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HOUSEHOLDS FINANCE

How market demand of savings and insurance instruments evolves against variations in several economic variables.

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A mio padre e mia madre

1. ABSTRACT

The objective of this thesis is to provide a deep understanding of the dynamics of households' savings and insurance coverage with respect to Italian families that can be used as reference population. This objective is persecuted by focusing on the few most important variables, which include pure and financial risk, the trend of economic cycle, and finally the impact of COVID-19 pandemic. Data analysis and economic indicators shows significant trends on how Italian households have answered to changing financial conditions and increased health and economic uncertainty.

The statistics show an important increase in market demand for insurance coverage during this period, maybe given to an increased knowledge of risk-related subjects. Hence, it can be assessed that the demand for insurance coverage increases in difficult situations, not only from the economic standpoint, reflecting an increasing uncertainty in financial markets. The output of these findings suggests that the economic cycle is a key element that must be studied. The COVID-19 pandemic has further emphasized this tendency, as Italian households look for greater financial security when having to do with market volatility and increase in general level of uncertainty. In this case talking about turning point in economic cycle is not enough, maybe the recent economic history can be seen as disruption in economic cycle and exactly in this way the writer decided to treat COVID-19 pandemic while drafting this paper. Furthermore, research made by the author on demographic and economic variables has shown an important correlation between wealth, education, gender, age, and reliance on insurance and savings products. Wealth and education can be seen as significant explanatory variables in the decision to purchase insurance coverage, while differences in gender, geographical position and age can be used to explain variances in consumption patterns.

This study tries to provide a thorough understanding of savings dynamics and how both insurance market and demand work under the light of Italian households' preferences. Contemporarily it provides for analysis of important elements that influence individuals' behaviors. The conclusion reached can be used in the insurance sector and in economic policy making, as they provide a solid basis for further research in this field.

2. INTRODUCTION

The objective of this thesis is to have a better understanding of how households react to adverse income shocks and related economic uncertainty by using savings and precautionary savings as well as changing demand for insurance coverage as best response. So many variables may have an impact on this field, to give the reader an example, the change in the economic cycle must have an impact on individuals' risk propensity and so on and so forth. Several variables' studies and data analysis are made to pursue this goal while drafting this work. The starting paragraphs attempt to provide an overview of the purpose to readers and explain the vacancy that this paper tries to fill, here an explanation of the survey used as baseline to make data analysis is mandatory.

Households finance context is briefly explained during the first main chapter of this paper (chapter four), individuals' decisions about finance are essential both in their daily lives but also from the writer's point of view when aiming to understand market dynamics in various sectors. Here it is possible to assess how people make informed decisions on investments time horizon, degree of risk, and also whether to invest or divest. Here graphs and hypothesis tests make realistic the advent of behavioral finances because financial choices appear frequently biased with different degrees as certain conditions or variables change and more often are far from the optimum level.

The concepts of risk and risk aversion are explained during chapter five. As already said after explaining biases in households' investment decisions it is important to see them linked to different risks and degrees of risk. The evolution of literature can explain even more biases, hence an overview of theories developed in decades is required. This chapter primarily focuses on classical approach, sustained by Markowitz, Capital Asset Pricing Model (CAPM) and Merton's Consumer based CAPM and only in the second section the behavioral model is presented with the aid of Prospect Theory.

Chapter six introduces the concept of the economic cycle based on different schools of thought. Surely one of the most global and socio-economic disruptions in modern history – the COVID-19 pandemic – could have a direct impact on variables introduced and used in this thesis. The first part of the chapter tries to explain what an economic cycle at a general

level is, as already said, with different theories that explain it. Soon after an introduction of qualitative indicators and their timing with respect to the economic cycle is made. Finally, the last section explains the stages of economic cycle experienced by Italy in recent history, with the answers given by central banks to shocks due by pandemic.

In chapter 7 is the moment to give the reader a deep explanation of savings. It is important to understand savings and savings allocation to comprehend which variables the model seeks to study in subsequent chapters. As already done while drafting this thesis it is important to start explanation with a literature review on savings theories as it helps the reader understand dynamics of savings over decades. Here an important point of improvement is given by using examples for the explanation of major theories to have more understandability of the theories described.

Regarding insurance sector acquire importance while drafting the chapter to emphasize the centrality of others, closely related concepts, such as pure risks that are those risks that insurance instruments seeks to cover, or the presence of demographic variables and economic ones as explanatory variables that surely influence portfolio choices. These concepts are better explained in chapter eight. To understand the evolution of insurance instruments and especially insurance demand made in subsequent chapter an evolution of theories about insurance, related to behavioral biases is mandatory.

Chapter nine represents the final chapter of the discussion in which the model is presented. The aim is to have applied evidence of the hypothesis made during literature review about savings and insurance coverage. Here the need for graphs is highlighted soon after a brief explanation of socio-economic variables used. The main goal is to monitor variation in insurance and savings demand both in terms of variation of economic cycle and linked to different kind of individuals' characteristics in the sample population. The purpose of this paper is to attempt to provide empirical support for the hypothesis made during literature review. This work is done with the use of data because shocks are large, quick alterations in physical variables that are better investigated with the help of data analysis.

3. MATERIALS AND METHODS

The main source of data while drafting this thesis to explain variable and make hypothesis will be the survey made by the Bank of Italy, which gives the main advantage to have a large quantity of data with so many degrees of specificities based on the necessities of different users.

Starting from 1960s, the Bank of Italy has been collecting data on households' characteristics such as income and savings in Italy through the Italian Household Budget Survey (HBS), which can be seen as a sample survey. The main purpose behind the survey is explicitly stated in one of the early papers:

"The economic significance of households in our system—as well as in all the others with market economies—becomes relevant when considering that households directly or indirectly own almost all the nation's wealth, receive almost all its income, and make up about 75% of all domestic demand in Italy nowadays. Along with contributing significantly to financials and holding a considerable amount of mobile wealth, households bear a heavy financial burden. To acquire this information and, initially, estimate some magnitudes regarding to the households' sector, the Bank of Italy has started a new series of sample surveys regarding variables such as the income, consumption, and savings of Italian households". (Bank of Italy, 2021)

Nowadays the scope of the survey is broader than in the past thanks to the collection of more and more data and factors that can be useful for studying wealth management and financial behavior of the sample population. In fact, even more information is collected, such as payment method used or the percentage share of wealth that Italian's households allocated in insurance coverage in different times.

Before 1987, the survey is organized by conducted explorations yearly; after this moment it has been decided to switch to biannual surveys with the exceptions of 1998 and 2020. Over time there has been a great growth in sample size that in recent times has reached 8,000 families. This makes the sample size a very good approximation of the Italian

population, that the survey tries to represent, without so many simplifications that can maybe appear forced.

To make improvements to the analysis made over the years it has been decided to include a fraction of sample units already surveyed in the previous survey (from now on they are called panel households). The percentage of panel households grew during the years and now account for nearly half of the sample size. The panel percentage is chosen randomly and consists of families that satisfy one of these two requirements:

1) They have been surveyed in at least two previous survey editions.
2) They have been surveyed in the last survey edition.

On the other hand, non-panel households derive from a random choice in the master list. With the survey of 2020 a new concept is introduced, the one of stratification of sample units. The idea is to build an appropriate income and debt level stratification when choosing sample units. This structural shift led to the necessity of the newest weighting method to maintain meaningfulness of historical comparisons, an important feature when making data analysis that make useful the availability of data collected.

The main goal of this final project is to use this huge availability of data to estimate what are the magnitudes of changes in demand for certain instruments like insurance and savings one. This aim can be persecuted by comparing percentage differences in the answers given by sample units to specific questions and hence deducting how families' behavior are affected by disruptions in economic cycle. Here the survey gives a lot of starting data on both the percentage of insurance coverage with the help of dichotomous variables as answers and in terms of percentage of wealth allocated to savings and especially precautionary saving. Given the fact that COVID-19 shocked the economy, radically changed households' behavior when dealing with savings and risk propensity, it gives a bigger room for improvement for better problem comprehension.

3.1 THE NEW SURVEY

The end of the XXXVIII edition of the Household Budget Survey (HBS) is marked in 2021 as COVID-19 pandemic postponed a little bit data exposure, the survey refers to 2019 data and

had to be presented in 2020. The inspiration of best practices coming from abroad led to radical changes in the methodology made in the last survey with respect to the one made in 2016. In addition to the standard demographic variables, information on income and debt status of families that could be surveyed was added when dealing with sample units' selection.

This information is not previously available and now make simpler to reach specific population groups, such as wealthiest and most indebted ones that have systematically escaped from the survey by using merely demographic variables like age and residence because of the smallest number they account for. In the end, the inclusion of income and debt levels along with the oldest categories more socio-economic oriented allows for a more accurate estimation of the carry to the universe weights. In other words, the idea is to improve the number of families in the Italian population that have a representation inside the sample size selected in the survey.

Overall, it can be seen that these changes have improved a lot the ability of the survey to track a wide range of population segments, by also including the ones that have a notable share of the survey's primary variables of interest. Therefore, the survey is now able to give a very good approximation of the population object of study, with a better picture of the distribution of primary variables throughout the sample population.

The main drawback of the improvement in the HBS representation is the disruption of the continuity of historical series. Hence, the only way to make historical comparisons is to apply statistical methods to counterbalance the effects of changes made in the survey of 2020. The objective can be persecuted by using information on income and debt of sample units interviewed for the HBS of 2016 and surveyed again in 2020. In this way a data reweighing system is developed which allows for approximation of the newest sample composition that would have been obtained as if no changes in sampling method happened. It is important to highlight that to ensure consistency in data analysis made in this work and compliance of graphs developed, data used in this thesis derive solely from the portion of answers that has been corrected to make meaningful historical comparisons.

4. HOUSEHOLDS FINANCE

Households Finance is a branch of financial economics that studies how people use financial products and financial instruments available on the market to achieve their goals, both in long term horizon, and in day-to-day operations. At these times even more actions require minimum knowledge of financial instruments, among these duties for example choosing the right payment options, or knowing what the various savings options are available, knowledge of various form of debt financing (i.e., short-term vs long term, leasing, project financing and so on and so forth), and last but not least different kind of insurance coverage. In this challenging environment families can choose to make choices on their own or keep trust in financial intermediaries who have less information gap and are more skilled in the subject matter.

Normative Household Finance is the branch that focuses mainly on studying what are the reasons behind choices made by households when they must manage their finances and make portfolio allocations. Directly from this perspective Positive Household Finance analyzes the compliance of households' choices with the prescriptions of the Normative Model. The objective of this work is persecuted starting from the assumption that there exist deviations from the Normative model because of the presence of behavioral biases that influence individuals' choices. For this reason, the presence of professional guidance and financial education can be a very good point of improvement to reach the optimal choices in portfolio choices especially when dealing with biases and deviations. Here is the first hypothesis of this thesis: understand the impact that variables such as educational qualification have on insurance demand and savings allocation. One reason for idiosyncrasies that deviate from the Normative Model could be the numerous external variables that could influence it. Particularly important among others are:

a) *The size of the industry*: In 2010 survey made from Federal Reserve (FED) estimates that 72 trillion household assets are made up of illiquid assets such as real estate, while 48 trillion are considered financial assets. With assets that account for 28 trillion, evenly divided between tangible and intangible assets, and liabilities of 13 trillion, market size is considered an important statistic for corporations.

b) *Households' characteristics*. Differences in access to finance, the division among liquid assets and tangible assets, the burden of transaction costs and the degree of information barriers are the characteristics considered in this section.
c) *The institutional setting*. There are institutional standards that surely influence individuals' choices, for example: in the US a higher percentage of households apply for fixed-rate mortgages; in contrast to the UK where the biggest part of mortgages is made up at variable rate.
d) *Degree of financial education.* During this work will emerge that especially in Italy a very high percentage of individuals has a very low level of financial skills, hence, they do not have so much confidence in financial system and this result is dramatic especially in uncertainty period where opportunity costs of misconceptions rose.
e) *Regulations*. International regulations, information gaps, and network externalities must all be considered when talking about behavioral biases and deviations from the optimal response.

Main topics analyzed by General Households Finance are linked to great availability of financial instruments and market for households as long as differences in households' attributes. When dealing about households' desires and decisions the primary emphasis is on the fact that, for example, a small percentage of households are business executives who make marginally uncommon decisions due to their greater financial expertise and hence, have easier access to money.

Households can rely on two types of financial resources throughout their lifetimes: they are tangible assets and human capital.

4.1 ASSET FINANCING- HUMAN CAPITAL

With the sentence Human Capital can be considered the stock of individual skills and their knowledge that can lead to labor productivity and labor income. The variables that have a direct positive effect on human capital can be educational background and skills development. Moreover, it can be calculated as the present value of cash flow earned during individual lifetime from income discounted at a proper rate of return. More often the stock of human capital H_a of an individual that have age a can be calculated as follows:

$$H_a = E_a \sum_{\tau=a}^{T} \beta^{\tau-a} y_{a+\tau},$$

In this equation $y_{a+\tau}$ is the (uncertain) labor income at an age a+τ, β is the discount factor, E_a is the expected income at age a, and T is the life horizon. It reaches the peak early during working life and then starts decline as the remaining working years and the expected labor income decline. Surely expected returns can be considered risky because of the uncertainty of revenues on future labor income. Variables that affect the stock of human capital is, among others, educational level, in fact high skilled households experience a much higher rate of percentage of wealth decrease, for example by fixing a benchmark at age of 55 individuals with university background have made up 60% of overall wealth and by decreasing educational skills, for the ones with only primary school it accounts for 80% of the overall wealth.

4.2 ASSET FINANCING- TANGIBLE ASSETS

By moving up to tangible assets, they can be divided into two main categories: real assets and financial assets. Regarding the real estate sector, it can be considered comprehensive of residential and commercial properties, durable commodities, and properties owned by private companies. In the branch of financial assets so many instruments can be considered, for example: cash and cash accounts, various types of securities from the simpler ones to the most sophisticated ones (i.e., derivatives). Most important differences among these products are the degree of risk, the level of liquidity, and the degree of information asymmetry on the value of such assets that can be held in household's portfolio with different degrees.

Fixed assets can be considered differently from other instruments because there cannot be debts or other liabilities on them, hence they have the direct control solely of the owner. Financial assets can be derived also from revenues that comes from real estates that is owned by a third person that is not the title holder, phenomenon that if due with many assets putted together is called *cartolarization*, very useful to produce more transferable securities from very illiquid assets with the aim also to lower risks connected to each asset

by making pooling and risk diversification. In financial operations where there are incentive contracts and control frameworks there can be control delegation to more skilled individuals that operate on more efficient market for exchanges, more liquid than the ones available for real estate's properties.

Nowadays the trend highlights a continuous growth in the number of financial exchanges because of the growth of the finance at common level (also note as *disintermediation*): Financial operations are made on exchange markets that are sometimes publicly available. Even though the complexity in financial securities can lead to difficulties in understanding for most common individuals. Furthermore, even if information on past performances of corporations is available to general public at least when dealing with listed companies, they can be unclear and can lead to misconceptions.

Residential and commercial properties have the main drawback that are traded on a very illiquid market, also highly specialized. This is since a very small percentage of properties are owned to be traded. As a result, durable goods can be affected by the well-known "*lemon problem*" because in this field there is bigger room for information asymmetry. Moreover, the real estate sector is highly affected by transaction costs and taxes and sometimes merely holding real assets can leads to only non-monetary revenues that is explained in a bit. The primary use made with real estate's properties and durable goods is to satisfy consumers' needs and only at a final stage increase its resale value. Hence, they are not commonly traded even if they represent a large share of individuals and corporations' wealth. As a result, this makes it difficult to estimate the risk and expected return of real estate assets.

In figure 1 is represented the distribution of tangible assets split into six main categories. Three of them can be linked to tangible assets that are represented by real estate, business, and vehicles. The others are closely related to money in absolute terms and are divided into cash, other financial sources, and obligations. Cash can be also divided into certificates of deposits and saving accounts that can be both directly or indirectly held in a bank account or through pension funds. Moreover, in the graph is also included cash value life insurance, whereas in securities can be allotted derivatives, leasing and loans to friends and family.

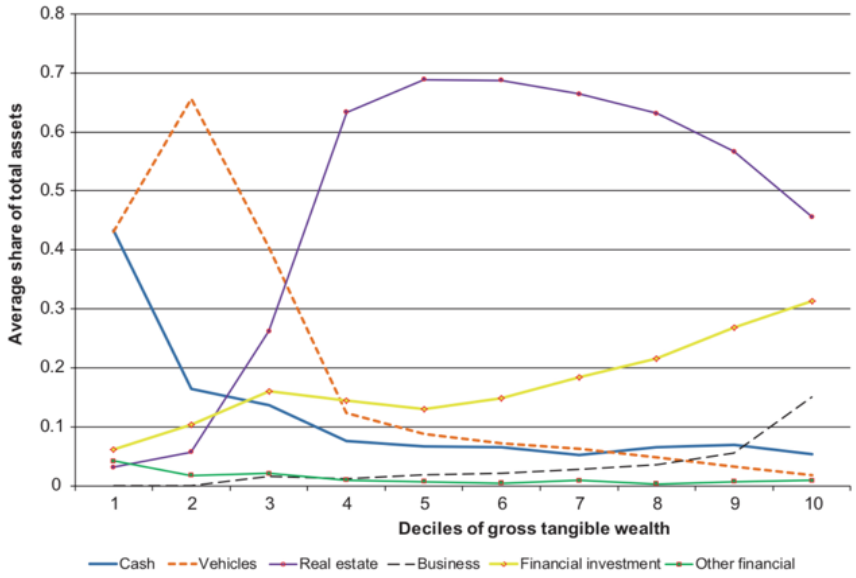


Figure 1: Wealth composition: allocation of tangible wealth in different types of stocks, divided by deciles of gross tangible wealth.

From figure 1 can be seen that a house is the most valuable asset if a certain family can afford it. Residential properties are often difficult to sell because of a negative income shock because is primarily used for consumption needs rather than to having gains. As a result, real estate properties can be seen as a source of underlying risk that is not diversifiable in empirical models for portfolio allocation. Hence, from now on the model takes into consideration that the distribution of financial wealth has more and more horizontal differences at this point.

Moreover figure 2 shows the portfolio allocation in five asset classes that are: cash, fixed income, equity, cash value life insurance and other assets. In this model both direct and indirect investments can be included, knowing that when dealing with indirect investments the model refers to investments made through a dedicated investments fund, hence, a more informed and skilled intermediary. What it is possible to highlight is one of the first variables that this thesis wants to study, i.e., the fact that the percentage share of assets held in equity through stock (i.e., higher risky share of portfolio) steadily increases with wealth suggesting that these two variables are positively correlated. On the other hand, cash that is seen as a safe asset clearly falls with increasing investor's wealth.

In ultimate instance Canner, Mankiw, and Weil (1997) highlight a newer phenomenon known as *Asset Allocation Puzzle* that talks about the fact that investor choices about risks

significantly vary among individuals. This is an important deviation from the Classic Portfolio Model which asserts that there are not different degrees of risk aversion based on individuals' preferences and that there are no frictions in the market. Soon after in this paper will be discussed how this strong assumption cannot be held meaningful.

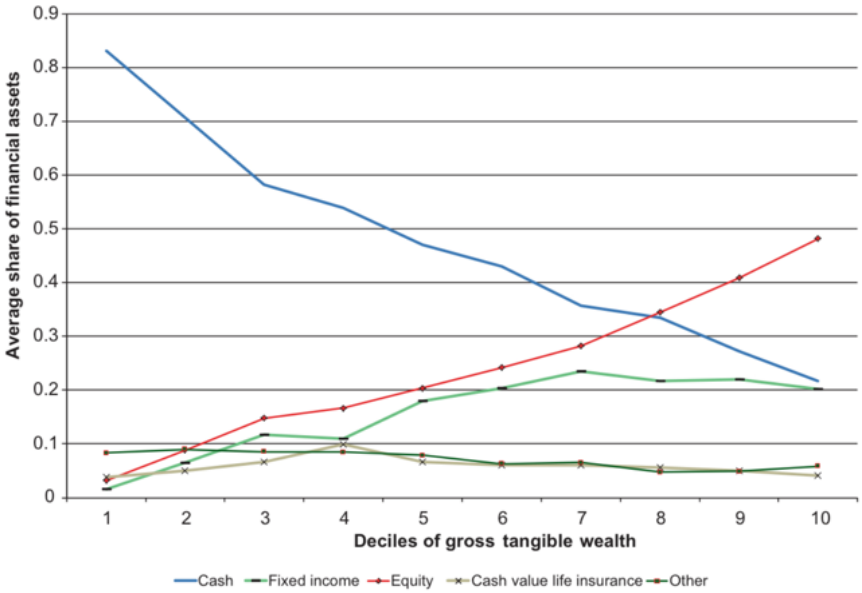


Figure 2: Allocation by deciles of gross tangible wealth of financial wealth held in various stocks.

According to the Classical Model each investor should hold the same portfolio with an equal share of risky assets and risk-less ones, hence, the result must be almost 100% level of behavioral homogeneity. As a result, investments in risky asset classes could be made only to gain equity risk premium and cannot lead to diversification in portfolio allocation. The graph clearly shows huge differences in behaviors, which strongly contradict the reality emphasized by classical hypothesis and even more evidence of this hypothesis is further explained during this work.

4.3 DEBT FINANCING

The first necessity for families in order to invest in tangible assets and human capital is surely to have access to financial markets and, more generally, to sources of financing. Individuals can have a very wide variety of debt instruments to invest in financials; for instance, they can make application for a mortgage, can use credit card line, use student loan or even consumer loan. It is possible to assess that debt recourse varies with different

explicative variables, for example asset level, ownership level. Consequently, also debt to income ratio varies across households' categories and asset classes.

Among many important things to consider when dealing with households' finances, particularly relevant for this thesis is the trend of connection between debt and asset level. In fact, poorer families have more difficulties in obtaining a mortgage than the average wealthy households, which have a rate of mortgage at 70%. Households in the third decile of wealth rely more than others on student loans and consumer loans, especially with respect to wealthier ones. Finally, individuals in the second to eighth decile of wealth distribution have more chances to have a credit card debt. In second instance as each assets' category vary so widely, ownership and debt-to-income ratio surely change consequently.

By analyzing participation rate on mortgages, it increases proportionately with assets but at a lower rate for families with lower income. It becomes a hump when dealing with consumer loans and credit cards; moreover, regarding educational loans they decrease as assets owned increase. Finally, the unconditional debt-to-income ratio shows a similar trend. (Sodini, 2013)

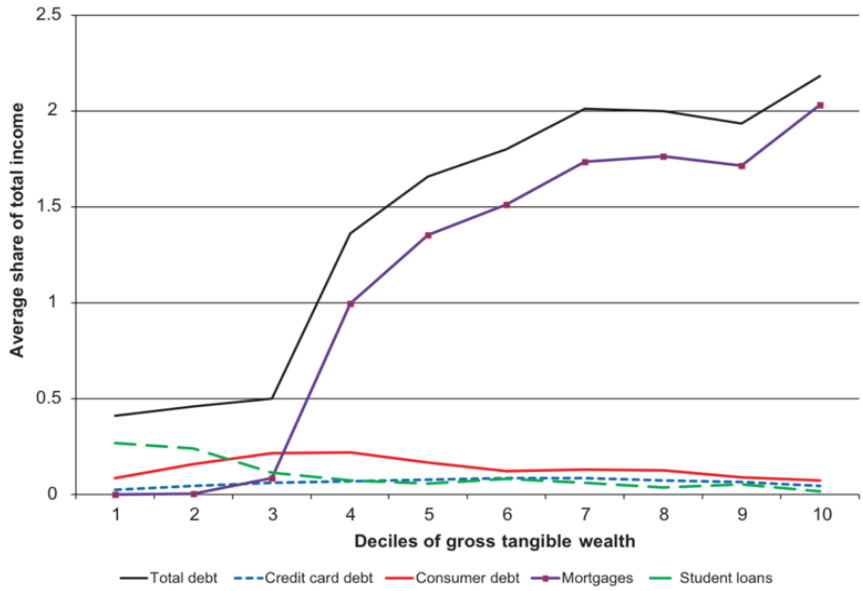


Figure 3: Debt-to-income ratio expressed in deciles of gross tangible wealth for different debt classes.

5. WHAT IS RISK AND HOW IT IS ACCOUNTED IN PORTFOLIO THEORIES

Households finance study how individuals consider risks when having to do with financial markets and to gain access to money. When dealing about risk, it can include both the uncertainty about the expected value of future income that has a percentage probability surely below 1 and secondly, the chance that the future value of certain investment could exceed or fall below its initial value. The direct definition of the sentence degree of risk of a certain security can be assessed by the volatility of its future cash flows. Risks can be divided into two main categories: idiosyncratic and systematic risks. When dealing with idiosyncratic risks they represent company-specific risks that can be lowered by holding a diversified portfolio. On the other hand, systematic risks may affect an entire sector, market segment or, even, the entire economy, hence it is a function of socio-economic elements. It can be also called market risk and as such it is more difficult to lower it. The best example of the latter type of market risk is COVID-19 pandemic, broken out in 2019 that has impacted the entire world economy and has both direct and indirect consequences even nowadays.

Financial intermediaries and individual investors are concerned about the debt level of corporations and the linked chance to survive with shortages in liquidity. As a direct consequence the price of securities generally declines, reducing consumption patterns and the stock of financial assets. To summarize the new environment, the level of uncertainty raised up because of the pandemic scenario, leading to demand and supply shocks, personal consumption decreases, precautionary savings increase and budget constraints on firm expenditures can be experienced.

The Market Risk Premium can be considered an important benchmark in several financial domains, such as portfolio allocation, pricing assets and risk management. In the economic literature the Equity Risk Premium (ERP) can be seen briefly as the excess return that the market portfolio must give to their holders beyond the return provided by the portfolio made only by risk free assets.

5.1 ASSESS VARIATIONS IN DEGREE OF PROPENSITY TO RISK

In 2008 Lettau, Ludvigson and Watcher deeper discuss the economic risk and try to show the correlation between the equity risk premium in the U.S. market and the trend of economic volatility. To see this correlation one graph that can be used linking the volatility of GDP growth and the dividend-to-price ratio that can be used as a good approximation of the equity risk premium.

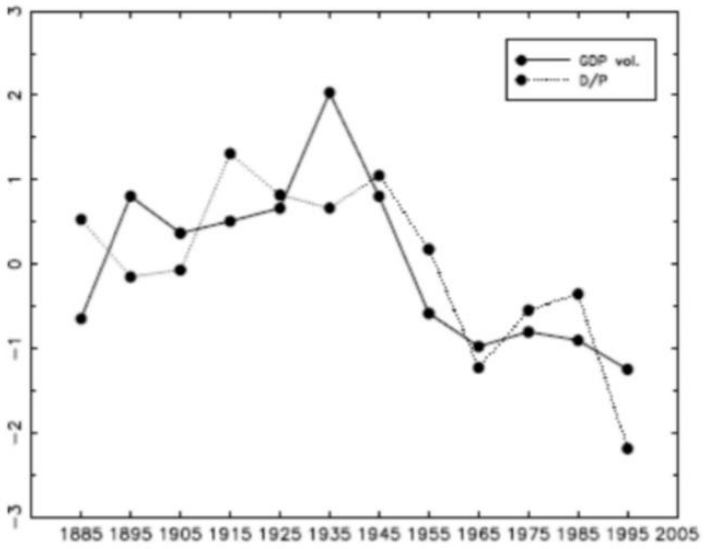


Figure 4: GDP volatility and D/P index.
Source: Damodaran, 2008, ERP: Determinants, Estimation, and Implications, page 7.

The graph represented in figure 4 shows perfectly that when dealing with long-term analysis the dividend yield has the same trend of volatility as the real economy. This trend can be explained by the cyclical nature of these metrics, better explained in the subsequent chapter, and by the reciprocal influence that these variables have. In the real-world riskier investments are more likely to be subscribed in expansion phases of the real economy, yielding a higher return; hence the ERP need to go up in the growth phase of the economy. As already said it is important to see from figure 4 the importance of the economic cycle as a driver for the market return. As an example, it can be seen when there is a drop in D\P ratio like in deflationist environments or, also, a smaller equity risk premium is expected during a recession but can be seen as a positive payoff in every case because of an increasing level of uncertainty that reduce expectations on future returns.

People that do not like to take risks are called risk averse in the literature. An investor can be considered risk averse when prefers a lower return, in some cases even below the average level, in exchange for a higher level of certainty. Since price volatility allows for both large gains but also large losses, it can be considered a good benchmark for evaluating risks. If the investor looks for capital preservation, the holding portfolio surely must contain mostly low-risk investment, with very low chances of capital loss but also a very little return. In an inflation environment the objective of risk averse investors is more often merely to outpace inflation with no gains over it.

Investors that do not consider risks when evaluating securities and related expected return are known as “risk neutral”. The expected return can be seen as the profit (or loss as a counterpart) that an investor can expect based on the analysis of past performances of a certain security. The calculation consists of multiplying the amount of possible returns by the probability to have such return. A risk neutral investor dives deep into the expected profit calculation, regardless of the related risk. On the other hand, risk averse investors are searching for a lower return in exchange for a high probability of receiving their money back. It can be concluded that they want a probability as close to 1 as possible.

As a direct consequence of this hypothesis there is a broad difference between both investors and investments they choose. Risk averse investors are more inclined to choose among others, dividend stocks, government bonds or certificates. Usually by referring to risk-averse investors it is possible to include investors that have a more conservative behavior. Those type of investors want to reduce volatility in their portfolio as much as possible, hence by holding merely a nearly liquid asset. If they want to close their investments, they do not like to choose the right moment on the market to exit. In summary, they want to be independent from market dynamics and this is what they search for when building their portfolios. Choosing investment based on degree of risk can be a good strategy for protects portfolio by market volatility, but it is important to say that there are several strategies to reduce risks on portfolios, one very good benchmark can be portfolio diversification, which protect at least from some type of risks.

Diversification can be explained as holding portfolio with unrelated assets and businesses. Doing this can help a lot in mitigate expected losses and maximize expected returns by also reducing portfolio volatility and hence, overall risk. Another good way to lower risks can be to invest in income-producing securities, for example bonds and all the financial instruments that have fixed returns and regular cash flows rather than a type of reward Thai is linked to capital gains. In this investors' class falls for example pension funds. The main drawback of such types of investments is the low balance with rising inflation and little safeguard against adverse income shocks. Nevertheless, it is important to say that it is possible to protect portfolios from inflation by increasing the share of inflation protected securities especially in inflationist environment of the economic cycle.

Even if risk aversion tries to maximize the probability of earning back own money, the main drawback is that it minimizes the expected return. Here there is the "risk-compensation trade-off" that is the best explanation of this new phenomenon. The advent of Behavioral Finance seeks to explain individuals' choices and also the fact that more often risk adverse investors decide even to do not undertake profitable opportunities because of the unjustified fear of losing everything. If this is not enough, the presence of inflation dramatically reduces the value of cash maintained liquid. In the language of economist, this is a cost because the investor does not care about opportunity to use resources in a more profitable way; mathematically it can be accounted as the profit that can be made by undertaking the best outside option available. In 1979 Kahneman and Tversky broke out with the newest "Prospect Theory", that states that talking about risk aversion cannot be linked to loss aversion.

Risk aversion can be explained as the behavior focused on eliminating all possible losses, by lowering their probabilities. On the other hand, loss aversion is explained mainly by the asymmetry in consideration of suffering losses which are treated more heavily than enjoying gains even if in absolute terms are equal with respect to a reference point. Risk aversion, as a result, can be considered as a completely rational behavior, but loss aversion is an irrational deviation that behavioral finance tries to explain. Prospect theory gives credit to the hypothesis that individuals are not completely rational when choosing options

that, at least in theory, could have the same expected profit. Here it is possible to build a model that pushes losses ahead of profits.

As a practical example one case study made gives the participants the chance to choose to earn 0 with a 25% chance and 4,000 euros with a 75% chance, or 3,000 euros with a 100% chance. Those who want to make a safe profit surely choose the latter one. However, when the options are presented as 100% probability of losing 3,000 euros or 75% probability of losing 4,000 euros and 25% probability of losing nothing, more people chose the latter. This case study explains that even if results in the two possibilities are extremely comparable, safer gains lead people to choose safer chances.

Another phenomenon that this work wants to study is the fact that rapid decisions that do not consider the true risk exposure usually lead to overconfidence. This is defined as the people's inclination to ignore worst scenarios in favor of better ones. As a direct consequence risk appetite can be biased from how chances are presented. This phenomenon is known as "Framing effect" and directly impacts the choices made by individuals based on options presented. Previous research in literature has demonstrated that people's behavior in financial decision-making is not completely logic. Again, the role of Behavioral Finance must play its protagonist role in the field.

Risk aversion is widely described until now in this chapter as a critical topic when dealing with investment decisions and biases. This is one of the most impacting factors explaining differences among households' preferences and hence, the deviation from classical literature or optimal approach. In the end it can be seen during literature review and data analysis that some variables have impact in the model, for example women are less risk addicted than men, and that more wealthy individuals are more likely to take risks. Furthermore, it has been observed that risk aversion decreases with age and that parental education has a negative impact on risk aversion of their child. (Parmegian, 2021)

The aim of this project after the literature review is specifically to study how these variables and changes affect a specific sector, namely the insurance sector and savings allocation. The objective is to understand how these instruments' demand vary according to some explanatory variables (i.e., gender, education, wealth…).

Till this moment in the description this chapter has explored concepts and definitions of risks and risk aversion. Now is the moment to introduce risk indicators and theories that use Normative and Descriptive approaches.

5.2 CLASSICAL FINANCIAL THEORY: RISK INDICATORS AND PORTFOLIO THEORIES

Classical financial theory studies the variation of expected returns from target and average values by taking risk into account as a metric for benchmark the variability in the former ones. This measurement can be classified as in table 1 below.

Misure simmetriche: Tale misure si sviluppano dall'ipotesi che i rendimenti siano distribuiti normalmente		
Deviazione standard (SD)	Misura della media ponderata (ovvero pesata per le probabilità π) delle potenziali deviazioni dei rendimenti (r), in un ipotetico scenario, rispetto al loro valore atteso.	$\sigma = \sqrt{\sum_{i=1}^{n} \pi_i [r_i - E(r)]^2}$ con $E(r) = \sum_{i=1}^{n} r_i \pi_i$
***Tracking error variance* (TEV)**	È definita come la differenza tra i rendimenti attesi di un investimento e i rendimenti di un *benchmark* a cui si fa riferimento.	$TEV = \sum_{i=1}^{n} \pi_i [r_i - b_1]^2$
Misure asimmetriche: misurano il rischio di *down side*. Tali misure richiedono la specificazione di un punto di riferimento a partire dal quale sia possibile individuare la parte negativa dei rendimenti		
***Below target semi variance* (BTSV)**	È calcolato prendendo in considerazione solo i rendimenti inferiori all'obiettivo (*target*).	$BTSV = \sum_{i=1}^{n} \pi_i \, Max[0, (T - r_i]^2$
***Below mean semi variance* (BMSV)**	È calcolato prendendo in considerazione solo i rendimenti inferiori alla media.	$BMSV = \sum_{i=1}^{n} \pi_i \, Max[0, (E(r) - r_i]^2$
VaR	È il più basso quartile della distribuzione delle perdite potenziali che possono verificarsi all'interno di un dato portafoglio per un periodo di tempo specificato. I due principali fattori che occorre scegliere per la computazione .	$probability\,[V_t \geq VaR] = 1 - \alpha$

Table 1: Risk indicators in classical theory

5.2.1 MARKOWITZ THEORY

These indicators can be used as a reference point for risk assessment procedure as well as in Modern Portfolio Theory (MPT) exposed by Markowitz. MPT theory was exposed by Markowitz in 1962 as a useful tool for showing the relationship between mean and variance, with variance degree that play the main role in decision making phases. The primary hypothesis is outlined here:

- Investors should consider expected returns and related risks when making choices about investments (more often it can be made with the help of standard deviation).
- Investors are risk averse and want to maximize expected return by making rational decisions. (with this assumption risk has a negative connotation).
- The time horizon is the same among investors.

The first two hypotheses are closely related to the relationship highlighted between mean and variance. The assumption is that each investor will choose the option that minimizes risk and maximizes expected return. In the optimization process the purpose of the investor is to calculate the expected return as a weighted average of returns and the risk as a weighted average of the risk linked to each security, added to the sum of the covariances, as formulas below try to explain.

$$E(r_p) = \sum_{i=1}^{n} E(r_i) * w_i$$

$$\sigma_p = \sqrt{\sum_{i=1}^{n} (w_i \sigma_i)^2 + \sum_{i=1}^{n} \sum_{j=1}^{n} w_i w_j \sigma_i \sigma_j \rho_{i,j}}$$

As already said the purpose of investors is to minimize risks and increase the expected return. The objective is to reach a final decision that is the best response in the process of building a strong portfolio. The optimal portfolio according to Markowitz theory can be the one that has the highest expected return at a given level of risk, or, on the contrary, the minimum risk level at a given level of expected return. Surely the choice about the optimal portfolio is affected by the level of risk aversion of the investor. By collecting a sort of reference offers each investor can build his own MPT-defined indifference curve. Indifference curves can be extracted by the quadratic formula below.

$$U = E(r) - \frac{1}{2} A \sigma^2$$

This feature allows to confirm the MPT hypothesis and highlight two important results of classical theory listed below.

- ✓ The trade-off between risk and reward determines the utility function of each specific investor.
- ✓ The correlation between risk and profit has a negative connotation.

5.2.2 THE CAPITAL ASSET PRICING MODEL (CAPM)

The hypothesis and results reached by Markowitz theory allows to conclude that there is a positive connotation between increasing risk and rising expected return. The effort put in place to accept higher risks has the counterpart of higher returns. Starting from 1960 Capital Asset Pricing Model (CAPM) helps to establish a formal link between risk and return. This model adds several underlying assumptions to the ones made by MPT.

a) Investors are price takers.
b) All investors have the same information and can deduct the same expectations about future returns, as well as the same level of standard deviation and covariance.
c) Every investor selects his own portfolio with the objective of maximizing the expected return. The expected profit is dependent only on E(r) and σ and varies based on both investor and investment under consideration.
d) Decisions are made simultaneously and for the same time horizon.
e) There is an infinite number of risk-free securities.
f) There are no taxes.
g) Each security is infinitely tradable and divisible.

Under the light of CAPM, the expected return on risky investments can be seen as the sum of expected return on risk-free assets plus the already met equity risk premium, which is weighted by the degree of risk (βj) of the security itself (see equation below):

$$E(R_j) = r_f + \beta_j(E(R_m - r_f))$$

This return can be defined as the minimum requirement that an investor would have to hold the risky security in his portfolio instead of the risk-less one. Here becomes clear that the relationship between risk and return is linear. Risk aversion has not a direct effect on the selection of riskier portfolios, despite influencing the share allocation of portfolio held

in risk-free securities. This regulatory approach is the baseline for both Capital Asset Pricing Model and Modern Portfolio Theory and aims to give a price to risks based on the fundamental trade-off between risk and reward. Statistically it can be seen as a variance or the degree of dispersion of results. Hence, in Classical Theory the idea of risk is evaluated through the structure of the own built utility function. (Bontà, 2014)

5.2.3 AN EXTENSION OF THE CAPM – THE MERTON CONSUMER BASED CAPM

Merton, Lucas and Brock try to give an extension of the Capital Asset Pricing Model made by Sharpe and Lintner known as the Consumption-Based Capital Asset Pricing Model which has the main purpose to study how asset valuation and serial correlation properties as regarding to asset returns and consumption patterns might be made. The output explains that the most important technique for pricing assets is to use their own return, by discounting it at the newest Inter-temporal Marginal Rate of Substitution (IMRS). As a result, the cost of a certain claim can be calculated by multiplying the expected payout by the investor's marginal rate of substitution.

The optimization problem that needs to be solved includes a client with N different assets at individual's disposal. The client needs to choose portfolio and consumption patterns that optimize expected utility in lifetime, subject to inter-temporal budget constraints. Considering the assumption that preferences may be constructed over time to build future random streams of consumptions, the maximization problem for the individual h can be written as follows:

$$\max E_t \left[\sum_{s=t}^{T} \beta^{s-t} U(c_{h,s}) \right];$$

s.t.

$$\sum_{k=1}^{N} A_{h,s}^{k} = \sum_{k=1}^{N} A_{h,s-1}^{k}(1 + r_s^k) + y_{h,s-1} - c_{h,s-1},$$

Here the non-asset income of consumers is represented by $y_{h,t}$, β represents the time discount factor, k is the total wealth held in a certain asset whose return is $r_{k,t+1}$, and finally the individual consumption of the h individual through a period with length s is represented by $C_{h,s}$.

The C-CAPM gives so many improvements as well as some drawbacks. In fact, the empirical data does not confirm the fundamentals of rational expectations and market efficiency in modern economic theories. Over time the literature has made some effort to explain this evidence and to give the reader an example of this output, Epstein considers relative consumption and the general level of utility and focuses on individual preferences by relaxing the hypothesis of time-separable utilities. On the other hand, Lucas focuses more on market failures and incompleteness included in trading costs.

In decades even more considerations must be included in the model and now is the moment to consider the concept of limited participation in financial markets. It has direct bad consequences as the assumption of per-capita consumption growth as a proxy for individual consumption growth cannot be held when pricing assets based on their covariance with the Inter-temporal Marginal Rate of Substitution.

It consists of the idea that non-shareholders do not need to adjust their consumption as a response to change in expected returns simply because their income is not correlated with market returns on stock exchanges. This hypothesis might explain the heterogeneity in participation and the output between expectations and evidence emerged. As a result, there is almost no correlation between non-shareholders' consumptions and forecasts on expected returns on the market, hence, adding them, as C-CAPM has done, can lead to very inconsistent results. In conclusion it is implied that a larger share of the stock market is owned by a smaller number of shareholders that, hence, have great volatility in expected return and in the end must be discounted at a higher rate than others, especially with respect to one's falling into non-shareholders category. (Paiella, 2004)

5.3 BEHAVIORAL FINANCIAL THEORY: RISK INDICATORS AND PORTFOLIO THEORIES

Behavioral Finance causes a disruption with respect to traditional financial theory because broke out with the idea that risk cannot be based solely on the volatility of expected returns. Prospect Theory made by Tversky and Kahneman has the most important role in the revolution that affects decision making processes. In this process investors usually consider the level of gains and losses when building a utility function. Now, while making decisions investors should draw a newest value function. This radical change in the theoretical

framework highlights the need to identify risk indicators more consistently than the symmetric ones used by Classical Theory. The newest critical indicators are highlighted in Table 2. The main criticisms on classical theory and especially to Markowitz theory comes in 2012 with Lucarelli, Brighetti and Alemanni which want to highlight the normality of irregularities in investment choices as presented by Behavioral Finances and focuses mainly on two underlying assumptions of MPT:

- The risk aversion issue is highlighted by classical theory.
- The linearity of structure of probability.

Momenti parziali inferiori (MPI)	Tale indicatore si misura solo quando i rendimenti sono inferiori all'obiettivo target.	$MPI(t,k) = \sqrt[k]{E[(t-x)^k \mid x \leq t]}$ Il parametro k esprime la sensibilità della misura alle perdite estreme (più è alto più sarà il peso alle perdite estreme nella determinazione del rischio)
***Absolute shortfall* (AS)**	Rappresenta la media dei casi in cui il rendimento è inferiore all'obiettivo t. È un MPI con k=1	$AS = MPI(t,1) = E[(t-x)^k \mid x \leq t$
VaR	Stima una perdita potenziale relativa a un determinato intervallo prefissato. È un indicatore che si presta anche ai modelli comportamentali.	

Table 2: Risk indicators in behavioral theory

The main purpose of this newest school of thought is formalized in the Behavioral Portfolio Theory (BPT). The objective of the modern BPT is always to maximize expected utility in the same way as MPT but starting from different input variables. Dealing with the reference point, financial outcomes are evaluated in relation to the "status quo", from this point any achievement above this benchmark can be considered gain. On the other hand, if the output value falls below the benchmark it is considered a loss in the eyes of investors. The second main point highlighted by BPT is the idea of diminishing sensitivity, which says that the absolute values of gains and losses decrease as they increase. Thirdly, when comparing gains and losses the concept of loss aversion makes losses heavier than gains even if equal from the reference point (see also Cumulative Prospect Theory).

In the end it can be concluded that BPT radically modifies the mechanisms for risk assessment; with respect to classical theory risks cannot be considered as closely related to the shape and density function of probability distribution. Instead, they are linked to the representation of the cumulative probability distribution chosen by investors. (Bontà, 2014)

5.3.1 PROSPECT THEORY

Prospect Theory carried forward by Tversky and Kahneman has the main purpose to recover the irrational deviations and psychological variables that influence behavioral decisions from the perspective of human qualities and behavioral aspects. They primarily look at the problems in the relationship between expectations and utility concepts. A very good illustration of Prospect Theory is the value function as in figure 5:

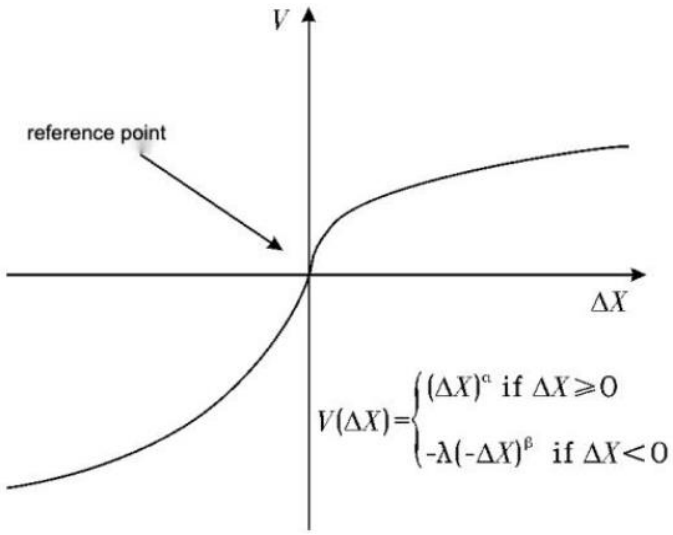


Figure 5: Value Function

Prospect Theory helps scholars to emphasize that since what matters to people in real world is the relative wealth change other than wealth in absolute terms the value function can be the best representation of how individuals answer to relative change in wealth. Value function helps also to present the three main pillars of Prospect Theory listed below:

1) Individuals risk aversion in the face of acquisition situation.
2) Individuals risk chasing in the face of deficit situation.
3) Individuals react to losses more strongly than to gains.

As regards the reference point, the value function can be divided into two separate S curve lines. If the profit or loss exceeds the reference point, people are more likely to choose exit programs, which can be considered profitable as they fall in the convex part of the value function (see the right part of figure 5 with respect to the origin point). Whereas if personal earnings or losses are lower than the reference point (left part of the S curve in figure 5) they feel themselves in losing environment, which increases the average propensity to take risks. Individuals' risk perceptions are directly affected by the framing effect, which might cause difference evaluations of the current environment, and whether it involves gains or losses. Of course, also the reference point is subjective and depends on the risk attitudes of each individual and desired level of wealth.

Nowadays there are so many behavioral factors that might influence individuals' financial decisions. According to Prospect Theory an objective risk with low probability receives a higher subjective psychological evaluation and vice versa. (Wei, 2023)

5.4 COVID 19 AS A SOURCE OF SYSTEMATIC RISK

COVID-19 pandemic can be seen as a disruptive and unexpected event with socio-economic global implications. The recession breaking out was made by a real non-financial shock of the economy that damaged both supply and demand side. Regarding COVID-19 Caballero in 2021 constructed a model for measure the risk tolerance to endogenous risk and the methodology for pricing assets during phases of economic cycle where there is contraction in aggregate demand because of a real shock in the economy. According to this newest theory a recessionary shock reduces the absolute wealth of risk loving individuals by lowering price of the assets, this in the end lead to increase in financial leverage.

Therefore, there is a decrease in the tolerance of market risk, which starts a downward spiral by pressuring more and more asset prices and hence, overall demand. The economic activity in the euro area saw an incredible fall because of pandemic, and especially, Italy's GDP shrink by 14.3% during the first semester of 2020 (Istat estimate on domestic economy). The impact can be seen in all sectors including industry, the service sector, agriculture, forestry fishing and so on and so forth.

The GDP trend has dropped to levels never seen in modern history, reaching a level comparable to the Second World War, hence the effect can be seen noticeably worse than the previous crisis of last decades. From the macroeconomic point of view the recession caused by Covid disease was a perfect example of systematic risk that affects extensively all market segments, even if only temporarily, in the world economy. The immediate effect on the financial market was a huge decline in economic activity because of the real-life shock that happened. In fact, the economic market lived in a very challenging environment, with stock prices pushed down and an incredible rise in volatility indexes, describing a very uncertain world from many points of view.

Here is the moment to evaluate the effects of pandemic through a graph as in figure 6. The equity risk premium has a direct link with the spread of the pandemic as can be seen below. The black line represents the pattern of equity risk premium (ERP) value in the U.S. market. The ERP was estimated starting from the value of S&P 500 and the Treasury Bond Rate at the conclusion value of each day of trading. Then, the total return of such securities was calculated by considering the entire number of stocks repurchases and dividends distributed in dollar currency over the previous twelve months.

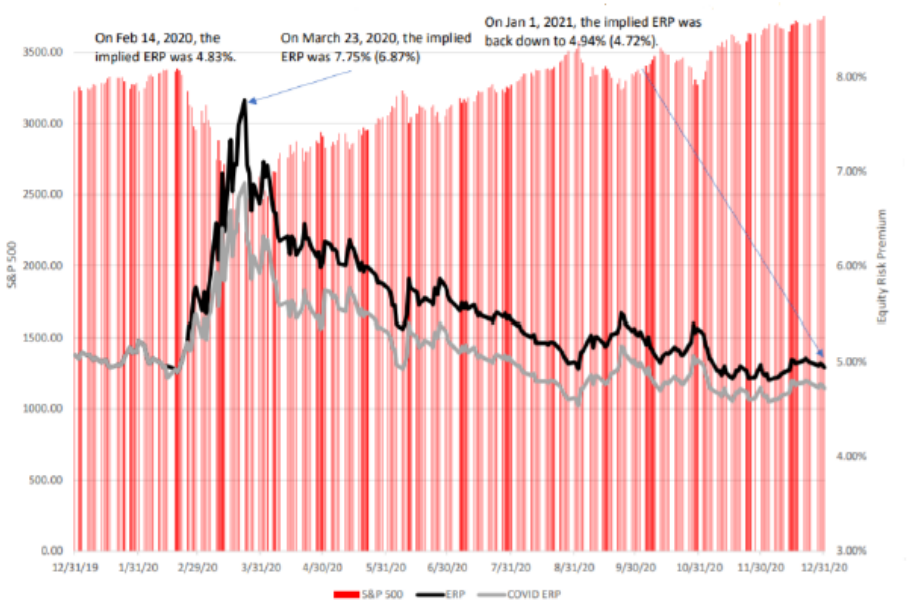


Figure 6: Equity Risk Premium referring to S&P 500.
Source: Damodaran, 2021, ERP: Determinants, Estimation, and Implication pag. 104.

Damodaran, professor of finance at the Stern School of Business at New York university, made a data analysis that shows that on March 23, exactly after the Italian's government

announced 200 confirmed cases of COVID-19, the value of ERP for the U.S. S&P 500 index increased from 4,7% to 7,75%. This abnormal increase in equity risk premium was the main consequence of investors' increasing anxiety. In other words, since the economy becomes rapidly more uncertain and unpredictable, investors become more risk adverse, hence, market shocks has led consequently to a huge increase in the implicit market risk premium.

It is important to highlight that the ERP level returned soon to the pre-crisis level early in September 2020. On the other hand, in the 2008 financial crisis the level of ERP remains higher than the pre-shock level for at minimum three years. Finally in December 2020, the ERP level registers a fall to 4,72%, a registered value even lower than the pre-crisis level. This suggests that investors felt the market as the pandemic crisis has never existed starting from the last quarter of 2020. Regarding the risk assessment perspective, it can be seen that the broke out of COVID-19 pandemic does not lead to fundamental shift in the economic market since the change in market risk premium was reabsorbed in less than a year and hence no long-term consequences can be seen from the market point of view (Damodaran - Parmegian, 2021).

6. THE ECONOMIC CYCLE – CONCEPT AND DEFINITIONS

The economic cycle is the representation of the trend of expansion and contraction in the economic activity of a certain reference economy. The fact that there are several definitions of economic expansion and contraction also starting from the same historical series can lead to misconceptions. Here is a description of what can be defined as an economic cycle based on some scholars' idea found in the literature.

Moreover, in the literature it has been found three different definitions of economic cycle that can be applied to this contest. These are the notions of growth cycle, the classical cycle, and the growth rate cycle.

The term **classical cycle** has the main advantage that does not needs to separate the historical data into cycle component and trend component, hence, it can be used independently to assess variations in the level of economic activity (see for example how GDP works). In the end, it is possible to use historical series to assess whether there is a recessionary or growth phase by using the notion of *stages* of the economy.

The term **growth cycle** can be seen as a deviation analysis of the economic activity from its long-term potential level. Here it is important to highlight that if the objective is to extract from the historical series the short-term fluctuations in the economic cycle, the long-term trend must be deleted from data. The classical example is the *detrending* operation from data on GDP to have in isolation short-term variations in economic cycle. Here is the moment to introduce an important concept, the one of *output gap*, which deals with fluctuations of the actual level of economic activity with respect to its potential value.

Finally, the notion of **growth rate cycle** tries to assess what is the correlation between economic oscillation and the growth rate of GDP, or, in other words, the growth rate of the economic activity.

Over the decades the main indicator of the state of the economy has evolved. For example, at the beginning of the twenty-first century the most often used economic indicator is the *general level of prices*. The problem that arose is that it continuously grew by losing its representativeness, hence it has been substituted by other newest indicators such as the

level of employment or the level of production (I.e., the gross domestic product: GDP). The latter one became the most used indicator of economic growth.

The economic cycle can be commonly divided into four main phases: *expansion, crisis, recession,* and *recovery.* During the expansion phase it is possible to see a rapid growth of the GDP level, this is especially due to high output levels and expansionary monetary and\or fiscal policies. When the expansion phases reach its peak, it lives the stage to a crisis period in which the expansion stops growing. This is the moment when Okun in 1962 highlights the necessity of assessing which indicators can be best suitable in order to to mark the incoming recession, for example an increase in general level of prices, a lack of confidence in financial system and so on. Soon after the characteristics typical of the depression era occur including a fall in level of production, reduced income and hence, high level of employment. It can be discussed a recession typically when the GDP's negative trend accounts for more than 10% and it persists for a reasonable period of time, more or less four years. Here is the moment to find a different type of profit which can push the recovery phase. In this way, a new economic cycle can start.

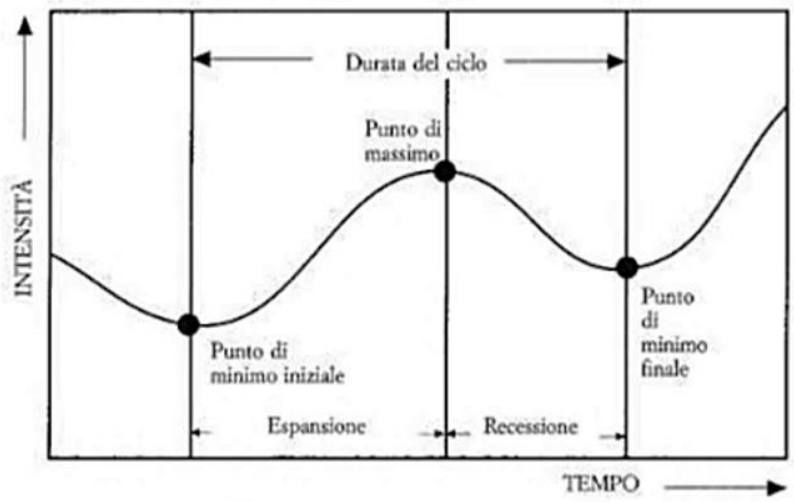


Figure 7: Four phases of the economic cycle

From figure 7 it is important to highlight the necessity of the right assessment of turning points, in other words the highest and lowest points of the economic cycle where explanatory variables change their trend. Thanks to the fact that the economy follows a cyclical path, a perfect alternation of turning points can be discussed. There are several ways to make this assessment, some of which are listed below.

1) A deep analysis of the trend of variables
2) With the help of data analysis software
3) By using techniques based on probabilistic methodologies

During the analysis of the main forces behind the economic activity some important components of GDP have emerged. The economic production, the level of export and import, hence the notion of balance of payments, the domestic consumption (divided for private sector and public administration), the link between income distribution and savings allocation and so on and so forth, can offer very important insights. In conclusion, these variables can act as a baseline for central banks for their regulatory role and policy making.

6.1 CLASSICAL THEORY

The main pillar of the classical economics theory is the Law of Outlets made by Say. It asserts that market supply always creates its market demand without having an influence on the state of the economy or other variables. Obviously, this led to inconsistency of the concept of *overproduction*, and, as such, there can never exist a *deficit* in total demand with respect to total supply, at least from a macroeconomic standpoint. In the end Say concluded that people should use most of their income and that various markets are closely related. There can be a macroeconomic equilibrium where total supply and total demand are equal but merely by putting together all the existing markets. In other words, there exists imbalances on single markets that in absolute value, by adding the entire economic environment are balanced. The primary consequence is that savings must be used for investments even when the former come from excess income, hence, creating their own level of demand.

The main purpose of regulators while monitoring the economic cycle is trying to eliminate, or at least reduce, the effect of negative issues linked to recession phases. For this reason, the first phase is focused on price observation, at the beginning by accounting only for commodities and then by adding other related expenditures for employment like salaries and for credit activities like interest rates.

6.2 KEYNES AND POST-KEYNESIAN THEORIES

With the advent of the crisis in 1929, the two main pillars of classical theory – the flat change between national currencies and gold and the equilibrium between supply and demand – becomes inconsistent to hold.

6.2.1 KEYNESIAN THEORY

Keynes emphasizes the necessity of public policies that have the main objective to reach full utilization of resources and also complete utilization of labor force by also assuming that there can be disequilibrium in market economy, hence, he refuses the law of outlets that till this moment takes the stage. What it means is that there can exist a deficit in money supply that can be solved by government intervention.

Till 1970s Keynes school of thought strongly support the use of debt by the national economies, regardless of variables such as the level of inflation, since the latter one is the price to pay while searching for full employment of resources. The problem arose in 1970s when a newest phenomenon called *stagflation* affected national economies. The problem is that in this economic phase there is no economic development or growth added to the continuously rising level of inflation. This evidence led to inconsistency in some hypothesis of Keynesian theory that was initially set aside.

This is the main reason why several post-Keynesian theories returned to scholars of classical economic theories. From now on this sub-chapter discusses post-Keynesian theories, and soon after IS-LM model, the neo-Keynesian theory, Monetarism and the new classical macroeconomy by closing the literature review on economic cycle theories.

6.2.2 MONETARISM

In 1963 Milton Friedman arrive to the conclusion that changes in the economic cycle were mostly due to changes in the value of currencies. This means that by increasing the supply of currency it is possible to have a stable demand, but this does not necessarily affect the stability of the economic cycle. Friedman introduces the concept of the *k-percent rule* which says that the supply of currency must have the sole objective to reach a certain level of inflation.

This output has a direct influence on the Central Bank's ability to react in the national economy, which is therefore reduced but on the other side gives more adjustment power to economic intermediaries before new monetary measures may be implemented. Here is the moment to introduce the concept of the Quantitative Theory of Demand that tries to explain the correlation between currency and inflation.

$$M * V = P * Q$$

From the equation above it is possible to describe price and quantities (Q and P on the right side) of an economic environment, hence the GDP and productive capacity in a certain stage of the economic cycle. Whereas to the left side there is the amount of cash circulating now, derived by multiplying the currency used for exchanges and the velocity of circulation. What is important to note is that according to Friedman, in the short-term the equalities can be held without so many approximations, hence:

$$\Delta M = \Delta P$$

What is possible to demonstrate from this equation is that the supply of currency is the most important factor influencing changes in the level of prices.

6.2.3 NEW CLASSICAL MACROECONOMY

Lucas is the most proponent of the criticisms moved to the Keynesian theory through the New Classical Macroeconomy. The main purpose behind this theory is the idea that individual behavior is aimed to reach maximization of profits and utility. In other words, economic agents try to increase the chances that a certain event will happen by acting in a way aimed at reaching the exact event that they expect in the near future. Now becomes more important to consider that individuals modify their preferences based on changes made by Central Banks' policies. Hence, reasonable expectations must leave the stage to adaptive expectations more than what was done in the past.

In conclusion what is important to emphasize from Lucas' theory is that alterations in economic policies will certainly affect the structure of the econometric model. This happens because when historical series change their paths the economic agents change rules while

searching for optima decisions, hence the ultimate effect are changes in individuals' behavior based on newest adaptive expectations.

6.2.4 NEOKEYNESIANS

With the arrival of the 1980s a new school of thought based on ideas of the Classical Macroeconomy broke out. This is the Neokeynesian theory that with respect to previous models allows to adjust individuals' decisions based on expectations of quantities and recognizes that changing price levels independently was impossible. Neokeynesian purposes highlight the importance of the role played by governments and central banks in the process to achieve economic stability. This is a disruption with the previous concept of "laissez faire" which says that the only way to achieve economic stability is by taking government out of the market.

The Neokeynesian evidence is that individual's objective is the maximization problem for both expected utility and leisure time under the burden of financial constraints and furthermore the concepts of equal access to identical technologies across corporations. The school of thought reached the conclusion that with increasing public government intervention, there is a growth in both output levels and level of employment.

6.2.5 IS-LM MODEL

Hicks developed the IS-LM model in 1937 by putting most of efforts to highlight the relationship between the financial market (represented through the LM curve) and the market of goods and services (represented through the IS curve) already available in Keynesian theory. The only constraint contained in the model is a short-time interval with the objective of neglecting the population growth and price volatility.

Moreover, this model has two main drawbacks: firstly, exactly as Keynesian theory states, it neglects endogenous expectations, by considering merely the exogenous ones. Secondly it cannot take into consideration the path of general level of prices. The objective reached by the IS-LM model is to give more space for realistic expectations for endogenous variables and completely change how economic policy making must work.

In this model there is also the advent of the Philips curve, which tries to explain the correlation between current prices and present and future costs. Moreover, it is introduced the concept of demand curve where current production is merely an output coming from the expected output and real level of interest rates. From the Philips equation it is possible to see the combination of Keynesian rigidities with real business cycle components. Finally, the concept of monetary policies is also added to the model (Pizzutto 2004).

The creation of the aggregate supply curve was the primary output taken by the *Neoclassical Synthesis*. The latter theory aimed to compare the aggregate demand and supply curves. It is one of the most common experiments made by Keynesians that in this case was successful. Here there is the concept of Marshallian function that aimed at determining the level of prices at the point where aggregate supply curve crosses the aggregate demand one (Genua, Burlando, Valli, 2010).

6.3 CONGIUNTURAL INDICATORS

Congiuntural indicators can be seen as the output of several socio-economic forces that have together an influence on the economic system at a specific point of time. It is important to highlight that an economic conjunction is the result of several future economic scenarios, among which there is also one that successfully confirms the effective real state of a certain economic system. The fact that multiple scenarios are put together is due to the uncertainty that affects forecasts on future trend with respect to the present, hence there is a multiplicity of factors and combinations that may occur (Cipolletta, 1992).

Now is the moment to make a differentiation between the congiuntural analysis which focuses more on the long-term trend and the fact that studying how scenarios are put together must do more with short-term variables. Consequently, there will be more focus on flow factors rather than absolute values, or employment level change rather than the entire amount of labor force, or even, public deficit instead of public debt and so on. To summarize it is possible to assess that long term structural trends are more concentrated on resource development, while resource utilization is the focus of short-term cyclical phase (Lowenthal, 1988).

From now on the word short-term can be referred to as period that goes from one to eighteen months and describes the time frame within which the economic structure may be considered coherent with short-term variables' change. In this way the economic cycle can be seen as the illustration of how the combination of several variables can move the economic conjuncture. Economists use numerous tools to analyze the short and medium-term patterns of economic activity. Among others there are several economic cycle indicators that can provide useful information on the short-term evolution of the economic cycle.

While making literature review it becomes important to emphasize once more that there are more incidental and\or seasonal factors other than cycle component and trend that need to be considered when examining the evolution of historical data. To give the reader a brief illustration, if the objective of the assessment is to check a corporation's output level, there is evidence of increasing values from August to September. It is important to emphasize that this increase has nothing to do with economic cycle expansion, whereas it can be described merely as the outcome of the seasonal fact that factories are closed in August. Moreover, it can also be the result of extraordinary events like earthquakes or even pandemics that cause closure and decreased production.

After all what emerged is that while searching for an increase in production there are several factors that need to be deleted from the historical data. For example, it is possible to find biases like trend (T), seasonality (S), and accidentality (A) and finally there is the cycle (C) notion as already described in this chapter. By diving deep into seasonality, it can be described as a regular, predictable variation in output level that occurs on a regular basis, whit peaks that can be linked to certain months or quarters. On the other hand, accidentality is defined as unexpected and unpredictable movement that causes errors while making historical comparisons. Because of the similar path that cyclical component of economic cycle has with the path of economic activity, here there is the highest share of economist efforts, hence where they are more focused on.

To give the reader a brief recap, the trend can be seen as a tendency that does not necessarily reflects the real state of the economy in each point of time, seasonality is the

most predictable part of variables of interest clearly related to the time frame under examination and accidentality is completely unpredictable, hence what scholars trying to do is to neglect this factor. Finally, the cyclical component of the historical series can be computed as the absolute variation between the value of certain value at a given point of time with the past value experienced in the same timeframe, for example the same quarter, of previous year.

This is the best way to assess how situations really changed over time, and is the method applied also for making data analysis in this paper. From the empirical data, it can be seen that this pattern is cyclical, hence those cyclical components can be extracted after removing noise such as trend, seasonality and accidentality.

In conclusion it can be assessed that countries with poorer recovery are the result of poorer use of cyclical indicators in recession prediction and minimize financial crisis or recession repercussions. Now is the moment to introduce another important difference between pro- and counter-cyclical indicators. The former one can be expressed as the ones that rise in expansion phase, and fall in a recessionary phase, simply because they follow the economy. To give an example of pro-cyclical indicators, employment is a good indicator as it follows the economy by rising in expansion and falling in recession. A-cyclical indicators typically have a low level of significance as do not seem to be impacted by changes in the economic cycle. An example can be the number of zoos in a given nation, this variable is completely unrelated to the state of economic development. Finally, there are counter-cyclical indicators that have the opposite path of the economy, like the unemployment rate which rises in recession phase while falling in expansion one.

The ultimate important difference that this paper tries to emphasize is the timing at which these indicators track the short-term changes in economic cycle. In fact, while leading indicators predict the path of the economic cycle, lagging indicators emerge a few months or quarters after the reference economy signal a turning point in the economic cycle. Finally convergent indicators follow the same dynamics of the economic cycle.

6.3.1 LEADING INDICATORS

The main role played by analysts is the one of collecting from firms their assessment of the state of the economy by using surveys based on their economic operations. They employ high frequency indicators usually monthly or quarterly with the objective to forecasts the direction of the economic cycle. Soon after economic survey indicators are created starting from the combination of firm-level data. Variables such as the level of orders, variations in inventory, and expectations about the level of output contribute to build the Business Confidence Climate Index. The European commission released it for each state of Europe, starting from the already mentioned economic surveys.

Another role is played by the Organization for Economic Cooperation and Development (OECD) that creates a set of Composite Leading Indicators (CLI) that have the main objective to predict the trend of economic cycle starting from output data of business survey indicators. They occur six to nine months before the turning points, moreover their maximum and minimum are a very good approximation of those of the economic cycle.

CLI can be thought as a composition of basic indicators such as changes in inventory, volume of orders, business climate indexes and financial market indicators like share prices, which has the main characteristic that tend to decline a few months before the start of the decline of the economy and then start rising again about two quarters before the economy exit the recession. It is important to highlight that in smaller open economies, information about industries and sectors are more valuable while assessing the path of economic cycle.

The computation for the composite leading indicator made by OECD is based on the notion of growth cycle, which has the technique to identify economic cycle and turning points by analyzing deviation of historical series from the reference value. The GDP is the main pillar for determining the economic cycle turning points used by OECD apart from China where OECD use the industrial value added at 1995 prices. The components of CLIs are finally extracted by simply taking into consideration the time series that exhibit a relationship with the reference series of GDP level during turning points. The CLI of each country depends on several factors, like data quality, time horizon, cyclical inclination, and economic usefulness. CLIs developed by OECD have the main purpose to give early signals of warnings of

economic cycle turning points or even changes in the level of economic activity with respect to its potential level or long term one.

What is important to highlight of this technique is that produces qualitative information on short-term economic movements instead of quantitative ones (i.e., peaks and troughs) as it is focused on detecting cycle turning points. Usually, CLI values of 100 or below are linked to recession and expansion stages, while if the value rises or falls and the value is smaller or greater than 100 the recovery mode can be claimed.

6.3.2 COINCIDENT INDICATORS

Now is the moment to emphasize the fact that both expectations for the near future and the development of best responses for economic policy require an analysis of the current situation. This is the field where coincident indicators take the stage as they are perfect in showing the economic activity-related pattern and also, they can be used as a measurement for the related economic cycle. To have the right measure of the variables and related dynamics, these quantitative indicators are used monthly or quarterly. From the reference literature examples of coincident indicators like the industrial production index, data on international trade and survey for employees can be extracted.

- **The industrial production index** -> indicator that depicts the historical evolution of manufacturing volumes. It can be derived from a statistical sample survey conducted ISTAT monthly among businesses.
- **The index of international trade** -> here there is an important link between public authorities and enterprises to understand the trade movement between Italy and global nations. Again, this information ca be found monthly on ISTAT platform.
- **Survey for employees** -> here there are so many data about labor market in Italy collected through a sample labor force survey. For example, official estimates about the percentage share of employed people and unemployed ones can be calculated from the sample data. Moreover, data on industrial economic activity as well as length of contract and hours worked can be found. The survey is commonly known as continuous because it collects weekly data that will be published monthly on ISTAT website.

6.3.3 LAGGING INDICATORS

As already said and as the name mentions, lagging indicators are those that receive the impact many months after the path of the real economy. Examples of these indicators can be the unemployment rate, which more often varies three or four quarters after the pattern of economic cycle, the rate of inflation or the consumer price index, the interest rates applied by banks to individuals, labor expenses and also the level of inventory held by industries.

The consumer price index -> here there is the most powerful tool to monitor the inflation, is the consumer price index, which works by comparing the price of a certain basket of goods and services usually bought by households over time, for example each year. ISTAT has the role of creating three different consumer price indexes: the FOI for workers and households, the NIC for the country and the European Harmonized Index (IPCA).

Each mentioned index plays a specific function, for example the NIC is useful for tracking inflation at the system level, hence it sees the country as one big family of consumers, each of which with different spending habits. The NIC is also useful for policy makers to plan their next economic actions. The FOI lists how employees use non-agricultural goods and services for consumption after making some monetary adjustments made annually. This index is useful for making assumptions on rents and alimony. Finally, is the IPCA, useful tool for examining the trend of inflation in a certain country by benchmarking it with the degree available in the Euro area.

The main difference between the difference indexes is the reference populations considered when assigning weights to different goods and services in the basket. For example, FOI refers to resident households, but only the workers or employees, whereas in the NIC there is the population living in the national territory. The IPCA has the same sample population of the NIC, but it differs with respect to the previous two indexes in the context of the basket. In fact, lotteries, bets, and related things are not included in the basket.

The second main difference between IPCA with respect to NIC and FOI is what is included in prices. Specifically, IPCA takes only the final payment asked to consumers into consideration. For example, the consumer's payment can be used for the European

harmonized index while the full cost of production can be used for national indices. Finally, as the IPCA considers only the price paid by consumers, it can take into consideration sales and promotions.

The Interest rates -> The Bank of Italy periodically releases statistics on interest rates applied by banks to individual consumers. These interests are influenced by many variables such as industry, client's area, loan type, length of the debt, and approved credit classes. Moreover, the Bank of Italy also publishes what are the current account interest rates with a breakdown by industry, client, and region.

Here central banks have the chance to choose between a sample survey and a census with specific regulations for coherence in the harmonized statistics on interest rates. The second one was the most spread choice, as it was chosen by fourteen countries, including the most important ones. As already said sampling criteria and publishing criteria of sample data are outlined on ECB website.

The labor cost -> here the objective of surveys is to collect data about labor demand and hiring decisions of companies. At the beginning the idea is to understand how many people work in large corporations, hours worked, the number of salaries and so on. Other surveys can be focused more on quarterly information on employment, social security, and such information.

Istat releases an information letter according to which data on labor expenses, working hours, salaries and employment in bigger corporations must be entered into the online form monthly.

The inventory -> The ISTAT description of inventory states that can be called inventory all items that are owned including production units, raw materials, work in progress or semi-finished products and finished products, hence all the ones that can be considered gross investment but by excluding fixed capital. Inventory change can be calculated as exits minus inputs of all products in a warehouse at a given point of time. (Rudelli, 2019)

6.4 THE ITALIAN ECONOMIC CYCLE

The main purpose of this new chapter is to analyze the various phases of economic cycle that Italian national economy goes through. Figure 8 tries to provide an overview of the path followed by economic cycle in Italy between 1996 and 2022, by using GDP volume trend at chain linked prices with a seasonality adjusted trend for the reference period (ISTAT source).

Figure 8: Evolution of Italian GDP.

As the graph shows several stages of economic cycle have affected Italian economy during the thirty years under consideration, with both a cycle of expansions and contractions. The country is going through a period of serious diminishing economic activity which have reached the historical minimum in 2020, because of the economic downturn broken out by COVID-19 pandemic. It is possible to say that this pandemic has impacted all the national economies in the world, albeit temporarily and to different degrees.

Soon after the pandemic, the Italian economy went through a recovery phase thanks to the help of Recovery Fund that can be seen as an important expansionary monetary policy. As the literature has explained, this policy has led to abnormally high levels of inflation even if this is a merely indirect consequence. It is possible to see that GDP has already reached the pre pandemic level, but the pre-crisis level of 2008 has not yet been recorded. The main drawback is that the European Central Bank has continued to increase interest rates, which

during 2023 have reached 45 level (see also figure 9) by continuously raising them of 0,5% percentage points. Updates in October 2023 state that the ECB is not going to further increase the level of interest rate which might be held constant now. It is possible to assess that COVID-19 pandemic is the worst crisis in the recent history of the country, even if it is not the first one because the shocks happen in each sector independent of the specialization.

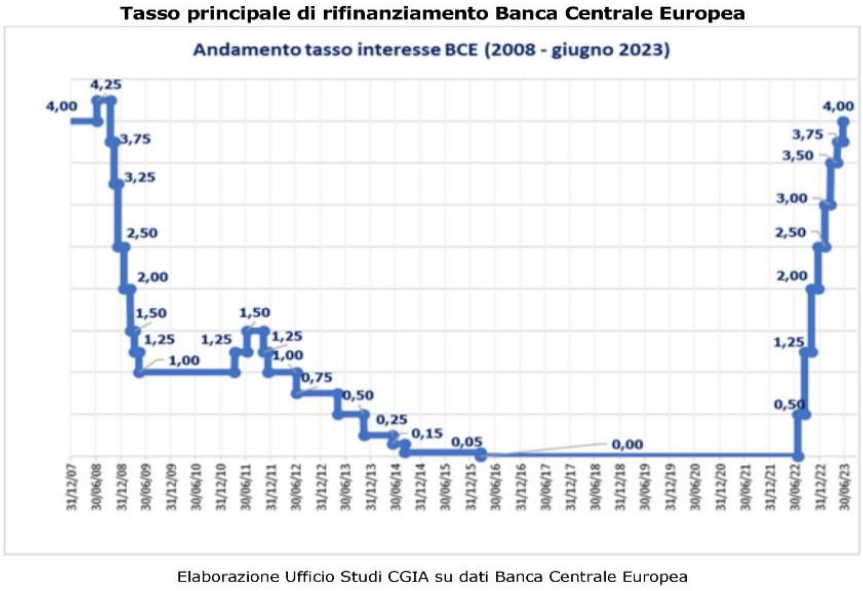


Figure 9: Evolution of interest rates that European Central Bank sets.

The first financial crisis lived by the Italian country has broken out in 2008, the first consequence is an abnormal level of uncertainty. The mechanism was started from the bankruptcy of one of largest US investment bank Lehman Brothers, which worsened the financial conditions of several businesses. Many bank institutes become choosier when has to do with credit lending and the contagion effect has quickly reached other nations. The fall in Americans' demand also worsened Italian's export, in fact GDP has decreased by 3,5% points in the last quarter of 2008 and 7,5% points in the first quarter of 2009. Fortunately, 2009 have also set the beginning of recovery in several nations including Italy. Another important point is that foreign investors ask also for insurance coverage when making investments because of the economic crisis had seriously weakened the US economy and financial reputation, hence it becomes more and more expensive which of course slowing the recovery.

In figure 8 it is also possible to see the path of GDP growth began in the fourth quarter of 2011 after a big decline of 5.2% points registered at the beginning of the year. This is the demonstration of the second big crisis that happened in the reference period, the one of "sovereign debt" that has affected national economies in 2011. The fact that national banks start showing insolvency signals sign the starts of Europe influence on Italy to recapitalize the banking system as soon as possible. The strategy applied by Italy to reduce sovereign debt is the one of "austerity" that has the main objective to increase taxes and decrease public expenditures. What can be seen form the graph is that the second GDP recession is not as severe as the first one happened in 2008, but there is an additional factor, hence, the fact that the economy has not yet completely recovered from the first crisis and this fact surely must have an impact.

By jumping to 2020 national governments started to take drastic measure with the aim to contain virus spread. For example, travel limits and the stop of non-essential production lines can be seen in many countries. This happened when the Word Health Organization (WHO) classified the SARS-COV-2 as a highly contagious global pandemic. Here the problem is that there is an extreme contagiousness and high mortality which obliges governments to take containment measures because of the unexpected health crisis. The crisis has led rapidly to the economic market with a double impact in the real economy, a shock on both supply and demand side.

The shutdown ordered by the government on any non-essential supply chain directly caused a huge decrease in supplies. The consequence is that net exports, consumption, and business investments were all negatively impacted by the demand shock. According to Coldiretti Institute and Istat data 2020 saw a dramatic drop in consumption, talking about 130 billion decreases, solely in Italy. Among others travels, transportation and food and beverage were the most impacted sectors which need immediate help. Moreover, the crisis in the financial market reduces dramatically income and wealth by increasing the adverse effects in the most impacted industries, but at least only momentarily. The COVID-19 pandemic also has an impact on companies invest propensity. In fact, 41% of businesses have reduced their investment forecasts because of the virus, which is in line with the 45%

EU average. In the end the incredible fall in global trade have led to 9,7% decrease in export of Italy in the reference period between 2019 and 2020.

The impact of virus has a several consequences also in the stock market where analyst and investors had more concerns about the level of corporate debt and the chances of survival of industries in a very liquidity constrained scenario (Ramelli, Wagner, 2020). The ultimate output of a strong decrease in the shares value is that households now have even more purchasing power, and hence, a lower degree of financial stability.

In conclusion, what can be learned from the virus spread is that pandemic scenario has dramatically raised the level of uncertainty, has shocked market demand and hence, discouraged corporations' investments and households' consumption by promoting the use of precautionary saving.

6.4.1 MONETARY ANSWER OF ECB AND FISCAL POLICY OF ITALIAN GOVERNMENT

The objective of the European Central Bank and national governments is to try to sustain economic activity and families with coordinated economic policy measures aimed to reduce the effects of pandemic.

The main effort of economic institutions was put in trying to implement monetary policies to boost economic recovery and stop the deflation scenario. Starting from 12 March 2020, the European Council has started several measures aimed at reducing credit crunch probability and liquidity crisis by using very unconventional measures in the help to banks, businesses, and families. This extreme decision was assumed to keep business as safe and profitable as possible.

The main channel offered by the ECB's policy is found in gives long-term refinancing at a very affordable lending terms for financial institutions. The ECB has also expanded its Asset Purchase Program (APP), a very useful tool that ECB can uses to buy from banks covered bonds, corporate bonds from non-financial institutions operating in the Euro Area, asset backed securities, and government bonds issued by EU national governments. To give more data to the reader, 120 billion euro is included in the APP program, albeit only temporarily, but they are on top on previously agreed 20 billion allocated on a monthly basis.

Additionally, the European Central Bank had also implemented additional monetary policy measures in the newest form of Pandemic Emergency Purchase Program (PEPP) because of the abnormal market volatility broken out with pandemic in the first half of March 2020. According to the PEPP there is an initial capital injection of 750 billion dollars that would be followed by a second run of 600 billion and an extra 500 billion. The main purpose behind this capital injection is to prevent fragmentation and to lower spread and for this reason has more adaptable features.

The impact of these programs can be seen in the yields of both public and private assets because of the euro system purchasing operations. The objective was persecuted by pushed down market returns, hence improving conditions for credit supply and newest investments. This is the reasons behind the huge expenditure of 142 billion euro made by ECB on Italian public debt during the first three quarters of 2020; among which 95 billion came from the PEPP plan.

By analyzing Italian policies aimed at sustaining families and companies, with the Law 27\2020 (DL. “Cura Italia”) the government starts its expansive fiscal policies. The objective of this law is to give 25 billion euros to improve the social safety net system, improve integrating income mechanisms and gives oxygen to corporate liquidity. The principle was reinforced by Law 40/2020 (DL. "Liquidità"), which has the main purpose to delay contributions and taxes until September, in the hope of improvements in the pandemic situation. With the arrival of "Rilancio" Legislative Decree 34/2020 there can be non-refundable business contributions and other policies aimed at helping local governments, families and especially the most impacted tourism sector.

According to different types of needs that businesses must have, for example if income was fast worsening with no chances of recover it, or in other cases merely temporarily worse conditions, or even getting worse not now but in the near future there are several types of fiscal policies put in place by Italian government (Bruegel, 2020). The primary goal of social amortizations and fiscal policies can be boosting liquidity, postpone paying taxes and offer businesses loans guaranteed by the public administration. In the graph below it can be seen

how different countries have used fiscal measures, according to their immediate needs. (Parmegian, 2021)

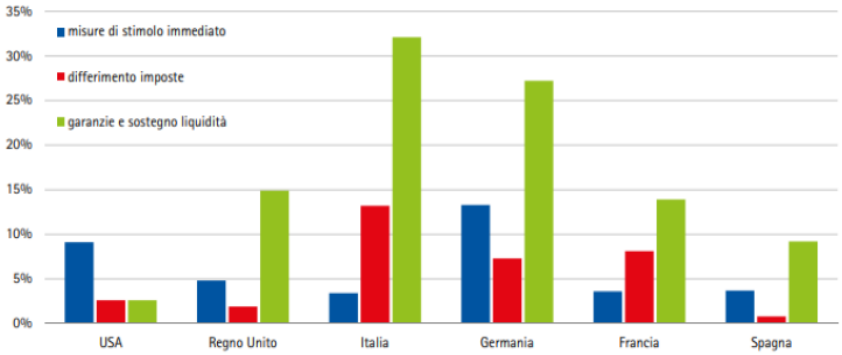


Figure 10: Incidence of fiscal measures to support the economy in some countries. Source: Bruegel, 2020.

7. SAVINGS & SAVINGS MANAGEMENT

The main purpose of chapter seven is to analyze the impact of financial and economic crisis in the dynamics of savings because the hypothesis is that it must have a direct effect on households' ability to save, propensity to save and net households wealth as they have experienced radical changes.

The first sub-chapter tries to give the reader a definition of savings from both micro and macroeconomic standpoint. Moreover, it is possible to see the differences between two types of economy, the first one that is an open economy with the chance of government intervention and a closed one that does not allow for public administration sector. The second part of the paragraph discusses several savings theories, as well as some variables that affect the model.

Here is the moment to discuss the **Life Cycle** idea taken forward by Modigliani – Brumberg. The idea behind it reviews the concept of wealth and savings from a macroeconomic perspective, in two cases: the simplified one of stagnant economy and the second one which explore the idea of economic growth resulting from a constant rate of growth of the reference population.

Finally **Permanent Income** model discussed by Friedman is highlighted. In this theory the idea of unlimited life horizon requires scholars to take hereditary legacies into consideration. In the end the idea behind ***precautionary savings*** put forward by Flavin and Hall was included as in the eye of the writer can be helpful while discussing the effects of COVID-19 disruption. The main purpose behind the latter theory is the uncertainty around labor income that can better explain the conditions that this thesis wants to explore.

As already mentioned, more spaces to examples are left by the author while drafting this paragraph. The idea behind it is to give practical evidence of the theories explained.

7.1 MICROECONOMIC AND MACROECONOMIC PERSPECTIVE

Starting from the micro economic standpoint the savings held by a family in the absence of inflation can be seen in two different forms:

a) Households change in wealth over a given period because of changes in savings allocation.

$$A_{t+\Delta t} - A_t = s_t \Delta t$$

The formula above shows the variation of savings per unit of time.

From the first definition it is possible to see that savings are a flow quantity, hence the measurement must be made for a definite time frame. As a consequence, when considering a time interval, the output is:

$$A_{t+1} - A_t = s_t$$

By extending it in continuous time:

$$\lim_{\Delta t \to 0} \frac{A_{t+\Delta t} - A_t}{\Delta t} = \dot{A}_t = s_t$$

In the formula above, $\dot{A}_t$ describes the derivative of financial wealth with respect to time.

b) Savings can be seen also as the difference between disposable income in a given time period minus consumption in the same time frame.

$$s_t = Y_{dt} - c_t$$

With income expressed net of taxes and transfers from the state.

In the second definition savings can be discussed as the share of income that is not used for consumption needs.

While considering disposable income as income from capital and working activities put together, the formula below can be derived:

$$Y_{dt} = rA_{t-1} + W_t - \tau$$

Here r represents the real interest rate, W_t real wage and τ net taxes. By linking the last two equations another definition can be found

$$A_{t+1} - A_t = s_t = rA_{t-1} + W_t - \tau - c_t$$

From this equation it is possible to assess whether savings can be positive or negative. In the former case, households can be considered as a net saver family with its wealth that constantly growing while in the latter case a net debtor.

The second way of examining savings is from a macroeconomic standpoint, it is possible to differentiate between theories of an open economy and a closed one without a public administration sector. The former will include the following variables:

$$Y = C + I$$

with Y representing GDP, C the aggregate consumption of final goods and services and I gross fixed investments.

By linking the definitions of savings already mentioned, it is possible to obtain:

$$Y = C + S$$

From which:

$$S = I$$

The above formula is derived to demonstrate that savings and investments can be considered equal in absolute values. This means that savings can be seen as the supply of resources available for investments and hence, wealth accumulation. This is another important point empirical evident, already presented in the reference literature.

The operators included in the model are the public sector, and the private one that can be divided into households and firms. These operators can be independently in surplus, if dealing with net savers, who are willing to finance the ones considered net debtors as they are in deficit. S=I mean that in the end the entire amount of debt must equal the total

amount of credits. Therefore, GDP will be written as in the formula below when considering an open economy that allows for a public sector.

$$Y = C + I + G + XN$$

Here, government expenditures are represented by the G letter and XN represents the more difficult notion of balance of payments as the net amount of goods and services exchanged with other nations, positive if export more than counterbalance import (see below).

$$XN = E - Z$$

Moreover, it is possible to indicate the balance of payments in current accounts with:

$$CA = XN + YN$$

Here the model links the net current transfers from abroad with YN representing the current net income.

By introducing taxes (T) and transfer (Tr) from public administration to private sector the Gross National Disposable Income (GNDI) can be derived (see formula below).

$$GNDI = Y + YN + Tr - T = C + I + G + XN + Tr - T$$

Another notion that can be expressed is the one of total gross savings held by the private sector as follows:

$$Sp = GNDI - C$$

And again, by linking the two formulas above it is possible to obtain:

$$Sp = I + G + XN + YN + Tr - T$$

On the other hand, the level of gross national public savings is:

$$Sg = T - Tr - G$$

This variable can also have a negative value which tells that the government has a public deficit. Finally, the notion of national savings will be:

$$S = Sp + Sg = I + XN + YN = I + CA$$

According to the last formula highlighted the total savings of a given economy can be seen as the sum of the balance of payments with its current account balance and gross domestic investments.

Maybe it is possible to say that investments, public deficit, and current account balance can be financed by savings. In reality it is possible to assess that S=I is an equation impossible to hold in an open economy. Hence, two possibilities can arise:

1. S>I (hence, CA>0) -> it means that the country has a positive balance of payments, hence expand assets or lower liabilities. This can be due to positive net exports and the current account surplus.
2. S<I (hence CA<0) -> the nation is purchasing resources from abroad to maintain its investments' level by lowering foreign assets or even, by increasing foreign liabilities. Here the situation presents net imports and a negative current account balance.

In the end if the private sector's savings remain constant a decline in public sector savings can be due only to decreases in investments or, in the same way, an aggravation of external accounts. This is the reason behind the idea of "twin deficits" when dealing with current account deficit and public deficit.

Finally, is the moment to leave the stage to some scholars with their theories that best describe how savings' allocation are considered over time. This objective can be persecuted starting from Life Cycle theory of Modigliani to the newest best allocation of precautionary savings.

7.2 MODIGLIANI-BRUMBERG LIFE CYCLE THEORY

Modigliani and Brumberg have the main objective to revitalize Fisher's research from a macroeconomic standpoint. Fisher for a long time is neglected because of the Keynesian's pillars that linked consumption levels to current income rather than total wealth as in the paradigm made by Fisher. The Life Cycle Model tried to analyze wealth savings and consumption levels in two different versions. The more simplified one that considers merely

a stationary economy, and the second version that gives space to economic growth because of increased productivity (hence, per capita income) or increased population growth rate.

The main advantage of these two economists is that they analyze concepts and theories already presented by some scholars, but merely at an intuitive level. Before having a dive deep into the model explanation starting from the stationary economy, some theories might be explained.

Static expectations deal with the idea that savings is used to maintain a constant level of consumption during the entire life of an individual as income, assumed constant over time, is received only during working years. In other words. As income varies during individuals' life, in this case because of the difference between working years and retirement period, individuals save money while they are in working years to maintain a constant level of consumption also in retirement period, when they do not receive income from work.

By considering only essential consumption the individual behavior is the optimization of the intertemporal utility function, defined as a function of consumption expenditures. The hypothesis is that consumers do not have assets when they start living and no inheritance wants to be left. Here there are some explanatory variables of the model:

1) N -> the total years of employment
2) L -> the number of years since the individual is in the labor force, hence L-N represents the retirement period.
3) Continuous productivity of labor.
4) Y -> a constant level of wage during working life.
5) The real interest rate is negligible.
6) Everyone has the same preferences, making it easy to hold a steady level of consumption over time.

When using these assumptions Modigliani and Brumberg can assess the path of assets level, savings, and consumption over the entire individuals' life cycle at an aggregate level.

By neglecting inheritance, the starting wealth is represented by the variable NY, and the constant level of consumption can be calculated as follows.

$$C = NY/L$$

From which the annual savings rate during working age can be written as:

$$S = Y(1 - N/L)$$

On the other hand, when dealing with retirement period it is possible to see a negative rate of annual savings, that exactly equals the level of consumption, held constant at the level:

$$-(NY)/L$$

In the end savings can be seen as follows:

$$NY(1 - N/L) - (NY/L)(L - N) = 0$$

And finally, the total wealth of an individual will be:

$$W = Y(1 - N/L)E$$

When the individuals are in working years and during retirement:

$$W = Y(1 - N/L)E - (YN/L)(E - N) = YN(1 - E/L)$$

With the individual's age being E.

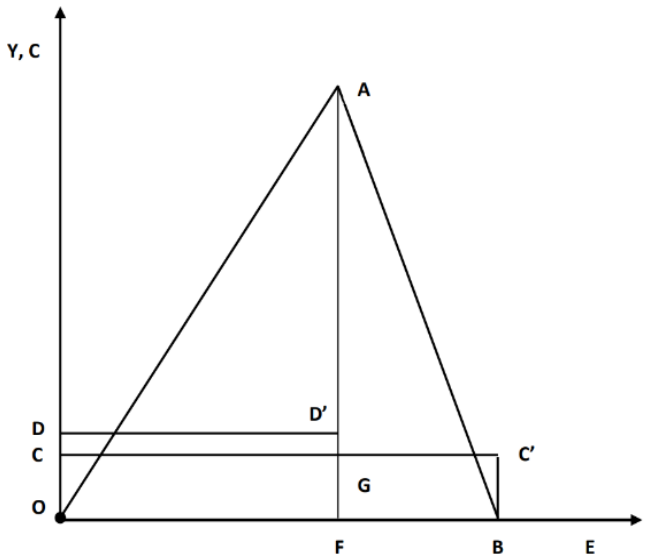


Figure 11: Longitudinal trend of income, consumption, savings, and wealth

From Figure 11 can be determined the macroeconomic features of the stationary economy that have the characteristic of constant rate of population growth. The graph is useful to give the reader a representation of the stationary economy from which aggregate level of income, consumption, savings, and wealth can be derived. This is done by assuming that there is only one individual per age class, representing the age class on the abscissa and consumption, income, savings, and wealth on the ordinate.

The area of the ODD'F rectangle represents total income, the OCC'B area represents consumption, the CDD'G area represents positive savings, and the FGC'B area represents negative savings. Finally, the area of the OAB triangle represents overall wealth.

From the notion of identical sides of savings values even if positive and negative, it is possible to assess that there is no aggregate savings or savings propensity when dealing with a stagnant economy, hence, constant level of income during working life, zero interest rate and steady level of consumption throughout life. Therefore, these are the hypotheses behind what the graph in figure 11 shows.

Moreover, the overall wealth to GDP ratio (with YN total income of all individuals) is equal to (L-N)/2, i.e., a function of the L-N retirement period, since overall wealth (OAB area) equals (L-N)YN/2. Finally, the graph shows that the control of the biggest share of wealth in the economy is held by individuals who are approaching retirement with those recently retired.

Now Modigliani decided to remove some constraints of the model by relaxing the hypothesis of a stagnant economy, by depicting the case of a continuously developing economy. Moreover, Modigliani make a differentiation between two types of population expansion in two different scenarios:

3. With n population growth rate
4. With θ productivity growth rate):

1) An economy with growing population. -> ***Neisser effect:***

The amount of savings is positive and the propensity to save has a concave path, hence there is an increasing level of the population growth rate. In other words, positive savings more than outweigh negative ones since thanks to growing population the number of active subjects in the economy (the ones in working age) is greater than the ones already retired and the former share continuously growing. Moreover, if the n variable of the growth in population tends to infinite the overall propensity to save can be well approximated by the one of active actors in the economy.

2) Technological evolution can also lead to growth in economic production, hence, rise in per capita income -> ***Bentzel effect:***

   Starting from the static expectations theory, active actors in the economy have an unexpected rise in income which lead to an increase in savings level, by holding fixed the negative amount of savings held by retired actors. As a result, the overall savings level has risen as the marginal propensity to save is increased thanks to the rise in the productivity growth rate. Moreover, the wealth / GDP ratio can be considered a negative function of θ according to this theory because most of the wealth is owned by just retired individuals or the ones that are approaching to retirement., as such the amount of wealth now is influenced to the income received in past years and hence, by the amount of savings allocated. In the end it can be assumed that the larger the proportional difference between individuals' current income and income received in the past, the lower the relative value can be expected with respect to current income.

Modigliani can find useful to use these outputs to study the problem of "consumption puzzle". In fact, his own explanation starts from the idea that in the short term can be held the Keynesian hypothesis of an increase in income that led to an increase in the marginal propensity to save and a decrease in the marginal propensity to consume. In the end, for an unexpected increase in income there is also a less than proportional increase in wealth, hence, in consumption. This is since consumption increases less than proportionally with respect to income, and hence decreases in the opposite situation with a decrease in income

exactly because of savings. As a result, the propensity to save increases and the propensity to consume decreases. This is the output of Modigliani studies that suggests that propensity to save can be seen as a pro - cyclical measure, and propensity to consume as anti – cyclical measure.

Finally, it can be argued that in the long-term overall income and wealth have the same rate of growth and hence, they are able to maintain a constant propensity to consume, average speaking. The Modigliani Life Cycle model has been seriously criticized; among the others the most significant in the context of this paper are listed below.

1) The use of static expectations with respect to the more useful adaptive expectations. In fact, individuals are skilled in even more economic factors, including the rise in income that comes from increased productivity. Hence, they can find convenient to borrow in the first part of working age to take advantage of the increased income at the expense of reduced savings. This idea led to a different conclusion with the one reached by Modigliani, here the output is that there is a negative correlation between the propensity to save and the productivity rate hence, the aggregate propensity to save could have an inverse function of the increase in productivity rate.

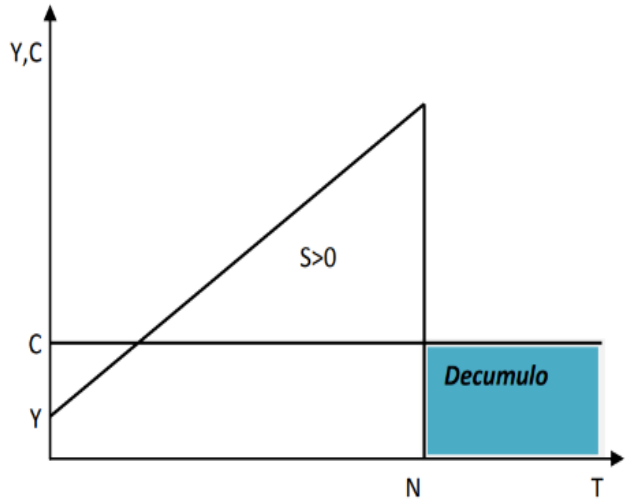


Figure 12: Trend of consumption, savings, and income through time when there is growth in productivity, reasonable expectations, and consumption.

2) The second critic moved against Modigliani is the fact that his use of utility function ignores households' consumption. Fisher was one of the most actors in these ideas, by also assessing that the utility function is too simplistic. As a result, Modigliani

proposes the model that consumption function has a hump during life cycle, and this path resembles the size of a certain family. Moreover, there is an inverse relationship between the growth rate in population and the average propensity to save based on family size influence. The output of this model is the idea that younger families with more children and hence, savings rate that is below the average must have a greater weight in the population sampling, producing a reduction in the aggregate propensity to save and vice versa. In 2010 Casarosa and Spataro give a contribution to the model by concluding that propensity to save and the growth rate of the economy must have a negative correlation. The contrary with the prescriptions made by the Life Cycle theory has previously been discussed. This output of newest studies is based on hypothesis of adaptive expectations reasonable high level of n and low timing of births.[1]

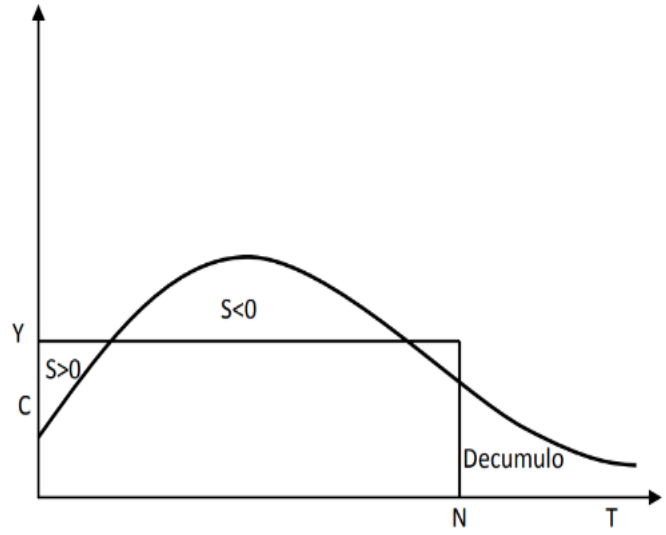


Figure 13: Income, consumption, and savings trends over a family's lifetime.

7.2.1 EXAMPLES OF LIFE CYCLE THEORY OF MODIGLIANI-BRUMBERG

As previously explained Modigliani's Life Cycle hypothesis is focused mainly on individuals' habits about savings and consumption puzzles during lifetime. The idea behind them is that individuals have to do with an optimization problem of savings and consumption to keep

[1] Please refer to the article "The relationship between the savings rate and the growth rate in the life cycle theory: from Harrod to Modigliani-Brumberg" by Casarosa.

them constant during lifetime subject to the constraint of age and income. The following examples are given by the author to clarify the theory explained until now.

- Early Career Stage -> in this part of the life individuals have more often to do with lower income since they have just started the professional carrier and hence because of high level of consumption due to housing, student loan and so on and higher expectations about future income they use to save less than the average.
- Peak Earning Years -> here is the moment where savings rate goes above the average as wages have reached its peak and individuals know that they must save more to afford more important event of their life including establishing a family, purchasing a home, and paying for their kids' college fees.
- Pre-Retirement Stage -> during this stage of the life cycle savings rate reach its maximum as people want to make sure they have enough money to maintain their consumption patterns after retirement period has begun. To easily reach the objective they usually have to do with investments in retirement plans like 401(k)s and IRAs.
- Retirement -> now is the moment in which there cannot be yet a source of income as in the working age, hence retired people transform their savings into consumption with a certain degree to maintain a steady level during the entire retirement period and by considering at priori the idea of inheritance to leave at the right moment. Their retirement consumption may also be aided by pensions, investment income, and social security payments.
- Late Retirement Years ->here is the moment in which an individual may need extraordinary long-term care or is facing increasing medical costs, consequently savings can be used more in this phase by losing their constant pattern.
- Inheritance -> this is the last stage of the savings pattern in the lifecycle theory that might not happen if people decided to leave heirs without an inheritance. If this is not the case, they leave part of their savings accumulated during life to their descendants, with the aim of helping the financial stability of the following generation. As people think about their legacy and how they may support their children or grandkids, this might be a part of the life cycle hypothesis.

To give a brief recap according to Modigliani – Brumberg life cycle hypothesis, people should quantify their savings and consumption patterns based on income and age. They usually ask for loans in the early career path, save most of their income as the latter increases and finally convert savings into consumption in retirement stage. It is important to highlight that every person's situation is different, and the aim of theory is to provide a broad baseline for comprehending how people save and spend money throughout their lives.

7.3 PERMANENT INCOME MODEL OF FRIEDMAN

Now is the moment to examine another savings theory in the final section of this chapter. The idea behind it is that the consumption patterns must be based on resources availability. This is the context explained by Permanent Income Model emphasized by Friedman. Then is the moment of Hall and Flavin ides of rational expectations that help building the concept of precautionary savings. Here the hypothesis of Friedman model is presented by taking inheritance into account. Current income can be thought of as the sum of two main components as listed below.

1) Y^P (permanent income) represents permanent income that is the average income that individuals expect to continuously earn.
2) Y^T (transitory income) represents the part of income that can deviate the earnings from the average value because of unforeseen circumstances.

$$Y = Y^P + Y^T$$

The hypothesis behind this model is that people want to maintain a constant level of consumption and hence, in the presence of fluctuations in income with different nature they must use other instruments to maintain consumption steady like savings or raising debt. In the end consumption and the level of income that might be held constant must be related as follows:

$$C = \alpha Y^P$$

with α representing the annual share of permanent income. Moreover, Friedman also proposes an explanation for the Consumption Puzzle using the ideas listed below.

$$PMeC = C/Y = \alpha\, Y^P/Y$$

The idea is that PMeC has a negative correlation with respect to income as in the short run people with lower income necessarily have a larger share of transitory income with respect to higher income families. On the other hand, PMeC can be held constant over time as according to Friedman fluctuations in income can be only due to permanent income.

By assuming r=δ, the expression of consumption can be written from the formalization of the model by holding the hypothesis of absence of uncertainty, indefinite life horizon because of the presence of inheritance and the maximization of the intertemporal utility function. Hence, it can be derived that:

$$\frac{C}{r} = h_1 + w_1 \rightarrow c = r(h_1 + w_1)$$

with w_1 starting financial wealth and h_1 human wealth. Therefore, it can be assessed that permanent income is the value that allows individuals to maintain a constant level of consumption during their entire life by holding constant the vital wealth. As a consequence, annual consumption can be equalized to the perpetual income of vital wealth. Moreover, positive wealth is maintained thanks to heredity.

With the aim to give further insights to the theory of Friedman Flavin and hall added the concepts of rational expectations and labor income uncertainty, by holding the hypothesis of infinite time horizon and constant financial market.

Lucas's criticisms that emphasize the impossibility of estimating a structural consumption function gives these authors the idea to use the Euler equation to study the dynamics of consumption by introducing an intertemporal quadratic utility function as follows.

$$v(c_s) = c - \frac{b}{2}c^2$$

Hence, by assuming reasonable expectations and by assessing that r=δ for simplicity in calculation it is possible to obtain:

$$v'(c_t) = E_t v'(c_{t+1})$$

Which becomes:

$$v'(c_{t+1}) = v'(c_t) - e_{t+1}$$

With e_{t+1} representing unsystematic error. Therefore, it is possible to conclude that the value of marginal utility at time t can be used as the best estimate of marginal utility at time t+1 in this model. In other words, since consumption is a stochastic variable in the context of quadratic utility, current consumption is the searched best estimate for future consumption. In the end consumption can be held constant over time with the exception of unforeseen abnormal changes ($E_t(c_{t+1})=c_t$). It is important to highlight that this model works even by implying income from work as a random function as follows.

$$r[w_t + h_t] = y_t^P \; with \; c_t = y_t^P$$

As already said, but also with this random connotation that the best estimate of the marginal utility at time t+1 is the marginal utility at time t. in other words the strongest predictor of future consumption can be found in present consumption, by using quadratic utility and by assuming consumption as a stochastic variable. This implies once more that consumption will remain constant over time except for huge fluctuations in variables of interest. Finally, by also complicating the model by allowing for randomly distributed income from work, the result obtained is the same as in Friedman model.

$$s_t = y_t^D - c_t = rw_t + y_t - r(w_t + h_t) = y_t - rh_t$$

Now the amount of savings yearly allotted to increase the financial wealth and hence, allows future consumption can be calculated as the difference between the income received in the present year and the annual return of the human capital as the formula explains. It is important to see that this formula allows the reader to see also this difference exactly equal to the notion of transitionary income previously explained. In other words, the objective that individuals have when making savings is to make a stock of financial wealth to afford future unpredictable and unforeseen events that affect income received from work, hence enabling a consistent level of consumption that must be at least equal to the one that individuals have if income is constant at a certain level.

To put another way, savings can be mathematically seen as the inverse of the entire number of expected changes in future income that can have two features:

5. If an increase in income is expected, it becomes more convenient to have a negative value of savings presently or, in other words, it is the right moment to raise debt, because it can be repaid when the income effectively increases.
6. When a decrease in income is expected in the near future, a positive level of savings can be seen as built a precautionary stock of wealth to afford these unpleasant moments.

Now is the moment to study the role played by uncertainty in the just presented quadratic utility model or, in other words, certainty equivalent model. This is made by examining two time periods, when there is only certainty, income can be assumed constant and by using Euler equation, it is possible to derive the below formula.

$$v'(c_1) = v'(c_2) \rightarrow v'(y_1) = v'(y_2)$$

In other words, if consumption and income are held constant s=0 will exist. By introducing uncertainty around the income earned in the second time period, the Euler equation allows to get:

$$v'(y_1) = E_t v'(y_2)$$

It is possible to see that s=0 is always the best option as follows.

$$c_t = y_t - s_t$$

$$c_{t+1} = y_{t+1} + s_t$$

And hence, Euler equation can be written as it is made below.

$$v'(y_t - s_t) = E_t v'(y_{t+1} + s_t)$$

By remembering that the marginal utility can be assumed linear in the case of quadratic utility, and hence:

$$E_t v'(y_{t+1} + s_t) = v'[E_t(y_{t+1} + s_t)] = v'(y_t + s_t)$$

What can be seen now is that the marginal utility of the expected value and the expected value of marginal utility are exactly equal. Thus, the Euler equation is written as follows.

$$v'(y_t - s_t) = v'(y_t + s_t)$$

The above equation is valid only when s=0, hence the initial hypothesis of the model has been demonstrated.

The conclusion that this literature review wants to highlight is that when dealing with quadratic utility function uncertainty has no effect on savings, from here the name certainty equivalent model can be assessed. The objective reached in the end is that income variation must leave savings unaffected thanks to the structure of the quadratic utility function, hence precautionary savings do not need to offset fluctuation in future income from work. The graph depicted in figure 14 gives more representation of the studies expressed.

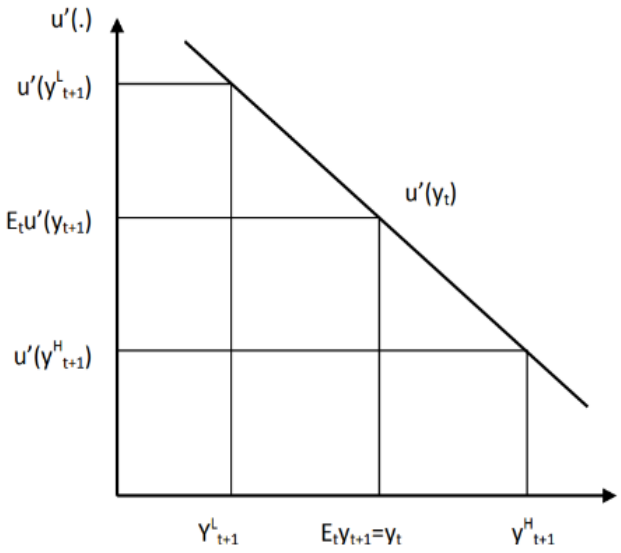


Figure 14: Case of linear u' (quadratic utility)

It is required that s=0 to meet the first order criterion. Moreover, by drafting the quadratic utility function with a convex one with diminishing marginal value, different outcomes where achieved (by highlighting that *Ef(x)>f(E(x))).* This definition will lead to the following equation.

$$E_t v'(y_{t+1} = y_t) > v'(y_t)$$

Therefore, having zero savings (s=0) does no longer satisfy the Euler equation when dealing with a marginal utility function that is convex which becomes now the sub optimal response, and not the best one. The individual consumer must have a positive level of savings to satisfy the Euler equation such that:

$$v'(y_t - s_t) = E_t v'(y_{t+1} + s_t)$$

Now the constraint for satisfying the first order condition can be written as follows.

$$S > 0 \rightarrow U'(y_t - S_t) = U'(y_{t+1} + S_t)$$

The output reached is that when there are increasing consumption, savings must be held positive when dealing with convex marginal utility functions. The second notion learned is that precautionary savings refers to positive savings that the marginal utility function classifies for prudent consumers. Prudence can be expressed with an index very similar to the second derivative of the utility function which tells the degree of elasticity in the model (formula wrote below).

$$p = -(\frac{u'''c_t}{u''} > 0)$$

Finally, it can be argued that precautionary savings increase with an increasing level of uncertainty. That is the useful conclusion while developing this thesis even if this work addresses this necessity in one specific sector. (Brilli, 2014)

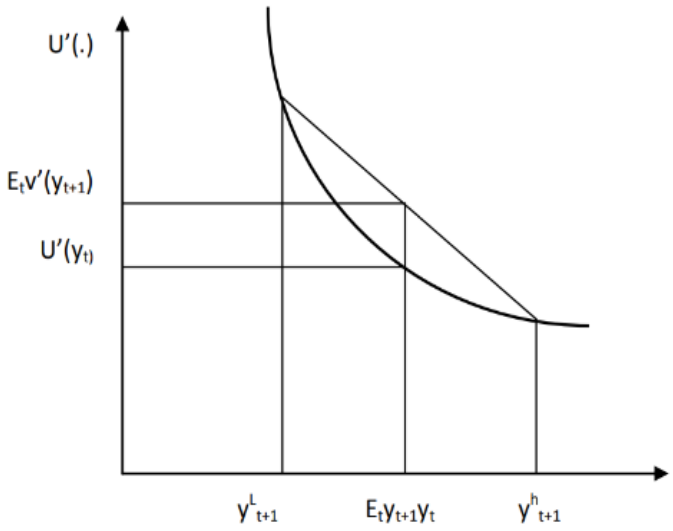


Figure 15: Convex u' for precautionary savings.

7.3.1 EXAMPLES OF PERMANENT INCOME MODEL OF FRIEDMAN

To give the reader a brief recap of Milton Friedman Permanent Income Model, exactly as it has been done for the previous theory, some examples are given. In summary the theory states that consumers should consider both current income and permanent income, defined as the expectation about future income, when dealing with savings allocation and financial choices. The hypothesis made by the model wants to highlight that expectations about future level of income must also have a weight when determining the level of consumption in a particular time frame.

- Extraordinary Income -> this is the case of consumers that wins lottery or receive a one-tantum extraordinary income from inheritance. Permanent Income hypothesis clearly established that as this is a one-time event that no longer have an impact on long term income expectations, hence, there is no necessity to increase consumption immediately. Whereas it can be better to save or invest a considerable portion of it to sustain a little growth in consumption in the long run or even increase the savings allotment for post-retirement period.
- Seasonal earnings -> more often the average yearly income received from workers is not the same as the one received by them each month. This because in certain field such as agriculture there is Seasonality that must be taken into account. Here the worker must be able to smooth income to have a smooth level of consumption throughout the course of the year. This is exactly the same concept that affects footballers which have a huge amount of money received as income from work in their short career and must be able to save or invest part of their income to pay off-career needs.
- Future income changing expectations -> consumers must be adaptive to changing conditions as they can increase their consumption even before the variable really increase if they forecast a growth in the long-term average level of income that can derive for example from a job promotion or rising salaries and vice versa.
- Changes in investment decisions because of changing future expected income -> more often companies base their investment budget on forecasts about long-term future revenues. If there are expectations about a future increase in demand for

goods or services for such a company it is reasonable to see increasing manufacturing capacity, creating new products, or recruiting more staff.

- Economic incentives -> according to Permanent Income Model of Friedman, the government intervention must influence choices on consumption with policies such as the one implemented because of COVID-19 pandemic. To have further explanations of different types of actions that government can make the reader is referred to chapter five to have a very good example of the influence of government on investments and consumption.

Finally, according to the Permanent Income Model of Friedman, consumers must give more attention to long term expectations over short-term changes in income when dealing with financial decisions, especially in uncertainty environments. This literature review aimed at highlighting the importance of adaptive expectations and policy effectiveness in long term income and consumption patterns to have a clear idea of what are variables that vary because of shock in the economy.

8. INSURANCE INSTRUMENTS

By analyzing the insurance instruments available on the market, it becomes important to have in mind the difference between risk and uncertainty. This aim can be reached starting from the definition of the objective assessment of a probability of occurrence.

The choices about insurance coverage involves securely the management of pure risks which is different by definition from the one of financial risk. The former must do more with a manifestation of binomially represented variables randomly chosen. To put it another way pure risks can be defined as the occurrence of an outcome which leads to damage as a negative consequence; or in the other case the non-occurrence of a certain event has no effect at all. Consequently, the household's behavior while answering to different type of risks such as financial or pure ones shows different features and hence various concerns.

The newest concept of longevity risk must be introduced in the context of insurance decisions because the time factor grew as more relevant factor with respect to pure risk in the strict sense. Longevity risk must do more with the ideas of uncertainty management, hence is a derivative variable that tries to assess the effect of several variables such as financial and intertemporal indeterminacy. Consequently, longevity risk can be defined as the risk that exposed insurance companies or other insurance intermediaries since insured can have a longer life expectancy, which lead to difficulties in afford annuities from the insurer economic standpoint.

As behavioral finance theory has explained in previous chapters the difference between risk and uncertainty is incredibly thin, hence can easily lead to misconceptions. The fact that individual's subjective interpretation is affected by a variety of mental, emotional, or social biases can affect the output of the model even if currently observed situation has an objective probability of occurrence. Here is the deviation from the rationality that classical economy assumes. (Alemanni, 2012)

Now is the moment to discuss how individuals deviate when have to do with pure risk as well as how biases affect decision making processes in the insurance field.

8.1 PURE RISK

To give the reader as much insight as possible a dive deep into pure risks characteristics is made as well as how they affect the various stages of the risk management process. Moreover, the risk management process can be described as the manifestation of a continuous process that goes through three main phases. Here is the moment to describe them in more detail to have an overview of the issue that must be solved.

To put it another way, the risk management process can be described as the collection of choices, methods, and instruments helpful in the management of events identified as critical because can lead to measurable benefit or damages that cannot be predicted and that depends on the degree of risk undertaken.

8.1.1 RISK IDENTIFICATION

Certainly, risk identification is the first step of the risk management process. As already said pure risk must comprehend risks that have an unknown future outcome, and they cannot be predicted in advance. Moreover, they have no chance of making a project, while they can lead to losses as certain events are verified.

To give a very good example, demographic risks can be defined in pure risk class as they are the ones associated with human life and whose uncertainty is uncorrelated with the event in the absolute terms (i.e., death), but rather, they must do more with the moment in time in which it happens. As the definition of pure risks assesses demographic risks have solely a negative impact. By using again, the example used above the death can be expressed as the event whose occurrence jeopardize the ability of an individual to earn income, which may eventually decline or even come to an end.

The fact that there are no positive effects of pure risks results in no compensation effect for the subject exposed to them. This means that the harmful event should repeat over time or alternatively, there have been several pure risks manifestations to have a probability that the cumulative effect will be opposite. Hence the earnings of insurance companies can be seen solely by seeing the cumulative effect of many policies issued as the single policy can lead to losses or alternatively no effect at all as the definition of pure risks describes.

8.1.2 RISK MEASUREMENT

The next step is represented by the evaluation of possible outcomes that derive from the occurrence of certain events. This is made to assess a proper risk measurement, hence the level of risk that the individual affected must bear. The pure risk measurement passes through the assessment of two quantitative factors that influence it: the severity of a certain loss and the frequency distribution. Both aim to represent the likelihood that a certain event will occur. For individuals it can be difficult to have an assessment of the probability of occurrence of certain events properly made as they are not skilled as insurance companies are, hence, they may have an incorrect estimate of the risk exposed.

Generally, it can be assessed that the most important reason of these difficulties is the high degree of information asymmetry between actors in the field, hence, it is hard to have an objective assessment of probability of occurrence of certain events, attaining to the decision. Moreover, inadequacy of educational background limits the individuals' ability to process even limited information on their hand. The objective of this table below is to show the reader a risk map based on the assessment of impact and probability of certain events.

Bassa probabilità, elevato impatto *(LFHI)* Es. Eventi catastrofali, atti terroristici	Alta probabilità, elevato impatto *(HFHI)* Es. Rischio incendio in industrie chimiche
Bassa probabilità, modesto impatto *(LFLI)* Es. Piccoli danni ad elettrodomestici	Alta probabilità, modesto impatto *(HFLI)* Es. Piccoli incidenti in impianti sportivi

Table 3: The mapping of pure risks.

8.1.3 RISK MANAGEMENT

The third and final phase of the risk management process is the management of risk in terms of hedging the risky position. This objective can be persecuted by distinguishing two features that separate pure risk field. The first one must do more with the binomial nature of pure risks that has been explained as the mere chance or loss, or in "positive" side the attainment of the current situation. The second is made by assessing how the individual behavior influences the probability of occurrence of the risky event. The first feature in the pure risk context affects the field of potential risk retention and transfer strategies as well

as the insurer evaluation assigned to one insured instead of another one. The second feature becomes important while an individual sets a goal to lower his risk exposure. It can be assumed that the risk management decision must fall somewhere between the first and second feature.

To have a summary it becomes evident that the behavior of the subject exposed to the risk in question must have a direct impact on whether the risky event may occur or not. This is the reason behind the fact that there is merely the chance to control risks in the field of pure risk, that can be seen in terms of lowering its likelihood or lower its impact. In the field of insurance choices, the decision about risk management has been made with the aim of controlling uncertainty and potential dangers. Consequently, it would be more precise to refer to an attitude towards *uncertainty* rather than an attitude towards *risk*, at least in the perspective of the individual stuck in the pure risk scenario. In the eye of the reader the difference can be neglected, but in reality, those attributes lead to completely different behaviors, and hence, different choices.

The conclusion reached is that the individual's attitude on pure risk can be even more different with respect to how he deals with financial risk. Actually, the underlying reasons and psychological strategies are completely different. In fact, a pure risk adverse would pay a premium in exchange for transfer its risks suffered independently if he has to do with low probability of losses. On the other side a financial risk adverse actor would demand a high probability of success before affording the risky scenario. This is the output reached because the nature of the two risks in terms of outcomes available are completely different. Moreover, as this work has been already explained in previous chapters the threshold between choices can be different as the scenario is framed in terms of success or loss. This already mentioned framing effect necessarily affects the ultimate choice made by the individual in the context of behavioral explanations.

Finally, it could be argued that pure risks have an underlying asymmetry, hence individuals can be more averse to pure risks with respect to financial risk which is therefore more balanced. As a result, management strategies in the context of pure risks are more strong

pre-requirements while it might be reasonable to maintain a higher degree of risk exposure when dealing with financial risk because of its balanced nature.

8.2 DEMAND MODELS FOR INSURANCE INSTRUMENTS

Generally speaking, the demand for insurance instruments has several similarities with the purposes behind savings money. Purchasing insurance coverage has the main objective to protect consumption from the oscillatory trend of income. For example, policy holders can maintain a constant level of consumption after having retired if during working age have had the attention to use part of savings and hence wealth accumulated to build a pension fund for future perspectives. Another example can be the subscription of life insurance policies to cover the death of the income earner in a family. In the latter scenario the death in premature times of the head of the family can lead to an unexpected interruption of the income received from the family. This event might be hedged with a life insurance provision. The main objective is to maintain constant level of consumption in the family, hence, offsetting the loss in the income from work of the income earner.

As already said, the far-sighted consumer is the focus of Life Cycle theory and Permanent Income hypothesis but is important to highlight that unfortunately this predictive behavior can be the least spread behavior made in real world by consumers that for various biases does not follow these rules. The approximation made while explaining these theories is that the forward looker consumer at the microeconomic level is a representative agent that can be extended without removing significance to the aggregate results. This agent must deal with different uncertainty environments and preference formation mechanisms as the individual characteristics are the output of several heterogeneities that determine the consumption path chosen by individuals. (Alemanni, 2012)

Now it has become necessary to use behavioral expectations as the most suitable application for the expected utility theory even though in decades has been long criticized.

8.3 INFLUENCE ON INSURANCE CHOICES

From this paragraph it becomes necessary to have a general presentation of the variables that appear to be particularly important while signing insurance contracts. Hence, after the

overview on requisite basis, all variables found in prior research have benne presented. Insurance variables' assessment can be useful when making comparisons between evidence found in the empirical representation and the direct link that they have in the reference literature. Two main methods can be used when making analysis on individuals' decisions in the insurance sector.

1) The deductive approach -> it has the purpose of going from the general to particular case, hence it uses more general hypothesis to reach a specific behavioral choice as a final conclusion. Tis is the model depicted when making review of previously stated economic models. It starts from a general principle with the aim to reach a specific conclusion regarding individual behavior by making use of concatenations and similarities.
2) The inductive approach -> is a process that goes from the particular case to the general one. In other words, by starting from specific instances, efforts are made to make general hypothesis that are applicable to the general case.

To give the reader some examples these methods aim both at finding patterns and trends in the sample population so that insurance behavior can be predictably assessed without space for doubts. To put it another way, the objective is to link empirical evidence of the influence undergoes from individuals when having to do with insurance market. Overall, it can be said that results have reached both regularities and contradictions in the end. This is not necessarily the conclusion from a poorer data analysis, rather it can be due to biases in the database content, as well as deviation in the research methods employed. To have a clearer understanding of the results reached, it can be helpful to group evidence showed into several categories, by referring them to each particular element or variable or theory studied. This is mostly given to have more clarification as the literature diversity found is very broad.

8.3.1 DEMOGRAPHIC VARIABLES

First and foremost, it can be assessed that a certain level of ***age*** can become a threshold over which there is no more demand for insurance coverage as time have allowed individuals to accumulate a certain level of wealth such that there is sufficient stock to face

unexpected and unfavorable situations. On the other hand, one could argue that the demand for insurance products must increase as individuals grow older, simply because as the income increases there is more need to cover the position of dependent family members. However, there cannot be said that the results of empirical evidence are always clear. In fact, some scholars have seen a positive impact of the age on the insurance demand that is clearly measurable. On the other hand, others clearly see a negative correlation. Moreover, some others suggest that there is no correlation at all between the age and insurance demand, suggesting that the former cannot be used as a significant factor.

On the other side many studies have highlighted the presence of a positive correlation between the demand for insurance policies and the ***level of education***. This connotation can be mostly because higher educated people have greater career progression, and hence higher income for a long period of time. This means that there is the need to protect the family against the early departure of the income earner who, as more educated people with higher income, leave a bigger financial loss for the family, hence there is more need to ask for insurance coverage. To put it another way, by not considering the death date of the income earner, there can be assessed that people with higher levels of education are typically more likely to recognize the pros and cons of risk management, particularly when dealing with insurance sector.

Moreover, several empirical studies have found that another important role while explaining insurance demand is played by the variable ***family size*** and hence, number of children. This is since a higher number of children results in higher demand for insurance, hence a positive connotation, as there is more need for financial resources if the income of the head of the family declines or even stops. On the other hand, some studies have found a negative connotation as growing family size requires a higher level of consumption, hence lower share of savings are allocated into insurance policies. Finally, there are also some scholars that do not find a clear correlation between variables under consideration.

Another variable that may have an impact in the model is the one of ***employment*** with respect to the market demand for insurance policies. This is a result of the fact that a secure job of the income earner must boost the demand for coverage. The influence of the partner

in the family's demand for insurance coverage is not completely clear. This means that maybe also empirical data does not allow for secure assessments. In the literature some authors claim that when the partner works also, it lowers the family's demand for insurance, because the income of the partner can be seen as a perfect substitute of insurance in the case of unforeseen events. According to other scholars as the partner's income rises, the general level of insurance demand of the family as there are more resources that can be used for this purpose.

The variables ***marital status***, ***nationality***, and ***health status*** can be considered other good candidates as explanatory variables in the empirical model; nevertheless, as there is less evidence of the influence of them, they are treated in a single point during the revision. Zhu in 2007 try to find evidence of the impact that personal characteristics have in the decision-making process. With personal characteristics she means variables such as health prospects. Moreover, she tries to assess what is the correlation between the subscription of stock options and the subscription of life insurance policies. In the end she arrives at the conclusion that the expected life duration has a positive correlation with the individual choice to subscribe to insurance policies. In the same way, research made by Baek and Devaney in 2005 demonstrates that more healthy households spend even more in the field of life insurance. On the other hand, marital status can be found as a good estimator of the insurance demand of both single individuals and families. It is normally assessed that married people spend more money in the insurance field than those unmarried ones. Contrarily the literature that emphasizes no correlation at all or even negative connotation between marital status and insurance plans does not give incredible insights.

Finally, there is no incredible point of improvement in the study of the impact of culture on the insurance field, regardless of its use for studying differences in mortality or survival, family or risk management.

8.3.2 ECONOMIC VARIABLES

After having presented the most common demographic variables affecting the model it is possible to change paradigm by analyzing the results that economic variables have in the insurance sector.

Income has been found to be one of the most useful estimators in the empirical study with a high level of positive correlation with the market demand for insurance policies. This can be explained because as income rises, it gives more accessibility to insurance tools, moreover, as income rises the opportunity cost associated with the premature death of the income earner grew rapidly. Hence, the result found in the literature is that households with a high level of income are more likely to buy insurance policies with the aim to preserve heirs from the income stop consequent to their passage away, ensuring the constant level of consumption as the income decline has never happened. In the end it is important to highlight the incredible scarcity in the literature evidence that deviates from the theory stated until now. The objective is to highlight the significance of the function income plays in the underwriting of insurance policies.

Contrarily, the reference literature does not have the same degree of concordance as dealing with the ***wealth*** effect on insurance demand. According to some scholars there is a positive correlation between wealth and the demand for policies because wealth boosts the degree of households' risk aversion. On the other hand, some other studies emphasize the fact that life insurance in the insurance sector especially must have a negative correlation with the wealth level. The reason put forth is that wealth allows by definition to answer financial shocks such as income earner death, without the need to ask for insurance coverage.

To add another variable additional scholar supports the idea that ***owning a home*** must have a positive connotation with respect to insurance demand irrespectively from demographic characteristics such as the gender of the property owner.

8.3.3 PSYCHOGRAPHIC FACTORS IN THE CONTEXT OF PURE RISK CONTROL

To give the reader a complete overview of variables in the field there are psychographic variables that must be analyzed. They have the overall aim to represent all the aspects of the individuals' personality that can have the potential to affect their opinions in the field of insurance sector. Before starting the assessment, it is important to say that as they are related to individuals' personality and behavioral traits there is a low level of objectivity with respect to economic preferences and demographic composition in this field. These

objective characteristics are summarized under the name of a science called psychography, that can be seen as the practical evidence of an individual's attitudes, personality, opinions, and behavioral tendencies.

The individuals' ***attitude toward risk*** can be declined into the aversion, indifference, or inclination of households to take risks. This can be used as psychographic factor as it is a good estimator of many insurance behaviors. This concept has been broadly discussed in the previous chapter regarding the risk definition from the theoretical standpoint. Moreover, as it is a continuous variable indicator, it must be considered in the economic model, while it can be challenging to identify it from the sample data. This is the main reason why the empirical evidence with respect to the reference literature is comparatively scarce. In the end it can be said that findings about the correlation between risk attitudes and the market demand for insurance coverage seem to be unclear. The hypothesis made in the economic framework by which the higher risk aversion must necessarily lead to higher level of purchasing in insurance sector is confirmed by the empirical evidence of some scholars but rejected from others. Maybe the broad variation in the results observed can be explained as there are several types of risk that the individual must deal with. Hence, the situation in which the individual is solely put in front of potential losses in the negative scenario and the preservation of his economic status in the positive case has not yet been deeply considered.

The lack of empirical evidence on the correlation between an individual attitude toward risk and his inclination to buy insurance instruments can be brought back to the idea that risk indicators used are the ones related to financial risk rather than pure risks. This means that the estimators used are not the most suitable for predicting the individuals' behavior.

Williams in 1996 put forth the idea that individuals' attitudes regarding pure risks can be widely different from the attitudes toward financial risks. To give the reader an example one individual can be more inclined to take risks when there is a high enough probability of profits, hence a kind of reward; on the other side it is reasonable that if the outcome can be only a loss, he wants that those risks are transferred trough the issuance of issuance coverage.

In 2001 Helek and Heisenhauer are the ones among few scholars that have deeply studied the individuals' behavior toward risks by differentiating between pure and financial ones and also connected them to the demography of the sample population. The important newest empirical evidence shows that households have different responses when deals with different type of risks, hence that the traits of people most likely to take financial risks are not always aligned with the traits of people who instead wants to be exposed to pure risks.

In the empirical analysis one of the factors that have most influenced individuals' behavior is professional ***circumstances***. To give an example, self-employed do not seem to evaluate financial risk differently with respect to employees, contrarily the self-employed one is much more adverse with respect to pure risks.

Another factor that seems to have different effects based on the different types of risk considered is ***education***. In fact, higher education has to do with more aversion with respect to pure risks and, on the other hand, greater attitude toward financial risks.

In the end ***aversion to uncertainty*** can also be defined as one of the psychographic factors that influence households' behavior with respect to different types of risks. The already explained distinction between risk and uncertainty must have even more importance when making this analysis on consumers' behavior in the insurance industry. Unfortunately, there is no applied evidence of the connection between insurance behavior and aversion to uncertainty indicators. This is because theoretical research has been focused on the general definition of aversion towards uncertainty. Furthermore, as the studies are still at early stages, they have very high potential to give further insights on the distinctions between outcomes produced in uncertainty attitudes with respect to risk inclinations. At a first glance, women appear more risk averse than men, but on the other side women have demonstrated to best react when passing from an almost certain situation to another one that allows for the presence of uncertainty. Overall men and women do not seem to have a significative difference in how they evaluate un uncertain situation. In the end it can be argued that gender can be used as explanatory variable when dealing with risks' exposure,

while it does not appear to raise evidence of differences with respect to attitudes toward uncertainty.

To give the reader some conclusion coming from definition used while explain uncertainty, it can be said that households prefer situations in which the probability of certain events can be assessed with certainty rather than uncertainty, i.e., the majority seem to have a reasonable level of aversion to uncertainty, that does not exclude the possibility that propensity attitudes exist individually. Moreover, gains scenario exhibits a stronger aversion to uncertainty with respect to losses domain. Finally, when dealing with events that have a low probability of occurring, there is an aversion to uncertainty in losses domain, whereas in higher probability situations, there is more tolerance towards uncertainty. (Alemanni, 2012)

8.4 INDIVIDUAL BEHAVIORS IN INSURANCE FIELD

In this advanced phase of the literature analysis, it becomes clear that Life Cycle Theory and Perpetual Income Hypothesis give reasonable explanations for human decisions, while few of them appear to have a distinct connotation. Here it appears reasonable to introduce the concept of limited rationality to explain these inconsistencies. The objective of this concept is to evaluate decisions as excessively complex because there are several variables, concept, and computations involved, hence, even if the subject matter can be mostly theoretical, the required understanding is considered uncommon among individuals.

According to Kahneman and Tversky, the authors of Prospect Theory, distortion and abnormalities can be defined as " the effect of true and real anomalies of the human evaluation process". Hence, the issue in question is more complicated as the real heuristic processes are not just a primary output of mental work. To give the reader an example, the savings rate of households is lower than the expectations derived from Life Cycle Model even if the assumption hold that families know the perfect savings rate. The answer to this output can be linked to the low level of self-control while driving their consumption. To put it another way, families lack the knowledge that they can save more now by lowering current consumption in favor of future ones. In the end the bigger barrier against the

appropriate level of savings has nothing to do with lack of knowledge or security related subjects, rather it can be linked to the ability to answer to it with the necessary effort.

It becomes clear that behavioral choices in the insurance industry as well as in savings sector and economy at all cannot be completely explained as the output of rational attitudes. To be precise, households' decisions can be defined as the set of decisions mostly impacted by psychological and emotional biases or, to be more general, affected by human nature.

Now take even more space the concept of hyperbolic discounting while the necessity to explain the concept of lack of constraint in cost-benefit analyses arises over time. As a result, individuals must evaluate their options in several scenarios, while dealing with decision-making process, by also considering the allocation over time of costs and rewards. To be precise, in the neoclassical paradigm, the economic agent uses an exponential discount factor while having to do with the weighted average of future expected utilities. This discount factor can be held constant across time when the agent is in the environment of intertemporal decisions. Hence, the concept of dynamism is refused in all other non-exponential discount functions, even in stationary ones or in the ones that have exponential functions but with a dynamic intertemporal discount rate as they are considered inconsistent.

Thaler in 1981 was able to test empirically the inconsistency in the nature of discount rate. Findings derived from his research highlight the fact that individuals more often use a diminishing discount factor when they must discount their future utility over time. In conclusion, individuals can be considered impatient when dealing with temporal consumption profile that is preferred when is more expected in advance. Moreover, they are also more impatient when the gap between costs and benefit is thin in terms of timing as opposed to those that will become apparent over time. As a result, empirical studies serve as a demonstration of the fact that the decisions that can be observed can be reasonably explained by implying the use of hyperbolic or quasi hyperbolic discount functions rather than the exponential ones.

The difficulty in making deviations from the routines that individuals establish, and the gradual postponing of decisions can be the best manifestation of the poor intents that the hyperbolic discount model tries to describe. This phenomenon applies also in the insurance sector as the following sub-chapters tries to emphasize. Thus, other things being equal, hyperbolic discounting can explain the fact that there is a temporal inversion of preferences, and hence, individuals are able to deviate themselves from their usual choices only when there are incredible favorable incentives.

The problem can be summarized as the fact that even if the ultimate goal is subjectively valued more than the different deviations that can arise during the path, the individuals' mindset has human deviations that brings people to evaluate deviations more heavily with the passage of time. Even at the point that they outweigh the vision of long-term goal. In ultimate instance, hyperbolic discounting can be used to divide individuals into two main macro-categories, sophisticated agents, who are more conscious about their biases and lack of self-control and naïve agents who can be considered unaware of it.

After having finished the introduction of the individuals' behaviors, the following subchapters try to explain various points that can be summarized as follows. When to join, how much to contribute, how to allocate resources and finally the divestment phase and the trade-off between income or capital. During the analysis some biases arise and hence are better discussed. It is important to say that generalities about them are discussed in Kahneman and Tversky Prospect Theory (chapter 5). Instead, in this chapter the main focus is on their application when dealing with pension decisions.

8.4.1 WHEN TO JOIN?

The savings concept can be linked to the one of life insurance or security pension and this assertion can be confirmed by the fact that the individuals' propensity to delay savings decision is a direct result of the hyperbolic discount. As a result, the hyperbolic discount makes immediate utility more heavy than future utility. The problem is that people do not care about the future horizon unless they reach a certain age, on average between 40 and 50 years of age. This is the phase in which more often people start worrying about future

plans and hence, long-term financial planning has a time horizon much shorter than their entire lifetime.

Here is the moment to introduce the concept of ***status quo bias*** which tries to explain the fact that individuals perceive a change from their current condition as riskier than staying in the current situation; as a result, they prefer to be stuck in their current status. As it is broadly explained that biggest rooms for improvement can be found in riskiest areas that are, the ones more far from the individual's comfort zone, the outcome of the status quo bias is that it can be proved as irrational deviation. To put it another way, the status quo bias can be better explained linked to the concepts of regret and loss aversion. In conclusion this distortion can be defined as a bias in human perception, who feel an irrational tendency to remain in the current status, hence, do not deviate from the standards and predefined models, which are also referred as default options.

Decisions about insurance plans are marked by increasing complexity and concerns because deals with period very far in the life from the current situation. As will be seen, there are numerous other pension-plan related decisions in addition to when to contribute to insurance plans that ca ne considered problematic because of the deferral nature. As regarding to the default options the effectiveness of an automatic enrollment pension plan, which is a feature of the US labor market, argues the idea that silent agreement provides unambiguous proof of the relevance of the status quo bias previously discussed. In the United States, newly hired employees are directly and involuntary enrolled in an investment plan from their employer. The savings rate is typically around 3% of the employee's salary. According to the behavioral bias explained till this moment the automatic enrollment mechanism must raise the participation rate significantly.

The concept of framing effect, already introduced and better described in a bit can also be included in the success of the automatic enrollment. Figure 16 below shows the evolution of the participation rate in pension funds before and after the introduction in the US of the automatic enrollment plan. This is because the empirical evidence has just shown that the way in which various options are presented has an influence on the final outcomes, which is in the contrary of what classical theory tries to explain. To be more general, it can be

assessed that individuals when encountering challenges use helpful shortcuts to make the issues faced easier to handle.

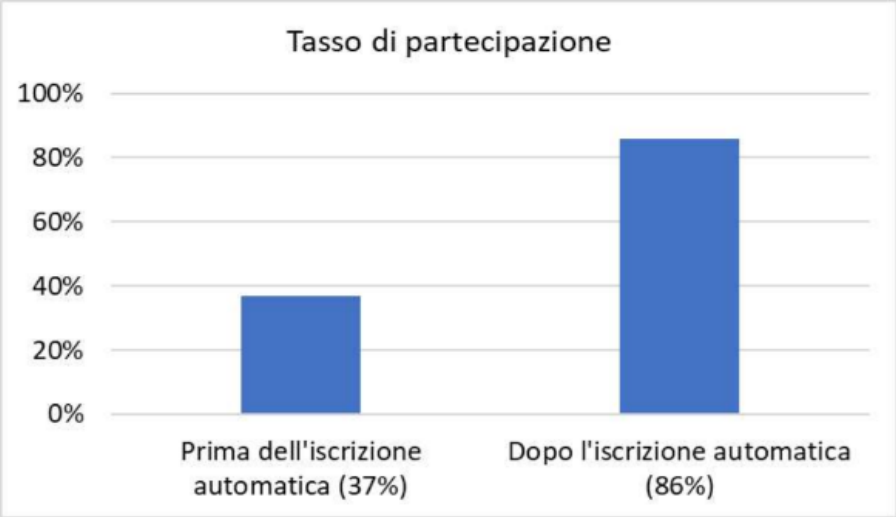


Figure 16: Consequences of insurance auto-enrollment in US.
Source: Madrian and Shea (2001)

The newest heuristic can be described as the one that makes others' decision, i.e., the default option, as their own. This definition leaves the stage for the use of automatic enrollment programs (AEP) since in absence of AEP the decision required to employees is the choice to enroll, whereas in presence of AEP, the decision is the option to opt-out. Furthermore, the distortion from the classical economic theory, which states that the availability of more options at hand can be considered a better condition must encounter the outcome of behavioral finance. Additionally, another explanation of the status quo bias can be found in the abundance of information to which individuals are exposed daily. In fact, the more information is complex, the more inertia and delay it causes to individuals when they experience difficult situations and decisions. It can be said that complexity is linked to the new concept of imitation behavior, and, in a broader sense, there is an influence suffered by the decision maker by the surrounding and reference environment.

In conclusion it can be argued that instinctive processes of comparison, recognition and categorization drive intertemporal choices rather than cost-benefit analysis. As a result, peers' influence in supplementary pensions can be explained in at least two different ways. First of all, individuals more often are not pretty good in the evaluation of advantages and disadvantages of various options available, which result in a sub-optimal decision made by

them because of there is not proper assessment of the information at their hand. The simplest way to mitigate this issue in their vision is to use the decision made by someone else in the same field as their own choice. Secondly, another explanation is linked to the fact that social systems aim at reaching the maximum possible level of conformity and homologation. In conclusion, it is possible to argue that more social people are more likely to learn information and decisions about certain investment choices because of their interaction with some else, possibility more remote for less friendly ones.

8.4.2 HOW MUCH TO CONTRIBUTE?

While the decision about when to start contributing can be considered the initial factor affecting insurance and pensions decisions, several studies have demonstrated that the contribution rate has arisen as the crucial factor in determining the actual amount accumulated. Even in this field several biases affecting individuals have been found with empirical evidence. The limited rationality of workers as well as their lack of understanding of how economic policies work must be considered. The primary drawback of the automatic enrollment plan is the low level of contribution inside the “default option”. This feature must be explained in correlation with the notion of the status quo bias. This is because the high degree of inertia results in the preservation of the default parameters and hence in the standard option. It can be assessed that the contribution rate is another difficult choice in the eyes of decision makers. In fact, the ability of individuals to make mental shortcuts or even rely on other factors becomes crucial when dealing with this difficult decision.

According to Engelhardt and Kumar (2003), the decision made by the corporation in which the single individual works must have an impact. In fact, in their research they highlight the presence of an increase of roughly 0.25% in the employee-determined contribution rate for every percentage point increase in the amount paid directly by the employer. As regarding to the Italian case, Legislative Decree 252 of 2005, has the main purpose to promote the use of complementary pensions allocation. In fact, starting from 2007, employees had to make a clear or implicit decision regarding whether to assign their accruing severance pay to the company or the pension fund. The decision affects individuals that have not yet decided the pension fund where to allocate their severance and includes:

1) people who have never registered in a pension fund.
2) people who were enrolled in a pension fund prior to April 28, 1993, or "old members", for whom there was no legal requirement to allocate severance pay to a pension fund.
3) those who enrolled in a pension fund after April 28, 1993, but who had made INPS contributions before then, known as "new members," who were not first employed; for whom the law imposed only a partial obligation to pay severance pay to the pension fund, at least on 50% of the contributions made by the worker and the company.

Both the employer and the employee may choose to make a voluntary contribution in addition to the accrued TFR; the minimum contribution is determined by collective contracts. Benarzti and Thaler in 2004 put up the Save More Tomorrow (SMART) program, as a one potential remedy for the issue of rigidity of the position held by individuals that enter the pension plan. With the SMART program an automatic escalation mechanism is implemented in which members start their pension allocation with a small contribution to social security and tacitly agree to a series of automatic increases in contributions. To prevent a diminishing salary for participants and hence, view severance pays as a loss in current consumption, these increase in pension plan contributions are distributed over time and also matched with salary increases. This is the best way to solve both the automatic enrollment setting and the excessively conservative feature of default options.

8.4.3 HOW TO ALLOCATE RESOURCES?

The feature of risks and obligations allocation to individuals goes beyond the notions of when to contribute and how much to do it and includes the proper distribution if accumulated wealth. These decisions have the potential to significantly alter the replacement rate—which is the annual ratio between the first pension and the last income from work—given the same income from work and contributions. To give the reader an example, Italian workers had to select between using an individual pension form or a collective pension form, the latter is based on collective agreements, in addition to deciding whether to enroll in the supplementary pension generally speaking. The idea behind this definition has more to do with the fact that investors must have the necessary skills to build

an optimal portfolio by following Modern Portfolio Theory's guidelines. It is important to say that this is not the outcome that usually occurs. Because factors and preferences used to build the investment portfolio differ from those that rational approaches theorize. Several empirical evidence have shown that investors use a variety of heuristic principles, including the impact of covariances while making portfolio selections, the aim of which is to reduce the complexity of decision-making in the situation encountered.

Furthermore, it is possible to see that the degree of risk in portfolio built by savers depends more closely on company investments' line rather than their own degree of risk. To put it another way if the organization provides to stock funds and one bond related fund the employee is morel likely to invest about two thirds of his money in the riskier side of assets. Whereas, if a company provides two bond funds and one stock fund, the individual portfolio will consist of about two thirds of less risky and hence less volatile assets. In recent years several studies have shown that when the range of possibilities is wider workers face more complexity in decision making choices and hence try to escape the issue by focusing on the predefined possibility.

In 2007 Mitchell reviewed the choice issue by focusing on the effects of lifecycle investment plans on asset allocation made by individuals. The sample size used by this scholar of about 250.000 sample units gives the chance to apply the empirical results in many geographic areas even if the focus is on US workers. Lifecycle funds can be better defined with the help of dynamic asset allocation. Specifically, as retirement approaches the shares percentage in the built portfolio declines for two main reasons:

1) The individuals' risk propensity decreases with age.
2) By reducing the equity share of the portfolio the risk inside it is hereby reduced. In this way the portfolio has less room for deviation from the mean as retirement draws near.

Life cycle funds can be made available in three different ways:

1) As an automatic switch from more static risk-related plans.
2) As an addition to the current choices' menu.

3) As a suggested default option within the plan from the hiring company.

The second main point of improvement taken out by the sample interview made by Mitchell is its ability to distinguish situations based on their different initial state. In the first scenario, the choice about the lifespan is the outcome of an intentional decision. Whereas in second and third scenario the output is the result of passive conditions. The final conclusion broken out by this study is the fact that lifecycle fund found loyalty in individuals that have lack in financial literacy, for whom choices about asset allocation can appear unduly complex. In fact, younger individuals, as those with lower income and least educated people—i.e., the sociodemographic groups most frequently linked to a lack of financial literacy—results in a higher likelihood of enrolling in these types of programs.

On the other hand, it appears evident that there is a clear tendency of employees to make excessive investments in shares of the company they work for. This is a problem associated with the concept of investment ***diversification*** that has more to do with behavioral biases that affect decisions. The bias encountered is the one of familiarity, which have the main drawback in the fact that individuals concentrate their portfolio on well known securities such as those of the company in which they belong or, generally, those that investors perceive more familiar with. Behavioral finance studies characterize the familiarity issue as the tendency to see more familiar stocks – risky assets in which individuals knows or believe there is a great deal - as less dangerous or, in other words, with a low probability of losses with respect to less well-known ones.

Moreover, investment decisions are biased by the fact that there are two other types of deviations. The first one is ***affection***, which is the decision to give more weight in portfolio to the company employees work for, and hence, in contrast to the classical theory, the investment made have a sentimental history and as a result, selling shares acquired through a stock option plan is seen as a betrayal of the organization the employee hardly work for. The second bias discussed is the one of ***overconfidence***, which underlines the fact that employees have the unfounded belief that they have a higher level of information about the company they work for with the ones available to general public on the market.

Another bias that must be discussed is the one of ***mental accounting*** which states that more often employees view the shares of the company they work for as an investment class completely different from other stock or bond assets that might be a part of the built portfolio. In the end the definition of mental accounting must take into consideration the fact that mental models influence individuals thinking also in the environment of risk propensity and tolerance to them. One more important point to consider is the static nature of portfolios, which is believed to result from both mental accounting and ***regret aversion***. The latter is the act in which the potential regret resulting from an error completely outweighs the actual loss that could happen if the error actually happened. This is the main reason why some behavioral models include the chance that people could make decisions aiming at reducing the potential for regret derived from the choices made.

In conclusion it is possible to assess that subscribers have a conceptual definition between newly contributed funds and savings already allocated in the past. This is because the idea is that investors have more probability to regret if they must reallocate funds already allotted with respect to newly invested ones. This is because they have the mental bias in which a rebalanced portfolio could yield a lower rate of return with respect to the ones that could have been achieved by keeping things as they are.

8.4.4 DIVESTMENT PHASE: INCOME OR CAPITAL?

The ultimate choice discussed and made by individuals in the insurance industry is the set-up of pension and savings decumulation phase. Each individual now has an amount known as accumulated savings that is net of all the consumption and expenses made during the working age. This amount must be paid back at the retirement moment. Essentially there are only two possibilities available to individuals. The first one is the choice to earn a lifetime annuity that is matched with the expected residual life and the amount of savings that a certain individual was able to set aside during working age. The second one is a single tranche coincident to the entire amount of capital that the individual is able to save.

Yaari was the first scholar that have tried to address the subject matter in detail in 1965. He empirically demonstrates that a normal level of risk aversion is enough to persuade a saver to select a fair lifelong annuity with the aim of covering the impacts of longevity risks even

in the absence of a desire to leave inheritance. Moreover, it has been demonstrated that individuals' capacity to make financial decisions significantly decreases with age. Hence could make sense to make these decisions when an individual is still in the position to do it as best as possible. All these findings must be added to the ones already discussed, hence having in mind that sample survey have demonstrated how is difficult for people lacking the required financial literacy to construct suitable models for savings and investment over the life.

Moreover, justifications must be given for deciding to turn the savings shelved into an annuity. In addition to the information already given to the reader, the saver that will choose capital instead of annuity must be able to construct an optimal spending plan and hence a budget for each period he encounters. The result can be that due to the excessive difficulties in finding optimal level of consumption a saver can have a level of consumption different from the proper one, excessive or insufficient are the two sides. Furthermore, the chance to convert savings into income has the potential to solve two conceptually challenging issues. The first one has to do with evaluating the reasonable level of consumption given the individual's wealth and age. The second one is the supply of the monthly income target that is required to carry out the plan in question. In the end, empirical evidence shows, as in the majority of cases, contradicting results even if the theory emphasizes the preferability to choose a life annuity based on the theoretical concepts of efficiency, convenience, risk insurance, and adequacy of pension funds.

As COVIP, the Pension Fund Supervisory Commission, emphasizes there is very little use of these instruments in the real world, according to 2011 data. However, the Italy is not alone in this situation as the current framework led to same results even in other nations, including Switzerland and United States. The Legislative Decree 252/2005 tries to re-establish the centrality of income, considering the risks of making the system less appealing as the degree of income forcing increases, this endeavor has not yielded good outcomes thus far. With respect to other nations in 2000 Brown and Poterba have addressed the evidence of low demand for income by considering the fact of family solidarity that would decrease the extent of financial risk by sharing it without being dependent on sporadic payments. Moreover, they have also argued that the presence of annuities deriving from

company integrated plans may cause a crowding-out of the annuity demand for supplementary pensions. This will result in a scenario where the majority of subscribers would prefer capital at the expense of annuities. This is the ***Annuity Puzzle*** that refers to this pattern of inadequate use of annuity when making choices with respect to capital even if the classical model theorizes differently.

Literally speaking the notion of ***altruism*** is used to explain the fact that annuities are given up in exchange for capital. The definition of altruism is the wish to have something to give to heirs when the individual passes away. This assumption, even if completely rational, is in contrast with the formulation of “homo economicus” which depicts an individual that is self-centered, who only seeks to maximize personal utility.

Another bias that deviates from the choice to select annuities is the ***adverse selection*** regarding the misconception of the individual longevity risk. On the other hand, the lack of knowledge about mortality premium causes the fear that tends to make capital preferable. The mortality premium can be defined as the coefficient for converting the capital contributed into an annuity for life, which enters into the pricing of these instruments. In the end annuities can be priced more reasonably, since annuities paid to some are subsidized by the death of others. As could be discussed so far, behavioral finance seeks to give important interpretations to these human deviations.

The first effect discussed is ***framing*** as it was done in the literature review. A negative framing can be defined as the consequences of the subject's inability to follow a certain behavior, whereas positive framing emphasizes the positive results that can be brought about by adopting the suggested behavior. Several studies in the field have led to several conclusions. Firstly, negative framing is better adapted in more complex and uncertain situations. In other words, when there is a high level of complexity and uncertainty, economic agents could need more time to process information and have a preference for situations that are presented in a negative light. Secondly, annuity demand increases as risk aversion increases. On the other hand, more interesting is the negative correlation between annuity demand and financial literacy. In this field, more experienced individuals in the financial sector have such a confidence level that are able to maximize investing choices

also by refusing properly priced annuities. The objective of this work is to test if these correlations and even other ones can be found in the sample survey used by the author as well as the drivers in COVID-19 scenario.

To conclude the framing discussion, the agent could assess the lifetime value of consumption if he approached the annuity from a broader perspective, such as that of individual consumption. From this perspective, it is possible to say that the annuity takes on a much more attractive meaning for those who are entitled to it: this type of income allows them to live longer and hence, consume more. If the individual focuses on the spending he can do during life, then it does not matter that the annuity loses value after death. Like an insurance policy, the annuity increases in value when the beneficiary needs it the most, i.e., if he lives longer.

In the same way as can be seen in the resource allocation environment, loss aversion and mental accounting can be useful while explaining the concept of annuity puzzle. According to Hu and Scott (2007) point of view, mental accounting can be considered as the first responsible reason why annuities are not selected when analyzing the context of annuity puzzle. By separating the flow that annuities are able to generate from their effect on overall pension consumption, the purchase of an annuity becomes more similar to a hazardous game that increases the decision-maker's overall risk exposure rather than an insurance policy that aims to reduce it. This newest method to present annuities choice is supported by a sample survey conducted among US workers, the aim of which was to reveal that most individuals view the annuity as a gamble on longevity. The survey reveals that part of the money saved is allocated to an unpredictable periodic flow that could lead to large losses in the event of premature death or even if there is no buffer for unexpected and unpredictable events.

The "*Cumulative Prospect Theory*", which contains several distortions explanations to support what has been said so far, is another important component of the behavioral finance system that indirectly encourages the refuse of income in the form of annuity in favor of capital one. The use of reference points and a value function characterized by risk aversion in the domain of gain, risk attitude in the domain of loss and loss aversion are in

fact what one may find. Finally, there must be considered the presence of a weighting function that causes an underestimation of high probabilities, and an overestimation of low probabilities further emphasizes the phenomenon in the presence of potentially huge gains or losses. According to this theoretical paradigm, decision-makers express income exactly as mental accounting advises, using the status quo, i.e., the accumulated capital, as a reference point. Moreover, in the presence of loss aversion, the high-stake amount and the strong penalty associated with the weighting function – which, as already said, tends to overestimate a low probability of premature death - make the inferiority of returns even more pronounced and widen the gap between subjective and objective probabilities. The impact of certainty, i.e., the decision-makers' more than proportional preference that they have for the certain event - in this case for certainty the model could refer to capital preference - over the totally probabilistic event, is another reason why the weighting function penalizes income as annuities. Once again, Hu and Scott's research reveals that there are even more elements related to behavioral theory that can be considered capable of changing the demand for annuities and hence, by adding them to the analysis a more tailored conclusion, more approaching the reality can be found.

Availability and ***aversion to ambiguity*** are two of such characteristics. The first can be considered as the tendency to attribute the probability of an event based more on its subjective probability rather than on its objective likelihood; this leads to a distortion of reality resulting from subjective deviations that affects human decisions. This implies that incidents that happened more recently or had a greater impact on a person are often regarded as with higher level of probability. Thus, the model must consider that people do remember negative experiences and do not think about assets as annuities, which, in the end, could lead to a pre-death or impoverished old age. According to the second one, an individual is considered averse to ambiguity if he favors a combination of two ambiguous bets, f and g, bets that, in the absence of ambiguity, would be treated indifferently by the individual, i.e., f~g. In the context of social insurances, this could mean arguing that the indeterminacy of the situation, such as the total lack of information about the probability of survival, in the end a very good explanator of why people are forced to make decisions.

Finally, decisions on decumulation must be considered as biased by the emotional impact. For instance, the purchase of an annuity may be considered a risky choice because of the ***aversion to regret***. At first glance, it could be argued that regret plays a minor role in this case, because the individual, after his death was unable to express his regrets due to the unfavorable circumstances that led to his death. This criticism, however, does not consider the fact that a person could live with a great sense of regret in the last months or years of his life if he had invested most of his retirement assets in an annuity and then discovered that he had a disease that ensured his short survival. Over the years, it has generally been shown that regret aversion leads people to make intermediate decisions; in other words, regret-averse people are less likely not to be fully insured, but also less likely to be fully insured. In this way, regret aversion can be defined more broadly by attributing it the real importance giving the effect it has on insurance decisions.

The last emotional component resulting from behavioral deviations is known as ***anticipatory anxiety***, which is a state of extreme tension caused by the mere idea of being in a situation that is thought to cause anxiety or panic. This anxiety is often the basis for the decision to abandon a particular activity, to visit a particular place or to be in a particular situation.

In the end, insurance is seen by economists and literature scholars as a mechanism capable of shifting resources from periods of low marginal utility - in which more money has lower value - to periods of high marginal utility - in which money becomes extremely important. This exact type of effect can be seen thanks to the outcomes produced by the annuity system, which shifts resources from states where a person who dies young is likely to have low marginal utility to states where a person who lives to a high and significantly longer life expectancy is likely to have high marginal utility. The statement "I buy insurance against harmful events" is true in reality, and as a result, many people buy insurance to compensate for situations in which their marginal utility rate is higher than their general utility rate. This also can indicate that many people buy insurance coverage to protect themselves against adverse events. Since low general utility and high marginal utility are often positively correlated, it can be said that this approximation works well in situations such as health or life insurance. This heuristic, however, often turns out to be false, since high marginal utility

or high general utility are often correlated, or vice versa. To put it more clearly, the market of life insurance policies offered to cover family members is much more widespread with respect to offering to a family an insurance contract to cover the risk of their child being accepted into a prestigious private university. This can be a very good example given to the reader of a typical situation of high general utility and high marginal utility.

Ultimately, it can be assessed that the choice to convert the amount of contributions into income has two distinct effects. Firstly, it increases the average level of future consumption, by also lowering the disutility caused by an anxious state; second, it increases the volatility of future consumption, and hence, increasing the disutility caused by an anxious state. These two conflicting impacts, together with the overall level of anxiety that each individual decision-maker surely experiences, determine the final demand for income. A simulation found in the reference literature leads to the conclusion that equilibrium is generally reached with minimal conversion of accumulated capital into income. (Del Savio, 2019)

9. EXAMINATION OF DECISION-MAKING BEHAVIORS IN INSURANCE AND SAVINGS

In this final chapter the main goal is to give the reader an overview of how the insurance demand works as well as the main variables that affect the model. In the end, in the opinion of the writer, the reader can have all the instruments needed to understand the sector that this thesis wants to analyze, as well as the main factors that influence it. Here is the moment to use data analysis to understand better how the insurance market works and what are the main variables that affect it, an important point of improvement is given by COVID-19 pandemic which allows for a better understanding of the problem analyzed.

9.1 INSURANCE DEMAND IN THE LIGHT OF COVID 19

While drafting this section the author wants to use the data available in the survey made by the Bank of Italy to have applied evidence of the hypothesis made in this work. This allows for the effective identification of variation in demand for insurance coverage and changes in savings allocation and benchmark the result of the analysis with the ones emerged in the reference literature. This is the final goal of this thesis.

In the eye of the author the decision to better examine the sample population behavior in terms of insurance coverage and social security and hence the households' financial decisions have broken out to investigate a crucial topic, neglected until now. The question is how decisions about savings and insurance have been influenced by a disruption like the one taken out by COVID-19 pandemic. Regarding this field the analysis wants to explain both the reasons behind the subscription of savings and insurance products and how socio-economic factors influence the usage of them, as the current environment evolves.

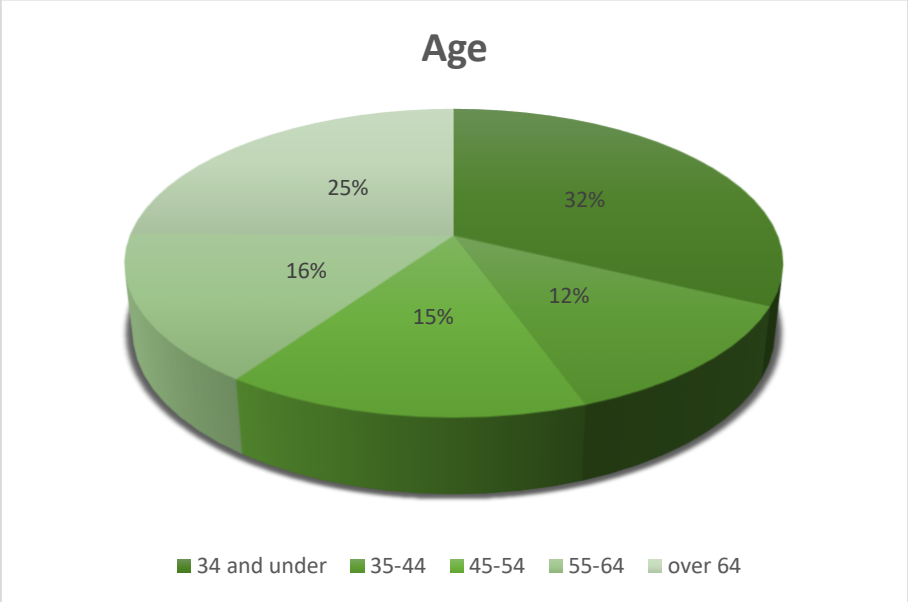
9.1.1 DISPLAY OF DATA AND SAMPLE CHARACTERISTICS

Now is the moment to present the data available on Bank of Italy as well as a description of the sample's key features. Soon after data analysis will be made and finally results interpretation will be assessed in the final section. As already said, the baseline of empirical studies derives from the survey conducted by the Bank of Italy, a sample survey that is made with a four-year cadence with the aim to dive deep into the balance sheets of Italian

families. The large amount of sample size gives more chance of accurate results while making data analysis. To have further information on materials used and methodology please refer to chapter 3 of this paper. Here the reader can find all the information needed about both the sample population and survey characteristics.

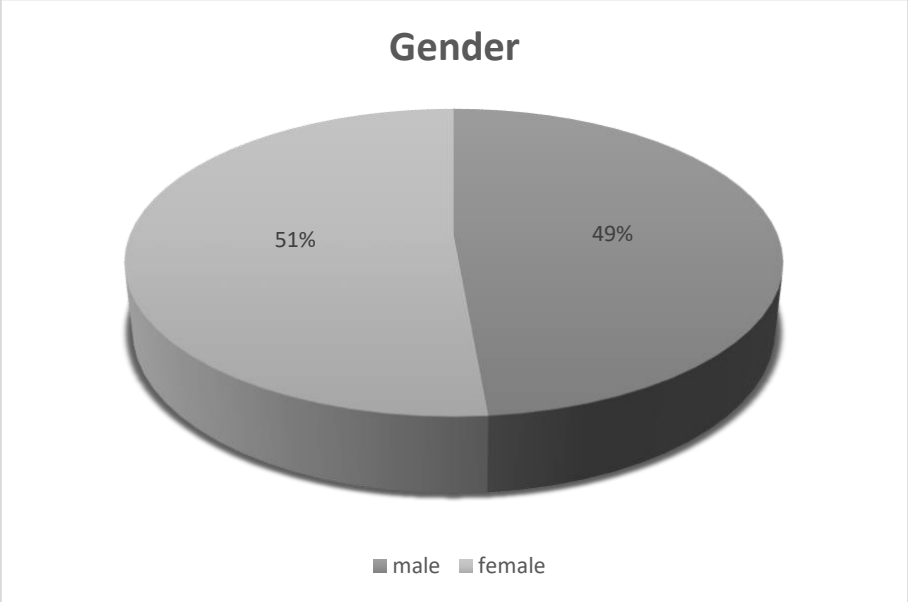
The questions added more and more to the questionnaire and the ones that this thesis is more focused on aim to determine whether households had a life insurance policy or supplemental pension and what the percentage share of wealth is allocated in savings at the time of the survey. The objective is to assess the interest of sample population in these instruments as well as argue if this interest has main drivers by also assessing which are these ones.

Regarding factors considered as explanatory variables, the author refers to socio-demographic features as well as some economic features recently added to the survey to have more variability into data analyzed. Regarding the ***age*** proportion as depicted in Graph 1, it seems to consist primarily of people with an age under 34 (32%), then with subjects over 64 (25%), subjects between 55 and 64 (16%), then subjects between 45 and 54 (15%) and than between 35 and 44 years (12%) to a lesser extent. Moreover, the sample records an average of 43 years.



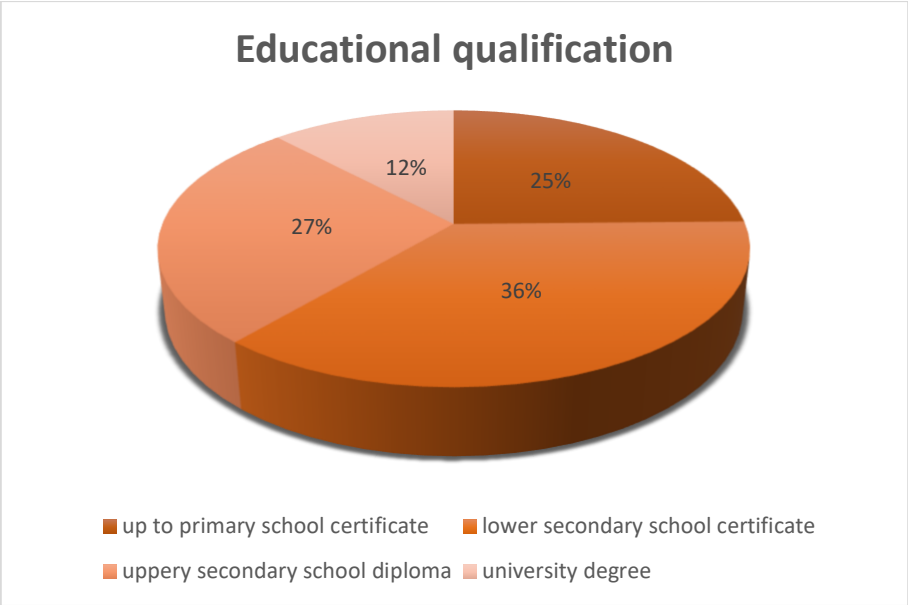
Graph 1: Sample population divided by age.

By looking at ***gender*** perspective, the sample used for the investigation comprises 51% females and the remaining 49% is made up of males (Graph 2).



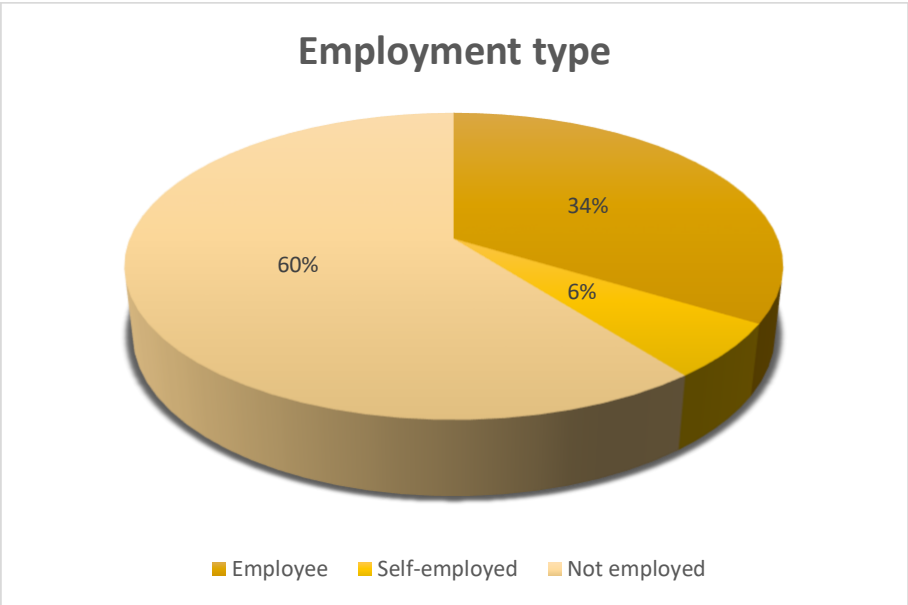
Graph 2: Sample population divided by gender.

Educational qualification can be used for assessing if this variable has an influence when dealing with fluctuations in the market demand for insurance products as a response to shock in the real economy (please refer to Graph 3). What must be highlighted from the graph is that in the sample population almost 88% have no formal education, by intending the formal one with a university degree which gives the right level of knowledge of financial threats and opportunities. In other words, the percentage of individuals lacking financial education refers to the summed percentages having an elementary, middle, or high school diploma, or no education at all. While developing the model has been assumed that, only university or post-university studies can make households able to make informed decisions in the field of social security, insurance, and finance in general, hence being able to do best response especially in situations that has to do with risk and uncertainty that are the main situations when financial education could have more weight. Furthermore, research emphasize the need of interventions as financial education level in Italy put the nation at the lowest level among OECD nations when dealing with financial literacy standards.



Graph 3: Sample population divided by educational qualification.

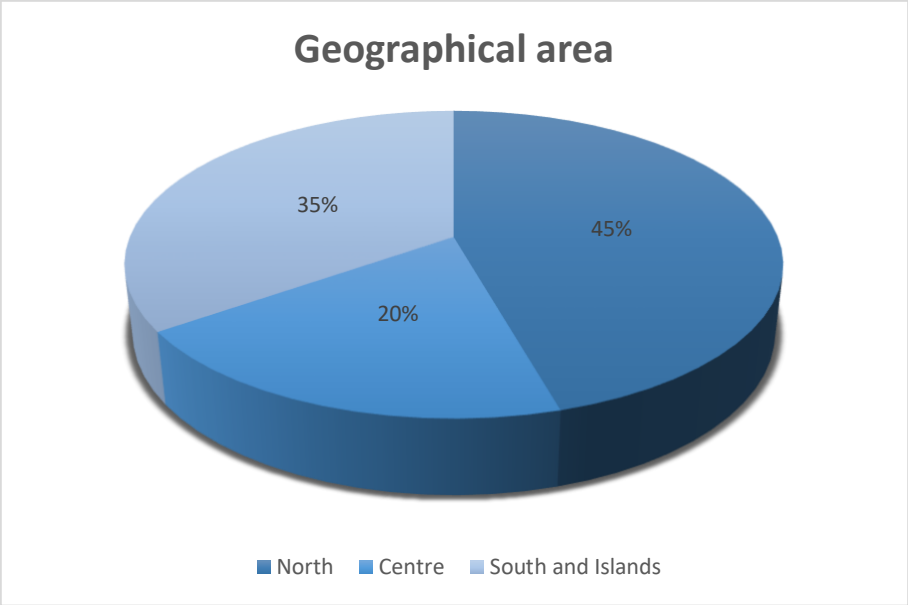
Another variable that the author finds useful in assessing different magnitudes in the demand for insurance products is employment status (Graph 4). The latter indicates ***employment*** assumed at the time of survey responses. Specifically, the variable may take on three different values depending on whether the sample unit is employed, self-employed, or non-employed at all (meaning unemployed or retired).



Graph 4: Sample population divided by work status.

It goes without saying that within the non-employed variable, lower demand is expected for the products considered due to the nature of the variable's components that compound it. In any case more information will be provided during the analysis

Finally, it was planned to use another explanatory variable present within the questions to try to see if a correlation existed between the ***geographical area*** of the respondents (Graph 5) and the dependent variables of the model i.e., demand for life insurance and supplementary pensions. From this first graph it is possible to see a greater concentration in northern Italy, but the main objective remains to understand whether or not this demographic characteristic has a correlation with the demand for insurance coverage.



Graph 5: Sample population divided by geographical area.

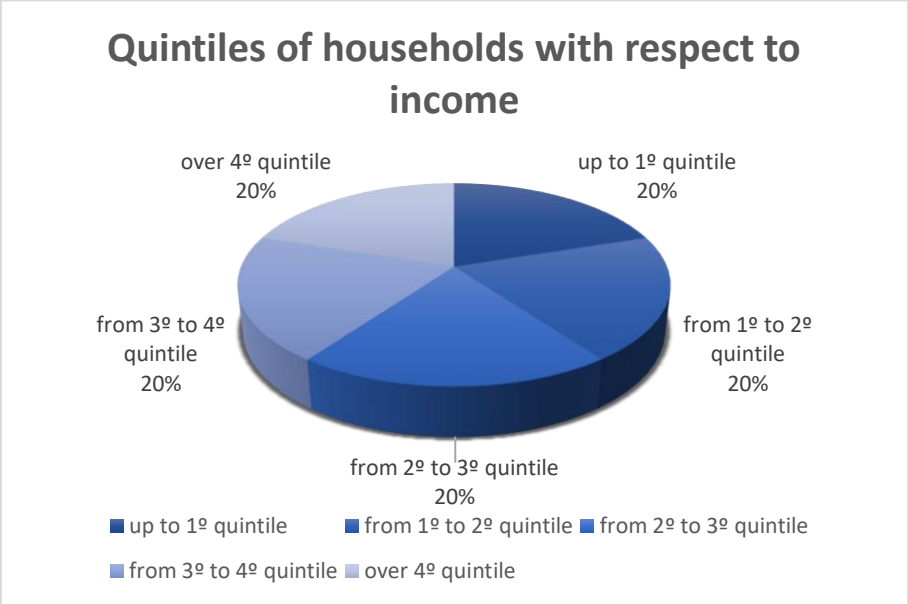
To give the reader more instruments and to raise the quality of data analysis, economic features are also added to the model. The purpose behind this idea is that those variables can have a great level of explanatory power and hence can explain why a rise in the demand for goods is directly correlated with an increase in income and hence ***wealth***. The latter is assumed to be derived from various sources, including work, investments, rent, and so on and so forth.

As the graph (6) clearly states, there is an equal distribution among quintiles of wealth of households' population but on the other hand there is a completely unbalanced division in the percentage of income and hence, wealth owned by each quintile as Table 4 shows. This output can be relevant when dealing with changes in absolute demand for insurance instruments and also in percentage points terms between 2016 and 2020 in order to see

the effect of incoming virus spread on the dependent variables that the model wants to primary studies.

	Quintile	*Share of households*	*Share of income*
	(euros)	*(percentages)*	*(percentages)*
Quintiles of households with respect to income			
up to 1° quintile	15580	20	6,6
from 1° to 2° quintile	22303	19,9	11,6
from 2° to 3° quintile	30237	20,1	16,2
from 3° to 4° quintile	44948	20	23,1
over 4° quintile	2385705	20	42,5

Table 4: Quintile of households with respect to income and share of income owned.
Source: Survey on Italian Household Budgets made by Bank of Italy



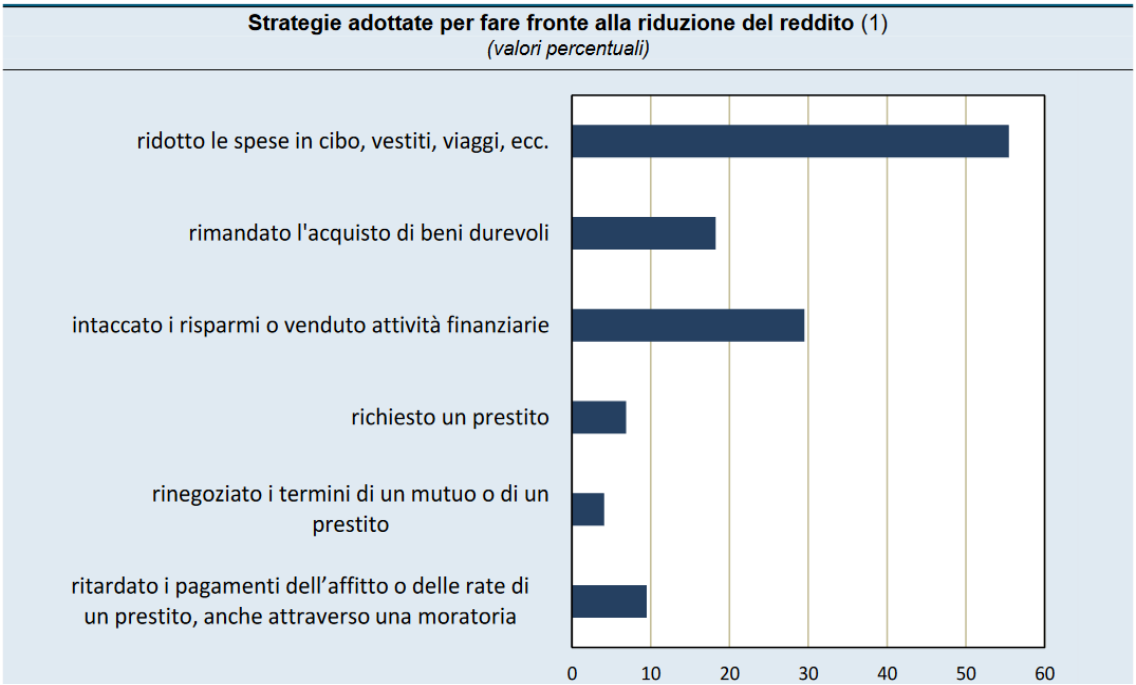
Graph 6: Sample population divided by quintiles of income.

Regarding the dependent variables it is important to see that subscription of life instruments and supplementary pensions instruments can be derived from some responses in the survey. For sleek of simplicity the answers are treated as dichotomous variables, meaning that the output can be 1 and 0, where 0 denotes the non-subscription of one of these two instruments and 1 denotes its subscription. Moreover, after having presented both dependent and independent variables as well as sample characteristics it becomes necessary to study the approach used in the empirical elaboration and the rationale behind some choices made while making data analysis. (Del Savio, 2019)

9.1.2 DATA PRESENTATION AND INTERPRETATION IN LIGHT OF COVID 19

The economic crisis that pandemic have caused in 2020 must have an impact on the variable of interest in the model, hence give significance to the deviation analysis between 2016 and 2020 data. In fact, in 2020, 17% of families have reported to have a level of income incredibly low. This value registers 5% points rise from the survey made in 2016, to be more precise, the growth has particularly affected households where the primary wage is received from an under 35 members. To give another information only 3% of surveyed households have reported that at least one family member has lost his job, meaning that the positive effect of layoff freeze broken out in March 2020 have had a measurable and sizeable impact. In contrast, a considerable percentage of households have reported a temporary reduction or even interruption of income deriving from work; 11% when dealing with temporary reduction and 5% for complete interruption. Consequently, families have been obliged to rapidly stop unnecessary consumption and also sold some financial assets with the aim to offset the decline in income from work experienced (see also Graph 7). In the end 10% of households have taken the decision to defer rent or loan repayments even if almost always this led to increased interests.

Moreover, the graph shows also that 83% of households expect an income level that is comparable to a normal year in 2021. The answers that registered an abnormal low level of income reach 11% points and was even greater by 2% points than the one had in 2014 following the recession experienced by Italy in the period 2011-2013. A general level of pessimism has spread especially regarding the state of the economy after the disruption had because of COVID-19 disease. This is true especially for most vulnerable families and for the ones that have experienced a low level of income in 2020. Furthermore, households that do not have the chance to work from home have been particularly affected or even the ones that have seen their work activity mandatory closed from government because of they have been considered non-essential production lines.



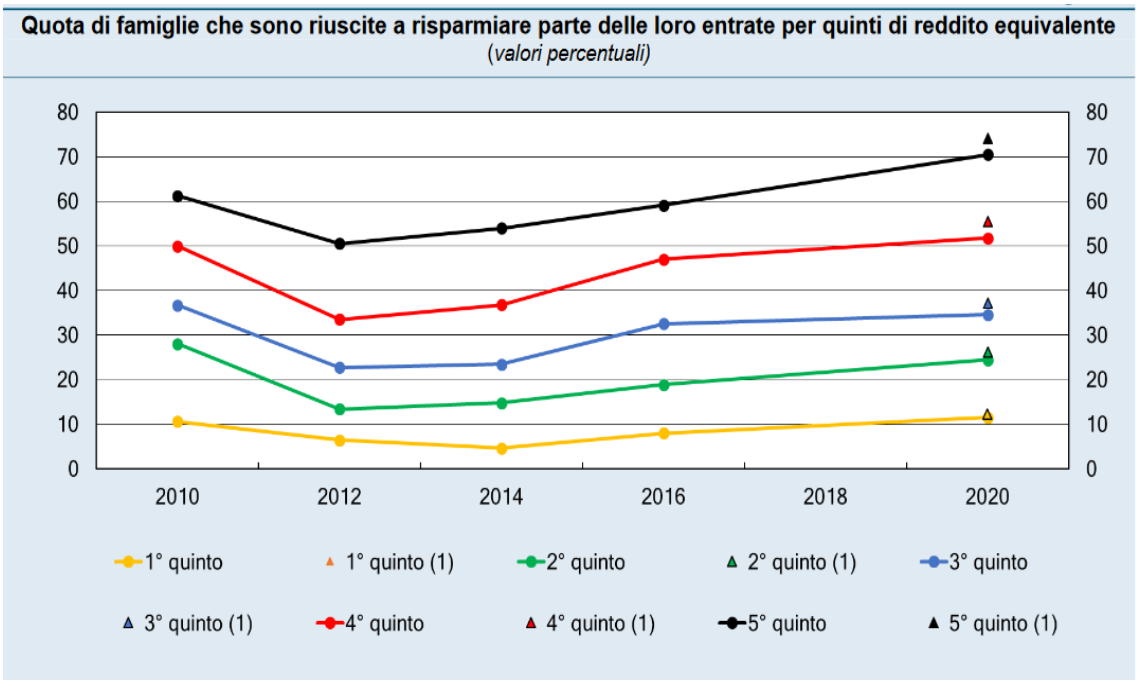
Graph 7: Strategies adopted to cope with reduced income.
Source: Survey on Italian Household Budgets made by Bank of Italy.

By analyzing the consumption point of view, containment measure as well as worries about uncertainty on future income level and contagion risk have impacted consumption which are pushed down. As a result, savings have been used more for precautionary purposes. In 2020 almost twice the percentage of families seen in 2016 have reported unusually low level of consumption. This value in 2020 have reached 10% points of the entire sample population. The ratio between people who answered that have experienced unusually high levels of consumption and those indicating abnormally low level of consumption is positive for all quintiles of wealth even though is wider for the highest level of income. Starting from an average of 3,7% it reaches the maximum value of 11% for the wealthiest quintile. This idea is consistent with the theoretical idea that there are both higher share of wealthy families' consumption unaffected by the containment measures as well as greater propensity to consume goods and services whose consumption has been affected by it.

In another instance 18% of families reported a savings level above the average for a normal year. 41% of households were able to save a portion of their income even though the uncertainty raised in this particular year independently on the wealth level under consideration. By using data coherent for historical comparisons this percentage reaches 39%, that is in every case above the level registered in 2016 for more than 5 percentage

points. Moreover, the percentage share of families who reported consuming more than in the past is stable at 9% for both the weighting system and also this is in line with the registered value reached in 2016.

By splitting the sample population by quintiles of wealth all sections have seen an increase in the percentage share of households in the sample population with positive level of savings, furthermore the highest magnitude of intensity is registered in the highest quintile of wealth. From Graph 8 it is possible to see that nearly 11% points is the highest growth experienced by wealthy ones. This means that exactly as the literature broadly explains, a disruption as brutal as the COVID-19 pandemic have led, among other things, Italian households to increase their savings ratio during the period under object of the analysis. This is because it can be deduced that savings are the best response to a period of great uncertainty in all spheres, that has not affected merely the financial market one like in previous recessions, and this has both threats and opportunities.

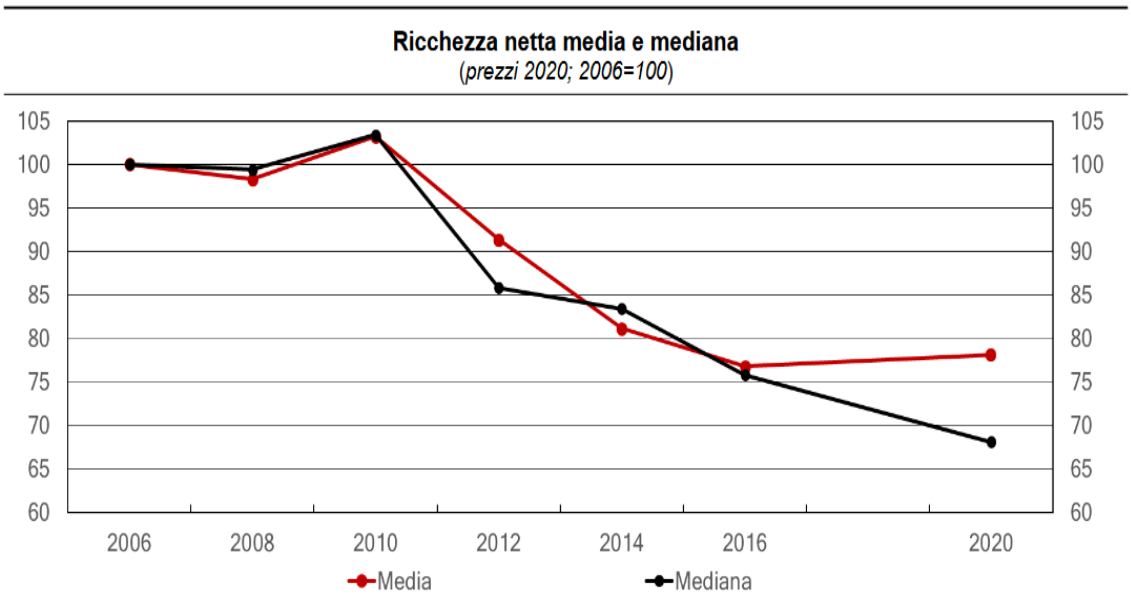


Graph 8: Shares of households that managed to save part of their income by quintiles of equivalent income. Source: Survey on Italian Household Budgets made by Bank of Italy.

As can be also seen from the graph above the percentage varies according to the wealth quintile under consideration, this is because there is a part of consumption known as subsistence consumption that is much harder to reduce even in these situations and, certainly, this consumption represents a larger slice of the income, and hence wealth, of

households in the lowest quintile of wealth. On the other hand, for households with higher incomes, the part of consumption considered non-essential had a much higher opportunity cost during a phase of uncertainty, or at least an unfavorable phase of the economic cycle. This has led to pushing up their savings allocation share considerably.

From the point of view of wealth, at the end of 2020, based on the survey used in the analysis, Italian households result having an average net wealth, that can be considered constituted as the sum of real and financial assets net of financial liabilities, of about €341,000; the median value, that is the one which separates the least wealthy half of households from the richest half, was significantly lower (just under €151,000). By making comparison with respect to the last survey, referring to 2016 data collected, the average wealth has increased in real terms by 1.7%; the gap between average and median net wealth, used as an indicator of the degree of inequality of the relative distribution, has widened further (Graph 9).



Graph 9: Average and median net wealth.
Source: Survey on Italian Household Budgets made by Bank of Italy.

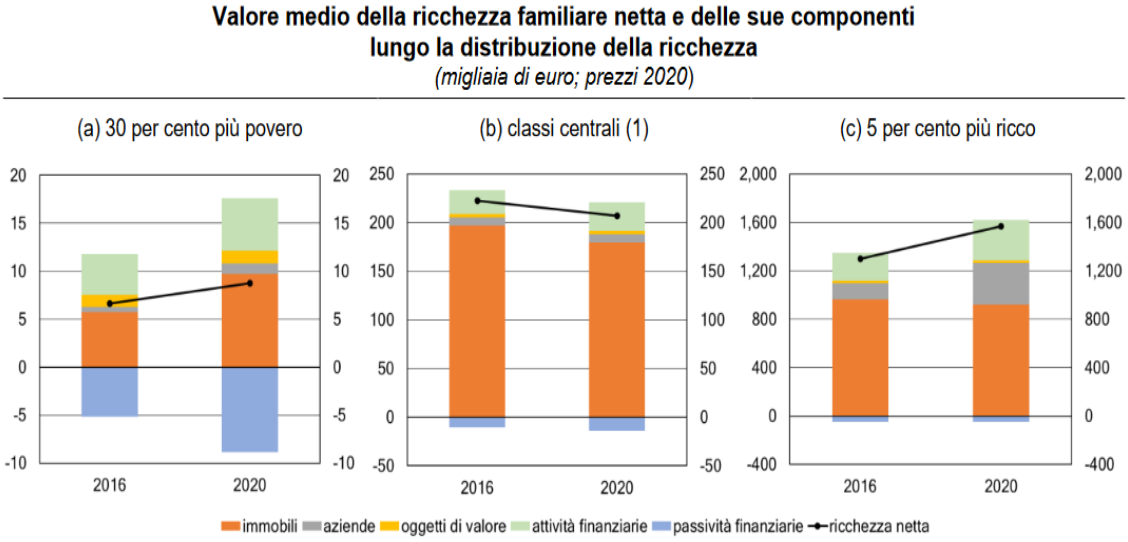
According to the survey, the poorest 50 per cent of households account for merely 8 per centage points of the total net worth, while half of this total net worth was held by the richest 7 per cent. It is possible to reach these results by maintaining the previously used division by wealth quintiles. The aim is to provide an important insight into the extent to which the pandemic effect was, among others, to widen the gap between rich and poor,

and this effect can be clearly seen from Graph 9. Furthermore, it is possible to assess that in general inequalities are becoming a major problem especially in recession scenarios where the gap widens more and more. Moreover, it can be seen that, especially in Italian country, it is more necessary than ever to close the gap with direct economic policies aimed at reducing it.

As the answers provided in the sample survey shows, at the end of 2020, 82% of the gross assets of Italian households can be considered constituted of real assets (such as cash, real estate, businesses, and collectibles), while the remaining 18% consisted of financial assets. By making comparison with respect to 2016 answers' division, the weight of the financial side has increased by more than 3 percentage points, indicating that households' financial assets have increased even though real wealth has decreased. This data wants to show that the type of shock given by the pandemic was not a typical financial shock like the ones given by the previous recessions happened in 2008 and 2011 that have had effect till the survey made in 2016. Hence, there was no such shock in the level of household confidence with respect to financial asset class, which as a result remained stable by not experiencing a crowding-out in demand side. Furthermore, the market demand for financial assets can be considered also increased, when dealing with the consideration of started economic recovery scenario.

By considering constant prices, the average value of real assets at the end of 2020 was marginally lower than in 2016, this can be mainly due to the fact that real estate, which constitutes a larger portion of the asset class, was worth less (-6.9%). Households held much larger average financial assets (+30.8%); this development affected households in all wealth quintiles and can be partly considered the result of the widespread increase in savings that occurred during the pandemic as it was used as a safe asset in contexts of increased risk aversion and aversion to uncertainty already discussed in the literature review. It is important to remind the reader that the increase in financial assets share just discussed refers to financial assets in general and hence, has nothing to do with the share of risky assets held inside the built portfolio, which require a separate discussion when dealing with turning points of economic cycle.

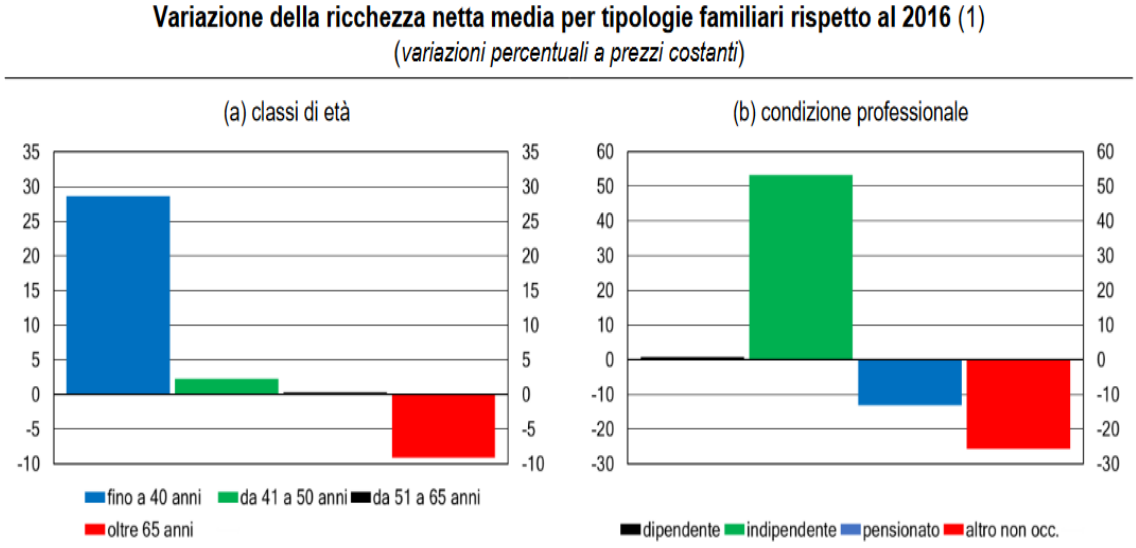
By focusing on financial liabilities of all households in the sample population they amount to just over 6% of their gross assets, while indebted households account for 16% of the total of respondents. At constant prices, the average value of liabilities increased by more than 30% from 2016 to 2020, impacting the entire distribution of wealth independently on the quintiles into consideration. The value of financial assets, the growth in savings and the increase in real business assets contributed to the almost 20% increase in the average wealth held by the richest 5% of households compared to 2016 (see Graph 10). Although still less than 2% of total wealth, the average net wealth of the poorest 30% of households can be considered improved from 2016 to 2020. However, as houses are the main asset of households in the middle class and also, they have declined in value, the average wealth in the middle classes of the distribution has also declined. It is important to remind that this decrease in value of real assets has no effect on poorer quintiles since it has been considered a type of asset unaffordable to that class which must have an answer in the survey coincident with no owning a home to be classified in those quintiles.



Graph 10: Net family wealth distribution between the 30th and 95th percentiles.
Source: survey on Italian household budgets made by bank of Italy.

Overall, the distribution of net wealth has become more unequal due to this phenomenon. To give the reader a real, quantitative measure of the considerations made about social inequality, it was thought to introduce the concept of the GINI index. The GINI index is a statistical measure used to assess economic inequality or income distribution in a given population or geographical area. It was developed by Italian statistician Corrado Gini and is

widely used to analyze inequality in income, wealth, expenditures, and other economic variables from data similar to those used in this discussion on the incomes and household budgets of the population object of the analysis. The Gini index ranges from 0 to 100, where 0 represents perfect equality, meaning that every individual or household has the same income or wealth. In contrast, 100 represents perfect inequality, meaning that one individual or family has all the income or wealth, while the others have nothing. A Gini value closer to 0 indicates a more equal distribution of income or wealth, while a value closer to 100 indicates greater inequality. After taking into account data for methodological changes, the Gini index for 2020 increased from 61.6 in 2016 to 64.7 in 2020. It is important to highlight that not all socio-demographic groups have experienced the same wealth dynamics. In fact, over the past four years, the wealth gap between age groups has narrowed maybe also thanks to the contribution made by the increase in the gross wealth of younger households mainly due to an increase in savings that have more than counterfeited the increase in debt level (see Graph 11). Moreover, after decreasing between 2012 and 2016, the average net worth of households headed by the self-employed has started to grow again.



Graph 11: Change in average wealth compared to 2016, by age group (right) and by occupational type (left). Source: Survey on Italian Household Budgets made by Bank of Italy.

It is important to note from Table 5 below that there was very little mobilization between the wealth quintiles of the population between 2016 and 2020. In fact, it can be argued that there is no mobility between the reference periods because most of the data is on the

diagonal of the reference table. The fact that most of the relevant data lie on the diagonal in question is the empirical evidence that it becomes even more difficult to make changes in the level of wealth of Italian households, particularly when it comes to favorable changes.

	Quintiles of households in 2020					
	up to 1° quintile	*from 1° to 2° quintile*	*from 2° to 3° quintile*	*from 3° to 4° quintile*	*over 4° quintile*	**All**
Households in 2016						
up to 1° quintile	65,8	22,4	6,2	3,4	2,1	**100**
from 1° to 2° quintile	25,2	45,9	21,3	6	1,6	**100**
from 2° to 3° quintile	6,1	25,7	43,4	21,6	3,1	**100**
from 3° to 4° quintile	2,4	4,5	23,9	49,4	19,8	**100**
over 4° quintile	0,4	1,4	5,5	19,6	73,1	**100**
All	**100**	**100**	**100**	**100**	**100**	**100**

Table 5: Quintile of households with respect to income, comparison between 2016 and 2020.
Source: Survey on Italian Household Budgets made by Bank of Italy

Furthermore, at the end of 2020, 91 per cent of households owned financial assets which includes deposits accounts, bank accounts and financial securities, it is 7 per cent higher than in 2016. Obviously, these instruments have undergone different trends depending on the type of asset under consideration. In general, it is possible to see from data collected that the share of households with liquid or diversified assets increased between 2016 and 2020: the share of households with deposits increased by about 7 percentage points, while the share of households with investments in mutual funds or asset management increased by nearly 4 percentage points. However, the trend of households owning fewer government bonds persists, and by 2020 the share of such households has fallen to a new all-time low: less than 6 percent of households. Here the author wants to have an applied proof of how difficult it is for government institutions to regain trust in financial markets from households, which are the economic actors that finance both the public and private economic systems, and how current economic development policies have not yet succeeded in reversing this dramatic trend.

Moreover, the number of households owning at least one deposit account has increased, and this expansion has been attributed to a wider adoption of non-cash payment methods among the population. Among those who do own them, the average value of a household's financial assets is around EUR 69,000. Only 23% of respondents owned at least one financial asset, mainly in the form of managed investments, which may be mutual funds or asset management, in addition to bank or postal accounts. Moreover, the average financial

wealth of these households was estimated at around EUR 219,000. The distribution of financial assets is more concentrated than the distribution of net wealth; in fact, it can be seen that the richest 3% of households control almost half of the financial assets, while the half with the lowest net worth owns only 7% of the total gross financial wealth. Concentration has also increased since 2016, which can be referred as indicative of the higher absolute savings of the richest households and the greater weight of financial assets in their portfolios, that, as a result, have benefited from the overall good market dynamics over the past four years.

The disparities in the percentage of financial wealth held are related to very different portfolios in terms of composition. The poorest five per cent of households hold mainly deposits; in the middle classes of net worth, the share of Italian government bonds, private bonds and managed investments increases steadily; households in the richest twenty per cent, on the other hand, are those who own shares directly and entrust professionals with the management of a significant part of their financial wealth (see Table 6). The objective of this specific analysis is intended to show the reader how much the variables of wealth and financial education influence the demand for financial products and the type of financial assets owned which is directly related with the degree of risk attitude. Thus, as can be seen in a bit, the former independent variables just cited must have an influence also on insurance products which could be used to optimize reactions in response to a business cycle shock.

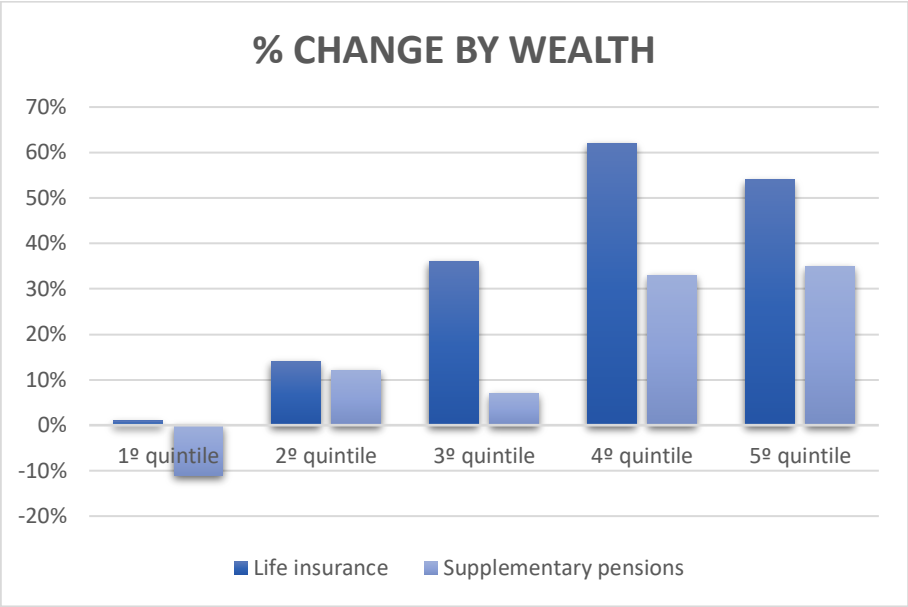
Ripartizione delle attività finanziarie per quinti della distribuzione della ricchezza netta
(valori percentuali)

QUINTI DI RICCHEZZA NETTA	Quota di attività finanziarie	Quota percentuale							
		Depositi (1)	Investimenti gestiti (2)	Azioni e partecipazioni	Obbligazioni private (3)	Titoli di Stato (4)	Titoli esteri (5)	Altro (6)	Totale ricchezza finanziaria
1° quinto	1,4	92,5	2,7	0,4	2,0	1,3	1,2	0,0	100,0
2° quinto	3,1	82,1	12,0	1,6	1,6	2,6	0,0	0,1	100,0
3° quinto	5,3	78,9	10,0	1,7	2,1	5,4	1,3	0,5	100,0
4° quinto	11,9	64,3	14,5	4,3	7,4	7,9	0,4	1,2	100,0
5° quinto	78,2	38,3	39,1	7,7	6,5	4,9	2,1	1,4	100,0
Totale	**100,0**	**45,6**	**33,3**	**6,7**	**6,1**	**5,2**	**1,8**	**1,3**	**100,0**

Table 6: Breakdown of financial assets by fifths of net wealth distribution.
Source: Survey on Italian Household Budgets made by Bank of Italy

Turning to a deeper analysis of the insurance part of Italian households' budgets, the starting focus of this discussion, nearly 19 percent of households, after taking into account data for historical comparisons, reported that at least one household member had joined

pension funds or purchased life insurance to increase the normal state pension, according to data derived from the survey. This represents a 2-percentage point increase from 2016. By focusing the data analysis from the answers given to the survey, the ***wealth*** demographic variable can be considered significant. The trend shows the share ranging from negative percentages in the lowest income fifth to a positive increase of about 40 percent in the highest income fifth (see Graph 12). Moreover, it becomes clear the relationship between the explanatory variable: wealth and the level of market demand in insurance coverage. Even talking about percentage changes, wealthy households are those who more than others have raised their demand for that type of coverages.

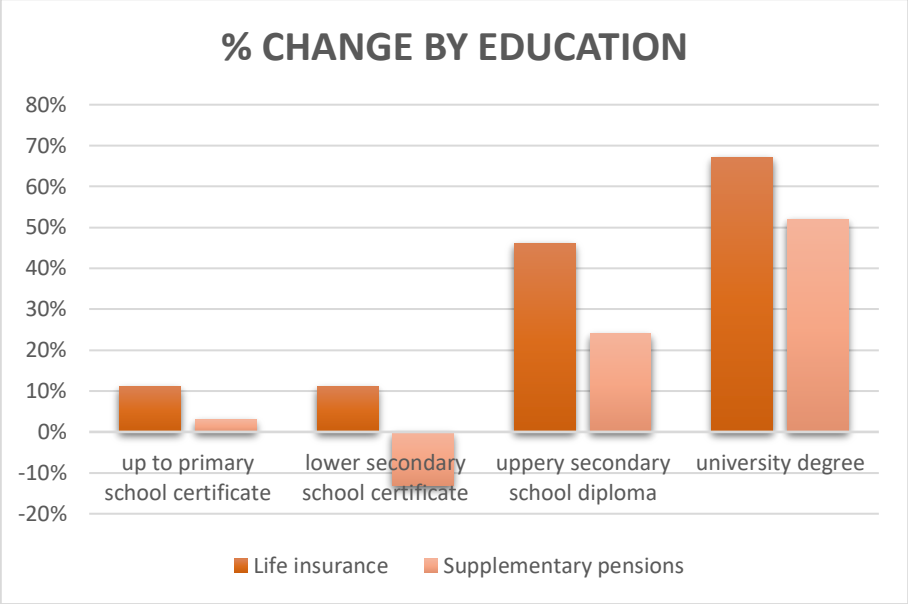


Graph 12: Percentage change between 2016 and 2020 of subscription of insurance instruments by quintiles of net wealth distribution.

This last conclusion can be reached also by talking about absolute values, meaning that the use of insurance for share risks is used from wealthy households to rapidly answer the shock due to the COVID-19 disease. Whereas poorer quintiles of family do not seem to recognize the value of the protection given by insurance and especially supplementary pensions during difficult times and this conclusion can be also due to unaffordability to sustain them. These supplementary pension plans are more common among executives (49 percent of employees; about 28 percent and 15 percent for blue-collar and white-collar workers, respectively). Moreover, the age distribution is narrower (about 21 percent of workers in the 20 to 45 age group, nearly 29 percent between 46 and 55, and about 25 percent

between 56 and 65). Finally, 21 percent of the self-employed participate, with a slightly lower rate among the youngest (about 16 percent in the up to 45 age group versus 26 percent in the remaining classes).

A further point of improvement is given by the variation in demand for insurance products as the level of ***education*** changes (see Graph 13). Here it is possible to see a large gap between those with almost no education and those with relevant educational experience, especially in the finance field; the latter can be linked to a college degree. The trend goes from +3% to +67%, -13% by considering secondary school, a huge difference that represents the importance of financial education in portfolio choices and in managing risk and uncertainty as highlighted in the literature review.

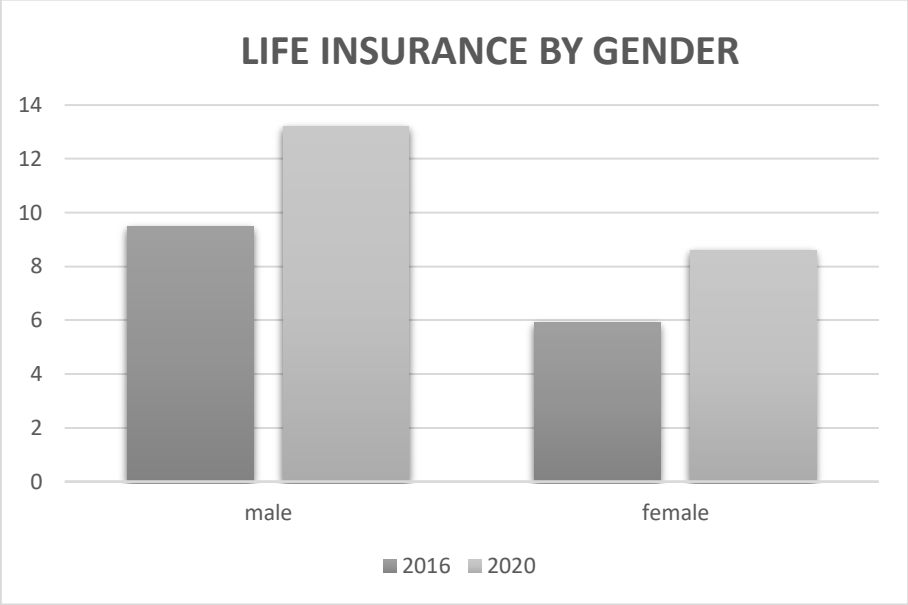


Graph 13: Percentage change between 2016 and 2020 of subscription of insurance instruments by level of education.

This is the main reason why the writer has first decided to explain which demographic and socioeconomic variables should be considered. The analysis shows that almost all of the variables considered determine a trend in the choice of insurance products during the pandemic that differs depending on the value of such variable. Education has a considerable impact, as do wealth and age.

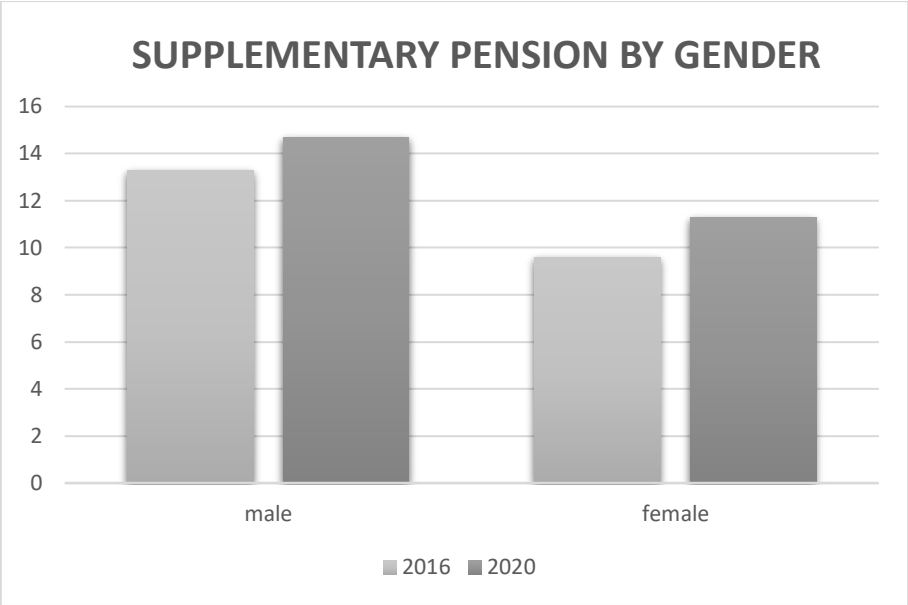
On the other hand, there is also a noticeable increase in the market demand for insurance instruments based on ***gender*** perspective. Here, it can be assessed that there is a difference due to the lower attitude of women toward this type of product, which leads to a different rate of adoption of these instruments based on the clear correlation that the gender has with insurance market demand.

Moreover, it can be also seen that there is an overall increase in insurance demand between the answers given in the survey conducted in 2016 and 2020. The outcome is that regardless from the gender perspective there is an overall trust in these instruments as a way to transfer risk incurred in recession period to someone else, i.e., the insurance companies.



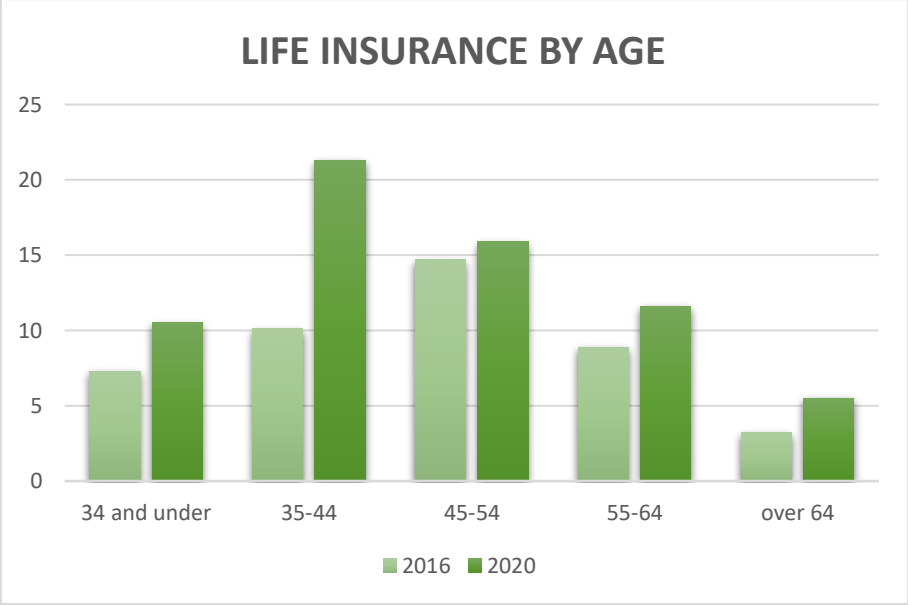
Graph 14: Absolute demand for life insurance policies by gender group in 2016 and 2020.

The percentage increase is very similar; for example, plus 35 percentage points in males demand for life insurance and +30% for females in the same industry which means that there are no such differences based on gender variable as regarding to advent of COVID-19 disease.



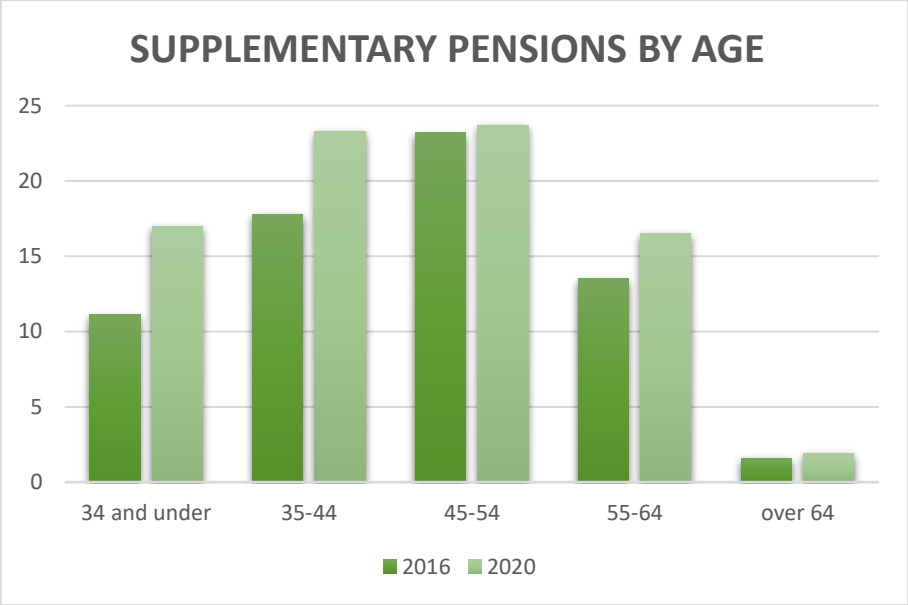
Graph 15: Absolute demand for supplementary pensions policies by gender group in 2016 and 2020.

Moreover, by looking at the population segments divided by ***age*** (Graph 16-17), two trends are clearly visible. Firstly, the graphs for the different instruments show a sustained trend over the years in relation to age group. This means that the age variable is very explanatory of the demand for insurance products, and therefore for a given age group there will be a certain level of demand, even if the relationship with the other groups remains more or less constant.



Graph 16: Absolute demand for life insurance policies by age group in 2016 and 2020.

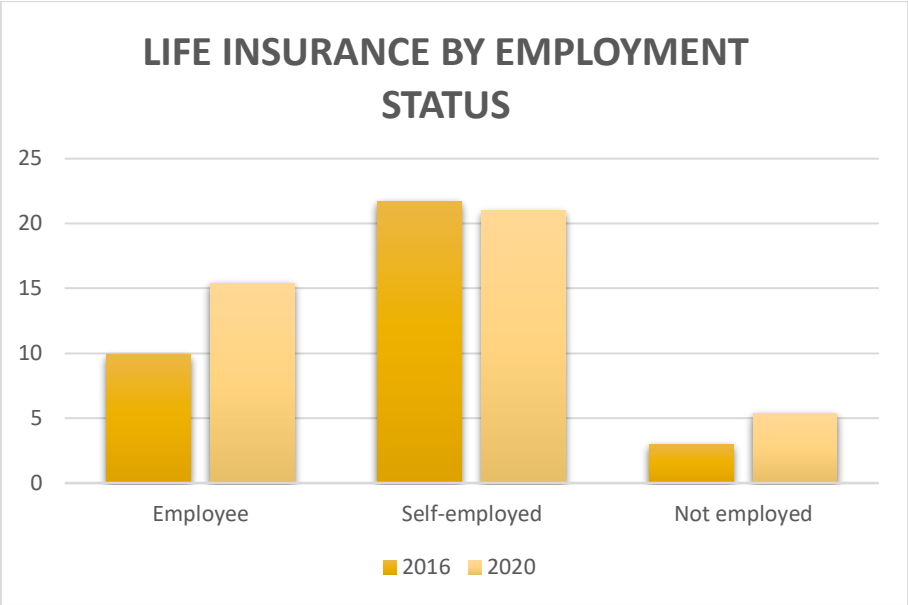
Secondly, an upward trend can still be observed between 2016 and 2020 in all age classes. This means that during the pandemic these tools were well viewed by Italian families of all age groups, precisely because they were useful in sharing risk and improving economic prospects on their future, both from the point of view of health, which has become increasingly central, and from the point of view of pension plans.



Graph 17: Absolute demand for supplementary pensions policies by age group in 2016 and 2020.

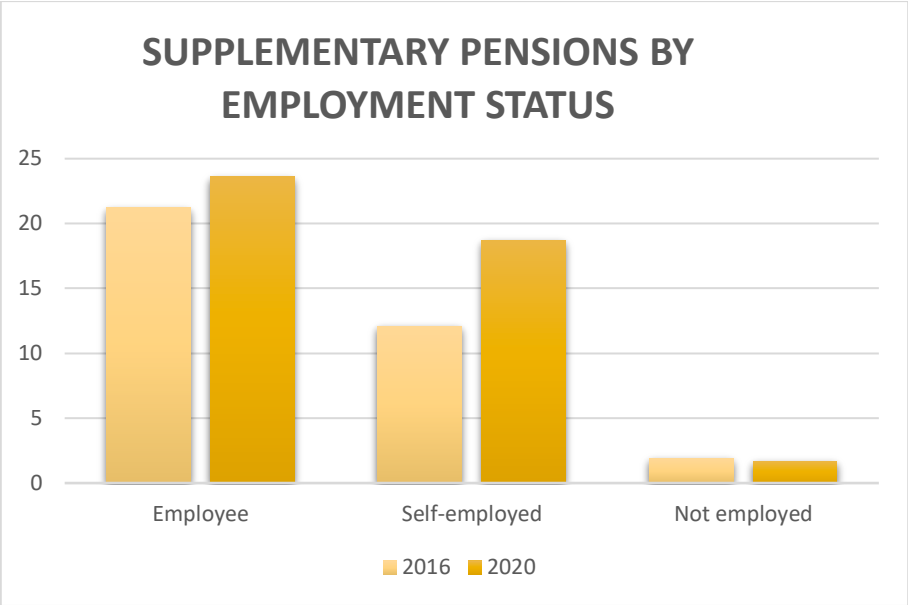
Regarding the correlation between the demand for insurance products and the explanatory variable ***employment status*** (Graph 18-19), first of all, it is possible to combine the discussion for simplicity between the two insurance products considered because the trend is almost similar. In any case any differences will be mentioned with due importance.

Starting from the correlation analysis between the dependent variable demand for products and the explanatory variable employment status a trend can certainly be seen in that most of the demand for life insurance comes from the self-employed, probably because this type of product is already present within most employee hire contracts. On the other hand, a higher percentage of demand for insurance products in the field of supplementary pensions is shown in white-collar workers who therefore, according to the survey data, decide to set aside a greater share of wealth than the state pension.



Graph 18: Absolute demand for life insurance policies by work status group in 2016 and 2020.

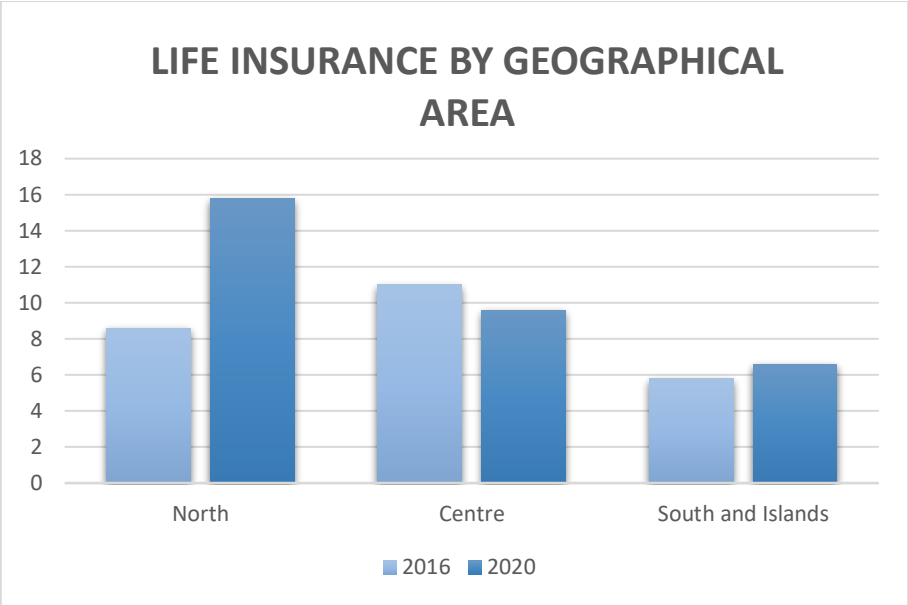
It is also important to note the very low level of market demand for insurance products for not employed status. As previously mentioned, this status is intended to include the unemployed and retired individuals. It goes without saying that for these population categories there can be only a very low interest in such products for different reasons. On the one hand an inability to care about these issues on the part of the unemployed and on the other hand the fact that underwriting insurance products for retired people would have practically zero level of utility. With reference to the change in demand between 2016 and 2020 using data that allow for historical comparisons the goal is always to look for the effect of COVID-19 on insurance demand. Certainly, it is possible to see an increase in demand as it is seen as a safe haven asset regardless of the population categories. However, an outlier is present in that the demand for life insurance for the self-employed fell between 2016 and 2020. This could for example be due to the countless closures brought about by the pandemic for the self-employed, especially in some sectors such as tourism or catering that could well explain a decrease in demand for these products.



Graph 19: Absolute demand for supplementary pensions policies by work status group in 2016 and 2020.

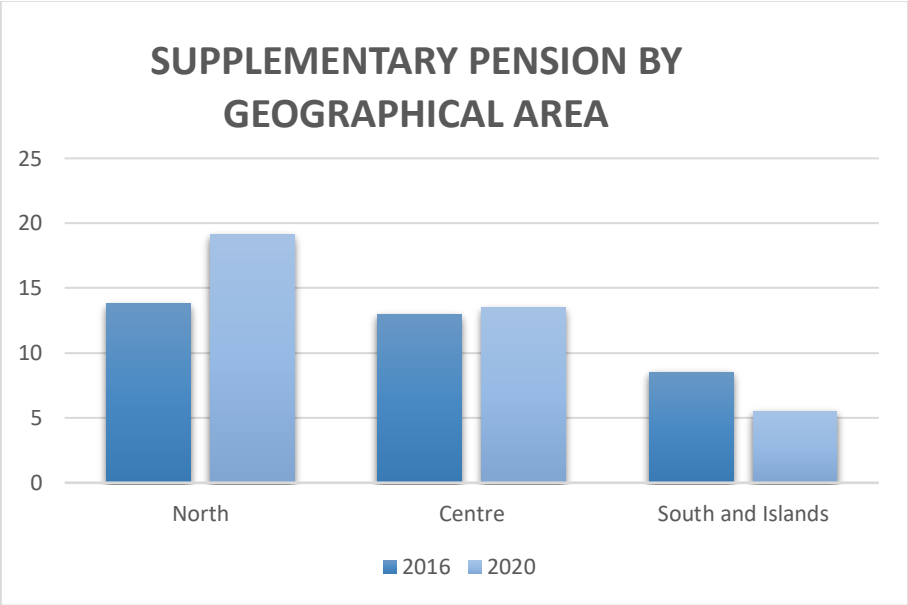
The last explanatory variable studied in the correlation analysis with the demand for insurance products is ***geographic location***. The goal as always is to look for a possible dependence of market demand on this type of population division. The result is a higher demand for insurance coverage in northern Italy immediately followed by the center for both life insurance products and supplementary pensions. Unfortunately, at the tail end remains southern Italy and the islands. This means that there is a correlation between dependent and explanatory variable and that northern Italy leads the way for the rest of the nation to try to reach levels at least comparable with European benchmark.

Finally, regarding the percentage change in the demand for insurance coverage between 2016 and 2020 after taking into account the adjustments for historical comparison it is possible to see a general increase in the demand for products, except for isolated cases. What it is possible to emphasize to the reader is how the north not only has a higher demand for insurance products in absolute terms but also has a greater ability to respond to the incentives given by the economic system, in this case with a negative perspective, managing to grow much more even in percentage terms. Here it is possible to see for example a value of a +72% for life insurance in northern Italy compared to an incredible minus 30% for supplementary pensions in the south and islands, a truly counter-trend figure which confirms how this variable is very significant.



Graph 20: Absolute demand for life insurance policies by geographical area group in 2016 and 2020.

Now it is possible to see how the certainly visible increase given by the change in the economic cycle in favor of a phase with considerably higher volatility and hence, uncertainty goes hand in hand with a series of variables that in this work have been called explanatory variables and that results in having a relevant impact as the literature on the subject teaches. The presence of outliers and exceptions does not invalidate the result of the analysis since they are part of the design and can be explained by innumerable causes that do not invalidate the results of this work.



Graph 21: Absolute demand for supplementary pensions policies by geographical area group in 2016 and 2020.

10. CONCLUSIONS

This study comprehensively studied the evolution of savings and insurance product demand among Italian households with respect to several key variables, including risk, the economic cycle, and the incidence of the COVID-19 pandemic. After analyzing the information and correlations, some important findings were found.

First, it has been noted that the average requirement for insurance goods is rising among Italian households. This increase can be explained by people realizing how important it is to protect their assets, sharing increasing risk and also reach financial stability in an environment of growing both health and economic uncertainty.

Second, research has demonstrated a strong correlation between the demand for insurance products and a few significant socio-demographic variables. Specifically, it has been discovered that key factors influencing insurance demand include age, gender, education background, geographical area, and overall wealth. Wealthier families realize the importance of having additional protection, which is why they usually spend more money on insurance products, in absolute terms. Furthermore, it was discovered that educational background has a positive impact on customers' understanding about pure risks and disruptions in the economic cycle, hence, increasing adoption of these products.

Finally, the impacts of the COVID-19 pandemic have a clear impact in the increased demand for insurance, especially when talking about life insurance and social security which are main dependent variables studied in the model. The pandemic issue has highlighted the need for adequate insurance coverage to deal with emergency situations, full of risks and uncertainty.

All things considered, this study increased understanding of the factors influencing Italian households' propension toward insurance products and highlighted the growing importance of financial security. These findings offer important data that legislators, insurance companies, and financial advisors may utilize to adjust their products and services to meet the changing needs of Italian households.

Finally, the author would like to express gratitude to all the readers and viewers for their time and understanding throughout this final section, hoping it was as clear and easy to use as possible.

It is important to say that the goal has been at least partially achieved as if the definition of the work's objective in the introduction is to investigate the magnitudes represented by risk tolerance, financial, and demographic influences, and how these magnitudes changed as the demand for savings and insurance products changed during changes in the economic cycle.

After much time and effort was spent establishing this concept, it was discovered that several analyses completely matched the reference literature on the subject, which gave rise to a sense of completion and satisfaction. The intention was to make clear the theories that were applied as well as in the sections where various conclusions were drawn to provide the most comprehensible and direct explanation for the data analyzed.

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