Investment goals and mental accounting in French retail clients

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Abstract

Mental accounting is a cognitive process that guides individuals' personal financial decisions (spending, investment, portfolio composition). Although it is well documented, the investigation of how individuals form and select mental accounts and how accounts evolve over time and result of environmental factors has not already been conducted. In this paper, we identify how an external force, i.e. the mandatory MiFID (Markets in Financial Instruments Directive) questionnaire and more precisely the question relative to retail clients' investment goals, may strengthen mental accounting. On a sample of more than 60,000 retail clients' questionnaire answers and banking records, we identify the determinants of the number of investment goals. Furthermore, we build a retail client typology according to their assessed financial goals. Then we show that real investment decisions of retail clients fit the mental goals of our typology. These results are controlled for both socio-demographic indicators and wealth and patrimony indicators.

Keywords : Budgeting, mental accounting, MiFID questionnaire, investment goals

JEL Classification : G11, G20, G41

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1 Introduction

Introduced by Thaler (1985), mental accounting is a set of cognitive operations used by individuals and households to organize, evaluate, and keep track of financial activities (Thaler, 1999). Mental accounting is an anomaly to traditional economic theory because it violates the economic principle of fungibility (Shefrin and Thaler, 1988, Thaler, 1990, 1999, Abeler and Marklein, 2017). Three components of mental accounting are defined (Thaler, 1999). The first component captures the ways outcomes are perceived and evaluated (Shefrin and Thaler, 1988, Shefrin and Statman, 2000, Rockenbach, 2004, Cheema and Soman, 2006, Helion and Gilovich, 2014 and Statman, 2014). The second component is funds categorization: individuals assign money to specific categories (or mental accounts). The third component focuses on choice bracketing/budgeting, i.e. mental accounts could be balanced narrowly or broadly, and the frequency of accounts evaluation. Therefore, mental accounting is a cognitive process that guides individuals' personal financial decisions such as spending and investment decisions and also portfolio composition (Alexander and Baptista, 2011, Baptista, 2012 and Alexander et al., 2017).

Although mental accounting is a well-documented phenomenon[1], the investigation of how individuals form and select mental accounts and how accounts evolve over time and result of environmental factors has not already been conducted. In this paper, we focus on mental accounting within the context of financial decision-making. We aim at identifying how some external forces may strengthen the categorization of funds. Specifically, the analysis of households' budgeting and investment decisions should be done *ex ante* by the study of their investment goals and financial needs. Indeed, investment goals aim to increase individuals' wealth level and impact their financial decisions. Therefore, an appropriate measure of investment goals is necessary for deepening individual's mental accounting process.

To offer a comprehensive picture of mental accounting, we combine MiFID (Markets in Financial Instruments Directive[2]) questionnaire answers of a large number of retail clients to their banking records. Specifically, in the MiFID questionnaire, retail clients have to select their financial goals in a list provided by the bank. In this study, we investigate whether assessing financial goals via MiFID helps reinforcing the effectiveness of earmarking by enhancing self-control for example, or if it has no significant effect. The impact of interventions to enhance savings has recently been explored by Soman and Cheema (2011). They found that visual reminder of the saving goal (a picture of the household's children) and segregating savings into sealed envelopes significantly increased the saving

[1] See Zhang and Sussman (2017) for an extensive literature on mental accounting.

[2] Implemented in 2007, MiFID I (2004/39/EC) gathers 31 member states of the European Economic area (28 European member states and 3 other states: Iceland, Norway and Liechtenstein). It replaces the Investment Services Directive (ISD) adopted in 1993. From January 2018, MiFID II (2014/65/UE) has been implemented and then replaces the actual directive, MiFID I (2004/39/EC) that we consider in our paper. This regulation aims at strengthening the transparency, the efficiency of financial markets but also the protection of investors. We have to precise that MiFID questionnaire is only imposed to the MiFID member states.

rate of participants.

Actually, MiFID requires investment service providers to collect detailed information on retail clients. This data collection intends investment service providers to offer advices and financial products suited to their clients' financial situation. The use of MiFID questionnaire answers provides an alternative approach and an original opportunity for analyzing mental accounting whereas other studies use lab experimental choices (Heath, 1995 and Soman, 2001).

Many academic studies have shown that setting saving goals is important in savings effectiveness (Hogarth and Anguelov, 2003 and Ülkümen and Cheema, 2011). Moreover, whether households have specific saving goals impact saving behavior (Fisher and Anong, 2012, Fisher and Montalto, 2010, Rha et al., 2006, Soman and Zhao, 2011, Wärneryd, 1989, Wärneryd, 1999 and Zhong and Xiao, 1995), particularly if they are hierarchically ordered (Canova et al., 2005, Devaney et al., 2007 and Xiao and Noring, 1994). Moreover, household characteristics such as age, family size, income, gender, race, education, health and risk tolerance have significant effects on saving behavior (Xiao and Anderson, 1997, Xiao and Fan, 2002 and Devaney et al., 2007).

In our paper, we show that the number of investment goals is determined by socio-demographic indicators, wealth and patrimony indicators and financial decisions of individuals. Looking at assessed financial goals of retail clients, we build a typology of clients regarding their mental goals. Finally, we show that retail clients' real investment decisions are consistent with their mental goals while controlling for socio-demographic indicators and wealth and patrimony indicators. Throughout this study, we include a variety of variables, some of which are defined as drivers of investment decision such as gender, age and income. Specific variables are also included, such as geographical variables (rarely studied) and matrimonial regime choice (never studied yet).

This paper is organized as follows. Section 2 documents the literature related to mental budgeting. Section 3 describes our data. Section 4 and Section 5 focus on our empirical results. Section 6 is dedicated to robustness checks. Section 7 concludes.

2 Related literature

A number of studies demonstrate that mental accounting influences individuals' wealth perception (Zhang and Sussman, 2017). Mental accounting is an important anomaly to traditional economic theories which was introduced by Thaler (1990). In his paper, Thaler gives a first example to illustrate mental accounting, taken from his own life, in which he shows that after a winning bet of \$300, according to the life cycle theory (Modigliani and Brumberg, 1954 and Friedman, 1957), he should have saved this amount for future consumption in the next years instead of using it in a restaurant or in another extra expense. Mental accounting is an anomaly to classical economic theory because all its components violate the economic principle of fungibility (Shefrin and Thaler, 1988, Thaler,

1990, 1999 and Abeler and Marklein, 2017). According to this principle, any increase of wealth, either from a regular salary, savings revenues or winning bets, should have no effect on subsequent expenditures behavior. However, in practice, these wealth increases are perceived and evaluated differently, then assigned to specific accounts or categories which could be balanced narrowly or broadly. In other words, mental accounting components are: outcomes perception and evaluation, categorization of funds and choice bracketing/budgeting. In this paper, we present the literature on mental accounting that is related to financial decision making and therefore exclude consumption spending decisions. Specifically, we present mental accounting components and examine how mental accounting influences budgeting, savings and investment decisions.

The first component of mental accounting is the way money is perceived and evaluated. According to Thaler (1999), money is labelled into three levels. The first level is devoted to expenditures that are allocated into budgets, such as housing, foods, etc. The second level corresponds to wealth which is allocated into accounts (checking, pension). The third level is represented by income that is divided into categories such as regular income or exceptional income.

As a second component of mental accounting, categorizing funds in mental accounts matters because it eases financial decision making and also affects how people choose to spend and save their money[3]. For example, mental accounting may explain why any salary increase is set aside for the future or why people primarily use loans to afford long-term and durable goods or why they choose illiquid saving accounts to limit the temptation to use it. By organizing information into groups based on commonalities, categorization can reduce the cognitive effort required to make decisions (Henderson and Peterson, 1992). There are two primary methods to categorize funds: categorizing the sources/origin and uses of funds and categorizing choices and outcomes involving funds.

In the first method, looking at the sources of funds, Shefrin and Thaler (1988) and Thaler (1990, 1994, 1999) document three categories: current income (e.g. cash on hand), current assets (e.g. savings or liquid asset accounts such as stock or mutual funds and home equity) and future income (e.g. retirement saving accounts). Inside these categories, the propensity to consume is different (higher for current income and lower for future income) and some sub-partitions also exist (e.g. "regular income" and "windfall" are sub-categories of current income). The impact of the nature of income on the nature of expenditure has been deeply studied in the literature (Courant et al., 1986, Shefrin and Thaler, 1988, Arkes et al., 1994, O'Curry, 1997, 1999, Thaler, 1999, O'Curry and Strahilevitz, 2001 and Milkman and Beshears, 2009). For example, it is well known that frivolous (serious) incomes are allocated to frivolous (serious) expenditures (O'Curry, 1997). More generally, people spend money on items that align with the source of the funds used. Another illustration is

[3]Soman and Ahn (2011) provide a review of mental accounting research in which the relationship between mental accounting and framing effects is documented. Frydman and Camerer (2016) review the psychology and neuroscience in the context of financial decision-making.

given for dividend payment by Shefrin and Statman (1984) who show that investors prefer dividend payment to cash payment.

The second method for categorizing funds is by grouping a set of choices or outcomes together. Grouping can take the form of bracketing (Read et al., 1999). Choice bracketing can be broad (grouping all expenses for a week end trip) or narrow (grouping expenses inside different categories like traveling, dining and housing expenses). Bracketing behavior also manifests in temporal bracketing i.e. based on the timing of funds use.

The third component of mental accounting is budgeting. Thaler (1985), Heath and Soll (1996) and Hastings and Shapiro (2013) document that household set budgets for various expenses (e.g. food budget or gas budget) and treat funds between the accounts tagged for each purpose as distinct and imperfectly substitutable. Budgeting[4] is defined as the process used to segregate and track the allocation and use of funds against different accounts with implicit or explicit spending limits or "budgets" (Galperti, 2016). Because mental accounting guides this process, budgeting leads individuals to set present and future funds against various accounts for facing their expenditures. Each budget is then allocated to a class of expenditures both for the short-term (e.g., prioritizing spending across different categories) and for the long-term (e.g., determining how much money to set aside for the future). Individuals track their investment against their budget (Heath, 1995) as if they were using a "household balance sheet". Perceptions of this balance sheet can influence how much people feel they can afford to spend and how they choose to finance purchases. According to Heath and Soll (1996), the tracking system is composed of two stages. First, expenditures should be noticed, i.e. booked. Then, they should be assigned to their proper accounts, i.e. posted and allocated according to their time use. Then, people may borrow in order to move consumption forward from the future to the present. However, empirical evidence of debt aversion seems to be explained by psychology more than by any trade-offs about interest rates (Field, 2009). To explain debt-averse behavior, Prelec and Loewenstein (1998) proposed a "double-entry" mental accounting model: first, people associate the consumption and payment of a good and, second engage in "prospective accounting" where they only enjoy consumption of what has already been paid. This model allows explaining a preference for payment in advance and therefore debt-aversion.

Mental accounting has many implications for the study of households' savings and investment decisions. Many of these come from the shared views of mental accounting and Prospect Theory (Kahneman and Tversky, 1979). According to Prospect Theory, outcomes (gains or losses) are

[4]Mental budgeting has been analyzed in various specific contexts. In marketing, Stilley et al. (2010) examine the relationship between budgeting, promotions and spending behaviour. Brida and Tokarchuk (2015) study mental budgeting regarding tourists' spending at a Christmas market in Merano (Italy). LaBarge and Stinson (2014) show that donors in the U.S. and Canada have mental budgets for philanthropy. Bao et al. (2015) introduce mental budgeting into travelers' route choice and show that travelers with low and moderate travel budget perceive a high cost than their actual cost on the high tolled roads.

evaluated relative to a reference point, people experience diminishing sensitivity to any gains or losses and exhibit loss aversion (losses loom larger than gains). Thaler (1980, 1985, 1999) argue that, because people experience diminishing sensitivity to gains and losses, they should prefer to segregate gains and integrate losses. Mental accounting and segregating funds benefit to our understanding of households financial choices. Segregating narrows the set of choices under consideration for use of allocated funds (Simon, 1947 and Read et al., 1999). Segregating also helps household to have a financial discipline and to manage self-control problems (Shefrin and Thaler, 1988). In this respect, mental accounting is of particular interest when (saving) accounts are physically separated in order to fit different saving goals.

According to Thaler (1999), the sources and uses of money are categorized both in real and mental accounting systems. The impact of the number of savings goals in separate envelopes on savings behavior has been documented by Soman and Cheema (2011). They show that when funds earmarked as savings are presented in two savings accounts the global savings amount is higher than when they are grouped in only one account[5]. Beyond the psychological cost that transfer between accounts implies, there are potential banking fees (Shefrin and Thaler, 1988) and multiple saving accounts may enhance long-term saving behaviors (Thaler, 1999).

Closed to these considerations, is the Behavioral Portfolio Theory (BPT) of Shefrin and Statman (2000) that assimilates investors' portfolio to a pyramid with multiple layers. Each layer, i.e. mental account, corresponds to a specific objective. The first layer of the pyramid concentrates risk-free investments, such as saving accounts, treasury bonds and monetary funds, for preserving wealth level. Conversely, the top of the pyramid is devoted to risky investments, such as foreign stocks, options, high risk securities, for becoming richer. Therefore, the BPT refers to under-diversified portfolios which are non-optimal unlike the predictions of Markowitz's theory.

However, mental accounting and segregating funds can also lead to sub-optimal behavior. For example, the time at which an account is opened or closed could be ambiguous (Thaler, 1999). Shefrin and Statman (1985) proposed a model in which an account is opened when an investment is made, and closed when the investment is sold. Then, as long as the investment is not entirely sold, the account remains opened. Under this theory, they show that with a natural reference point as being the nominal buying price of assets, a disposition effect is observed: "investors sell winners too early and ride losers too long". Riding losers too long is commonly observed because investors want to avoid the pain of experiencing a loss by selling the asset. Another way to avoid this pain is to "roll" mental accounts. For example, individual investors sell an initial asset at a loss (in one mental account) and use the money to buy a new asset, the two decisions being bracketed in the same mental account that remains opened (Frydman et al., 2018). Another example of sub-optimal

[5]De Giorgi (2011) documents the relationship between loss aversion and multiple investment goals.

behavior related to mental accounting is known as "house money accounting". This notion refers to the excessive risk-taking behavior that is observed after a loss (for gamblers for example) in order to return to the initial wealth level (Thaler, 1990). Finally, mental accounting drives sub-optimal diversification of individual investors' portfolios. Benartzi and Thaler (2001) have shown that different investments are treated in different mental accounts instead of being considered as a portfolio as a whole.

3 Data description

The data we use in this paper was provided by a large European commercial bank. It consists in MiFID questionnaire answers and banking records of a sample of 68,190 retail clients over the period 2007-2015. In this bank, retail clients answered the MiFID questionnaire at least once (and at most thrice) over the period 2007-2015. The questionnaire was administered for the first time to any retail client who subscribed to any financial product after 2007. A second questionnaire was then fulfilled three years after the first one. A third questionnaire was fulfilled after having subscribed to any financial product after the second one or three years after the second one. In this paper, the most recent MiFID questionnaire answers are used for retail clients having complemented it at least two times. Note that the questionnaire was set freely by the bank and was the same over 2007-2015. We observe that retail clients' answers are stable over time. Besides, for each MiFID question, the unreported answers rate decreases between two successive questionnaires. Therefore, taking the more recent questionnaire answers allows gathering much more retail clients' useful data.

The use of the MiFID questionnaire provides useful insights since retail clients' financial decision making is assessed within the bank in the presence of a financial adviser and not online through a survey participation (Crossley et al., 2017). According to Duffy et al. (2005), respondent fatigue leads to more noticeable consequences for online surveys. They argue that the absence of an interviewer does not encourage respondents to answer questions because respondents may often click down. However, a low response-rate may be mitigated by a high quality data obtained from online surveys (Evans and Mathur, 2005). Therefore, in the context of the MiFID questionnaire, retail clients may give relevant answers for getting well suited advices from their financial adviser.

For each retail client who held a current account within the bank, we match MiFID questionnaire answers at the questionnaire administration date which is the closest before the 07/31/2015 to the banking records (extracted on the 07/31/2015). Specifically, the MiFID questionnaire answers refer to retail clients' investment goals. As for the banking records, they refer both to socio-demographic indicators (Panel A) and to wealth and patrimony indicators (Panel B). Accounts of minors, i.e. those aged under 18 years old, are excluded like in Bauer et al. (2009) and Hoffmann et al. (2013, 2015).

3.1 Investment goals

The MiFID questionnaire of the bank is composed of six sections dealing with socio-demographic characteristics, income, patrimony, credit, saving capacity and investment goals respectively. In this questionnaire, we focus on the subsection dealing with the main investment goals. Specifically, the bank asks retail clients to indicate their main investment goals. Seven proposals are given: building a precautionary saving, preparing a real estate project, getting additional income, preparing retirement, appreciating capital, preparing patrimony transmission and no goal (Table 1). Retail clients have to choose at least one investment goal or none of them ("No goal").

Table 1 – Investment goals

Variables	**Definitions**
Saving	Dummy variable coded 1 if the client aims to build precautionary saving and 0 otherwise.
Real estate project	Dummy variable coded 1 if the client aims to prepare a real estate project and 0 otherwise.
Additional income	Dummy variable coded 1 if the client aims to get additional income and 0 otherwise.
Preparing retirement	Dummy variable coded 1 if the client aims to prepare his/her retirement and 0 otherwise.
Capital appreciation	Dummy variable coded 1 if the client aims to appreciate his/her capital and 0 otherwise.
Patrimony transmission	Dummy variable coded 1 if the client aims to prepare his/her patrimony transmission and 0 otherwise.
No goal	Dummy variable coded 1 if the client has no investment goal and 0 otherwise.
Nber of goals	Number of investment goals chosen by the client (from 0 to 6).

Table 1 defines investment goal choices extracted from the MiFID questionnaire answer of 68,190 retail clients.

Assessing investment goals allows retail clients to project themselves into the future. Indeed, the main investment goals of retail clients may impact the decision to invest in banking saving accounts (Sub-panel B1) and in financial products (Sub-panel B2). According to Xiao and Anderson (1997), we assimilate saving accounts to the lowest-level needs and financial products to the highest-level growth needs. Actually, financial goals and needs reflect psychological needs. For example, the willingness to invest in real estate derives from an emotional attachment when individuals becomes owners (Salzman and Zwinkels, 2017). In the same vein, saving for retirement reflects the need to reduce financial distress after retirement (Lee and Hanna, 2015).

However, setting investment goals is a cognitive process that should occur prior to the real financial decision-making. In the questionnaire answers, we cannot distinguish whether investment goals were assessed before or after investment decisions were made. Therefore, in this paper we only look at the consistency between real investment decisions and mental goal choices.

Table 2 displays descriptive statistics of investment goals. A large proportion of retail clients (58.41%) aims to build a precautionary saving. Covering unexpected costs, this "primary" investment goal represents a safety mattress which usually represents the first privileged investment of French retail clients according to the French national statistics bureau (INSEE)[6]. A second reported goal

[6]Information provided by INSEE at the beginning of 2015.

(about 23% of retail clients) is capital appreciation. Precautionary saving and capital appreciation aim to preserve and increase wealth level. They allow retail clients to face short-term and long-term expenditures. A third goal is preparing patrimony transmission which represents 16.59% of retail clients' goals. Patrimony transmission is a family preoccupation for the long-run. The remaining investment goals are preparing a real estate project (13%) and preparing retirement (12.62%). They are specific long-term investment goals. A low proportion of retail clients (6.36%) wishes to obtain additional income. Furthermore, we notice that retail clients have, on average, 1.30 investment goals and 18.49% of them declared they have no investment goal.

Table 2 – Descriptive statistics of investment goals

Variables	**%/$\overline{\mathbf{X}}$**	**std**	**min**	**max**
Saving	58.41%	-	-	-
Real estate project	13%	-	-	-
Additional income	6.36%	-	-	-
Preparing retirement	12.62%	-	-	-
Capital appreciation	22.96%	-	-	-
Patrimony transmission	16.59%	-	-	-
No goal	18.49%	-	-	-
Nber of goals	1.30	0.94	0	6
Retail clients (N=68,190)	100%	-	-	-

Table 4 displays descriptive statistics of investment goals. The first column reports variable names. The second column indicates the proportion (%) of retail clients for which the corresponding variable is coded 1 for binary variables and the mean ($\overline{\mathbf{X}}$) for continuous variables. The third, fourth and fifth columns report the standard deviation, the minimum and maximum values respectively.

3.2 Banking records

Table 3 presents banking records, i.e. socio-demographic indicators (Panel A) and wealth and patrimony indicators (Panel B).

In Panel A, aside to classical variables such as gender and age, "Native" and "Paris" give a fine insight in retail clients living place, which is rarely analyzed in the literature. Native-born retail clients ("Native") are distinguished from those who where born in foreign countries. Retail clients living in the biggest region ("Paris"), in terms of economic activity and size, are distinguished from those living in other regions. Complementing marital status, matrimonial regime is implemented for the first time in our study. Specifically, matrimonial regime choice allows structuring wealth allocation between spouses before the marriage and after its breakdown. Among the different matrimonial regimes[7], we pay particularly attention to the separation regime (also called "separation of prop-

[7] In France, two matrimonial regime categories exist. The first category refers to community regimes, i.e. regimes focusing on the notion of common goods. There are three community regimes: universal community of property regime (all goods acquired before and after the marriage are common within spouses), community of movables and acquets regime (except for real property, all goods are common within spouses) and community of property regime (only goods acquired after the marriage are common within spouses). The second category refers to the separation of property regime that we study in this paper. In Europe, community regime is the default regime in some countries (e.g. Belgium, France, Italy and Luxembourg) whereas separator regime is applied by default in other countries (e.g. England, Germany and Greece). In the US, the legal matrimonial regime is different from one state to another one.

erty regime"). As its name suggests, the separation regime implies that there is no joint-ownership between spouses. So, any increase or decrease of the wealth level of a spouse does not impact the wealth level of the other spouse. This financial independence is considered as a proxy of patrimony protection needs. At last, four socio-professional categories are distinguished. Retail clients may be self-employed, salaried, retired or exercise no professional activity.

Panel B presents wealth components such as income and credit[8]. Income refers to the net monthly income of retail clients. Credit corresponds to overall indebtedness including consumer and real estate credits. Two sub-panels are dedicated to study investment in savings accounts (Sub-panel B1) and in financial products (Sub-panel B2). Actually, like in Shefrin and Statman (2000), we argue that portfolio is designed as a "two-layered pyramid". The low layer aims to preserve wealth by investing in risk-free accounts (Sub-panel B1) and the high layer aims to become richer by investing in financial markets (Sub-panel B2). In this paper, Sub-panel B1 refers to regulated saving account, standard saving account, home saving account and life insurance. Sub-panel B2 refers to stocks, mutual funds, warrants, bonds, unit-linked life insurance products and retirement plans. In each sub-panel, investment diversification is measured by "Nber of saving accounts" and "Nber of financial products". We also document retail clients' portfolio value in Sub-panel B2.

[8]Due to a large number of missing banking data, the net monthly income and the credit amount have been extracted from the MiFID questionnaire answers. In the questionnaire, six net monthly income brackets (in euros) are reported: 0; lower than 1,500; between 1,500-3,000; between 3,000-5,000; between 5,000-10,000 and upper than 10,000. We compute their median values, i.e. 0; 750; 2,250; 4,000; 7,500 and 10,000 (the lower bound) respectively and use them in the analysis. The same process is applied for credit. Indeed, the questionnaire reports four credit amount brackets (in euros): 0, lower than 10,000; between 10,000-100,000 and upper than 100,000. We use their median values, i.e. 0; 5,000; 55,000 and 100,000 (the lower bound) respectively. Therefore, this approach allows to consider income and credit like continuous variables.

Table 3 – Banking records

Variables	Definitions
	Panel A: Socio – demographic indicators
Gender	Dummy variable coded 1 for male clients and 0 for female clients.
Age	Age of the clients as of the 07/31/2015 (in years).
Native	Dummy variable coded 1 if the client is native of the country and 0 otherwise.
Paris	Dummy variable coded 1 if the client lives in and close to the biggest town of the country and 0 otherwise.
Matrimonial	Dummy variable coded 1 if the client is subjected to the separation of property legal regime and 0 otherwise.
Self-employed	Dummy variable coded 1 if the client directly perceives his/her income from his/her own professional activity and 0 otherwise.
Salaried	Dummy variable coded 1 if the client has a wage or salary from an employer and 0 otherwise.
Retired	Dummy variable coded 1 if the client is retired and 0 otherwise.
No occupation	Dummy variable coded 1 if the client has no occupation (e.g. students and those having no professional activity) and 0 otherwise.
	Panel B: Wealth and patrimony indicators
Income	Net monthly income (in euros).
Credit	Credit amount remaining to be reimbursed (in euros).
	Sub-panel B1: Savings accounts
Regulated saving account	Dummy variable coded 1 if the client holds regulated saving accounts and 0 otherwise.
Standard saving account	Dummy variable coded 1 if the client holds standard saving accounts and 0 otherwise.
Home saving account	Dummy variable coded 1 if the client holds home saving accounts and 0 otherwise.
Life insurance	Dummy variable coded 1 if the client holds life insurance saving accounts and 0 otherwise.
Nber of saving accounts	Number of saving accounts held by the client as of the 07/31/2015 (from 0 to 7).
	Sub-panel B2: Financial products
Stocks	Dummy variable coded 1 if the client holds stocks and 0 otherwise.
Funds	Dummy variable coded 1 if the client holds mutual funds and 0 otherwise.
Warrants	Dummy variable coded 1 if the client holds warrants and 0 otherwise.
Bonds	Dummy variable coded 1 if the client holds bonds and 0 otherwise.
UL life insurance products	Dummy variable coded 1 if the client holds unit-linked life insurance products and 0 otherwise.
Retirement	Dummy variable coded 1 if the client holds retirement plans and 0 otherwise.
Nber of financial products	Number of different kind of financial products held by the client as of the 07/31/2015 (from 0 to 6).
Portfolio value	Value of the investment assets of the client as of the 07/31/2015 (in euros).

Table 3 defines banking records variables of 68,190 retail clients.

Table 4 displays the descriptive statistics of banking records. In Panel A, we first shed light the presence of gender parity. Men represent 50.82% of the sample whereas this percentage is around 80% in European studies, like in France (Boolell-Gunesh et al., 2009), Belgium (Bellofatto et al., 2014), Germany (Weber and Welfens, 2007), the Netherlands (Bauer et al., 2009), the UK (Richards et al., 2017), Italy (Guiso and Jappelli, 2005) and Finland (Grinblatt and Keloharju, 2009)[9] and in

[9]Grinblatt and Keloharju (2009) study a specific sample containing only men enlisted into mandatory military service.

the US studies (Barber and Odean, 2001), the only exception being China with about 50% of men (Feng and Seasholes, 2008). The average retail client is 49 years old. 85.50% of retail clients are French native-born and 12.31% of them live in the Parisian region. Looking at matrimonial regime choice, about 11% of retail clients are married under the separation of property regime. As for professional categories, the sample is mainly composed of salaried (55.57%). By comparing our data on these socio-demographic variables with INSEE data, we find that our sample is representative of the whole French population.

Similarly, the representativeness of the sample is confirmed with regard to income and credit amounts (Panel B). In our sample, the net monthly income and the credit amount remaining to reimburse are, on average, about 2,521€ and 30,029€ respectively[10].

Analyzing Sub-panels B1 and B2, we define a classification criterion and argue that retail clients' perception differs between savings accounts and financial products.

Sub-panel B1 refers to four usual types of savings accounts. First, regulated saving accounts are deposit accounts which are free of French income tax and social charges. They are limited to a maximum value (M) and pay a low interest rate (i) which is about 1%[11]. Second, standard saving accounts charge fees of French income tax and social charges and they pay interest rates that are freely determined by banks[12]. They precisely refer to taxed booklets, term deposit and popular saving plans[13]. Third, home saving accounts are interest-earning bank accounts giving access to a subsidized mortgage. In France, there are two types of home saving accounts: *Compte Epargne Logement* (*CEL*) and *Plan Epargne Logement* (*PEL*). They slightly differ regarding down payment, ceiling, remuneration rate and payment frequency. Life insurance accounts represent the fourth type of savings accounts. They primarily allow clients to set aside and invest money for retirement or other long-term financial projects. They also pay in case of death before the end of the policy term. Two types of life insurance contracts exist: products in euros (Sub-panel B1) and unit-linked products (Sub-panel B2). Products in euros do not generate any capital risk[14] whereas unit-linked products do since these latter are investment vehicles allowing retail clients to invest in different asset classes like stocks, bonds or funds. In France, life insurance mainly refers to life insurance for savings, i.e. products in euros. They offer a return that is generally higher than bank savings schemes and the right to make withdrawals during the life of the policy. Furthermore, they are an

[10] According to INSEE, the net monthly income is about 2,225€ (in 2014). As for the credit amount, if we only consider indebted retail clients, the credit amount remaining to reimburse is, on average, 58,194€. This amount is close to that communicated by INSEE, i.e. 61,900€ (in 2010).

[11] In France, regulated saving accounts are for example *Livret A* (M= 22,950€ and i= 0.75%), *Livret Bleu* (M= 22,950€ and i= 0.75%), *Livret de Développement Durable* or *LDD* (M= 12,000€ and i= 0.75%), *Livret d'Epargne Populaire* (M= 7,700€ and i=1.25%) and *Livret Jeunes* (M=1,600€ and i= 1.75%).

[12] There is no ceiling in such accounts.

[13] Since 2003, it is not possible to open a popular saving plan (*Plan Epargne Populaire* in French). Individuals who opened this account before 2003 can continue to feed it.

[14] Return is based on the government bonds that the insurer actually purchases when they invest clients money.

excellent tool promoting patrimony transmission due to their fiscal advantages, e.g. exemption from inheritance tax. On average, retail clients hold 1.34 different savings accounts. Looking at empirical frequencies[15], the first saving accounts are regulated saving accounts (58.73%), then life insurance (35.38%), followed by home saving accounts (23.44%) and standard saving accounts (13.03%).

Sub-panel B2 refers to six risky financial products. We first point out that financial market participation rate is low since the number of different kind of risky financial products is, on average, lower than one (0.34). Focusing on empirical frequencies, the more diversified products like unit-linked life insurance products (17.13%) and mutual funds (9.52%) concentrate a larger number of retail clients. Besides, stocks (5.41%), retirement plans (1.45%), bonds (0.73%) and warrants (0.18%) show low rates. We note that financial market participation is mainly indirect through insurance companies and mutual funds.

[15]In Sub-panel B1, we only know whether savings accounts were held by retail clients. The amount invested in savings accounts is not available unlike Sub-panel B2.

Table 4 – Descriptive statistics of banking records

Variables	%/$\overline{X}$	std	min	max
Panel A : Socio-demographic indicators				
Gender	50.82%	-	-	-
Age	49.14	17.55	18	105
Native	85.50%	-	-	-
Paris	12.31%	-	-	-
Matrimonial	10.90%	-	-	-
Self-employed	12.76%	-	-	-
Salaried	55.57%	-	-	-
Retired	16.93%	-	-	-
No occupation	14.74%	-	-	-
Panel B : Wealth and patrimony indicators				
Income	2,520.66	2,225.25	0	10,000
Credit	30,029.48	39,437.44	0	100,000
Sub-panel B1 : Savings accounts				
Regulated saving account	58.73%	-	-	-
Standard saving account	13.03%	-	-	-
Home saving account	23.44%	-	-	-
Life insurance	35.38%	-	-	-
Nber of saving accounts	1.34	1.19	0	6
Sub-panel B2 : Financial products				
Stocks	5.41%	-	-	-
Funds	9.52%	-	-	-
Warrants	0.18%	-	-	-
Bonds	0.73%	-	-	-
Unit-linked products	17.13%	-	-	-
Retirement	1.45%	-	-	-
Nber of financial products	0.34	0.70	0	5
Portfolio value	58,414.83	1.01e+07	0	2.60e+09
Retail clients (N=68,190)	100%	-	-	-

Table 4 displays descriptive statistics of banking record variables. The first column reports variable names. The second column indicates the proportion (%) of retail clients for which the corresponding variable is coded 1 for binary variables and the mean ($\overline{X}$) for continuous variables. The third, fourth and fifth columns reports the standard deviation, the minimum and maximum values respectively. Note that "Income" and "Credit" are the only variables extracted from the MiFID questionnaire answers due to a large number of missing banking records (see footnote 8 for further information).

4 Univariate analysis

In Section 4, we derive a typology of retail clients based on their investment goal choices and in order to understand their real investment decisions. Section 4.1 presents the retail client typology design. Section 4.2 gives descriptive statistics. Section 4.3 focuses on the relationship between the number of investment goals and income.

4.1 Retail client typology

We create the retail client typology according to their investment goals from the Multiple Correspondence Analysis[16], labelled MCA henceforth, (Husson and Josse, 2014). This multivariate descriptive method allows detecting associations among a set of nominal variables. The interpretation of MCA is based on proximities between points in a low-dimensional map[17]. In the MCA, investment goals are projected on the map together with "natural" variables used in sociology (Chapoulie, 1969), i.e. gender and age, as supplementary (or passive) variables. Likewise, "No goal" is considered as a supplementary variable since it is naturally opposed to the other investment goals. Supplementary variables do not impact the MCA solution, i.e. the main investment goals position, and their modalities appear on the map. Since MCA is based on nominal variables, we "categorize" the variable "Age" by creating the following age brackets: (1) aged between [18-30]; (2) aged between [31-59] and (3) aged over 60 years. The proportions of retail clients belonging to these age brackets are 15.81%, 54.86% and 29.33% respectively.

Figure 1 reports the MCA results from which we derive a retail client typology composed of four groups. First, we notice that the saving goal (close to the origin) forms a pattern of its own. Therefore, we create the first group (G1) which gathers retail clients who aim to preserve their wealth level. Second, we observe that capital appreciation, additional income and patrimony transmission are clustered together (on the right side). Consequently, we create a second group (G2) for retail clients who aim to increase their wealth level. Third, preparing a real estate project and preparing retirement are clustered together (on the top). As a result, we create a third group (G3) which gathers retail clients who aim to realize specific long-term investments. At last, the fourth group (G4) is devoted to retail clients having no investment goal[18]. Looking at socio-demographic variables, we notice that male retail clients seem to be more attracted by specific long-term investments than their female counterparts. The same pattern is observed for middle-aged clients. The propensity to save seems to be higher among young clients (aged between 18-30 years) than the other age categories.

From that typology, we can hypothesize that there is a cycle of investment goal choices. Indeed, retail clients are first more likely to save for preserving their wealth and facing any unexpected events like financial crisis (G1). Then, they seek to accumulate their wealth (G2) for focusing on specific long-term investments suited to their needs (G3).

[16] In the MCA, we mainly focus on the graphical representation for determining similarities within retail clients. For further analysis, see Greenacre and Blasius (2006) and Le Roux and Rouanet (2010).

[17] Generally, two or three dimensions are interpreted.

[18] "No goal" is, as expected, opposed to the other investment goals.

Figure 1 – MCA results

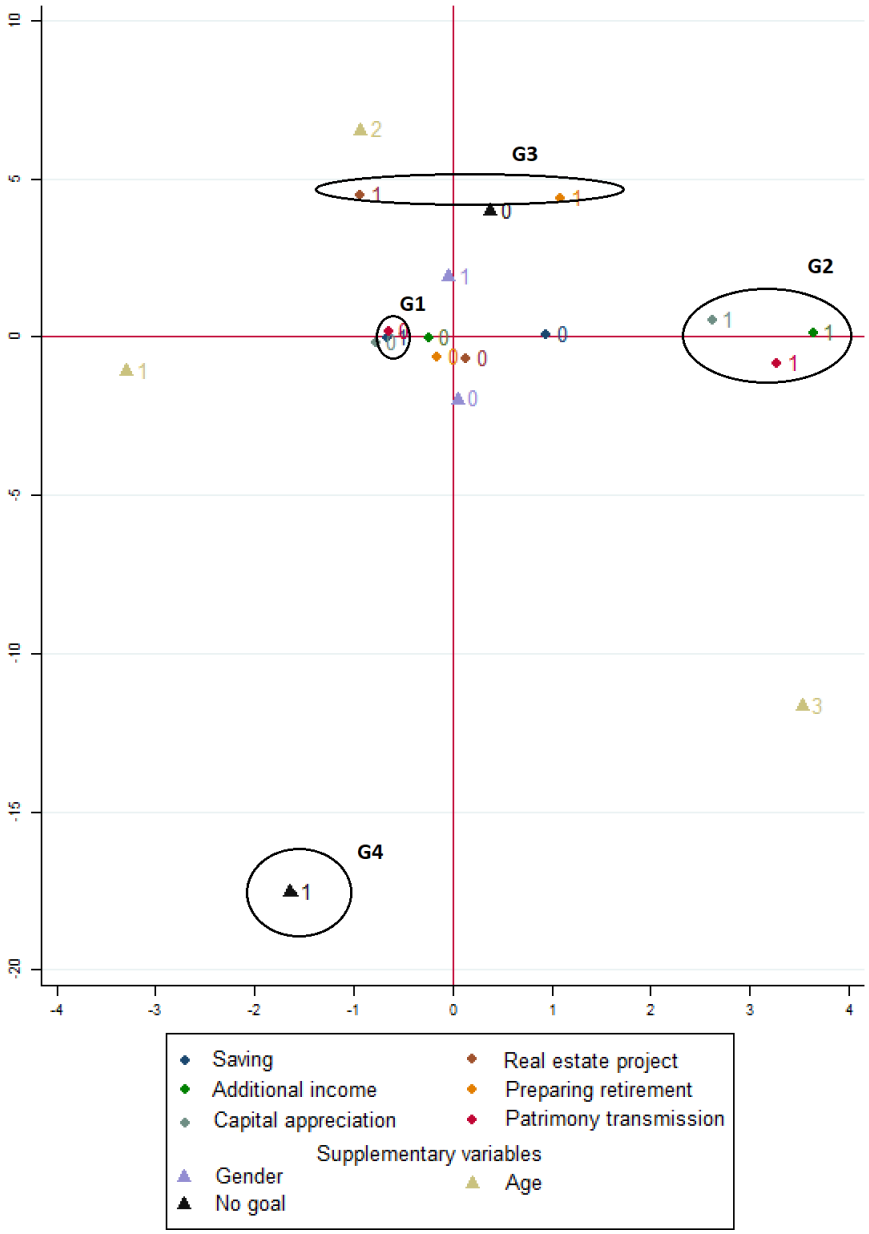

Figure 1 presents the MCA results from which we highlight a retail client typology. Four groups are identified regarding their common characteristics: G1 (wealth preservation), G2 (wealth accumulation), G3 (specific long-term investments) and G4 (no goal), which is a supplementary variables so are the natural variables "Gender" and "Age". Gender is coded 1 for males and 0 for females. As for age, three age brackets are used: [18-30] coded 1, [31-59] coded 2 and over 60 years coded 3.

The typology groups are also in line with the literature dealing with funds categorization into accounts (Shefrin and Thaler, 1988, Thaler, 1990, 1999). Described by Shefrin and Thaler (1988), the categories "current wealth" and "future income" allow to study retail clients' investment goal choices. We assimilate the "current wealth" category to G1 and to G2. The "future income" category is assimilated to G3. Likewise, we argue that the temptation to spend money for facing expenditures is higher in G1 than in G3. Furthermore, these groups are consistent with the Behavioral Portfolio Theory (Shefrin and Statman, 2000). Indeed, these authors assimilate investors' portfolio to a pyramid with multiple layers. The first layer contains risk-free investments (e.g. savings accounts)

for maintaining wealth level whereas the top of the pyramid refers to risky investments (e.g. foreign stocks or options) for becoming richer.

4.2 Retail client typology's descriptive statistics

Based on assessed investment goals, we match retail clients to the typology groups. Retail clients with multiple investment goals may be affected to different typology groups. For example, a retail client who aims to build a precautionary saving and prepare his/her patrimony transmission belongs both to G1 and to G2.

Our retail clients are distributed in the typology groups according to the following proportions: G1 (wealth preservation) corresponds to 58.41% of the sample, G2 (wealth accumulation) to 34.91%, G3 (specific long-term investments) to 23.45% and G4 (no goal) to 18.49% of the sample. We also observe that retail clients differ depending on the number of investment goals they chose. 45.77% of retail clients have a single investment goal and one quarter of retail clients chose two investment goals. We note that saving is mostly represented in pairwise combinations (31.48%). Only 10.15% of the sample has three or more investment goals. A low proportion of the sample has more than two investment goals. We do not interpret these investment goal combinations since none of them are chosen by more than 3% of the whole sample[19]. Likewise, in Lee and Hanna (2015), the number of goals chosen by respondents significantly decreases from three investment goals. This result is not surprising because of the high number of investment goals in the questionnaire. Tversky (1964), Sidick et al. (1994), Rodriguez (2005) and Schneid et al. (2014) argue that three-option items are optimal for multiple-choice type tests. Moreover, Erez et al. (1990) show that individuals with multiple goals can usually only exceed in one goal due to the limitations of cognitive abilities.

4.3 Investment goals and income

A particular analysis is dedicated to retail clients who reported to have no investment goal in the MiFID questionnaire (G4). Actually, the lack of investment goal can find two explanations. First, retail clients may really have no investment goal because they do not care about future financial planning. We classify these retail clients into the sub-group G4-1. Second, retail clients may not report their investment goal choices for preserving discretion towards their bank. These clients belong to the sub-group G4-2.

In order to empirically discriminate these two sub-groups, we focus on retail clients' income regarding the number of investment goals. Table 5 shows the results for all goal numbers.

[19] As an illustration, we report hereafter the two highest number of retail clients having chosen three investment goals. 2.29% of retail clients aim to save, appreciate their capital and prepare their patrimony transmission. 1.14% of them aim to save, appreciate their capital and prepare their retirement.

Table 5 – Income analysis regarding the number of goals

Nber of goals	Average income amount	%
0	1,999.13	18.49%
1	2,354.11	45.77%
2	2,845.28	25.29%
3	3,283.92	8.56%
4	3,857.80	1.60%
5	3,940.91	0.24%
6	3,342.86	0.05%
Retail clients (N=68,190)		**100%**

Table 5 displays descriptive statistics on retail clients' income. The first column reports the number of investment goals. For each number of goals, the second and third columns report the average net monthly income (in euros) and the percentage of retail clients respectively.

First of all, we point out that, on average, retail clients' net monthly income increases with the number of investment goal choices (except for the lowest proportion of retail clients who checked all goals). Consequently, retail clients' savings abilities become higher as their income level increases. This interpretation is in line with those of Chang (1994), Dynan et al. (2004), Rha et al. (2006) and Yuh and Hanna (2010). Therefore, to distinguish G4-1 and G4-2, we focus on the average income amount of retail clients with single goal, i.e. 2,354.11€. We assume this amount as a threshold beyond which retail clients have a single non-reported investment goal. As a consequence, among G4, 18.27% of retail clients are classified into the sub-group G4-2. Conversely, 81.73% of them belong to G4-1, i.e. true no goal retail clients. This distinction is particularly interesting to study since we are able to identify variables responsible for the unwillingness to communicate investment goals. We expect that retail clients belonging to G4-2 share similar characteristics than those having checked at least one investment goal (G1, G2 and G3).

5 Multivariate analysis

In Section 5, we analyze retail clients' real investment decisions and their mental goals. In this section, mental goals correspond to each of the four typology groups that we identified in Section 4. Section 5.1 focuses on the determinants of the number of investment goals. Section 5.2 assesses the consistency between real investment decisions and mental accounts of retail clients.

5.1 The determinants of the number of investment goals

In this sub-section, we investigate the determinants of the number of investment goals. The impact of the number of goals on savings behaviour has been documented by Soman and Zhao (2011). These authors demonstrate that individuals with a single savings goal have a stronger savings intention than those with multiple savings goals due to trade-offs among competitive goals. Furthermore, they demonstrate that this effect is attenuated when a single goal is easily implemented or when multiple

goals (competitive ones) are integrated. We complement these findings by studying the determinants of the number of investment goals while controlling for both socio-demographic indicators and wealth and patrimony indicators. In our work, the dependent variable "Nber of goals" is retreated to take into account G4-2 retail clients. Indeed, we assume that G4-2 retail clients have one investment goal (see Section 4.3). We first check the presence of possible correlation problems[20]. Then, we do not analyze warrants, bonds and retirements plans any further due to their low empirical frequencies (Table 4).

Table 6 presents regression results. Except for gender, all independent variables influence significantly the number of investment goals chosen by retail clients[21].

In Panel A, we notice that the number of goals increases with age. The impact of age on savings has been documented in the literature although findings are not clear cut. Yuh and Hanna (2010) find that young households are more likely to save than their older counterparts whereas Mirer (1979) and Chang (1994) find that saving increases with age. We point out that the impact of age on the number of saving goals and on the amount of savings could be different. Accordingly, it is not surprising that people have more saving goals when they get older. Interestingly, native-born retail clients and those opting for the separation regime are more likely to choose multiple investment goals, the reverse pattern being observed for retail clients living in the capital region. We argue that the high cost of living may restrict the number of investment goals of these individuals. As for professional categories, the number of investment goals is higher among self-employed and salaried whereas it is lower for retired (compared to those exercising no professional activity). In a similar vein, Yuh and Hanna (2010) show that the propensity to save is higher among self-employed households than in other professional categories and is lower among retired households than in non-retired ones.

In Panel B, the number of investment goals increases with income and credit. The impact of income is particularly strong whereas, for credit, it is much lower since indebtedness situation limits the diversification of investment goal choices. At last, the number of goals is higher among retail clients holding savings accounts and/or financial products. We point out that, coefficients of both sub–panels are greater than those of other variables. Therefore, real investment decisions have a strong impact on investment goal diversification, which is consistent with mental accounting.

[20]The variables "Nber of saving accounts" and "Nber of financial products" are excluded since they are highly correlated with the savings accounts and financial products respectively (Pearson correlation coefficient being larger than 0.50). The typology groups are not included as they are obviously correlated with the number of investment goals. We also test the presence of multicollinearity problem by using two methods. First, the condition index (or BKW indicator) of Belsley et al. (1980) is 18.77. Since it is below the critical threshold of 30, we conclude we do not face such problem. We also respect the critical threshold of 20 suggested by Erkel-Rousse (1995). The strength of this method has been demonstrated by De Bourmont (2012). Second, we compute the Variance Inflation Factor (or VIF). According to Chatterjee et al. (2000), a VIF larger than 10 and/or a mean VIF larger than or equal to 2 denote the presence of multicollinearity problem. Satisfying both conditions (the largest VIF is 3.07 and the mean VIF is 1.66), we anew do not face multicollinearity problem.

[21]Note that we get similar results without retreating "Nber of goals" except for "Gender" which is significant at 5% and "Matrimonial" which is no longer significant. Variable signs remain unchanged.

Table 6 – The determinants of the number of investment goals

	coef.	**std**
Dependent variable		
Nber of goals		
Independent variables		
Panel A: Socio-demographic indicators		
Gender	-0.0020	0.0065
Age	0.0010***	0.0003
Native	0.1011****	0.0093
Paris	-0.0226**	0.0099
Matrimonial	0.0324***	0.0105
Self-employed	0.0622***	0.0138
Salaried	0.0396***	0.0108
Retired	-0.0449***	0.0148
No occupation	(omitted)	
.....		
Panel B: Wealth and patrimony indicators		
ln(Income)	0.0714***	0.0020
ln(Credit)	0.0081***	0.0007
Sub-panel B1: Savings accounts		
Regulated saving account	0.1068***	0.0069
Standard saving account	0.0942***	0.0100
Home saving account	0.2449***	0.0081
Life insurance	0.3850***	0.0085
Sub-panel B2: Financial products		
Stocks	0.0611***	0.0154
Funds	0.1545***	0.0123
UL life insurance products	0.1463***	0.0101
_cons	0.3125***	0.0169
N	68,190	
F test	861.85	
Prob>F	0.0000	
R^2	0.1769	
Adjusted R^2	0.1767	

Table 6 displays OLS results that aim to identify the determinants of the number of investment goals. Note that the dependent variable takes into account G4-2 retail clients, i.e. those who did not report their investment goals, by assuming they have one investment goal. The first column reports variable names. The second and third columns display coefficients and standard deviations of the corresponding variables respectively. The variable "No occupation" is the reference category among professional categories. Statistical significance levels are fixed at 1%, 5% and 10% that are represented by ***, ** and * respectively.

5.2 Investment decisions and mental accounts

In this sub-section, we aim to verify the consistency between retail clients' real investment decisions and their mental accounts (i.e. G1 to G4) while controlling for socio-demographic indicators and wealth and patrimony indicators.

We separately analyze typology groups (G1, G2, G3 and G4)[22], savings accounts (Sub-panel B1) and financial products (Sub-panel B2). In Sub-panel B1, we group regulated and standard savings accounts together in the variable "Classical saving account". This grouping is justified by temporal bracketing (Thaler and Johnson, 1990): outcomes that are temporally proximate are more likely to be affected into the same mental accounts[23]. In Sub-panel B2, we exclude warrants, bonds and retirement plans due to their low detention rates (Table 4).

Accordingly, we perform binary logistic regressions (BLR) to assess retail clients' real investment decisions and pay particularly attention whether or not these decisions fit with the mental accounts[24]. Average marginal effects (AMEs) are used for interpreting the magnitude effects.

Table 7 presents the results corresponding to savings accounts and Table 8 presents those corresponding to financial products.

Looking first at our typology groups, we emphasize all coefficients are statistically significant at all reasonable significance levels and concentrate the highest AMEs. First, G1 retail clients are more likely to hold saving accounts than financial products, which is not surprising. Specifically, the probability of holding classical saving accounts (10.76%) is higher than those of home (7.66%) and life insurance (2.24%) saving accounts. G2 retail clients are more likely to invest both in saving accounts and in financial products. We notice that the AME is particularly higher in life insurance holding (26.73%) than in classical (12.64%) and home saving (14.65%) accounts. This result is consistent with G2 retail clients' goals since increasing wealth could better be reached with life insurance. They also exhibit a greater preference for diversified products such as mutual funds (10.78%) and unit-linked life insurance products (16.26%). The same pattern is observed for G3 retail clients who exhibit a high propensity to invest in home saving (11.44%) and in life insurance (14.71%) accounts. Both accounts fit these retail clients' specific goals, i.e. preparing a real estate project (reached by home saving account investment) and/or retirement (reached by life insurance investment). Besides, looking at financial product holding, we notice that AMEs of G3 are lower than those of G2. We argue that investing in financial markets is better suited to retail clients wishing to accumulate further wealth than to those with long-term specific goals. As for G4 retail clients, AMEs are unsurprisingly negative and the lowest in all models illustrating thus the absence of future financial planning. Indeed, they are specifically stronger and consistent for saving accounts since these latter are assimilated to the lowest-level needs (Xiao and Anderson, 1997). Overall, we demonstrate that retail clients' investment decisions fit their mental goals.

[22] Typology groups are separately analyzed since retail clients with multiple goals may belong to several groups.

[23] As opposed to narrow bracketing which promotes the separation of mental accounts. Moreover, grouping regulated and standard saving accounts together leads to a decrease of the log likelihood of the estimation.

[24] The presence of multicollinearity problem is tested. Analyzing the whole BLR, we find that the maximum value taken by the condition index (Belsley et al., 1980) is 18.60. Being below the critical threshold and satisfying VIF criteria (the largest VIF is 3.03 and the largest mean VIF is 1.61), we conclude we do not face multicollinearity problem.

Table 7 – Saving account investment decisions

	Classical saving accounts				Home saving accounts				Life insurance			
G1	0.1076***				0,0766***				0,0224***			
	(0.0037)				(0,0034)				(0.0036)			
G2		0.1264***				0.1465***				0.2673***		
		(0.0041)				(0.0034)				(0.0028)		
G3			0.0964***				0.1144***				0.1471***	
			(0.0045)				(0.0036)				(0.0039)	
G4				-0.1709***				-0.1941***				-0.2794***
				(0.0044)				(0.0053)				(0.0053)
Gender	0.0004	-0.0034	-0.0035	-0.0007	0.0014	-0.0017	-0.0019	0.0011	0.0003	-0.0015	-0.0014	0.0025
	(0.0037)	(0.0037)	(0.0037)	(0.0037)	(0.0033)	(0.0033)	(0.0033)	(0.0033)	(0.0036)	(0.0034)	(0.0035)	(0.0035)
Age	0.0038***	0.0022***	0.0034***	0.0031***	0.0016***	-0.0002	0.0015***	0.0011***	0.0084***	0.0055***	0.0086***	0.0081***
	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Native	0.0750***	0.0643***	0.0723***	0.0651***	0.0656***	0.0509***	0.0616***	0.0561***	0.0737***	0.0450***	0.0691***	0.0609***
	(0.0052)	(0.0052)	(0.0052)	(0.0052)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0051)	(0.0048)	(0.0051)	(0.0050)
Paris	0.0076	-0.0029	-0.0044	0.0025	0.0411***	0.0318***	0.0299***	0.0380***	0.0519***	0.0441***	0.0436***	0.0555***
	(0.0057)	(0.0057)	(0.0057)	(0.0056)	(0.0049)	(0.0048)	(0.0048)	(0.0048)	(0.0053)	(0.0050)	(0.0053)	(0.0052)
Matrimonial	-0.0384***	-0.0549***	-0.0475***	-0.0450***	-0.0074	-0.0227***	-0.0141***	-0.0115**	0.0116**	-0.0074	0.0095*	0.0133**
	(0.0059)	(0.0059)	(0.0059)	(0.0059)	(0.0054)	(0.0053)	(0.0054)	(0.0053)	(0.0055)	(0.0052)	(0.0054)	(0.0054)
Self-employed	-0.1210***	-0.1339***	-0.1360***	-0.1262***	-0.0251***	-0.0340***	-0.0374***	-0.0272***	-0.0013	-0.0072	-0.0100*	0.0031
	(0.0056)	(0.0055)	(0.0056)	(0.0055)	(0.0053)	(0.0052)	(0.0053)	(0.0052)	(0.0054)	(0.0051)	(0.0054)	(0.0053)
Retired	-0.0192***	-0.0264***	-0.0023	-0.0186***	-0.0347***	-0.0408***	-0.0125**	-0.0340***	-0.0306***	-0.0404***	-0.0048	-0.0286***
	(0.0070)	(0.0070)	(0.0070)	(0.0070)	(0.0058)	(0.0058)	(0.0059)	(0.0058)	(0.0060)	(0.0058)	(0.0060)	(0.0059)
No occupation	-0.0141**	-0.0281***	-0.0129**	-0.0163***	-0.0055	-0.0186***	0.0016	-0.0060	-0.0035	-0.0207***	0.0089	0.0000
	(0.0061)	(0.0061)	(0.0061)	(0.0061)	(0.0055)	(0.0054)	(0.0055)	(0.0054)	(0.0061)	(0.0058)	(0.0061)	(0.0060)
Salaried	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
ln(Income)	0.0099***	0.0083***	0.0087***	0.0064***	0.0081***	0.0048***	0.0055***	0.0042***	0.0111***	0.0019***	0.0071***	0.0045***
	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0010)	(0.0010)	(0.0011)	(0.0012)	(0.0011)	(0.0012)	(0.0012)
ln(Credit)	-0.0030***	-0.0025***	-0.0026***	-0.0029***	-0.0060***	-0.0056***	-0.0058***	-0.0059***	-0.0032***	-0.0030***	-0.0033***	-0.0034***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0003)	(0.0004)	(0.0003)
N	68,190	68,190	68,190	68,190	68,190	68,190	68,190	68,190	68,190	68,190	68,190	68,190
LR Chi2	2,902.35	2,991.88	2,543.27	3,466.86	1,258.81	2,497.70	1,671.16	2,335.53	7,553.60	13,686.50	8,819.02	10,599.85
Prob>chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pseudo-R2	0.0320	0.0330	0.0281	0.0383	0.0170	0.0336	0.0225	0.0315	0.0852	0.1544	0.0995	0.1196
Log likelihood	-43,852.74	-43,807.98	-44,032.28	-43,570.48	-36,500.62	-35,881.18	-36,294.44	-35,962.26	-40,530.46	-37,464.01	-39,897.75	-39,007.33

Table 7 reports the results of BLR wherein the dependent variables are saving account investment decisions of 68,190 retail clients as of the 07/31/2015. The Average Marginal Effects (AMEs) are reported for each independent variable. Standard deviations are given in parentheses. The variable "Salaried" represents the reference category among professional categories. Statistical significance levels are fixed at 1%, 5% and 10% that are denoted by ***, ** and * respectively.

Table 8 – Financial product investment decisions

	Stocks				Funds				UL life insurance products			
G1	-0.0241***				-0.0225***				-0.0058**			
	(0.0018)				(0.0022)				(0.0029)			
G2		0.0576***				0.1078***				0.1626***		
		(0.0020)				(0.0025)				(0.0028)		
G3			0.0136***				0.0393***				0.0923***	
			(0.0021)				(0.0026)				(0.0032)	
G4				-0.0416***				-0.0930***				-0.1716***
				(0.0031)				(0.0043)				(0.0053)
Gender	0.0188***	0.0197***	0.0192***	0.0197***	0.0057**	0.0066***	0.0061***	0.0072***	0.0165***	0.0162***	0.0160***	0.0182***
	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0023)	(0.0022)	(0.0023)	(0.0023)	(0.0029)	(0.0028)	(0.0029)	(0.0029)
Age	0.0024***	0.0020***	0.0026***	0.0025***	0.0036***	0.0027***	0.0039***	0.0037***	0.0040***	0.0024***	0.0043***	0.0040***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Native	0.0297***	0.0250***	0.0299***	0.0287***	0.0426***	0.0330***	0.0423***	0.0398***	0.0448***	0.0285***	0.0424***	0.0382***
	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0036)	(0.0035)	(0.0036)	(0.0036)	(0.0044)	(0.0042)	(0.0043)	(0.0043)
Paris	0.0325***	0.0354***	0.0338***	0.0355***	0.0249***	0.0275***	0.0253***	0.0290***	0.0173***	0.0156***	0.0138***	0.0211***
	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0043)	(0.0042)	(0.0043)	(0.0043)
Matrimonial	0.0188***	0.0190***	0.0207***	0.0214***	0.0226***	0.0200***	0.0245***	0.0258***	0.0149***	0.0063	0.0153***	0.0175***
	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0031)	(0.0030)	(0.0031)	(0.0031)	(0.0043)	(0.0042)	(0.0043)	(0.0043)
Self-employed	0.0027	0.0049*	0.0040	0.0053**	0.0064*	0.0081**	0.0066**	0.0100***	0.0007	-0.0008	-0.0032	0.0047
	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0033)	(0.0032)	(0.0033)	(0.0033)	(0.0044)	(0.0043)	(0.0044)	(0.0043)
Retired	-0.0191***	-0.0197***	-0.0172***	-0.0189***	-0.0281***	-0.0293***	-0.0219***	-0.0276***	-0.0379***	-0.0418***	-0.0210***	-0.0370***
	(0.0027)	(0.0026)	(0.0027)	(0.0027)	(0.0035)	(0.0034)	(0.0035)	(0.0035)	(0.0048)	(0.0046)	(0.0048)	(0.0048)
No occupation	0.0130***	0.0119***	0.0154***	0.0144***	-0.0017	-0.0054	0.0034	0.0005	-0.0185***	-0.0273***	-0.0088*	-0.0156***
	(0.0032)	(0.0032)	(0.0032)	(0.0032)	(0.0043)	(0.0042)	(0.0043)	(0.0042)	(0.0053)	(0.0052)	(0.0053)	(0.0053)
Salaried	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
ln(Income)	0.0128***	0.0092***	0.0132***	0.0125***	0.0166***	0.0099***	0.0156***	0.0146***	0.0111***	0.0045***	0.0083***	0.0073***
	(0.0010)	(0.0009)	(0.0010)	(0.0010)	(0.0012)	(0.0010)	(0.0012)	(0.0012)	(0.0011)	(0.0010)	(0.0011)	(0.0011)
ln(Credit)	-0.0006***	-0.0006***	-0.0008***	-0.0008***	-0.0005**	-0.0004*	-0.0007***	-0.0006***	-0.0005	-0.0004	-0.0007**	-0.0007**
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
N	68,190	68,190	68,190	68,190	68,190	68,190	68,190	68,190	68,190	68,190	68,190	68,190
LR Chi2	3,652.30	4,451.71	3,496.72	3,687.04	4,103.82	6,188.49	4,216.87	4,636.38	2,669.91	5,768.46	3,438.66	4,037.06
Prob>chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pseudo-R2	0.1274	0.1552	0.1219	0.1286	0.0957	0.1444	0.0984	0.1081	0.0428	0.0924	0.0551	0.0646
Log likelihood	-12,513.23	-12,113.53	-12,591.02	-12,495.86	-19,383.66	-18,341.33	-19,327.14	-19,117.38	-29,890.59	-28,341.31	-29,506.21	-29,207.01

Table 8 reports the results of BLR wherein the dependent variables are financial product investment decisions of 68,190 retail clients as of the 07/31/2015.. The Average Marginal Effects (AMEs) are reported for each independent variable. Standard deviation are given in parentheses. The variable "Salaried" represents the reference category among professional categories. Statistical significance levels are fixed at 1%, 5% and 10% that are denoted by ***, ** and * respectively.

In Panel A, we first notice that there is no gender difference in saving account holdings. In line with Riley and Chow (1992), Sundén and Surette (1998), Agnew et al. (2003) and Charness and Gneezy (2012), we find that male retail clients are more likely to participate in financial markets than their female counterparts. The probability of investing in saving accounts and in financial products increases with age (Mirer, 1979, Chang, 1994 and Shum and Faig, 2006). We also find that being native-born and/or living in the capital region increases the probability of holding saving accounts (except for classical accounts for which the coefficients are no significant) and financial products. Specifically, AMEs of "Native" are stronger than those of "Paris". Likewise, Osili and Paulson (2004) and Chatterjee (2009) demonstrate that immigrants participate less in financial markets than natives in the US. As for the matrimonial regime choice, retail clients opting for the separation regime are less likely to hold classical and home saving accounts. Being financially independent from their spouse, they are more attracted by getting a high remuneration (via life insurance account holding) and bearing capital risk (due to financial market participation). Looking at the professional categories[25], we find that salaried are more likely to hold saving accounts than the other professional categories. Retired are less likely to invest in financial markets than salaried. This result is in line with that of Yuh and Hanna (2010). Finally, we find that financial independence, illustrated by "Matrimonial" and "Self-employed", promotes financial market participation.

In Panel B, we find that the probability of investing both in saving accounts and in financial products increases with the net monthly income and decreases with the credit amount. Specifically, the probability of investing in financial products is higher than that of investing in saving accounts when the net monthly income increases. As for credit, although AMEs are negative in both investments, we notice that the decrease of the probability is lower in saving account investment than in financial product investment when the credit amount increases.

6 Robustness checks

In Section 6, we perform three robustness checks of the determinants of the number of investment goals (Section 5.1):

- Robustness check 1 (RC1) evaluates whether portfolio value influences the number of investment goals. We replace portfolio holdings, i.e. "Stocks", "Funds" and "UL life insurance products", by the whole investment asset value for testing whether a quantitative measure of financial wealth has an impact on the main findings[26].

[25] Among professional categories, "Salaried" is the reference category since it contains the largest number of retail clients. Moreover, it is highly correlated with each of the other professional categories. Therefore, "Salaried" is the most appropriate reference for interpreting professional categories.

[26] We exclude "Portfolio value" from the main findings in order to equally treat savings accounts and financial products. Since saving account value is not available in the banking records, we only study the detention of savings accounts and financial products.

- Robustness check 2 (RC2) tests the impact of retail clients' attitudes towards risk on the number of investment goals. According to Devaney et al. (2007), risk tolerance has an impact on the likelihood of movement from lower to higher saving levels. In the MiFID questionnaire, retail clients (N=64,086) self-assess their attitudes towards risk by choosing one out of three proposals in which risk tolerance increases from the first to the third one. Looking at the distribution of retail clients, a large proportion of retail clients (about 68%) are not risk tolerant whereas about 32% of them have a low or high risk tolerance level. This result is similar to that of Hong et al. (2004)[27].

- Robustness check 3 (RC3) tests the impact of financial literacy on the number of investment goals. In the MiFID questionnaire, some retail clients (N=46,553) self-assess whether they know the risk associated to stocks, bonds, other peculiar financial products (such as warrants, differed service settlement, convertible bonds and other financial investments) and whether they know financial markets (i.e. change of order execution delay and existence of different types of orders). Based upon these questions, we build a financial literacy score ("Financial literacy") that ranges from 0 (no financial knowledge) to 4 (high level of knowledge). In our sample, the average score is about 1.98 (std=1.16).

Table 9 reports robustness checks results. In RC1, we find that the number of investment goals increases with portfolio value while controlling for the whole wealth and patrimony indicators. Portfolio value's coefficient is close to those of the continuous variables "Income" and "Credit". Therefore, we reinforce our main findings. In RC2 and RC3, we exclude Panel B to check whether our findings are robust regarding qualitative analysis. We test whether both socio-demographic indicators[28] (Panel A) and individual characteristics (Panel C), i.e. risk tolerance and financial literacy, have an impact on the number of goals. Individual characteristics are separately analyzed to isolate their impact on the number of goals. In RC2, we find that risk tolerance level influences the number of investment goals. Retail clients who are not risk tolerant are much more likely to limit the diversification of goal numbers than those having a high risk tolerance level (coefficient value being the greatest). In RC3, we find that financial literacy has a significant and positive impact on the number of goals. Retail clients with high financial literacy are more prone to diversify their investment goal choices.

[27] Hong et al. (2004) report that 32.53% of households are risk tolerant.

[28] Among the professional occupations, the reference category is different in RC2 and RC3 because of collinearity. This change does not impact the interpretation of results.

Table 9 – Robustness check results

	RC1		RC2		RC3	
	Coef.	**Std.**	**Coef.**	**Std**	**Coef.**	**Std**
Dependent variable						
Nber of goals						
Independent variables						
Panel A: Socio-demographic indicators						
Gender	-0.0037	0.0065	-0.0130*	0.0067	-0.0118	0.0084
Age	0.0006**	0.0003	0.0062***	0.0003	0.0061***	0.0003
Native	0.0971***	0.0092	0.1327***	0.0097	0.0956***	0.0127
Paris	-0.0260***	0.0099	0.0010	0.0103	-0.0274**	0.0124
Matrimonial	0.0287***	0.0105	0.0253**	0.0108	0.0049	0.0126
Self-employed	0.0646***	0.0138	0.1505***	0.0140	0.1547***	0.0170
Salaried	0.0430***	0.0108	0.1475***	0.0119	0.1620***	0.0136
Retired	-0.0392***	0.0148	(omitted)		0.0026	0.0188
No occupation	(omitted)		-0.0432***	0.0151	(omitted)	
Panel B: Wealth and patrimony indicators						
ln(Income)	0.0707***	0.0020				
ln(Credit)	0.0085***	0.0007				
Sub-panel B1: Savings accounts						
Regulated saving account	0.1080***	0.0069				
Standard saving account	0.0828***	0.0100				
Home saving account	0.2406***	0.0081				
Life insurance	0.3804***	0.0081				
Sub-panel B2: Financial products						
ln(Portfolio value)	0.0279***	0.0011				
Panel C: MiFID indicators						
Risk tolerance level						
No risk			-0.5138***	0.0249		
Low risk			0.0102	0.0252		
High risk			(omitted)			
Financial literacy					0.1050***	0.0037
_cons	0.3294***	0.0169	1.2424***	0.0344	0.8426***	0.0222
N	68,190		64,086		46,553	
F test	992.15		792.33		201.31	
Prob>F	0.0000		0.0000		0.0000	
R^2	0.1792		0.1100		0.0375	
Adjusted R^2	0.1790		0.1099		0.0373	

Table 9 displays OLS results corresponding to robustness checks (RC1, RC2 and RC3). The dependent variable "Nber of goals" takes into account G4-2 retail clients by assuming they have one investment goal. Statistical significance levels are fixed at 1%, 5% and 10% that are represented by ***, ** and * respectively.

7 Conclusion

In this study, we analyzed retail clients' budgeting and investment decisions together with their self-reported investment goals. This unique opportunity was given by the availability of the answers to the MiFID questionnaire together with banking records of retail clients. Saying it differently, data on investment goals are rare and, more importantly, it is even more rare to find intended goals and realizations for an identical set of individuals. Therefore, as soon as we had an appropriate measure of investment goals, we could finely deepen individual's mental accounting process.

We demonstrate that retail clients' real investment decisions have a strong impact on the number of investment goals while controlling for socio-demographic indicators and wealth and patrimony indicators. Therefore, we provide useful insight on mental accounting process regarding "mental goal diversification". From self-assessed investment goals of retail clients, we derive a retail client typology regarding their mental goals. We demonstrate that retail clients' real investment decisions are consistent with their mental goals while controlling for the same indicators. We point out that, throughout this study, we use a variety of variables, some of which are defined like drivers of investment decision such as gender, age and income. Specific variables are also taken into account, like geographical criteria (rarely studied) and matrimonial regime choice (never studied yet). At last, we show that our findings are robust to three robustness checks by considering financial wealth, risk tolerance and financial literacy.

Our findings have the followings implications. First, we contribute to the literature on mental accounting because we match investment goals and fund categorization/earmarking. Second, by showing that MiFID questionnaire answers are helpful regarding mental accounting analyses, we give an academic justification to this mandatory questionnaire. Actually, data collection from investment service providers through MiFID, seems to reach its objective, i.e. making advices and financial products suited to the clients' financial situation. We hope that this finding would enhance a systematic data collection of MiFID questionnaire answers. Finally, as investment goals were assessed by individuals in a mandatory questionnaire, we demonstrate that external forces reinforce the effectiveness of this process. Therefore, our paper contributes as well to the research on consumer finance and well-being. We think that investment providers should develop platforms and/or softwares that play the role of external forces to fund categorization. These tools should also help people set financial goals, establish budgets and keep track of their expenses and savings. More importantly, they should also help individuals to prevent the pitfalls of mental accounting, for example, by easing the connection between different mental accounts that correspond to differently labelled saving accounts.

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