

Bocconi

NUDGING FINANCIAL AND DEMOGRAPHIC LITERACY: EXPERIMENTAL EVIDENCE FROM AN ITALIAN PENSION FUND

Conference «Rischio Longevità»,

Bocconi University

November, 2019

Francesco C. Billari

Carlo A. Favero

Francesco Saita

Financial Education Research Unit,

BAFFI CAREFIN



Università
Bocconi

BAFFI CAREFIN
Centre for Applied Research
on International Markets, Banking,
Finance and Regulation

Overview

- We present the results of a low-cost, Internet-based financial and demographic literacy program (*Finlife*), implemented on a sample of workers from the largest industrial pension fund in Italy (based on contributions by blue and white collars from the engineering industry)
- Questions:
 1. Can low-cost, Internet-based education efforts based on a 'nudge' in financial and demographic literacy on adults be effective?
 2. Can they be effective even for individuals who have ex-ante a lower level of financial literacy, and need it the most?
 3. Can these efforts produce actual behaviours, in terms of information search and of actual decisions (in our case, change of investment line)?

The project was supported by two grants by Citi Foundation, New York

The Experiment and the Results

- **Treatment:** Video lecture of about 25 minutes presenting demographic trends in life expectancy, basic concepts of financial literacy, and how to get information on Cometa investment lines through Cometa's website (the 'nudge')
- **The Experimental Design:** Random Assignment to a treatment and a control group of members Cometa Pension Funds
- **The Treatment Effect:**
 - questionnaire within two weeks
 - questionnaire some months after treatment
 - Behaviours: did workers espoused to the nudge change their behaviour : Did those who viewed the video actually change their investment line?
- **Does the treatment effect depend on individual characteristics ?**
- **Robustness Checks:** sample selection bias

Conclusions

- The experiment described in our paper provides evidence that **even a low-cost, Internet based treatment can be effective in improving financial and demographic literacy, and changing the decision process.**
- **Treatment effect mostly homogeneous** among subgroups (and sometimes reducing ex ante literacy gaps) + lasting over time
- **Clear evidence of change in actual behaviour (chosen investment line)** among workers originally invested in the default line; stronger effect on younger workers
- The paper also suggests that **demographic literacy can be important in increasing individual efforts** to take better retirement planning decisions

An introduction to Cometa Pension Fund

- Defined contribution, closed industry pension fund for workers of the engineering and plant installation sector (largest non-compulsory industry pension fund in Italy, 408,797 members at the end of 2014)
- Members include factory workers and (mainly lower level) office workers
- Since 2005 the fund has offered multiple investment lines with different risk-return profiles
- Very few members invest in the higher risk, higher return investment line

Name of the investment line	"Money market plus"	"Safety"	"Income"	"Growth"
Investment profile	100% short-term bonds; 0% stocks	Minimum guaranteed return, maximum 10% of stocks	85% bonds 15% stocks	60% bonds 40% stocks
Number of members (end of 2014)	173,634 (42.5%)	58,057 (14.2%)	160,832 (39.3%)	16,274 (4.0%)

- For many years before the experiment, new members who did not opt for any investment line were assigned to the safest one ("money market +") as a default option

Experimental design: (1) The treatment

- Video lecture of about 25 minutes presenting demographic trends in life expectancy, basic concepts of financial literacy, and how to get information on Cometa investment lines through Cometa's website



4.1. Tenere conto dell'inflazione: rendimenti nominali e rendimenti reali

Comparto	Monetario Plus	Reddito
Grado di rischio	Basso	Medio
In cosa investe il comparto?	100% obbligazioni	85% obbligazioni 15% azioni
Rendimento medio annuo NOMINALE	2,0%	4,1%
Inflazione media annua nel periodo	1,7%	1,7%
Rendimento medio annuo REALE	0,3%	2,4%

Dati basati sul periodo aprile 2005 - dicembre 2014

Experimental design: (2) Treated and control groups

- Target: about 27,000 individuals to be chosen out of fund members whose e-mail was known by the pension fund (140,000)
- The 27,000 were divided in 4-dimensional bins based on 1) job type (white vs blue collars); 2) gender; 3) macroregion of birth; 4) age interval (20-39; 40-59; 60 and more)
- Random extraction of individuals in each bin, then random assignment to treated and control samples within each bin
- Full anonymity preserved
- Both groups of individuals invited to participate by e-mail to the Bocconi-Cometa project with an identical e-mail proposing a web link

Experimental design: (2) Treated and control groups

Treated group T1:

- Link → invited to view the video in streaming
- 2 weeks after having viewed the video: invited to fill in an online questionnaire (11 demographic and financial literacy questions + 5 questions on behaviours)
- *Second online questionnaire* with 6 of the 11 demographic and financial literacy questions resubmitted after some months (median distance 8.6 months, 90% b/w 4 and 12.6 months)

Control group:

- Link → Invited to fill in the online questionnaire without having had access to the video.
- The opportunity to view the video offered later to those who completed the questionnaire
- Overall sample for main questionnaire: 1,436 individuals (770 treated, 666 controls)

The questionnaire (1): Demographic literacy

a1. Life expectancy - In Italy, today, a man that is already 60 years old, could expect to live until... (1) 79 yrs or more, (2) 76-78 yrs, (3) 73-75 years, (4) 72 yrs or less, (5) Do not know

a2. Evolution of life expectancy - A man or a woman that are 60 years old in Italy, with respect to 20 years ago, can expect to live: (1) At least 2 years less (2) 1-2 years less (3) More or less as much as 20 years ago, (4) 1-2 years more (5) *At least 2 years more* (6) Do not know

a3. Life expectancy and pension - Given the same quantity of contribution years and of paid contributions, if life expectancy increases, what happens on the public monthly pension that a retired person can expect to receive? (1) increases (2) *decreases*, (3) remains the same, because given the current law it is independent from the expectation of life, (4) Do not know

The questionnaire (2): Financial literacy I

Basic financial literacy questions on numeracy, inflation and compounding as defined by van Rooij, Lusardi Alessie 2011)

a4. Numeracy - Suppose you had €100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow: (1) More than €102, (2) Exactly €102, (3) Less than €102, (4) Do not know

a5. Inflation - Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? (1) More than today, (2) Exactly the same, (3) Less than today, (4) Do not know

a6. Interest compounding - Suppose you had €100 euro in a savings account and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have on this account in total? (1) More than €200, (2) Exactly €200, (3) Less than €200, (4) Do not know

The questionnaire (3). Financial literacy II

a7. *Expected return ranking* - Considering a long time period (for example 10 or 20 years), which asset normally provides the highest return? (1) Saving accounts, (2) *Stocks*, (3) Bonds, (4) Do not know

a8. *Risk ranking* - Normally, which asset displays the highest fluctuations over time? (1) Saving accounts, (2) *Stocks*, (3) Bonds, (4) Do not know

a9. *Risk-return relationship* - An investment that has a high expected return is more likely to have a high risk: true or false? (1) *True*, (2) False, (3) Do not know

a10. *Diversification 1* - If you invest 1000 euro in stocks, is it riskier to invest 1000 euro in only one stock or 100 euro in 10 different stocks? (1) *It is riskier to invest 1000 euro in only one stock*, (2) It is riskier to invest 100 euro in 10 different stocks, (3) Do not know

a11. *Diversification 2* - When an investor diversifies his investment among different assets, does the risk of losing money... (1) increase, (2) stay the same, (3) *decrease*, (4) Do not know

The questionnaire: (4) Reported Behaviour

- b1. Over the last two weeks, I looked for information on savings and pensions: (1) Yes, (2) No**
- b2. Over the last two weeks, I discussed savings and pensions with my family members: (1) Yes, (2) No**
- b3. Over the last two weeks, I discussed savings and pensions with my colleagues: (1) Yes, (2) No**
- b4. Over the last two weeks, I tried to estimate my expected future pension through the Cometa website or reading my annual personal report from Cometa: (1) Yes, (2) No**
- b5. Over the last two weeks, I looked for information about the investment lines of the Cometa fund: (1) Yes, (2) No**

Questions are not about *intentions*, but about reported *behaviour* over a 2-week period

b1, b4 and b5 → searching information

b2 and b3 → social interaction

Measuring the Treatment effect

Treatment effect tested through a difference estimator within a system of 16 linear probability equations (11 literacy + 5 behaviour questions):

$$Y_i^1 = \beta_0^1 + \beta_1^1 X_i + \sum_{j=1}^{23} \beta_{j+1}^1 W_i + u_i^1$$

...

$$Y_i^{16} = \beta_0^{16} + \beta_1^{16} X_i + \sum_{j=1}^{23} \beta_{j+1}^{16} W_i + u_i^{16}$$

Where

Y_i^k are binary variables that capture the correct answer to the k-th question

X_i is the treatment dummy

W_i represent the controls for individual characteristics (all non-dummy controls, e.g. age or years of contributions, are demeaned; baseline=blue collar male, middle school education, born in Northern Italy)

(An alternative logit model tested for robustness confirms the baseline evidence)

Does treatment effect depend on individual characteristics?

- Baseline regressions confirm significant differences among subgroups:
 - (a) poorer performance for women, and for individuals born in Southern Italy
 - (b) better performance for white collars and university graduates
- 1. Is the treatment able to generate significant improvements for all participants or only for those subgroups who are already more literate *ex ante* (e.g. white collars with university education)??
- 2. Does the treatment close or widen initial financial literacy gaps?

→ Analysis of interaction effects between the treatment and the relevant dummies (female, white collar, university degree and South).

Do treatment effects last in time?

- Second (and much shorter) online questionnaire to the treated individuals who had completed the video lecture and the second questionnaire
- The median distance between the two questionnaires is between 8 and 9 months; 90% of questionnaires filled between 4 and 12.6 months from the lecture
- Six questions tested comparing *only* the 392 treated who completed the second questionnaire with the 666 control individuals (hence, smaller overall sample):
 - a2 – Evolution of life expectancy over time
 - a3 – Impact of increase of life expectancy on pensions
 - a4 – Numeracy
 - a5 – Inflation
 - a6 – Interest compounding
 - a10 – Diversification 1 (*note: not significant even after 2 weeks*)

Robustness check: self-selection bias

- Potential concern: treatment and control groups might have had different level of motivation/commitment
- Remark: the e-mail invitation sent to individuals was identical for treated and control individuals, who did not know what could be found in the web link (and only about 11%, in both groups, opened the link)
- Further test: since the 666 control individuals were invited later to view the video...
- ...and 370 (i.e. almost 56%) of them actually viewed it, what happens if we restrict the control group to these 370 whose motivation is unquestionably identical to the treated group?

Did the video lecture have an effect on behaviours?

- We have also investigated **actual** behaviours after the video. Here the treated sample («T2») is represented by all 770 T1 individuals plus the 370 individuals of the control sample who viewed the full video.
→ Did people who viewed the video actually changed their investment line?
- Each subject has been matched with two individuals enrolled in the fund but not involved at all in the experiment and having *exactly the same age, gender, job qualification, education, initial investment line, macroregion of birth*. Matched individuals were allowed to serve as a match only once.
- Despite these restrictive criteria we have obtained 923 triplets, checking actual changes of investment line within 3 (and 12) months from the video
- Main analysis on a 3-month horizon
- For matched individuals we look for changes of investment lines in the same months we consider for the treated individual

EMPIRICAL RESULTS

Descriptive Statistics: treatment (n=770) and control (n=666) samples

Characteristics		Control	Treated	Difference	P-Value ¹
Age		43.84	45.03	-1.19**	0.0103
Occupation	% of "Blue Collar"	45.95%	34.94%	11.01%***	0.0000
Sex	% of Males	69.52%	71.69%	-2.17%	0.3683
Place of birth	Northern Italy	50.30%	51.95%	-1.65%	0.5337
	Central Italy	22.82%	24.16%	-1.33%	0.5530
	Southern Italy/Islands	21.62%	19.87%	1.75%	0.4142
	Abroad	5.26%	4.03%	1.23%	0.2676
Educational Qualification	Univ. Degree	20.12%	26.10%	-5.98%***	0.0075
	High School	52.55%	53.25%	-0.69%	0.7929
	Compulsory Education	23.42%	17.40%	6.02%***	0.0046
	No School	3.90%	3.25%	0.65%	0.5026
Years of Contribution		12.39	12.82	-0.43*	0.0760
Investment line	"Money market plus"	25.23%	16.75%	8.47%***	0.0001
	"Safety"	14.86%	13.77%	1.09%	0.5532
	"Income"	45.95%	50.65%	-4.7%*	0.0754
	"Growth"	13.96%	18.83%	-4.87%**	0.0134

About 70% men, 40% blue collars

Randomization is not rejected under most dimensions.

Exceptions: in the control group more blue collars and investors in safer investment lines; lower education

Similar patterns also for extra occasional or regular contributions to the pension fund, and partial withdrawals from the fund

All these variables included as controls in subsequent regressions

Treatment effect : Demographic literacy

	Life Expectancy	Evolution. of L.E.	L.E. and Pensions
Constant	0.582***	0.729***	0.300***
TREATMENT	0.056**	0.078***	0.173***
WHITE COLLAR	0.056*	0.052**	0.023
FEMALE	0.035	0.010	-0.036
AGE_DEV	0.0028	0.0037**	-0.0003
SOUTH	0.004	-0.045	-0.043
UNIV DEGREE	-0.025	0.066	0.217***
HS DEGREE	-0.023	0.021	0.074**
Observations	1,436	1,436	1,436
R-squared	0.020	0.035	0.092

- Treatment dummy is significant for all demographic literacy questions
- For the third question (which is particularly important in order to be motivated to plan) the baseline of 30.0% is very low, and is raised by 17.3% by the treatment
- The null that the effect of the treatment is not significantly different from that of the university degree cannot be rejected

Additional controls: born abroad, yrs of contribution and early withdrawals in deviation from the mean, dummies for investment lines and voluntary contributions.

Treatment effect : Financial literacy

	Numeracy	Inflation	Interest Comp.	Expected Returns	Risk	Risk-Returns	Diversification 1	Diversification 2
Constant	0.733***	0.807***	0.531***	0.510***	0.886***	0.930***	0.952***	0.783***
TREATMENT	0.119***	0.052***	0.174***	0.196***	0.034***	0.054***	0.015	0.057***
WHITE COLLAR	0.058**	0.063***	0.158***	0.001	0.055***	0.032**	0.013	0.053***
FEMALE	-0.041*	-0.040**	-0.126***	-0.024	-0.021	-0.054***	-0.013	-0.023
AGE_DEV	-0.0047***	0.0037***	0.0029	2.7e-05	-0.0012	0.0011	0.0013	0.0025**
SOUTH	0.002	-0.041**	-0.036	-0.043	-0.060***	-0.056***	-0.046***	-0.084***
UNIV DEGREE	0.100***	0.065**	0.127***	0.117**	0.029	0.022	0.045**	0.139***
HS DEGREE	0.028	0.005	-0.004	0.002	0.011	-0.027	0.019	0.084***
Observations	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436
R-squared	0.083	0.089	0.143	0.107	0.054	0.062	0.038	0.112

- Treatment always significant, except for the first question on diversification (where the constant is 95.2%)
- Evidence of a gender gap (especially on interest compounding)

Additional controls: age in deviation squared, born in Central Italy, no school, born abroad, yrs of contribution and early withdrawals in deviation from the mean, dummies for investment lines and voluntary contributions.

Treatment effect (4). Behaviours

	Info on pensions	Discussion Family	Discussion Coll.	Estimate my pension	Info on invest.lines
Constant	0.346***	0.514***	0.582***	0.208***	0.139***
TREATMENT	0.121***	-0.012	-0.036	0.169***	0.221***
WHITE COLLAR	0.027	-0.0002	0.0245	0.029	0.004
FEMALE	-0.032	0.038	-0.086***	-0.036	-0.047*
AGE_DEV	0.0067***	0.0039*	0.0051**	0.0018	-0.0018
SOUTH	-0.004	0.012	0.044	0.008	0.094***
UNIV DEGREE	0.033	-0.069	-0.119**	-0.029	-0.038
HS DEGREE	0.013	-0.028	-0.015	0.030	-0.005
Observations	1,436	1,436	1,436	1,436	1,436
R-squared	0.049	0.020	0.044	0.056	0.073

- The treatment has not fostered discussion with relatives/ colleagues ...
- ... but it has had a strong impact on
 - Looking for information on pensions/savings
 - Trying to estimate the expected pension through the fund's website/the individual annual report
 - Looking for information on the four investment lines of the pension fund

Does treatment effect depend on individual characteristics? (2)

	Life Expectancy.	Evolution. of L.E.	L.E. and Pensions	Numeracy	Inflation	Interest. Compound	Expected Returns.	Risk	Risk>Returns	Diversifi-cation 1	Diversifi-cation 2
Constant	0.612***	0.725***	0.335***	0.735***	0.800***	0.514***	0.553***	0.897***	0.928***	0.944***	0.774***
TREATMENT	0.0004	0.101**	0.116**	0.114***	0.0751**	0.201***	0.107**	0.0156	0.0711***	0.0302	0.0735**
TR x UNIV DEGREE	-0.173**	-0.128**	-0.0974	-0.0606	0.00239	-0.266***	-0.0357	-0.0497	0.0176	-0.0356	-0.0663
TR x SOUTH	0.0722	-0.00263	0.0286	0.0137	-0.00254	-0.0122	0.00114	0.0721**	0.0162	0.00504	0.0657*
TR x FEMALE	-0.00400	0.0258	0.0685	-0.0307	0.0260	-0.0499	0.0337	0.0206	0.0484*	-0.0453*	-0.0152
TR x WHITE COLLAR	0.0535	-0.0342	-0.00606	0.00626	-0.0431	0.0914*	0.0978*	-0.0119	-0.0749**	-0.00671	-0.00295
TR x AGE_DEV	-0.00385	-0.00729***	-0.00368	-0.000465	-0.00287	-0.00298	-0.000340	0.000116	-0.00266*	0.00158	0.000461
TR x AGESQUARED	0.000649**	0.000258	0.000730**	0.000278	-6.54e-05	-3.64e-05	0.000381	0.000211	6.88e-05	0.000132	-0.000117
Observations	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436
R-squared	0.025	0.043	0.094	0.084	0.090	0.154	0.112	0.065	0.068	0.044	0.116

Additional controls: age in deviation, age in deviation squared, macroregion of birth dummies, education dummies, white collar, female, yrs of contribution and early withdrawals in deviation from the mean, dummies for investment lines and voluntary contributions.

- Treatment effect remains significant in 8 out of 11 literacy questions
- Apart from 5 cases, interactions are not significant at the 1% or 5% level...
- ... and they generally show a reduction (green) rather than an increase (red) of literacy gaps among subgroups

Does treatment effect depend on individual characteristics? (3)

	Info on pensions	Discussion Family	Discussion Coll.	Estimate my pension	Info on invest. lines
Constant	0.353***	0.506***	0.623***	0.221***	0.172***
TREATMENT	0.123**	0.0129	-0.112**	0.145***	0.164***
TR x UNIV DEGREE	-0.0496	-0.0490	0.0613	0.0328	0.177***
TR x SOUTH	-0.0215	0.0252	0.0676	-0.0336	-0.0437
TR x FEMALE	0.00839	-0.0160	0.0420	0.0228	0.0468
TR x WHITE COLLAR	0.0123	-0.0315	0.0545	0.0431	0.00698
TR x AGE_DEV	-0.0138***	-0.00463	-0.00648**	-0.00472*	-0.00625**
TR x AGESQUARED	3.83e-05	5.63e-05	2.83e-05	-0.000118	9.61e-05
Observations	1,436	1,436	1,436	1,436	1,436
R-squared	0.050	0.021	0.050	0.057	0.083

- Treatment still significant for the 3 key behaviours
- Negative significant effect on discussion with colleagues, but positive effect on younger workers
- On the 3 key behaviours significantly stronger effects for younger workers

Additional controls: age in deviation, age in deviation squared, macroregion of birth dummies, education dummies, white collar, female, yrs of contribution and early withdrawals in deviation from the mean, dummies for investment lines and voluntary contributions.

Do treatment effects last in time?

VARIABLES	Evolution of Life Exp.	L.E. and Pensions	Numeracy	Inflation	Interest Compound.	Diversifi- cation
Constant	0.730***	0.349***	0.731***	0.807***	0.453***	0.933***
TREATMENT	-0.0595	0.0745	0.148***	0.0981***	0.164***	0.0312
TREATMENT_UNIV DEGREE	-0.202***	-0.110	-0.0542	-0.0487	-0.171**	-0.0463
TREATMENT_SOUTH	0.0662	0.0487	-0.0205	0.0153	-0.0434	0.0254
TREATMENT_FEMALE	0.121*	0.106	-0.00289	0.00691	0.00598	-0.0462
TREATMENT_WHITE COLLAR	0.0952	0.0311	-0.0379	-0.0313	-0.00181	0.00129
TREATMENT_AGE_DEV	-0.0104***	-0.00746**	0.00122	-0.00258	-0.000277	0.000378
TREATMENT_AGESQUARED	0.000116	0.000486	0.000306	-7.82e-05	1.79e-05	0.000144
DISTANCE_DEV	-0.000792***	-0.000253	-0.000158	-0.000157	5.73e-05	3.95e-05
Observations	1,058	1,058	1,058	1,058	1,058	1,058
R-squared	0.060	0.103	0.086	0.096	0.137	0.040

- Treatment dummy still significant at 1% for 3 questions (numeracy and interest compounding, with a higher coefficient, and inflation)
- On the evolution of life expectancy and the linkage between life expectancy and pensions there is a significant effect on younger workers

Robustness check: self-selection bias? (2)

Part 1 – Effect on financial and demographic literacy

Full sample
(770+666)

	Life Expectancy.	Evolution. of L.E.	L.E. and Pensions	Numeracy	Inflation	Interest. Compound	Expected Returns.	Risk	Risk>Returns	Diversifi-cation 1	Diversifi-cation 2
Constant	0.582***	0.729***	0.300***	0.733***	0.807***	0.531***	0.510***	0.886***	0.930***	0.952***	0.783***
TREATMENT	0.0561**	0.0782***	0.173***	0.119***	0.0524***	0.174***	0.196***	0.0344***	0.0537***	0.0154	0.0568***
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436
R-squared	0.020	0.035	0.092	0.083	0.089	0.143	0.107	0.054	0.062	0.038	0.112

Restricted sample
(770+370)

	Life Expectancy.	Evolution. of L.E.	L.E. and Pensions	Numeracy	Inflation	Interest. Compound	Expected Returns.	Risk	Risk>Returns	Diversifi-cation 1	Diversifi-cation 2
Constant	0.552***	0.790***	0.337***	0.750***	0.794***	0.579***	0.568***	0.925***	0.955***	0.966***	0.842***
TREATMENT	0.0633**	0.0626**	0.183***	0.106***	0.0523***	0.128***	0.167***	0.0212	0.0496***	-0.00201	0.0160
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140	1,140
R-squared	0.023	0.018	0.083	0.085	0.075	0.119	0.101	0.044	0.056	0.042	0.088

8 out of 11 variables still significant

Robustness check: self-selection bias? (3)

Part 2 – Behaviours

Full sample
(770+666)

	Info on pensions	Discussion Family	Discussion Coll.	Estimate my pension	Info on invest.lines
Constant	0.346***	0.514***	0.582***	0.208***	0.139***
TREATMENT	0.121***	-0.0121	-0.0360	0.169***	0.221***
Additional controls	Yes	Yes	Yes	Yes	Yes
Observations	1,436	1,436	1,436	1,436	1,436
R-squared	0.049	0.020	0.044	0.056	0.073

Restricted sample
(770+370)

	Info on pensions	Discussion Family	Discussion Coll.	Estimate my pension	Info on invest.lines
Constant	0.370***	0.555***	0.595***	0.167***	0.113**
TREATMENT	0.112***	-0.0392	-0.0168	0.180***	0.227***
Additional controls	Yes	Yes	Yes	Yes	Yes
Observations	1,140	1,140	1,140	1,140	1,140
R-squared	0.039	0.018	0.036	0.049	0.064

1. The three key behaviours remain significant (with very similar coefficients)
2. For behaviours (and 4 literacy questions) this holds even if all treatment interactions are added

Did the video lecture have an effect on behaviours? (2)

- Preliminary evidence: 3-month migration patterns
- Important: money market is the default investment line if no choice is made

			Matched sample				
			Final investment line				Total
			1-Money market	2-Safety	3-Income	4-Growth	
Initial investment line	1-Money market	N	352	0	2	0	354
		% initial	99,4%	0,0%	0,6%	0,0%	100,0%
	2-Safety	N	0	215	0	1	216
		% initial	0,0%	99,5%	0,0%	0,5%	100,0%
	3-Income	N	0	1	935	0	936
		% initial	0,0%	0,1%	99,9%	0,0%	100,0%
	4-Growth	N	0	2	0	338	340
		% initial	0,0%	0,6%	0,0%	99,4%	100,0%

- For the matched sample, there are almost no migrations (6 out of 1846)

Did the video lecture have an effect on actual behaviour?

- The treated sample shows many more migrations, especially from the money market investment line (i.e. the default investment line)

			Matched sample					Treated sample				
			Final investment line				Total	Final investment line				Total
			1-Money market	2-Safety	3-Income	4-Growth		1-Money market	2-Safety	3-Income	4-Growth	
Initial investment line	1-Money market	N	352	0	2	0	354	160	2	10	5	177
		% initial	99,4%	0,0%	0,6%	0,0%	100,0%	90,4%	1,1%	5,6%	2,8%	100,0%
	2-Safety	N	0	215	0	1	216	0	106	2	0	108
		% initial	0,0%	99,5%	0,0%	0,5%	100,0%	0,0%	98,1%	1,9%	0,0%	100,0%
	3-Income	N	0	1	935	0	936	0	1	462	5	468
		% initial	0,0%	0,1%	99,9%	0,0%	100,0%	0,0%	0,2%	98,7%	1,1%	100,0%
	4-Growth	N	0	2	0	338	340	0	0	1	169	170
		% initial	0,0%	0,6%	0,0%	99,4%	100,0%	0,0%	0,0%	0,6%	99,4%	100,0%

- The pattern over 12 months is similar: migrations away from the default investment line are 2.5% for the matched sample and 14.1% for the treated one

Did the video lecture have an effect on behaviours? (4)

- Second step: we check the effect of treatment on 3-month horizon changes through a linear probability model, interacting the treatment with the initial investment line and checking for the fixed effects of the triplet:

$$Y_i = \beta_0 + \sum_{j=1}^4 \beta_j C_{ij} X_i + \underline{\beta}'_5 \underline{w} + \underline{\beta}'_6 \underline{X}_i \underline{w} + FE(Triplet_i) + u_i$$

where

Y_i is the probability of changing investment line within 3 months,
 C_{ij} takes value 1 if individual i was originally in investment line j ,
 X_i equals unity if individual i was treated (i.e. watched the video),
 \underline{w} is a vector of controls.

Did the video lecture have an effect on behaviours? (5)

VARIABLES	(1)	(2)	(3)	(4)	(5)
Treated * "Money Market Plus"	0.0904***	0.0905***	0.0860***	0.0904***	0.0914***
Treated * "Income"	0.0118*	0.0118*	0.0135**	0.0152	0.0165
Treated * "Safety"	0.00927	0.00939	0.0113	0.0127	0.0140
Treated * "Growth"	2.67e-05	0.000175	-0.00152	-6.03e-05	0.00114
Controls for job, gender, macroregion of birth, education, age in deviation, initial investment line	Yes	Yes	Yes	Yes	Yes
Control for age in deviation squared	No	Yes	No	No	No
Treatment x age in deviation	No	No	Yes	Yes	Yes
Treatment x Controls for job, gender, macroregion of birth, education	No	No	No	Yes	Yes
Additional controls	No	No	No	No	Yes
Triplet FE	Yes	Yes	Yes	Yes	Yes
Observations	2,769	2,769	2,769	2,769	2,769
R-squared	0.356	0.356	0.357	0.358	0.359

- Treatment is strongly significant for workers in the default investment line (money market)
- Some effect also on the «Income» investment line
- Are effects homogeneous within the default investment line?

Did the video lecture have an effect on behaviours? (6)

VARIABLES	(4)	(5)	(6)	(7)
Treated * "Money Market Plus"	0.0904***	0.0914***	0.0737***	0.0748***
Treated * "Money Market Plus" * Agedev			-0.00342**	-0.00338**
Treated * "Income"	0.0152	0.0165	0.0117	0.0130
Treated * "Safety"	0.0127	0.0140	0.00906	0.0103
Treated * "Growth"	-6.03e-05	0.00114	-0.000979	0.000109
Controls for job, gender, macroregion of birth, education, age in deviation, initial investment line	Yes	Yes	Yes	Yes
Control for age in deviation squared	No	No	No	No
Treatment x age in deviation	Yes	Yes	Yes	Yes
Treatment x Controls for job, gender, macroregion of birth, education	Yes	Yes	Yes	Yes
Additional controls	No	Yes	No	Yes
Triplet FE	Yes	Yes	Yes	Yes
Observations	2,769	2,769	2,769	2,769
R-squared	0.358	0.359	0.360	0.361

- Treatment has a stronger effect for younger workers...
- ...who are precisely those who should take higher risk given their investment horizon
- The coefficient on the interaction implies an extra 1% every 3 years below average age (44.41 years)
→ less than 1% for a 64-yr old, more than 14% for a 24-yr old