Deposit Insurance dummy	–	0.176***	−0.031	−0.004	−0.212***	–	0.006
		[0.027]	[0.053]	[0.018]	[0.005]		[0.008]
Predicted probability	0.3470	0.1129	0.3627	0.1399	0.0667	0.0916	0.0901
No. of observations	11,184	21,040	30,119	15,536	9,069	9,132	33,042
Pseudo R^2	0.139	0.145	0.115	0.127	0.170	0.133	0.215
Panel B: Saving for old age by region and pension-system characteristics							
	(9)	(10)	(12)	(13)	(14)	(15)	(16)
Log benefit in PPP US$	0.026*	2.626***	−0.004	0.011***	−0.082***	−0.031	0.012***
	[0.015]	[0.053]	[0.010]	[0.001]	[0.004]	[0.078]	[0.004]
% population over 60 covered	0.091	216.423***	0.003	−0.320***	–	0.304	−0.042
	[0.103]	[6.358]	[0.059]	[0.029]		[0.614]	[0.035]
Contribution rate (%)	−0.195***	25.968***	0.709***	1.147***	5.905***	0.090	0.144
	[0.070]	[0.535]	[0.163]	[0.088]	[0.267]	[0.350]	[0.099]
Predicted probability	0.3753	0.1294	0.3557	0.1393	0.0702	0.0969	0.0908
No. of observations	5,000	14,036	26,114	14,528	8,069	6,112	27,040
Pseudo R^2	0.141	0.148	0.12	0.136	0.168	0.118	0.225

Note: * p < 0.10, ** p < 0.05, *** p < 0.01.

Source: Authors' calculations from Global FINDEX data 2015—weighted averages.

Endnotes

1. The literature does offer contrary views on retirement and wellbeing, such as Charles (2002).

2. The author reviews how designing public policy toward retirement security must recognize both the heterogeneity among households saving for retirement, as well as the multiple policy objectives that are served by various policy instruments.

3. In a similar vein, the Future of Retirement report (HSBC 2013), which surveyed 1,050 respondents in the UK and more than 16,000 people across 15 countries, revealed that almost two-fifths of retired UK respondents (39%) said that they had not prepared adequately or at all for a comfortable retirement.

4. Moreover, one-third of respondents said that they had foregone some form of medical treatment in the preceding year due to the treatment's expected cost. Not surprisingly, the decision not to seek treatment was more common for those without savings, those indicating that they were struggling with their finances, or had no insurance.

5. For a detailed investigation on the heuristics and the biases that emerge in the area of retirement savings, see Benartzi and Thaler (2007). Other studies on retirement planning strategies involving relevant considerations include Ameriks and Zeldes (2004) and Brown (2007).

6. See Holzmann (2012) and Pallares-Miralles et al. (2012) for reviews of international pension systems.

7. The rationale is that by separating the redistributive function from the savings function, the public pillar, as well as the size of the payroll tax needed to support it, can be kept relatively small, thus avoiding many of the growth-inhibiting problems associated with a dominant public pillar (World Bank 1994).

8. Such incentives involve tax exemptions and subsidies. These might require changes in fiscal policy that can be socially costly because they increase distortions. Moreover, such schemes might suffer from limited or lower coverage as well as volume of savings, particularly among the poor, compared to the remaining pillars. Valdés-Prieto (2002a) suggests that most third-pillar fiscal incentives are regressive because the incentives are taken up mostly by higher-income workers while the increase in general tax rates fall to some degree upon middle- and lower-income workers. There is a rich literature on the effects of social security incentives and provisions on labor market distortions (e.g., Gruber and Wise 1998, 2002; Coile 2015), on the strong connections between subjective retirement expectations and future work behavior (e.g., Chan and Stevens 2004), on the role of financial incentives on retirement choices (e.g., Kingston 2000; Belloni and Alessie 2009), and on the role of fluctuations on the business cycle, financial markets, and the housing market on retirement choices (e.g., Crawford and Lilien 1981; Coile and Levine 2010).

9. The complete database is available at: <http://datatopics.worldbank.org/financialinclusion>.

10. The survey is conducted in the major languages of each country. The target population is the entire civilian, non-institutionalized population age 15 and above. Data weighting is used to ensure a nationally representative sample for each economy. Final weights consist of the base sampling weight, which corrects for unequal probability of selection based on household size, and the poststratification weight, which corrects for sampling and nonresponse error. Poststratification weights use country-level population statistics on gender and age and, where reliable data are available, education or socioeconomic status. In some large economies, such as China and Russia, sample sizes of at least 4,000 are collected. Detailed country-level information about the data collection dates, sample sizes, excluded populations, and margins of error can be found at <http://go.worldbank.org/IGRTPHK660>.

11. We do not exclude from the sample individuals older than 65 years old, following the evidence in Alessie et al. (1999), who find little evidence of decumulation among the elderly, and only at an advanced age. The authors find that precautionary savings, bequest motives, and health are among the reasons why some elderly do not decumulate in the pattern predicted by the life-cycle model.

12. All summary statistics are weighted country averages.

13. Data on real GDP per capita, PPP (constant 2011 international dollars) are from the World Development Indicators.

14. Out of the total 146 countries in the Global Findex 2014 data, Liberia, Paraguay, and South Sudan are excluded from these specifications due to missing data on saving for old age.

15. Across the developing world, only about 4% of adults—160 million people—are unbanked but save by using a savings club or a person outside the family, while in Sub-Saharan Africa the share is three times that size. On average, in the region's economies, 13% of adults are unbanked and save semi-formally (Demirgüç-Kunt et al. 2015).

16. The housing affordability index is from Numbeo (2015). The data and description are available at: <http://www.numbeo.com/property-investment/rankings_by_country.jsp?title=2014>.

17. The data and detailed description are available at: <http://www.pension-watch.net/pensions/about-social-pensions/about-social-pensions/social-pensions-database>.

18. The data are described by Pallares-Miralles et al. (2012) and are available at: <http://www.worldbank.org/en/topic/socialprotectionlabor/brief/pensions-data>.

19. Descriptive statistics for the main variables in the analysis of old age saving around the world appear in Tables 7A.1 and 7A.2 in the Appendix. Column 1 presents weighted averages for the pooled sample of all countries (147,692 individuals), while columns 2 and 3 present averages for individuals who save for old age (24.8% of the weighted sample, or 30,395 individuals) and those who do not (75.2% of the weighted sample, or 117, 297 individuals), respectively. Column 4 also presents the mean difference and significance levels for tests of

differences in the means of the variables across the two samples. Weighted mean differences are computed and a t-test for weighted mean differences with unequal variances produced using the parmby and metaparm commands in Stata.

20. It is worth noting that the magnitude of the effects with respect to the income variables does not differ much when overall equivalized household income centiles are used, instead of centiles by country (results available upon request).

21. Indeed, there is limited empirical evidence in favor of downsizing housing adjustments on retirement, such as Ermisch and Jenkins (1999).

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