

INDIVIDUAL REPORT

Demographic and Economic Influences on Italian Household Saving Decisions (2022)

Introduction

During our course, we studied a model that explains individuals' consumption decisions. According to this model, the Life Cycle Theory Model, individuals prefer to smooth their consumption across the years rather than letting it fluctuate with changes in income. This model suggests that consumption and saving decisions are based on expectations of future income and lifespan. Additionally, it assumes that individuals consume all their income rather than accumulating excess savings. Another model we studied, Keynesian consumption theory, argues that individuals consume a fixed proportion of their current disposable income.

In practice, we know that the Life Cycle Theory Model assumptions generally do not hold. We have seen that savings and consumption decisions differ across countries based on their pension systems. In countries with stronger pension systems, private savings rates tend to be lower since individuals rely more on public pensions for retirement. Furthermore, empirical data show that consumption and saving actually follow income trends, contradicting the model's prediction that consumption remains smooth. Additionally, individuals do not deplete all their wealth in old age, as the model suggests; retirees tend to keep saving rather than dissaving.

Moreover, we observed that typical households do not invest optimally. This is not an isolated issue; it is common across many countries, not just Italy. Several factors may explain this general lack of participation in financial markets, ranging from asymmetric information to insufficient financial literacy to risk aversion. Empirical data examined during the lectures also showed that factors such as age, gender, and seasonality affect risk aversion and, consequently, investment decisions. For instance, women were shown to be more risk-averse and to hold fewer risky assets, especially when they had children. Additionally, young people tend to take more financial risks than older individuals.

In this report, we investigated the influence of demographic and economic factors on the saving and investment decisions of Italian households in 2022. After an exploratory analysis of our data to observe the cross-sectional heterogeneity among our variables, we performed a linear regression analysis followed by a logistic regression.

Data description

For this analysis, we used the Survey on Household Income and Wealth (SHIW) of the Bank of Italy. The dataset consists of observations from 9,641 Italian households in the year 2022. Among them, approximately 45% are from Southern Italy, less than 40% are from the North, and the remaining 16% are from the Center of Italy. In 32% of households, the person with the highest level of education is a woman. We define the individual with the highest educational attainment as the "head of the family".

Among these women, 21.87% have a high school diploma as their highest level of education, 21.97% hold a master's degree or an equivalent qualification, 18.1% have a middle school diploma, 17.17% have an elementary school diploma, 5.25% have a professional diploma, 3.28% hold a PhD, 2.95% have no formal education, and 2.92% have a bachelor's degree. For men, 31.27% have a high school diploma, 25.25% have a middle school diploma, 22.15% hold a master's degree or equivalent, 9.5% have an elementary school diploma, 5.29% have a professional diploma, 3.5% hold a PhD, 1.76% have a bachelor's degree, and less than 1% have no formal education.

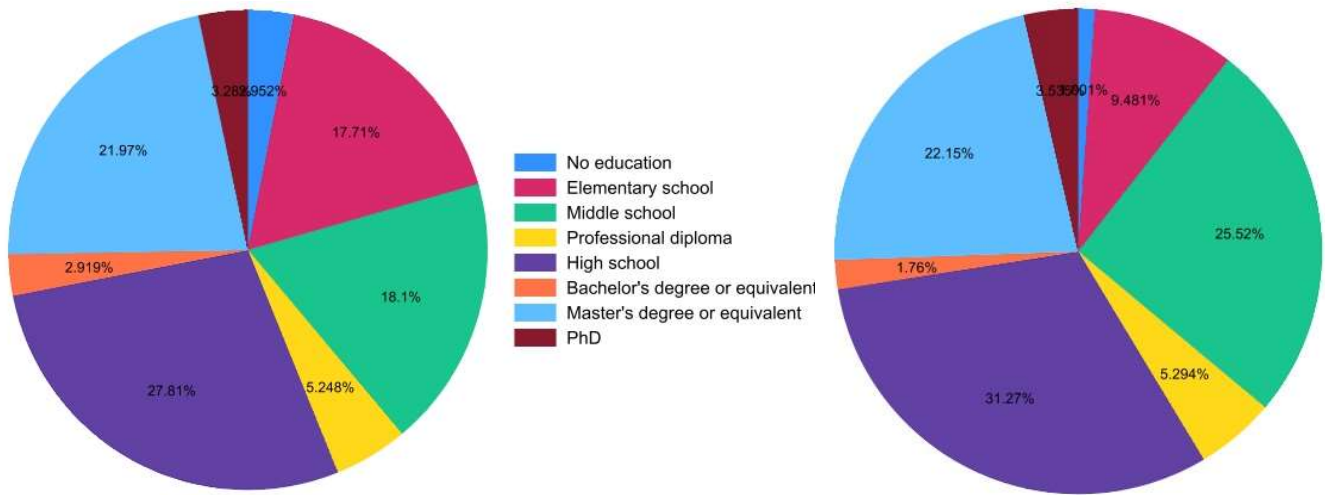


Figure 1. Educational attainment distribution among women (left) and men (right).

In terms of age distribution, almost 50% of individuals are older than 64 years, 22.14% are between 55 and 64 years, 15.38% are between 45 and 54 years, 8% are between 35 and 44 years, and less than 5% are younger than 34 years. A similar pattern is observed for men, where 45.78% are older than 64 years. Given that both sexes are significantly represented by individuals older than 64 years, it is logical to assume that this age group will have a considerable impact on the results obtained when analyzing investment decisions. Therefore, we examined the educational attainment of individuals in this age range for both sexes. Among women, less than 2% hold a PhD, 14.32% have a master's degree or an equivalent qualification, and less than 1% have a bachelor's degree. Almost 50% of women in this age group have either an elementary school or middle school diploma as their highest level of education. Regarding men, 3.31% hold a PhD, 22% have a master's degree or equivalent, and less than 1% have a bachelor's degree. Additionally, 26.5% have a high school diploma, 23.53% have a middle school diploma, and 17.53% have an elementary school diploma.

Regarding household composition, the most frequent household sizes are 1 and 2 members, meaning that more than 50% of households consist of either 1 or 2 members. 18% of households have 3 members, 14.84% have 4 members, and then there is a long right tail with low-frequency values between 5 and 10 members.

In families where the head is a man, 40% of households consist of 2 members, 19.68% have 3 members, 17.38% have 4 members, and less than 17% consist of only one man. When the head is a woman, however, less than 46% of households consist of only one person, 27.19% have 2 members, and 14.53% have 3 members. Among households with

2 members, 80.36% of them are married couples. This percentage is slightly lower for 3-member households and reaches 85% for 4-member households.

Almost 63% of the women in the dataset are risk-averse, while fewer than 1% are risk lovers. For men, the situation differs, with less than 53% being risk-averse and only 1.5% being risk lovers. This aligns with what we observed in class, where women appear to be more risk-averse.

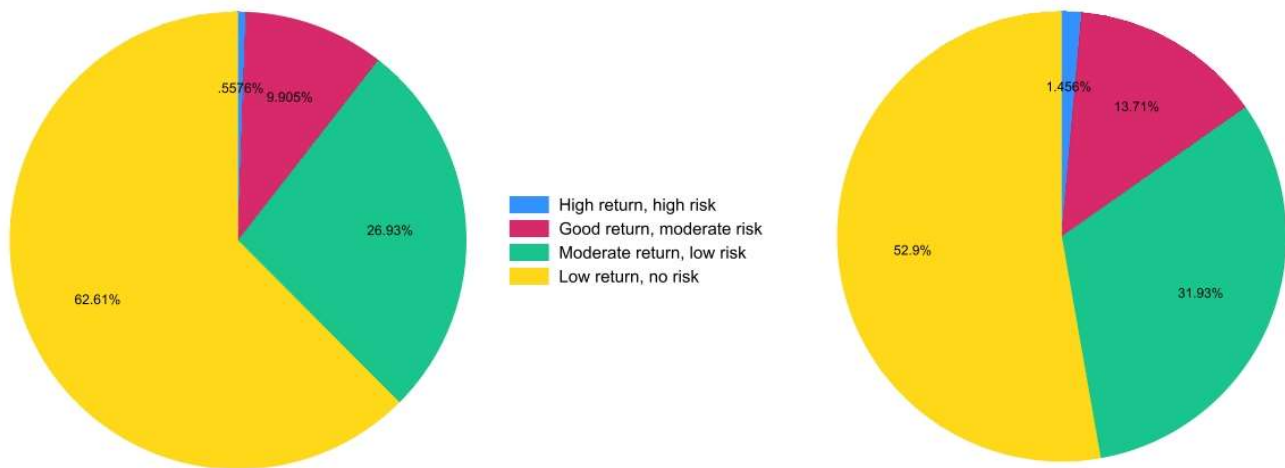


Figure 2. Risk aversion distribution among women (right) and men (left).

Empirical methodology

In this paragraph, we first performed a linear regression analysis to investigate the relationship of the considered regressors on the output. Since our dependent variable, *savings*, is continuous, a linear model was an appropriate choice to estimate its variation based on demographic and economic predictors. The regressors we considered for our analysis were:

- geographical area
- number of children
- number of components in the household
- sex
- educational attainment
- marital status
- age
- financial assets
- net income
- consumption

First, we computed the Pearson correlation to examine the linear relationships between numerical variables. We found that net income and financial assets are strongly positively correlated with our outcome, with correlation coefficients of 0.9788 and 0.7635, respectively. Given the strong correlation between savings and net income, we applied a logarithmic transformation to both to mitigate skewness. Histograms of the transformed variables indicated a closer approximation to a normal distribution, confirming the effectiveness of the transformation. Additionally, the R^2 from

the linear regression considering only numerical regressors improved significantly after applying the transformation, from 0.6348 to 0.7358. This indicated that the transformed variables better explained the variability of the output.

Afterward, we introduced the remaining categorical variables and performed a linear regression analysis. We used the `robust` option to account for potential heteroscedasticity, as the variance of the error term may vary with the regressors. It is important to address this heterogeneity, as linear regression assumes that the error term is random noise with a zero mean and constant variance.

In the second part of our analysis, we computed a logistic regression analysis¹ to investigate the likelihood of households investing in the financial assets considered. A linear model wouldn't have been appropriate here, as it could produce values outside the [0,1] range. Instead, we used the ratio of savings to net income as our dependent variable to determine the probability that households would invest in the considered assets if the ratio exceeded an arbitrary threshold of 0.2. If the ratio was below this threshold, the household was considered not to invest. In performing the logistic regression, we again used the `robust` option to address potential heteroscedasticity.

We then ran separate logistic regression analyses to investigate the probability of investing in risky assets, and thus, taking on financial risks.

Results

| VARIABLES | (1) Log(Savings) Coefficient | (2) SE |
|-----------------------------|------------------------------------|-----------|
| <i>Geographical area</i> | | |
| Area (Center) | 0.0302 | (0.0227) |
| Area (South) | 0.0671*** | (0.0189) |
| Children | -0.0537** | (0.0238) |
| Components | -0.0231** | (0.0104) |
| Sex (Women) | -0.00339 | (0.0190) |
| <i>Education Attainment</i> | | |
| Elementary school | -0.000558 | (0.0972) |
| Middle School | -0.0596 | (0.0950) |
| Professional School | -0.120 | (0.0992) |
| High School | -0.194** | (0.0957) |
| Bachelor's | -0.242** | (0.105) |
| Master's | -0.224** | (0.0966) |
| PhD | -0.321*** | (0.101) |
| <i>Marital Status</i> | | |
| Single | 0.0971*** | (0.0274) |
| Divorced | -0.00949 | (0.0355) |
| Widower/Widow | -0.0218 | (0.0333) |

¹ The table for the logistic regression has not been included due to the large number of assets considered in the analysis.

| | | |
|--------------------|--------------|------------|
| <i>Age</i> | | |
| 35-44 years | -0.0375*** | (0.0473) |
| 45-54 years | -0.0101 | (0.0447) |
| 55-64 years | -0.0312 | (0.0471) |
| More than 64 years | -0.0194 | (0.0492) |
| | | |
| Financial assets | 2.46e-08** | (1.24e-08) |
| Consumption | -2.21e-05*** | (1.58e-06) |
| Log(Net income) | 2.285*** | (0.0421) |
| Constant | -14.10*** | (0.410) |
| | | |
| Observations | 8,318 | |
| R^2 | 0.739 | |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Based on the linear regression analysis results presented above, we can observe that the geographical area is only statistically significant for individuals from the South, which may be due to regional economic disparities. People in the South might face different economic conditions, such as higher cost of living or different saving habits, leading to a significant effect on savings. The presence of children negatively impacts savings, as households with children tend to have higher expenses. Larger households, as indicated by the number of components, are also statistically significant. This suggests that larger households may have a higher consumption rate, reducing the amount available for savings.

Education attainment shows negative and statistically significant coefficients for individuals with a high school diploma, bachelor's degree, master's degree, and PhD. This could be explained by the idea that individuals with higher education may prioritize current consumption over savings, possibly due to higher income leading to a higher standard of living and more consumption. The results for marital status are also statistically significant, with single individuals having a positive coefficient. This may make sense since single individuals typically have fewer financial responsibilities compared to married couples, who might allocate more income toward family-related expenses, reducing their ability to save.

Looking at age, we see that only the age group 35-44 years is statistically significant. The negative sign is consistent with the idea that younger individuals tend to save less due to higher consumption needs. This fits with empirical evidence suggesting that saving rates are lower among younger individuals as they focus on consumption in the early stages of their life cycle. The financial assets variable is also statistically significant and positive, suggesting that individuals with higher financial assets tend to save more. This is consistent with the $\log(\text{net income})$ variable, which is also statistically significant and positive. Higher income allows individuals to allocate more resources to savings and investment, supporting the notion that individuals transfer resources from their working years to provide for future consumption. Finally, consumption is statistically significant and has a negative sign, suggesting the expected trade-off: as savings increase, consumption decreases, and vice versa. This is consistent with the basic principle of the Life Cycle Model, where individuals balance their consumption and savings over their lifetime to smooth their consumption.

Moving on to the results from the logistic regression analysis, we see that geographical area influences the probability of investing in assets, with households from Northern Italy serving as the

baseline. Specifically, households from the South and the Center are more likely to invest compared to this reference group. The number of household members is also significant; larger households are less likely to invest, possibly due to higher expenses. Educational attainment plays a surprising role, as the results suggest that less educated individuals are more likely to invest than those with higher education levels. Consumption is highly significant, indicating that as consumption increases, the likelihood of investing decreases. Conversely, as net income increases, the likelihood of investing rises.

Running separate logistic regressions for each risky asset, the results show that:

- men are more likely to invest in risky assets compared to women, with a predicted probability of 0.017 for men and 0.0057 for women;
- the predicted probability of investing in risky assets increases with higher levels of education;
- individuals aged 35-44 have the highest probability of investing in risky assets, while those under 34 years old have the lowest probability, followed by individuals over 64 years old;
- households without children are more likely to take on risk, as are individuals who are not married;
- the predicted probability of investing in risky assets is highest for households from the North, with a probability of 0.0298, followed by households from the Center with a probability of 0.014, and those from the South with a probability of 0.0044.

These findings recall what we studied during the course. In particular, we observed that men tend to take on more financial risk than women, which aligns with the results showing that men are more likely to invest in risky assets. We also discussed how higher education attainment leads to better financial literacy and, consequently, greater risk-taking capabilities. Additionally, the finding that younger and older age groups are less likely to invest in risky assets is consistent with the Life Cycle Theory, which suggests that financial accumulation peaks around age 45, allowing individuals in their mid-life stage to take on more investment risk.

Conclusions

In conclusion, the analysis highlights that geographical location, household size, educational attainment, age, and marital status significantly influence savings and investment behaviors. Households from the North and Center are more likely to invest in risky assets compared to those in the South. Larger households and those with children tend to save less and invest less. Higher levels of education increase the likelihood of investing in risky assets, while higher consumption and lower income decrease the probability of investing. Finally, men are more likely to invest in risky assets than women.