Do informal workers of small firms self-insurance for retirement?

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Outline

Motivation

The Social Protection system

- The traditional social protection structure (contributive and non-contributive) was largely established by the majority of Latin American countries
- There is scarce research about informal or non-traditional protection alternatives that individuals might have been using to finance consumption during old-age
  - 2/3 of labor force do not use the traditional social protection structure.
  - Are they thinking about retirement?
  - How are they going to finance their retirement?
  - Are they taking any action outside the traditional structure?

Literature Review

- Parada-Contzen, M. (2018): Crowd-out effects of considering different sources of savings in Chile
- Carpenter, S. B., & Jensen, R. T. (2002): How households decide to save between formal and informal institutions in Pakistan
- Attanasio, O. P., & Brugiavini, A. (2003): Evidence that private saving rates increase as a result of a reduction in pension wealth (substitution effect).
- Gelber, A. M. (2011): Substantial "crowd-in" of non-401(k) financial assets in response to 401(k) eligibility.

Economic aim and results

- Aim:
  - Understand the interaction between different non-traditional saving options, and what are the determinants of these dynamics
- Data:
  - Novel survey data of 5560 workers from micro-firms in Metropolitan Lima
- Methodology:
  - Probit analysis for "saving decisions" and Principal Component Analysis (PCA) for "saving options relationships".
- Results:
  - Yes, they have plans for retirement and take actions for their future
  - The main choice for retirement is not the traditional system
  - There is a "portfolio" of saving options, where "having an own business" stands out
  - There is a substitution between formal saving options and investment options.

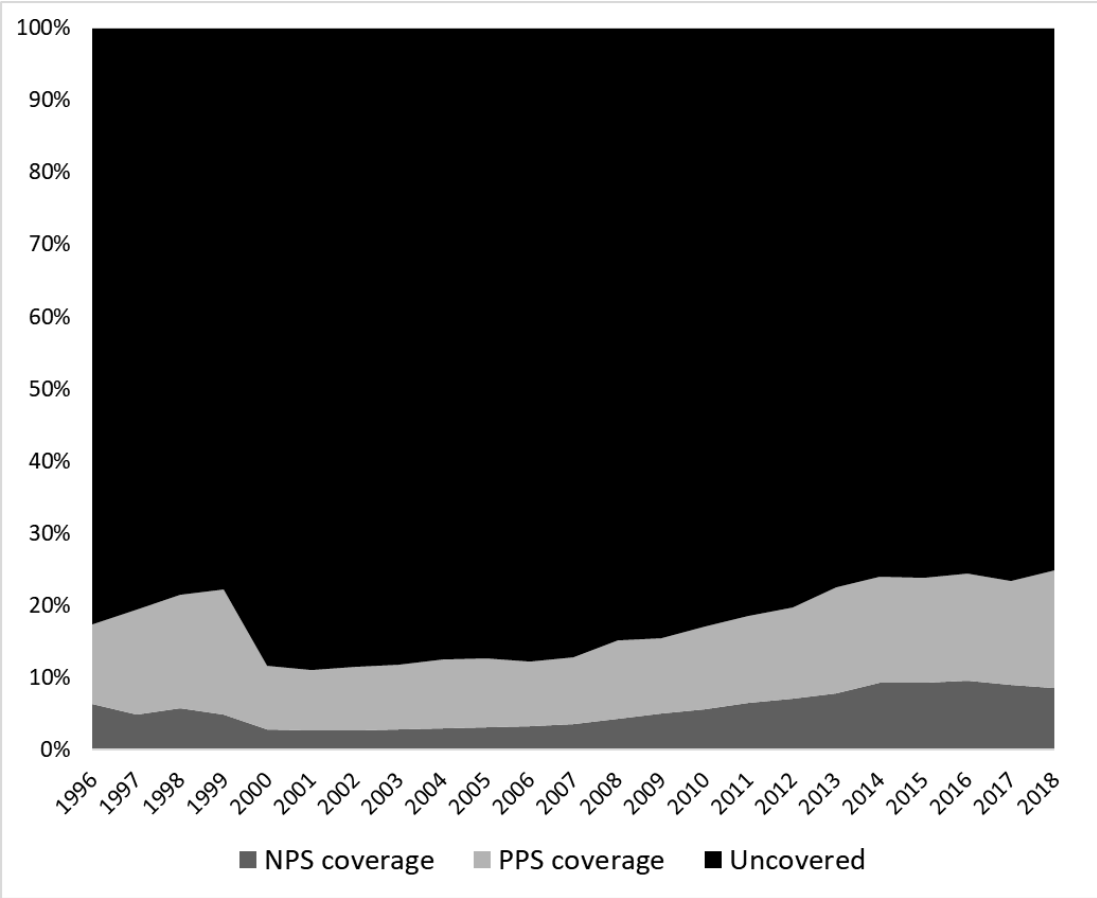
The Traditional Pension System

- Contributive Pensions:
  - The National Pension System
    - A pay-as-you-go scheme (defined benefit)
    - Partially funded by workers contributions and generally subsidized by the government
  - The Private Pension System
    - Defined contribution system
    - Retirement savings depend on her own contributions
- Non-contributive Pension:
  - Monetary transfers provided to poor individuals 65+ (Pension65)
- Concerns: coverage, contributions, pension adequacy, sustainability.
- Overall: Coverage rates are low

The Traditional Pension System

- The coverage evolution, in both the NPS and the PPS, will not increase substantially despite the increasing elder population.

Figure: Coverage of active population (1996-2018)

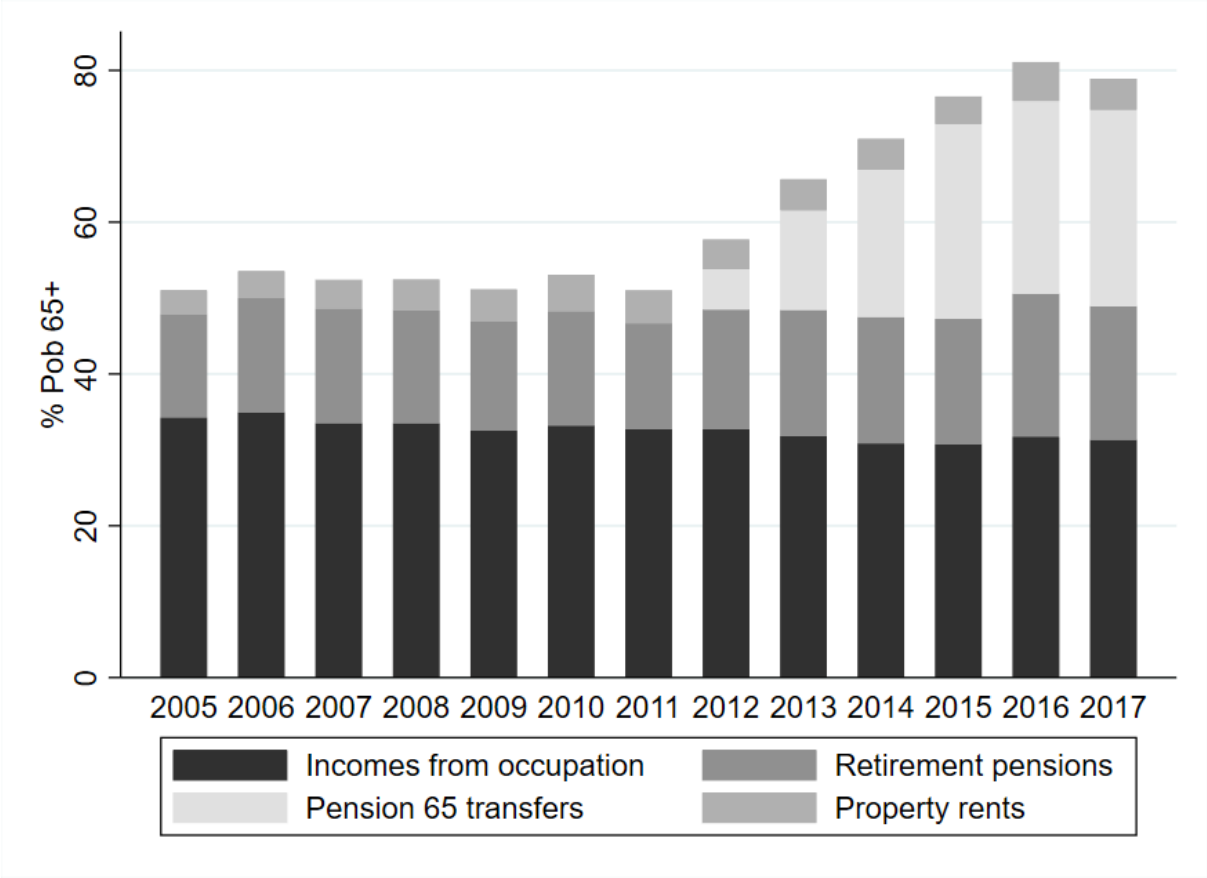


Source: ONP for the NPS coverage, SBS for the PPS coverage.
Note: Coverage rate is calculated as the proportion of the contributors over the Economically Active Population (EAP).

The Traditional Pension System

- Current alternatives of finance retirement is not only related with pensions.

Figure: Sources of financing retirement



Source: INEI. ENAHO pool 2005-2017.
Note: Sample for people over 65 years old

Database and selection

- Fieldwork to collect information about 5560 workers in Lima Metropolitan from a random subsample from the "Directorio de Micro y Pequeñas empresas"
- Information about:
  - (i) Demographic characteristics, (ii) Labor variables, (iii) Household variables (ENAHO-2017)
  - (iv) Preferences: Risk Aversion, Money preferences over time (Global Preferences Survey 2016).
  - (v) Retirement: Saving Plans and Actions taken for retirement (Encuesta de Protección Social 2015 - Chile)
  - (vi) Financial Literacy: Financial test (Encuesta de Medición de Capacidades Financieras en los Países Andinos, 2014)

Table: Characteristics of workers in Lima

	Obs	Mean	Sd
A. Demographics			
Sex: Female	5554	**0.55**	0.50
Age	5553	**43.16**	13.14
Educ level: Primary	5510	0.06	0.24
Educ level: Secondary	5510	**0.40**	0.49
Educ level: Superior non-univ	5510	0.31	0.46
Educ level: Superior univ	5510	0.23	0.42
Married or cohabiting	5545	**0.53**	0.50
Has children	5560	**0.72**	0.45
B. Labor			
Individual monthly income[1/]	3576	1761.98	1501.73
Employer	5560	0.32	0.47
Self-employed	5560	0.24	0.43
Employee	5560	0.44	0.50
Signed a formal labor contract[2/]	2433	**0.08**	0.28
Labor hours per day	5474	9.21	3.02
Formal contract duration (months)	119	15.57	20.95
Working duration (months)	4812	105.00	89.28

	Obs	Mean	Sd
C. Household			
Monthly income: $[0 - 3,000 >$ soles	4170	0.71	0.45
Monthly income: $[3,000 - 10,000 >$ soles	4170	0.27	0.45
Monthly income: $[+10,000 >$ soles	4170	0.02	0.13
Household expenditures	5117	1050.46	644.55
Property: Rented	5493	0.20	0.40
Property: Own	5493	0.65	0.48
Property: Other	5493	0.15	0.36
Savings: Cash	5478	0.29	0.46
Savings: Banks	5483	0.34	0.47
Savings: Municipal banks	5367	0.03	0.18
Savings: Fixed deposits, mutual funds	5395	0.03	0.18
Savings: Pension system	5444	0.20	0.40
Savings: Properties, lands	5425	0.10	0.30
Savings: Others	5364	0.02	0.16
Credit: Comsuption	5554	0.23	0.42
Credit: Real state	5548	0.05	0.21
Credit: Home repairs	5526	0.07	0.25
Money admin: Other case	5257	0.54	0.50
Money admin: Herself	5257	0.46	0.50
A member already in the PS	5127	**0.34**	0.48

Source: Own elaboration.

Notes:
[1/] Individual income is not mandatory but otherwise workers report monthly income ranges and 43.4% indicates they earn less than 2,000 soles.
[2/] The explicit question was: "In this job, Did you signed a formal labor contract?, So this variable indicates the labor formality status".

Table: Characteristics of workers in Lima

	Obs	Mean	Sd
D. Preferences and Retirement			
Risk aversion index	4904	7.01	1.75
Time preference index	4855	5.88	1.53
Financial literacy index	5392	6.06	2.63
Checks her personal finance	5408	0.67	0.47
Expected retirement age	3413	62.95	10.17
Expected lifespan	2667	78.12	11.18
Pension expected: Less than now	4922	0.20	0.40
Pension expected: Same as now	4922	0.34	0.47
Pension expected: More than now	4922	0.46	0.50
Thought in his retirement	5323	0.50	0.50
Has a saving plan[3/]	5173	**0.46**	0.50
Own business	2398	**0.62**	0.49
Own savings (banks)	2398	**0.27**	0.44
Real state investments	2398	**0.32**	0.47
Pension system savings	2398	**0.11**	0.32
Children education	2398	**0.14**	0.34
Has taken saving action[4/]	5323	**0.30**	0.46
Own business	2671	**0.25**	0.43
Own savings (banks)	2671	**0.17**	0.37
Real state investments	2671	**0.22**	0.41
Pension system savings	2671	**0.08**	0.28
Children education	2671	**0.09**	0.28
Continue working: Economic situation[10/]	87	0.46	0.50
Continue working: Enjoy working	87	0.36	0.48
Continue working: Want to be active	87	0.56	0.50
Continue working: Her pension is low	87	0.16	0.37
E. Firms			
Monthly sales: $[0 - 5,000 >$ soles	2402	0.83	0.38
Monthly sales: $[5,000 - 15,000 >$ soles	2402	0.12	0.33
Monthly sales: $[+15,000 >$ soles	2402	0.05	0.21
Total of workers	5551	3.58	71.33
Facilities: Owned	2802	0.51	0.50
Facilities: Rented	2802	0.39	0.49
Facilities: Borrowed	2802	0.04	0.20
Facilities: Other	2802	0.05	0.22

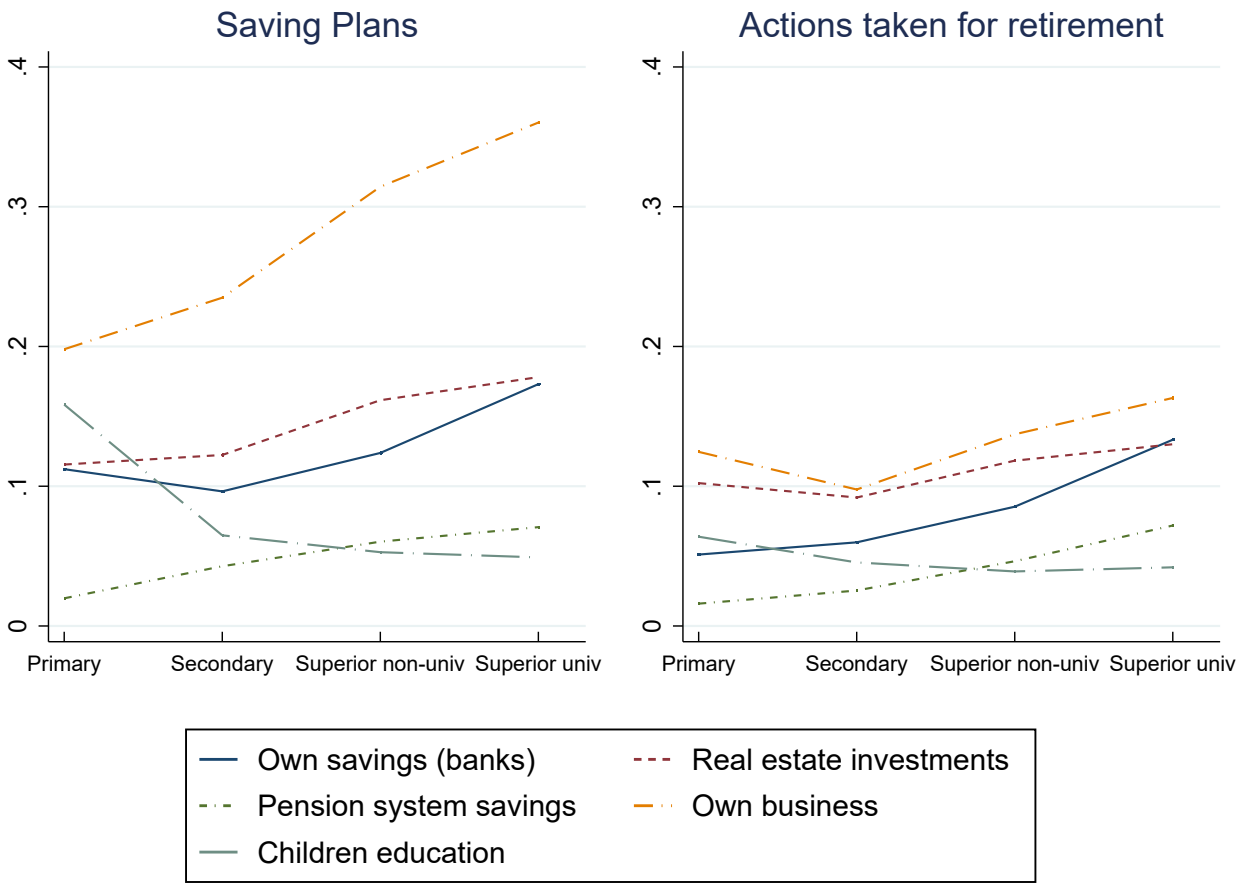
Source: Own elaboration

Notes:
[3/4/] These are yes/no questions which constrain the five next questions (i.e. when a worker indicates she has a saving plan/action then she can choose for every next five saving plan/action alternatives)

Heterogeneity and Saving for Retirement

- The saving option "Owning a business" is the most preferable along education level.

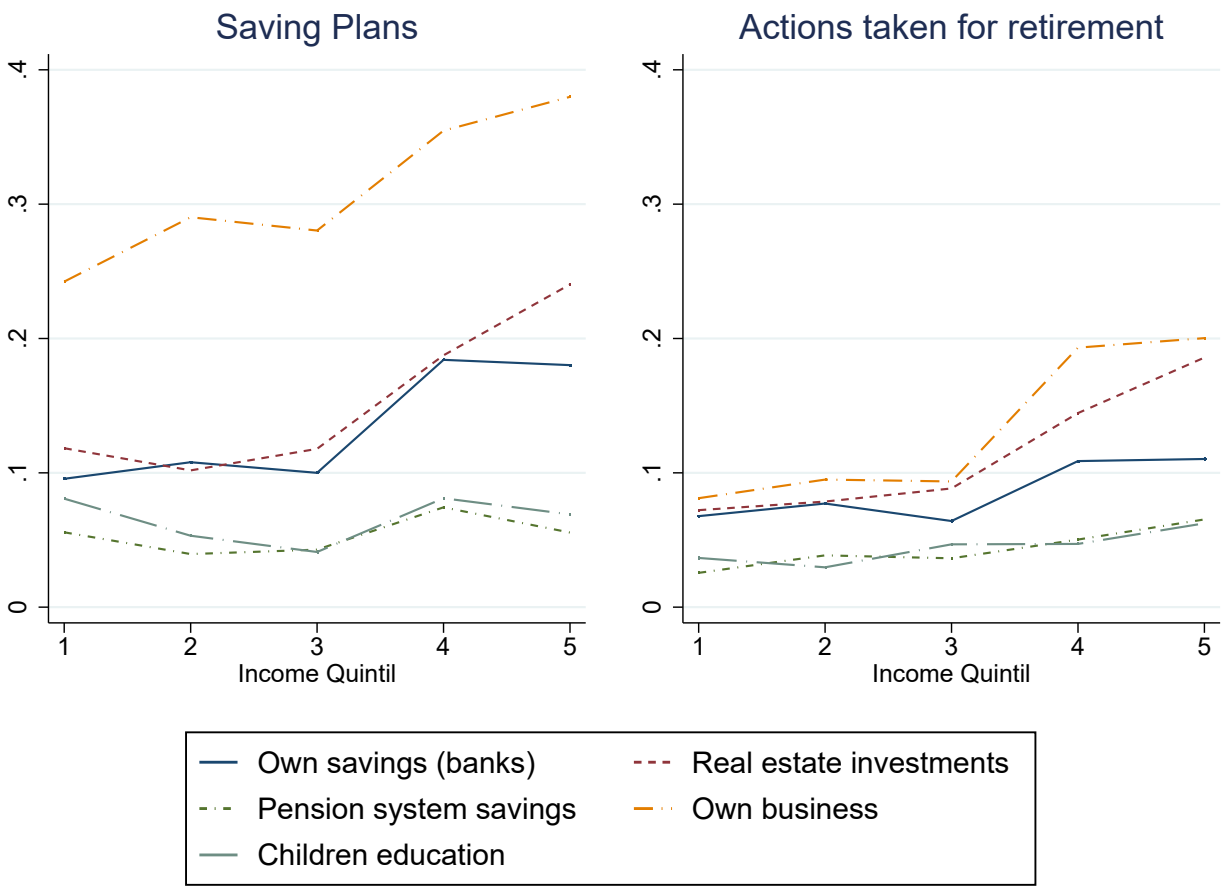
Figure: Saving plans and retirement by education level



Heterogeneity and Saving for Retirement

- The saving option "Owning a business" is the most preferable along income.

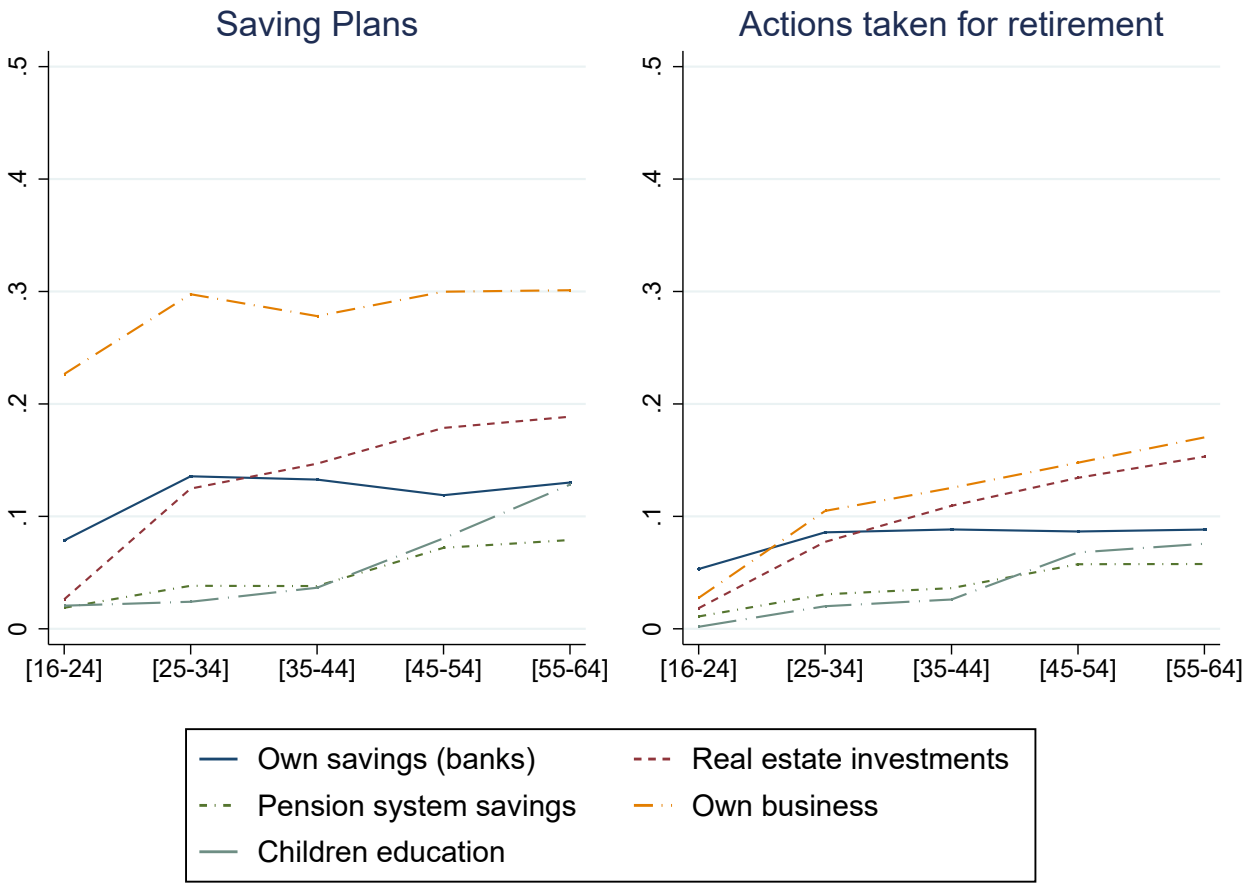
Figure: Saving plans and retirement by quintil of income



Heterogeneity and Saving for Retirement

- The saving option "Owning a business" is the most preferable along age ranges.
- The saving option "Keeping PS savings" is one of the less preferable .

Figure: Saving plans and retirement by age range



Methodology I

The estimated regression:

$$Y_{ij} = \beta_0 + \beta_1 sex_{ij} + \beta_2 age_{ij} + \beta_3 age_{ij}^2 + \beta_4 civil\_st_{ij} + \beta_5 children_{ij} + \beta_6 member\_PS_{ij} + \beta_7 educ\_level_{ij} + \vartheta_i + \xi_j + \varepsilon_{ij}$$

Where Y_{ij} are the outcomes of the worker i from the firm j:

- The worker has saving plans (yes/no)
- The worker has taken actions for retirement(yes/no)
- Specific saving plans: (i) Having own savings in banks, (ii) Investing on real estate, (iii) Saving on the Pension System, (iv) Having own business, (v) Investing in children education.
- Specific actions taken: (i), (ii), (iii), (iv), (v)

Methodology II

The extended regression:

$$Y_{ij} = \gamma_0 + \gamma_1 X_{ij} + \gamma_2 educ\_level\_dist_{ij} + \gamma_3 age\_dist_{ij} + \vartheta_i + \xi_j + \varepsilon_{ij}$$

$X_{ij} = civil\_st_{ij}$, $children_{ij}$, $member\_PS_{ij}$. We add $educ\_level\_dist_{ij}$, and age_dist_{ij} which are worker's age ranges.
Econometric methodology:

- Probit analysis: to evaluate saving alternatives' determinants.
- Principal Components Analysis to understand: the dynamic between saving alternatives
- Bivariate probit: to jointly predict individual saving choices

Decision for Retirement Alternatives

Table: Probability to have saving plans and actions for retirement

	Has a Saving Plan		**Has taken a Saving Action**	
	(1)	(2)	(1)	(2)
Female	-0.082***	-0.086***	-0.061***	-0.065***
	(0.01)	(0.01)	(0.01)	(0.01)
Age	0.016***		0.015***	
	(0.00)		(0.00)	
Age^2	-0.000***		-0.000**	
	(0.00)		(0.00)	
Married or cohabiting	0.008	0.008	0.008	0.008
	(0.02)	(0.02)	(0.02)	(0.02)
Has at least one child	-0.008	-0.003	0.011	0.017
	(0.02)	(0.02)	(0.02)	(0.02)
Some member in the PS	0.088***	0.089***	0.089***	0.090***
	(0.02)	(0.02)	(0.01)	(0.01)
Education level	0.098***		0.069***	
	(0.01)		(0.01)	
Secondary		0.040		-0.005
		(0.03)		(0.03)
Superior non-univ		0.162***		0.089***
		(0.03)		(0.03)
Superior univ		0.249***		0.151***
		(0.03)		(0.03)
$Age : [25 - 34]$		0.121***		0.104***
		(0.03)		(0.02)
$Age : [35 - 44]$		0.153***		0.138***
		(0.03)		(0.02)
$Age : [45 - 54]$		0.219***		0.207***
		(0.03)		(0.02)
$Age : [55 - 64]$		0.230***		0.226***
		(0.03)		(0.02)
Observations	4828	4828	4965	4965

Standard errors in parentheses

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

Decision for Retirement Alternatives

Table: Probability to have specific saving plans

	(1) Own savings	(2) Real estate investments	(3) Pension System	(4) Own Business	(5) Children education
Female	-0.017*	-0.020*	0.020***	-0.084***	0.020***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Married or cohabiting	-0.010	0.022*	0.020***	0.013	0.005
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Has at least one child	-0.023	-0.000	-0.003	-0.008	0.066***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Some member in the PS	0.029***	0.014	0.047***	0.050***	0.020***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Secondary	-0.025	0.020	0.034***	0.029	-0.043**
	(0.02)	(0.02)	(0.01)	(0.03)	(0.02)
Superior non-univ	-0.002	0.061***	0.048***	0.111***	-0.045**
	(0.02)	(0.02)	(0.01)	(0.03)	(0.02)
Superior univ	0.037	0.079***	0.054***	0.144***	-0.043**
	(0.02)	(0.02)	(0.01)	(0.03)	(0.02)
$Age : [25 - 34]$	0.060***	0.096***	0.016	0.063**	-0.037**
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
$Age : [35 - 44]$	0.064***	0.115***	0.013	0.040	-0.036*
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
$Age : [45 - 54]$	0.058***	0.149***	0.047***	0.076***	-0.001
	(0.02)	(0.01)	(0.01)	(0.03)	(0.02)
$Age : [55 - 64]$	0.068***	0.163***	0.052***	0.078***	0.030
	(0.02)	(0.02)	(0.01)	(0.03)	(0.02)
Observations	4828	4828	4828	4828	4828

Standard errors in parentheses

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

Decision for Retirement Alternatives

Table: Probability to have specific actions for retirement

	(1) Own savings	(2) Real estate investments	(3) Pension System	(4) Own Business	(5) Children education
Female	-0.014*	-0.035***	-0.010*	-0.047***	-0.005
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Married or cohabiting	0.002	0.030***	-0.004	-0.007	0.003
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Has at least one child	-0.034***	0.010	0.003	0.018	0.054***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Some member in the PS	0.030***	0.006	0.046***	0.039***	0.022***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Secondary	0.010	0.006	0.011	-0.016	-0.004
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
Superior non-univ	0.029*	0.038**	0.032***	0.029	-0.004
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
Superior univ	0.069***	0.051***	0.047***	0.047**	-0.000
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
$Age : [25 - 34]$	0.033***	0.057***	0.017**	0.079***	0.018
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
$Age : [35 - 44]$	0.045***	0.082***	0.024***	0.094***	0.014
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
$Age : [45 - 54]$	0.049***	0.113***	0.046***	0.124***	0.048***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
$Age : [55 - 64]$	0.053***	0.128***	0.046***	0.141***	0.051***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Observations	4965	4965	4965	4965	4965

Standard errors in parentheses

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

Principal Components Analysis

Table: Principal components of saving plans

	(1) Own Savings Own Business index	(2) Pension system index	(3) Real estate invst index	(4) Children educ invst index
Female	-0.065**	0.159***	0.021	0.126***
	(0.03)	(0.03)	(0.03)	(0.03)
Married or cohabiting	0.051	0.053	0.088**	0.016
	(0.03)	(0.03)	(0.03)	(0.04)
Has at least one child	0.041	0.043	-0.054	0.237***
	(0.04)	(0.04)	(0.04)	(0.04)
Some member in the PS	0.191***	0.153***	0.034	-0.026
	(0.03)	(0.03)	(0.03)	(0.03)
Secondary	-0.024	0.092*	0.236***	-0.242***
	(0.07)	(0.05)	(0.06)	(0.08)
Superior non-univ	0.128*	0.043	0.296***	-0.332***
	(0.07)	(0.06)	(0.06)	(0.08)
Superior univ	0.230***	0.002	0.291***	-0.405***
	(0.08)	(0.06)	(0.07)	(0.08)
$Age : [25 - 34]$	0.199***	-0.160***	0.160***	-0.170***
	(0.05)	(0.04)	(0.04)	(0.04)
$Age : [35 - 44]$	0.190***	-0.193***	0.208***	-0.150***
	(0.05)	(0.04)	(0.04)	(0.04)
$Age : [45 - 54]$	0.342***	-0.092**	0.281***	-0.038
	(0.05)	(0.05)	(0.05)	(0.04)
$Age : [55 - 64]$	0.431***	-0.075	0.257***	0.087*
	(0.06)	(0.05)	(0.05)	(0.05)
_cons	-0.428***	-0.134**	-0.490***	0.112
	(0.08)	(0.06)	(0.07)	(0.09)
Observations	4828	4828	4828	4828

Standard errors in parentheses

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

Principal Components Analysis

Table: Principal components of actions for retirement

	(1) Own Business index	(2) Pension system index	(3) Formal savings substitution index	(4) Investments substitution index
Female	-0.143***	-0.002	0.003	-0.057*
	(0.03)	(0.03)	(0.03)	(0.03)
Married or cohabiting	0.031	-0.054	0.001	0.080**
	(0.03)	(0.03)	(0.03)	(0.03)
Has at least one child	0.093**	-0.148***	0.179***	-0.123***
	(0.04)	(0.04)	(0.04)	(0.04)
Some member in the PS	0.185***	0.164***	0.084**	-0.062*
	(0.03)	(0.03)	(0.03)	(0.03)
Secondary	0.009	0.063	0.014	0.056
	(0.06)	(0.06)	(0.06)	(0.06)
Superior non-univ	0.147**	0.122**	0.016	0.128*
	(0.06)	(0.06)	(0.06)	(0.07)
Superior univ	0.264***	0.216***	-0.046	0.141**
	(0.07)	(0.07)	(0.07)	(0.07)
$Age : [25 - 34]$	0.210***	0.059	-0.072	0.082**
	(0.04)	(0.04)	(0.05)	(0.04)
$Age : [35 - 44]$	0.266***	0.082*	-0.093*	0.162***
	(0.04)	(0.04)	(0.05)	(0.04)
$Age : [45 - 54]$	0.439***	0.048	0.021	0.120***
	(0.04)	(0.05)	(0.05)	(0.04)
$Age : [55 - 64]$	0.500***	0.022	0.019	0.137***
	(0.05)	(0.05)	(0.06)	(0.05)
_cons	-0.492***	-0.085	-0.134*	-0.111
	(0.07)	(0.07)	(0.07)	(0.07)
Observations	4965	4965	4965	4965

Standard errors in parentheses

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

Complementarity and Substitution

Table: Substitution effects in activities for retirement

	(1) Formal saving substitution	(2) Investment substitution
Female	0.015	-0.053
	(0.04)	(0.04)
Married or cohabiting	-0.041	0.028
	(0.04)	(0.04)
Has at least one child	0.086*	-0.355***
	(0.05)	(0.03)
Some member in the PS	0.117***	-0.088**
	(0.04)	(0.04)
Secondary	0.004	0.042
	(0.10)	(0.08)
Superior non-univ	0.083	0.113
	(0.10)	(0.08)
Superior univ	0.069	0.116
	(0.10)	(0.08)
$Age : [25 - 34]$	0.043	0.125
	(0.08)	(0.25)
$Age : [35 - 44]$	0.097	0.206
	(0.08)	(0.25)
$Age : [45 - 54]$	0.193**	0.086
	(0.08)	(0.25)
$Age : [55 - 64]$	0.161**	0.105
	(0.08)	(0.25)
Observations	597	698

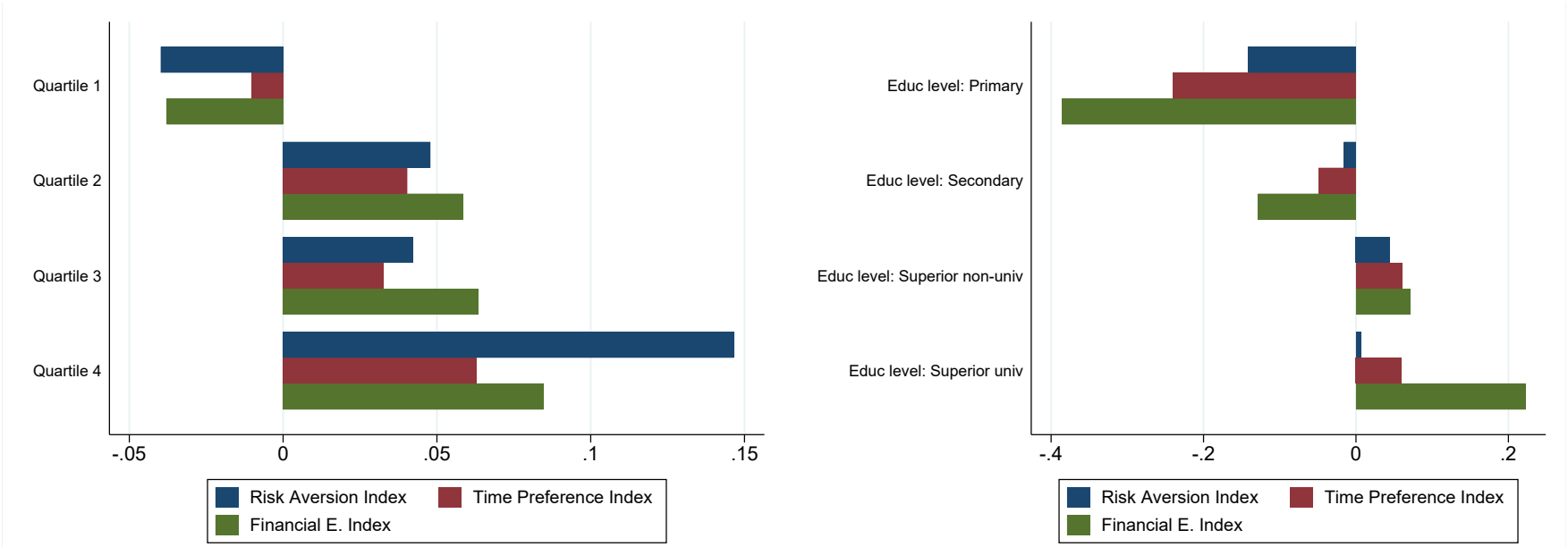
Standard errors in parentheses

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

Heterogeneity and Worker Preferences

- Less wealthy (quintile 1) and less educated (primary) are less risk averse, less patients and less financially educated.

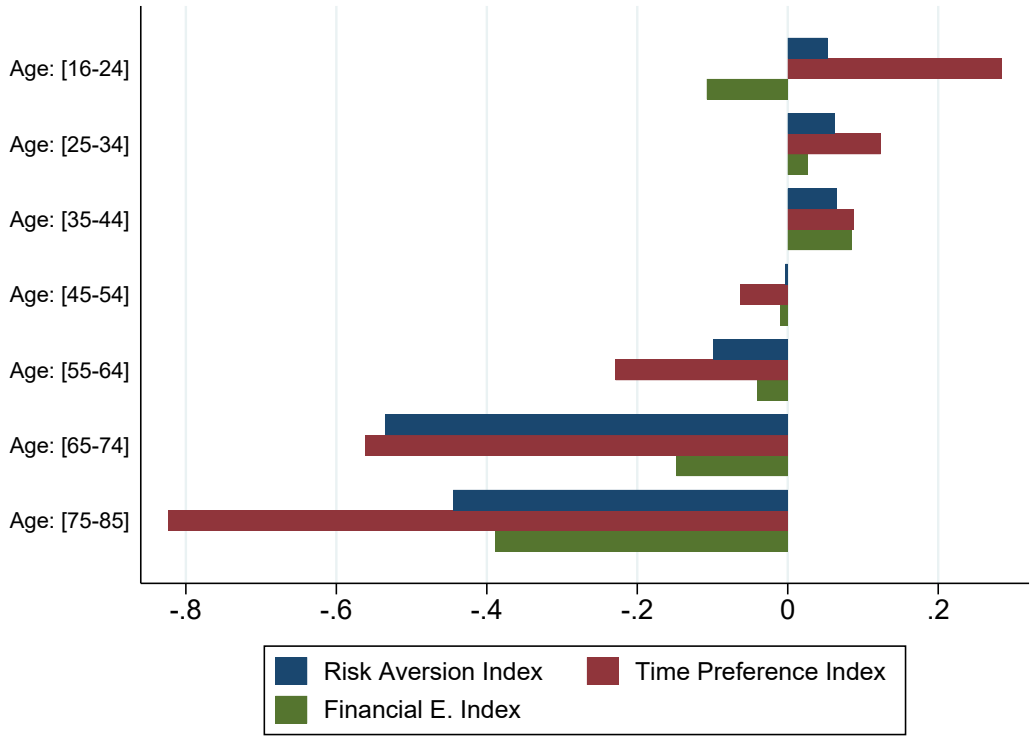
Figure: Preferences indexes by quintil of income and education level



Heterogeneity and Worker Preferences

- Older people are less risk averse, less patients and less financially educated.

Figure: Preferences indexes by age range



Summary

- The decision to save in the Traditional pension system is part of the picture and in reality people have non-traditional alternatives.
- The non-traditional options seem to be more important than the traditional one for informal workers.
- The entrepreneurial worker's main feature determines their expectations and decision for retirement choices.

- Outlook
  - Dynamic analysis of preferences
  - Use a follow-up analysis
  - Gap between planning and actions

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