Judgment and Decision Making, Vol. 9, No. 1, January 2014, pp. 77–82

Does menu design influence retirement investment choices? Evidence from Italian occupational pension funds

Andrea Lippi*

Abstract

Previous research has demonstrated that consumers' decisions regarding supplementary pensions could be affected by biases. Bernatzi and Thaler's experiment demonstrated that menu design can influence pension fund enrollment decisions, in that participants appear to adopt a naïve heuristic, i.e., "extremeness aversion". Using a database of 27 occupational pension funds from 2007 to 2011, representing 1,732,530 employees, this study asked whether menu design affected Italian workers' choices regarding the supplementary pension system as a result of the new rules enacted by the regulator in 2007. Most enrolled workers opted for the median investment line. I discuss the possible relevance of this result to public policy, in particular the possibility of including these preferences in the regulations, with the aim of benefiting employees.

Keywords: decision making, middle option predominance, pension funds.

1 Introduction

On 1 January 2007, the Italian government introduced an important and wide-ranging reform of the pension system, designed primarily with employees in mind, having the aim of increasing and developing the supplementary pension scheme.[1] The reform, which was explained to employees by means of flyers and announcements in the mainstream mass media, basically presented workers with three alternatives to choose from, two explicit and one tacit. The two possible expressed alternative options are:

a) to indicate the name of the pension fund the employee wants to enroll with. This pension fund will collect the employee's and the employer's contributions and accumulated severance pay;

b) to declare his/her willingness to leave accumulated severance pay with the employing company and therefore decide not to enroll with any pension fund. In this case, if the company has more than fifty employees, the employer must switch the accumulated severance pay to the "Treasury fund" held by the National Social Security Institute (INPS).[2]

If the employee does not express any choice (so called "tacit-members"), the tacit option works by providing automatic enrollment with, and depositing of accumulated severance pay in, one of the following alternative options:

1) the pension fund identified by collective agreement or by company agreement;

2) if point 1 does not apply, the pension fund that has the highest number of company employees;

3) if points 1 and 2 do not apply, the INPS Fund[3], created and managed by INPS.

After choosing the pension fund in which to enroll, either explicitly or tacitly, the worker is asked to choose one or more investment lines[4]. Again, on the one hand, if the employee decides not to decide ("tacit-member"), the law[5] identifies as the default option the guaranteed line without any risk (no-risk investment line). On the other hand, the members who make an explicit choice ("explicit member") decide which line to enroll in from those available in each Italian occupational pension fund.

Past literature includes many studies by authors who have considered how people made decisions in financial settings (Kahneman and Tversky, 1984; Kahneman and Knetsch, 1992; Levin et al., 2002; Kahneman, 2003) and how people decide portfolio asset allocation, including that for their supplementary pension. Bernatzi and Thaler (2002) in particular found "extremeness aversion" in pension fund asset allocation choices. Benartzi and Thaler found that menu design can influence pension fund enrollment decisions. They asked UCLA plan participants to

*Department of Business Administration, Faculty of Economics, Università Cattolica del Sacro Cuore (Piacenza Site), Italy, Via Emilia Parmense 84, 29122 Piacenza (Italy). Email: andrea.lippi@unicatt.it.

[1] Regulation of complementary pension schemes, Legislative Decree n. 252 of 5 December 2005.

[2] The National Social Security Institute is the Italian social security institution responsible for paying pensions and social security welfare.

[3] The INPS Fund is a pension fund created by law.

[4] All pension fund statutes establish the number and the types of lines in which the workers can invest. Moreover, the statute stipulates whether it is possible to diversify across lines or not.

[5] Regulation of complementary pension schemes, Legislative Decree n. 252 of 5 December 2005.

Table 1: Number of Italian occupational pension funds related to number of investment lines (2007-2011), drawn from the Covip Annual Report (2007-2011) and Italian occupational pension funds' balance sheets (2007-2011)

Number of investment lines	2	3	4	5
Number of occupational pension fund plans examined	6	13	6	2

select an investment from three different menus. The investment lines offered ranged from A (low risk) to D (high risk). The first menu included options A, B, and C; the second one, just options B and C; the last one, options B, C, and D. Comparing options B and C, which appeared in all three menus, 29% of participants preferred C over B in the first menu; 39% in the second menu and 54% in the third menu. This result shows that, in the first menu, where option C was an extreme, it was the least popular; in the third menu, where option C was the middle choice, it was the most popular. Thus Benartzi and Thaler's (2001) experiment demonstrates that participants appear to use a naïve heuristic (i.e., "avoid extremeness") rather than maintaining a consistent set of well-ordered risk preferences. Bearing in mind these results, the present paper aims to test whether the explicit members in Italian occupational pension funds asset allocation choices have been influenced by the menu design in order to identify a middle option predominance.

The results presented in this paper expand the existing literature on the topic of pension fund enrollment decisions considering a new unexplored market, Italy, and at the same time, they could be taken into consideration by the regulators, with the aim of benefiting employees.

The paper is organized as follows: Section 2 presents the sample; Section 3 presents the methodology and the results; Section 4 comments on the main results obtained and concludes.

2 Data sample

The sample used in this paper was created from the list of occupational pension funds identified and recognized by the Pension Funds Supervision Commission (COVIP) (a total of 35) at the end of 2007, the year of the introduction of Italian pension reform . Those no longer operating at the end of 2011[6] (two) were eliminated. The occupational pension funds existing before 2007 which did not provide a guaranteed investment line had to introduce one in order to be able to enroll the tacit members, as provided for by law.[7] For this reason 2007 represents a year of strong discontinuity with the past.

For each occupational pension fund, we analyzed the balance sheets from the years 2007–2011 in order to gather information about: a) the number and the types of investment lines offered in each fund; b) the total number of subscribers at the end of each year examined; c) the number of new subscribers enrolled during each year; d) the total number of tacit members at the end of each year examined; and e) the number of new tacit members enrolled during each year examined. Therefore the occupational pension fund whose balance sheets did not show the distinction between tacit and explicit members as well as the total number of tacit members at year-end or the number of tacit members acquired during the years examined were eliminated. After this selection, of the original 33 Italian occupational pension funds representing 1,988,639 members, our final sample comprised 27 occupational pension funds (that is to say 81.82%), representing 1,732,530 members (87.12%) at the end of 2007. In order to assess the presence of predominant behavior in Italian occupational pension fund asset allocation choices, only expressed choices can be considered, given that the tacit members do not express any choice but simply accept the default option determined by law. For this reason, the total number of guaranteed-line members was reduced by the number of tacit members. In addition, we consider the Italian occupational pension funds based on the number of investment lines offered by each one, as shown in Table 1.

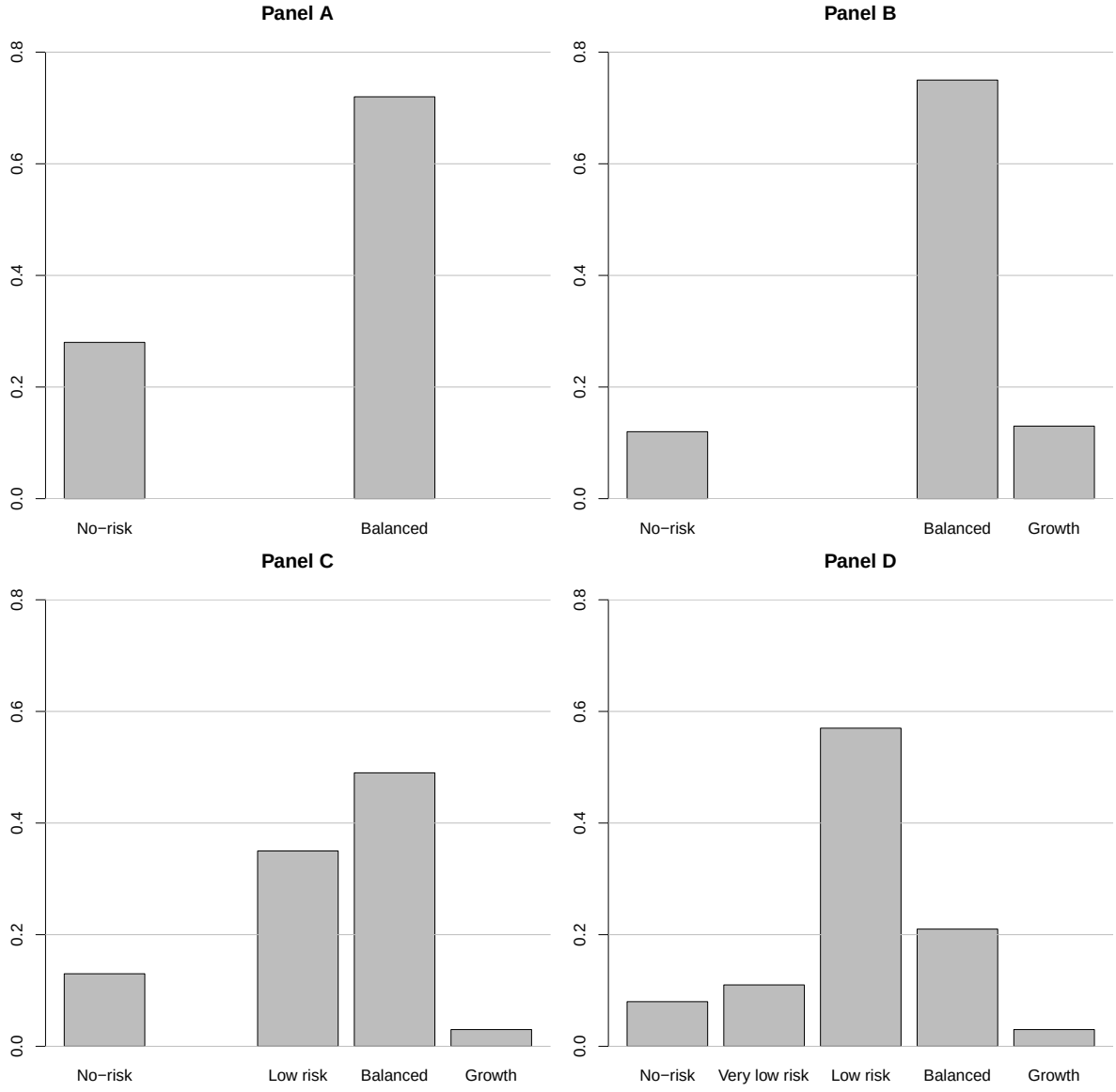
In each occupational pension fund, investment lines are presented to workers sorted by the level of risk, from no-risk (also called "guaranteed line") to higher risk, with increasing order. In fact, according to the Pension Funds Supervision Commission (COVIP) guidelines, the guaranteed line is the investment line without any risk, so the expected loss by members is zero; the "very low risk line" is the investment line for which the expected annual loss by its members is maximum 10%; the "low risk line" considers the possibility of maximum 30% expected loss per year; "balanced" is the investment line for which the expected loss by its members is (maximum) from 30% and 50%; "growth" is the investment line for which the expected loss could be even higher than 50% per year.[8]

[6] COVIP Annual Report 2007–2011.

[7] Regulation of complementary pension schemes, Legislative Decree n. 252 of 5 December 2005.

[8] In panel D, workers were removed not only when their assignment was tacit according to government rules but also when they were assigned to new lines as the result of a merger of two companies. Many of these workers were assigned to the low-risk and growth lines, which would have higher numbers if they were included.

Figure 1: Subscribers distribution of the Italian occupational pension funds investment line at year-end 2007–2011, elaborated by the author based on the number of explicit members enrolled in each investment line per Italian occupational pension fund (year-end 2007-2011).



3 Methodology

The methodology used in this paper comprises two steps: *Step 1* is designed to show the graphic evidence of the subscribers distribution in investment line choices made by explicit members in Italian occupational pension funds from 2007 to 2011; *Step2* involves the econometric analysis of the graphic evidence identified in Step1.

3.1 Step 1

Each Italian occupational pension fund is reserved for a defined category of workers; if new workers join this category they can also join the pension fund. In 2007, Italian workers were asked to choose between the two, three, four and five investment lines respectively offered by their occupational pension fund. Graph 1 shows subscriber distribution over investment lines and years (2007–2011) for Italian occupational pension fund enrollment. Initial consideration of panels B, C, and D reveals graphic evidence of a strong middle option predominance in Italian occupational pension fund asset allocation choices.

However, on the one hand, faced with an even number of choices menu, panels A and C, in which there is a non-dominant choice, employees tend to opt for an in-

Table 2: The middle choice predominance in Italian occupational pension funds calculated by the HHI, calculated on the basis of the number of subscribed members (year-end 2007-2011) taken from the balance sheet of each Italian occupational pension fund.

Investment lines:	2	3	4	5
No-risk	805.93	134.47	169.15	36.44
Very low risk				117.84
Low risk			1218.32*	2735.13**
Medium risk	5128.14**	5691.39**	2378.31**	695.17
High risk		168.02	11.03	19.74

Notes: * indicates medium concentration; ** indicates high concentration.

termediate or compromise alternative (Tversky & Simonson, 1993). In panel A only two alternative options are available so a middle choice is not identifiable. In general, in a binary choice polarization could occur (Chernev, 2004). In fact, as shown in panel A, the medium risk alternative tends to attract most employees' choices. However, in panel C there are two middle choices, not only one; in this case employees tend to choose this two middle alternatives. On the other hand, faced with an odd number of choices menu, panels B and D, there is a strong middle choice predominance.

The graphic evidence is also confirmed by statistical analysis. In particular, choice of the Balanced fund is significantly greater when it is the middle option, in Panel B, than when it is one of two options, in Panel A, for each of the 5 years, despite the fact that some of those who choose the Balance fund in Panel A would have chosen the Growth fund in B. Overall the difference was 75.8% vs. 71.4%, again a small difference, but enough to be significant every year by a χ^2 test at $p < 10^{-10}$, because of the large number of members.

Choice of the Low-risk fund was much greater when it was the middle option, in Panel D (67.0% overall) than when it was not, in Panel C (34.9%). Again this difference was highly significant in each of the 5 years. Preference for the middle option might be especially strong when members have more options to choose from.

3.2 Step 2

To test in another way the appeal of the middle choice in Italian occupational pension fund asset allocation choices, the Herfindahl Hirschman Index (HHI)[9] was calculated using the following equation:

[9]The HHI is designed to measure industry concentration. The US Department of Justice associates the following threshold values with the HHI for particular use: an HHI below 1,000 signals a low concentration, while one above 1,800 signals a high concentration; an index between 1,000 and 1,800 shows a moderate concentration.

Table 3: Description of variables, for data collected from each Italian occupational pension fund's balance sheet (year end 2007-2011).

Variable	Description
Dependent variable:	
type	Investment line type, from 0 to 4. The investment line risk increases from the guaranteed line (0) to very high risk (4).
Independent variables:	
sub	Total number explicit members at year end
sub2	Total number explicit members squared at year end
performance	Yearly performance for each line
t1, t2, t3, t4, t5	Time dummies (t1=2007; t2=2008; t3=2009; t4=2010; t5=2011)

Note: Other independent variables—such as: the Total Expensive Ratio (TER) per investment line obtained from the Covip web site; and the worker macro-categories obtained according to each Italian occupational pension fund's status—were included in the analysis, but these variables (individually or included together) did not give any results. For this reason they were eliminated.

$$\text{HHI} = \sum_{i=0}^{n} (100 s_i)^2 \quad (1)$$

In Equation 1, s_i, is the single investment line proportion per different menu design, i is the investment line type from 0 (guaranteed line—no risk) to 4 (very high risk investment line—growth). The use of HHI is the most appropriate. In fact each Italian occupational pension fund is reserved for a defined category of workers (if new workers join this category they can also join the pension fund)

Table 4: Panel regression analysis of extremeness aversion(2007-2011)

No. of investment lines:	2	3	4	5
sub		182.2**	44.69***	49.65***
		(88.36)	(14.65)	(16.21)
sub2	1.22e-09***	−207.2**	−80.75***	−65.11***
	(4.89e-10)	(100.6)	(26.96)	(21.44)
performance	−5.430	−5.333	0.674	−9.126
	(9.821)	(18.43)	(13.76)	(8.807)
2007	0.122	9.728*	1.410	0.278
	(0.899)	(5.225)	(1.577)	(1.073)
2008	−0.096	8.577*	0.638	−0.262
	(0.909)	(5.140)	(1.462)	(1.212)
2009	0.325	7.000*	0.331	0.983
	(1.052)	(3.848)	(1.761)	(1.234)
2010	0.084	5.722*	0.187	0.511
	(0.895)	(3.269)	(1.386)	(1.245)
N. Obs 20	15	20	25	
Prob>χ^2	0.0596	0.4561	0.0597	0.1027
Pseudo R^2 0.2445	0.2046	0.2445	0.1650	

Note: *** p<0.01, ** p<0.05, * p<0.1 (Standard errors in parentheses).

representing its potential market; the investment line opportunities offered in each fund are therefore in competition with each other and they are presented to workers in order of increasing risk; if the middle investment line/s is more attractive, a predominance for the central choice is identifiable. The HHI results, shown in Table 2, indicate a strong concentration in the middle investment line/s in each occupational pension fund, except for the two investment lines in which there is "polarization".

The middle investment line is generally the most popular; this situation is anomalous and can be explained by factors including the influence of menu design on decision making and the inconsistent set of well-ordered risk preferences (Simonson, 1989).

To test the existence of the middle option predominance, so as to confirm the HHI results, an ordered logistic regression (OLOGIT)[10] is used as follows:

$$\text{type} = \alpha\text{sub} + \beta\text{sub}^2 + \gamma\text{performance} + d_1t_1 + d_2t_2 + d_3t_3 + d_4t_4 + d_5t_5 + \varepsilon \quad (2)$$

The dependent variable "type" assumes values from 0 to 4 according to the investment line risk level. The OLOGIT model is justified to test the presence of the predominant central investment line choice bearing in mind that the menu design presents the investment lines with a specific increasing risk level order. The variables used in the model are shown and described in Table 3.

Considering the two-investment-line choice, the meaning of the sub-squared coefficient indicates a growing trend of hyperbole to confirm the polarization phenomenon. With reference to the other lines (3, 4 and 5) the sub-squared coefficient is negative and statistically significant, and the sub coefficient is positive and statistically significant; this identifies a parabola with a peak, with the confirmation of the concentration of explicit members' choices in the middle. Table 4 shows that investment line performance is not statistically significant, that is to say that subscribers' choices are not influenced by it. This factor is important because it leads us to the conclusion that the impact of investment menu design on participant investment choices in Italian occupational pension funds has a more powerful influence on the decision-making process than the underlying risk and performance characteristics of the investment lines offered (Benartzi and Thaler, 2002; Agnew and Szykman, 2005).

[10]Ologit fits ordered logit models of ordinal variable on the independent variables. For example, to test if "health" (0=bad; 1= not so good; 2=good; 3=very good) is depending by gender, skin color and/or age an ologit regression can be used as follows: ologit health female black white age.

4 Conclusions

Bearing in mind the wide gap between the moment in which the choice is made and the future time of "enjoyment", a wrong or unsuitable asset allocation choice in terms of pension funds could seriously compromise the maintenance of living standards after retirement. The results presented here show that many Italian occupational pension fund subscribers opt for the middle option. Choices influenced by menu design could often be contrary to rationality, not being dictated by an awareness of risk profiles. In this context, the dilemma arises as to which would be the optimal number of investment lines to make available in occupational pension funds. A solution could be the introduction of a life-cycle investment line, independently followed by a manager who would change asset allocation depending on the member's age. The regulator could adopt this kind of investment line for tacit members; at the same time it could consider standardizing the number of investment lines in each occupational pension fund, for example, five, the life-cycle line being in the middle. Further research in this area could be a source of inspiration for Italian (and other) regulators, exploiting these specific middle-favoring biases to the subscribers' benefit.

References

Agnew, J., & Szykman, L. (2005). Asset allocation and information overload: the influence of information display, asset choice, and investor experience, *Journal of behavioral finance, 6*, 57–70.

Benartzi, S., & Thaler, R. (2001). Naïve diversification strategies in defined contribution saving plans, *American Economic Review, 91*, March, 79–98.

Benartzi, S., & Thaler, R. (2002) How much is investor autonomy worth?, *Journal of finance, 57*, August, 1593–1616.

Chernev, A. (2004). Extremeness aversion and attribute-balance effects in choice, *Journal of consumer research, 31*, 249–263.

Festinger, L. (1957). *A theory of cognitive dissonance,* Stanford C.A.: Stanford University Press.

Gourville, J., & Soman, D. (2007). *Extremeness seeking: when and why consumers prefer the extremeness,* HBS-working paper n. 07–092, May.

Kahneman, D. (2000a). A psychological point of view: violations of rational rules as a diagnostic of mental processes, (Commentary on Stanovich and West), *Behavioral and brain science, 23*, October, 681–683.

Kahneman, D. (2000b). Experienced utility and objective happiness: A moment-based approach. In D. Kahneman and A. Tversky, *Choice, values, and frames.* New York: Cambridge University Press.

Kahneman, D. (2003). Maps of bounded rationality: psychology for behavioral economics. *The American economic review, 93*, 1449–1475.

Kahneman, D., & Knetsch, J. (1992).Valuing public goods. The purchase of moral satisfaction, *Journal of environmental economics and management*, 57–70.

Kahneman, D., & Tversky, A. (1979). Prospect theory: an analysis of decision under risk. *Econometrica*, 263–291.

Kahneman, D., & Tversky, A. (1994). Choices, values and frames, *American psychologist*(39).

Kahneman, D., Knetsch, J., & Thaler, R. (1991). The endowment effect, loss aversion, and status quo bias, *Journal of economic perspectives, 5* , 193–206.

Levin, P., Gaeth, G., & Schreiber, J. (2002). A new look at framing effects: distribution of effect sizes, individual differences, and independence of types of effects, *Organizational Behavior and Human Decision Processes, 88*, 411–429.

Simonson, I. (1989). Choice based on reasons: the case of attraction and compromise effects, *Journal of consumer research, 16*, 158–174.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice, *Science* (211).

Tversky, A., & Kahneman, D. (1992). Advances in prospect theory. Cumulative representation under uncertainty, *Journal of risk and uncertainty, 5*, 297–323.

Tversky, A., & Simonson, I. (1993). Context-dependent preferences, *Management science, 39*, 1179–1189.