Long-range planning attitude in a declining welfare:
when individual behaviours inhibit retirement voluntary plans

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Abstract

Declining welfare systems increase the importance of self-determination in pension decisions. Thus, the stability of long-life consumptions markedly relies on the individual long-range planning attitude. Our paper investigates how behavioural components affect this attitude, by observing in which conditions individuals hold voluntary integrative pension schemes (VIPS). We find that psychological and psycho-physiological heterogeneity, together with saving/indebtedness behaviours, plays a relevant role in predicting the demand for VIPS, taking socio-demographical variables under control. Subjects with high degree of impulsivity, precisely a non-planning impulsiveness, and with high emotional reactions, in terms of somatic response to events, are less likely to demand for VIPS. Our results implicate that behavioural features might bring individuals to lack integrative resources able to maintain stable lifestyles in the long-range.

JEL: G02; G28; D14; D87
Keywords: long-range planning attitude; psycho-physiological heterogeneity; integrative pensions schemes; impulsivity; Skin Conductance Response (SCR).

I.   Introduction

This paper investigates how individual heterogeneity affects long-range planning attitude. We examine if consumer style, personality traits and emotional components influence the probability of holding voluntary integrative pension schemes (VIPS), taking socio-demographical features under control.

Individual behaviours noticeably increase relevance when self-determination and self-control intensify, in pension decisions. This intensification is mainly due to the general declining of welfare systems, world-wide, that asks individuals to develop a long-range planning attitude. Workers are increasingly being given saving responsibility, and should be able to both manage their pension investments and draw down their retirement assets. OECD (2012) shows that private or more generally, funded pensions, often organized as Defined Contribution plans (DC plans), play an important role in the retirement income systems of many OECD countries. This role is expected to grow as recent pension reforms in many OECD countries will lead to a reduction in pay-as-you-go (PAYG) public pension benefits, traditionally organized as Defined Benefits plans (DB plans). However, unlike public pensions, private pensions are voluntary in many countries. As a result, participation in and contributions to these plans are largely the result of decisions made by employers and individuals, leading to wide disparities in coverage and contribution rates across the population and between countries.

In such a context, long-range retirement planning, DC plans above all, implies that individuals   decide when to start saving, the proper amount of saving, and the appropriate investment strategy. In addition, participants in DB pensions should evaluate also if retirement plans are going to provide forward income sufficient to preserve quality of life, during retirement; or conversely, whether they should self-organize with supplemental plans, such as VIPS.

Both theoretical literature and empirical evidence indicate that individuals face a series of obstacles in developing a long-range planning attitude. Some of these pitfalls are related to individual behaviours that tend to amplify short terms benefits, compared to long-term rewards, inducing for example overconsumption (Lusardi and Mitchell, 2009, 2011). This attitude seems to be related to cognitive biases that emerge when individuals are incapable to properly deal with concepts such as, discount rates and probabilities, which are incorporated in lifetime expected utility function (Ainslie and Haslam, 1992; Thaler, 1981). Some other pitfalls might be related to

personality traits, such as self-esteem in decisional tasks, or also the individual impulsivity, with particular reference to the behavioural ability to attend for future planning. Finally, an emotional component may influence the individual long-range planning attitude, because neuroscience literature recently demonstrated how emotions actively interact with rationality, in the human decision making (Reimann, Bechara, 2010).

In this paper we analyse a case study which is a natural experiment for a declining welfare in pension schemes: the Italian retirement system. Coherently, we observe a qualified sample of 645 Italian subjects and ask whether they effectively hold some voluntary integrative pension schemes (VIPS). Then we submit a verbatim questionnaire together with a psycho-physiological experiment which reproduces in a laboratory setting the individual decisional process under uncertainly; precisely we run the Iowa Gambling Task (IGT) with the simultaneous measurement of the Skin Conductance Response (SCR). A relevant contribution of this paper consists in the possibility to observe and relate indicators for psychological and psycho-physiological heterogeneity with retirement plans decisions that individuals undertake in their real life.

Our findings indicate that tendency to overconsumption and to informal debt arrangements, high impulsivity and high emotional activation tend to reduce the probability of holding VIPS, taking socio-demographical features under control. We believe that these attitudes may induce a lack of foresight that, if brought to its extreme, might bring to an increase in the long-run poverty risk.

The paper is organized as follows: Section II offers a review of the vast literature concerning cognitive and emotional components that should lead (or interfere with) the human decision making when concerning the long-range planning attitude; Section III briefly contextualized the empirical analysis within the declining welfare of the Italian case study; Section IV provides a description of methods used, in terms of sample, experiment, probit models and explicit research hypothesis; Section V depicts results of multivariate analysis and Section IV concludes.

II.   Long-range planning attitude: cognitive and emotional pitfalls

The life-cycle model is the standard framework which economists use to think about the intertemporal allocation of time, money and effort. The consumer has a lifetime expected utility, which is the expected value of the sum of period utility discounted to the present, multiplied by the probability of survival from the agent's current age to the oldest possible lifetime (formalization is offered, among the others, by Lusardi Mitchell 2009). Such a model implies several strong hypothesis: firstly, that households are able to formulate expectations regarding prospective survival probabilities, discount rates, investment returns, gross and net earnings, pensions and Social Security benefits, and inflation. Secondly, it assumes that they can *rationally* employ these data to plan and implement optimal consumption/saving choices.

Real world investigation shows that households behave differently from what models postulate, because of either under or, more often, over consuming. Low levels of financial literacy appear to be one reason why many households fail to plan very far into the future (Lusardi and Mitchell 2007, 2008, 2009, 2011). In addition, research on intertemporal choices (Ainslie, 1992; Akerlof, 1991; Thaler, 1981) includes numerous demonstrations of the "pervasive devaluation of the future" as described by Ainslie and Haslam (1992). Thus, individuals are willing to accept a small sum of money today in exchange for a larger sum in the future (Thaler, 1981). In this and many other cases (Hausman, 1979; Akerlof, 1991; Soman, 1998), the value of the future consequence (money, time or effort) appears smaller when viewed in the present. Such a dynamic inconsistency and the consequent bias towards the present is well explained by model of hyperbolic discounting as in Strotz (1956) or quasi-hyperbolic discounting as proposed by Laibson (1997) and O'Donoghue and Rabin (1999). As noted earlier, findings of dynamic inconsistency suggest that while individuals might make well-reasoned and prudent choices for the future, the temporal proximity to the stimuli often leads them to impulsively switch from their earlier selection. This behaviour has often been represented by using models of multiple selves. An individual is best understood as a succession of selves with different preferences and different

levels of awareness of such preferences. While most of the time these systems interact synergistically to determine behaviour, at times they may compete, producing different dispositions for the same information.

While recent neuroeconomics research has focused on the notion of several decision making subsystems, the idea of multiple systems of processing is not unique to decision making and has been developed, in strikingly similar ways, by many thinkers in philosophy, psychology, neuroscience and medicine over the past several hundred years[1]. The earliest accounts of dual-process theories in cognitive psychology date back to 1970's and 1980's (Evans, 1989; Wason & Evans, 1975) and have become the focus of much interest in contemporary research on these topics (Barbey & Sloman, 2007; Evans, 2007a, 2008; Evans & Over, 1996; Kahneman, 2011; Kahneman & Frederick, 2002; S. A. Sloman, 1996; Stanovich, 1999, 2011; Stanovich & West, 2000). Although there are nuances specific to each theoretical conception, for the most part, these dual-process models are all structurally very similar. In general, these models propose the existence of two distinct systems. System 1 is described as automatic, fast, effortless, unconscious, associative, slow learning, and emotional. System 2 is painted as controlled, slow, effortful, conscious, rule based, fast learning, and affectively neutral. System 1 processes may be as automatic as basic perception and are associated with baseline functioning. System 2 is described as more computationally demanding, thus used to monitor and override System 1 when the latter requires conscious control.

This type of models has been extended and applied to economic situations. Bernheim and Rangel (2004) and Bernheim and Bisin (2004) study consumption choices and consumption-saving plans under "cold" and "hot" modes.

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[1] One of the early proponents of this approach was Renee Descartes who, in "De l 'Homme" (1662), proposed that the body automatically sent sensory signals to the brain and then, based on these signals, the soul sent volitional commands to be carried out by the body. Wilhelm Wundt, the so-called father of experimental psychology, also hypothesized that consciousness could be divided into two types of processes. In his theory of selective attention, Wundt described voluntary action as a slow, effortful, and conscious process, while involuntary action, in contrast, requires little effort and operates beyond conscious control.

Loewenstein and O'Donoghue (2005) use this duality to explain, among other things, why people tend to exhibit an S-shaped probability-weighting function.

In another set of models pioneered by Thaler and Shefrin (1981) and Shefrin and Thaler (1988), dual-processes take a myopic versus forward-looking temporal dimension: the individual is splitted into a long term planner, interested in the future effects of choices, and a short-sighted doer, interested in immediate gratification only. The authors use the model to explain the benefits of commitment devices such as mandatory pension plans and lump- sum bonuses in promoting savings.

In trying to explain the mechanics of the dual process, some authors have gone further, suggesting that there are two evolutionarily distinct brain systems responsible for these two types of processing (see especially Epstein, 1994; Evans, 2010b; Evans & Over, 1996; Reber, 1993; Stanovich, 1999, 2004). Important support for such a point of view comes from neuroimaging investigation of intertemporal choices for both primary (McClure et al, 2007) and secondary (McClure et al, 2004) rewards. Using functional magnetic resonance imaging (fMRI), these authors show that decisions that involve at least some short-run tradeoffs recruit both analytic and emotional brain systems, whereas decisions that only involve long-run tradeoffs primarily recruit analytic brain. These findings support the idea that System 1 involves a limbic brain, while System 2 occurs in a pre-frontal cortex one.

The increasing availability of innovative technology amplifies understanding of the physiology of human decision making. Precisely, human decisions result to be based on the network synchronization between central and peripherical systems and emotions are simultaneous to the act of any decision making, with an effect which is not transient. Among the others, Wong, Xue and Bechara (2011) integrated fMRI images with psycho-physiological measures, in particular the Skin Conductance Response (SCR). Their results suggest that psycho-physiological data, obtained from SCR, would complement with fMRI findings in providing a more comprehensive understanding about the physiological and neural mechanisms of decision making.

These recent empirical findings appear in line with the Damasio' (1994) Somatic Marker Hypothesis, where the decision-making is considered a process that is influenced by marker signals that arise in bioregulatory processes, including those that express themselves in emotions and feelings; this influence can occur at multiple levels of operation, some of which occur consciously, and others non-consciously.

Our research is addressed at investigating a large sample of individuals, and some experiments, such as fMRI, are impracticable for hundreds of subjects. Therefore, we opted to rely on scientific evidence that support for the network synchronization between central and peripherical systems; coherently, we exploit an experimental task that allows us to deduce the individual emotional activation, related to System 1 and to limbic brain, from measurements of the Skin Conductance Response during an experimental task that involve a risky decision making.

III. A Declining Welfare in Pension Systems: The Italian Case Study

The Italian pension system has been heavily reformed during the last twenty years. A mandatory public pension pillar, namely the Pillar I, is organized as a DB earnings-related scheme and has been progressively transformed into a notional DC scheme. Changes did not apply to the financing which remained based on intergeneration pay-as-you-go (PAYG) system. In order to counterbalance the expected reduction in the replacement rate of public pensions, caused by the Pillar I reform, a supplementary-funded pillar has been introduced. Consistently, additional reforms envisaged supplementary schemes that can take one of these forms: collective (Closed/Open Pension Funds), similar in principle to US 401(k) or individual (Open Pension Funds or *Piani individuali pensionistici* -PIPs), similar in principal to US IRA. Closed collective occupational pension funds are managed by social partners, while open pension funds in case of both collective and individual affiliation are managed by

financial institutions, finally PIPs, which are specific forms of life assurance, are managed by insurance companies. Supplementary funds use mainly DC formulae. As part of this supplementary pension schemes, workers can contribute at minimum their severance pay, the *Trattamento di Fine Rapporto* (TFR), which is financed by 6.91% of contributions on gross wages and additionally any amount they might want to commit.. In case of voluntary addition, in the collective schemes further contributions come from the employer, as established by agreements, while in the individual schemes employer's contributions are optional. Regardless the form, contributions up to around 5,000 euro are tax-deductible.

In spite of the reform leading to a drastic reduction in the substitution rate, relatively few Italians workers embraced pensions outside Pillar I. In 2003, members did not exceed 2,6 millions, only about 12 per cent of the employed workforce. In 2005, in order to boost participation, a scheme of automatic enrolment of private sector employees was implemented by law. Entered into force in 2007, the mechanism entails the payment of the flow of the severance pay provisions into pension funds, unless the workers opt out. Differently from other successful national experiences, the Italian auto enrolment scheme did not increase remarkably participation. COVIP, the pension system watchdog, reports that by the end of 2012 members reached around 5.8 millions, still a bare 25 per cent of the employed workforce. In analysing this poor result, Rinaldi (2011) remarks a combination of ill-design of the default option and the lack of unanimous consensus of the different parties involved (social parties, employers, government) for such a process.

Given the structural declining of Pillar I and the generalized scarce success for VIPS, our empirical study, with voluntary pension fund participation overrepresented, appears of particular interest for analysing drivers of demand, different from the usual socio-demographic ones. In other terms, the case is pertinent because we aim at investigating that side of pension demand (the voluntary one) where the self-determination and self-control is dominant.

Thus, the exploration of psychological and psycho-physiological heterogeneity is reasonable and worthy.

IV.   Methods, Models and Research Hypothesis

IV.a The sample, the experiment and the questionnaire

The empirical analysis has been developed within an Italian research project addressed to study behavioural and emotional issues that concern financial decision making (Lucarelli, Brighetti, 2010[2]). A research team of economists and psychologists cooperated in running an *in-person survey* that involved a large sample of individuals in a psycho-physiological experiment. More than 800 individuals were asked to take part to the analysis and 645 of them did so, with no obligation or reward. The sole condition that has been imposed in the sampling procedure was that individuals had to be directly responsible for their financial decisions. This circumstance renders appropriate the investigation of a relationship between individual heterogeneity and personal real-life financial choices[3].

The condition of inviting people in charge of financial decisions explains two main features of our sample: firstly, we have a considerable share of individuals (almost one third) that take financial decisions also for professional duties (mainly on line traders, asset managers and financial advisors[4]); secondly, features of our sample indirectly reproduce the overall characteristics of those

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[2] An overview of the project is offered in Lucarelli, Brighetti, 2010 where we refer to a first set of 445 individuals and focus on research questions that are different from those investigated in this paper. This initial investigation has been allowed thanks to a grant provided by the Italian Ministry of University and Research, as a Project of Research of National Interest - PRIN 2007, from September 2008 and September 2010. An incremental grant provided by ASSORETI, the National Association of Financial Products and Investment Services Placing Firms, allowed us to reach the sample of 645 individuals, that is considered in this paper, with the specific research question referred to retirement behaviors.

[3] We take into consideration, properly in multivariate analysis, those conditions when financial decisions could be affected by familial context (i.g. the economic capability is typically referred to the overall familial condition) or by other forms of external influence (i.e. the presence of professional financial advice).

[4] Even if these individuals take *professional* financial decisions, we always asked them to answer refereeing to their *personal* financial decisions.

who take care, in Italy, of households familial decisions, that are typically males[5].

The complexity of the *in-person* psycho-physiological experiment required a well organized research activity that could be managed uniquely with the strict cooperation of financial institutions, that invited both their employees and their customers, and that hosted the experiments inside their offices, across the Italian territory. Nevertheless, the research activity was in line with a stringent privacy statement that rendered each personal investigation anonymous: each individuals was invited by the financial institution, randomly among customers or employees, and was codified with an Identification Number (ID) that was finally given to the research team in order to recognize each subject.

The psycho- physiological experiment was the Iowa Gambling Task (IGT) combined with the measurements of the Skin Conductance Responses (SCR), run coherently with instructions of Bechara and Damasio (2002). Although originally intended to explain decision-making deficits in people with specific frontal lobe damage, the IGT has been successively proved to be effective in exploring one's physiologic and emotional response, whilst making risky choices. For a detail description of the experiment see Uberti, Lucarelli, Brighetti (2013) or visit the on-line Appendix[6].

Briefly, the IGT simulates real-life decisions in conditions of uncertainty and requires an individual to take a sequence of choices among decks A, B, C and D which implies different gains (rewards) and losses (punishments). According to the original definition of Bechara and Damasio (2002:1677), two of these decks (deck A and deck B) were defined as being, '*in the long run disadvantageous*', because the risks they contained were not adequately rewarded and, at the end of the task, individuals who preferred these decks 'lost'; conversely, decks C and D were defined as '*advantageous*', because the risks unbundled in these decks were adequately rewarded. During the task, participants sequentially select a

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[5] In our sample we have more than 80% of individuals that are males. An analysis of the Istat annual households surveys shows that men are predominantly head of the households in around 70% of cases (Istat, 2011).

[6] http://www.risktolerance.univpm.it/igtscr

card from four decks and receive a (virtual) monetary outcome after each selection. The subject is not given the information of how many choices she has to take; finally, the task is based on 100 selection and its duration is about thirty-forty five minutes for each participant.

In the meanwhile the subject is making IGT choices, and therefore she is receiving positive or negative outcomes from her choices, we measure her Skin Conductance Response (SCRT), from the voltage drop between two electrodes placed on the skin surface. Electrodes are attached to the palm surface of the second phalanx of the index and middle fingers of the non-dominant hand, after the subject is seated in a comfortable chair in front of the computer screen where the sequence of the IGT choices is displayed. Changes in SCR occur when the eccrine sweat glands, which are innervated by the sympathetic autonomic nervous system fibers, receive a signal from a certain part of the brain. Recording of SCR starts at least ten minutes before the beginning of the IGT, and continues throughout. Sample rate is set at 1 Hz.

Somatic reactions to IGT rewards and punishments are generated after each card selection so that individuals begin to trigger anticipatory reactions that will guide their forthcoming choices[7], coherently with the Somatic Marker Hypothesis (Damasio, 1994). In line with the Bechara and Damasio's (1997) formulation, we measure the value of the Skin Conductance Response that individuals show before the choice of disadvantageous decks and we refer to this value as a measure of emotional reaction of individuals against risky situations.

After this experimental task, we submit to our sample of individuals a verbatim questionnaire, where we included an impulsivity test, i.e. the BIS-11 questionnaire of Patton, Stanford and Barratt (1995), as well as a wide range of questions concerning socio demographic information that is used to set descriptive variables and controls.

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[7] Even if gain and losses are only simulated, a similar performance pattern emerges when the nature of the incentive used is varied, for example, when giving real money instead of facsimile reinforcers (Bowman and Turnbull, 2003).

A specific part of the questionnaire was prepared to collect personal financial choices, such as investments, VIPS, insurance coverage and debt. From Table 1 we observe that the participation rate to VIPS is relevant and much higher than what is revealed by the overall Italian situation (see Sections II). This is due to the composition of our sample; on the one hand it could be representative of some Italian features (such as gender, given financial decisions are typically taken by head of household, that is typically male). On the other hand, our sample has been randomly selected among customers of banks or financial firms; therefore levels of income/wealth are somehow higher compared to the average Italian situation[8]. Nevertheless our research goals are not addressed to depict a survey that should be representative of the Italian situation; they mainly refer to a more general relationship that should exist between individual heterogeneity, such as a behavioural or emotional component, and specific personal financial choices. In this sense, features of our sample are absolutely beneficial to our study because they allow us to observe a quite large number of individuals that opted for VIPS, that otherwise would have been fewer.

Another distinctive feature of our sample is the presence of financial professionals. From Table 2 we observe that we have 281 interviewed specialized in financial jobs, among which we have 234 individuals that are either asset manager or professional financial advisors. This inclusion could induce biases in the VIPS demand due to conflict of interest, because these professionals might be either managing or selling the VIPS that they hold. In fact, the VIPS participation rate decreases from 48%, to 38%, when excluding such financial professionals from the overall sample.

<insert Table 1 about here>

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[8] Our yearly average income, transformed in order to be statistically comparable (because weighted by dependents) is 52,000 euros, against roughly 38,000 euros of the similar figure referred to Italian households living in similar geographical areas for the same period of our analysis, i.e., years 2009 and 2010 (Rapporto Istat "Reddito e condizioni di vita" 2011).

Coherently, in order to have our findings robust in relation to this possible sample-bias, we run the multivariate analysis within both the overall sample and the restricted one (asset manager and professional financial advisors excluded).

IV.c Models for probability of holding VIPS

We build a probit model which includes a series of explanatory variables, organized in matrices/vectors, according to indications from existing literature, in order to explain the probability that interviewees hold a VIPS (VIPS dummy variable equals to 1):

$$Pr(VIPS = 1 | S, F, C, P, E) \qquad [1]$$

The probability of holding VIPS is sought to be motivated by: socio-demographic variables, organized in matrix S and that play mainly as controls (Table 2); by conditions of financial literacy and financial decision process, indicated by variables included in matrix F (Table3); by variables of individual consume and debt style, grouped in matrix C (Table 4); by variables describing certain personality traits, summarized in Matrix P (Table 5) and finally by emotional activations, measured as the Skin Conductance Response revealed by individuals during our experimental task (Table 6).

Demand for pension funds is highly affected by the nature and generosity of Social Security systems and by the legal framework for private pension schemes (mandatory, quasi-mandatory or voluntary), so that socio-demographic characteristics of subscribers may change accordingly. At macro-level, OECD (2012) shows that younger individuals tend to be less often enrolled in privately managed funded pensions, especially in voluntary systems. Participation tend to increase with age and also with income. Gender-wise findings are heterogeneous: negative female gap is remarkable in countries like Netherlands and Ireland (16,4 and 10,3 percentage points respectively) and negligible in other like UK, Germany or United States. Finally, the coverage rate is lower for workers having a temporary contract than for workers having a permanent contract in all countries which provide such an information. At micro-level, Hira, Rock and

Loibl (2009) surveying high income US workers (75.000$ income per year and above) find out that a combination of socio-demographic and behavioural variables are likely to influence pension fund participation and contribution maximization. Older and Caucasian individuals are more likely to own private pension, as well as if they are early and active investors. Consistent conclusions are drawn in UK by Clark, Knox-Hayes and Strauss (2008), who find out that income, age and household status, i.e. having a spouse who contributes, are correlated with saving for the future. These evidences motivate the list of socio-demographical variables that we include in Matrix S and show in Table 2: age, gender, the presence of dependants, education, profession, the presence of a stable working contract (*stable-workcont*), levels of income (*income-dol*), number of property houses (*real-estate*).

<insert Table 2 about here>

Matrix F embraces conditions of financial literacy and financial decision process according to that literature that indicate these conditions as relevant (Lusardi and Mitchell 2007, 2008, 2009, 2011). Moreover, Hira, Rock and Loibl (2009) find evidence that individuals are more likely to own private pension if they collect financial information from different sources. Information strategies matter as well: individuals who engage in ex ante research, i.e. research financial information before speaking with an individual, and in ex post evaluation, i.e. review investment material from the mail, are more likely to maximize their contribution. The list of variables included in F is offered in Table 3 and include: holding high financial knowledge (*high-financ-knowledge*), the access to a financial professional advice during the decision making (*profess-advise*), the regular access to financial information (*use-financ-info*).

<insert Table 3 about here>

Matrix C consists of variables describing the individual consumer style and its implications on saving ratios (*saving-ratio*), on debt repayments (*debt-repayment*), on access to informal debt agreements (*use-informal-debt*) and finally on the overall insurance coverage (IC- see Table 4). In our empirical

analysis we did not collect explicit information about cognitive biases that individuals may face in managing discount rates and probabilities, which are incorporated in lifetime expected utility function (Ainslie and Haslam, 1992; Thaler, 1981). We prefer to gather indirect information of theses biases, which might be objectively deduced by their consuming behaviours. For example, the *saving-ratio* (the ratio between monthly income and current expenses) is both an indicator of saving attitude and of overconsumption, because we have evidence of individuals with negative ratio even if belonging to the highest income class we included in the analysis.

<center>*<insert Table 4 about here>*</center>

Matrix P, which embraces variables describing certain personality traits, such as *self-esteem*, trust in future (*trust-future*) and impulsivity (see Table 5). There is a large literature suggesting that impulsivity might affect the long-range planning attitude. For example, Martin and Potts (2009) suggest that highly impulsive individuals are biased toward immediate rewards during option evaluation and are less sensitive to the negative consequences of their choices. Moreover, Howlett, Kees, Kemp (2008) find that the lack of self-regulation and lower propensity for considering future outcomes of current behaviours negatively influence long-term financial decisions.

<center>*<insert Table 5 about here>*</center>

As anticipated, we ask individuals to fill the BIS-11 questionnaire of Patton, Stanford and Barratt (1995). The BIS-11 is based on 30 items and is designed to assess general impulsiveness by taking into account its multifactorial nature: non-planning, motor, cognitive. The component scores, that are used in the analysis, measure different aspects of impulsivity: 1) non-planning impulsiveness (*bisnpln*), which reflects a lack of planning for the future; 2) motor impulsiveness (*bismotn*), which reflects a tendency to act without forethought; and, 3) attentional impulsiveness (*biscogn*), which is largely characterised by a selective concentration on one aspect of the environment while ignoring other aspects.

Finally, we include the indicator for the emotional activations (see Table 6).

<insert Table 6 about here>

Coherently with the theoretical idea in Thaler and Shefrin (1981) and Shefrin and Thaler (1988), and the empirical neuroscience findings in McClure et al (2004, 2007), we assume that dual-processes (i.e. System 1 vs System 2) take a myopic vs. forward-looking temporal dimension. We exploit the IGT-SCR experiment to obtain a measurement for emotional activation and select the individual SCR shown before disadvantageous decks (decks A and B), after the first twenty choices that are largely considered a trial period. We followed the protocol of the experiment indicated by Bechara and Damasio (2002) and computed our variable *SCR* which is the mean value of the Skin Conductance Response recorded of each individuals before any choices that is addressed toward a disadvantageous deck, within the last set of 80 choices of the trial.

IV.c Research Hypothesis

Our research question refers to how individual behaviours affect long-range planning attitude. Therefore, we examine if consumer style, personality traits and emotional components influence the probability of holding voluntary integrative pension schemes (VIPS), taking socio-demographical features under control. As anticipated, we rely on information about individuals who effectively hold VIPS in the real-life.

Socio-demographical features here are mainly used as control variable, and we formulate hypothesis mainly referred the literature (Hira, Rock and Loibl, 2009; Clark, Knox-Hayes and Strauss, 2008) and OECD findings:

H1.a: the probability of holding VIPS increases with age.

H1.b: the probability of holding VIPS increases with income.

H1.c: having a stable contract increases the probability of holding VIPS.

H1.d: active investors increases the probability of holding VIPS.

With reference to matrix F, from literature (Lusardi and Mitchell 2007, 2008, 2009, 2011; Hira, Rock and Loibl, 2009) we would expect:

H2.a: the probability of holding VIPS increases with financial knowledge.

H2.b: the probability of holding VIPS increases if the subject relies on a professional advice.

H2.c: the probability of holding VIPS increases with access to financial information.

With reference to matrix C, with reference to the literature on behavioural life-cycle consumer choices, we would expect:

H3.a: the probability of holding VIPS increases with saving attitude and decreases with overconsumption

With reference to matrix P, from mainly Martin and Potts (2009) and Howlett, Kees, Kemp (2008) we would expect:

H4.a: the probability of holding VIPS decreases with the individual impulsivity

With reference to vector E, inspired by Thaler and Shefrin (1981), Shefrin and Thaler (1988) and McClure et al (2004, 2007) we would expect:

H5.a: the probability of holding VIPS decreases with the emotional activation, as a sort of prevailing of System 1, limbic - myopic, on System 2, pre-frontal – forward looking.

V.   Results and Discussion

We estimate the probit models of [1] reporting marginal effects in Table 7, both including all the individuals of the sample (whole sample), and excluding asset managers and professional financial advisors, because of their potential bias in holding VIPS. In the restricted sample, within the "financial professionals" we keep a residual of N.49 subjects that are *on line traders*, i.e.,

those individuals specialized exclusively in short-term trading strategy, either professionally or as a secondary occupation.

As far as socio-demographic variables are concerned, age is able to predict demand for VIPS and with a U shape-relationship, as expected (positive sign of *agen* and negative sign of the quadratic term *agen²*), because people tend to underwrite VIPS when ageing, but with a decreasing intensity as they aged. We believe that this relationship is reliable, even if the *agen* variable results not significant when restricting the sample to N. 409 subject; this is mainly due to the reduced informative power of the smaller sample. Therefore *H1.a* is accepted. Conversely, *H1.b* cannot be accepted because neither the *income-dol* variable nor the *real-estate* variable result significant in our estimations. It seems that the economic power of individuals does not play any effect in predicting the demand for VIPS, when other variables are controlled. *H1.c* is largely accepted, instead, because having a stable contract (*stable-workcont*) always significantly and positively predicts holding VIPS, even when restring the sample and adding further variables. In opposition, *H1.d* is to be selectively accepted, because being a financial professional, as proxy of being *active investor*, increases the probability of holding VIPS, but only when using the whole sample, i.e. when including asset managers and professional financial advisors. If we exclude them, and leave on line traders, *Financial Professionals* result not significant. This rises the idea that the increased probability of holding VIPS, for asset managers and financial advisors, might not be related to their active/conscious involvement in financial issues, but it is rather linked to their professional business. Marginally, we observe that *gender*, the presence of *dependents* and *educational* do not significantly affect the predictability of holding VIPS.

We do not comment results on education, that appear not in line with literature (Lusardi and Mitchell 2007, 2008, 2009, 2011), because we precisely investigate this issue by adding the financial literacy matrix F to the probit model. Nevertheless, the driver that supports this deduction is mainly the presence of a professional advice that support the financial decision making, with *profess-advise* always positively significant. On the contrary, high levels of

technical, but self-assessed, financial knowledge, indicated by *high-financ-knowledge* – i.e., the theoretical confidence of individuals with complicated financial products- never result significant in predicting the demand for VIPS. Conversely, *use-financ-info* plays a fragile positive role, because its significance disappears when adding further variables, in such as the further matrices[9]. Therefore, only *H2.b* can be unambiguously accepted.

With reference to matrix C, *H3.a* is largely accepted because the probability of holding VIPS increases with saving attitude and decreases with overconsumption, as shown by the significant and positive sign of the *saving-ratio* variable, in both samples of estimations (641 and 409 subjects) and when adding further matrices, up to the complete model of [1]. The same consistent role is played by the *use-informal-debt* variable and its interpretation is enriched if it is joined with the *debt-repayment* variable. In fact, the latter is never significant, indicating that having debt *tout court* has no relevance on long range investment choices. Instead, the *use-informal-debt* variable always results significant and negative on VIPS holding. This means that those individuals used to rely on informal debt solutions, i.e., that request financial support from familiars, colleagues or neighbours, are less likely to access to VIPS. Interpretation is twofold: on the one hand, informal debt arrangements may represent a source of social capital, that might induce people to substitute formal long-range investments, such as VIPS, with availability of such kind of resource. On the other hand, such informal debt may also play the role of lender of last resort, which is used when regular debt from financial institutions is interdicted, as a consequence or over-indebtedness. The consequent deduction is that those individuals more likely to access to last resort debt solutions are less likely to

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[9] We performed likelihood ratio tests to check is the inclusion of matrix F significantly enrich the model. We observe that likelihood ratio tests are accepted, both in the whole (p-value of LR test=0.037) and in the restricted sample (p-value of LR test=0.047) of estimations. This means that the inclusion of variables indicating levels of financial literacy significantly increases the predictive power of VIPS, even if in Table 7 it seems that variables of Matrix F are seldom significant.

hold VIPS[10]. Finally, the significance of the variable IC, that indicates the intensity of insurance coverage by number of policies underwritten, may testify both a cross-selling condition, within the Italian marketplace, where VIPS are jointly offered with insurance contracts; and a tendency to consider the long-term uncertainty as a kind of ambiguous situation that individuals are likely to manage similarly to more appropriate sources of pure risk (death, damages, illness, etc..).

Matrix P introduces in our probit model some psychographic variables that we would expect influence VIPS demand. We focus on the *bispln* variable, that is always significant and with a negative sign, as expected. Therefore, *H4.a* is accepted: the probability of holding VIPS decreases with the individual impulsivity. The inclusion of disaggregated BIS scores indicates that the impulsivity driver is the non-planning impulsiveness (*bisnpln*), which reflects an individual lack of mind-set for planning for the future. This result is fascinating and support evidence that long-range planning attitude is driven also by some individual psychographic features, such as impulsivity; nevertheless, the reaming variables in Matrix P, are not significant (*trust in future*) or significant only when the whole sample is considered (*self-esteem[11]*).

Conversely, the last inclusion of emotional variables, with the vector E, significantly increases the predictive power of model, even when the restricted sample in considered[12]. The sign of the relationship with the variable *SCR* is negative, and it proves evidence that *H5.a* is accepted. We find evidence that the probability of holding VIPS decreases with the emotional activation, and seems to support that when System 1, limbic, is prevailing ceteris paribus on System 2,

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[10] Overall, from LR tests we observe that, both in the whole and in the restricted sample, the inclusion of Matrix C significantly increases the predicting power of the less restricted model (p-value of LR test=0.000).

[11] One might guess that *self-esteem* could be related to the *self-assessed financial knowledge*; nevertheless, we run a preliminary check for correlations among explanatory variables and the ρ coefficient is 0.27 in the whole sample and 0.28 in the sample that excludes asset managers and financial advisors. Therefore we choose to keep the both variables in the model.

[12] The p-value of LR test is 0.008, for the less restricted model compared to the restricted one, with 641 individuals; p-value of LR test is 0.004 with 409 individuals.

pre-frontal, a forward looking behaviour is reduced, bringing about a decrease probability of holding long-range investment plans.

VI.   Conclusions

Retirement is about dreams, fears and changes, not just money and schedules. Some people retire to satisfactory lives, others to unhappy, even miserable ones. In most cases the causes for this difference lies, to paraphrase Shakespeare, not in our wallets but in ourselves.

The economic implications of this ascertainment is that self-determination and self-control are crucial in retirements and pension decisions. Nevertheless, if welfare systems decline, the individual long-range planning attitude becomes important to ensure stable consumptions along life. Many obstacles have been shown impeding a forward-looking financial decision making; theoretical and empirical researches support that individuals tend to privilege present instead to future consumptions. If this is brought to an extreme, and referred to the large part of world-wide population that is ageing, the lack of long-range planning attitude might bring to an increase of poverty risk.

Our paper makes valuable contributions to further our understanding on how individual components impact on real-life long-range investment choices. We support empirical evidence that individual heterogeneity plays a relevant role in predicting the demand for voluntary individual pension schemes. Some socio-demographical variables and individual economic behaviours in relations to savings, consumptions and indebtedness, mainly confirm traditional results from existing literature. The unique contribution of our study lies in the findings that additional psychological and psycho-physiological components are significantly related to the probability of holding long-range investment plans. Taking all the other variables under control, subjects with high degree of impulsivity, and precisely a non-planning impulsiveness, and with high emotional reactions, in terms of somatic response to events, are less likely to demand for voluntary individual pension schemes. This finds bring to two major conclusions. At individual level, our research makes clear that, after controlling for socio-demographic variables, demand for VIPS will always be influenced by psychological components impacting time preferences: some individuals who are less emotional and impulsive will

be able to discount less severely the future consumption and save for retirement; others who are more emotional and fares present consumption too high are unable to save. At social level, these results implicate the idea that these behavioural features might bring individuals to take (or not to take) financial decisions that might bring them to lack in the long-range that amount of money sufficient to preserve their consumptions, and finally increasing their long term poverty risk.

Implications of these findings are remarkable both at the micro and macro level. As long as impulsive or emotional individuals lack a long-range planning attitude, i.e. a capability to plan for retirements, communication campaigns regarding the individuals' choices, and the potential implications these choices have for their financial well-being in retirement, should be considered. Benartzi, Iyengar and Previtero (2007) show that affective communication might enable to increase the willingness to save. We believe that a communication is "affective" if incorporates these findings on individual heterogeneity. Time preferences can also be manipulated thanks to an emotional visualization of self. For example, Hershfield et al. (2011) propose that allowing people to interact with age-progressed renderings of themselves will cause them to allocate more resources toward the future.

Additional implications at policy level could be considered, as well. While reforming pension systems, policy makers could capitalize on our findings by taking special care in communicating the role that VIPS can play for the old age welfare. In designing default option, they must put special emphasis on the emotional consequences of different features such as contribution rate escalation or financial design. Default options seem to be important not only because they might foster participation decisions, but because they complement education and information, that might result not sufficient, as we show, to induce a long-range planning culture.

Table1- Demand for voluntary integrative pension schemes (VIPS)

Overall Sample	Freq.	Percent	Excluding Asset Managers and Financial Advisors	Freq.	Percent
No VIPS	331	51.32	No VIPS	252	61.31
VIPS	314	48.68	VIPS	159	38.69
Total	645	100	Total	411	100

Table 2- The socio-demographical variables (Matrix S)

This Table describes regressors that are included in Matrix S. Some of them are dummy variables and here we specify which condition we observe in the multivariate analysis. For example, *gender* considers males opposed to females; *dependants* considers having familial weights. The *profession* variable is categorical and results of multivariate analysis refer to category (1, i.e., employees and pensioners) compared to the others. Our 281 financial professionals are: 51 on-line traders; 84 professional asset managers; 150 professional financial advisors. Among the variables indicating the economic power of individuals, we omit to consider financial wealth and the value of real estate because highly correlated with *income-dol* and *real-estate* (numbers of houses).

Variables of matrix S	Observed condition					
		Obs	**Mean**	**Std. Dev.**	**Min**	**Max**
agen	Age relative to 100	645	0.44	0.12	0.18	0.82
					Frequency	**%**
		Overall sample			**645**	**100**
gender	Male as opposed to female					
		Males			509	78.91
		Females			136	21.09
dependants	Having dependants or not	Yes			357	55.35
		No			288	44.65
education	Highest level of education obtained	Secondary School			30	4.65
		High School			283	43.88
		University Degree			261	40.47
		Master or Ph.D.			71	11.01
profession	This variable has been categorized and results show category (1) against the others	Unemployed (0)			26	4.03
		Employee, Pensioners (1)			184	28.53
		Entrepreneurs, Managers, Professionals (2)			154	23.88
		Financial Professionals (3)			281	43.57
stable-workcont	Having a stable working contract as opposed to not	No stable contract			332	51.47
		With stable contract			313	48.53
income-dol	Mid-points in value of the income classes proposed	< 500 euros			2	0.31
		(500 - 1.000 euros)			10	1.55
		(1.000 - 2.000 euros)			57	8.84
		(2.000 - 3.000 euros)			129	20
		(3.000 - 4.000 euros)			124	19.22
		(4.000 - 5.000 euros)			92	14.26
		(5.000 - 6.000 euros)			58	8.99
		> 6.000 euros			173	26.82
real-estate	Number of owned houses	0			93	14.42
		1			292	45.27
		2			123	19.07
		3			51	7.91
		more than 3			86	13.33

Table 3- Financial literacy and financial decision process (Matrix F)

This Table describes regressors that are included in Matrix F. The variable *high-financ-knowledge* is a dummy variable which is 1 if individuals declare themselves being confident with functioning of peculiar typologies of financial product, such as ETF, hedge fund, derivative, and structured finance. The variable *profess-advise* describes the individuals' decision process and indicates if they are guided by financial professionals. Finally, the variable *use-financ-info* indicates if individuals are used to read financial newspapers.

Variables of matrix F		Overall sample	Frequency 645	% 100
high-financ-knowledge	This variable is 1 if individuals feels confident with concepts such as ETF, hedge fund, derivative, and structured finance; 0 elsewhere.	Without high financial knowledge	539	83.57
		With high financial knowledge	106	16.43
profess-advise	This variable is 1 if individuals follows a professional advice in their financial decision; 0 elsewhere.	Absence of professional advice	450	69.77
		Presence of professional advice	195	30.23
use-financ-info	This variable is 1 if individuals are used to read specialized financial information; 0 elsewhere.	No use of financial newspapers	585	90.7
		Use of financial newspapers	60	9.3

Table 4- Consumer style and its financial implications (Matrix C)

This Table describes regressors that are included in Matrix C. We include *saving-ratio* which is the ratio between monthly income and current expenses; *debt-repayment* which indicates the monthly debt repayment in value; the variable *use-informal-debt* indicates whether individuals ever asked for a financial support to relatives, friends, colleagues or neighbours; IC stands for the number of insurance policies underwritten, among the four: life insurance, health insurance, casualty insurance and indemnity insurance.

Variables of matrix C		Overall sample		Frequency 645	% 100
saving-ratio	Ratio between monthly income and current expenses. The ratio is -1 if monthly income is not sufficient to cover current expenses and individuals are obliged to use reserves or assume debt; the ratio is 0 if monthly income is just enough to cover current expenses; it is +1 if monthly income exceeds current expenses and individuals are able to save.		-1	43	6.67
			0	86	13.33
			1	516	80
debt-repayment	Monthly debt repayment in value	0 (no debt repayment)		283	43.88
		under 200 euros		20	3.1
		(200-400 euros)		63	9.77
		(400-600 euros)		61	9.46
		(600-800 euros)		55	8.53
		(800-1.000 euros)		62	9.61
		(1.000-2.000 euros)		71	11.01
		over 2.000 euros		30	4.65
use-informal-debt	Dummy variable which is 1 if individuals resolve to informal debt arrangements; 0 if not.	No informal debt		541	83.88
		Request for informal debt		104	16.12
IC	Insurance coverage	No policy		148	22.95
		1 policy		159	24.65
		2 policies		157	24.34
		3 policies		101	15.66
		4 policies		80	12.4

Table 5- Personality traits (Matrix P)

This Table describes regressors that are included in Matrix P. Self-esteem is a dummy variables which is 1 if the individual declares having self-esteem in her decision process. The same is for the *trust* variable (whether they trust in future or not). Impulsivity scores, desegregated, result from the BIS-11 questionnaire of Patton, Stanford and Barratt (1995).

Variables of matrix P	Observed condition		Frequency	%
		Overall sample	645	100
self-esteem	Dummy variables which is 1 if the individual declares having self-esteem in her decision process; 0, elsewhere.	Absence of self-esteem	549	85.12
		Presence of self-esteem	96	14.88
trust_future	Dummy variable which indicate when individual show trust in the future versus not	No trust in the future	100	15.5
		Trust in the future	545	84.5

		Obs	Mean	Std.Dev.	Min	Max
bisnpln	Normalized BIS score non-planning impulsiveness	645	0.25	0.04	0.15	0.36
bismotn	Normalized BIS score motor impulsiveness	645	0.19	0.03	0.11	0.34
biscogn	Normalized BIS score attentional impulsiveness	645	0.14	0.03	0.08	0.24

Table 6- Emotional activation (Vector E)

From the IGT-SCR experiment we obtain a measurement for emotional activation: it is the individual SCR shown before disadvantageous decks (A and B), after the trial period of the first twenty choices, according to traditional protocol of Bechara and Damasio (2002). The SCR is measured by the voltage drop between two electrodes placed on the skin surface of the individual running the experiment. Changes in SCR occur when the eccrine sweat glands, which are innervated by the sympathetic autonomic nervous system fibers, receive a signal from a certain part of the brain. Recording of SCR starts at least ten minutes before the beginning of the IGT, and continues throughout. Sample rate is set at 1 Hz.

Variable	Obs	Mean	Std. Dev.	Min	Max
SCR	641	0.178	0.167	0.006	1.333

Table 7- Multivariate analysis for the probability of holding VIPS

Table 7 offers estimations of a probit regression, reporting marginal effects, where the dependent variable is the probability that the interviewed hold a VIPS (VIPS dummy variable equal s to 1). Independent variables are those included in matrices/vector of equation [1]. Variables income-dol, debt-repayment and SCR are used in log. The *profession* variable is categorical; alternative categories are indicated by # and results refer to each category against (1), i.e., Employee, Pensioners. The Column dF/dx is for discrete change of dummy variables (#) from 0 to 1. Statistical significance at the 1, 5, and 10 percent levels is evidenced by ***, **, and *, respectively.

	Whole sample			Asset managers and financial advisors excluded		
	dF/dx	Std. Err.		dF/dx	Std. Err.	
Dependent variable: P(VIPS=1)						
agen	4.721	1.524	***	2.600	1.656	
agen^2	-0.0005	0.0002	***	-0.0003	0.0002	*
gender	0.037	0.055		0.031	0.068	
dependants	-0.009	0.047		-0.001	0.058	
education	-0.005	0.033		-0.003	0.038	
unemployed #	-0.042	0.123		-0.037	0.117	
entrepreneurs, managers,professionals #	0.056	0.067		0.076	0.070	
financial professionals #	0.165	0.064	**	-0.021	0.106	
stable-workcont	0.131	0.048	***	0.188	0.064	**
income-dol	-0.059	0.054		-0.015	0.061	
real-estate	0.014	0.020		0.006	0.024	
high-financ-knowledge	0.049	0.054		0.023	0.064	
profess-advise	0.098	0.054	*	0.132	0.059	*
use-financ-info	0.100	0.080		0.096	0.076	
saving-ratio	0.095	0.043	**	0.092	0.050	*
debt-repayment	0.009	0.007		0.005	0.008	
use-informal-debt	-0.118	0.058	**	-0.196	0.061	**
IC	0.080	0.018	***	0.078	0.022	***
self-esteem	0.098	0.046	**	0.064	0.059	
trust_future	0.042	0.062		0.044	0.067	
bisnpln	-1.685	0.675	**	-1.336	0.786	*
bismotn	-0.064	0.731		0.341	0.881	
biscogn	1.153	0.885		1.234	1.066	
SCR	-0.055	0.021	***	-0.074	0.026	***
Number of observation	641[1]			409[2]		
LR chi2(24)	135.39			91.55		
Prob > chi2	0.000			0.000		
Log likelihood	-376.385			-227.058		
Pseudo R2	0.1524			0.1678		

[1] Among 645 subjects, four individuals have been excluded because they never selected disadvantageous decks, condition that allows SCR computation.

[2] From 645 subjects we excluded 84 professional asset managers and 150 professional financial advisors. Among these 411 residual individuals, two subjects never selected disadvantageous decks and therefore excluded.

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