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Understanding retail investors: a clustering approach

Document for the exclusive attention of professional clients, investment services providers and any other professional of the financial industry

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Understanding Retail investors: A Clustering Approach

The Amundi Investment Institute, in partnership with Crédit Agricole du Languedoc, the University of Montpellier, and Montpellier Business School (MBS), has forged a unique collaboration dedicated to advancing our understanding of individual investors' financial preferences and needs. This partnership combines academic rigor with practical insights from the financial industry, creating a rich foundation for exploring the evolving landscape of retail investment behavior.

Our approach is multi-faceted and comprehensive. It includes conducting regular, large-scale surveys to capture retail investors' appetite and attitudes toward various investment strategies; performing quantitative analyses to uncover patterns in consumption and savings behavior; and implementing innovative online experiments to test the effectiveness of different incentives aimed at developing investment participation. A particular emphasis is placed on responsible investment behavior, reflecting the growing importance of sustainable finance in individual decision-making.

These research initiatives are conducted in close collaboration with the CSR and responsible investment, sales and marketing teams at Crédit Agricole Languedoc and Amundi. This integrated effort ensures that our findings are not only academically robust but also directly relevant and actionable for financial institutions seeking to better serve their clients.

We are pleased to share the second chapter of this ongoing research endeavor. Using granular administrative data matched with survey responses, we cluster retail investors to uncover both observed and unobserved dimensions of their financial behavior, including financial sophistication, expectations, risk and socially responsible preferences. We identify five distinct investor segments that differ markedly in demographics, consumption patterns, and investment choices: affluent sophisticated investors, life-insurance holders, liquidity-oriented savers, young consumers, and financially fragile clients. Only the first two clusters allocate a significant share of their investment portfolio to socially responsible investment (SRI) funds, though their motivations differ: affluent sophisticated investors combine financial and impact considerations, while life-insurance holders are more impact-driven.

Overall, the results highlight substantial heterogeneity among retail investors and suggest that more differentiated product offerings and tailored communication strategies could better meet the needs of each segment. We aim to support financial institutions in better tailoring their advisory services and product offerings to meet evolving client demands in a rapidly changing market.

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#1

Abstract and survey highlights

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Abstract

Using a randomly selected sample of 50,000 clients of Crédit Agricole Languedoc, we identify 12,902 investors and analyze their financial behavior using granular administrative data.

The dataset covers several dimensions, including demographic characteristics (age and gender), consumption patterns based on bank card transactions, financial activity such as account inflows, loans, savings and financial wealth, and detailed investment holdings in CTO, PEA, PERI, and life-insurance portfolios. Together, these data provide a comprehensive view of clients' financial situation, saving behavior, and portfolio allocation.

In addition, 1,080 clients from the sample participated in an online survey on investment practices. The survey complements the administrative data by capturing information that is typically unobservable in banking records, including risk tolerance, social and sustainability preferences, expectations about financial markets, and beliefs about socially responsible investment (SRI). It also provides insights into investors' financial sophistication, portfolio management approaches, sources of financial advice, and motivations for engaging in SRI.

By combining detailed administrative records with survey responses, the analysis provides a richer understanding of retail investor behavior and the heterogeneity of investment practices across clients. In particular, we identified five clusters of retail clients—Affluent Sophisticated Investors (4%), Life-Insurance Holders (11%), Liquidity-Oriented Savers (61%), Young Consumers (16%), and Financially Fragile Clients (8%)—that are distinct in their demographic characteristics, financial sophistication, expectations, and consumption and investment behaviors.

Survey highlights

50.000
Clients surveyed

Randomly selected **Crédit Agricole Languedoc** clients in the sample

Almost **13.000**
Qualify as investors

Clients identified as investors using granular administrative data

1080
Clients surveyed online

Clients surveyed online to capture unobservable factors such as risk tolerance, expectations, and SRI preferences

We identify five clusters that are different in their demographic characteristics, consumption and investment behaviors:

61%
Liquidity-Oriented Savers

Conservative savers focused on liquidity and capital preservation

16%
Young Consumers

Younger clients prioritizing consumption over saving or investing

11%
Life-Insurance Holders

Wealthy, tax-efficient investors with a strong allocation to life insurance and SRI funds

8%
Financially Fragile Clients

Constrained households relying heavily on cash and with limited financial buffers

4%
Affluent Sophisticated Investors

Financially sophisticated, predominantly male, high risk tolerance, long-term diversified investors

2 clusters with SRI

Only **Affluent Sophisticated** and **Liquidity-Oriented Savers** segments allocate a significant share of their portfolio to **SRI funds.**

Most sophisticated

The **SRI-oriented clusters** are also the **most financially sophisticated** and more exposed to risky assets.

Different motives

Affluent sophisticated investors combine financial and impact motives, while life-insurance holders are mainly impact-driven.

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#2

Clusters of retail clients

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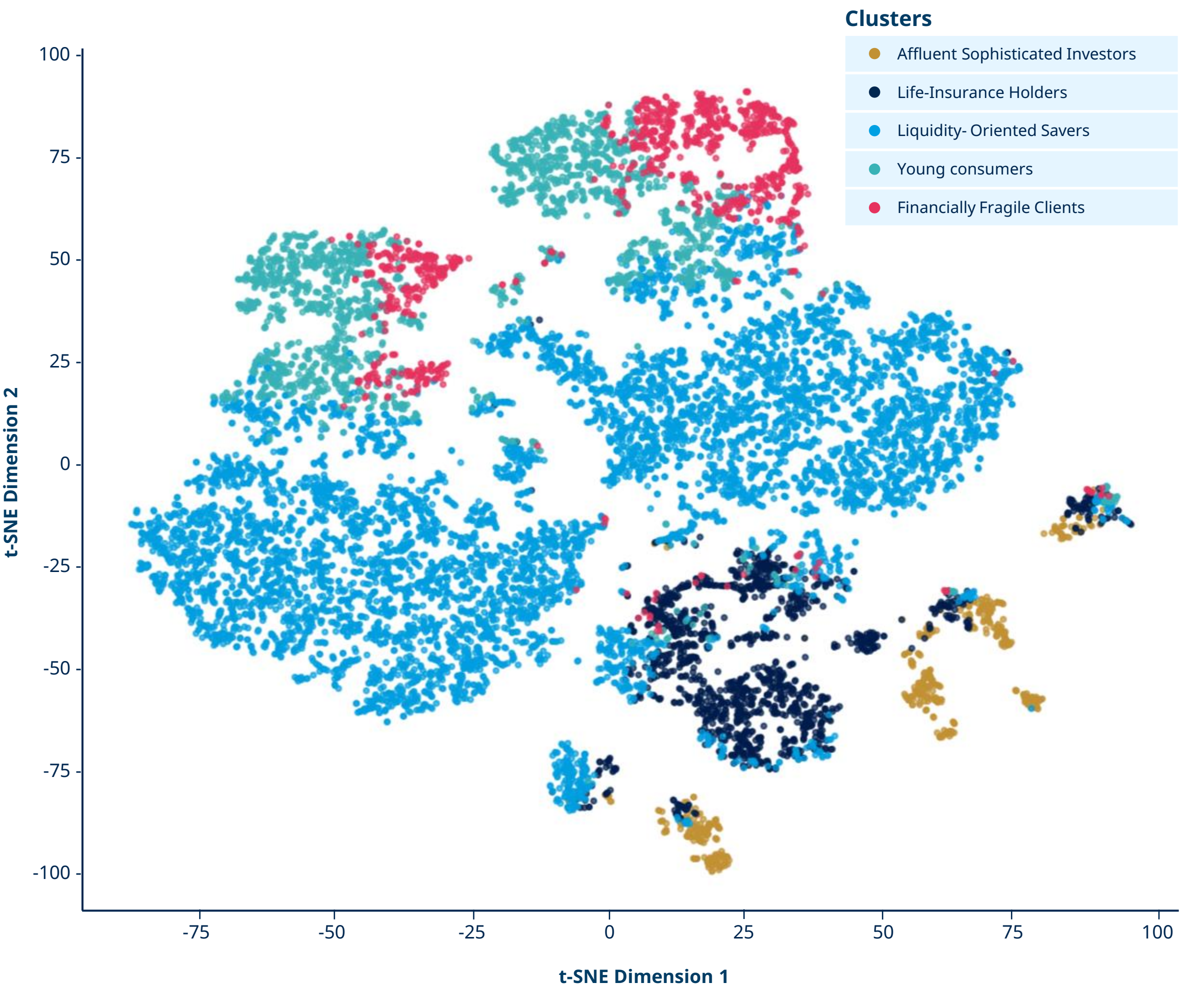
Clusters of retail clients

Our clustering methodology follows a two-step approach. In Step 1, we applied a global K-means clustering to the full investor dataset (N = 12,902), testing different values of K and identifying the best separation at K = 2.This initial global split revealed a natural division between wealthy investors with high levels of savings and investments, holding more diversified and riskier portfolios—including responsible investment products (15.5%)—and mainstream investors with moderate to low income and savings, who tend to hold simpler, low-risk portfolios (84.5%). However, these macro-clusters proved too coarse to yield actionable insights. In Step 2, we refine this segmentation using a recursive bisecting K-means procedure. Each macro-cluster was treated as a new dataset and recursively divided into two sub-clusters (*K = 2*). At each iteration, we split the cluster with the lowest local silhouette score, continuing until further division no longer improved the silhouette or results in clusters that are too small. This process produced a refined segmentation of **five investor clusters**—two SRI-oriented and three mainstream groups—offering a more granular and meaningful understanding of investor profiles.

Figure 1 **t-SNE visualization by cluster projected onto two embeddings**

t-SNE (2D) – Final Bisecting Kmeans Clusters



The datapoints are displayed along two t-SNE dimensions. t-SNE is a nonlinear dimensionality-reduction technique that projects high-dimensional data into a lower-dimensional space for visualization. These dimensions do not correspond to specific variables; instead, they are constructed to preserve local similarities between observations, so that points that are close in the original feature space appear close in the map, allowing natural groupings to emerge.

1. *We define investors as those having positive holdings in their investment accounts (PEA, CTO, PER Individual or Life Insurance)*

2.1. Diversified High-Wealth Investors

As shown in *Table 2*, the two clusters **Affluent Sophisticated Investors (ASI)** and **Life-Insurance Holders (LIH)** hold responsible investment products in their portfolio. However, the two clusters exhibit distinct features, as summarized in *Figure 2*. Particularly, ASI reflects affluent, financially sophisticated, and predominantly male investors with strong risk tolerance, long-term and diversified investment strategies. On the other hand, the LIH cluster is characterized by wealthy, tax-efficient investors with a focus on life insurance products and a pronounced ESG orientation.

Figure 2

Affluent Sophisticated Investors and Life Insurance Holders (plotted using standardized values)

Affluent sophisticated — *Life insurance*

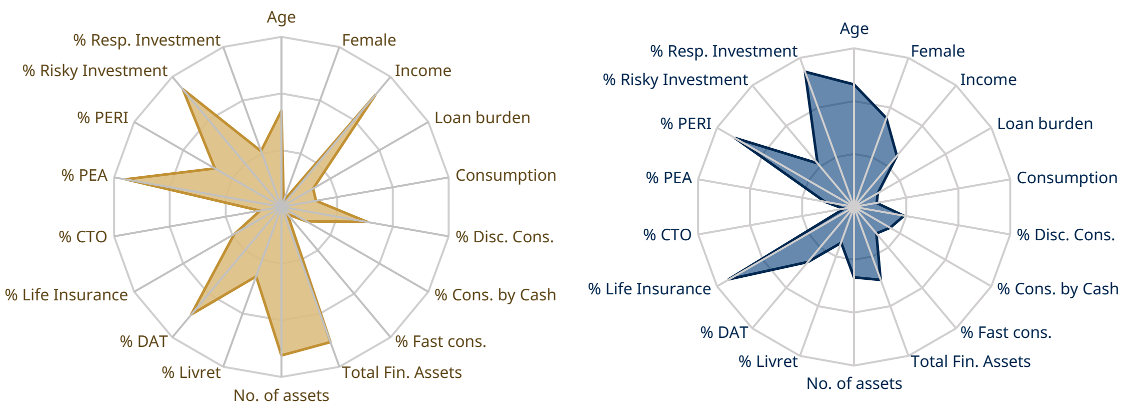


Table 2 presents the average values for each variable across the identified clusters.

ASI represents about **4%** of the sample. This group is predominantly male (64%) and characterized by substantial financial resources, with average savings of €111,000 and annual bank account inflows of €121,000. They exhibit very high exposure to risky assets (90%) and maintain a well-diversified portfolio, holding around 9.2 different assets on average. Their investments span multiple asset types—58% hold funds, 68% equities, 10% bonds, and 9% ETFs—and are distributed across various account types, including life insurance (AV, 16%), securities accounts (CTO, 12%), and equity savings plans (PEA, 19%). Notably, 11% of their holdings are sustainable investments.

LIH makes up **11%** of the sample and represents the oldest investor group. They hold substantial financial resources, with average savings of €60,000 and annual bank account inflows of €73,000. Their exposure to risky assets is moderate (27%), and their portfolios are heavily concentrated on life insurance products, which account for 62% of their total assets. With relatively low diversification—around four financial assets on average—these investors stand out for their high sustainable investment participation, as 39% of their holdings are classified as sustainable.

2.2. Mainstream clients

Figure 3 summarizes the distinction features of the three mainstream clients clusters.
The **Liquidity-Oriented Savers (LOS)** clusters include conservative savers who prioritize liquidity and capital preservation over investment risk or diversification, and this cluster also has the highest level of debt. The **Young Consumers (YC)** cluster consists of younger clients who prioritize spending and lifestyle consumption over saving or investing. Finally, the **Financially Fragile Clients (FFC)** cluster represents financially constrained, cash-oriented clients who face significant liquidity challenges and limited financial flexibility.

Figure 3 **Liquidy-Oriented Savers, Young Consumers and Financially Fragile Clients**

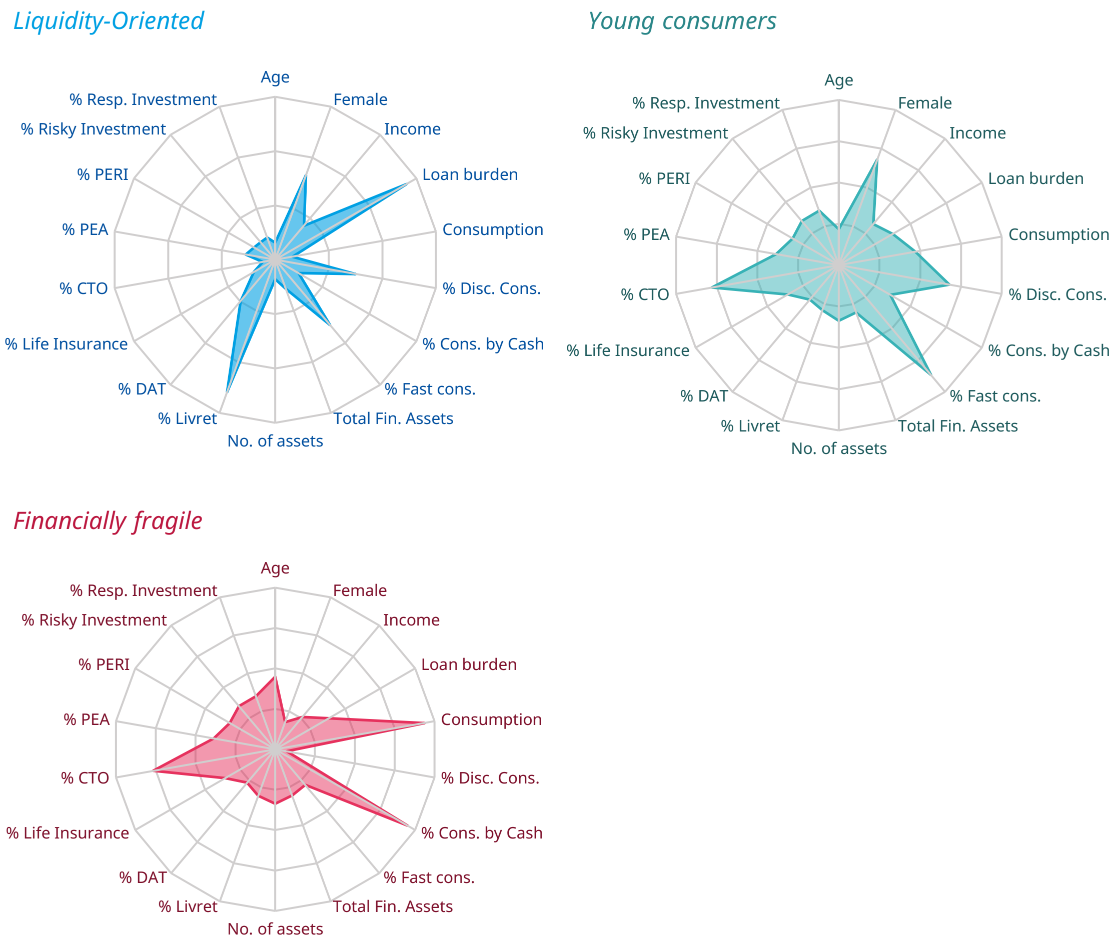


Table 2 gives more details about these three traditional clients clusters, particularly:

Liquidity-Oriented Savers constitute the largest group, representing **61%** of the sample, with an average age of 40 years. They maintain moderate financial resources, holding average savings of €18,000 and total inflows of €57,000, but exhibit a relatively high debt-to-inflow ratio (15.7). Their wealth is primarily concentrated in highly liquid savings accounts—such as *Livrets* (91%)—and they show minimal exposure to risky assets (1%).

Young Consumers represent **16%** of the sample and are the youngest group, with an average age of 37 years. They have moderate annual inflows (€38,000) but hold very limited savings—around €1,000 on average, primarily in “parts sociales” at their local bank. Their consumption behavior is marked by high consumption relative to income (85%), with a significant share devoted to discretionary spending (51%) and a notable portion to fast-economy (fast food or fast fashion) consumption (5%).

Financially Fragile Clients account for **8%** of the sample and are characterized by very limited financial resources, with average savings of only €1,000 and annual inflows of €29,000. Their spending behavior reflects financial vulnerability: 43% of their consumption is made in cash, 77% is devoted to essential expenses, which amounts to 178% of their income.

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#3

Insights from a subsample of surveyed clients

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Insights from a subsample of surveyed clients

To gain more insights about investors' financial sophistication, expectation and other aspects of their investment practices across investor clusters, we analyzed a sub-sample of surveyed investors comprising 320 individuals. This sub-sample included 22 ASI, 49 LI, 181 Liquidity-Oriented Savers, 45 Young Consumers, and 23 Financially Fragile Clients.

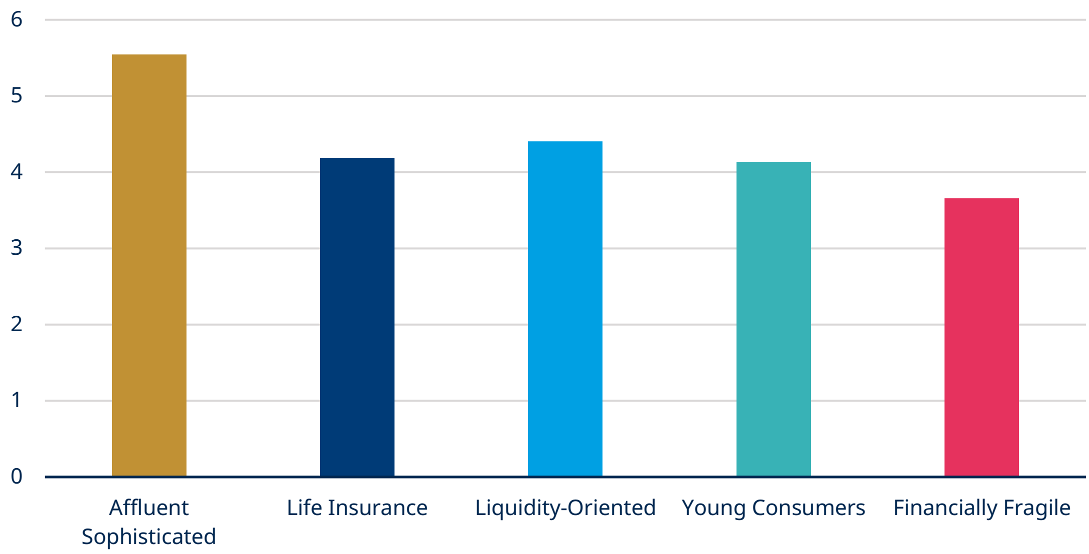
3.1. Financial sophistication

We asked subjects about their self-evaluated level of financial literacy (1-10). As shown in *Figure 4*, **ASI** tend to rate themselves higher than other cluster subjects, with an average score of 5.5 (median = 5). *Table 4* suggests that, belonging to the ASI clusters is associated with 1.41 points higher in financial literacy (significant, p-value = 0.02), compared to the baseline cluster YC.

Figure 4

Financial Literacy across clusters

Mean of financial literacy



Both **ASI** and **LIH** tend to have more investment experience in risky assets (in years, based on midpoints) than other groups, with the average experience of the former at 14.4 years (median = 20 years) and the latter at 12.8 years (median = 20 years), as shown in *Figure 5. Table 3* also shows that investors in the ASI cluster have 10.4 more years (significant, p-value = 0.00) and those in the LIH cluster have 8.8 more years (significant, p-value = 0.00) of experience in risky investment than the baseline cluster.

2. Parts sociales are ownership shares in a cooperative or company that give members voting rights and sometimes limited financial returns, but are generally not freely tradable like ordinary shares)

Figure 5 **Investment experience and investment horizon across clusters**

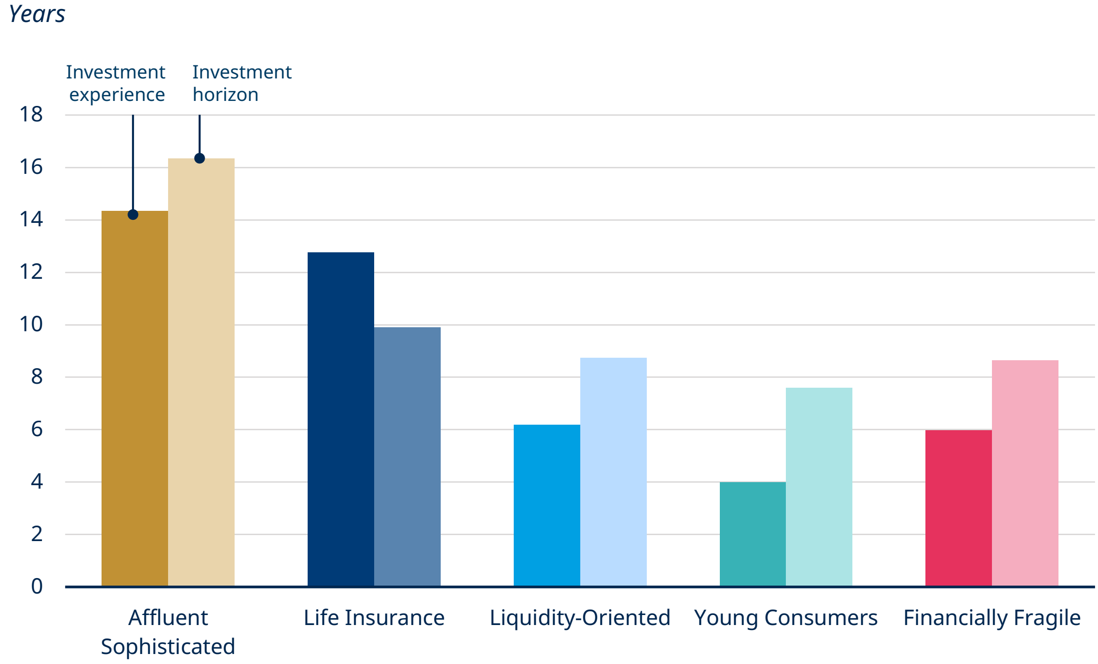


Figure 5 shows the contrast in investment horizons (in years, based on mid-points) of **ASI** and other clusters. Investors in this cluster reveal having a planned investment horizon of average 16.3 years (median = 20 years). *Table 3* suggests that investors belonging to this cluster have a planned horizon that is 8.7 years more than the baseline – YC (significant, p-value = 0.00).

Overall, the combination of greater financial sophistication and longer-term orientation seen in the **ASI** cluster is consistent with their stronger engagement in financial markets. **LIH** similarly exhibits substantial experience with risky investments, though with more moderate levels of perceived financial literacy.

3.2. SRI Beliefs

We also elicited participants' beliefs about socially responsible investment (SRI), measured on a 1–10 scale capturing agreement with the statement that SRI offers higher long-term returns (and lower long-term risk). *Figure 6* indicates that **LIH** hold comparatively more favorable views toward SRI. Their average belief score is 6.1 (median = 6.0) for long-term returns and 6.1 (median = 6.0) for long-term risk.

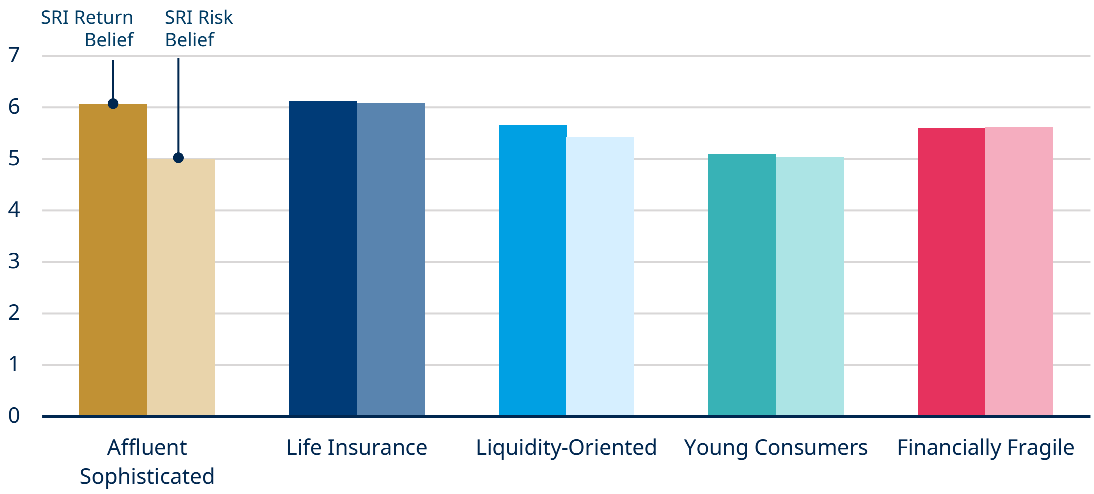
Consistent with these descriptive patterns, *Table 4* shows that investors in the LIH cluster report an SRI return belief score that is 1.0 point higher than that of the baseline group (marginally significant, p-value = 0.07). They also report an SRI long-term risk belief score that is 1.0 point higher than the baseline group (significant, p-value = 0.04).

Interestingly, we observed very similar SRI beliefs among other clusters of clients.

Figure 6

Belief that SRI have higher long-term returns and lower long-term risk

Mean Belief Score



3.3. Reasons for investing in SRI

We also asked investors who invest in SRI for their motivations. Since only the **ASI** and **LIH** clusters hold SRI products, we show the disclosed motives of these two clusters in *Figure 7*.

Overall, **ASI** choose SRI for a variety of reasons, with **climate hedging** being the most common motive—responsible investments are seen as more likely to preserve or even enhance their value if climate risks materialize. They also invest in SRI to help fill the gaps by public policies (**Policy inefficiencies**) in areas like the environment, health, and society and for SRI environmental and social impact (**Impact).**

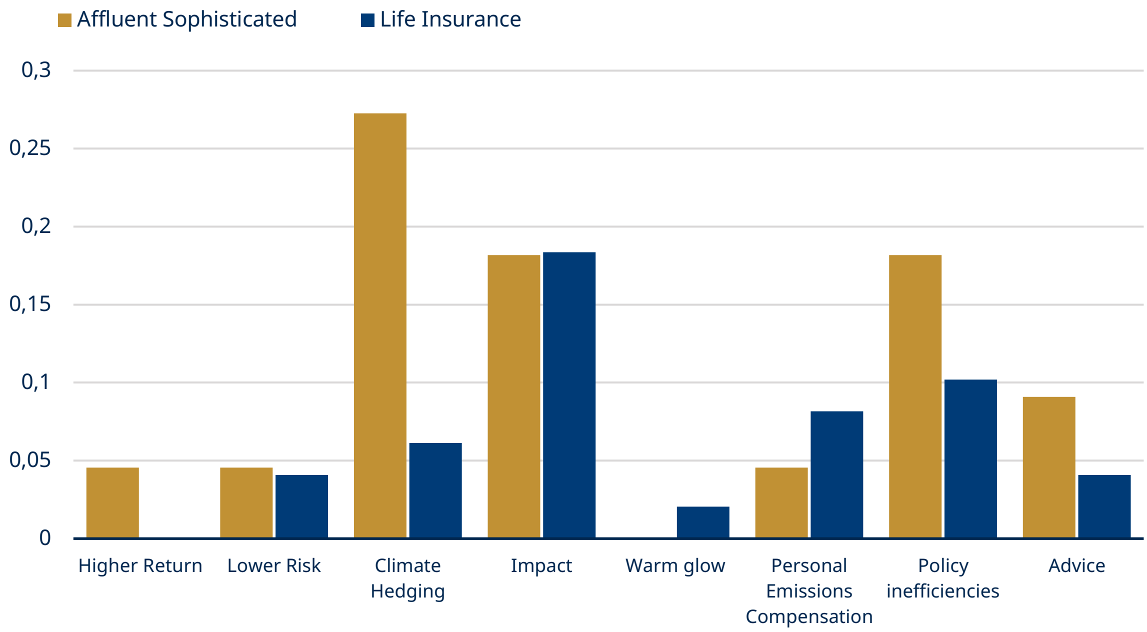
On the other hand, **LIH** reported investing in SRI mainly for the environmental and social Impact (**Impact**).

For the other clusters who have no allocation to SRI, the main reason cited is the lack of information about these investment products.

Figure 7

Reasons for investing in SRI

Mean (Share selecting the reason)



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#4

Implications for product offerings and communication approaches

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Implications for product offerings and communication approaches

Based on the distinct characteristics of each investor cluster, product offerings and communication strategies could be tailored to address their specific financial objectives as well as their level of financial sophistication.

For **Affluent Sophisticated Investors,** product offerings should focus on advanced, long-term investment solutions with high equity exposure. Responsible investment products should be positioned in a way that aligns with these investors' financial objectives, highlighting, for instance, their comparable performance to conventional investments and their potential to hedge climate-related risks. These investors also report investing in responsible investment products in order to address policy inefficiencies in areas such as the environment, health, and broader societal challenges, and to generate measurable environmental and social impact. Communication should therefore be data-driven and transparent, emphasizing the financial benefits and long-term resilience of SRI investments, while providing clear, quantifiable metrics on their impact. Personalized messaging that reflects ASI's financial sophistication and long-term perspective is essential to effectively engage this cluster.

For **Life Insurance Holders**, product offerings could prioritize impact-driven SRI products for life insurance with transparent ESG indicators and measurable outcomes, enabling clients to clearly see the positive effects of their investments. One could also gently encourage greater diversification to complement their moderate risk profile. Communication should take into account their investment experience and strong interest in responsible investing, providing clear, accessible information that highlights the long-term benefits and performance of sustainable products, while emphasizing the diversification benefits of SRI as a complement to their moderate risk profile.

For **Liquidity-oriented Savers** cluster, product offerings could focus on introducing simple, low-risk investment solutions that preserve liquidity and offer clear advantages over traditional savings accounts. Accessible SRI products with capital protection features and easy entry and exit options—specifically designed to address their preference for liquidity and low risk—could be particularly appealing. Communication should prioritize education, using straightforward language and practical examples to demystify responsible investing and highlight how SRI can align with their financial goals without sacrificing security.

Product offerings for **Young Consumers** clusters should focus on accessible, low-entry savings solutions (automated micro-saving) to encourage wealth accumulation. Communication should center on financial education, using relatable, digital-first content and real-life examples to explain the basics of investing, including SRI, and demonstrate how even small, regular contributions can make a difference over time.

For **Financially Fragile Clients**, the priority should be to provide basic financial education and practical support. Communications should center on essential topics such as budgeting, cash-flow management, and building emergency savings, delivered in a clear, empathetic, and accessible manner.

Conclusion

In a clustering analysis of French retail banking clients, we identified five clusters of savers: affluent sophisticated investors, life insurance holders, liquidity-oriented savers, young consumers, and financially fragile clients. Due to their distinct characteristics and behaviors, aligning product offerings and communication strategies with each cluster strengthens client engagement and improves the relevance of investment solutions across saver segments. A differentiated approach—ranging from advanced strategies for experienced investors to accessible and educational solutions for less engaged clients—can help foster broader participation in investing while supporting investors' diverse financial goals and preferences, including responsible investment.

Appendix

Test of Differences Across Investor Clusters

To test how distinct each cluster is in terms of predicting a particular aspect of preference and expectation observed in the survey, we regress each survey variable on cluster dummy variables using Young Consumers (YC) as the reference group. Specifically, the model takes the form:

$$Survey\ var_i = \alpha + \beta_{ASI}.D_{ASI.i} + \beta_{LI}D_{LI} + \beta_{LO}D_{LO.i} + \beta_{FF}D_{FF.i} + \varepsilon_i$$

With $D_{ASI.i}, D_{LI.i}, D_{LO.i}$, $D_{FF.i}$, the binary variables taking value of 1 if the client belongs to the cluster Affluent Sophisticated, Life Insurance Holders, Liquidity-Oriented and Financially Fragile, respectively. *Table 3 and 4* shows the test results for different survey variables.

Table 1 **Definitions of variables**

Variable	Definition and units
Age	in years
% Female	Percentage of women
Total Inflows (annual, k€)	All inflows into bank account as of December 2024, annualized, in thousands of EUR
Debt/Monthly Inflow	Outstanding loan divided by monthly account inflow, as of December 2024
% Cons./Monthly Inflow	Monthly consumption in 2024, as percentage of monthly account inflow
% Discretionary Cons.	Average discretionationary consumption in 2024, as percentage total consumption
% Cons. by Cash	Average cash withdrawal in 2024, as percentage total consumption
% Fast cons.	Average fash consumption in 2024, as percentage total consumption
Total Financial Asset (k€)	Total amount of financial assets (including savings and investments), as of December 2024
Nb. Investment Assets	Number of different investment investment assets
% Livrets	Amount in saving accounts (Livrets), as a percentage of total financial asset
% DAT	Amount in term deposit (Dépôt à Terme), as a percentage of total financial asset
% Life Insurance	Amount in Life Insurance accounts, as a percentage of total financial asset
% CTO	Amount in Brokerage accounts (Compte-Titres Ordinaire), as a percentage of total financial asset
% PEA	Amount in Equity Savings Plan (Plan d'Épargne en Actions), as a percentage of total financial asset
% PERI	Amount in Individual Retirement Savings Plan (Plan d'Épargne Retraite Individuel), as a percentage of total financial asset
% Risky Investment	Investment in PEA, Life Insurance, CTO and PER Individual, except for EUR fund (fonds en EUR), bond funds and money market funds, as a percentage of total investment
% Resp. Investment	Responsible investment, identified using responsible keywords, as a percentage of total risky investment

Table 2

Summary of clusters

	Affl. Sophisticated	Life Insurance	Liquidity-Oriented	Young Consumers	Financially Fragile
Age	48.6	52.4	40.2	37.5	43.1
% Female	36	53	52	52	32
Total Inflows (annual, k€)	121,000	73,000	57,000	38,000	29,000
Debt/Monthly Inflow	6.6	6.1	15.7	6.1	6.2
% Cons./Monthly Inflow	71.8	62.6	57.1	84.6	178.1
% Discretionary Cons.	48.9	42.2	48.4	50.9	23.2
% Cons. by Cash	11.8	15.7	11.6	10.9	43.2
% Fast cons.	2.6	3.2	4.3	5.4	2.6
Total Financial Asset (k€)	111,000	60,000	18,00	1,000	1,000
Nb. Financial Assets	9.2	4	0.1	0	0
% Livrets	50.7	32.3	91.1	14.7	16.6
% DAT	3.2	1.7	1.2	0	0
% Life Insurance	15.5	61.7	2.2	1.1	1.5
% CTO	11.7	4	5.5	84.1	81.9
% PEA	18.8	0.1	0	0	0
% PERI	0.1	0.2	0	0	0
% Risky Investment	89.8	26.5	1	0	0.1
% Resp. Investment	11	39.3	0.6	0	0
No. Clients	571	1426	7864	2007	1034

Table 3

Significance test of clusters for financial sophistication and investment horizon

Financial Literacy			Investment Experience			Investment Horizon		
Cluster	Coefficient	p-value	Cluster	Coefficient	p-value	Cluster	Coefficient	p-value
ASI	1.41	0.02	ASI	10.36	0	ASI	8.74	0
LIH	0.05	0.92	LIH	8.76	0	LIH	2.31	0.35
LOS	0.27	0.49	LOS	2.19	0.07	LOS	0.14	0.6
FFC	-0.48	0.39	FFC	1.98	0.35	FFC	1.04	0.75
N = 320			N = 284			N = 206		
R-squared = 0.03			R-squared = 0.15			R-squared = 0.08		
p-value (F-test) = 0.06			p-value (F-test) = 0.00			p-value (F-test) = 0.00		

Table 4 **Significance test of clusters for SRI return and risk belief**

SRI return belief			SRI risk belief		
Cluster	Coefficient	p-value	Cluster	Coefficient	p-value
ASI	0.96	0.12	ASI	-0.03	0.96
LIH	1.03	0.07	LIH	1.05	0.04
LOS	0.56	0.16	LOS	0.4	0.23
FFC	0.5	0.48	FFC	0.59	0.34
N = 277			N = 293		
R-squared = 0.02			R-squared = 0.03		
p-value (F-test) = 0.36			p-value (F-test) = 0.27		

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UNDERSTANDING RETAIL INVESTORS: A CLUSTERING APPROACH

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