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The Life Cycle of Saving in Japan and Italy
An Institutional Perspective

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要旨

本稿では社会制度が貯蓄と貯蓄のライフサイクルに与える影響に関して研究している。ライフサイクル仮説は 1954 年に Modigliani 氏と Brumberg 氏という学者によって初めて提案されてきた。この仮説とは、消費関数を分析する際に、現在の所得だけではなく、将来の所得も考慮する必要があるということである。なぜなら、経済主体は人生の中で所得が変わることを知って、消費をスムーズにするからである。それから、人生で消費の優先する期間がないということも仮定して、消費が一定で、所得が変わるため、貯蓄と貯蓄率は所得の変化に依存する。だから、働く期間に貯蓄と貯蓄率が給料と一緒に上がって、退職したら収入が下がるから貯蓄と貯蓄率も下がって、負の数になる。ミクロ経済学の観点に基づくと、遺産と予備的貯蓄がなければ、死亡時刻までに資産を完全に使い切るということになる。そして、マクロ経済学の観点から判断すると、少子高齢化を迎えている国の総貯蓄が低下することを予測している。

　そういうわけで、本稿は少子高齢化を迎えている日本とイタリアのケーススタディを分析する。イタリアと日本が 1980 年代に世帯の貯蓄率が高い国として知られていたが、最近はこの変数が非常に低落してきた。そのため、この国ではどのような政策を行っていることか、どのような効果があることかを調べる必要がある。実は、イタリアと日本の貯蓄行動を対象とした研究が多く、国の社会制度に関する指標と貯蓄の相関関係を勉強した研究者たちもいる。しかしながら、この論文は従前の研究と違い、歴史的な分析も定量分析も行っている。なぜかというと、現在の貯蓄行動をもたらした現象が理解できるからである。また、今の社会制度を観て、将来には貯蓄行動がどうなるかということについて仮定することもできる。

本稿は二つの部分に分類されている。第一はイタリアと日本の社会制度について説明して、二つの章に構成されている。第一章にイタリアの雇用制度、年金制度、医療制度、クレジット市場と租税について述べてある。第二章は第一章と同じ社会制度の要素を解析することによって、日本の事情を論じる。この二つの章は定性的研究に基づき、一次資料と二次資料の討究で書かれてきた。一次資料はイタリアと日本の諸省の資料や、経済協力開発機構と欧州連合のデータなどである。二次資料は従前の研究と新聞記事である。

第二次部分は第一部分の仮説を検証し、定量分析に基づいている。第三章と第四章はこの部分を組成する。第三章は 2000 年から 2016 年まで、イタリアでは世帯の可処分所得、消費支出、貯蓄、貯蓄率、金融資産などがどのように変化したかを説明する。第四章は日本のケースに同じ変数を研学する。日本の場合、データの参考期間は 2000 年から 2019 年までである。第二次部分の研究は要約統計量で行われた。データは世帯主の年齢階級別になっている。まず、参考期間に変数の変化を観察することによって、政策の効果は世帯主の年齢によって違っているかどうかが分かる。次に、異なる年齢の世帯の間に変数の差の検討を通して、貯蓄のライフサイクルが仮定できる。

最後にまとめの部分にイタリアと日本を比較して、社会制度が変数の変化と貯蓄のライフサイクルに与える影響を措定する。また、将来の事情を予測して、本稿の制約も今後の研究課題も述べてある。

Introduction

The Life-Cycle of Saving Theory and the Application to Japan and Italy

The Life-Cycle of Saving theory was first conceived in 1954 by Modigliani and Brumberg. For the first time in economic studies, consumption was not considered a function based solely on present income, but also on the future one. The authors assumed that individuals do not have a favorite period for consumption, which thus remains flat over life, while savings change according to income. The consequence of this assumption at the micro-level is that an individual increases his savings, and saving rate, during the prime earning years, while the variables turn negative after retirement because of the fall in income. Since the authors do not consider the presence of bequests and precautionary savings, which are other saving motives together with the purchase of durables, they assume that wealth is completely consumed by the time of death. On the macroeconomic level, this theory predicts that the saving rate of countries that are undergoing a process of population aging will decline considerably (Modigliani, Brumberg, 1954). This is why this theory has attracted the interest of scholars who study the Italian and the Japanese economy.

Italy is an interesting case when studying the application of the life cycle of savings because its rate of elderly population is higher than the OECD's average since at least the 1970s (Figure 1). However, in the 1990s, the household saving rate of the country was still among the highest in the world. The big negative shift arrived after 1995. As we can see from figures 2 and 3, both the national saving rate and the households' saving rate declined considerably. While the former is influenced by various factors, the evolution of the latter poses serious issues for it. The macro-economic consequences of the fall in the household saving rate are not treated in this dissertation but, to make an example, lower saving increases dependence from foreign capital which, according to the type of investor, can be very volatile, as demonstrated by the European debt crisis in 2010-2011. The fact that households' saving rate started declining only in the 1990s suggests that the aging of population is not the only factor influencing this economic variable. This is why it is necessary to study both the saving of the elderly and of the working population, as we will do in this dissertation.

Concerning Japan, the Life Cycle of Saving has attracted scholars' interest since the 1980s. At that time, the main focus was to find a correlation between the demographic structure of Japan and its aggregate saving rate, which was among the highest in the world (Horioka 1984; Hayashi 1986). Hayashi (1986) noted that the saving rate estimated by Japan's System of National Account (from now SNA) is not suited to international comparison because of the underestimation of capital

depreciation. However, even after adjustments, Japan's saving rate was still remarkably higher compared to other countries, such as the United States (Hayashi 1986). In the last years, the fast-paced ageing of the population and the falling birth rate became the main concern of the academic community. Indeed, during the 1990s, the proportion of Japanese population aged 64 years or over surpassed OECD's mean (figure 1). At the same time, Japan's national saving rate and household saving rate decreased significantly (figures 4 and 5).

In the next sections we will present the existing literature about the life cycle of saving in Japan and in Italy and how does this dissertation contribute to the existing academic debate. However, before introducing these topics, it could be useful to discuss the characteristics of microeconomic statistics about households' savings in Japan and in Italy.

Figure 1: Percentage of the population aged 64 or over compared to total population, Italy, Japan, OECD
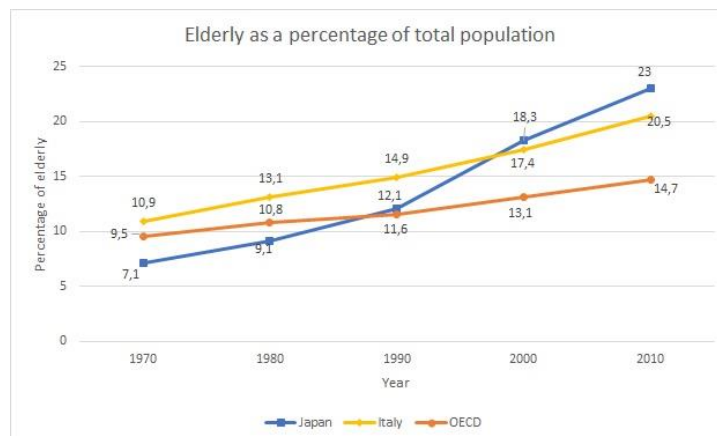
Source: OECD. Data inserted by ten-year intervals.

Figure 2: Evolution of Italy's Net National Saving Rate

Source: OECD

Figure 3: Evolution of Italy's Net Household Saving Rate
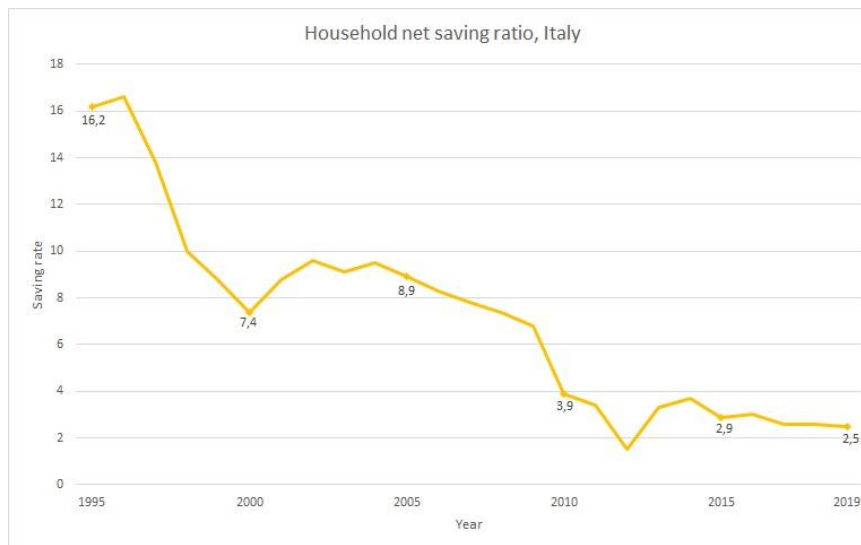
Figure 4: Evolution of Japan's Net National Saving Rate

Figure 5: Evolution of Japan's Net Household Saving Rate
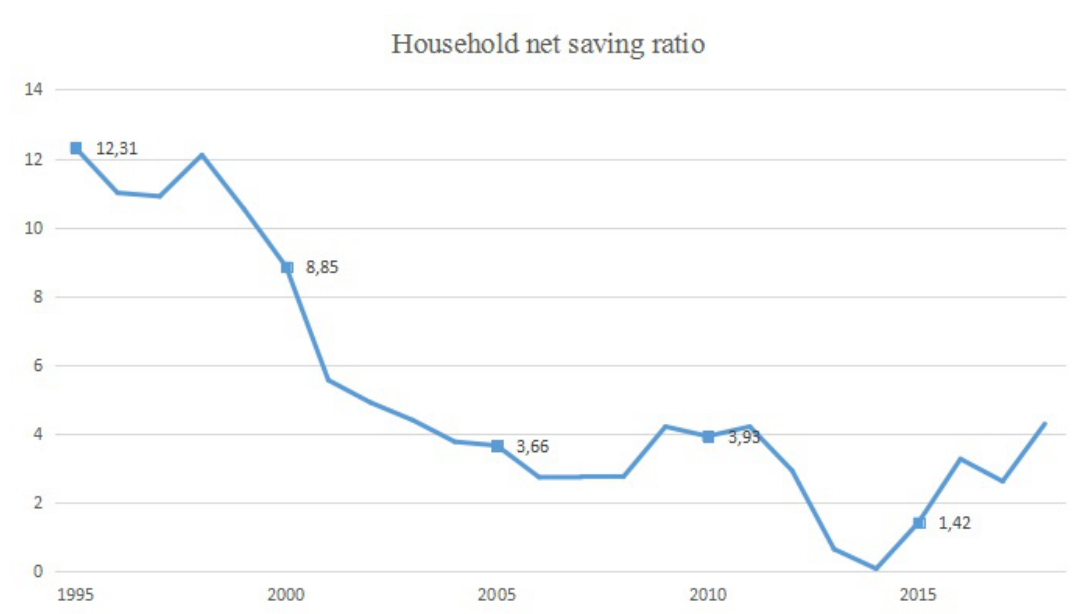
Source: OECD

Microeconomic statistics about households' saving in Italy

The website of the Italian National Institute of Statistics (ISTAT) presents various data about the economic conditions of Italian households. However, these data have many shortcomings. First of all, data about households' income classified by age of the household's head are available only from year 2003. Moreover, young and old households are grouped in large age categories (under 35 and over 65), while middle aged households are divided by ten-year groups. Since the income of a household whose head is in his twenties and the income of a household whose head is in his thirties could differ much (and the same reasoning applies to old people, if someone aged less than 70 is still working while someone aged more is not), it would be desirable to use shorter age intervals. Furthermore, the dataset that shows the age of the household's head does not display his employment status and it is not linked to the consumption dataset. For this reason, it's impossible to compute saving from the ISTAT data.

As a result, the studies about household saving in Italy are usually based on the Survey on Household Income and Wealth (from now, SHIW), conducted by the Bank of Italy. The survey is carried out every two years since the 1960s and provides important information about households' characteristics and sources of income. Nevertheless, also this survey presents shortfalls. Brandolini and Cannari (1994) demonstrated that disposable income in the SHIW is underreported by 25% compared with data from National Account, while consumption is underreported by 30%. Brugiavini

and Padula (2003) confirmed the gap between data from the SHIW and from the National Account, but they realized that the movements of the two saving rates are similar: they both fell by 6 percentage points between 1984 and 1985. Finally, Baldini and Mazzaferro (2000) affirmed that financial wealth is another variable underreported, compared to the National Account, and that the degree of underreporting differs from one group to the other. Households whose head is self-employed tend to underreport income by a higher degree compared to employee and retired households (Baldini and Mazzaferro, 2000). In addition, old households tend to underestimate income, while young households underreport consumption. For this reason, the saving rate of the elderly might be higher than it appears, while the saving rate of young people could be lower (Baldini and Mazzaferro, 2000).

Microeconomic statistics about households' saving in Japan

In this section we will outline the core characteristics of microeconomic statistics on household saving realized by the Japanese Government: the *National Survey on Family Income and Expenditure* (from now NSFIE) and the *Family Income and Expenditure Survey* (from now FIES).

The NSFIE is conducted every five years since 1959. The survey offers information about income and expenditure, purchase of durable goods, housing, savings and liabilities. It is considered one of the most reliable surveys because of the large size of its sample. Indeed, the survey covers about 57.000 households (Statistics Bureau of Japan, 2009). Nevertheless, it has some shortcomings. On the one hand, disposable income and non-consumption expenditures are not reported and have to be estimated. On the other hand, since NSFIE is carried out from September to November, consumption is affected by seasonality (Hayashi, 1986).

The FIES is the other survey conducted by Japanese Government on household saving and is carried out every month. In contrast with NSFIE, it reports disposable income and non-consumption expenditure. Moreover, since it is conducted every month, consumption is not affected by seasonality. Nonetheless, the sample size is considerably smaller compared to NSFIE: 9000 households (Statistics Bureau of Japan, n.d.).

Another shortage concerns all the statistics conducted by the Japanese Government: the unit of the survey is the household, not the individual. This characteristic makes it difficult to isolate the effects of different members on household saving (Horioka, 1984). For example, if a couple of elderly people lives with his son or daughter, and if the person with whom they live earns more than them (and is thus the household head), it becomes hard to estimate their saving.

A literature review of households' saving in Italy

The studies about the Life Cycle of Saving in Italy do not focus only on the saving of elderly households, but they also examine younger groups, since reforms in the pension system and in the labour market put these households at risk. Moreover, some studies tried to understand if other factors in addition to age could have influenced the changes in households' saving rate that occurred in the last years.

Baldini and Mazzaferro (2000) provided an analysis of 5 SHIW surveys (1987-1995) by taking into account the shortcomings that we have seen. Financial wealth has been adjusted thanks to data obtained by a survey conducted by Banca Nazionale del Lavoro (BNL), while consumption expenditure was changed on the basis of ISTAT's data and income of self-employed households was raised by 15% (Baldini and Mazzaferro, 2000). Their findings show that the saving rate of old households is always positive, while financial wealth grows until the age of 60 and remains flat thereafter. The authors link this behaviour to intergenerational transfers. With respect to young households, the income of young cohorts is lower than that of older cohorts at the same age, while the difference in consumption is not large. This causes the saving rate of young cohorts to be below the one of older generations when they were the same age. Since the Italian pension system was modified in the 1990s in a way that reduces social security wealth for the retirement of young cohorts, these households were expected to increase their saving. Given that the authors do not find evidence of such a behavior, they believe that the family network and intergenerational transfers might replace the need for saving (Baldini and Mazzaferro, 2000). However, the first pension reform was carried out in 1992 and, since the last survey examined by the paper was conducted in 1995, the time span was too short to see if young people adapted to the reform.

Another study that examines the saving behaviour of the elderly is the one by Brugiavini and Padula (2003), who used the SHIW from 1984 to 1998 and based their analysis on the distinction between discretionary and mandatory saving. They argue that, since social security contributions can be considered as mandatory saving for retirement, they should be taken into account while studying the saving behavior. As a result, the authors identify two measures of income: disposable income and earned income (Brugiavini and Padula, 2003). The former treats social security contributions as non-consumption expenditures and social security benefits as income, while the latter considers contributions as part of income and social security benefits as an expenditure. Discretionary saving is obtained by subtracting disposable income and consumption, while mandatory saving is the result of the subtraction between earned income and consumption (Brugiavini and Padula, 2003). Nonetheless, this definition is problematic because the Italian pension system is not fully funded but

it's a pay-as-you-go system and it had a defined-benefit pension scheme until 1995 (Schludi, 2005). This means that the social security benefits do not come from mandatory saving and they were not even linked to the amount contributions until 1995. Concerning the results of their analysis, the age-saving profile appears with an inversed-U shape but almost flat, while mandatory saving becomes negative after age 54-59 and discretionary saving never turns negative. Consequently, the authors state that old households consume the wealth stored through mandatory saving but keep discretionary saving positive in order to leave bequests.

Jappelli, Marino and Padula (2015) mainly concentrate on young groups but they also observe that the mean saving rate of elderly households never turns negative. An analysis of the SHIW data from 1984 to 2012 showed that households whose head is aged between 30 and 45 have the lowest propensity to save in many years of the period examined. While the saving rate of the different age groups changes in a similar way (increases and decreases at the same time for different groups), the distance among the groups has increased between 1984 and 2012 (Jappelli, Marino, Padula, 2015). Given that a deregulation process of the labour market started at the end of the 1990s, a significant part of this phenomenon could be explained by the policies implemented. We will see these reforms in our institutional analysis, together with the transformation of the pension system, which is another problem underlined by Jappelli, Marino and Padula (2015). Moreover, the authors observe that negative saving is more widespread in the South of the country, reflecting the stark regional inequality of Italy. While we do not treat the problem of regional inequality in Italy in the quantitative analysis, we confirm the risks to incur in negative saving rates in this area through the institutional analysis and we identify different factors, not only linked to income but also to the offer of public services.

Finally, Campiglio (2013) is the only author that finds the saving of elderly households to be negative. This is because, contrary to the authors that we have cited above, he excluded imputed rent from the definition of disposable income. In this dissertation I adopt the same definition, since I think that including imputed rent in income could be misleading, as I argue in chapter 3. In addition, Campiglio (2013) investigates also the effects of economic policies on households' saving rate and concludes that the aggregate variable did not decline only because of income, but also because of cuts in public spending, higher tax burden and reduction of wages. While chapter 1 of this dissertation provides an historical analysis of policies related to public spending (especially for health care), fiscal system and work instability, the quantitative analysis carried out in chapter 3 does not distinguish between the effect of taxes and wages, since the SHIW displays only net data.

A literature review of household savings in Japan

The first studies about the Life Cycle of Saving in Japan were carried out by Horioka (1984) and Hayashi (1986). Horioka (1984), based on the 1982 Family Saving Survey, found out that financial resources of households aged 55-64 increased and later decreased, but the flow of savings remained positive even at old age. Hayashi (1986) detected the same phenomenon even in the case of elderly who are not the main earners of the household. Nevertheless, these studies face the limitations of the data of that time, that did not distinguish the working status of households. For this reason, we cannot know if the elderly households studied by Horioka (1984) and Hayashi (1986) are retired or not.

Later, the FIES replaced the Family Saving Survey and started collecting data about the working status of households in 1995. As a consequence, Horioka (2010) studied the relationship among age, saving and professional activity for employee and non-working households. The results of his study show that the saving rate of workers aged 60 or over has always been lower than younger households in the period 1990-2008 but, at the same time, it never turned negative, even if it decreased considerably. On the other hand, retired households have always shown a negative saving rate, which declined remarkably from 1995 to 2008. The most important explanatory element is the fall in social security benefits, while the second most significant element is the increase in non-consumption expenditures (direct taxes and social security contributions). Thirdly, also the growth of consumption, partly due to medical expenditures, is a determinant of the phenomenon. Nevertheless, even if the saving rate is negative and its absolute value increased, Horioka estimates that it would take between 41,8 and 51,6 years to consume all the financial wealth (Horioka, 2010).

Horioka and Niimi (2017) continued the work started by Horioka (2010) in order to analyze the saving behaviour based on working status. Their results do not differ much from the previous work, the only new finding is that the saving rate of retired elderly households further decreased between 2008 and 2015. The determinants are the same as 1995-2008 but in this case consumption growth accounted for more of the change compared to social security contributions. Again, the authors estimate that it would take a long period to expend all the stock of financial wealth (Horioka, Niimi, 2017).

Another study that focused on the saving behaviour according to working status is the one from Unayama and Ōno (2017), who analyzed data from different microeconomic statistics referring to the period 1989-2009. The analysis points out that the saving rate decreases during old age, but it becomes negative only at a very advanced age. We observe a fall in the saving rate between 1989 and 2009 for different categories of workers, but the pensioners (55-80 years old) were the most affected group and the only one that showed a negative saving rate. Moreover, the proportion of the elderly

who do not work has increased substantially. This caused an aggravation of the aging effect on the aggregate saving rate.

Until now we have seen studies who considered only the relationship among age, saving and working status. However, other scholars underlined the importance of analyzing other factors when examining the saving behaviour of households. For example, Kitamura et al. (2003) analyzed data from the NSFIE and found out that the saving behaviour is influenced by several elements: age, income, professional activity, living area and home ownership. Particularly, the variance among those who are in the same age group is higher than those who are in the same income class and the analysis of the factors' contribution demonstrated   that income is the most important determinant of the saving behaviour (Kitamura et al., 2003). This study underlines therefore the importance of considering the distribution of intragenerational wealth, while Modigliani and Brumberg (1954) stated that it is not the level of income in itself that determines the saving behaviour but the increasing or decreasing of the revenue.

The study by Iwaisako et al. (2016) is another research that makes us consider the importance of income groups when studying the saving behaviour. They use data from the Nikkei Radar survey to examine the changing of financial resources over life. This research is based on information about the financial situation of households who live within 40 km from Tokyo Station. The paper refers to the years 2000-2014, and the sample covers 2500-3000 households per year. The gross and net financial wealth of these households have increased steadily, at a respective yearly growth rate of 3,1% and 7,6%. The authors sustain that, since the growth rate of gross financial wealth displayed by aged households is the highest, the aging of population will lead to an increase of wealth. Nevertheless, given the limited geographical area of the study and given the fact that surveyed households are richer than the national average (as confirmed by the authors themselves), we can question this statement and assume that the data is influenced by households' social status. For this reason, income appears again as an important element for the explanation of saving behaviour.

Another scholar who took into consideration other elements possibly affecting households' saving is Movshuk (2012). Particularly, he observed the evolution of saving over life in 5 categories of households: single-member, married couple without children, married couple with children, single parents with children and, finally, multigenerational family. The estimates are based on 1989, 1994, 1999 and 2004 NSFIE. Movshuk corrects the seasonality effect, so his results are not influenced by the problems that we cited before. The analysis shows that single-member households display the lowest saving rate, while the highest is exhibited by multigenerational households. Moreover,

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Movshuk also discovers that the life cycle of saving varies according to the household type: only couples with children show an age-saving profile that reflects the prediction of the life cycle of saving, while other households exhibit lower savings in their 40s (single-member households) or 60s (couples without children) and higher savings during old age. A limitation of Movshuk's study is that he does not consider the work status of households, but his research demonstrates that saving can be determined also by the family composition and, since single-member households are increasing in Japan (Statista, 2019), it is crucial to start studying their saving behavior.

In the end, the lesson that we can draw from the literature review about households' saving in Japan is that this economic process is a very complex one and is interwoven with demographic, social and professional characteristics of households.

Content and methodology of this study

The aim of this study is to investigate the role of institutions over saving and the life cycle of saving. In order to do this, the work relies on a comparative analysis of two countries, Japan and Italy, that are both undergoing a process of population aging and which experienced significant institutional reforms in the last decades. While institutional characteristics such as replacement rates and indexes for income or health risks have already been linked to saving behaviour in research, for example in the work edited by Börsch-Supan (2003), the approach that we use here is more historical, so that we can try to understand the processes that led to the current situation in saving behaviour and, on the basis of what we have observed, we can also try to make predictions about the future. Indeed, we can assume that saving changes for different cohorts according to the institutional environment that surrounds them. If a country is now undergoing population aging and the elderly are not consuming their wealth, or they are doing it only by a small degree, it is not necessarily true that aging will not be a problem for saving in the future if the pension system is going to change. At the same time, saving can also be affected by current policies that can target only certain age groups and that intertwine with future changes, thus having complex effects. This is why it is necessary to carry out a detailed institutional analysis when analyzing saving behaviour.

The first part of the work is theoretical: we analyze institutions and policy reforms in Italy and Japan and hypothesize what could be the consequences for saving and the life cycle of saving. Particularly, chapter 1 examines the labour market, pension system, health system, credit access and fiscal policy in Italy. Then, chapter 2 presents the same institutional elements for Japan. The research of this part

is qualitative and based on both primary and secondary sources. Primary sources consist of official documents and data provided by the websites of Ministries or National Agencies of the two countries, by the OECD and by the European Union. Secondary sources are mainly composed of academic literature on the topics examined, but also online newspapers were consulted.

The second part of the work is empirical: we conduct a quantitative analysis of income, consumption, saving, saving rate and net financial wealth in Italy (chapter 3) and Japan (chapter 4). The methodology is the same adopted by Horioka (2010) and Horioka and Niimi (2017): observations of changes based on descriptive statistics and computation of the direct effects caused by the variables' elements (for example how much of the change in disposable income is caused by non-consumption expenditures). Nevertheless, differently from Horioka (2010) and Horioka and Niimi (2017), we do not focus only on elderly households. We study the variation of the variables over the years for all age groups in both countries and we also examine the differences among age groups in order to understand how do the variables change in the passage from one age to another. A limitation of the study is that it is based on cross-section observations and not on panel data.[1] Only panel data allow to effectively observe the change of the variables over life, since the fact that an old group presents certain characteristics in one year does not mean that younger groups will show the same features when they will be older. Nonetheless, we observe cross-section data over different years so that we can see if a pattern is repeated. On this basis, we hypothesize the life cycle of saving in the two countries and construct cohorts by multiplied cross-section in order to confirm our assumptions. Consequently, the analysis of variables' change over the years allows us to see how did policies studied in part one affect different age groups. On the other hand, the examination of variation among groups and the estimation of the life cycle of saving permits us to confront the two countries and see if institutional differences have an effect on the shape of the curve.

It is important to underline that data were adapted in order to ensure their comparability. Data from Japan were obtained by consulting the 2000, 2005, 2010, 2015 and 2019 FIES statistical tables, that can be found on the Japan Statistics Bureau's website. These data are very limited because they do not provide the samples of the survey and report only mean values. Indeed, it is necessary to obtain an authorization to access the full samples and it was not possible to request it because of time constraints. On the other side, the Italian data are from the 2000, 2004, 2008, 2012 and 2016 SHIW datasets, that can be found on the website of the Bank of Italy. In this case, the full samples were available and data could be adjusted in order to make them comparable with Japan. The adjustment

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[1] Cross-section data are observations of different groups (in this case defined by the age of the households' head) in one year. On the other hand, panel data are observations of the same unit (in this case it would be a household) over the years.

and analysis of the Italian data were carried out with the R-studio software for statistical computing, while changes over time and among groups were calculated with Excel. In addition, all the variables expressed in currency were converted to the 2019 value of euro. This allows us to observe the real changes of the variables (net of inflation) and makes the comparison between the two countries easier. Further information about methodology is provided in chapter 3 and 4.

Part 1: The Institutional environment in Italy and Japan

Chapter 1

The Italian institutional environment and potential effects on saving

1.1 Introduction

In this chapter we present the main institutional characteristics of Italy and their potential effects for saving and the life cycle of saving. The research is based on secondary sources such as scientific literature and on primary sources such as the website of the Ministry of Health, the Ministry of Economy, the National Institute for Social Security (INPS), the Department for Economic Planning and data from OECD and European Central Bank. We will first see the labour system and the reforms of the last twenty years. Secondly, we will describe the pension system and the deep change that it experienced. Next, we will review the health system, the accessibility to credit and, finally, the evolution of the tax system.

1.2 The Labour System in Italy

The employment system can affect savings in several ways. First, in societies with a low degree of employment insecurity individuals have less reason to save for precautionary motives. In the second place, the way in which salary is determined has a direct effect on income over life. For these reasons, we will present the Italian employment system and its potential consequences for the life cycle of saving.

The Italian labour system is characterized by sector-based collective agreements that establish the working conditions and the minimum wage for the sector. Indeed, in Italy a national minimum wage does not exist. Even though the collective agreement applies only to companies that participate in it, an employer cannot pay employees below the minimum wage settled by the agreement. In addition, collective agreements envisage seniority wage increases that differ according to the sector and to the role of the worker. These increases take place every three years if the employee continues to work for the same enterprise and a worker can experience them a maximum of six times. In order to provide an example, the lowest position held in the tourism sector has the right to a wage increase of 30,47 euro, while the highest role can count on a growth of 40,80 euro (Associazione Giovani Giuristi Fiorentini, 2019). By seeing this example, we can affirm that even if a part of wage is determined by seniority in Italy, the amount is not very high.

As regards employment security, the Italian job market is characterized by segmentation and dualism. Open-ended contracts have been subjected to strict rules for a long time after the 1970s. In fact, the Law 300/1970 stipulated that, in the event of an unfair dismissal, the worker could choose whether being reinstated or receiving a compensation. The article linked to this provision applies only to firms employing more than 15 employees. Given that the duration of legal proceedings is considerable in Italy, that the compensation sum was not clearly defined, and that the reinstated worker had the right to receive the wages he had not earned since the dismissal, firing costs were significant (Rodano, 2015). Later, this produced a situation of structural unemployment, and policies tried to address the problem by introducing atypical work-and-training contracts in 1983, and by easing the conditions for the use of fixed-term contracts in 1987 (Barbieri, Scherer, 2009). Nevertheless, the most important changes for the liberalization of atypical contracts happened at the end of the 1990s and in the early 2000s.

In 1997, a series of bills proposed by the Minister of Labour of the time, Tiziano Treu, reduced the penalties for the violation of rules governing the use of fixed-term contracts, decreased the social security contributions linked to atypical contracts and established temporary employment agencies (Garibaldi, Taddei, 2013).

In 2001, following a European Union's Directive, a new law permitted a larger application of the fixed-term contract, under the condition that the motivation for its use was expressed if it was renewed after one year (Garibaldi, Taddei, 2013).

Later, in 2003, the so called "Biagi Law" introduced other types of atypical contracts, whose aim was in part to create new forms of collaborations between firms and self-employed professionals (Berloffa, Modena, Villa, 2015). Nonetheless, a consequence of the law was the identification as self-employed of workers who were in a position very similar to that of employees (Garibaldi, Taddei, 2013).

The laws that we have seen above have been described by scholars as marginal reforms because they do not target the security of indefinite contracts but allow for the expansion of atypical contracts. This exacerbated the segmentation in the Italian job market, in which indefinite contract workers had access to employment security and social security benefits, while atypical workers had less stable jobs, were paid lower wages and were not eligible for many benefits (Barbieri, Scherer, 2009; Garibaldi, Taddei, 2013, Berloffa, Modena, Villa, 2015; Rodano, 2015).

Berloffa, Modena and Villa (2015) study the employment situation three years after graduation for different cohorts, in order to understand the effects of the liberalization of atypical contracts. They also consider the working status after six year, so that they can see if some changes have happened. The results, based on the Italian Households Longitudinal Study, show that the fall in open-ended contracts for cohorts who started working in the period 1993-2002, compared to those of the period 1971-1985, is impressive. The process affected both high school and university graduates. In addition, six years after graduation, the persistence in atypical contracts increased. This means that these contracts were not used as a screening tool to select valuable employees (Berloffa, Modena, Villa, 2015).

Barbieri and Scherer (2009) are other scholars who use the Italian Households Longitudinal Survey to understand cohorts' different opportunities in the labour market. Their econometric analysis reveals that the liberalization of atypical contracts is only partly responsible for the lower transitions to stable employment. Other factors include the transformation of the economic and productive situation. Nevertheless, the deregulation policies provoked the replacement of standard contracts with temporary ones, and the data demonstrate that repeated atypical work experiences cause a higher risk of unemployment or unstable work at age 35, no matter the level of education of the individual. Moreover, women and young people are more at risk. In the end, their conclusion that atypical contracts are not a selection device is consistent with Berloffa, Modena and Villa (2015).

As a result, cohorts who entered the labour market at the end of the 1990s face a higher risk of work instability, low wages and income losses in the case of maternity or sick leave (because they have a limited access to social security benefits). For this reason, they cannot expect savings to rise with age. Higher insecurity should push them to save more but it is not always possible to reduce consumption under a certain threshold. One might object that the saving of these cohorts would have been lower if they had been unemployed but, as Barbieri and Scherer (2009) state, the entrapment scenario suggests that it is better to wait for a stable job, rather than accept repeatedly atypical contracts.

At first, the rise in the employment rate during the early 2000s triggered the so called "honeymoon effect" (Boeri, Garibaldi, 2007). Later, with the burst of the economic crisis, the massive job destruction, mainly concentrated among young people, raised the issue of segmentation in the Italian job market. This led to a partial revision of the legislation protecting indefinite contract workers under the Monti government, in 2012. Particularly, the article 18 of the Law 300/1970, which concerned the reinstatement of workers in the case of unfair dismissal, was amended so that the decision of

reinstatement was taken by the judge and not by the worker. Furthermore, the conditions for the use of fixed-term contracts, especially the ones related to project works, were made stricter (Garibaldi, Taddei, 2013). Moreover, while before 2012 benefits were mainly based on monetary supplement for employees with reduced working hours (*cassa integrazione*), the reform reduced the resources of this social security scheme and replaced the low unemployment benefits with the Aspi and mini Aspi system, more generous in terms of replacement rate (Pinelli et al., 2017). This unemployment insurance scheme was financed through an increase of social security contributions by the employer (+1,4% of wages) (INPS, 2012).

In the period 2014-2015, a new set of regulations called Jobs Act were enacted under the center-left government, for the stated purpose of reducing the dualism in the labour market. The Aspi and mini Aspi were replaced by the Naspi unemployment benefit, which was more generous and had a larger target (Pinelli et al., 2017). Later, the Legislative Decree 23/2015 introduced the so called "graded security open-ended contract" (*contratto a tutele crescenti*), which decided that the article 18 of the Law 300/1970 would not be applied to new indefinite contracts. The option of reinstatement following unfair dismissal was eliminated and the compensation was settled between 4 and 24 monthly wages in case of court proceeding, and between 2 and 12 monthly wages in case of an agreement out of court. The compensation grows with tenure (Rodano, 2015). Furthermore, the 2015 Budget Law established open-ended contract hiring incentives in the form of a discount in social security contributions (Pinelli et al., 2017). The aim of these laws was to increase the number of open-ended contracts and transitions from fixed-term contracts. Boeri and Garibaldi (2018) examine the dynamics of the labour market involving firms employing between 10 and 20 employees from 2013 to 2016 thanks to the INPS data (National Institute for Social Security). They consider firms employing less than 13 workers as small enterprises to which the article 18 does not apply, and firms with more than 15 employees as large enterprises that are included in the target of article 18. The small firms only have hiring incentives as motivation for the increase in open-ended contracts, while large firms have both hiring incentives and advantages from the non-application of article 18 to new open-ended contracts. Boeri and Garibaldi (2018) state that the growth in open-ended contracts in large firms is considerably higher compared to small firms, and thus the introduction of the new contract boosted employment. Nevertheless, the same study demonstrates that open-ended hiring decreases after the reduction of incentives (Boeri, Garibaldi, 2018). In addition, the research by Pinelli et al. (2017), that analyzes a longer period, remarks that fixed-term contracts were again the main form of hiring after the end of incentives in 2017. Thus, employers responded again to the new legislation only to cut labour costs and not to select employees. Moreover, while the stated purpose of the Jobs Act was the flexibilization of open-ended contracts in order to raise the transitions from

fixed-term contracts, part of the reform caused the further liberalization of temporary contracts. Indeed, the Law Decree 34/2014 eliminated the obligation to state the reason for the use of temporary contracts and expanded the limit of renewal from 24 to 36 months, even though a barrier of 20% of employees was fixed. The result was that the Employment Protection Legislation Index (EPL) for temporary contracts passed from 2,7 to 1,8, below the OECD average (Pinelli et al., 2017). Pinelli et al. (2017) affirm that, since the indicator does not take into account the limitations to self-employed atypical contracts established by other laws of the Jobs Act, the legislation appears worse than it really is. However, Rodano (2015) underlines the risk of a long job instability and, given the new rise in temporary contracts, his doubts have been confirmed. Eventually, the Italian job market dualism was not eliminated. The grandfathering clause of the law introducing the graded-security open-ended contract provoked a further inequality between those who entered a stable job in the past and those who did it after 2015. Temporary contracts were not affected, on the contrary, they were deregulated again and the 20% limit was not enough to prevent this type of contract to be the primary form of employment after the end of incentives for the open-ended contract.

The Jobs Act was highly criticized in Italy and following the 2018 general elections, a new coalition government formed by the anti-establishment party Movimento 5 stelle and the far-right party Lega emerged. One of the laws proposed by the new government was the so called "Dignity Decree", which was approved in summer 2018. The law brought back the limit of the fixed-term contract to 24 months and settled that a causality should be expressed if the worker is employed for more than one year or if the contract is renewed. Nevertheless, this limit can be modified by sector-specific collective agreements (Zoppoli, 2018). Moreover, the law introduced a further social security contribution of 0,5% to be paid by the employer every time that the contract is renewed (INPS, 2019). This contribution will be given back to the employer if he/she transforms the contract in an open-ended one. While many have claimed that this constitutes an attempt to raise the costs of temporary work, it is important to notice that temporary contracts can be extended instead of renewed and this provision does not apply to extension (INPS, 2019). It is possible to extend a contract up to four times (five times before this law), within the limit of 24 months. Concerning the penalty for the unfair dismissal of an indefinite worker, the new legislation increases the lower and upper limit of compensation, without modifying the fact that reinstatement is not envisaged. Even though both the Jobs Act and this law established that the compensation should grow automatically with tenure, the decision of the Constitutional Court 194/2018 stated that the judge can decide to augment the penalty because of the harm provoked by the employer to the employee (Zoppoli, 2018). Nevertheless, this provision is affected by discretion. Another measure in order to encourage the employment of young people through open-ended contracts was the tax cut of employer's contributions for three years,

determined by the Law 160/2019 (INPS, 2020a). At the same time, in 2019, the same government introduced the "citizenship income" (*reddito di cittadinanza*), a benefit defined as a contrast to poverty, which is released to low-income households (Giugliano, 2019; Vittoria, 2019). The policy targets also elderly households, while working age people are requested to attend training courses and accept jobs (Giugliano, 2019). Nevertheless, the policy does not modify the problems of the labour market and Vittoria (2019) has found out that accessibility by the weakest parts of the population is lower than expected.

In the end, could the reforms of the labour system implemented under the Lega and Movimento 5 Stelle government invert the trend in temporary contracts' expansion? If we look at the evolution of the percentage of temporary workers to the total of employees (Figure 1.1), we notice that only a slight decrease took place from 2018 to 2019. It might be too early to evaluate the effect of the policies but, given that dualism and instability in the labour market have not been eliminated, and given that reforms in the labour market have concentrated on the supply side, without considering the problems of the demand side (the low innovation of Italian enterprises, that thus compete on costs), it is unlikely that Italians will experience more job security in the future.

In this section, we have seen that the Italian labour market has undergone a remarkable liberalization in the last 20 years. From the perspective of the life cycle of saving, this means that younger cohorts will experience less or no income growth during their working life, causing a flat saving curve in the absence of changes in consumption before retirement and a larger negative saving in the post-retirement because they paid lower social security contributions compared to life-time employees.

Figure 1.1: Share of temporary workers to total number of employees, Italy and OECD average
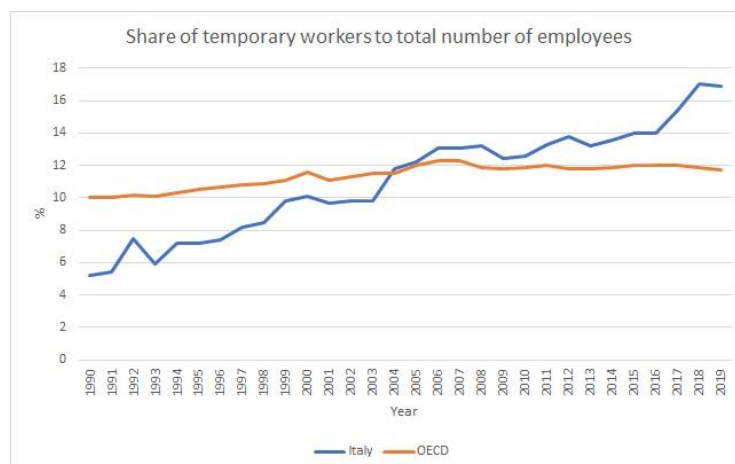
1.3 The Italian Pension System

In the previous paragraph we have analyzed how the characteristics of the labour system in Italy can affect the life-cycle of saving. Nevertheless, in order to have a full picture of the potential institutional influences over the whole life, we cannot ignore the pension system. For this reason, in this paragraph we will present the Italian pension system and its evolution over the years.

1.3.1 Before the 1990s

The Italian public pension system has been characterized by extremely generous rules until 1992. Before that year, the system was divided into different funds, on the base of sector (public or private) and professional status (employee or self-employed). The variety of the rules among these funds created disparities in the redistributive mechanism, especially between private and public employees (Brugiavini, Fornero, 1998; Schludi, 2005).

Under this system, the benefits were calculated according to an earnings-related formula. The elements that determined the amount of the pension were: the period of contribution (up to 40 years), the average salary (income in the case of self-employed) during the last five years of the career for the employees and ten years for the self-employed, and an accrual rate of 2% (INPS, 2017). This means that if a person contributed for 40 years, the accrual rate of 2% allowed him/her to receive a pension that was 80% of the average wage/income earned during the last five years of the career (70% in the case of 35 years of contributions). Moreover, the old-age pension was not the only benefit: a seniority pension was received after 35 years of contributions in the private sector (20 or in some cases 15 in the public sector), regardless of whether the person continued to work or not (Brugiavini, Fornero, 1998). In the event that an individual was not eligible for any pension, he/she was entitled to receive the "social pension", an allowance to protect against poverty during old age established in 1969 (Jessuola, Pavolini, 2011).

The high level of benefits, the absence of a penalty in the case of early retirement and the fact that the pension system was used as a tool for companies to reduce labour force in a rigid market, led to a situation in which workers retired as soon as possible. In 1987 only 30% of people aged between 60 and 65 years was active in the labour market and the figure was low also for those aged 55-59 years (65%) (Brugiavini, Fornero, 1998). This scenario provoked an increase in public expenditure for pensions from 9% of GDP in 1980 to 15% in 1992 (Schludi, 2005). The fiscal situation deteriorated further because of other generous policies: in 1988 the pension cap for high incomes was eliminated and in 1990 benefits of the self-employed were raised, despite their low contribution rate (Schludi, 2005). The growth of the contribution rate to 27% for employees was not enough to

counterbalance this expenditure, since the equilibrium rate was 45-55% (Brugiavini, Fornero, 1998). The constant deficit in primary balance, caused by different factors, led to a stark expansion in public debt, which was aggravated by the rise in interest rates (Ferragina, Arrigoni, 2021). The clientelist party system hindered a major policy change, but this came to an end in 1992, with a crisis that forced Italy to exit the European Monetary Union (Schludi, 2005).

1.3.2 The 1992 Amato reform

After the 1992 crisis, the Italian Parliament delegated the government to exercise the legislative function without its approval for a limited period (*Legge delega*). This event permitted, among others, the reform of the pension system (Schludi, 2005). The retirement age was raised gradually from 55 years to 65 for men and to 60 for women. Moreover, the indexation mechanism passed from wages to inflation. Another change concerned the equalization of contributions for the seniority pension in the public sector to the private one. Finally, the reference period for the average salary, used to compute pension benefits, was increased (Schludi, 2005). In the end, the pension was calculated on the average wage (income) of the last five (ten) years for employees (self-employed) on the base of the contribution period until 1992, and on the average wage (income) of the last ten (fifteen) years for employees (self-employed) on the base of the contribution period after 1992 (INPS, 2017). For the younger cohorts, the computation is based on the average salary of the whole working life (Schludi, 2005).

The Amato reform was a first step towards pensions' cut, but it was not sufficient for the sustainability of the system, since it did not change the defined-benefits feature and left the accrual factor at the 2% level (Schludi, 2005). For this reason, a new, more radical, reform was undertaken in 1995.

1.3.3 The 1995 Dini reform

After a failed attempt by the Berlusconi government to further decrease pension benefits in 1994, a new government, led by Lamberto Dini, introduced a profound change in the pension system. In addition to the increment in contributions to 32% for employees of the public and private sector, the progressive unification of the different schemes, the gradual elimination of seniority pensions and a flexible retirement period between age 57 and 65, the reform changed the nature of the system from defined benefits to defined contributions (Schludi, 2005). The new system is a notional defined contribution system, because it is based on defined contributions, but functions on a pay-as-you-go

basis (Franco, Tommasino, 2020).[2] Nevertheless, at the same time, it has some characteristics of a funded system because the benefit is determined by the capitalization of contributions, based on the GDP nominal growth rate (Franco, Tommasino, 2020). The computation of the benefits is based on the following steps: the social security administrator traces the yearly wages for employees and the income for self-employed and applies the category-specific contribution rate for each year; the contributions are revalued through the yearly capitalization rate given by the average nominal GDP variation of the previous five years; finally, the sum of the revalued contributions is multiplied by a coefficient that differs according to the retirement age (INPS, 2017). The reform established that this formula would completely apply only to those who entered the labour market after 1995, while those who had 18 years of contributions would receive their pension based on the defined-benefits formula and those who had less than 18 years of contributions would have their pensions computed partly with the defined-benefit method and partly with the defined-contribution one (INPS, 2017). The grandfathering clauses of the pension reform, asked by the unions, created a long transition period and a marked intergenerational inequality. In the same year, given that public pension benefits would decline significantly in the future, tax incentives were established for supplementary pension funds (Schludi, 2005).

Again, the target of the reform mainly focused on younger cohorts. Some provisions concerning all the workers, such as the abolishment of the differences between the public and private sector and the elimination of seniority pensions, were accelerated by the Prodi government in 1997, due to the strict fiscal conditions to be met before 1998 according to the Maastricht Treaty (Schludi, 2005). Nevertheless, the speed up of these measures did not affect the long transition period for the most important change: the passage to the defined-contribution system.

1.3.4 Reforms in the new millennium: from 2000 to 2019

The 2000-2010 period was characterized by different reforms that mainly involved the retirement age. In 2004, the Berlusconi government established that men could receive old-age pension benefits from the age of 60, while women from the age of 57 with 35 years of contributions. However, the reform introduced some incentives to retire later. In 2005, the Law 252/2005 settled that contributions to the *Trattamento di Fine Rapporto* (*TFR*, severance pay) would be transferred directly to the occupation-

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[2] The defined-contributions system can function on a fully funded basis (the contributions are accumulated in a fund and pension benefits are based on their performance) or on a pay-as-you-go basis (the contributions are transferred to retired people but pension benefits of cohorts who paid them are based on the value of this transfers). In the second case, the system is defined "notional defined-contributions system".

based supplementary pension fund, if the worker did not state his/her opposition explicitly.[3] The aim of the provision was to expand the participation in supplementary pension funds. Later, in 2007, the Prodi government adopted the *quota 95* pension mechanism, which allowed retirement if the sum of age and contribution period was equal to 95. In 2010 the retirement age changed again: it was raised to 65 years and it was decided that from 2015 it would be based on demographic trends (Ferragina, Arrigoni, 2021).

Finally, in 2012, in the aftermath of the 2011 debt crisis, a new major legislative change was undertaken: the Fornero reform. Although Italy was not exposed to financial risks directly linked to the 2008 crisis, financial speculations about default of Southern European countries, especially after Greece's crisis, caused an increase in the gap between interest rates on German and Italian long-term bonds (the so-called "spread") (D'Ippoliti, Roncaglia, 2011). The rise in interest rates and the fall of GDP and tax revenues provoked a worsening of the Italian public fiscal situation and the European Union called for policies that could stabilize the trust of international markets (D'Ippoliti, Roncaglia, 2011). It is in this economic context that the pension system was targeted again. Its revision provided more flexibility in the retirement age for those entered in the labour market after 1995 and stricter requirements for the workers of the pre-1995 system. Moreover, it equalized retirement age for men and women and decided a gradual increase: from 61 (in 2012) to 67 (in 2019) for women, and from 65 to 67 for men. Nevertheless, the most important provision was the extension of the defined-contribution system to workers who had more than 18 years of contributions before 1995 (Franco, Tommasino, 2020). Indeed, it was ruled that their pension benefits would be computed according to the defined-benefits formula for the period until December 31 2011 and with the defined-contribution mechanism for the subsequent years (INPS, 2017). This was an important decision for the acceleration of the transition period and, at least in part, for the reduction of intergenerational inequality. Figures 1.2, 1.3 and 1.4 illustrate the current formulas for the calculation of pension benefits according to the number of years of contributions in 1995.

After the crisis, two further reforms were taken in order to speed up the exit from the labour market. In 2017, unemployed or people affected by a debilitating disease and those taking care of a disabled relative could retire if they were at least 62 years old and had 30 years of contributions. Later, in 2019, it was decided that for three years those whose age and contribution years summed up to 100 could retire (*quota 100*) (Franco, Tommasino, 2020). According to Giugliano (2019), this last measure

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[3] The TFR is a lump-sum payment paid to employees in the private sector when they leave the firm. In the past it was considered a supplementary pension benefit because, in a context of labour market rigidity, it was usually paid at retirement. A corresponding benefit exists also for the public sector, called *indennità di buonuscita*. These benefits are compulsory (Jessuola, Pavolini, 2011).

provoked an increase in the deficit and in the spread between German and Italian long-term bonds and thus worsened the intergenerational inequality. Nevertheless, we have to underline that the measure was not financed through new debt because, as we will see in paragraph 1.7, the primary balance has been positive for almost 30 years between the beginning of the 1990s and 2019. Consequently, the deficit's growth was caused by the fact that less State's revenues were addressed to the repayment of old debt.

Figure 1.2: Pension formula currently applied to those who had more than 18 years of contributions in 1995

The present pension benefits formulas

If the worker had more than 18 years of contributions at the end of 1995

Pension benefits=$(2\%*n*k)+(2\%*m*y)+(b*r*f)$

Where:
n= years of contributions until December 31,1992;
k= average wage of the last 5 years before retirement for employees and 10 years for self-employed;
m= years of contributions between January 1 1993 and December 31, 2011;
y= average wage of the last 10 years before retirement for employees and 15 years for self-employed;
b= contributions paid after January 1, 2012;
r= capitalization rate based on the variation of nominal GDP in the previous 5 years;
f= coefficient based on the person's age at retirement.

Source: Author's elaboration based on INPS (2017)

Figure 1.3: Pension formula currently applied to those who had less than 18 years of contributions in 1995

The present pension benefits formulas

If the worker had less than 18 years of contributions at the end of 1995

Pension benefits=$(2\%*p*y)+(d*r*f)$

Where:
p= years of contributions until December 31, 1995;
y= average wage of the last 10 years before retirement for employees and 15 years for self-employed;
d= years of contributions after January 1, 1996;
r= capitalization rate based on the variation of nominal GDP in the previous 5 years;
f= coefficient based on the person's age at retirement.

Source: Author's elaboration based on INPS (2017)

Figure 1.4: Pension formula currently applied to those who had no contributions in 1995

The present pension benefits formulas

If the worker had no contributions at the end of 1995

Pension benefits=(d*r*f)

Where:
d= years of contributions after January 1, 1996;
r= capitalization rate based on the variation of nominal GDP
in the previous 5 years;
f= coefficient based on the person's age at retirement.

Source: Author's elaboration based on INPS (2017)

1.3.5 Public and supplementary pensions: trends and considerations

When Brugiavini and Fornero (1998) advocated for the importance of the notional defined contribution pension system, they stated that the elderly were less at risk of poverty than the active generations. The same position is taken by Franco and Tommasino (2020), who claim that the new system provides adequate benefits to the elderly. Nevertheless, since present retirees were workers in the pre-1995 system, the contribution-based pension formula only applies to the last period of their working lives, while a significant amount is based on the earnings-related formula. Moreover, these workers entered in a labour market that was highly regulated, so most of them had access to a stable career during their whole life. We have seen that the situation has changed for those who entered the labour market at the end of the 1990s. For this reason, it is necessary to study the impact of the reform for the cohorts who were also left without employment stability. Not only their careers are likely to be discontinued, but their benefits will also be based on GDP growth, in a country affected by low productivity (also because of poor investment in workers' training) and high public debt (initially caused by clientelist policies and later by high interest rates). A study of the European Union's Social Security Committee reported by Jessuola and Pavolini (2011) estimates that public pensions' replacement rate will be 56% in 2046, while the figure for supplementary pensions will be 12,4%. These data refer to someone who retires at 63 and who worked for 38 years as a full-time employee. The replacement rate of part-time workers, project-workers and fixed-term workers will be lower

(Jessuola, Pavolini, 2011). Moreover, participation in supplementary pension schemes is limited, especially among small enterprises and the self-employed. In addition, low-income workers may not have enough budget to participate in a private voluntary scheme (Jessuola, Pavolini, 2011). In 2020, the number of participants in supplementary pension plans was estimated to be 8,48 million (COVIP, 2020). If we consider that workers (both employees and self-employed) were 25,47 million in 2019 (INPS, 2020b), we estimate that the participation rate is only 33,3%. Another problem is that funded pensions face investment and inflation risks, so it is important to constantly monitor the perform of investments by these funds. Concerning inflation, we should consider that the private employees' pension in the first half of the XX century was already a mixed pay-as-you-go and funded system, but the funded part was abolished after the post-war inflation destroyed the value of its capital (Brugiavini, Fornero, 1998). So, even if a mixed system can compensate for cuts in the public pension due to fiscal pressure, the adequacy of the public system should be maintained.

The implication for the life cycle of saving is that, while before the 1990s Italian households could count on a life-long stable earning and high replacement rates that probably kept saving high after retirement, younger cohorts not only have fewer possibilities to save during their working life because of a deregulated labour market, but will also have lower replacement rates. Their saving could thus become negative repeatedly during their life, and they are likely to experience poverty during old age.

1.4 Health Care in Italy

Health care is another domain that can influence saving. In fact, in the presence of a public universal health care with low out-of-pocket payments, individuals have less motive to save. In contrast, a system with high out-of-pocket payments requires individuals to save or to buy a private health insurance.

Italy has a universal National Health System that covers all the citizens and foreigners residing legally on the territory. It was funded in 1978 and it was a highly centralized system until the 1990s. Then, during that decade, Regions started acquiring more power and this provoked the decentralization of the health system (Jessuola, Pavolini, 2011).

The services that are offered by public health care are defined through the Essential Standards of Care (*Livelli essenziali di assistenza,* LEA). These services are financed through different sources: entries of the local health agencies (which include co-payments); regional taxes; participation by Special Administrative Regions and Autonomous Provinces; State Budget collected through value-added tax,

excise tax on oil and resources from the National Health Fund (Giordani, Ploner, Polistena, 2017). A Region can decide to offer further services, but these have to be financed autonomously (European Commission, 2019). As we can see, public health expenditure is totally based on taxes and not on social security contributions.

In 2006, the main financing sources were the regional taxes (40,8%) and State budget collected by indirect taxes (44,2%). Entries of the local health agencies provided 2,1% of the resources (Figure 1.5) (CIPE, 2007). In 2019, the percentage financed by regional taxes was lower (27,4%) compared to 2006, while the figure for indirect taxes was higher (59,5%). Moreover, the percentage provided by local health agencies' entries decreased (1,7%) (Figure 1.6) (CIPE, 2020). Thus, differently from the early 2000s, in 2019 most of the system financing was centralized. The fact that the percentage paid through agencies' entries declined could give the impression that direct payments by citizens fell during the period 2006-2019. Nevertheless, if we look at the government expenditure for health as a percentage of GDP, we see that the value in 2019 is lower than that in 2006, while the one paid as out-of-pocket money has increased (OECD, not shown). According to a report by the European Commission, public expenditure covered 74% of the total health expenditure in 2017, while households paid directly 24% and private insurances accounted for 2% (European Commission, 2019). Italy is one of the countries with the lowest amount of public health expenditure in Western Europe and shows one of the lowest increases in this variable between 1990 and 2018 (Prante, Bramucci, Truger, 2020).

This apparent contradiction may be explained by the fact that some services needed by households are not included in LEA, and that cuts to public expenditure after the euro-zone crisis led to the drop of physical facilities offering these services, while not modifying the benefit package. Indeed, the package was even expanded in 2017, but some Regions could not afford to offer the new services (European Commission, 2019). Moreover, in 2015 pharmaceuticals represented the biggest private health expenditure by households (40%) (D'Angela, 2017). Co-payments for pharmaceuticals had an average of 15,3% on gross expenditure in 2019, while in 2006 it was between 0,7% and 1,1% for Regions that did not apply co-payments and between 6,1% and 6,9% in Regions that applied the highest co-payments (Federfarma, 2007; Federfarma, 2020). Indeed, co-payments are decided at the Region level and in 2019 the highest figure was 19,6% (Federfarma, 2020). Thus, over the years co-payments for pharmaceuticals increased and this had an effect on households' out-of-pocket expenditures. In addition, co-payments don't have a yearly ceiling, so people who need care and pharmaceuticals repeatedly and who are not exempted have to bear a significant charge (European Commission, 2019).

Figure 1.5: Financing of LEA in 2006
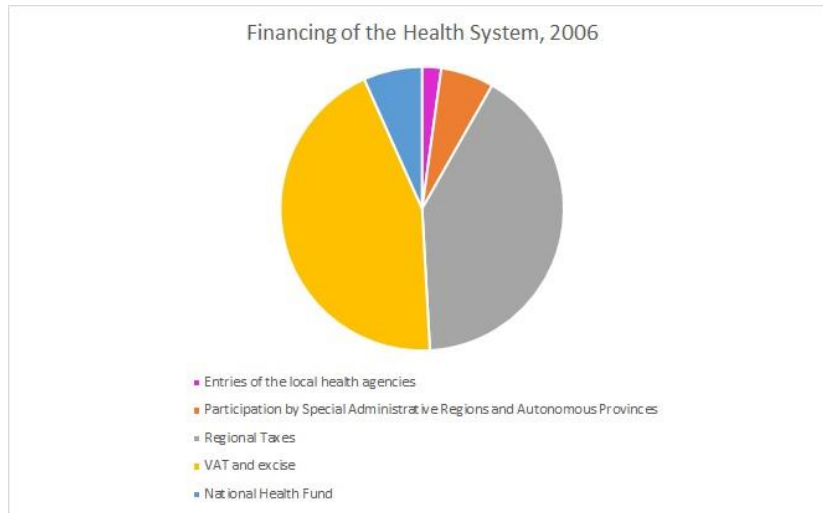
Figure 1.6: Financing of LEA in 2019
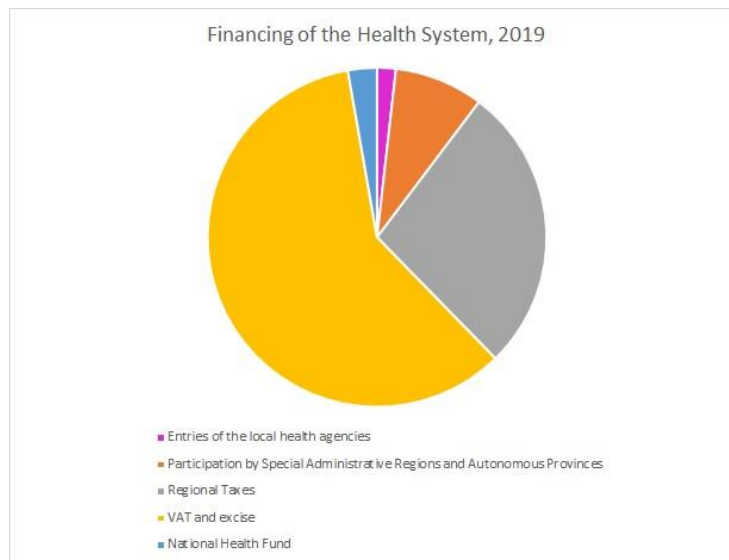
The burden of out-of-pocket payments weighs more on households of low consumption quintiles and residing in the South. Catastrophic health expenditures concern 5,5% of households living in Southern

Italy, while the figure for Central and Northern Italy is only 1,5% (D'Angela, 2017).[4] Furthermore, in 2017, 4,6% of low-income households reported having unmet medical needs, while the European average was 3,3% (European Commission, 2019). The percentage for the total population was equal to the European average, while the figure for high-income households was higher (European Commission, 2019). This means that in Italy access to health care is more unbalanced than in other European countries. A further supporting element to this statement is the percentage of patients getting treated in another Region, that increased from 7% in 2001 to 8,5% in 2016 (European Commission, 2019).

In the end, we can say that, although the State covers a significant part of health expenditure, this figure is among the lowest in Western Europe and the proportion paid directly by households has expanded over the years. Thus, we can assume that the need for precautionary savings rose, especially for people in the South, who have less access to services, also because of imposed cuts to Regions in deficit, which were prevented from hiring new staff (*Piani di rientro*) (Giordani, Ploner, Polistena, 2017). Considering that pharmaceuticals make up the biggest part of out-of-pocket expenditures, also because co-payments grew over the years, we can suppose that people affected by chronic conditions, including the elderly, need to save more.
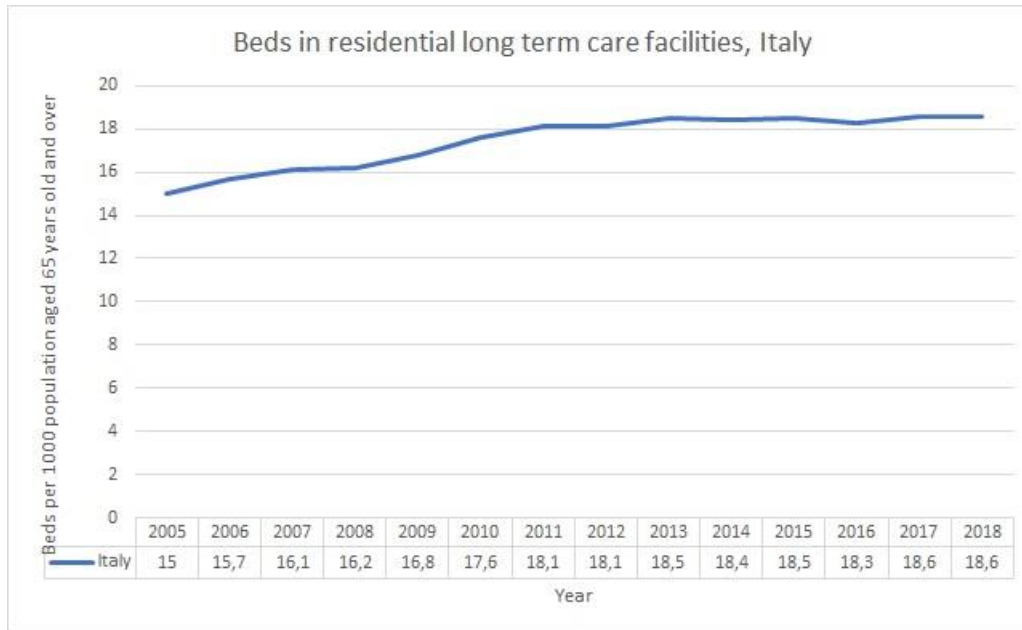
Until now, we have reviewed the Italian health care system, but we have not considered the Long-Term Care field. This will be the focus of the next paragraph.

1.5 The Long-Term Care System in Italy

Long-Term Care can be divided into two different forms of assistance: nursing homes and home-based care. In relation to the first form of care, Italy was the third last among 19 European countries in 2015 for the offer of LTC beds (Giordani, Spandonaro, 2017). There was an increasing trend from 2005, but the rate of growth stagnated after 2011 (Figure 1.7). Overall, the use of nursing homes remains limited (Crescentini, 2017). With respect to the financing of this form of assistance, the State covers 50%, which is the share accounting for health costs, while the remaining 50% due to housing can be partially financed by the municipality, whose share is based on the patient's income (Crescentini, 2017). Nevertheless, given the various spending capacity of municipalities, the support for housing costs differs considerably across Italy.

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[4] As reported by D'Angela (2017), the WHO's definition of catastrophic health expenditure is a disbursement that exceeds 40% of households' income after deduction of subsistence consumption.

Figure 1.7: Number of LTC beds in Italy

Beds in residential long term care facilities, Italy

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Italy	15	15,7	16,1	16,2	16,8	17,6	18,1	18,1	18,5	18,4	18,5	18,3	18,6	18,6

Source: OECD

Other plans concern cash-benefits and home care, which can be a medical or care-giving service. The cash-benefit (*indennità di accompagnamento*) is a national level program that targets disabled people regardless of income (Crescentini, 2017). In 2021, the amount of the benefit is 522,10 euro per month (INPS, n.d.). While in the 1980s people benefiting from this plan were mainly disabled adults, in 2016 71% of the subsidy was delivered to people aged 65 or over (Jessuola, Pavolini, 2011; Crescentini, 2017). A cash-benefit exists also at the local level, but as resources for nursing homes, the offer varies a lot depending on the municipality. In this case, the subsidy is based on income (Crescentini, 2017). The local level provides also services: ADI and SAD. ADI is an integrated home-based care service, mainly medical, it is delivered by local health agencies and is included in LEA. On the other hand, the purpose of SAD is assistance in the activities of everyday life and it targets low-income households (Crescentini, 2017). SAD presents the same segmentation problem of other municipality-based plans.

The Welfare system is still inappropriate to meet the needs of an increasing aging population. The fact that the cash-benefit is the most common welfare provision available to households created a large grey market of care-givers (Jessuola, Pavolini, 2011). On the other side, those who cannot afford to pay a residence or a care-giver internalize the assistance function in the household (Crescentini, 2017). Again, regional disparities are significant: at the same age, people from the South face higher risks of chronic diseases but the presence of Long-Term Care beds is limited compared

to the North, even if the figure is improving slowly for some Regions (Crescentini, 2017; Ministero della Salute, 2020).

As reported by Crescentini (2017), individuals are starting to recognize that it is inevitable to make use of the private sector for Long-Term Care, and they are willing to save more for this purpose but most of insurance products are ill-suited. Moreover, those who need to save more because of the inadequacy of public welfare in the area, households from the South, are also those who have the lowest income at the national level. Indeed, income in this area is 60% of that of the North (Corriere della Sera, 2020). For this reason, while we can expect a rising of saving during the working life for old age and a reduction after retirement for the payment of private long-term care services at the national level, poorer households might not be able to save enough for this purpose and, as a result, they would either internalize care functions or get impoverished to pay.

1.6 Accessibility to credit market for the purchase of housing

The restriction to credit market access can cause the need to save a great amount in order to purchase a house. Credit markets in Italy were highly regulated before the 1990s. Indeed, the 1936 *Banking Law* limited the area for the establishment of new branches and stipulated that banks should be divided according to the maturity of their loans. This led to a small presence of banks, and thus less credit available, and to a low competition that caused high interest rates (Casolaro, Gambacorta, Guiso, 2005). For this reason, when the housing boom started in the 1960s, individuals did not rely on mortgages. During this period, the main practices to own a house were self-construction and privatization of social housing (Bernardi, Poggio, 2002).

Later, in the 1980s, urban planning policies did not tolerate self-construction anymore and individuals could become home-owners mainly through accumulated savings and inheritance or gifts (Bernardi, Poggio, 2002). In the same years, restrictions to branches' opening started being eased but it was not until 1990 that they were abolished. In addition, the 1993 Banking Law decided that banks would not be separated according to the maturity of their loans anymore. The increase of branches and the possibility for all the banks to provide mortgages expanded available credit, boosted competitiveness and reduced interest rates (Casolaro, Gambacorta, Guiso, 2005). This process caused the mortgage to GDP ratio to rise by almost ten percentage points between 1984 and 2003. Nevertheless, the percentage of liabilities to households' disposable income was only 43% in 2000. According to Casolaro, Gambacorta and Guiso (2005) this could be explained by the inefficiency of Italian judicial proceedings and by the low level of social capital, in other words trust.

Thus, after the liberalization of the credit market in the 1990s, households need to save less in order to buy a house. Nevertheless, the figure about liabilities to disposable income suggests that a substantial portion of savings is still necessary for becoming home-owner. Moreover, in the period 2006-2012, loan-to-value ratios decreased because of the global financial crisis and all income groups suffered exclusion from the credit market due to higher down-payments. In the end, the middle class was the one that was the most affected (Liberati, Vacca, 2016).

After 2012, loan-to-value ratios grew again and in 2019 the overall figure was around 66% (Banca d'Italia, 2020). Furthermore, 69,8% of banks offered loan-to-value ratios above 80% (Banca d'Italia, 2020). At a first glance, we might assume that households need to save less compared to the 1980s in order to buy a house. Nonetheless, while the development of the credit market certainly provides advantages to households, we have to consider that, according to Liberati and Vacca's research (2016), family's support still plays an important role in providing accessibility. In addition, the increase of non-regular jobs that we have seen in the labour market section might cause the inability to get a mortgage for a long time. As a consequence, considering the life cycle of saving, those who have a stable job and can obtain credit have to save less compared to the past but still need some degree of wealth accumulation before purchasing the house. On the other hand, non-regular workers will definitely need their family's help, whether in the form of financial transfers for the purchase of a house, or in the form of real estate inheritance. In their case, saving is probably not affected.

1.7 Evolution of taxes and contributions in Italy and the consequences for saving

The fiscal system affects savings directly because an expansion of revenue through direct taxes reduces disposable income. Nevertheless, the consequences are different according to the type of financing source that the State chooses to use. Taxes are progressive if they weigh more on high-income groups and regressive if the most affected are low-income groups. Moreover, some sources of financing, such as social security contributions for pension, only target the working population. For this reason, it is important to analyze the whole system and the different implications depending on the groups involved.

The tax system in Italy is extremely complex. The personal income tax (IRPEF) is progressive in nature, but the presence of 140 types of credits and deductions, not all addressed to low-income households, creates bias in the system (Cammeraat, Crivelli, 2020). The Department of Finance, under the Ministry of Economy and Finance, estimates that more than 80% of the IRPEF is paid by

employees and retirees (Dipartimento delle Finanze, n.d.). Self-employed workers contribute for less than 7%, despite the fact that they were 23,2% of the labour force in 2017, about 7 percentage points above the European average (Dipartimento delle Finanze, n.d.; ISTAT, 2018). Thus, it is clear that income taxation weighs more on certain categories, and we can assume that their saving is more affected.

Another tax in Italy is the Value-Added Tax (VAT, or *IVA* in Italian). While the general rate is quite high (22%), the regressive nature of the tax is addressed through some lower rates: 4% for food and other items that weigh more on low-income households and 10% for certain items, among which products and services consumed by well-off groups such as hotels and restaurants (Cammeraat, Crivelli, 2020).

Finally, given that social security contributions apply a flat rate to wages, and that the rate applied to self-employed workers is lower, as reported by the INPS website, we can say that this source is not redistributive and that disparities emerge again between different working statuses.

In the end, the fiscal system in Italy appears quite unbalanced and some reforms have been proposed to shift a part of the revenue from income to wealth and real estate, without raising the VAT (Eyraud, 2014; Cammeraat, Crivelli, 2020). This topic is beyond the scope of this dissertation, but it is important to underline the inequities of the fiscal system, since the effect on income, and thus saving, differs according to the working category and given that not all taxes weigh the same on low-, middle- and high-income groups.

In figures 1.8, 1.9, we can see the evolution of public expenditure as a percentage of GDP and the change in tax revenue over the years. As we can notice, despite fluctuations, public expenditure is higher in 2019 compared to 2000. This was financed through an increase in tax revenue, and the percentage of GDP covered by social security contributions and consumption tax is higher than the one accounted for by personal income tax. If we look at the tax type as a percentage of total taxation (Figure 1.10), we see that social security contributions became the primary source of revenue in 2001, while VAT surpassed the personal income tax in 2013. It is true that a higher financing through VAT might help reducing the fiscal gap between employees and self-employed, but the main source of revenue still poses disparities among the two (and also between working-age population and retirees), and the result is that public expenditure is funded primarily by non-progressive resources. This might have caused an enlargement of income (and thus saving if consumption is not adjusted) disparities among groups and even if retirees pay taxes through VAT and IRPEF, most of the revenue is provided by employees through social security contributions. It is important to underline that the whole increase in public expenditure is financed by the fiscal system and not by debt, since from the
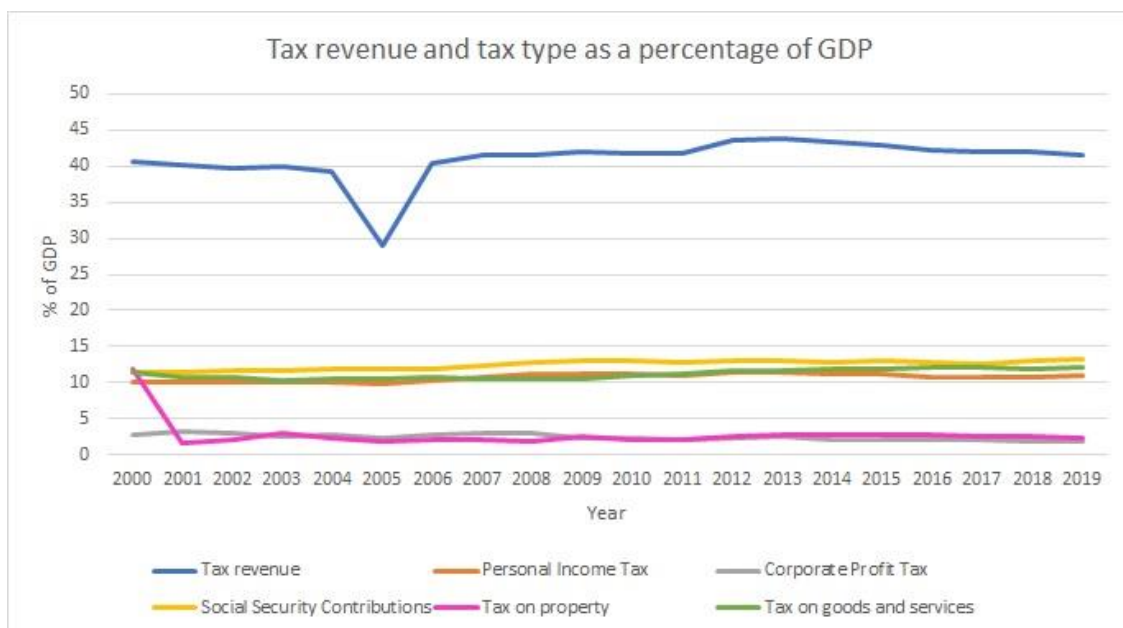
beginning of the 1990s to 2019 Italy's primary balance has always been positive, except for 2010 (Figure 1.11, values of 1990s not shown). Indeed, public deficits are caused by payments for debt service.

Figure 1.8: Public expenditure as a percentage of GDP, Italy
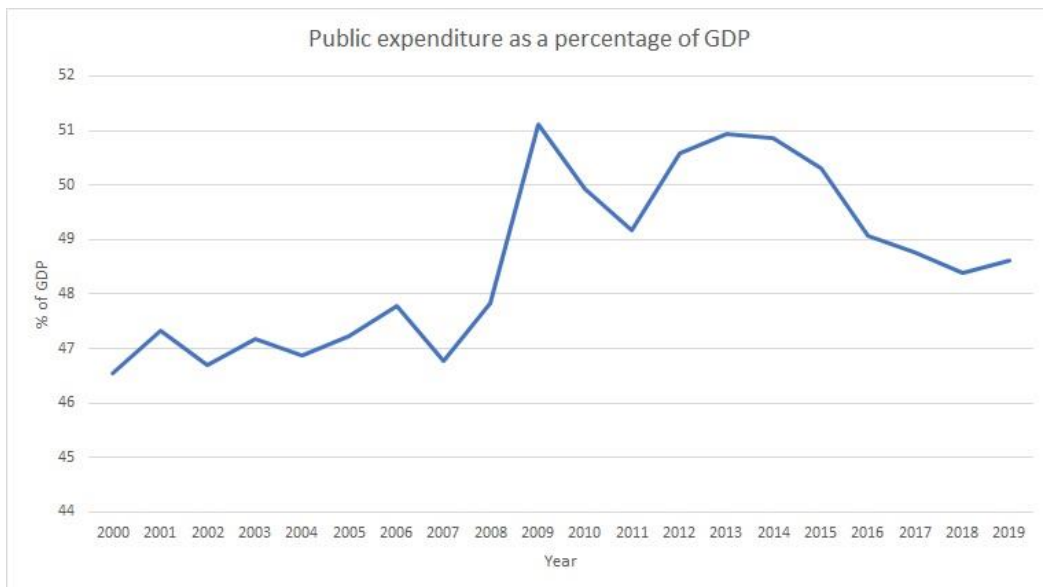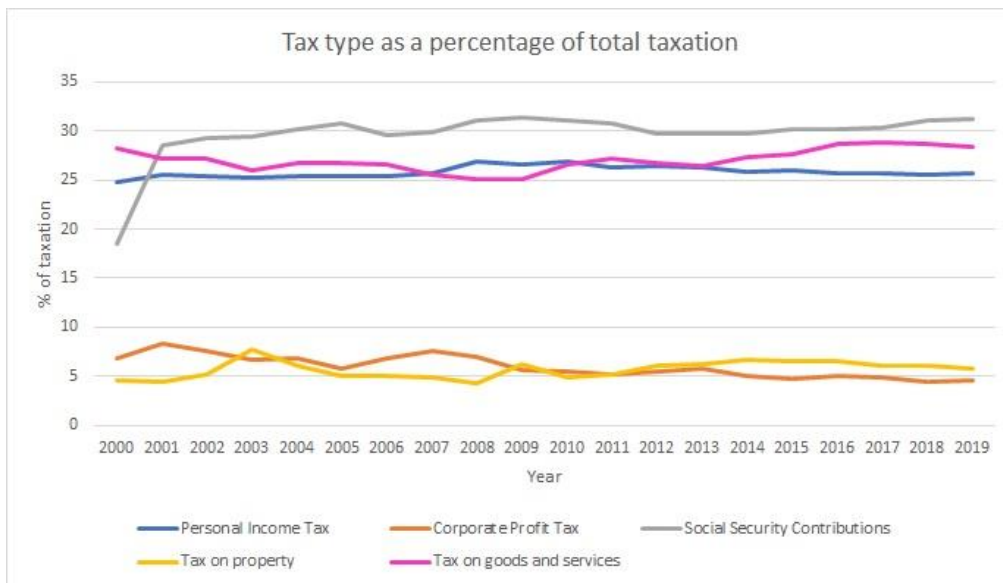
Figure 1.9: Revenue and tax types as a percentage of GDP, Italy

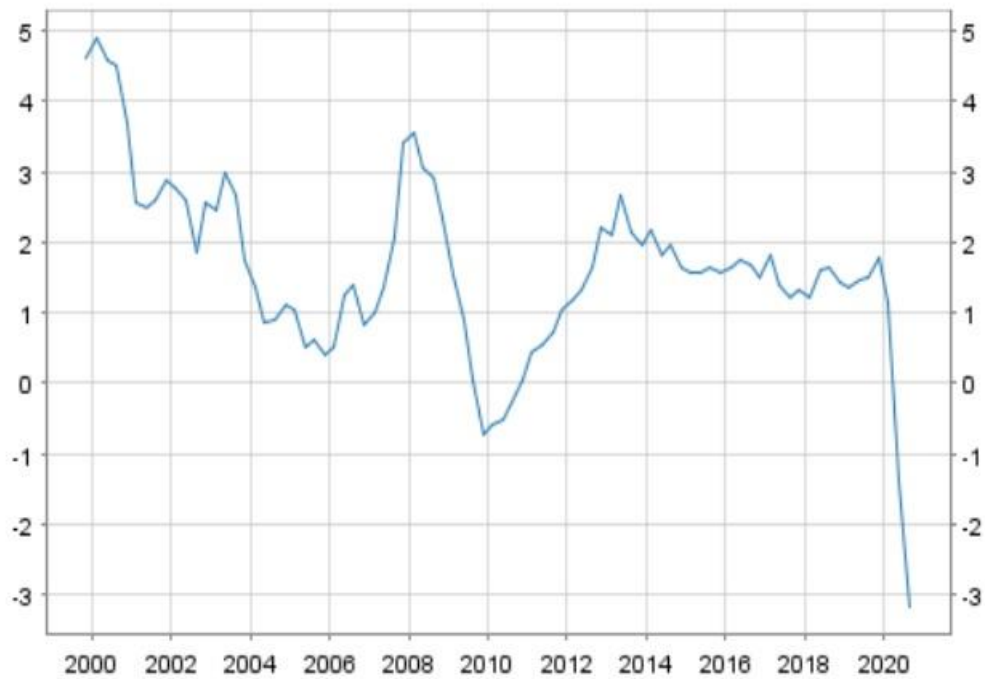Figure 1.10: Tax types as a percentage of total taxation, Italy

Tax type as a percentage of total taxation

Figure 1.11: Italy's primary balance as a percentage of GDP

1.8 Conclusion

On the basis of what we have seen about the employment, pension, health, credit and tax system, we can make hypotheses about different life-cycle of savings according to cohorts.

Cohorts who entered the labour market before the second half of the 1990s have worked in a highly regulated employment system, which granted them a continuous career and seniority wage increases, even if the amount of these is not particularly high. Moreover, a very generous pension system permitted high replacement rates for these cohorts, although the rise of out-of-pocket expenditures for health in the last years and the inadequacy of the health system to treat chronic diseases expanding with life expectancy might have caused their savings to decrease. As regards the credit system, these cohorts needed to save more when they were young because of limited access to mortgages. Finally, with respect to the tax system, estimates from the Department of Finance show that the personal income tax's revenue attributable to retirees has increased in the last twenty years, but this might be due to the numerical growth of this category, and the majority of taxes is still paid by employees. Overall, if consumption is constant, except for the purchase of a house, during the working life of these cohorts, we can expect savings to rise slightly with age until retirement, and then the variable decreases because of the growth in medical expenditures. Nevertheless, this fall in partially contained by the high replacement rates.

On the other hand, cohorts who entered the labour market after the second half of the 1990s risk to undergo income instability for a long period of their working life, because of the liberalization of the employment system. Moreover, they face a considerable risk of poverty during old age, due to the lower replacement rates and the defined-contributions system. The higher efficiency of credit markets could ease the purchase of a house without the need for high savings, but it is very unlikely that people without a stable job can be eligible for mortgages. Finally, the tax system experienced a shift towards non-progressive sources and this process risks to worse further the saving situation of this group.

In addition, another boundary about the life cycle of saving emerges clearly in Italy if we consider the differences between North and South. Indeed, the southern part of the country experiences a worse situation compared to the North in almost all the institutional characteristics: employment, public health care and access to credit market. For this reason, residents of the Sourh have more motives to save compared to the North, but they are face higher budget constraints. Thus, their risk of poverty is likely to be considerably higher compared to the northern part of the country.

In this chapter we have made hypotheses about the life cycle of saving in Italy. In part two we will see if the empirical analysis reflects some of our assumptions. Regarding the future of younger cohorts, this dissertation does not run a simulation and remains theoretical.

Chapter 2

The Japanese Institutional Environment and its consequences for saving

2.1 Introduction

The aim of this chapter is to present the institutional environment in Japan, its transformations over the years, and how it can affect saving and the life cycle of saving. The chapter is the result of qualitative research based on primary and secondary sources. Primary sources mainly consist of official documents by the Ministry of Health, Labour and Welfare and other governmental entities. Secondary sources are composed of scientific literature, newspapers' articles and websites of organizations involved in the labour market or in the insurance market. We are going to present the elements of the Japanese institutional environment in the same order as chapter 1: the employment system, the pension system, the health care system, the credit market system and the fiscal system. In the last paragraph, we will resume the findings of the chapter.

2.2 The Japanese employment system

In this section we will present the Japanese employment system and its potential consequences for savings and the life cycle of saving. Given the radical change of the economic situation after the burst of the bubble, we will first describe the system before the crisis and then we will try to understand if major changes happened.

2.2.1 The pre-bubble era

The pre-bubble employment system in Japan is usually described through its "three treasures": lifetime employment, seniority-based pay and company-based unions. All these elements are interdependent. As Hamaguchi (2009, p.13) states, the precondition to this system is a contract in which "the concept of job is tenuous" ("*shokumu to iu gainen ga kihakuna koto ni arimasu*").[5] Indeed, the employees commit to all the tasks that the employer assigns and in this way it is possible to offer lifetime employment (Hamaguchi, 2009). Indeed, thanks to this type of contract, if a department of the company exceeds human resources, the employer can move employees to other job functions. This is what Lechevalier (2011, p.145) calls the "internal flexibility of Japanese firms" as opposed to the "external flexibility of American firms".

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[5] Author's translation.

Another result of this contract is that it is difficult to base wages on job functions, as it happens outside Japan. In fact, remuneration should be changed every time that employees change task and workers would refuse to commit to job functions presenting a lower pay. This is why the pay is based on the years of service (Hamaguchi, 2009). However, it is important to underline that wages do not depend solely on age under this system. Indeed, two other factors, "skills" and "performance", are considered (Conrad, 2010). Nevertheless, performance plays only a marginal role in salary, while skills (which themselves increase with age) and years of service are the most important elements (Conrad, 2010).

Thirdly, since the wage is not based on a particular job, unions are not sector-based, as in many countries outside Japan, but they are company-based. Nonetheless, during the pre-bubble period we can find an example of collective bargaining in the *Shuntō* (Hamaguchi, 2009; Lechevalier, 2011).

Another essential aspect to the pre-bubble employment system is to be found in the financing method. In fact, in order to grant life-long employment and age-based wages' increases, it is necessary to have a stable and long-term oriented funding strategy (Lechevalier, 2011). This happens thanks to the "main bank system", which consists in the fact that companies finance themselves through banks instead of capital markets and that the main lender can have a role in the corporate governance if the firm experiences a bad financial situation (Lechevalier, 2011).

Until now, we have portrayed the core elements of the pre-bubble employment system in Japan. Yet, it is necessary to say that this model did not apply to all the workforce. Indeed, the employment security of regular employees was possible only with the presence of non-regular employees, who played a critical role during market fluctuations. For this reason, Lechevalier (2011; 2014) describes the Japanese employment system as a job market that has been structurally segmented since at least the 1950s, but whose nature has changed over the years.

Given the characteristics of the pre-bubble employment system in Japan, we can say that a part of the workforce had a very high level of employment security and experienced automatic income increases over life until retirement. If we assume a constant level of consumption over life, the resulting saving profile would be an inversed-U shaped curve as in Modigliani's theory. Concerning non-regular workers, their saving profile would be different because of higher employment insecurity and the exclusion from the age-based pay mechanism. This means that, during the working years, saving would not be affected by age and it would experience fluctuations due to the precautionary motive and income losses. After retirement, the saving of this category probably decreases because of the fall in income.

After having seen the nature of the employment system in Japan in the pre-bubble era and how it can affect the life-cycle of saving, let us now turn to the question of how did its conditions change after the burst of the bubble.

2.2.2 The post-bubble era

The financial crisis of the 1990s and the neoliberal policies allowing for greater financialization have resulted in the weakening of the institutional complementarities that characterized the classic model (although we have seen that the paradigm of the Japanese firm did not apply to the whole system). Nevertheless, as Lechevalier (2011) notes, the consequence of this process has not been the adoption of the Anglo-Saxon model but the increasing diversification of Japanese firms. [6] Since the scope of this dissertation is to analyze the links between institutions and the life cycle of saving, we will focus only on changes that afflict workers directly: the transformation of the lifetime employment and the age-based pay. Thus, we will not cover the financing methods of enterprises.

2.2.2.1 The life-long employment system

According to Tiberghien (2011), neoliberal reforms have not been particularly radical in the case of the job market. In his opinion, they have mainly concentrated on public workers, a minority of the workforce, and on unions. In relation to indefinite contracts, the dismissal of workers remains very limited, so the employment security of this category has not changed (Tiberghien, 2011).

Nonetheless, a radical change that occurred after the burst of the bubble is the dramatic rise in the number of part-time and non-regular workers. According to Lechevalier (2011), non-regular workers represented more than 30% of employees in 2009. This data is coherent with the one reported by Gotō (2012), who noted that while the majority of non-regular workers was aged more than 55 years in the 1990s, the largest group is aged 25-34 years in 2010. It is important to notice that there is a stark gender gap in this category, since 53,8% of women are non-regular workers, against 18,9% of men (Gotō, 2012). In addition, Gotō's analysis contrasts in part with Tiberghien's statements, because he finds that after the 2003 reform of the *Labour Standards Act*, that expands the upper limit of definite contracts to three years, the number of non-regular workers increased by 143% (Gotō, 2012). Thus, we can assume that while the economic situation pushed employers to reduce labour costs by increasing the percentage of part-time workers, there have been some institutional actions that made the change easier.

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[6] The Anglo-Saxon model can be identified by financing through capital markets and job hiring through market mechanisms.

In the end, we can say that while workers already employed with an indefinite contract did not experience radical changes from the point of lifetime employment, this kind of job security is not available anymore to a growing part of the workforce, particularly for women and young people. To be more specific, the percentage of employees working part-time, as an interim, as a contract employee or as a definite contract employee was 34,9% in 2017 (JILPT, 2018).

2.2.2.2 The age-based pay

As we have stated above, the pay system under the "classic" Japanese employment model was based on three elements: skills, age and performance. However, since performance played only a marginal role, this pattern was highly criticized during the 1990s. For this reason, we have to understand if the wages of indefinite contract workers have experienced major transformations during and after the 1990s.

According to Conrad (2010), who reviewed many studies about wage structure in Japan, some practices of pay-for-performance were introduced mainly for managers. This category underwent a replacement of the age-related and skills-related parts of pay by the performance portion, while most ordinary employees experienced a removal of the age-related remuneration but are still paid according to their skills. The reason for the difference between managers and non-managers is the difficulty of companies to establish performance evaluation systems for employees and to form evaluators. Furthermore, the introduction of pay-for-performance practices did not lead to increased productivity if it was not accompanied by the transparency of evaluation standards and by communication with employees. So, rather than paying ordinary employees according to their performances, companies continue to use the skills evaluation system but with some changes: they focus less on the age and educational background and more on the abilities that the worker can offer to the company (Conrad, 2010).

Haamaki et al. (2010) also find that age is less important in determining wages compared with the past. Their estimation of the median age-wage profile from 1989 to 2008 has highlighted that the curve flattened for workers in their 40s, especially in the non-manufacturing industry. Nonetheless, the wage of workers in their 40s-50s remains higher than that of young employees.

A more recent study realized by Ogihara (2017) examined the presence of the seniority wage system and the annual wage system in Japanese companies. [7] The scholar uses data from both the Japan Productivity Center and the MHLW which cover the period from the end of the 1990s to 2016.

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[7] The annual salary system is defined as a mechanism that establishes the wages of the workers through a year-based sum (Ogihara, 2017).

With respect to the seniority wage system, he affirms that the percentage of firms adopting it has declined for both managers and non-managers. Nevertheless, it is important to consider the gap between these categories. The data from the Japan Productivity Center exhibit a decline from 80% to 50% for companies applying the system to non-managers and from 30% to 20% for managers (Ogihara, 2017). On the other hand, the survey realized by the MHLW shows a fall from 80% to just below 50% for managers and from 90% to little less than 60% for non-managers (Ogihara, 2017). Since the Japan Productivity Center's data cover only companies listed on the stock exchange, we can assume that this practice was already consolidated in these firms, at least for managers. At the same time, the MHLW offers a wider picture of the situation and so we can state that the seniority-based salary is applied, at least in part, for non-managers by more than half enterprises and for managers by little less than half of companies. In addition, it is necessary to take into account the disparities based on company size: firms employing more than 1000 workers show a greater reduction in the implementation of the seniority-based wage system. As for the annual salary system, Ogihara (2017) claims that its introduction has expanded for managers and non-managers regardless of firm's size. Yet, again, we cannot ignore the differences between the two professional categories and between the dimension of enterprises. Data from the Japan Productivity Center show that the percentage of companies applying the annual salary system to non-managers was below 10% in 2006. Concerning the survey by MHLW, we can see that the percentage of SMEs using this system is around 10% in 2014, while the figure is 30% for large-sized companies. Moreover, as Ogihara (2017) states, the percentage of firms implementing this method is higher compared to the end of the 1990s but it did not experience a constant growth. Indeed, the figure reached its peak in 2006 and then declined. Finally, Ogihara says that the percentage of workers whose pay is based on the annual system has raised, but if we look at the detailed data the percentage is around 5% for large-sized enterprises.

Eventually, we can affirm that there have been some changes in the wage system for full-time employees. Nevertheless, the pay-for-performance system and the annual salary system have not spread significantly. On the one hand, the data demonstrate that the percentage of companies basing the wage on age has declined but, on the other hand, we have not seen a replacement by "performance-ism" (*seikashugi*). We can assume that, as reported by Conrad (2010), Japanese companies are increasingly basing their wage system on the skills-related part by adopting an evaluation which depends less on the individual's background and more on the abilities he/she can offer to the enterprise. This could cause the flattening of the wage curve after age 40 found out by Haamaki et al. (2010) but does not change the fact that workers in their 40s and 50s have the highest wages. Thus,

the implications for the life-cycle of saving for lifetime employees could be that the curve is less steep than in the past but it has always an inversed-U shape.

2.2.3 The issue of elderly workers

By describing the pre-bubble employment system, we have identified one of the core elements (even though it applies only to a part of the workforce) in the seniority salary. The fact that older workers earn a wage that is above their productivity, pushed employers to set a mandatory retirement age in order to contain labour costs.

In the 1970s, 50% of enterprises set their retirement age to 55 (Conrad, 2010). This caused a problem when the eligible age for fixed-sum public pension benefits (*kōseinenkin no teigakububun*) was raised from 60 to 65 in 1994 and the same happened for the earnings-related portion in 1998 (*kōseinenkin no hōshūhireibubun*) (although the transition is gradual) (Matsuura, 2008). [8] As a consequence, the Diet approved in 1998 the revision of the 1986 *Law Concerning the Stabilization of Employment of Older Persons* (*Kōnenreisha nado Koyō Antei nado ni Kansuru Hōritsu*).[9] The reform prohibited employers to set the mandatory retirement age below 60 years (Conrad, 2010).

In addition, since this reform did not close the gap between mandatory retirement and eligibility for public pension benefits, a new revision in 2004 stated that employers had three options: grant employment after the mandatory retirement until the age of eligibility for the public pension; raise the mandatory retirement age; eliminate the mandatory retirement age (Conrad, 2010). In the mid-2000s, 85,8% of companies chose the first option, 2,1% abolished mandatory retirement and 12,1% raised the mandatory retirement age (Matsuura, 2008). Concerning the situation of workers, data show that those who change employer usually become non-regular employees and work part-time, while those who stay with the same employer are more likely to have a full-time work. In addition, more than half of the elderly who change employer after mandatory retirement are blue-collar, while the majority of those who stay with the same employer are white collar. Regardless of the worker's situation, all the employees don't have a position and thus earn a lower salary compared to before mandatory retirement. Again, we notice a difference between those who changed employer and those who did not: the former earn 50% of the previous wage, while the latter earn 70% of the previous salary (Matsuura, 2008).

A new reform of the law is to be enforced from April 1 2021. The revised legislation requests employers to grant employment until the age of 70, but it does not envisage penalties since it settles

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[8] Please refer to paragraph 3 for the details of the pension system.

[9] The English translation of the Law name is taken from Conrad (2010).

a "duty of effort" (*doryoku gimu*) and not an obligation. Employers have five options: raise mandatory retirement age to 70; eliminate mandatory retirement; grant employment after mandatory retirement until age 70; grant employment by hiring the person as an independent contractor, if the worker agrees; grant employment through participation to projects of social interest realized by the employer or by a company with whom the employer has an investing or a contracting-out relationship, if the worker agrees. [10] The last two options need the agreement of more than a half of employees' representatives in order to be implemented (MHLW, 2021).

To conclude, the seniority wage system has created a mandatory retirement mechanism that contrasts with the eligibility age for public pension benefits. Policies have tried to close the gap between "private" and "public" retirement by requesting employers to grant employment to their workers even after mandatory retirement. If the employer does not re-employ the worker, he/she has to provide assistance in job-searching (MHLW, 2021). We have seen that both those who stay with the same employer and those who change employer undergo a decrease in labour income, but the change is more acute for the last group, who is composed for more than half by blue-collar workers. The consequence for the life-cycle of saving is that after age 60 saving decreases for all workers, if consumption is not adjusted for the fall in income. The decrease in saving is more severe for those who change employer, most of whom are blue-collar workers.
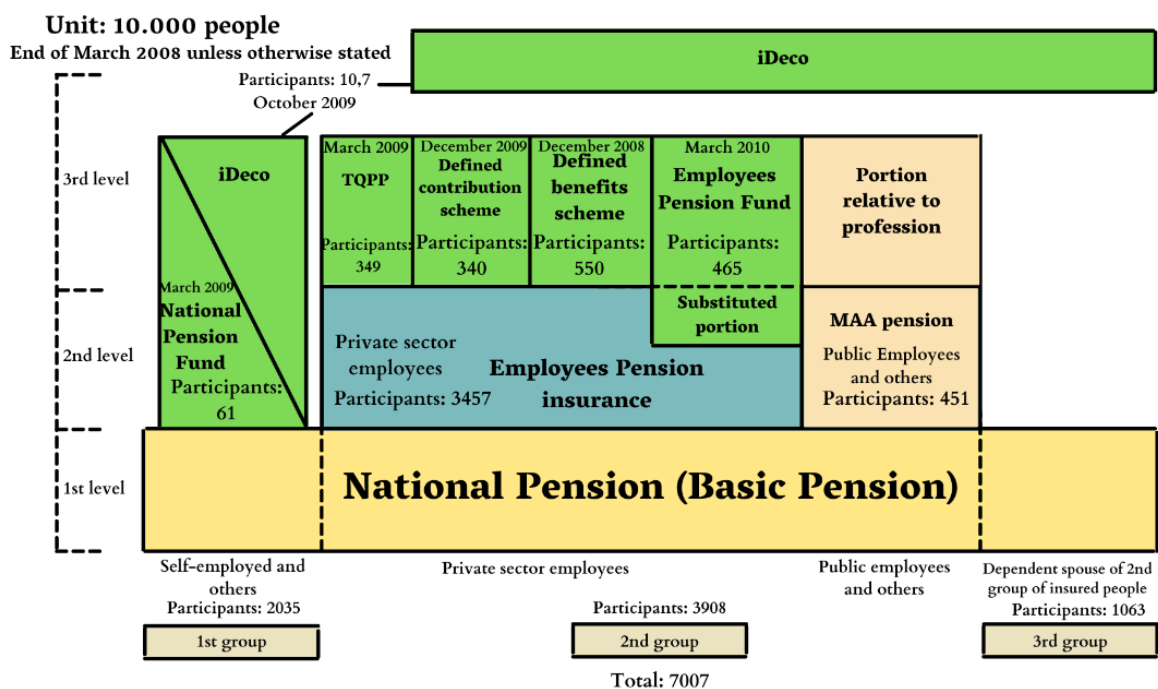
2.3 Japan's pension system

The pension system in Japan is composed by three levels of benefits. The first two of these are of a public nature, while the third one is either company-sponsored or an individual-based private plan. The first level of benefits is provided for by the National Pension Scheme (*Kokumin Nenkin*). The participation in this system is mandatory for the whole population aged between 20 and 60 years. Next, the second level of benefits is guaranteed by a mandatory public scheme targeting employees. While in the first decade of the 21st century employees of public institutions and private schools had their own dedicated Mutual Aid Association's Pension Scheme, the *Partial Revision of the Employees' Pension Insurance Act* (*Kōsei nenkin hoken hō nado no ichibu wo kaisei suru hōritsu*) approved in 2012 determined the unification of the Employees' Pension Insurance Scheme (from now EPI) for all employees after 2015 (MHLW, 2012a). As concerns self-employed and freelance workers, it exists

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[10] The Japanese word for the contract as an "independent contractor" is *Gyōmu itaku keiyaku*. It is not easy to find an official definition and a translation for this contract. According to Adecco Japan (2019) this contract is divided into two further contracts, that share these characteristics: the worker carries out a job for a company without being its employee; the worker is paid when the job is over, so he does not receive a salary but a remuneration.

a facultative public insurance system called the National Pension Fund that offers the possibility to have a supplementary retirement income in addition to the basic pension provided by the National Pension Scheme. Finally, there are several types of voluntary plans sponsored by companies or individual-based private schemes. The company-sponsored pension system includes the Employees' Pension Fund (from now EPF) and the Defined Benefits and Defined Contributions Pension schemes (DB and DC). Before 2012, companies could also take part into a system called Tax Qualified Pension Plan (TQPP). All the company-sponsored schemes allow the recipient to choose between a lump-sum and an annuity. Together with these systems, we can find a public third level benefit given to public employees. Prior to the 2012 reform, this part corresponded to a profession-linked benefit, while it was converted to a lump sum retirement payment afterwards (MHLW, n.d.d). We will see the details of these different systems in the next subparagraphs.
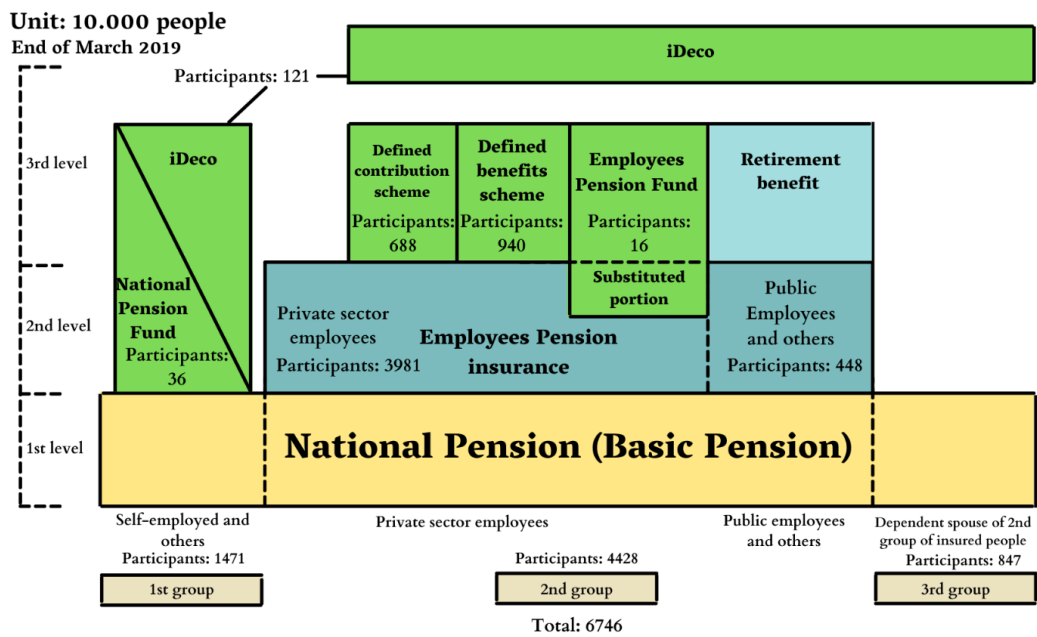
Figure 2.1: The Japanese Pension System before 2012

Source: Author's Translation of (Kokuritsukokkaitoshokan, 2010: p.5).

iDeco means "Individual defined contribution scheme".

Figure 2.2: The Japanese Pension System after 2012

Source: Author's translation of (MHLW, n.d.f)

2.3.1 The Public Pension System

2.3.1.1 National Pension

The National Pension System (*Kokumin nenkin*) was introduced for the first time in 1961. The reason for its introduction is to be found in the fact that the existing Employees' Pension Insurance (*Kōseinenkin*) did not cover self-employed people and workers of firms employing less than five people (Takayama, 2000). The amount paid by the scheme is calculated by multiplying a fixed sum for the years of contributions. However, the fixed sum amount was very low in the first years of the scheme and the elderly continued to rely mainly on their family network and on company-sponsored pension (Takayama, 2000). At the time of the creation of the system, the national pension did not constitute the first step of benefits for EPI's insured people. Indeed, the EPI scheme had its own two levels system (Fukao et al., 2006). Nevertheless, given that contributions did not match the benefits (contributions to the National Pension System were only 3770 yen per month in 1980), the independent management of the National Pension was questioned and a new system was established in 1985: the basic pension scheme (*Kisonenkin*). The latter covered all the population and it served as the first level of benefits also for people covered by the Employees' Pension Insurance. Moreover, it was abolished the principle according to which a standard couple should receive an amount of

national pension equal to the average one received by a man covered by the EPI scheme (Fukao et al., 2006).

Concerning the benefits, those of both the National Pension and the EPI are indexed to wages (when receiving the pension before becoming 65 years old) and inflation (at age over 65 years) since 1973.[11] While at the beginning the indexation was based on gross wages, this changed in 1994, when net wages were considered instead (Takayama, 2000). This was the first time that the indexation method was reformed in order to reduce pension benefits. Nonetheless, this measure afflicted only pensions that were received by people who were under 65 years old (Takayama, 2000).

Another important action concerning indexation was taken with the 2004 reform of the pension system. In this year, the "macro index" (*makuro suraido*) was introduced. Before 2004, people aged over 65 years received their pension indexed only to inflation. The introduction of the macro index resulted in a negative indexing factor (Figure 2.3). Indeed, it is based on the rate of decrease of the working age population and on the extension of the average life expectancy. The same process applies to pensions indexed on wages (but these are now received only by EPI's insured working elderly). Given the fact that pension benefits risked to lower considerably after the establishment of this indexation method, some countermeasures were implemented. If the wage growth and the inflation rate are low, the application of the macro index would cause pension benefits to decrease instead of increasing. In this case, the adjustment is limited so that pension benefits do not change (Figure 2.4). Moreover, in the event of a reduction in wages and deflation, in order to avoid a decrease in benefits overcoming the extent of the fall in salaries and prices, the macro index is not applied (Figure 2.5) (MHLW, n.d.e). The macro index mechanism was applied only three times: in 2015, in 2019 and in 2020 (Nihon Keizai Shinbun, 2020a).
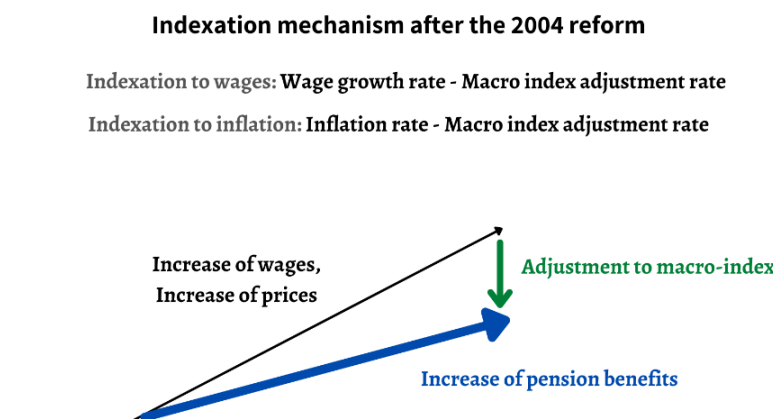
Further arrangements involving benefits were made with the 2012 reform, which was part of the *Comprehensive Reform of Social Security and Tax* (*Shakaihoshō to zei no ittai kaikaku*). In detail, the 2012 *Partial Revision of the National Pension Act* (*Kokumin nenkin hō nado no ichibu wo kaisei suru hōritsu*) established two different aid payments: one for households whose members are all exempted from the resident tax and whose income of the previous year is below the full sum amount of the basic pension; another one for households whose income is higher than the one cited but lower

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[11] The pension received before age 65 consists of special EPI benefits for employees aged between 60 and 65 years old. However, after the rise of the eligibility age for the fixed-sum portion (basic pension) to 65, the wage indexation was applied only to the earning-related portion. The age for the earning-related benefits will also increase to 65 in 2025. Since special EPI benefits are a temporary measure, it is likely that after 2025 the indexation to wages will be cancelled.

than a certain amount. These support measures were implemented in 2019 (MHLW, 2012c). In addition, the 2012 revision expanded the number of people eligible for National Pension benefits. Before the reform, the sum of the contribution and exemption periods had to be at least 25 years, but the amendment determined that it would become 10 years (enforcement in 2017) (MHLW, 2012b).

Takayama (2000) and Sakamoto (2009) state that public pension benefits are experiencing a constant reduction. While Takayama (2000) affirms that public pension benefits should be cut for middle and high earners and supports the expansion of private and corporate pensions' role, Sakamoto (2009) underlines the risks of a fall in public pension benefits and stresses the inadequacy of a substitution by other pension schemes. In order to understand if there has been a reduction, we have to look at both the basic and the EPI pension. Concerning the basic pension, if we look at the evolution of the full monthly sum (Table 2.1, Figure 2.6) we see that nominal values did not change much after 2000, while real values decreased slightly from 2012 to 2020. What is remarkable is not the change in the level of benefits, but the fact that the basic pension is too low to replace labour income during old age. Concerning the EPI benefits, we will see their evolution in subparagraph 2.3.1.2 .
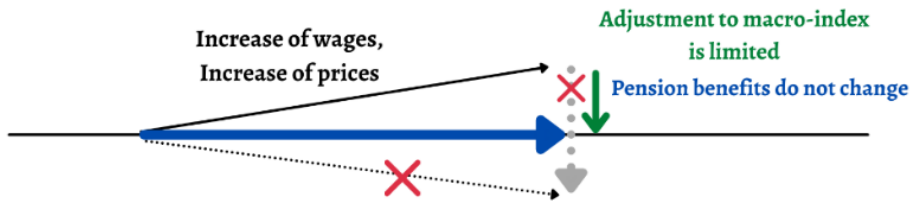
Figure 2.3: Indexation mechanism after the 2004 reform

Indexation mechanism after the 2004 reform

Indexation to wages: **Wage growth rate - Macro index adjustment rate**
Indexation to inflation: **Inflation rate - Macro index adjustment rate**

Increase of wages,
Increase of prices

Adjustment to macro-index

Increase of pension benefits

Source: Author's translation of (MHLW, n.d.e)

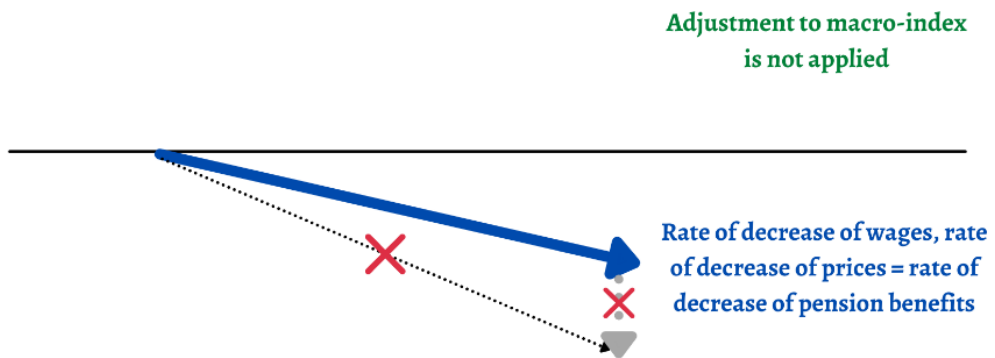Figure 2.4: Indexation mechanism in the presence of low inflation and low wages growth rate

In case of low inflation rate or low wage growth

Increase of wages,
Increase of prices

Adjustment to macro-index
is limited
Pension benefits do not change

Figure 2.5 Indexation mechanism in the presence of deflation and negative growth of wages

In case of deflation or negative wage growth

Adjustment to macro-index
is not applied

Rate of decrease of wages, rate
of decrease of prices = rate of
decrease of pension benefits

Table 2.1 Evolution of the full monthly sum of the basic pension (nominal and real values, yen)

Year	Nominal value	Real value (2019 yen)
1985	50.000	59.602
1989	55.500	63.841
1994	65.000	67.728
2000	67.017	68.843
2004	66.208	69.341
2006	66.008	69.132
2011	65.741	69.496
2012	65.541	69.356
2013	64.875	68.367
2014	64.400	66.088
2015	65.008	66.178
2020	65.141	65.141

Source: Nominal values for years 1985-2000 are the result of Author's calculation based on (Nenkin kiroku mondai kenshōiinkai ,2007). Nominal values for years 2004-2020 are obtained from (MHLW, n.d.g) and (Japan Pension Service, 2020). All the real values are obtained from Author's calculation

The values refer to the monthly basic pension (National Pension) benefits received by an individual who paid 40 years of contributions.

Figure 2.6: Full sum monthly basic pension (nominal and real values, yen)
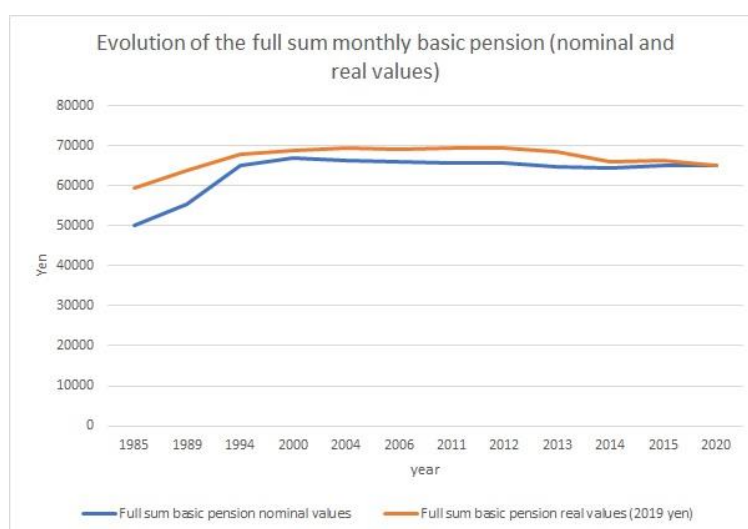
Source: Nominal values for years 1985-2000 are the result of Author's calculation based on (Nenkin kiroku mondai kenshōiinkai ,2007). Nominal values for years 2004-2020 are obtained from (MHLW, n.d.g) and (Japan Pension Service, 2020). All the real values are obtained from Author's calculation

The values refer to the monthly basic pension (National Pension) benefits received by an individual who paid 40 years of contributions.

Let us now analyze the financing of the basic pension system. When this system was introduced in 1985, the government decided to focus the State's support of the public pension on this scheme. However, the part covered by the Ministry of Finance was only 1/3 of the total benefits (Takayama, 2000). Later, the 2004 reform determined that the portion of the system covered by the State should become 1/2 and that this process would be accomplished by 2009 (MHLW, n.d.a). Nonetheless, when the 2012 reform was approved, this measure had not been enforced yet and the new revision stated that its complete implementation would happen in 2014 (MHLW, 2012b).

Regarding contributions, their level has increased steadily since the 1980s, when the amount paid each month for the National Pension was only 3770 yen (Fukao et al., 2006). Before the 2004 reform, contributions had raised to 13.300 but a further growth was required. This is why the revision settled a gradual augmentation to 16.900 yen by 2017 (MHLW, n.d.a).

2.3.1.2 The Employees' Pension Insurance

The Employees' Pension Insurance (EPI) was introduced for the first time in 1942. At the beginning, it was a fully funded system. This means that pension benefits were not based on transfers from the working generation, but they were the result of the funds previously collected through workers' contributions. Nevertheless, the post-war high inflation eroded the value of these funds and the pension benefits were totally inadequate to grant a decent standard of living. This is why a new EPI system was created in 1954 (Sakamoto, 2009). The new scheme was the first one to present two levels of benefits: one expressed as a fixed sum, and one related to the remuneration (Fukao et. Al, 2006). As we mentioned, the first level of benefits became common between the National Pension and the EPI with the introduction of the basic pension system in 1985.

Before the establishment of the basic pension system, the benefits of the EPI pension were computed with the following formula:

$$EPI\ pension\ benefits = Average\ Monthly\ Remuneration\ (revalued) * \frac{n}{1000} *$$
$$number\ of\ months\ of\ participation + kyen * number\ of\ months\ of\ participation \quad (2.1)$$

Where *n* changes according to the financial situation of the pension system, and *k* represents a fixed sum amount to be multiplied for the months of participation to the scheme.

After the implementation of the basic pension system, the *k* part was replaced by the basic pension. The *n* value in 1980 was 10 but it was reduced to 7,5 in 1985. Later, in 2000, *n* was equal to 5,48 (Nenkin kiroku mondai kenshōiinkai, 2007). The benefits' portion related to remuneration has thus experienced a decrease in its multiplier over the years. Yet, the multiplier depends also on the date of birth of the recipient (Japan Pension Service, 2015). For this reason, the transition is gradual. Furthermore, if we look at the evolution of the EPI pension benefits (Table 2.2, Figure 2.7) we see that the reduction in the nominal value is smaller than the one in the real value. This means that the real benefits have decreased not only because of a change in the multiplier, but also because of inflation. This contrasts in part with the statements from Takayama (2000) and Sakamoto (2009), because nominal benefits were raised before 2000 and were reduced only slightly before 2009, while real values increased during the same period. A remarkable reduction of the benefits happened after their studies, but it is possible that this occurred because the measures considered by these scholars were implemented only gradually. Thus, we can say that public pension benefits effectively underwent a constant decline in nominal terms over the last fifteen years, but the significant fall in real terms happened only after 2013.

Another important information about the benefits is that, as the National Pension, the EPI benefits too are subjected to the macro index and underwent a shortening of the contribution and exemption period necessary to be eligible for the pension.

Concerning the age of eligibility for receiving benefits, the standard EPI is given to people aged more than 65 years, but there is the possibility to get the special EPI pension for people aged between 60 and 65 who are still working, if the sum of the benefits and wages does not exceed a certain amount (MHLW, n.d.e).
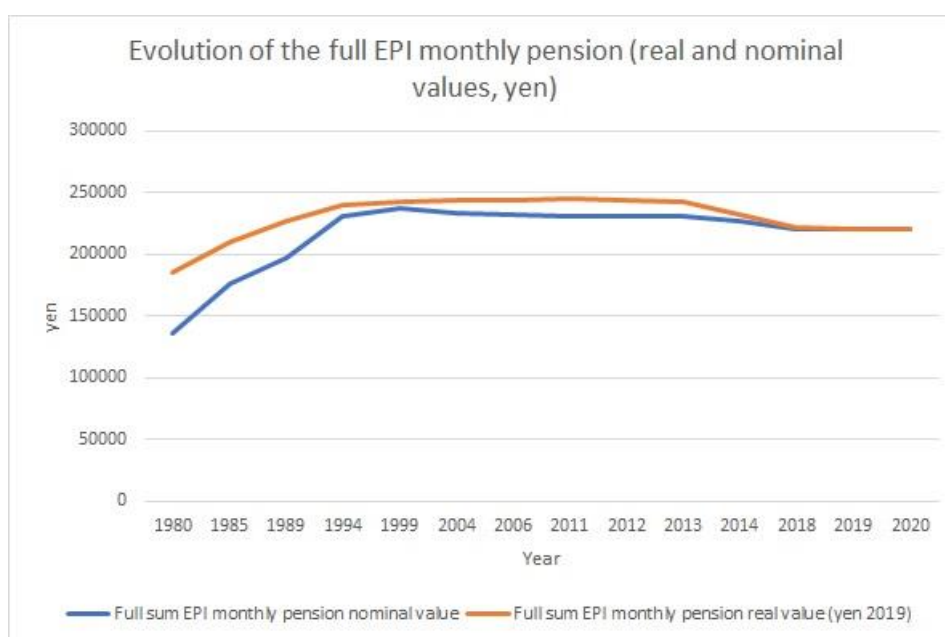
Table 2.2: Evolution of the full monthly sum of the EPI benefits (nominal and real values, yen)

Year	Nominal value	Real value (2019 yen)
1985	176.000	209.799
1989	197.400	227.066
1994	230.983	240.676
2004	233.299	244.340
2006	232.591	243.598
2011	231.648	244878
2012	230.940	244.384
2013	230.940	243.372
2014	226.925	232.873
2018	221.277	222.369
2020	220.724	220.724

The values refer to the EPI pension obtained by a family in which the husband has worked for a company, earned an average income and contributed to the scheme for 40 years, while the wife has been married to him for 40 years and during this time has always been a housewife. Since the husband's contributions covered also the wife's national pension, the resulting pension includes one part related to the husband's remuneration and two basic pensions (husband and wife).

Figure 2.7: Evolution of the full monthly sum of the EPI benefits (nominal and real values, yen)

The values, except for 1980 when housewives were not covered by pension schemes, refer to the EPI pension obtained by a family in which the husband has worked for a company, earned an average income and contributed to the scheme for 40 years, while the wife has been married to him for 40 years and during this time has always been an housewife. Since the husband's contributions covered also the wife's national pension, the resulting pension includes one part related to the husband's remuneration and two basic pensions (husband and wife).

Regarding the financing of the system, in the same way as social security payments for the National Pension, the EPI contributions have been lower than the necessary amount to cover pension benefits for a long time. Indeed, because of the post-war harsh economic situation, the contribution rate was reduced to 3% of wages and it did not reach the 11% pre-war level until 1985 (Fukao et al., 2006). Before the 2004 reform, contributions were 13,58% of the remuneration (including bonuses). The 2004 revision demanded a gradual increase to 18,3%, a level reached in 2017 (MHLW, n.d.a).

Finally, let us describe the coverage of the Employees' Pension Insurance. In 2000 the EPI scheme covered only full-time employees of the private sector. Indeed, workers whose working hours did not reach 3/4 of the standard time were not insured (MHLW, n.d.e). Following the rise in part-time

workers, however, the 2004 reform urged to extend the EPI to this category (MHLW, 2004). Even though the revision stated that it would take five years in order to study the possibility of the target's expansion, when the 2012 reform was passed the measure had not yet been designed completely. The 2012 reform claimed that three further years would be necessary to examine the opportunity to include in the EPI system employees working at least 20 hours per week, earning not less than 88.000 yen per month (overtime excluded) and being employed continuously for at least one year. In addition, these employees had to work for an enterprise employing at least 500 people (MHLW, 2012b). The provision was eventually implemented from October 2016. Moreover, from April 1 2017, the measure would apply also to smaller enterprises, under the condition of an agreement between the employer and the employees (MHLW, n.d.b). Since only large firms were obliged to grant the EPI coverage to their part-time workers, the 2016 provision was not enough to preserve the employees' rights. This is why a new reform in 2020 settled that the system would gradually cover also enterprises employing at least 50 people (to be enforced by October 2024) (MHLW,n.d.d).

Another extension of the EPI system concerned public employees and workers of private schools. This process was determined by the 2012 *Partial Revision of the Public Pension Act* (but the provision was implemented in 2015). The reform asserted that the differences between the EPI and the Mutual Aid Associations' pension would be eliminated by aligning to the EPI's characteristics. This meant that public employees had a limit age for participation in the scheme (70 years old) while before they had no restrictions, and that they required a certain number of contribution years in order to be eligible for the Invalidity Pension. In relation to the unification of contributions, the reform stated that all the schemes should reach the 18,3% rate. This level was achieved by the EPI scheme in 2017, while the fulfilment of the process is scheduled for 2023 in the case of public employees and for 2030 in relation to private schools' employees (MHLW, 2012a). Finally, the third level of benefits linked to occupation was abolished for MAA's insured people and it was replaced by a lump sum payment. Nonetheless, the participation period until September 30 2015 is considered for the payment of profession-related benefits (MHLW, n.d.f).

2.3.2 The corporate-sponsored and private pension

2.3.2.1 The Employees' Pension Fund (EPF)

The Employees' Pension Fund System (*Kōsei nenkin kikin*) was created in 1966 as a result of the discussion between the government and employers concerning the need to increase pension benefits.[12]

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[12] The English translation of the private pension schemes is taken from Sakamoto (2009).

As we have seen, the post-war high inflation caused the inadequacy of existing pension benefits, and employers were afraid of a rise in contributions (Sakamoto, 2009). For this reason, they asked the government to contract out the earnings-related portion of the EPI (Rajnes, 2007; Sakamoto, 2009). In exchange for bearing a part of social security, the government allowed employers to pay less contributions, but they had to provide an additional pension benefits to the substituted portion, called the increment (Sakamoto, 2009). Moreover, when the indexation of benefits was introduced in 1973, it was established that the difference between benefits paid by companies and indexation would be provided by the State (Sakamoto, 2009). The EPF plan was one of the most popular in the 1970s and 1980s but the 1990s crisis led to a weak performance of investments. As a result, employers had to pay the gap between the promised benefits and the funds (Sakamoto, 2009). By 2001, if we consider both EPF and Tax Qualified Pension Plan, 96% of corporate pension funds were underfunded (Rajnes, 2007). The crisis of corporate pension funds was also the result of accounting standards' change. In fact, new accounting rules required companies to report their pension obligations as liabilities in their financial statement (Rajnes, 2007). This fact worsened companies' credit ratings. The government tried to prevent companies to terminate the plans by decreasing the increment value from 30% of the substituted portion to 10%, but eventually had to pass a law in 2001 that permitted employers to give the substituted part back to the State and convert the increment to a Defined Benefit (DB) or Defined Contribution (DC) pension plan (Rajnes, 2007). As we can see from Figures 2.1 and 2.2, EPF funds underwent a radical reduction over the years. While in 2008 4,6 million employees were covered by this plan, the number was only 160 thousand in 2019.

2.3.2.2 The Tax Qualified Pension Plan (TQPP)

The Tax Qualified Pension Plan (*Tekikaku taishoku nenkin*) was another system introduced after a request from employers to the government. While before its creation in 1962 firms could only accumulate internally the funds for retirement benefits, the law establishing TQPP permitted to contract out the reserves to trust banks and insurance companies, with a favorable tax treatment (Sakamoto, 2009). Indeed, the employers' contributions were tax deductible (Rajnes, 2007; Sakamoto, 2009). The benefits of this pension plan were based on the years of service and they were calculated with a flat rate or with a formula based on remuneration (Rajnes, 2007). The 2001 *Defined Benefit Corporate Pension Law* (*Kakutei kyūfu kigyō nenkin hō*) settled that new TQPPs could not be created after April 2002 and that all of them should convert to another plan or terminate before 2012 (Rajnes, 2007).

2.3.2.3 The Defined Benefits Corporate Pension

Introduced in 2001, the Defined Benefits Corporate Pension (*Kakutei kyūfu kigyō nenkin*) was envisaged as a system to which companies who gave back the substituted portions of EPF and firms who had to prepare for the abolition of TQPP could convert. In some countries DB plans are exposed to investment, longevity and inflations risks. Nonetheless, Japanese DB plans are exposed only to investment risk because most of the benefits are paid in the form of annuities-certain[13] or in the form of a lump-sum. In addition, benefits are not indexed to inflation (Sakamoto, 2009). The benefits are usually based on the final remuneration, on the average career remuneration or on a formula including remuneration and an interest rate (Rajnes, 2007; Sakamoto, 2009).

2.3.2.4 The Defined Contributions Scheme (Corporate and Individual)

Another law approved in 2001 enabled the establishment of Defined Contributions Schemes both company-based (*Kakutei kyoshutsu nenkin kigyō gata*) and individual-based (*Kakutei kyoshutsu nenkin kojin gata*) (Rajnes, 2007). The DC system allows employers to have more options about the level of benefits provided and it meets better the requirements of an increasingly mobile work force. Indeed, even if workers with an indefinite contract face a low risk of dismissal, the study from Haamaki et al. (2010) shows that an increasing part of young indefinite contract workers changes job during their 20s, probably voluntarily. This is the only scheme that can permit these workers to transfer contributions when changing employer (Rajnes, 2007; Business Insider Japan, 2018). On the other hand, individual-based defined contributions schemes permit self-employed workers and employees without a corporate-pension coverage to prepare for retirement (Rajnes, 2007). However, since contribution limits exist for both corporate-based and individual-based plans, the DC system risks to offer insufficient benefits at retirement (Rajnes, 2007).

2.3.2.5 The Lump-Sum Retirement System

If we look at figures 2.1 and 2.2, we notice that the lump-sum retirement system (*Taishokukin seido*) (also called book-reserve plan), cited by many scholars, is absent. This is because the Lump-Sum Retirement System is not established by law (Ibaraki Labour Bureau, n.d.) and thus cannot be considered a pension plan. In the past, it existed a law obliging enterprises operating in some specific

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[13] Defined benefits plans can offer two types of benefits: life annuities or annuities-certain. While life annuities are exposed to longevity risk because they are paid as long as the insured person is alive, annuities-certain are granted only for a given number of years.

sectors (such as manufacturing and mining) to establish a retirement reserve plan: the 1936 *Retirement Reserve and Retirement Allowance Act* (*Taishoku tsumitatekin oyobi taishoku teate hō*) (Sakamoto, 2009). This law was not conceived to protect workers specifically against old age poverty but it was established as an unemployment benefit. Later, when in 1944 the EPI system introduced some lump-sum payments for early retirees, the Act was abolished (Sakamoto, 2009). Nevertheless, since the Lump-Sum Retirement System (from now LSRS) had spread across firms, many companies continued it voluntarily (Sakamoto, 2009).

Thus, the LSRS was firstly established as an unemployment benefit system, then its maintenance continued even after the abolishment of the law concerning it and came to be considered a corporate-sponsored pension system. This last process occurred because of both companies' rules and the State's fiscal treatment. Indeed, since the 1947 *Labour Standards Act* (*Rōdō kijun hō*) states that the target of the system, the timing of benefits' payment and the calculation formula is decided through companies' contracts (Ibaraki Labour Bureau, n.d.), enterprises pay higher benefits to employees who served for them during their whole career (Business Insider Japan, 2018). While we can assume that in the past this feature was due to the lifetime employment system that characterized the Japanese economy before the Lost Decade, now it could be linked to the competition for human resources in a shrinking workforce context (Business Insider Japan, 2018). Furthermore, the tax treatment too makes the receiving of the lump-sum payment more convenient at the end of the career. In fact, the formula for tax deduction is different based on whether the employee worked less or more than 20 years for the same company (National Tax Agency, 2020). Even if two people who worked 35 years receive the same amount of lump sum payment in total (but this is rare given what we have stated above), for example 24,3 million yen, someone who worked the whole time for the same company gets a deductibility of 1,3 million yen, while someone who changed job after 15 years and who worked 20 years gets the tax deductibility only for 487.000 yen (Nihon Keizai Shinbun, 2020c). For all these reasons, the LSRS is considered more a pension benefit than an unemployment one.

Nonetheless, we can find an exception to the conventional character of the LSRS: the Mutual Aid Retirement Allowance for Small and Medium Enterprises (*Chūshō kigyō taishokukin kyōsai seido*). This system concerns only smaller firms and it was established by the 1959 *Smaller Enterprise Retirement Allowance Mutual Aid Law* (*Chūshō kigyō taishokukin kyōsai hō*).[14] Employers who have some difficulties in establishing retirement benefits for their employees can join this State-supported scheme. The system is managed by the Smaller Enterprise Retirement Allowance Mutual Aid Office (*Chūtaikyō*) under an independent administrative institution called Mutual Aid Organization for

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[14] The English translation is taken from https://www.lcgjapan.com/pdf/lb09010.pdf

Workers' Retirement Allowance (*Dokuritsu gyōsei hōnin kinrōsha taishokukin kyōsai kikō*) (MHLW, 2020).

2.3.3 Trends and considerations about the Japanese Pension System

If we compare Figure 2.1 and Figure 2.2, we see that over the years the percentage of population covered by a second level benefit has passed from 56% to 66%. This rise by 10 percentage points is probably due to the extension of the EPI system to part-time workers. This is an important change, given that the amount of pension benefits provided by the National Pension is very low. As we can see from Figure 2.8, the wage-related portion adds a significant amount of benefits.

Figure 2.8: Full monthly EPI pension benefits of a single man, divided by wage-related portion and the basic pension portion (Euro 2019)
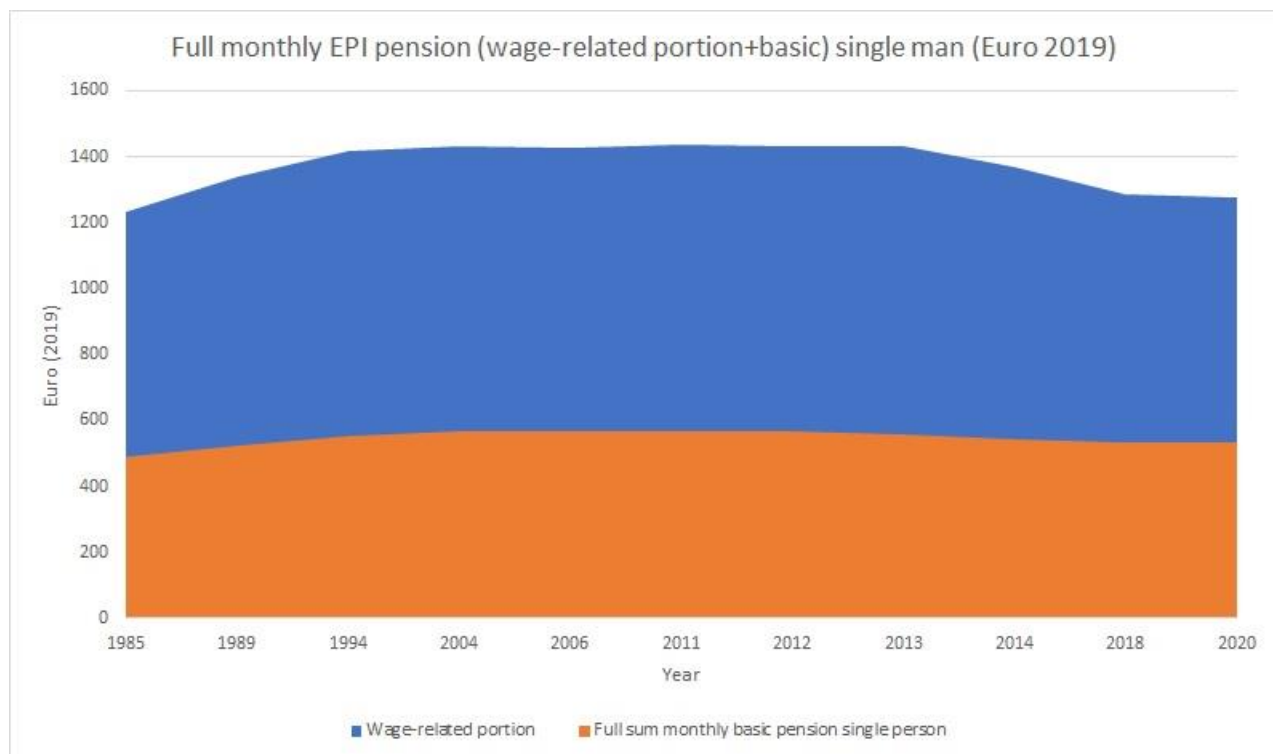
Source: Author's calculation based on (MHLW, n.d.c; MHLW, n.d.;g; Nenkin kiroku mondai kenshōiinkai, 2007; Resona Bank, 2014; Kurassist, 2018; Japan Pension Service, 2020). The full sum monthly EPI pension shows the benefits received by single man, earning an average salary, who participated in the EPI scheme for 40 years.[15]

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[15] The EPI benefits values reported by sources usually portray the amount for a couple who married at age 20, where the man participates to the EPI scheme for 40 years and pays contributions also for the basic pension of the woman who is a housewife. In this

Nevertheless, the new indexation method and the change in multipliers for the wage-related portion could lead to further benefit decrease. Transformations in an increasingly fluid labour market could make it difficult to contribute for 40 years and retired people could receive lower amounts than the already declining full sum public pension.

What is the role of corporate-sponsored pensions in this context? According to Sakamoto (2009), the government wants companies to expand their pension benefits in order to compensate for the fall in public pension. However, if we calculate the percentage of private sector's employees covered by a corporate pension thanks to the values in Figures 2.1 and 2.2, we see that the percentage has declined from 49,3% to 41,3%. As a result, we cannot say that companies are counterbalancing the drop in public benefits. In addition, a survey of the MHLW affirms that in 2018 55,2% of companies had only the LSRS system, 7,6% had only the pension benefits system, 15% had both, and 22,2% had no retirement benefits system (Nihon Keizai Shinbun, 2020b). This means that the majority of firms has the LSRS system and we have seen that it causes many problems for people who change employer. Moreover, the percentage of enterprises not having retirement benefits was only around 10% in 1989 but now it increased more than 10 percentage points (Nihon Keizai Shinbun, 2020b). The phenomenon is also about the differences between medium-small and big enterprises. While companies employing more than 1000 workers mainly have a pension benefits system (rather than LSRS) and show a small percentage of units not having retirement benefits at all, the figures for all companies display predominately LSRS and exhibit a higher rate of no benefits (Nihon Keizai Shinbun, 2020b). Thus, firms employing less than 1000 people bring down the percentage about the presence of pension benefits (meaning different from LSRS) and make the figure about no benefits at all higher. Another aspect we should underline is that company-sponsored pension benefits are not available to part-time workers. For this reason, and for the fact that these pension benefits are not indexed to inflation as stated by Sakamoto (2009), company-sponsored pension benefits are not adequate to compensate for the fall in public benefits.

Having seen that companies are not counterbalancing the fall in public pension benefits, we can notice another emerging trend: the rise in participation in individual-based defined contributions plans (iDeco). In fact, participants to this scheme were only 107 thousand in 2009, while the number augmented to 1,2 million in 2019 (Figures 2.1, 2.2). Participation is also encouraged from the government, who enlarged the eligibility criteria with the 2020 reform of the pension system (MHLW,

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case, I decided to represent the values for a single man (the wage-related portion for a woman is usually lower) so that there is a clear distinction between the basic and the wage-related amount.

n.d.d). Again, this type of scheme is subjected to inflation risk and thus it cannot substitute completely the public pension.

In the end, what were the implications of the pension system in Japan for the life cycle of saving at the beginning of the 2000s and how did these conditions change over the years? In the first decade of the XXI century, those who worked in an enterprise providing a pension scheme, and who retired before the fall of public pension benefits, had access to an adequate income after retirement and did not need to save a lot during working life. [16] Those who were not covered by a company pension but who were eligible for a second level benefits had to save more during the working life if they wanted to maintain a stable consumption after retirement. Finally, those who were not covered by a second level benefit had to save considerably during their working life if they did not want to experience poverty during old age. While we can assume that the decrease in income affected all pensioners and thus reduced saving, we can say that the biggest effect concerned those who were covered only by the basic pension. Over the years, those who are covered by the second level of benefits have augmented and this should cause a reduction of the need for saving during the working life and more income security during retirement. However, due to the decrease in already low public pension benefits and in the presence of a decline of the firm-based welfare, individuals need to save more and some of them are doing it through participation in individual-based private pension plan. Nevertheless, this form of private saving cannot grant completely income security after retirement, since funds are subjected to inflation, investment and longevity risk.

2.4 Health Care System in Japan

The Health Care System in Japan presents different insurance schemes according to the professional status and age of the insured person. We can distinguish three main insurance systems: the Employees' Insurance, the National Health Insurance and a separate system for the elderly. We will first treat the Employees' Insurance System and the National Health Insurance, together with the related high-cost system (*Kōgaku ryōyō hi seido*). Lastly, we will expose the system for the elderly.

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[16] In fact, we can maybe consider the corporate-pension as a "fourth treasure" of the pre-bubble labour system, without forgetting that this model did not apply to all firms.

2.4.1 Employees' Insurance

The employees' insurance system at the beginning of the 2000s covered full-time employees and their dependents. Part-time workers were eligible for this system only if their working hours are not less than 75% of those of full-time employees (JETRO, n.d.). Nevertheless, part-time workers were included in this insurance system in 2016, the same year that they were included in the EPI scheme. The Employees' Insurance covered 58,6% of the population in 2015 (Sakamoto et al., 2018). It is further divided in mainly three schemes: the Society-Managed Health Insurance (*Kenpo kumiai*), the Japan Health Insurance Association's scheme (*Kyōkai kenpo*) (former Government-Managed Health Insurance) and the Mutual Aid Societies' Insurance (*Kyōsai kumai kenkō hoken*). We will first see the common elements among these schemes and then will presents the specific characteristics.

Co-payments for the health expenditures are common to all the employees' insurance schemes. With the achievement of universal health care in 1961, out-of-pocket payments were abolished for this category. Later, they were settled to a fixed amount and in 1983 Japan established the 10% co-payment for people insured under this scheme (JHPN, n.d.; Sasagawa, 2020). In 1997 the rate was raised to 20% and to 30% in 2003 (MHLW, 1997; MHLW, 2002).

Concerning the premium rates, the values are different according to the insurer but, in every case, they apply to both standard wages and bonuses (since 2003) and they are shared equally between the employer and the employee (Sasagawa, 2020).

Let us now turn to the single schemes' characteristics. The Society-Managed Health Insurance targets large-size companies' employees and it is composed of corporate-based health insurance societies. The number of insurers in 2015 was 1409 and the system covered 22,95% of the population (Sakamoto et al., 2018). Even though the co-payments are the same for all the employees' health insurances, the benefits of this scheme and of Mutual Aid Societies are higher than those of the Japan Health Insurance Association. Moreover, the Society-Managed Health Insurance and the Mutual Aid Societies have also a stronger financial base compared to the other employees' insurance scheme and, consequently, their premium rates are lower (Sasagawa, 2020). However, the premium rate has increased for all the employees' insurances and this provoked the dissolution of many Society-Managed Health Insurance's societies (the premium rate of this scheme was on average 9,2% of the wages in 2019 according to a Ministry of Health, Labour and Welfare's document). Employees whose insurance society has dissolved join the Japan Health Insurance Association's scheme, thus incurring in a lower level of benefits (Sasagawa, 2020). The fact that many of the Society-Managed Health Insurance's societies have disappeared is testified by the fact that, according to Fukawa (2002), these

associations were 1814 in 1997, while the WHO's report of 2018, written by Sakamoto et al., counts 1409 insurers in 2015.

In 2000, small and medium enterprises' employees were covered by the Government-Managed Health Insurance but with the 2006 *Health Care Reform Act* (*Iryō hō kaisei*) the administration of the insurance scheme was transferred from the national government to the prefectural governments through the creation of the public corporation Japan Health Insurance Association (JHPN, n.d.). In 2015, this system covered 28,67% of the population. As we said, the benefits under this insurance scheme are lower than the others and, since the financial basis is relatively weak, premium rates are higher. The average value was around 8,5% of the wages in 2002 (Fukawa, 2002) but it reached 10% in 2012 and did not decrease since then (Sasagawa, 2020). The expenses that are not directly paid by insured people are covered by government's subsidies (16,4%) and premiums (83,6%) (Sakamoto et al., 2018).

Finally, the Mutual Aid Societies cover public servants and is composed of 85 insurers. In 2015, only 6,9% of the population was insured under this scheme.

2.4.2 National Health Insurance

People who are not covered by the Employees' Insurance System must subscribe to the National Health Insurance. This scheme was established in 1938 as an insurance based on municipal governments, but it became compulsory only in 1958 (JHPN, n.d.). The target of the system includes self-employed workers, unemployed and retired people. In 2015, the insurance covered 28,3% of the population and the number of insurers was 1716 municipal governments (Sakamoto et al., 2018). The premium rate depended on the municipal government, but the 2015 *Amendment of the National Health Insurance Act* (*Kokumin kenkōhoken hō nado wo kaisei suru hōritsu*) stated that prefectural governments must coordinate the financial management of the insurance and establish a single premium rate for the whole prefecture (Sakamoto et al., 2018). The premium includes a part based on income, a part based on the number of the household's members and a fixed amount paid by each household (Sasagawa, 2020). The co-payment is set at 30% of the total expenditure. With respect to the part not paid by the patient, 50% is covered by public subsidies and the other 50% is covered by premiums. However, there are additional public subsidies for insurers with a poor financial base (Sakamoto et al., 2018).

2.4.3 The high-cost system for people aged under 70

In the previous paragraphs we have seen the various insurance schemes for employees and for people covered by the National Health Insurance. Despite the differences of these schemes, there is a system that applies to all the insured people, called the *High-Cost Medical Expense System* (*Kōgaku ryōyō hi seido*). The system shows different levels of benefits for people aged under 70 and for people aged 70 or over, so we will expose them in separated paragraphs. The High-Cost Medical Expense System is a scheme that applies to out-of-pocket payments and it states that if co-payments overcome a certain amount established by the law, the exceeding amount must be reimbursed to the patient or excluded from the cost of care. The reimbursement takes around three months, while the exclusion from the cost of care is applied if the patient brings a document attesting the maximum amount he/she can pay at the reception (MHLW, 2017).

The levels of maximum payment changed over the years. Before 2000, the high-cost limit was equal to 63.600 for everyone, regardless of income level. The revision of the system in 2000 broke down patients according to their income and defined their respective level of maximum payment. The upper limit for the low-income group was set to 35.400 yen, that of the middle-income was 63.600 yen and finally, the maximum amount for high-income individuals was fixed at 121.800 yen (MHLW, 2000). The limits were subsequently raised for high- and middle-income groups in 2002 and 2006 (MHLW, 2002, 2006a). Eventually, in 2015, the high- and middle-income groups were split into further categories. The high-income group was broken down in two subgroups: the limit for the richer was set at 252.600 yen, while the other subgroup pays a maximum of 167.400 yen. The middle-income category was divided into two subsets too: the richer pays 80.100 yen, while the other's limit is 57.600 yen. There were no changes over the years for the low-income group.

2.4.4 Health Care and Long Term Care for the Elderly in Japan

Elderly people in Japan participate to two different programs: the Health Care Insurance System and the Long Term Care Insurance System. We will first discuss the Health Care Insurance System. We will see the financing of the system, the evolution of out-of-pocket payments over the years and the various changes of the high-cost system. Secondly, we will treat the Long-Term Care Insurance System.

2.4.4.1 The Health Care Insurance System

In 2000, the elderly were covered by the Elderly Health System (from now, EHS). The EHS was introduced in 1982, following the implementation of the *Public Aid for the Aged Act* (Sakamoto et al., 2018). The act led to the abolition of the system that granted free care for people aged over 70, which was introduced in 1972 with the amendment of the *Act on Social Welfare for the elderly* (JHPN, n.d.; Sasagawa, 2020). EHS was based on contributions by the elderly to the National Health Insurance System and on the support of Government's subsidies and transfers from other insurers. Indeed, since resources were pooled at the municipal level, municipalities presenting high rates of elderly as total population had a weak financing base and needed support from the government and from the redistribution mechanism that transferred funds from insurers with a stronger financing capacity (Sakamoto et al., 2018).

However, the redistribution mechanism did not solve the problem of financing the increasing expenses by old people resulting from population aging. For this reason, the system was modified in 2008 throughout the *Elderly Health Care Security Act* (Sakamoto et al., 2018). The new system divided the elderly in two categories: the people aged 75 or over (late-stage medical care system for the elderly), and individuals aged 70-74 (early-stage medical care for the elderly). The financing of the expenses of the former was separated from that of the latter. Particularly, people aged 75 or over were separated according to their income: those who had a level of income equal to that of the working generation, and the others. The financing of the system for the first group, excluding out of pocket payments that cover 30% of the cost, is based on contributions by the elderly deducted directly from their pension (10% of the expenses) and on transfers from the National Health Insurance System and Employees' Health Insurance (90% of the expenses). On the other hand, the system for people aged 75 or over who do not have a level of income equal to that of the working generation, not including 10% out-of-pocket payments, is financed through government's subsidies (50%), direct contributions by the elderly deducted directly from their pension (10%) and transfers from the National Health Insurance System and Employees' Insurance (40%) (Sakamoto et al., 2018).

By observing the financing mechanism of the late-stage medical care system for the elderly, we notice that the transfer of social security contributions from the working population is significant in both cases (even if the richer group pays as much as the younger population in out-of-pocket payments). This means that social security premiums are being used as taxes because they are being redistributed from a part of the population to another. We will see the implications of this funding mechanism in the last paragraph of this chapter.

Concerning the early-stage medical care for the elderly, the financing mechanism is the same as working generations: people pay an insurance premium to the NHI (if they are retired or not covered by other insurance schemes) or to the Employees' Insurance System (if they are still working and covered by it) and the system is financed by the insurers (Sakamoto et al., 2018). Consequently, it is not possible to know how much of the financing (excluding out-of-pocket payments) comes from the elderly and how much comes from younger generations. However, the copayments of this group are lower than those of the working generation.

Let us now describe the out-of-pocket financing of the system. As indicated in the previous paragraph, health care for the elderly (people aged 70 or over) was free from 1972 to 1982. When the *Public Aid for the Aged Act* introduced co-payments, out-of-pocket money was equal to a fixed amount (JHPN, n.d.; Sasagawa, 2020). Later, out-of-pocket payments were settled as 10% of the total cost (Sasagawa, 2020). This is the system that existed in Japan in 2000. Nevertheless, the co-payment system underwent several changes over the years. In 2002, following the *Partial Revision of the Health Insurance Act*, it was decided that individuals aged 70 or over whose income was at least 1.240.000 yen would pay 20% of the total cost (MHLW, 2002). In 2006 the percentage paid by elderly whose income was equal to that of the working generation was raised to 30% (MHLW, 2006a). Finally, the 2008 *Elderly Health Care Security Act* stipulates that elderly aged 75 or over pay 30% of the expenses if they have a high level of income or 10% if not, while people aged 70-74 pay 20% of the cost of care, regardless of their economic condition (MHLW, 2008).

Nonetheless, as for people aged less than 70 years, it exists a maximum amount that can be paid as out-of-pocket money and its level differs according to income. In the case of the elderly, the *high-cost system* presents separate figures for outpatient and inpatient care. Regarding the outpatients' care, before 2002 there was no distinction between their economic background: the maximum amount paid by people aged 70 or over was 3200 yen. However, in 2002 the system divided patients in three groups: high-income, middle-income and low-income. The maximum amount paid as out-of-pocket money for outpatient care was 40.200 yen for high-income people, 12.000 yen for the middle-income group and 8000 for the low-income category (MHLW, 2002). Later, in 2006, the amount was raised to 44.400 yen for the high-income group, while in 2008 the highest charge became 24.600 yen for middle-income people (MHLW, 2006a; MHLW, 2008). Finally, the system was revised again in 2018: high-income households were broken down further in three categories and the amount of this group did not differ between outpatient and inpatient care. Moreover, the highest payment by the middle-income group was reduced to 18.000 yen, while the figure for the poorest group remained

unvaried (MHLW, 2018a). With regard to monthly inpatient care expenditures, before 2002 the middle-income group paid a maximum of 37.200 yen. At the same time, the low-income group was composed by people who were exempted from the payment of the resident tax and people who received a pension below 800.000 yen. In the first case, the upper limit was 24.600 yen, while in the second case the extreme amount was 15.000 yen. After the revision in 2002, the high-income group was split from the middle-income's one and it was established that it would pay up until 72.300 yen. Concerning the middle-income group, the amount was raised to 40.200 yen (MHLW, 2002). In the subsequent years, there were no changes for the lowest income group. In relation to the middle-income group, the limit of the out-of-pocket money was raised again in 2006 and in 2008 (44.400 yen and 62.100 yen respectively), while it was reduced in 2018 to 57.600 yen (after the further splitting of the high-income group). Lastly, the maximum charge for the high-income category was raised to 80.100 yen in 2006, while in 2018 it was ruled that, according to the sub-group, the amount would be 80.100 yen, 167.400 yen or 252.600 yen (MHLW, 2006a, 2008, 2018a). In addition, if the cost of care exceeds a certain amount, patients belonging to the high-income group must pay 1% of the difference between the cost and the settled amount.

2.4.4.2 The Long-Term Care Insurance System

In 1997, the *Long-Term Care Insurance Act* (enforced in 2000) introduced an insurance system for long-term care that covers two groups of people: those aged between 40 and 64, and those aged 65 or over (JHPN, n.d., Sakamoto et al., 2018). Before 2000, people needing home assistance or care at long-term facilities used the *Welfare System for the elderly*. This system was offered by municipalities and the co-payment was based on the principle of spending capacity. However, following the establishment of the new scheme, out-of-pocket payments were settled at 10% of the cost for every user (MHLW, 2016). In 2006, it became no longer possible to use benefits from the insurance to cover food and housing expenses (expenses incurred during the stay), since they were already covered by pension. Moreover, additional benefits were set up for low-income people (MHLW, 2006b). Later, in 2015, through the *Reform of the Long-Term Insurance*, out-of-pocket payments were fixed at 20% of the cost for people whose income exceeded a certain amount. The charge for individuals living below the poverty line was further reduced. However, categories who only needed a mild support were excluded from the insurance system through this reform, and are now covered by local governments (Sakamoto et al., 2018). Lastly, a new reform in 2018 stated that co-payments would become 30% of the cost for people whose income was more than a certain amount (MHLW, 2018b).

Regarding the quantitative availability of the service, we can see from figure 2.9 that the number of beds was reduced in the recent years.

With respect to the financing of this system, the amount not paid directly by users is covered by both contributions to the insurance (50%) and taxes (50%). To be more specific, 46% of the contributions comes from people aged 65 or over (premiums are deducted directly from their pension), while the remaining 54% is paid by insured people aged 40-64 (MHLW, 2018b).

Figure 2.9 Number of beds in residential long-term care facilities, Japan

Beds in residential long-term care facilities, Japan

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Japan	24,2	24,4	24,8	25,3	26	26,4	26,6	26,4	26,2	25,1	24,1	25,1	25	24,4	24	24,3	24	24,1

What are the implications of the Japanese health care system for the life cycle of saving? Overall, the health care system in Japan is accessible to all the population, even though some categories have access to a higher level of benefits. While the co-payments of those who are aged under 70 years have not increased in the last years, the maximum amount paid ad out-of-pocket money has augmented for middle- and high- income groups. The same happened for the elderly, but in this case also the percentage of co-payments was increased: 20% regardless of income level for those aged 70-74 and different percentages according to income for those aged 75 or over. Moreover, also the Long-Term Care Insurance System expanded the burden of certain income categories. For this reason, there has been a slight growth of the need for precautionary saving linked to health care in the last years but only for middle- and high- income groups.

2.5 Accessibility to credit market for the purchase of housing

The restriction to credit market access can cause the need to save a great amount in order to purchase a house. Before 2000, Japanese households had significant liquidity constraints because the loan-to-value ratio[17] offered by private financial institutions was really low. This was the result of the fact that a public corporation founded in the 1950s, the Japan Housing Loan Corporation, played an important role in providing low and fixed interest rate loans to households. For this reason, households accessed to a public loan that covered between 34,5% and 42,6% of the purchase in the 1980s, while the financing from private sector institutions accounted for 9,5%-12,3 % of the value. After exclud8ing borrowing from other sources, such as the employer and relatives, the percentage of self-financing was between 38,6% and 45,1% (Seko, 1994). This means that households had to rely by a significant degree on their savings for the purchase of a house.

Did something change over the years? We can answer this question by consulting Horioka and Niimi's (2020) comprehensive study of the developments of housing credit in Japan from 1970 to 2017. Before presenting the data, it is important to say that financial liberalization of housing loans in the 1990s, and the transformation since 2003 of the role of the Japan Housing Loan Corporation (later replaced by the Japan Housing Finance Agency) from provider to guarantor and securitizer of the loans, created a favorable environment to the expansion of private financial institutions' involvement in the market (Horioka and Niimi, 2020). Concerning the data, Horioka and Niimi analyzed the evolution of several variables: the ratio of housing-related debt to household disposable income, the loan-to-value ratio, the homeownership rate and housing purchase to disposable income. The ratio of housing-related debt to household disposable income increased for all age groups during the period, and it was particularly remarkable for the group aged 30-39 in the period 2000-2017. The loan-to-value ratio increased from 37% to 72% for the whole sample and the other variables improved as well. Overall, the accessibility of housing credit expanded for all households and the phenomenon was particularly pronounced for the young group aged 30-39 after 2000. A consequence on the households' consumption side was a growth in housing loan repayments to housing disposable income which was not completely offset by the decrease in rent payments. For this reason, the ratio of total housing related expenditures to household disposable income raised, while the ratio of other expenditures to household disposable income declined (Horioka and Niimi, 2020).

In conclusion, we can say that greater access to the credit market has reduced households' necessity to save for the purchase of a house. On the other hand, the growth of loan repayments to

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[17] The loan-to-value ratio represents the portion of the purchase that can be covered by borrowing.

disposable income pushes households to reduce their consumption in other items. The whole effect on saving could depend on whether the household applied for a fixed or variable interest rate mortgage and on the households' understanding of the mechanism. If households are aware that their loan repayment amount could rise in the presence of a variable interest rate, they will save for precautionary motives, but Horioka and Niimi state that financial literacy is still low in Japan. Nevertheless, even in the presence of a higher level of financial literacy, the amount of saving required to pay higher loan repayments would still be lower than the one necessary for a high down-payment.

2.6 Financing the elderly related expenditures: the fiscal system and its consequences for saving

In the previous paragraphs, we have seen that social security contributions have been lower than the necessary for a long period and thus they have been increased over the last years. Nevertheless, given that half of the basic pension and a significant part of the health care system is covered by the State, we might wonder whether taxes rose too. By looking at figure 2.10, we notice that, after the decrease in tax revenue in the 1990s, the figure does not grow considerably until 2010. In addition, we see that taxes did not augment much, while the trend in social security contributions is clear. The tax on personal income declined during the 1990s and became slightly higher only recently. On the other hand, consumption tax increased in 1997, 2014 and 2019 (but the last increase is not shown in the graph) and revenue from it surpassed that from personal income tax after 2014. The fact that taxes did not rise significantly, despite the increase of the State's expenditures relative to the part of pension benefits and health care not covered by premiums, is explained by the stark upsurge in public debt (237,1% of GDP in 2015 according to OECD data).

Moreover, also the expenses of the elderly covered by social security premiums do not have enough funds, even though the elderly need to pay a rate deducted directly from their pension, since we have seen that there is a significant transfer of resources from other insurance schemes. This causes distributional problems not only among generations but also among income levels. In fact, as noted by Ikegami (2017) contributions to the Employees' Health Insurance tax only income from the main job and the effect is regressive because of an upper limit. Furthermore, it does not take into account family size and other criteria that represent the spending requirements of households (Ikegami, 2017). With respect to the contributions to the National Health Insurance System, the formula consists of a part depending on income, a part based on the number of household's members and, finally, a standard amount paid by each household (Sasagawa, 2020). In the end, we can say that the rise in contributions has a heavier effect on households with lower wages and higher spending requirements.

If the effect on income is unbalanced, also the effect on saving will be more severe for this category, if they cannot reduce consumption enough in order to offset the decline in income.

Given what we have seen, it is fundamental for Japan to expand other taxes in order to finance welfare expenses and the repayment of public debt. Takayama (2000) encourages the growth in consumption tax to cover increasing elderly related expenses. The advantages of the consumption tax cited by him are: the redistribution of the burden among generations; the neutrality towards wages (Takayama, 2000). Another positive aspect cited by Tezuka (2017) is the fact that its revenue does not change automatically to GDP's movements. Nonetheless, the argument that this tax allows the redistribution of the burden among generations is not completely true. Indeed, since pension benefits are indexed to inflation, even after the macro-index adjustment the rise of the consumption tax will have lighter effects on the elderly.[18] In addition, the consumption tax poses issues about distributional effects, since the percentage of consumption to income decreases at the increasing of income level. This issue could be solved by establishing lower rates for essential goods, but Tezuka (2017) says that this would cause a cut-back in welfare and thus it would not change the regressive effect. Consumption tax is still low in Japan compared to other developed countries, thus the negative effects of its increase could still be limited for the moment. At the same time, given that other tax increases are required and since inequalities are growing in Japan, we can say that it is important to consider raising the income tax too. In this way, also the saving distribution will not be too unbalanced.

Figure 2.10: Evolution of tax revenue in Japan

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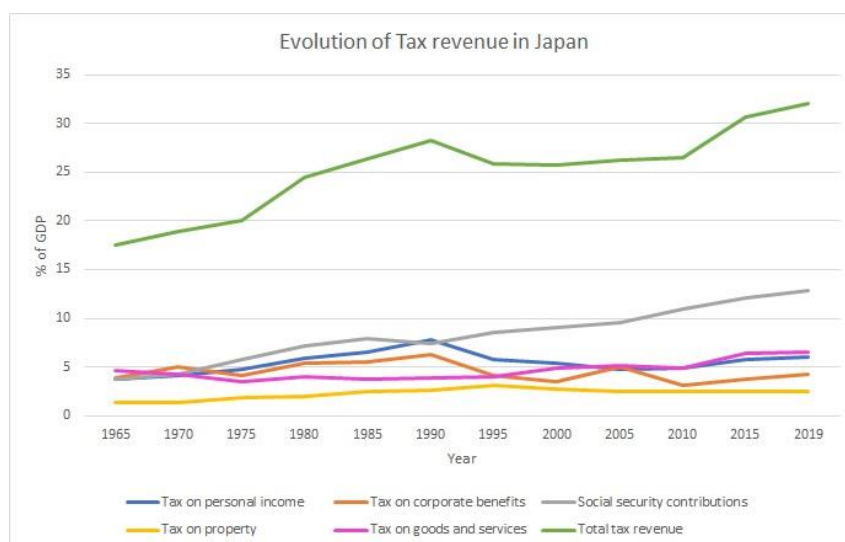
[18] This is not true only in the case in which inflation is low and thus the pension benefits are not increased, according to the mechanism described in Figure 2.4.

2.7 Conclusion

In this chapter we have examined the institutional environment in Japan, its transformations, and how it can affect saving and the life-cycle of saving. Before the burst of the bubble, indefinite contract workers could count on automatic wage increases thanks to the age-based pay. Consequently, if consumption did not change, or if it did not rise more than the growth in income, we could expect a rising saving curve during the working life. After retirement, if consumption was not adapted to the fall in income, the curve decreased. We can assume that the age-saving profile of indefinite contract workers before the burst of the bubble was thus an inversed-U shaped curve as in Modigliani theory. On the other hand, the saving curve during the working life of non-regular employees did not depend on age but on income fluctuations, and it probably decreased more than indefinite contract employees after retirement, since this category of workers had no access to the EPI or the corporate-sponsored pension.

Over the years, a growing part of the population stopped having access to the job security typical of lifetime employment. This means that the workforce that cannot count on wage increases with age is expanding. This population is primarily composed of young people and women. While only a minority of the latter was included in lifetime employment, the surge of precarious young people is a new phenomenon. Concerning retirement, these people have been included in the EPI scheme but, if the decline in public pension benefits continues, they will not have access to adequate income in old age and if they cannot save enough during the working life because of precarity they risk poverty during old age.

In relation to indefinite contract employees, the reduction of the seniority salary's application was not replaced by an annual salary system, especially for non-managers. Consequently, even if the wage curve flattened after age 40 and the increase in salary is not steep as in the pre-bubble period, workers can still expect growing wages. The difference with the past is that after mandatory retirement employees do not have access to public pension benefits and need to work for some years with a reduced salary. As a result, we can expect a growing saving curve until mandatory retirement and a decreasing curve after it even if the person is still working. The effect of the reduction will be heavier for blue-collar workers. With respect to retirement, we can assume that the fall in public pension benefits afflicted retirees mainly in the recent years.

The labour system and the pension system are not the only elements that can affect savings. The health care system, the accessibility to credit market and the fiscal system are other parts of society that need to be examined. As to the health care system, the working population did not experience a rise in the percentage of out-of-pocket payment after 2002, when the 30% rate was

established. Nevertheless, the maximum amount paid as co-payment has increased, but this measure concerned only medium and high-income groups. As regards the elderly, the rise of out-of-pocket payments to 20% involved all income groups of people aged 70-74, while the growth to 30% affected only upper income groups of people aged more than 75. The high-cost system of the elderly and the Long-term care insurance system expanded the burden too, but mainly on middle- and high-income groups.

Regarding the credit market, the broadening of accessibility reduced the need to save for the purchase of a house during youth. Nonetheless, the presence of variable interest rates should encourage precautionary saving if households are aware of the associated risks.

Finally, the expansion of the tax revenue, based primarily on social security contributions and slightly on the consumption tax, affects mainly the working age population and lower income groups. Given that resources are not enough to fund the welfare system, public debt rose remarkably and further tax increases cannot be avoided. It is important that this process considers redistribution problems not only among generations but also among income groups.

Overall, the combined effects of institutions on saving and on the life cycle of saving are complex. Currently, the tax burden is placed mainly on the working population, but the elderly are undergoing cuts in benefits. In part two we will try to see if the effects that we have hypothesized in this chapter are reflected by data and the quantitative analysis will help us to understand better the comprehensive impact of institutions.

Part 2: Empirical analysis of the Life Cycle of Saving in Italy and Japan

Chapter 3

The Life Cycle of Saving in Italy

3.1 Introduction

This chapter studies the life cycle of saving in Italy, with the aim of seeing if the institutional background that we have seen in chapter 1 has an influence on saving behaviour and with the aim of providing data that allow a comparison with Japan, that will be analyzed in chapter 4. For this reason, as I will explain in further details in section 3.2, the object of analysis has been adapted according to the characteristics of the Japanese data.

3.2 Methodology, data and definition of terms

In this chapter, we will analyze data from the 2000, 2004, 2008, 2012 and 2016 SHIW. The data are available on the website of the Bank of Italy and include the answers to the survey of the whole sample. This characteristic would allow us to examine also the distributional effects that we have hypothesized in chapter 1 but, given that full samples are not available for Japanese data, we leave the empirical verification of these assumptions to future research. The SHIW data have been analyzed thanks to the R-studio software for statistical computing. In this paragraph, I will discuss the definition of terms. In this case, I will depart from the existing literature for the choice of disposable income's definition. Later, I will explain the type of analysis carried out in the chapter.

The definition of disposable income adopted by the SHIW survey includes imputed rent on owner-occupied dwellings, which is the rent an owner would pay for his/her house if he/she did not own it (the same reasoning applies to people who do not own the dwelling but who live there without paying rent)[19]. Imputed rent is considered a part of income by many statistics because of the benefit gained by people living in an owner-occupied dwelling compared to people who have to pay rent. While taking into account imputed rent offers chances to envisage a tax system that reduces the fiscal burden on labour (Figari et. al, 2013), its use in the analysis of the saving behavior is problematic.

Figure 3.1 shows different cross-section saving rates for all households computed with the 2000 SHIW data. The highest saving rate includes both imputed rent and outliers, while the lowest excludes imputed rent and outliers. For now, let us focus on the inclusion or exclusion of imputed

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[19] For a more detailed definition see https://www.stat.fi/meta/kas/asuntotulo_en.html

rent. The difference in the saving rate including imputed rent and the one excluding it (and including outliers) is 13,7 percentage points for households whose head is aged 29 and under, 21,6 percentage points for households whose head is aged between 70 and 79, and 22,7 percentage points for households whose head is aged 80 or over. The fact that the gap in the saving rate rises with age could be linked to different homeownership rates among age groups. Thus, excluding imputed rent from income not only reduces the saving rate, it also makes the cross-section profile of saving appear less flat.

Figure 3.1 Mean cross-section saving rates in 2000 including or excluding imputed rents and outliers
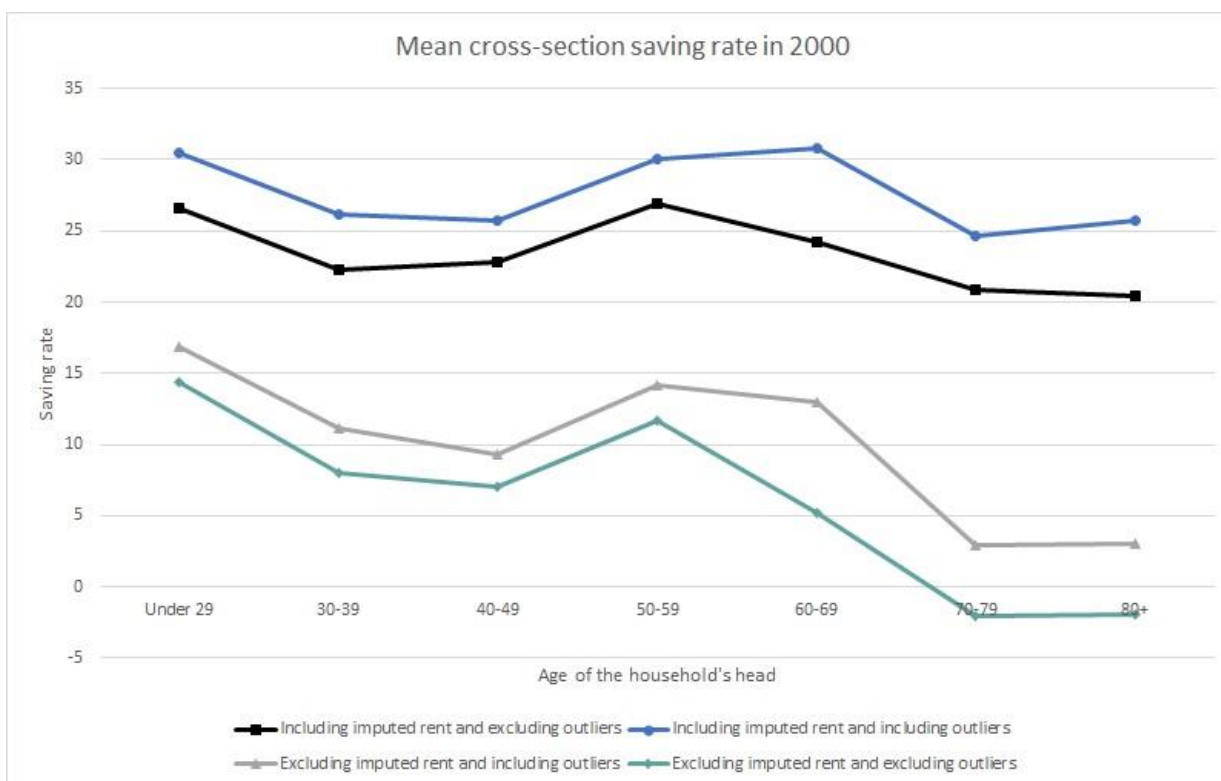
It is true that home-owning households have an economic advantage, but considering imputed rent while analyzing households' balance sheet can produce misleading results. For example, we know how much a household is not spending by living in an owner-occupied dwelling (however, even the estimation of imputed rent poses problems), but we cannot know how the same household would change its consumption if it had to pay a rent. Most importantly, the saving derived by including imputed rent in income does not flow into the economy and it is not bequeathable. If the saving rate of a household turns from negative to positive after including imputed rent in income, the data will show that the household is accumulating wealth while it is actually reducing it. For all these reasons, I think it is important to exclude imputed rent from income when examining saving behavior.

Let us now turn to the question of whether including or excluding outliers from the analysis. By looking again at figure 2.4, we see that excluding outliers produces lower saving rates and negative values for old households if we exclude also imputed rent. This is because the distribution of saving is skewed towards upper quintiles. For example, while the mean flow of savings of old households including outliers and excluding imputed rent is positive, the median value is negative (not shown in the figure). This means that, while at least 50% of the households show negative savings, the mean value appears positive. Another reason why it could be useful to exclude outliers from the analysis is the potential existence of errors or exceptional values in the data. For another example, Table 3.1 shows the distribution of financial wealth for employees' households (excluding administrators) whose head is aged 29 and under when outliers are included (panel A) or excluded (panel B).

Table 3.1 The distribution of financial wealth in households whose head is an employee aged 29 and under in the 2000 SHIW (Euro 2019)

Panel A: Distribution of wealth including outliers					
Min.	1st. quar.	Median	Mean	3rd quar.	Max
-292.328	0	1842	10.581	10.581	1.031.456
Panel B: Distribution of wealth excluding outliers					
Min.	1st. quar.	Median	Mean	3rd quar.	Max
-17.379	0	1043	3229	6952	28.849

Source: The 2000 SHIW

The definition of outliers used for excluding data refers to any value that lies more than one and a half times the interquartile range above the third quartile or below the first quartile. As we can see from panel A the maximum value of the distribution amounts to more than one million 2019 euro, which is an extremely uncommon value for a household whose head is a young employee. This causes the mean to be hugely far from the median. By looking at panel B, we observe that if we remove outliers using the interquartile range method, the mean is much closer to the median compared to panel A. Therefore, excluding outliers makes the mean more representative and we can see from figure 2.4 that doing so turns the mean saving rate of the elderly from positive to negative.

If the research is based on the observation of median values, excluding outliers may not be necessary, but since the aim of this dissertation is the comparison of the life cycle of saving between Japan and Italy, and given that the available data about Japan show only mean values, I will examine mean

values that exclude outliers of income, consumption and financial wealth with the interquartile range method.

Another characteristic of this research is that, as concerns working households, the object of analysis is limited to employees' households excluding administrators. This choice is linked to the fact that data about Japan displaying income and expenditures of working households classified by the age of the household's head are limited to employees' households excluding administrators. Another point in common with Japanese data is that the selected working households have at least two members. Moreover, working households whose head was aged 70 or over were excluded because of the extremely low number of observations. On the other hand, the examination of households whose head is retired includes all households (regardless of former professional activity), in consistency with Japanese data.

The exclusion of the data that we have seen above reduces the total sample from 39.561 households to 26.315. All the values were converted to 2019 euro by using the euro/lira exchange rate for the 2000 data and the ISTAT's coefficients based on consumer-price index for all the years. Disposable income, consumption expenditures, saving flows and saving rate are the yearly average of monthly figures, while net financial wealth is a yearly value.

With respect to disposable income, the SHIW displays income values net of non-consumption expenditures (gross income is not reported) but the variable includes imputed rent. As we have said, the definition of disposable income used in this work excludes imputed rent:

Disposable income = Net income – imputed rent[20]   (3.1)

Regarding other definitions, saving flows are given by subtracting consumption expenditures to disposable income.

Saving flows: Disposable income – Consumption expenditures   (3.2)

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[20] Net income includes also income from self-employed work that in the case of employees households could represent a freelance work. In the case of 2000 data, I excluded depreciation from this category of income, since it was not reported in subsequent surveys.

The saving rate is given by:

Saving rate = (Saving flows/Disposable income)*100   (3.3)

Finally, net financial wealth is defined as:

Net financial wealth = Financial assets – Financial liabilities   (3.4)

Now that we have cleared the definition of the variables, let us describe how we will analyze them. First, we will observe the cross-section profile of income, consumption, saving flows and saving rate of employees' households over the years. Secondly, we will describe the changes of the variables for age groups during the examined period. In the third place, we will study the differences between age groups and we will hypothesize an age-saving profile on the basis of these variations. Later, we will see if our assumptions are confirmed by multiplied cross-section data, which are more suitable to look at changes occurring at the passage from one age group to the other.

After having examined the data about employees' households, we will study the same variables for households whose head is an old person, based on their professional status. In this case, we will use the same definitions that are used in the Japanese data: households whose head is an employee aged 65 or over; households whose head is retired and is aged 65 or over; households whose head is retired and is aged 75 or over.

Finally, we will see the cross-section profile of net financial wealth of working and retired households over the years.

3.3 Results

3.3.1 Employees' households

Tables 3.3, 3.4, 3.5 and 3.6 show respectively the disposable income, consumption, flow of savings and saving rate by age of the household's head for employees' two or more or person households. The graphic representation of the results is given by figures 3.2, 3.3, 3.4 and 3.5.

Table 3.2 Number of observations: workers, two or more person households

Year	-29	30-39	40-49	50-59	60-69
2000	233	632	766	539	65
2004	197	511	686	580	84
2008	143	408	713	592	74
2012	99	332	604	583	126
2016	76	173	402	573	183

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.3 Disposable income by age of the household's head: workers, two or more person households (Euro 2019)

Year	Average	-29	30-39	40-49	50-59	60-69
2000	2396	2292	2289	2408	2717	2275
2004	2398	2399	2224	2338	2691	2336
2008	2324	2149	2172	2278	2645	2378
2012	2069	1952	1876	2064	2333	2120
2016	2184	2084	2001	2099	2327	2409

Source: Author's calculation on the 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.4 Consumption expenditures by age of the household's head: workers, two or more person households

(Euro 2019)

Year	Average	-29	30-39	40-49	50-59	60-69
2000	2023	1818	2025	2218	2301	1753
2004	2166	2065	2062	2259	2511	1933
2008	2072	1818	2043	2174	2361	1963
2012	2036	1795	1920	2102	2280	2084
2016	1896	1692	1825	1897	2094	1973

Source: Author's calculation on the 2000, 2004, 2008 and 2016 SHIW

Table 3.5 Flow of savings by age of the household's head: workers, two or more person households (Euro 2019)

Year	Average	-29	30-39	40-49	50-59	60-69
2000	373	474	264	190	416	522
2004	232	334	162	79	180	403
2008	252	331	129	104	284	415
2012	33	157	-44	-38	53	36
2016	288	392	176	202	233	436

Source: Author's calculation on the 2000, 2004, 2008 and 2016 SHIW

Table 3.6 Saving rate by age of the household's head: workers, two or more person households

Year	Average	-29	30-39	40-49	50-59	60-69
2000	15,6	20,7	11,5	7,9	15,3	22,9
2004	9,7	13,9	7,3	3,4	6,7	17,3
2008	10,8	15,4	5,9	4,6	10,7	17,5
2012	1,6	8	-2,3	-1,8	2,3	1,7
2016	13,1	18,8	8,8	9,6	10	18

Source: Author's calculations on the 2000, 2004, 2008 and 2016 SHIW

Figure 3.2 Age profile of disposable income: workers, two or more person households (Euro 2019)
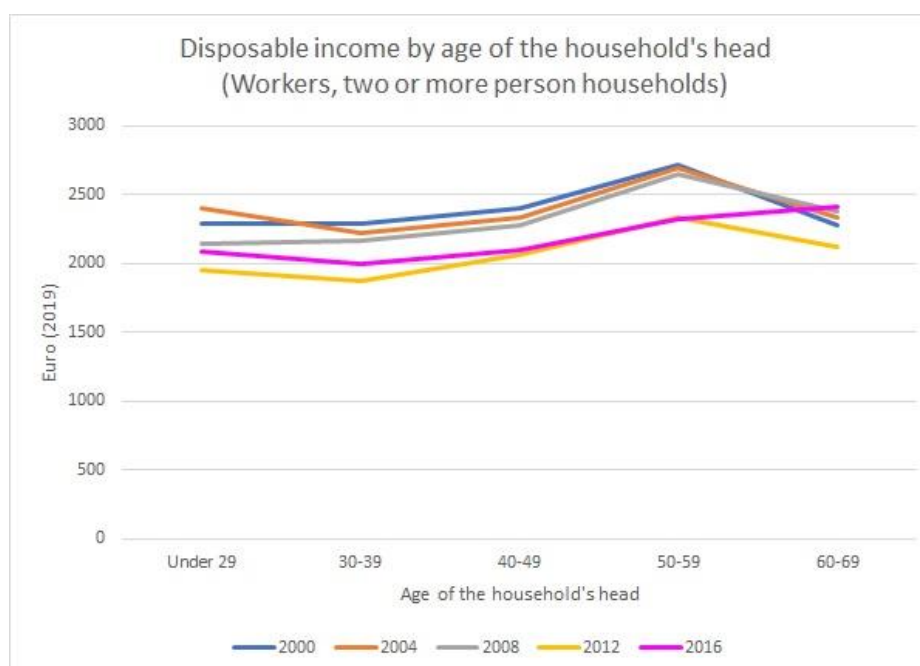
Source: Author's calculation on the 2000, 2004, 2008 and 2016 SHIW

Figure 3.3 Age profile of consumption: workers, two or more person households (Euro 2019)
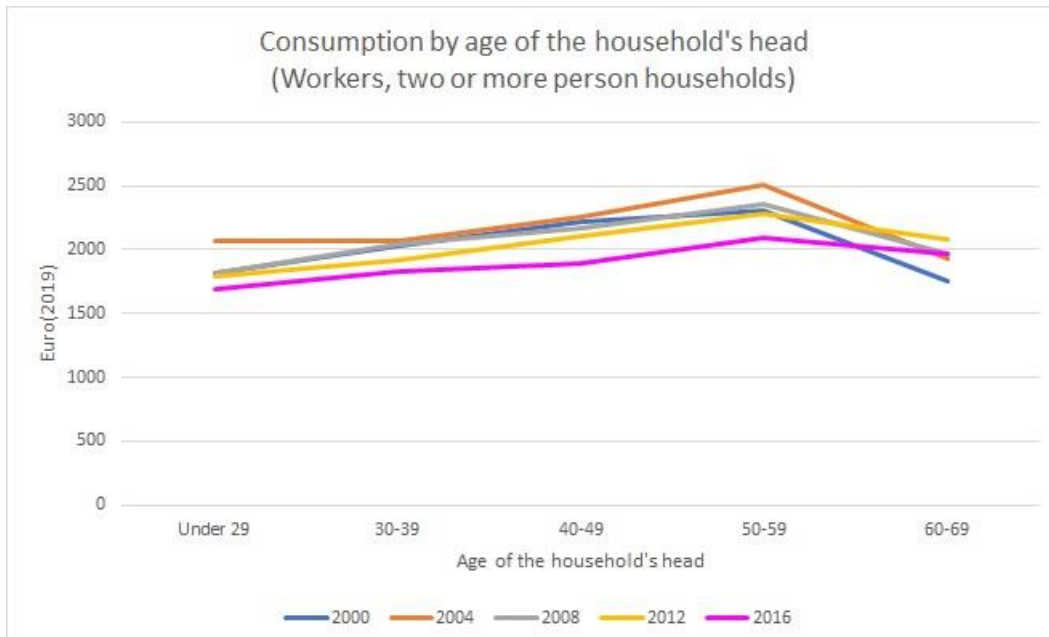
Figure 3.4 Age profile of the flow of savings: workers, two or more person households (Euro 2019)
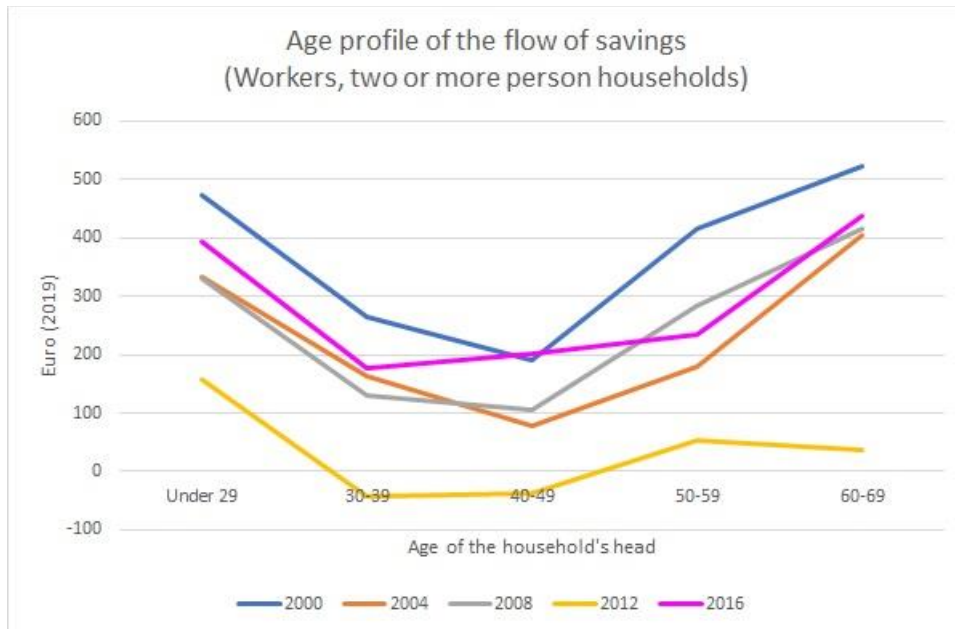
Figure 3.5 Age profile of the saving rate: workers, two or more person households
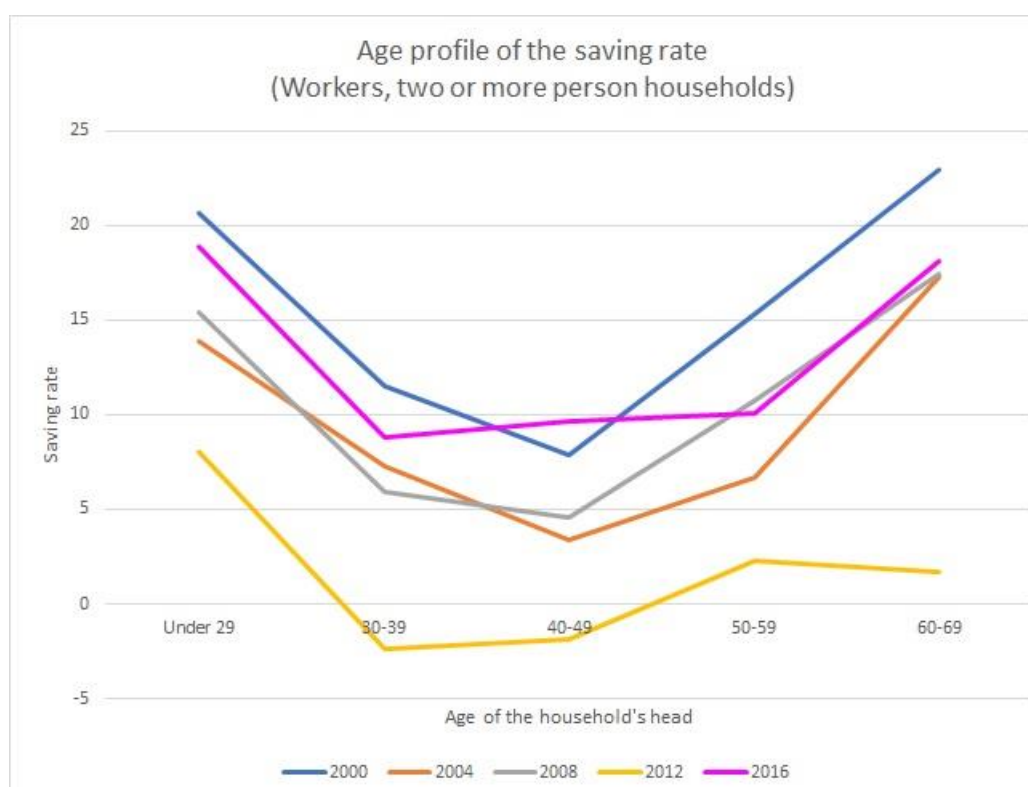
With respect to the change of the saving rate of each category of age over the years, we can see from figures 3.4 and 3.5 that the biggest changes in savings and in the saving rate have occurred between 2000 and 2004, 2008 and 2012 and, finally, between 2012 and 2016. Regarding the group aged 29 and under, from 2000 to 2004 the saving rate and savings declined by 6,8 percentage points and by 29,5% respectively. While disposable income increased, the rise in consumption outweighed the positive effect. From 2008 to 2012 the saving rate fell by 7,4 percentage points. Savings decreased by 52,4% because the small reduction in consumption (-1,2%) did not counterbalance the drop in disposable income (-9%). Later, from 2012 to 2016, the saving rate grew again by 10,8 percentage points. Savings expanded by 149,4%, because of both an increment in disposable income and decline in consumption.

The group 30-39 exhibits a fall in the saving rate by 4,2 percentage points between 2000 and 2004. Savings declined by 38,4%, as a result of a lower disposable income (-2,8%) accompanied by higher consumption (+2%). However, the drop in the saving rate between 2008 and 2012 was more remarkable (-8,2 percentage points). Savings decreased by 134% and turned negative, given that the big fall in income (-13,6%) was not outpaced by the reduction in consumption (-6%). From 2012 to

2016 the saving rate recovered by 11,1 percentage points. Income increased by 6,6% (accounting for +57% of the rise in the flow of savings) while consumption continued to decline (-5%).

Another category of households that exhibited a negative saving rate in 2012 is the one aged 40-49. Savings had already declined by 58% between 2000 and 2004 because of a reduction in income accompanied by an upsurge in consumption. However, from 2008 to 2012, the households scaled down their consumption expenditures (-3,2%) but it was not enough in the presence of a fall in disposable income by 9,4%. From 2012 to 2016 the saving rate increased by 11,4 percentage points. In the same period disposable income augmented by only 2%, while consumption in 2016 was 10% lower than the 2012 value. Indeed, the last variable explains 85% of the positive change in the saving flow.

With respect to households whose head is aged 50-59, the saving rate declined by 8,6 percentage points between 2000 and 2004, due to both a reduction in income and in the flow of savings (caused by a simultaneous increment in consumption). As the other groups, these households reduced their consumption from 2008 to 2012 but could not offset the decline in income. Savings recovered in 2016, but income was not changed much from 2012 (-0,2%). Thus, the rise in savings was due entirely to a lower consumption level (-8%).

Finally, the group 60-69, after a drop in savings from 2000 to 2004 because of consumption expenditures (+10%) that counterbalanced the positive effect of higher levels of disposable income (+2,6%), exhibited one of the biggest decline in the saving rate from 2008 to 2012 (-15,8 percentage points). This huge shift was linked to a drop in disposable income (-11%) and a decrease in savings (-91%). It is interesting to see that, in contrast to other groups, the negative change in disposable income was not accompanied by a reduction in consumption but by an increase (+6%).

In the end, all the households exhibit a lower saving rate in 2016 compared to 2000, except for the group 40-49. Nevertheless, the patterns of the flow of savings are different. Households aged 29 and under, 30-39 and 50-59 display lower consumption expenditures that did not outset the negative change in disposable income. While the groups 30-39 and 50-59 experienced a big decrease in labour income (-14,6% and -12%), households whose head is aged 29 and under showed a little change in this variable (-1%) but the negative shift in pension and transfers (-31%) had a big effect on their current resources (it explains -70% of the change) (see Appendix I for details about the changes in income sources). The group 40-49 presents a higher saving rate because, even though disposable income is lower than in 2000 (-13%), the flow of savings is higher (+7%). This fact is due

to a substantial fall in consumption (-14,5%). Lastly, households whose head is aged 60-69 were the only category whose disposable income increased between 2000 and 2016. Nevertheless, their saving rate in 2016 is lower than in 2000 because of a downsizing of savings brought by a big growth in consumption (+12,5%).

We have seen that all the groups, except for 60-69, reported a lower income in 2016, compared to 2000. The households' downsizing of consumption was not enough to counterbalance this phenomenon, except for the group 40-49. Since the SHIW does not show direct taxes, we cannot know how much of the reduction in income was due to taxation, but we can say that the drop in savings in almost all the age categories is connected to smaller financial resources. In relation to consumption, all households show a drop in the variable compared to 2000, except for the group 60-69. Unfortunately, information about consumption in the SHIW is scarce. The data state only how much consumption is due to durables and how much to non-durables. A way to speculate how did the composition of consumption change for households is to look at ISTAT's data by professional status of the household's head (see Appendix I for the figures). Unluckily, the data do not show the age of the household's head, but we have seen that the shift was common to almost all age groups. Another shortcoming is linked to the fact that data about white collar employees include administrators, a category that we have excluded from the sample and that is richer than normal white-collar workers. By looking at the data of this group, we see that food and health expenditures have increased only by a very low degree. On the other hand, the proportion of expenses in clothes and footwear, furniture, transportation, communication, culture and recreation has diminished. The share of consumption linked to housing, water and electricity has risen remarkably, but the value includes imputed rent and the data do not show the specifical value of this variable before 2014. Thus, we do not know how much of the rise in this expenditure is due to imputed rent and how much to all the other expenditures linked to housing. The growth of the proportion of restaurant and hotel can be considered a sign of well-being, but the fact that many consumption categories decreased seems to reveal some degree of distress. The pattern of change is clearer in the case of blue-collar workers. The share of food and housing expenditures has increased considerably, while all the other items of consumption show a stagnant or lower proportion compared to 2000. We can thus say that this category displays in a more evident way a shift towards essential consumption items.

Regarding the differences among age groups, if we look at the cross-section profile of savings and the saving rate, we can see that the figure is U-shaped. It could be supposed that the difference in the saving rate between households aged 29 and under and households aged 30-39 is due to the fact that a higher income could enable individuals to form a household when they are younger (we have seen

that in many studies a higher income is correlated with a higher saving rate), but by looking at table 3.3 and figure 3.2 we can see that there is not a remarkable difference between the disposable income of the two age groups, especially in 2000. Moreover, households aged 29 and under receive more pension and transfers compared to those aged 30-39, which means that they are not in a better economic situation. In 2000, the difference between the flow of savings of households aged 29 and under and households aged 30-39 was mainly due to the higher consumption of this last group (+11%, which explains -98% of the difference in the flow of savings) (see Appendix I for details). Subsequently, in year 2012 and year 2016 the lower savings of the group aged 30-39 was explained by both income and consumption (consumption is 8% higher compared with households aged 29 and under and explains -62% of the difference, while disposable income was 4% lower in 2016).

Concerning the difference between the saving rate of households aged 30-39 and those aged 40-49, the saving rate of the first group was higher in 2000, 2004 and 2008. While disposable income of the second group was larger than the one of households aged 30-39 in all the years of the survey, in 2000 higher consumption was not counterbalanced by higher income and so the savings and the saving rate of the group 40-49 were lower (see Appendix I). On the other hand, in 2012 and 2016, income offset the higher level of consumption and caused both the savings and the saving rate to be larger than the group aged 30-39. The saving rate of the group 50-59 overcame that of the group 40-49 in every year of the survey. While households aged 50-59 consumed more than households aged 40-49, the negative effect was outpaced by the rise in income. Finally, the group 60-69 showed higher saving rates compared to group 50-59 in all the years except for 2012. In 2000, the income of the older group was lower than that of the younger, but the decrease in consumption made the flow of savings of the group 60-69 larger. In 2012, the difference in income was not counterbalanced by consumption and thus the saving flow and rate of the group 60-69 was lower. In 2016, the pattern of the difference in saving was changed: the group 60-69 had higher savings than the group 50-59 and the difference was due both to a larger income (+4%, mainly due to pension and transfers, accounting for +40% of the disparity in the flow of savings) and a lower level of consumption (-6%).

To resume the cross-section age profile of saving, the fact that households whose head is 30-39 have lower savings than households aged 29 and under produces a U-shaped figure. While in 2000 this pattern was explained almost completely by a higher level of consumption with no larger income by the group 30-39, in 2012 and 2016 the younger group showed bigger savings because of both higher disposable income and lower consumption. The rising side of the U is then explained by the higher levels of savings of the group aged 50-59 compared to group 40-49. This is the result of larger disposable income that outpaces the higher consumption of the older group.

It is important to notice that the analysis that we have carried out until now has some limits because of the cross-section nature of the data. Indeed, we have analyzed the difference between groups, but we cannot say that it really describes the passage from one group to the other. In order to do this, we need panel data, which are available in the SHIW but reduce considerably the size of the sample. Nevertheless, we can construct cohorts thanks to the method of repeated cross-section and analyze the evolution of the variables with age. Unfortunately, since the data refer to a short time (2000-2016) it is only possible to track cohorts for a limited period of their life. Figures 3.6, 3.7 and 3.8 represent the disposable income, consumption and saving rate of different cohorts. Since the survey is conducted every two years, and given that the intervals of the surveys examined are four years long, the cohorts were divided by four-year intervals, so that all the components of one group have passed to the other in the subsequent survey. By looking at figure 3.6, we notice that younger cohorts earn less than older cohorts when they were their same age. This could reflect the tougher working situation of the young that we have seen in chapter 1. Cohorts who are in the first part of the life cycle form a sort of U-shaped profile, because income rises only during the middle years. On the other hand, most of the old cohorts incur in a reduction in income at the end of their 50s. In relation to consumption, we see that young cohorts have an almost flat profile, while old groups show higher consumption level. The interpretation of the profile of the saving rate poses some problems. The stark drop that we can see in many cohorts before a big final rise refers mainly to year 2012. This means that there was a period effect common to all the groups that makes it difficult to interpret the data. Nevertheless, if we look at the other movements of the cohorts, we see that the saving rate decreases from young age to middle age and recovers after. For example, if we look at the cohort 1980-1983, we see that the saving rate when the group is aged 33-36 is lower compared with the data of when the group is 25-28 years old. To make another example, if we observe cohort 1960-1963, we see that the saving rate at age 45-48 is lower than the value at age 37-40 but the variable improves at age 53-56. For this reason, even if the interpretation of the results poses problems, especially in the absence of isolation of cohort, age and period effects, we can suggest that employees' households' saving rate follows a U-shaped age-profile.

What can we say about the institutional background that we have analyzed in chapter 1 and these findings? First, as we have seen, young cohorts earn less than older cohorts when they were the same age. This confirms the intergenerational inequality created by policies. Moreover, we can assume that the age-saving profile is due to the characteristics of the labour market. While

consumption increases slightly over life, maybe because of household's composition, income cannot compensate for the increase of the variable because seniority wage increases are very low in Italy.

Figure 3.6 Disposable income by cohorts: workers, two or more person households (Euro 2019)
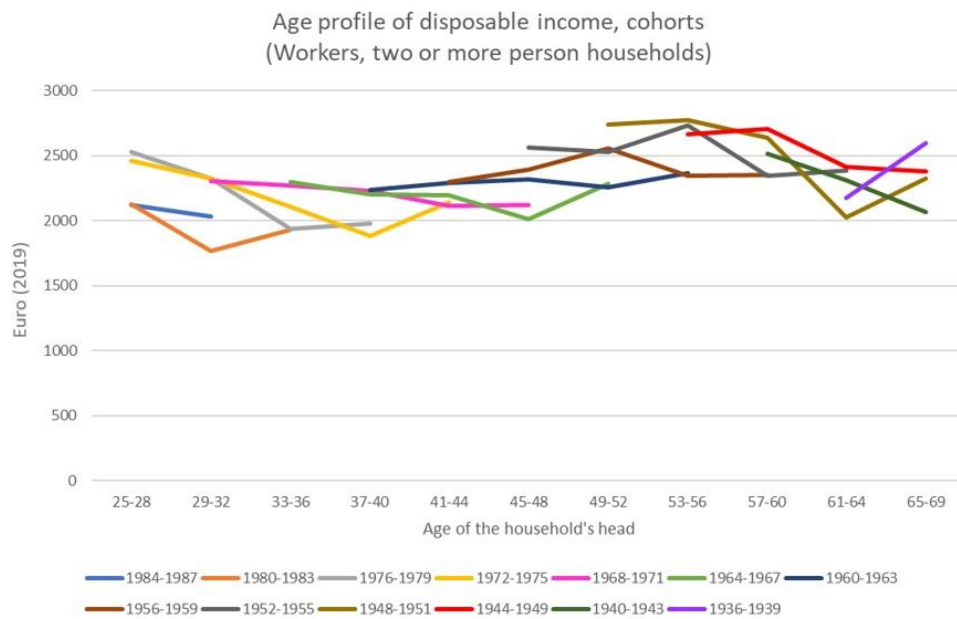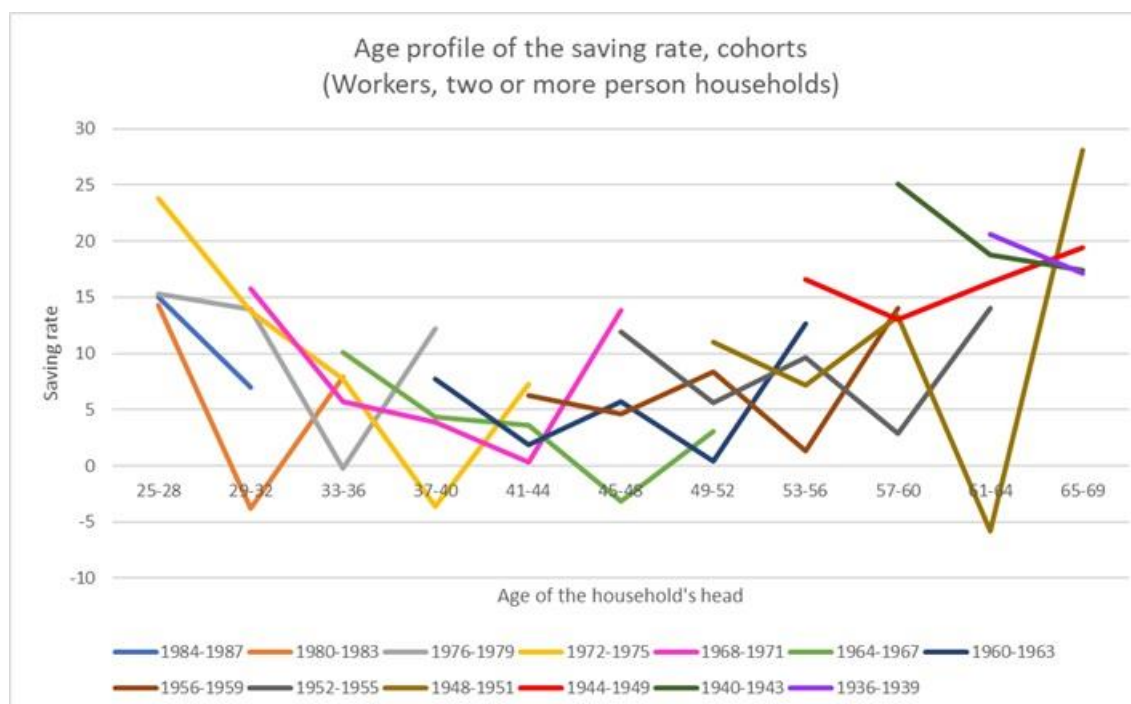
Figure 3.7 Consumption expenditures by cohort: workers, two or more person households (Euro 2019)
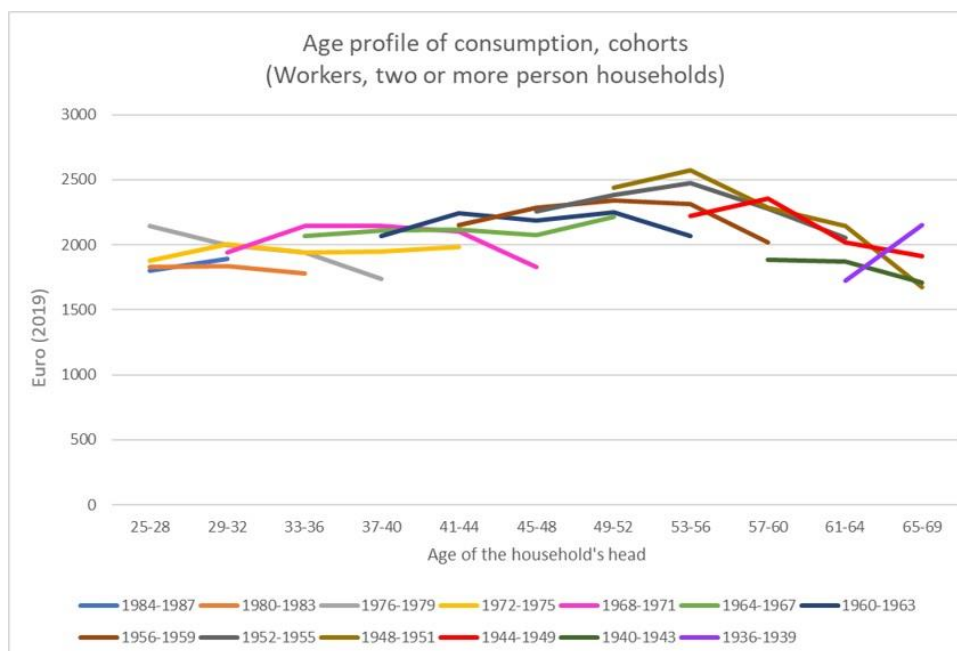
Figure 3.8 Saving rate by cohort: workers, two or more person households

Age profile of the saving rate, cohorts
(Workers, two or more person households)

3.3.2 Income, Consumption and Savings of the elderly based on their occupation status

Tables 3.7, 3.8, 3.9, 3.10 and 3.11 report respectively the number of observations, disposable income, consumption expenditure, savings and saving rate of households whose head is classified as elderly based on his/her occupation status. The representation of the results is given by figure 3.9, 3.10, 3.11 and 3.12.

Table 3.7 Number of observations: elderly households by the occupation of the household's head

Year	65+ worker	65+ retired	75+ retired
2000	18	1738	771
2004	13	2117	992
2008	13	2303	1143
2012	23	2533	1289
2016	32	2599	1456

Table 3.8 Disposable income: elderly households by the occupation of the household's head (Euro 2019)

Year	65+ worker	65+ retired	75+ retired
2000	2021	1324	1210
2004	1894	1384	1231
2008	2190	1501	1335
2012	1860	1465	1257
2016	2078	1484	1333

Source: Author's calculation on the 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.9 Consumption expenditures: elderly households by the occupation of the household's head (Euro 2019)

Year	65+ worker	65+ retired	75+ retired
2000	1622	1333	1220
2004	1745	1460	1316
2008	1640	1584	1448
2012	1538	1632	1449
2016	1474	1506	1400

Source: Author's calculation on the 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.10 Saving flows: elderly households by the occupation of the household's head (Euro 2019)

Year	65+ worker	65+ retired	75+ retired
2000	399	-9	-10
2004	149	-76	-85
2008	550	-83	-113
2012	322	-167	-192
2016	604	-22	-67

Source: Author's calculation on the 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.11 Saving rate: elderly households by the occupation of the household's head (Euro 2019)

Year	65+ worker	65+ retired	75+ retired
2000	19,7	-0,7	-0,8
2004	7,9	-5,5	-6,9
2008	25,1	-5,5	-8,5
2012	17,3	-11,4	-15,3
2016	29,1	-1,5	-5

Figure 3.9: Disposable income: elderly households by the occupation of the household's head (Euro 2019)
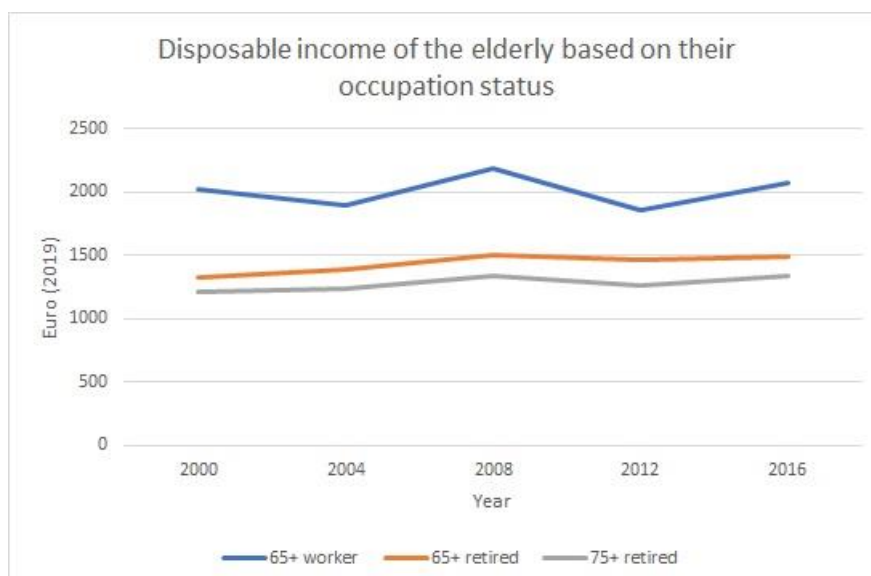
Figure 3.10: Consumption expenditure: elderly households by the occupation of the household's head (Euro 2019)
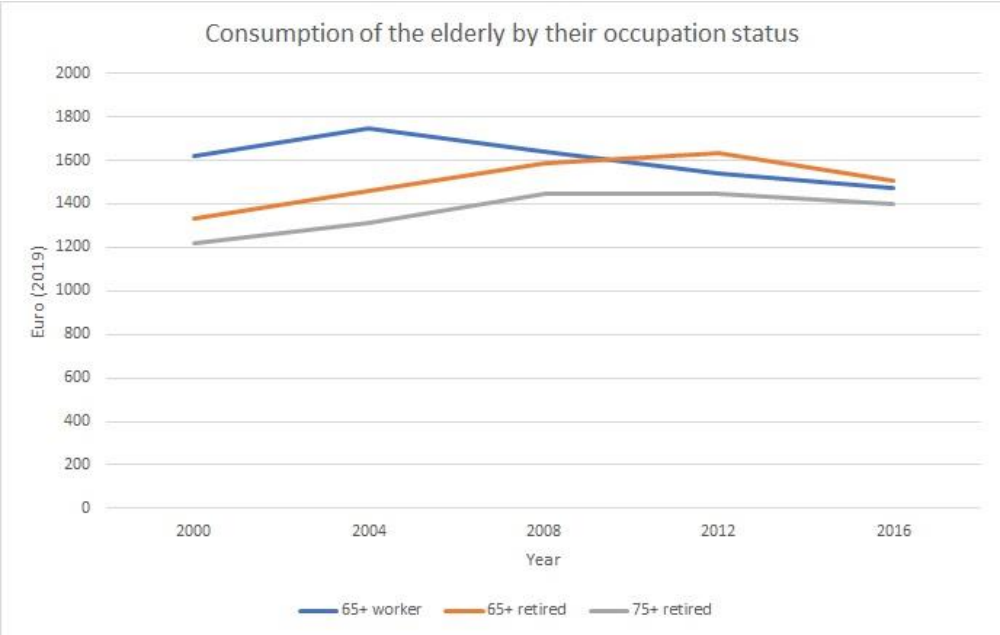
Figure 3.11 Flow of savings: elderly households by the occupation of the household's head (Euro 2019)
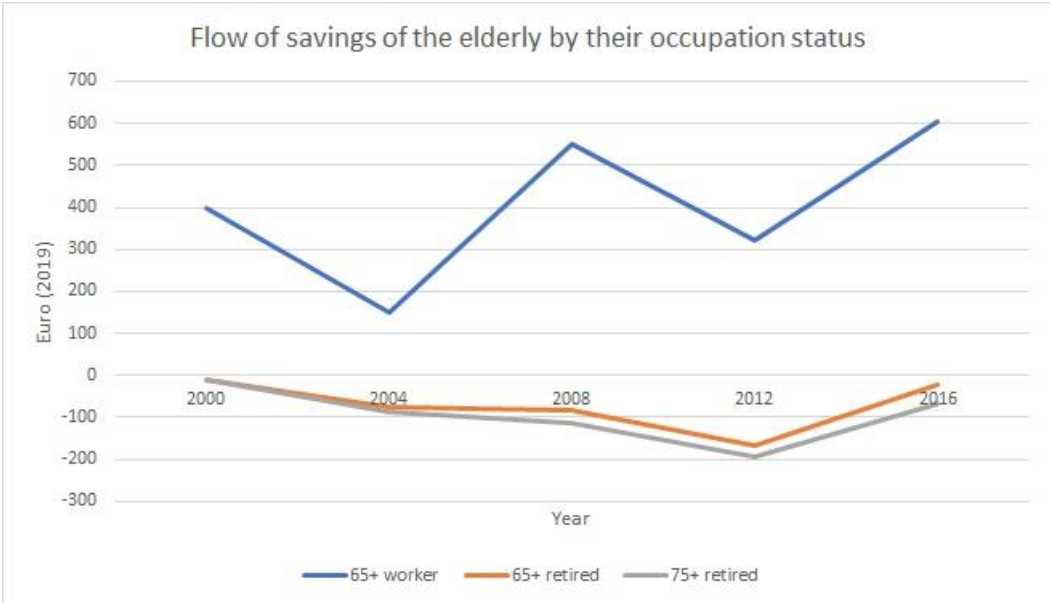
Figure 3.12 Saving rate: elderly households by the occupation of the household's head
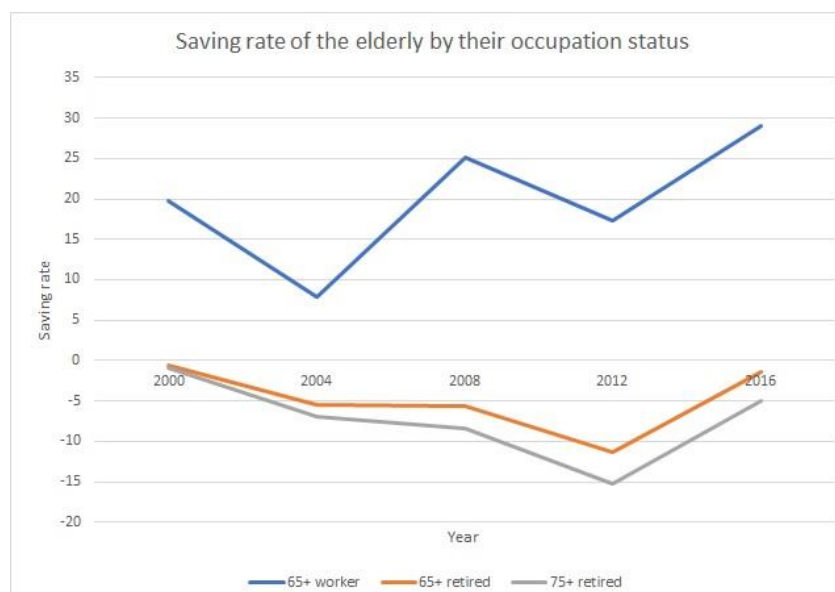
Source: Author's calculation on the 2000, 2004, 2008, 2012 and 2016 SHIW

From table 3.11 and figure 3.12 we can see that the saving rate of households whose head is aged 65 or over and who is an employee experienced various fluctuations from 2000 to 2016. From 2000 to 2004, the saving rate of these households declined by 11,8 percentage point, due of a fall in disposable income (-6%) and in the flow of savings (-62,5%). The flow of savings dropped because the negative change in disposable income was accompanied by an increase in consumption (+7,5%). Later, from 2004 to 2008, the saving rate increased again, thanks to a positive change in both disposable income and savings. While disposable income expanded by 16%, consumption decreased by 6%, causing a rise in the flow of savings by 268%. The downturn of the saving rate from 2008 to 2012 was less important than in the period 2000-2004. The size of the decline was 7,8 percentage points. In this case, the flow of savings (-41%) dropped even though consumption was reduced (-6%), given the degree of the negative change in disposable income (-15%). Finally, the saving rate recovered in 2016 (+10,8 percentage points compared to 2012). The flow of savings grew thanks to an increment in disposable income (+12%) and a reduction of consumption (-4%).

By looking at the saving rate of households whose head is aged 65 or over and 75 or over and retired, we notice that the value is always negative, even though it is close to zero in 2000 and 2016. Regarding households whose head is retired and aged 65 or over, the saving rate declined by 4,8 percentage points between 2000 and 2004, because the rise in disposable income (+4%) was

outpaced by the rise in consumption (+9,5%). From 2004 to 2008 the saving rate did not change, but it declined remarkably from 2008 to 2012 (-5,9 percentage points). This is linked to the fact that disposable income decreased (-2%) and consumption expenditures increased (+3%). Lastly, from 2012 to 2016 the saving rate recovered (+9,9 percentage points), mainly as a result of a reduction in consumption expenditures (-7,6%). However, as we can see from figure 3.10, consumption of this group exceeded that of the working elderly households in the same period.

The saving rate of the last category treated here, retired households whose head is aged 75 or over, fell steadily from 2000 to 2012 and recovered from 2012 to 2016. From 2000 to 2004 the saving rate diminished (-6,1 percentage points) despite a higher level of disposable income (+2%). This was the consequence of a large increment in consumption (+8%). Later, from 2008 to 2012, the negative change of the saving rate (-6,8 percentage points) was due to the fact that income decreased (-6%), while consumption levels remained unaltered. In the last period treated (2012-2016) the saving rate improved because of an expansion of income (+6%) accompanied by lower consumption (-3%).

In the end, if we observe the difference between savings in 2000 and in 2016, we notice various patterns. Households whose head is a worker aged 65 or over show an increase in the saving rate by 9,4 percentage points. Disposable income augmented by 3%, while savings rose by 51,6%. The drop in consumption (-9%) accounts for the greater part of the change in savings (it explains +72%). Both categories of retired households show lower saving rate compared to 2000 (-0,8 percentage points for the group over 65 and -4,2 percentage points for the group over 75). The two groups experienced a growth in income (+12% and +10% respectively), but their consumption expanded as well (+13% and +15%), causing the flow of savings and the saving rate to decline.

We can try to look at ISTAT's data to understand what happened to the consumption of these categories of households. Nevertheless, we encounter some definition problems because information about the consumption of retired households is not available on the ISTAT's website. The closer category is "retired from work", that refers to "someone who has stopped his working activity because of age, disability or other reasons. The category does not necessarily match pensioners, since the individual "retired from work" does not always receive a pension" (ISTAT, 2011). If we look at the data of this category, we see that the share of housing expenditures has increased substantially, while consumption for health has expanded only by a small degree. All the other items have either decreased or stagnated. Nevertheless, contrary to our data from the SHIW, the whole consumption of this category was lower in 2016 compared to 2000. Another category that we can observe to understand consumption of retired households is made up of couples without children

whose head is aged 65 or over. If we look at items as a percentage of total consumption (Appendix I), we see that only housing and bills and health expenditures increased between 2000 and 2016, as happened for households retired from work. Nonetheless, if we consider the absolute real change of consumption (not shown), we see that the category couples without children whose head is aged 65 or over has increased consumption even in items such as transportation and others, in contrast to the group retired from work. In addition, the consumption of this category has increased from 2000 to 2016 and this is consistent with our findings. As households retired from work, the biggest positive effect on consumption is created by the category "housing, water and electricity", but health care expenditures account for a higher share of the change in this case. Considering that the consumer price index used for the revaluation of Italian currency calculates pharmaceuticals on the base of the full price and not of copayments (ISTAT, n.d.), it is possible that the real growth in health expenditures reflects the rise in the self-burden for the purchase of pharmaceuticals, a phenomenon that we have identified in chapter 2. In addition, a rise in real expenditures for health could also be explained by the higher externalization of care (even if limited) compared to the past and to the increased need to turn to the private sector. Thus, part of the increase in consumption could be explained by the health financing policies that we have seen.

3.3.3 Net financial wealth

Table 3.12 and 3.13 display the financial assets, liabilities and net financial wealth of workers' households by the age of the head and of elderly households by the occupation status of the head, respectively. The representation of the results is given by figures 3.13 and 3.14.

Let us first observe the changes of the different categories over the years. Financial wealth of households whose head is aged 29 and under did not change much between 2000 and 2008. Later, it decreased between 2008 and 2012 (-34%) and increased in the period 2012-2016 (+125%). In the first period, the fall was due to the reduction in assets (-34%) that offset the lower level of liabilities (-33%). In the second period, financial wealth augmented thanks to both higher assets (+52%) and a decline in liabilities (-53%). Households whose head is aged 30-39 experienced a steady decline in financial wealth until 2012. From 2000 to 2004 the phenomenon was due to a decrease in assets (-9%) accompanied by an expansion of liabilities (+30%). From 2004 to 2008 liabilities diminished (-22%) but their positive effect was counterbalanced by the downturn of assets (-44%). The same pattern applies to the period 2008-2012. Finally, from 2012 to 2016 wealth grew by 87%, as a result of higher assets (+11%) and lower liabilities (-52%). In this last period, the positive effect of the liabilities (+73% of the change) exceeded that of assets (+27% of the change).

The outline of the change that experienced the group 30-39 was the same for the group 40-49: a fall in wealth until 2012 and then an increase. From 2000 to 2008 the negative change was due to the drop in assets, while liabilities decreased. On the other hand, in the period 2008-2012 liabilities rose while assets continued to decline. Assets did not stop diminishing from 2012 to 2016 (-7%), however, the big downturn in liabilities (-35%) led to a higher wealth level (+19%).

Table 3.12 Assets, Liabilities and Net Financial Wealth by age of the household's head, workers (Euro 2019)

Financial assets					
Year	-29	30-39	40-49	50-59	60-69
2000	6015	9548	11745	12402	7141
2004	6312	8656	10221	12352	13609
2008	5309	5632	8241	12371	10560
2012	3512	4620	7083	8798	7374
2016	5326	5121	6555	10029	9676
Financial liabilities					
Year	-29	30-39	40-49	50-59	60-69
2000	2787	2758	3567	2760	1250
2004	2744	3584	3306	3065	1989
2008	2158	2809	2928	3228	2429
2012	1445	2525	3467	3188	1681
2016	673	1204	2245	2561	1783
Net financial wealth					
Year	-29	30-39	40-49	50-59	60-69
2000	3228	6790	8178	9642	5891
2004	3568	5072	6915	9287	11620
2008	3151	2823	5313	9143	8131
2012	2067	2095	3616	5610	5693
2016	4653	3917	4310	7468	7893

Source: Author's calculation on the 2000, 2004, 2008, 2012 and 2016 SHIW

The major shift in the financial wealth of households aged 50-59 occurred from 2008 to 2012 (-39%). This happened because of a large decrease in assets (-29%) while liabilities did not change much (-1%). Later, in 2016 the wealth of this group was 33% higher compared to 2012, as a result of a growth in assets (+14%) and a drop in liabilities (-20%).

Finally, the wealth of the group 60-69 changed many times. From 2000 to 2004 wealth increased by 97% following a rise in assets (+90,5%) that outpaced the negative effect of higher liabilities (+59%). In the period 2004-2008 and 2008-2012 wealth decreased. In the first case the drop was the outcome of lower assets and an upsurge in liabilities, while in the second period the reduction in liabilities did not counterbalance the downturn in assets. From 2012 to 2016 wealth augmented again (+39%) despite the rise in liabilities (+6%), thanks to the expansion of assets (+31%).

Table 3.13 Assets, Liabilities and Net Financial Wealth of elderly households by their occupation status (Euro 2019)

Financial assets			
Year	65+ worker	65+ retired	75+ retired
2000	9285	8786	7948
2004	8984	10779	8353
2008	10295	10682	7830
2012	6335	10634	8519
2016	9634	11178	9809
Financial liabilities			
Year	65+ worker	65+ retired	75+ retired
2000	579	251	77
2004	3322	581	239
2008	631	477	189
2012	248	689	223
2016	789	478	182
Net financial wealth			
Year	65+ worker	65+ retired	75+ retired
2000	8706	8535	7871
2004	5662	10198	8114
2008	9664	10205	7641
2012	6087	9945	8296
2016	8845	10700	9627

Source: Author's calculation on the 2000, 2004, 2008, 2012 and 2016 SHIW

Figure 3.13 Net financial wealth by age of the household's head, workers (Euro 2019)

Net financial wealth by age of the household's head
(Workers, two or more person households)
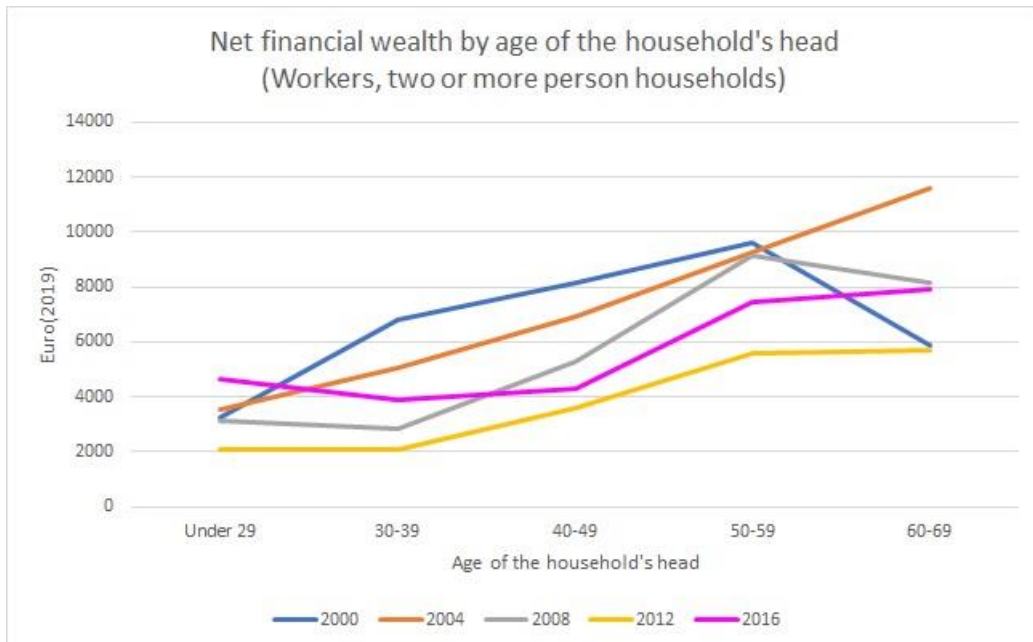
Figure 3.14 Net financial wealth of elderly households by their occupation status (Euro 2019)

Net financial wealth of the elderly by their occupation status
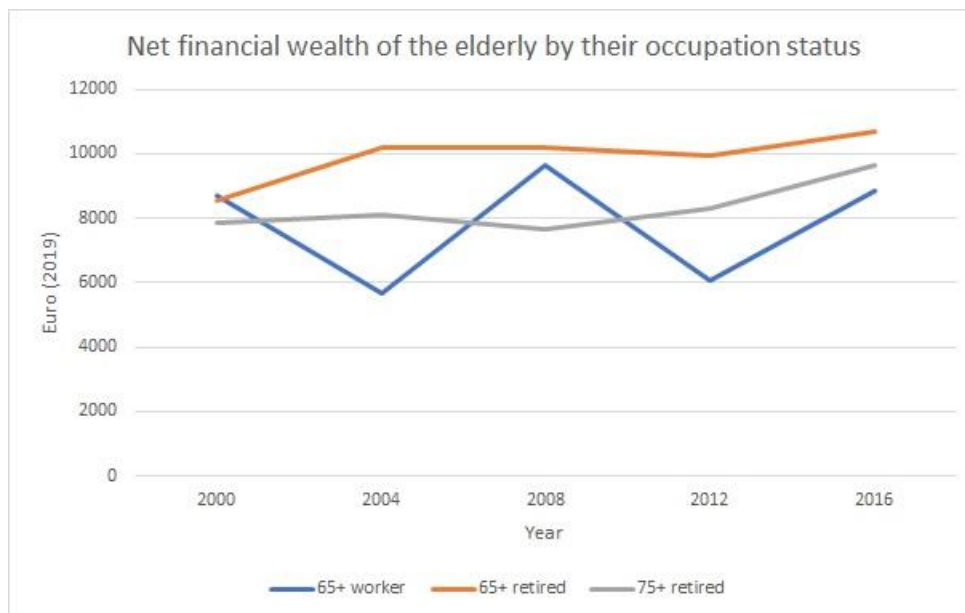
From a comparison of the 2000 and the 2016 data, we notice that wealth has declined for all the categories of households, except for the group 29 and under and 60-69. All the groups of households that show lower wealth compared to 2000 display less liabilities but a simultaneous decrease in assets, which caused the negative change in wealth. The group 29 and under exhibits higher wealth, but their assets have declined as well (-11%), while the huge drop in liabilities (-76%) offset the shift in assets. Lastly, households whose head is aged 60-69 were the only ones who experienced a positive growth in both assets (+36%) and liabilities (+43%). Overall, we can thus say that working households, except for the group 60-69, accumulated less savings in 2016 compared to 2000, while at the same time the use of credit market diminished. Nonetheless, it is not easy to understand if this last process was supply or demand-driven.

Now, let us discuss the differences among households' categories over the years. In 2000 and in 2004 the financial wealth curve rose steadily until age 50-59 (Figure 3.13). While in 2000 households whose head is aged 60-69 had less wealth than households whose head is aged 50-59, in 2004 we can see the opposite phenomenon. In the following years, the first part of the curve was flat, even slightly decreasing in 2008 and 2016. Households whose head is aged 30-39 exhibit a level of financial wealth that was not much different from the wealth of younger households. Even more remarkable, in 2016 households whose head is aged 40-49 had less wealth than households aged 29 and under. This happened because their assets exceeded the young households' savings only slightly, while liabilities were higher (table 3.12). Households whose head is aged 50-59 had more financial wealth than younger households in all the years of the survey. Concerning the group 60-69, the results change according to the year.

With respect to households whose head is classified as elderly, financial wealth of working households is at the same level of retired households aged 65 or over in 2000, while in the other years of the survey it is always below it (figure 3.14). The fact that the curve of retired households whose head is aged 75 or over is underneath the curve of households whose head is aged 65 or over reveals that older households have less wealth than younger groups. However, this is a cross-section result and data of the group 65 or over include also data about households in their 70s, so it is not sufficient to look at different points in time to see if the elderly are reducing wealth and to assess that the wealth profile is consistent with the flow profile. Figure 3.15 resolves this issue by portraying the findings obtained by constructing a retired cohort who is 60-63 in 2004 and 72-75 in 2016. As we can see, wealth declined steadily, confirming what we have observed about the flow data. Concerning the change in time of the categories of households, we can see from figure 3.14 that while the working

households' wealth experienced fluctuations, the variable augmented for retired households. This means that someone who is 65 or over and 75 or over in 2016 has more wealth than someone who was the same age in 2000. This fact could be linked to higher saving during the working life, but it is not the aim of this chapter to clear this point. In conclusion, we can say that both flow and stock data demonstrate that retired Italian households are reducing their financial wealth.

Figure 3.15 Financial wealth of the cohort 1941-1944, retired households (Euro 2019)
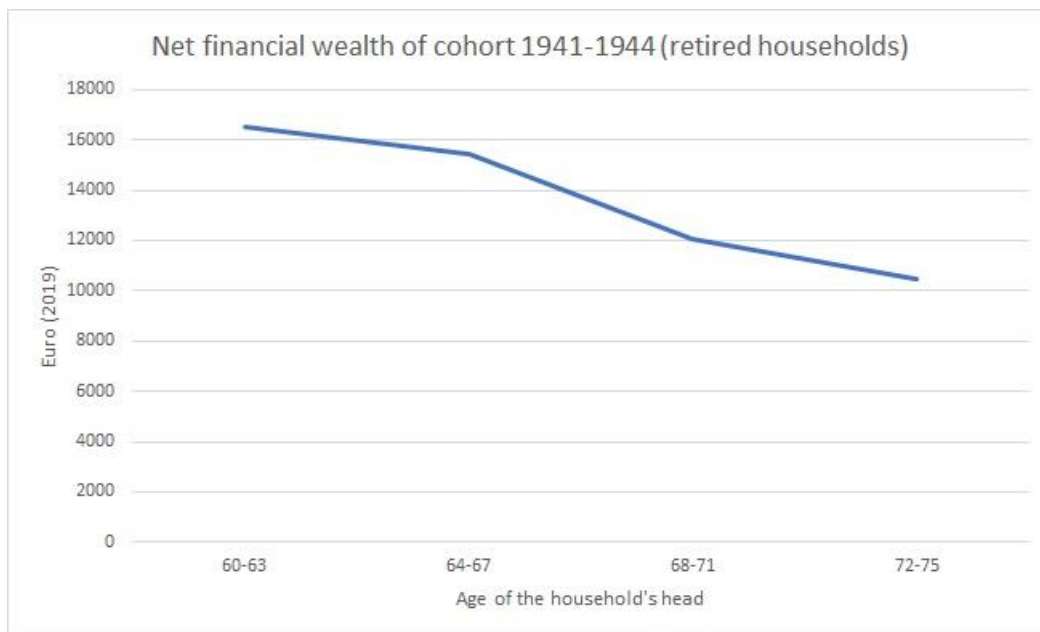
Source: Author's calculation on the 2004, 2008, 2012 and 2016 SHIW

3.4 Conclusion

The aim of this chapter was to provide a description of the life cycle of saving in Italy from 2000 to 2016, since these were the latest available data. The analysis was based on the SHIW survey.

In relation to the change over time, we have pointed out that all the groups show a lower saving rate in 2016 compared to 2000, except for the group 40-49. This group shows higher savings because the fall in consumption outpaced the decline in income, while the reduction in consumption of the groups aged 29 and under, 30-39 and 50-59 did not counterbalance the negative shift in income. Households whose head is aged 60-69 were the only ones that experienced a positive change in income, but this

effect was contrasted by a rise in consumption. Thus, all working households except the group 60-69 experienced a decline in income, but, given that the data show net values, it is not clear how much is due to wages and how much is caused by taxes.

From a cross-section and a repeated cross-section analysis of employees' households, we have seen that the age profile of the saving rate in Italy is U-shaped during the working years. This result seems to contrast with findings from previous research, but we considered also households whose head is aged 29 and under, while the existing literature display households aged 35 as the youngest.

We have noticed that in 2000 the falling part of the U was caused by higher consumption of households aged 30-39 while disposable income was not higher than that of younger households. Later, in 2012 and 2016, households aged 30-39 had lower savings than the group 29 and under because of both lower income and higher consumption. However, the group 29 and under is not richer than households aged 30-39, as we can see from the fact that they receive more pension and transfers (Appendix I). Concerning the rising side of the U, it is explained by higher levels of savings of the group 50-59 despite larger consumption compared to group 40-49, thanks to higher income. The age-saving profile can be linked to the Italian labour market because, while consumption increases with age, maybe due to family composition, income does not rise significantly until age 50-59 due to low seniority wage increases and probably high turnover rates in young age.

With respect to old households, we have observed that previous research does not find the saving rate of the elderly to be below zero, but if we remove imputed rent from income and consider the median measure, or compute the mean by excluding outliers and imputed rent, the value turns negative. More specifically, the cross-section study of elderly households by the occupation of the head shows that working households have a positive saving rate, while retired households display a negative saving rate. Over time, the saving rate of retired households has declined further until 2012 and then rose from 2012 to 2016. The level in 2016 was still lower than in 2000, but the gap was larger for households aged 75 or over.

We have seen that lower savings of retired households in 2016 compared to 2000 were not due to lower income, because this variable actually increased, but to higher consumption. This reflects the fact that the Italian pension system is still in transition and it is interesting to notice that retired households and working households aged 60-69 are the only ones who experienced a rise in disposable income over the years. This could be a sign of intergenerational inequality created by the

policies that we have seen in chapter 2: those who are the most affected by the reform of the labour market will also be those who will experience cuts in pension benefits, while older generations do not suffer any impact. If the rise in consumption of retired households is linked to essential goods, even the current high pension benefits cannot match basic needs and the effect will be even worse after the end of the transition period. Unfortunately, given the limitations of the SHIW and ISTAT data, it is not easy to understand the nature of this increase in consumption.

Concerning the change of net financial wealth over time, households in 2016 showed lower wealth than in 2000, except for the group 29 and under and 60-69. This was the results of a reduction in assets, that affected also the group 29 and under (but the huge decrease in liabilities caused the wealth of this last group to increase). On the other hand, the group aged 60-69 was the only one who experienced a rise in assets compared to 2000. In addition, if we look at the data regarding elderly households, we see that assets of retired households were higher in 2016, compared to 2000. Again, we can notice a sort of intergenerational inequality in the changes that happened between 2000 and 2016. The stock measure confirms that groups that will be the most affected by the new pension system risk to have less savings at retirement than cohorts that also enjoyed high benefits at retirement.

The cross-section profile of financial wealth demonstrates that, as far as it concerns working households, older groups showed higher values compared to the younger in all the years of the survey. However, in 2016 the first part of the curve appeared flatter than in previous years, and households aged 40-49 had less wealth than those aged 29 and under. This could mean that the saving rate of these households in the previous years was too low to accumulate a significant amount of resources. Another finding from the cross-section analysis of wealth is that retired households whose head is aged 75 or over have less wealth than those whose head is aged 65 or over. While this is not enough to assess that the stock of wealth of the elderly declines during retirement, the repeated cross-section analysis of a retired cohort confirmed this hypothesis, in consistency with the study of flow measures.

Appendix I

Table 3.14 Differences among households of different age groups in 2000

Year 2000				
Entries	30-39 compared with 29 and under	40-49 compared with 30-39	50-59 compared with 40-49	60-69 compared with 50-59
Differences	Savings: -44% Disposable income: -0,1% Labour income: +15% Pension and transfers: -48% Consumption: +11%	Savings: -28% Disposable income: +5% Labour income: +11% Pension and transfers: -37% Consumption: +10%	Savings: +120% Disposable income: +13% Labour income: +8% Pension and transfers: +66% Consumption: +4%	Savings: +25% Disposable income: -16% Labour income: -26% Pension and transfers: +49% Consumption: -24%
Direct effects				
Percentage of the difference in savings explained by YD	Percentage of ΔS= -2%	Percentage of ΔS= +160%	Percentage of ΔS= +136%	Percentage of ΔS= -417%
Percentage of the difference in savings explained by C	Percentage of ΔS= -98%	Percentage of ΔS= -260%	Percentage of ΔS= -36%	Percentage of ΔS= +517%

Source: The 2000 SHIW

Table 3.15 Differences amon households of different age groups in 2012

Year 2012				
Entries	30-39 compared with 29 and under	40-49 compared with 30-39	50-59 compared with 40-49	60-69 compared with 50-59
Differences	Savings: -128% Disposable income: -4% Labour income: +1% Pension and transfers: -30% Consumption: +7%	Savings: +12% Disposable income: +10% Labour income: +15% Pension and transfers: -38% Consumption: +9%	Savings: +239% Disposable income: +13% Labour income: +12% Pension and transfers: +42% Consumption: +8%	Savings: -32% Disposable income: -9% Labour income: -15% Pension and transfers: +69% Consumption: -9%
Direct effects				
Percentage of the difference in savings explained by YD	Percentage of ΔS= -38%	Percentage of ΔS= +3467%	Percentage of ΔS= +293%	Percentage of ΔS= -1246%
Percentage of the difference in savings explained by C	Percentage of ΔS= -62%	Percentage of ΔS= -3367%	Percentage of ΔS= -193%	Percentage of ΔS= +1146%

Table 3.16 Differences among households of different age groups in 2016

Year 2016				
Entries	30-39 compared with 29 and under	40-49 compared with 30-39	50-59 compared with 40-49	60-69 compared with 50-59
Differences	Savings: -55% Disposable income: -4% Labour income: -1% Pension and transfers: -7% Consumption: +8%	Savings: +15% Disposable income: +5% Labour income: +11% Pension and transfers: -36% Consumption: +4%	Savings: +15% Disposable income: +11% Labour income: +12% Pension and transfers: -7% Consumption: +10%	Savings: +87% Disposable income: +4% Labour income: -7% Pension and transfers: +125% Consumption: -6%
Direct effects				
Percentage of the difference in savings explained by YD	Percentage of ΔS= -38%	Percentage of ΔS= +369%	Percentage of ΔS= +732%	Percentage of ΔS= +40%
Percentage of the difference in savings explained by C	Percentage of ΔS= -62%	Percentage of ΔS= -269%	Percentage of ΔS= -632%	Percentage of ΔS= +60%

Table 3.17 Determinants of the change in savings, workers' households 29 and under

Entries	2000-2004	2008-2012	2012-2016	2000-2016
Savings	ΔS= -30%	ΔS= -52%	ΔS= +149%	ΔS= -17%
Direct effects				
Disposable income	ΔYD= +4,6% Percentage of ΔS= +77%	ΔYD= -9% Percentage of ΔS= -113%	ΔYD= +7% Percentage of ΔS= +56%	ΔYD= -9% Percentage of ΔS= -257%
Consumption	ΔC= +14% Percentage of ΔS= -177%	ΔC= -1,2% Percentage of ΔS= +13%	ΔC= -6% Percentage of ΔS= +44%	ΔC= -7% Percentage of ΔS= +157%
Indirect effects				
Labour income (YL)	ΔYL= +12% Percentage of ΔS= +145%	ΔYL= -10% Percentage of ΔS= -100%	ΔYL= +7% Percentage of ΔS= +44%	ΔYL= -1% Percentage of ΔS= -24%
Pension and Transfers (PT)	ΔPT= -11% Percentage of ΔS= -37%	ΔPT= -9% Percentage of ΔS= -18%	ΔPT= -1% Percentage of ΔS= -1%	ΔPT= -31% Percentage of ΔS= -180%

The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.18 Determinants of the change in financial wealth, workers' households 29 and under

Entry	2008-2012	2012-2016	2000-2016
Net Financial Wealth	ΔW= -34%	ΔW= +125%	ΔW= +44%
Financial Assets	ΔA= -34% Percentage of ΔW= -166%	ΔA= +52% Percentage of ΔW= +70%	ΔA= -11% Percentage of ΔW= -48%
Financial Liabilities	ΔL= -33% Percentage of ΔW= +66%	ΔL= -53% Percentage of ΔW= +30%	ΔL= -76% Percentage of ΔW= +148%

Source: The 2000, 2008, 2012 and 2016 SHIW

Table 3.19 Determinants of the change in savings, workers' households 30-39

Entries	2000-2004	2008-2012	2012-2016	2000-2016
Savings	ΔS= -38%	ΔS= -134%	ΔS= +501%	ΔS= -33%
Direct effects				
Disposable income	ΔYD= -3% Percentage of ΔS= -63%	ΔYD= -14% Percentage of ΔS= -171%	ΔYD= +7% Percentage of ΔS= +57%	ΔYD= -13% Percentage of ΔS= -328%
Consumption	ΔC= +2% Percentage of ΔS= -37%	ΔC= -6% Percentage of ΔS= +71%	ΔC= -5% Percentage of ΔS= +43%	ΔC= -10% Percentage of ΔS= +228%
Indirect effects				
Labour income (YL)	ΔYL= -3% Percentage of ΔS= -57%	ΔYL= -16% Percentage of ΔS= -173%	ΔYL= +4% Percentage of ΔS= +31%	ΔYL= -15% Percentage of ΔS= -341%
Pension and Transfers (PT)	ΔPT= +12% Percentage of ΔS= +30%	ΔPT= -3% Percentage of ΔS= -4%	ΔPT= +31% Percentage of ΔS= +32%	ΔPT= +23% Percentage of ΔS= +63%

The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.20 Determinants of the change in financial wealth, workers' households 30-39

Entry	2000-2004	2004-2008	2008-2012	2012-2016	2000-2016
Net Financial Wealth	ΔW= -25%	ΔW= -44%	ΔW= -26%	ΔW= +87%	ΔW= -42%
Financial Assets	ΔA= -9% Percentage of ΔW= -52%	ΔA= -35% Percentage of ΔW= -134%	ΔA= -18% Percentage of ΔW= -139%	ΔA= +11% Percentage of ΔW= +27%	ΔA= -46% Percentage of ΔW= -154%
Financial Liabilities	ΔL= +30% Percentage of ΔW= -48%	ΔL= -22% Percentage of ΔW= +34%	ΔL= -10% Percentage of ΔW= +39%	ΔL= -52% Percentage of ΔW= +73%	ΔL= -56% Percentage of ΔW= +54%

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.21 Determinants of the change in savings, workers' households, 40-49

Entries	2000-2004	2008-2012	2012-2016	2000-2016
Savings	ΔS= -58%	ΔS= -137%	ΔS= +627%	ΔS= +7%
Direct effects				
Disposable income	ΔYD= -3% Percentage of ΔS= -63%	ΔYD= -9% Percentage of ΔS= -149%	ΔYD= +2% Percentage of ΔS= +15%	ΔYD= -13% Percentage of ΔS= -2336%
Consumption	ΔC= +2% Percentage of ΔS= -37%	ΔC= -3% Percentage of ΔS= +49%	ΔC= -10% Percentage of ΔS= +85%	ΔC= -15% Percentage of ΔS= +2436%
Indirect effects				
Labour income (YL)	ΔYL= -2% Percentage of ΔS= -48%	ΔYL= -12% Percentage of ΔS= -174%	ΔYL= +1% Percentage of ΔS= +6%	ΔYL= -15% Percentage of ΔS= -2439%
Pension and Transfers (PT)	ΔPT= +4% Percentage of ΔS= +6%	ΔPT= 0% Percentage of ΔS= 0%	ΔPT= +35% Percentage of ΔS= +20%	ΔPT= +25% Percentage of ΔS= +291%

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.22 Determinants of the change in financial wealth, workers' households, 40-49

Entry	2000-2004	2004-2008	2008-2012	2012-2016	2000-2016
Net Financial Wealth	ΔW= -15%	ΔW= -23%	ΔW= -32%	ΔW= +19%	ΔW= -47%
Financial Assets	ΔA= -13% Percentage of ΔW= -121%	ΔA= -19% Percentage of ΔW= -124%	ΔA= -14% Percentage of ΔW= -68%	ΔA= -7% Percentage of ΔW= -76%	ΔA= -44% Percentage of ΔW= -134%
Financial Liabilities	ΔL= -7% Percentage of ΔW= +21%	ΔL= -11% Percentage of ΔW= +24%	ΔL= +18% Percentage of ΔW= -32%	ΔL= -35% Percentage of ΔW= +176%	ΔL= -37% Percentage of ΔW= +34%

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.23 Determinants of the change in savings, workers' households, 50-59

Entries	2000-2004	2008-2012	2012-2016	2000-2016
Savings	ΔS= -57%	ΔS= -81%	ΔS= +337%	ΔS= -44%
Direct effects				
Disposable income	ΔYD= -1% Percentage of ΔS= -11%	ΔYD= -12% Percentage of ΔS= -135%	ΔYD= -0,2% Percentage of ΔS= -3%	ΔYD= -14% Percentage of ΔS= -213%
Consumption	ΔC= +9% Percentage of ΔS= -89%	ΔC= -3% Percentage of ΔS= +35%	ΔC= -8% Percentage of ΔS= +103%	ΔC= -9% Percentage of ΔS= +113%
Indirect effects				
Labour income (YL)	ΔYL= +1% Percentage of ΔS= +12%	ΔYL= -13% Percentage of ΔS= -131%	ΔYL= +1% Percentage of ΔS= +9%	ΔYL= -12% Percentage of ΔS= -157%
Pension and Transfers (PT)	ΔPT= -13% Percentage of ΔS= -15%	ΔPT= -4% Percentage of ΔS= -4%	ΔPT= -11% Percentage of ΔS= -13%	ΔPT= -29% Percentage of ΔS= -41%

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.24 Determinants of the change in financial wealth, workers' households 50-59

Entry	2008-2012	2012-2016	2000-2016
Net Financial Wealth	ΔW= -39%	ΔW= +33%	ΔW= -23%
Financial Assets	ΔA= -29% Percentage of ΔW= -101%	ΔA= +14% Percentage of ΔW= +66%	ΔA= -19% Percentage of ΔW= -109%
Financial Liabilities	ΔL= -1% Percentage of ΔW= +1%	ΔL= -20% Percentage of ΔW= +34%	ΔL= -7% Percentage of ΔW= +9%

Source: The 2000, 2008, 2012 and 2016 SHIW

Table 3.25 Determinants of the change in savings, workers' households, 60-69

Entries	2000-2004	2008-2012	2012-2016	2000-2016
Savings	ΔS= -23%	ΔS= -91%	ΔS= +1100%	ΔS= -16%
Direct effects				
Disposable income	ΔYD= +3% Percentage of ΔS= +52%	ΔYD= -11% Percentage of ΔS= -68%	ΔYD= +14% Percentage of ΔS= +72%	ΔYD= +6% Percentage of ΔS= +156%
Consumption	ΔC= +10% Percentage of ΔS= -152%	ΔC= +6% Percentage of ΔS= -32%	ΔC= -5% Percentage of ΔS= +28%	ΔC= +13% Percentage of ΔS= -256%
Indirect effects				
Labour income (YL)	ΔYL= +6% Percentage of ΔS= +91%	ΔYL= -19% Percentage of ΔS= -107%	ΔYL= +10% Percentage of ΔS= +42%	ΔYL= +3% Percentage of ΔS= 64%
Pension and Transfers (PT)	ΔPT= -12% Percentage of ΔS= -38%	ΔPT= +88% Percentage of ΔS= +42%	ΔPT= +18% Percentage of ΔS= +16%	ΔPT= +7% Percentage of ΔS= +29%

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.26 Determinants of the change in financial wealth, workers' households, 60-69

Entry	2000-2004	2004-2008	2008-2012	2012-2016	2000-2016
Net Financial Wealth	ΔW= +97%	ΔW= -30%	ΔW= -30%	ΔW= +39%	ΔW= +34%
Financial Assets	ΔA= +91% Percentage of ΔW= +113%	ΔA= -22% Percentage of ΔW= -87%	ΔA= -30% Percentage of ΔW= -131%	ΔA= +31% Percentage of ΔW= +105%	ΔA= +36% Percentage of ΔW= +127%
Financial Liabilities	ΔL= +59% Percentage of ΔW= -13%	ΔL= +22% Percentage of ΔW= -13%	ΔL= -31% Percentage of ΔW= +31%	ΔL= +6% Percentage of ΔW= -5%	ΔL= +43% Percentage of ΔW= -27%

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.27 Determinants of the change in savings, elderly households, 65+ worker

Entries	2000-2004	2004-2008	2008-2012	2012-2016	2000-2016
Savings	ΔS= -63%	ΔS= +268%	ΔS= -41%	ΔS= +88%	ΔS= +52%
Direct effects					
Disposable income	ΔYD= -6% Percentage of ΔS= -51%	ΔYD= +16% Percentage of ΔS= +74%	ΔYD= -15% Percentage of ΔS= -145%	ΔYD= +12% Percentage of ΔS= +77%	ΔYD= +3% Percentage of ΔS= +28%
Consumption	ΔC= +8% Percentage of ΔS= -49%	ΔC= -6% Percentage of ΔS= +26%	ΔC= -6% Percentage of ΔS= +45%	ΔC= -4% Percentage of ΔS= +23%	ΔC= -9% Percentage of ΔS= +72%
Indirect effects					
Labour income (YL)	ΔYL= +25% Percentage of ΔS= +140%	ΔYL= +10% Percentage of ΔS= +45%	ΔYL= -33% Percentage of ΔS= -277%	ΔYL= +13% Percentage of ΔS= +57%	ΔYL= +4% Percentage of ΔS= +30%
Pension and Transfers (PT)	ΔPT= -67% Percentage of ΔS= -133%	ΔPT= +55% Percentage of ΔS= +23%	ΔPT= +117% Percentage of ΔS= +130%	ΔPT= -8% Percentage of ΔS= -15%	ΔPT= +2% Percentage of ΔS=+6%

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.28 Determinants of the change in financial wealth, elderly households, 65+ worker

Entry	2000-2004	2004-2008	2008-2012	2012-2016	2000-2016
Net Financial Wealth	ΔW= -35%	ΔW= +71%	ΔW= -37%	ΔW= +45%	ΔW= +2%
Financial Assets	ΔA= -3% Percentage of ΔW= -10%	ΔA= +15% Percentage of ΔW= +33%	ΔA= -38% Percentage of ΔW= -111%	ΔA= +52% Percentage of ΔW= +120%	ΔA= +4% Percentage of ΔW= +249%
Financial Liabilities	ΔL= +474% Percentage of ΔW= -90%	ΔL= -81% Percentage of ΔW= +67%	ΔL= -61% Percentage of ΔW= +11%	ΔL= +217% Percentage of ΔW= -20%	ΔL= +36% Percentage of ΔW= -149%

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.29 Determinants of the change in savings, elderly households, 65+ retired

| Entries	2000-2004	2008-2012	2012-2016	2000-2016
Savings	ΔS= -759%	ΔS= -99%	ΔS= +87%	ΔS= -148%
Direct effects				
Disposable income	ΔYD= +4% Percentage of ΔS= +88%	ΔYD= -2% Percentage of ΔS= -43%	ΔYD= +1% Percentage of ΔS +13%	ΔYD= +12% Percentage of ΔS= +1220%
Consumption	ΔC= +10% Percentage of ΔS= -188%	ΔC= +3% Percentage of ΔS= -57%	ΔC= -8% Percentage of ΔS= +87%	ΔC= +13% Percentage of ΔS= -1320%
Indirect effects				
Labour income (YL)	ΔYL= -17% Percentage of ΔS= -11%	ΔYL= 0% Percentage of ΔS= 0%	ΔYL= 0% Percentage of ΔS=0%	ΔYL= +23% Percentage of ΔS= +72%
Pension and Transfers (PT)	ΔPT= +7% Percentage of ΔS= +123%	ΔPT= -2% Percentage of ΔS= -39%	ΔPT= +2% Percentage of ΔS= +23%	ΔPT= +14% Percentage of ΔS= +1345%

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.30 Determinants of the change in financial wealth, elderly households, 65+ retired

Entry	2000-2004	2012-2016	2000-2016
Net Financial Wealth	ΔW= +19%	ΔW= +8%	ΔW= +25%
Financial Assets	ΔA= +23% Percentage of ΔW= +120%	ΔA= +5% Percentage of ΔW= +72%	ΔA= +27% Percentage of ΔW= +110%
Financial Liabilities	ΔL= +131% Percentage of ΔW= -20%	ΔL= -31% Percentage of ΔW= +28%	ΔL= +90% Percentage of ΔW= -10%

Source: The 2000, 2004, 2012 and 2016 SHIW

Table 3.31 Determinants of the change in savings, elderly households, 75+ retired

Entries	2000-2004	2008-2012	2012-2016	2000-2016
Savings	ΔS= -714%	ΔS= -71%	ΔS= +65%	ΔS= -544%
Direct effects				
Disposable income	ΔYD= +2% Percentage of ΔS= +29%	ΔYD= -6% Percentage of ΔS= -100%	ΔYD= +6% Percentage of ΔS= +61%	ΔYD= +10% Percentage of ΔS= +217%
Consumption	ΔC= +8% Percentage of ΔS= -129%	ΔC= 0% Percentage of ΔS= 0%	ΔC= -3% Percentage of ΔS= +39%	ΔC= +15% Percentage of ΔS= -317%
Indirect effects				
Labour income (YL) Pension and Transfers (PT)	ΔYL= -40% Percentage of ΔS= -10% ΔPT= +3% Percentage of ΔS= +54%	ΔYL= +33% Percentage of ΔS= +9% ΔPT= -7% Percentage of ΔS= -109%	ΔYL= -27% Percentage of ΔS= -6% ΔPT= +7% Percentage of ΔS= +70%	ΔYL= +17% Percentage of ΔS= +6% ΔPT= +12% Percentage of ΔS= +239%

Source: The 2000, 2004, 2008, 2012 and 2016 SHIW

Table 3.32 Determinants of the change in financial wealth, elderly households, 75+ retired

Entry	2008-2012	2012-2016	2000-2016
Net Financial Wealth	ΔW=+9%	ΔW= +16%	ΔW= +22%
Financial Assets	ΔA= +9% Percentage of ΔW= +105%	ΔA= +15% Percentage of ΔW= +97%	ΔA= +23% Percentage of ΔW= +106%
Financial Liabilities	ΔL= +18% Percentage of ΔW= -5%	ΔL= -18% Percentage of ΔW= +3%	ΔL= +137% Percentage of ΔW= -6%

Source: The 2000, 2008, 2012 and 2016 SHIW

Figure 3.16 Consumption patterns, white collar workers
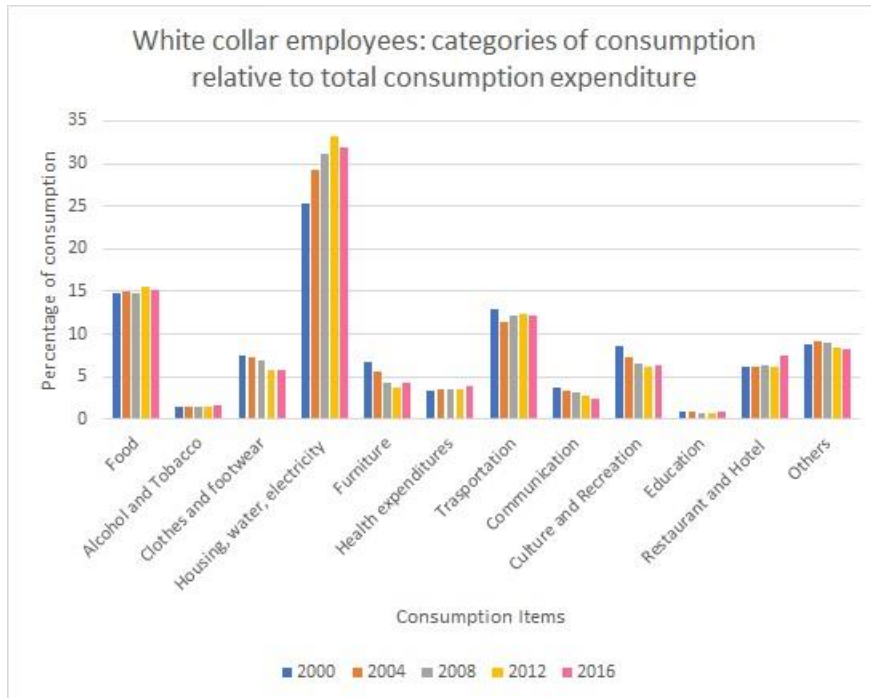
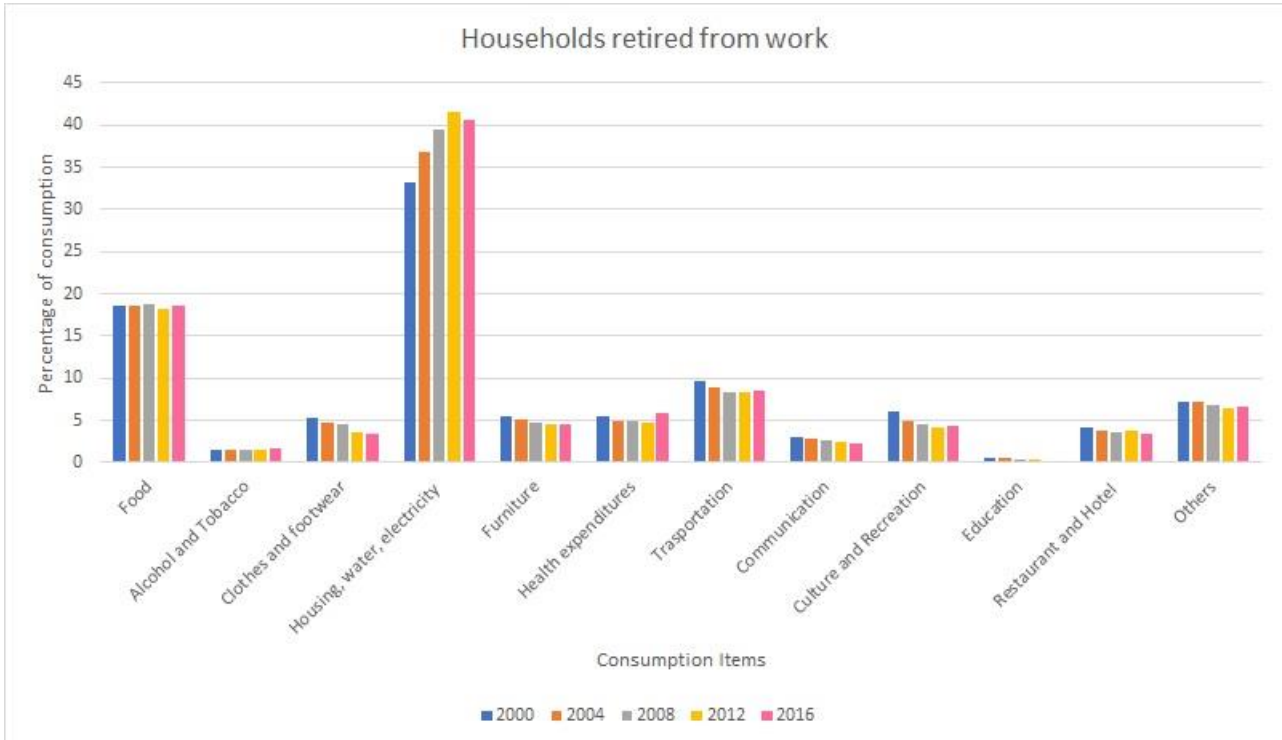Figure 3.17 Consumption patterns, blue collar workers
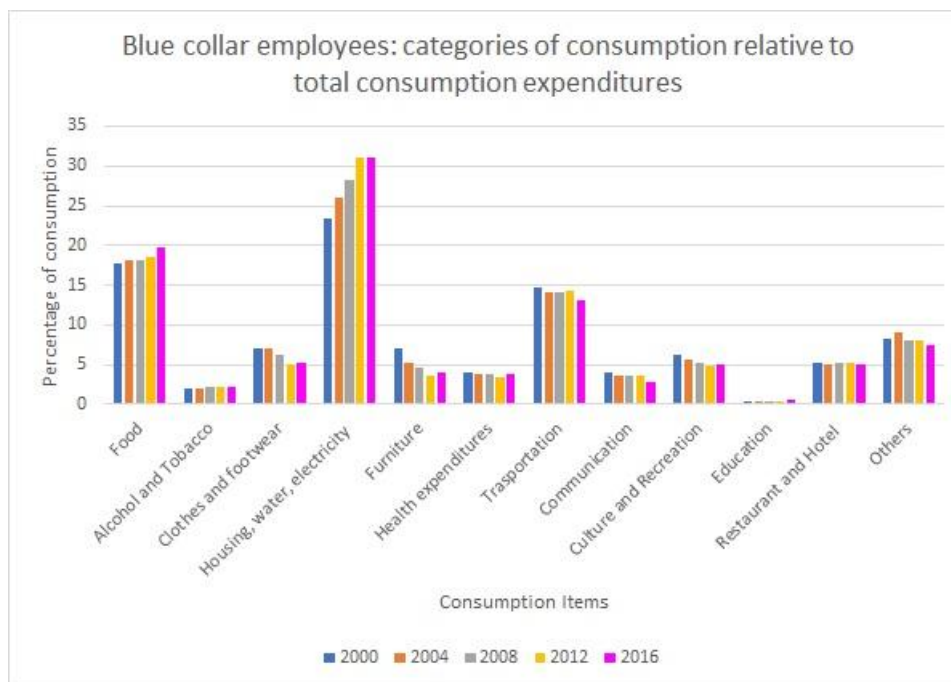
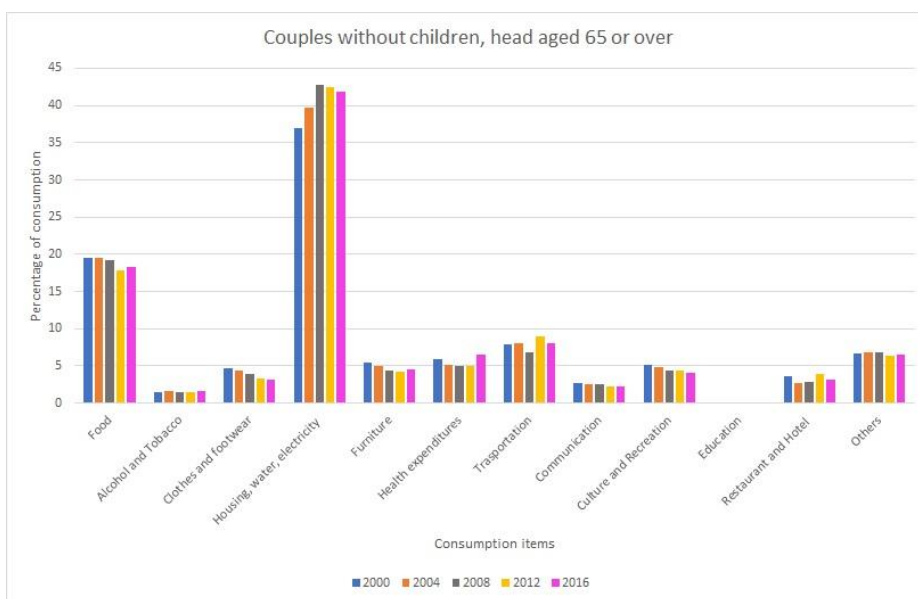Figure 3.18 Consumption patterns, households retired from work

Figure 3.19 Consumption pattern, couples without children whose head is aged 65 or over

Chapter 4

The Life Cycle of Saving in Japan in the last twenty years

4.1 Introduction

The main aim of this chapter is to verify whether the institutional effects that we have hypothesized in chapter 2 are reflected in the data. In this first section, we will see the existing literature about the application of the Life Cycle of Saving to Japan. We will then proceed to show data about saving and age collected by the Statistics Bureau of Japan in the last 20 years.

4.2 Methodology, data and definition of terms

In this paragraph, I will present the data, the definition of terms and the methodology adopted for this chapter. The data are from the statistical tables of 2000, 2005, 2010, 2015 and 2019 FIES, available on the website of the Statistics Bureau of Japan. These tables show only the average value per household. The median value is thus unknown and we cannot access to full samples, since an authorization is required. In the case of disposable income, consumption expenditures, saving flows and saving rate, as for chapter 3, the data are the yearly average of monthly figures. On the other hand, net financial wealth is a yearly figure. All the values were converted to 2019 yen and then to euro using the consumer price index of the examined years and the market exchange rate in 2019. The FIES, in contrast with the SHIW, gives information about taxes and contributions paid by households and does not include imputed rent in income.

For this reason, disposable income is defined as:

$$\text{Disposable Income} = \text{Gross Income} - \text{Non-consumption expenditure} \tag{4.1}$$

Where Non-consumption expenditure refers to the sum of direct taxes and social security contributions.

Concerning the definitions of saving flows, saving rate and net financial wealth, they are the same as equations 3.2, 3.3 and 3.4.

When explaining the contribution of different variables to the changes in the flow of savings in Appendix II, by direct effects I mean the impact of disposable income and consumption expenditures. On the other hand, indirect effects are represented by gross income and non-consumption expenditures (which influence the saving flows by affecting disposable income). Social security benefits and labour income are both part of gross income and so their effect should be considered as part of it. While gross income comes also from sources other than labour income and social security

benefits (such as capital income) I considered only these variables because they account for the largest part of income.

Regarding the methodology of analysis, as in chapter 3 we first observe the changes in income, consumption, saving flows and saving rate of employees' households over the years. We then observe differences between groups and try to estimate a saving-age profile. Given that the observation of cross-sections is not suitable to evaluate the changes that happen with age, we construct cohorts with the repeated cross-section method in order to confirm our assumptions. As opposed to the SHIW, the FIES gives detailed information about consumption and allows us to see its changes over the years. After the analysis of the employees' flow data, we study the case of elderly households. Finally, we examine net financial wealth of all the groups.

4.3 Results

4.3.1 Employees' households

Tables 4.1, 4.2, 4.3 and 4.4 show respectively the disposable income, consumption, saving flows and saving rate by age of the household's head for employees' two or more person households in different years. The graphic representation of the results is given by figures 4.1, 4.2, 4.3 and 4.4.

By looking at table 4.4, we can see that the saving rate decreased for all the age categories between 2000 and 2005. The groups under 29, 30-39 and 40-49 reported a fall in the saving rate of respectively 1,4, 1,5 and 1,3 percentage points. This was due to a decrease in disposable income and saving flows. Particularly, the decrease in disposable income was mainly caused by a fall in gross income, while the decrease in non-consumption expenditure had a positive effect but it was lower than the negative effect (see Appendix II for detailed tabulation). Concerning saving flows, all these groups reduced their consumption, causing thus a positive effect on the variable, but the negative impact of the decline in disposable income was bigger.

Table 4.1. Disposable Income by age of the household's head: workers, 2 or more person households (Euro 2019)

| Year	Average	-29	30-39	40-49	50-59	60-69	70+
2000	4.006	2.938	3.644	4.326	4.509	3.286	3.187
2005	3.806	2.770	3.521	4.138	4.207	3.029	2.463
2010	3.729	2.744	3.472	4.161	4.079	2.935	3.026
2015	3.572	2.882	3.486	3.891	3.938	2.754	2.856
2019	3.907	3.281	3.797	4.143	4.432	3.120	2.900

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.2. Consumption Expenditure by age of the household's head: workers, 2 or more person households (Euro 2019)

Year	Average	-29	30-39	40-49	50-59	60-69	70+
2000	2.887	2.173	2.472	3.068	3.283	2.719	2.434
2005	2.843	2.086	2.440	2.987	3.199	2.704	2.285
2010	2.760	2.009	2.367	2.848	3.123	2.755	2.488
2015	2.637	2.105	2.290	2.710	2.918	2.604	2.150
2019	2.654	1.814	2.361	2.741	2.972	2.514	2.214

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.3. Saving Flows by age of the household's head: workers, 2 or more person households (Euro 2019)

Year	Average	-29	30-39	40-49	50-59	60-69	70+
2000	1.119	765	1.172	1.258	1.226	567	753
2005	963	684	1.081	1.151	1.008	325	178
2010	969	735	1.105	1.313	956	180	538
2015	935	777	1.196	1.181	1.020	150	706
2019	1.253	1.467	1.436	1.402	1.460	606	686

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.4. Saving rate by age of the household's head: workers, 2 or more person households (Euro 2019)

Year	Average	-29	30-39	40-49	50-59	60-69	70+
2000	27,9	26,1	32,2	29,1	27,2	17,3	23,6
2005	25,3	24,7	30,7	27,8	24,0	10,7	7,2
2010	26,0	26,8	31,8	31,6	23,4	6,1	17,8
2015	26,2	27,0	34,3	30,3	25,9	5,5	24,7
2019	32,1	44,7	37,8	33,8	32,9	19,4	23,6

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Figure 4.1. Age profile of Disposable Income: workers, 2 or more person households (Euro 2019)
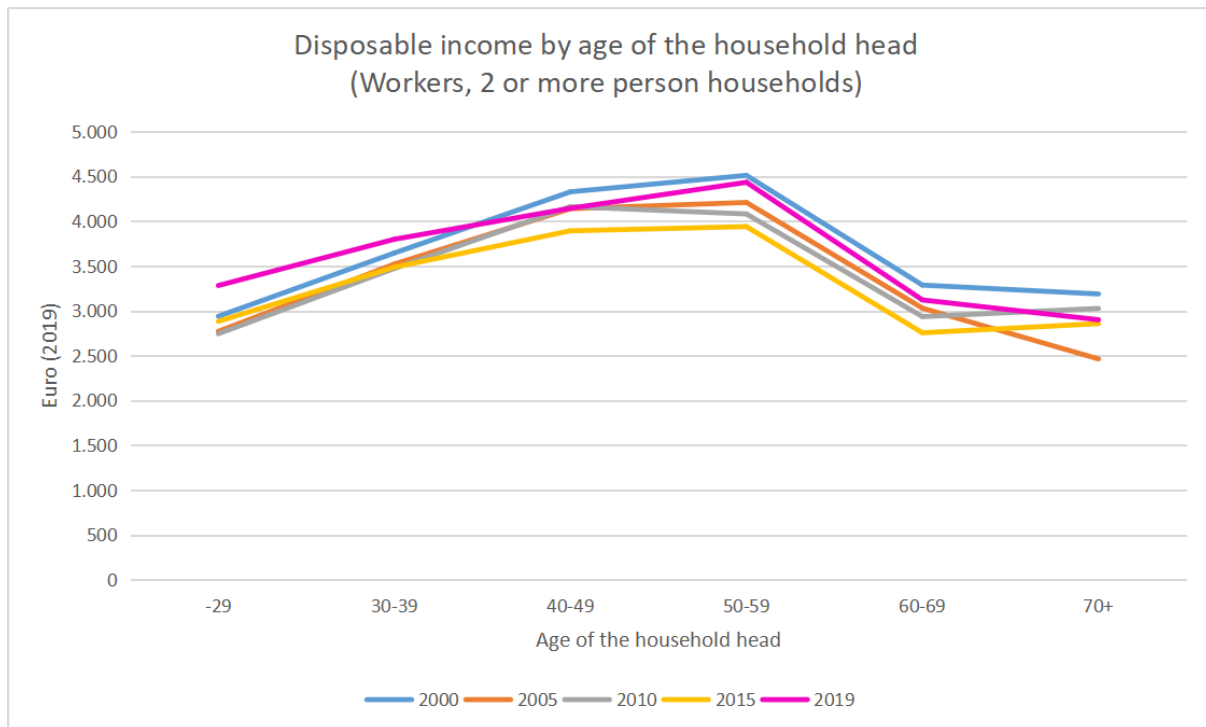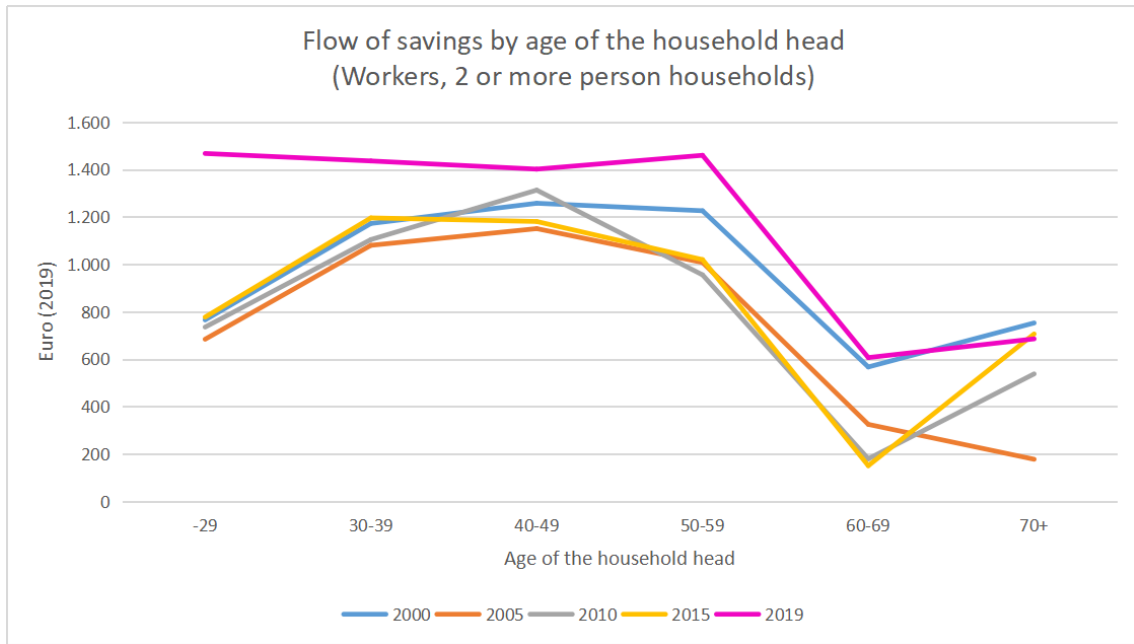

Disposable income by age of the household head
(Workers, 2 or more person households)

Figure 4.2. Age profile of Consumption: workers, 2 or more person households (Euro 2019)
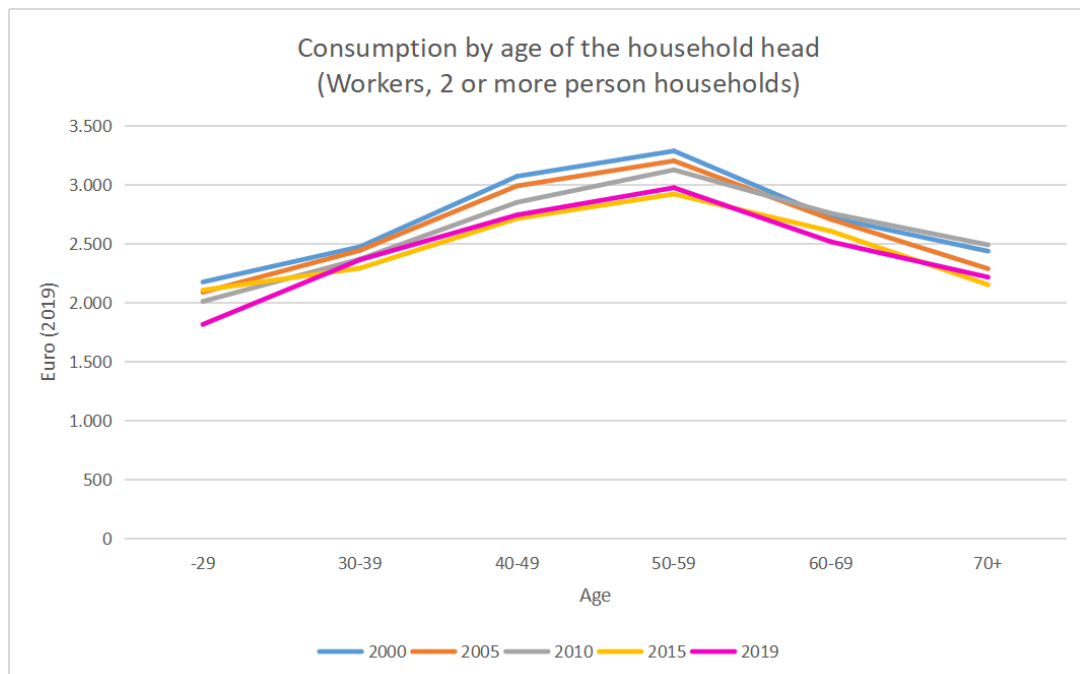
Consumption by age of the household head
(Workers, 2 or more person households)

Figure 4.3. Saving flows by age of the household's head: workers, 2 or more person households (Euro 2019)

Figure 4.4. Age profile of the saving rate: workers, 2 or more person households (Euro 2019)
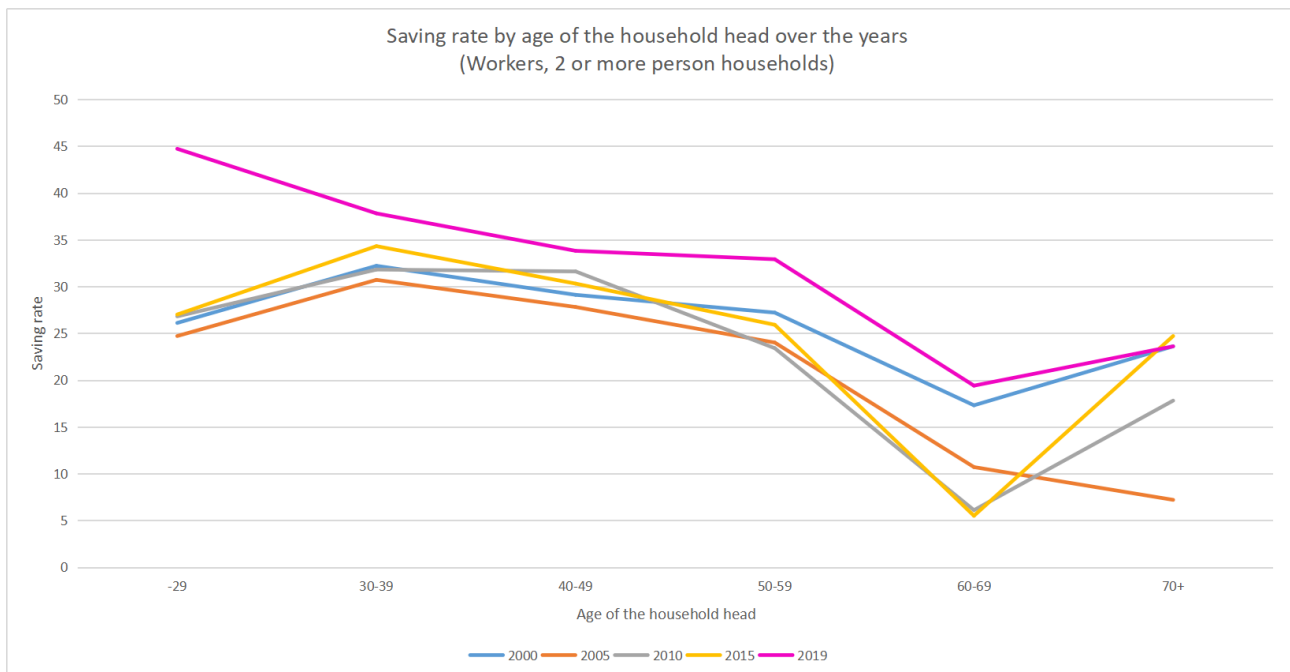
The groups 50-59, 60-69 and 70 or over were however the most affected. They reported respectively a fall in the saving rate of 3,2, 6,6 and 16,4 percentage points (table 4.4, figure 4.4). The group 50-59 showed a decrease of 7% in disposable income and of 18% in the flow of savings. As the other age

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groups, the fall in disposable income was caused by a decrease in gross income, while non-consumption expenditures were reduced. The decrease in consumption had a positive effect on the flow of savings but, as the other groups, it was lower than the impact of the decline in income. Concerning the group 60-69, the reduction in the flow of savings and in disposable income were respectively 43% and 8%. Despite the decline in income, this group did not cut down on consumption expenditures. In contrast with other groups, the effect of the change in social security benefits was quite strong. This reflects the fact that, even if the household's head is a worker, the social security benefits are an important part of income for this age group. A fall in social security benefits of 21% accounts for 73% of the change in saving flows, while the 8% decrease of the same variable for the group 50-59 translated into a small effect (2% of the change). It is important to notice that in this same period, the eligibility age for the basic pension was raised to age 61 in 2001 and age 62 in 2004. Thus, less people of this age group had the right to pension benefits compared to 2000. Also the group 70 or over reported a decline in social security benefits, by 33%, which explains 89% of drop in savings.

After 2005, the saving rates of the households based on the age of their head didn't change much, apart from the groups aged 60-69 and 70 or over. From 2005 to 2010, the saving rate of the group 60-69 declined by 4,6 percentage points, while that of the group aged 70 or over increased by 10,6 percentage point. The group 60-69 exhibited a fall in the flow of savings of 45%, and a decline in disposable income of 3%. The decrease in disposable income was mainly caused by a 22% rise in non-consumption expenditures (of which direct taxes +30% and social security contributions +16%, but the second variable accounts for a bigger part of the decline). Indeed, gross income didn't lower, so it did not cause the fall of the variable. The drop in the flow of savings is explained by both the rise in consumption (which accounts for 35% of the decline) and by the fall in disposable income (65% of the change in savings).

With respect to the group 70 or over, the large increase in the saving rate between 2005 and 2010 is explained by a 202% rise in the flow of savings and by a 23% growth in disposable income. Even though non-consumption expenditures increased by 59%, disposable income upsurged due to an increase in gross income caused in large part by the rise in social security benefits (+43%). Indeed, social security benefits account for 126% of the change in saving flow. As regards direct effects on the flow of savings, the negative impact of the increment in consumption expenditures was outpaced by the growth of disposable income. Moreover, the saving rate of this group increased again by 6,9 percentage points from 2010 to 2015. While income had a negative effect because of another fall in social security benefits, lower consumption expenditures (-14%) boosted savings.

From 2015 to 2019, the saving rate grew remarkably for all age groups except 70 or over. The rise was particularly striking for the group under 29, whose saving rate increased by 17,7 percentage points. If we look at figure 4.4, we can clearly see how the cross-section age profile of the saving rate was completely transformed in 2019 due to this change in the savings of the young. The group's disposable income was 14% higher than 2015, while the flow of savings grew by 89%. Disposable income was mainly influenced by gross income, while the decrease in non-consumption expenditure had a very small effect. Social security contributions did not change compared to 2015, while direct taxes decreased by 8%. Gross income expanded because of a rise in labour income, but also following higher social security benefits. Indeed, labour income accounts for 43% of the change in the saving flows, while social security benefits explain 13% of it. When it comes to direct effects, both disposable income and consumption played a positive role. Specifically, consumption expenditure fell by 14%, and it corresponded to 42% of the change in the flow of savings.

Age groups 30-39 and 40-49 showed both a rise in the saving rate of 3,5 percentage points. Disposable income and the flow of savings were higher compared to 2015 for these two groups. Non-consumption expenditures had a negative effect on disposable income, mainly because of social security contributions' rise, but the growth of labour income and social security benefits outpaced this impact. However, in contrast with the group under 29, consumption expenditures augmented.

The saving rate of the groups 50-59 and 60-69 respectively increased by 7 and 13,9 percentage points. In the first case, disposable income was 13% higher than in 2015, while the flow of savings expanded by 43%. The negative influence of the rise of consumption on the saving flow was outpaced by disposable income. Concerning this last variable, social security contributions and taxes had a negative effect on it, but it was more than counterbalanced by the increase of gross income (especially labour income). The second group shows instead a 302% upsurge in the flow of savings and a 13% growth in disposable income. Also in this case, the rise in non-consumption expenditures was more offset by labour income and social security benefits. Even though income increased, this group reduced its consumption.

Finally, the group aged 70 or over was the only one who registered a saving rate that was lower than in 2015, with a drop of 1,1 percentage points. This happened because, despite an increase in disposable income, a rise in consumption expenditure caused the saving flow to decrease.

In the end, what is the difference between the saving rate of each age group in 2000 and in 2019? All the groups show higher saving rates except 70 or over. The group under 29 reported an increase in the saving rate of 18,6 percentage points. The gross income of this group expanded by 12% thanks to both a rise in labour income (+9%) and in social security benefits (+272%). Particularly, the increase

in labour income explains a bigger part of the change in gross income, compared to social security benefits. For this group, gross income contrasted the negative effect of non-consumption expenditures (+15%, mainly social security contributions) on disposable income. Moreover, not only did disposable income increase, but the growth in savings was also supported by the decrease in consumption (-17%).

The groups 30-39, 40-49 and 50-59 displayed a rise in the saving rate by 5,6, 4,7 and 5,7 percentage points respectively. The households whose head was aged 30-39 experienced an increase in both the flow of savings and in disposable income. Although non-consumption expenditures augmented, social security benefits rose by 267%, having a bigger impact than labour income (which had a positive growth rate for the groups 30-39 and 50-59) and thus outpacing negative effects on disposable income. Moreover, consumption decreased as well (-4%). The group 40-49 showed a rise in the saving flows but a reduction in disposable income, which resulted mainly from the expansion in non-consumption expenditures (+22%). However, the positive influence of the decline in consumption on the saving flows was bigger than the negative one brought by disposable income. The same pattern results from the group 50-59, who showed an increase in the saving flow due to a reduction in consumption, while displaying a decrease in disposable income, mostly caused by the rise in non-consumption expenditures.

Finally, the change in the saving rate of the groups 60-69 and 70 or over was 2,1 and 0 percentage points. In the first case, the change was similar to the one of the groups 40-49 and 50-59: disposable income fell but the reduction in consumption caused the flow of savings to rise. In the second case, even if the change is 0, the pattern of saving is altered compared to 2000. The upsurge in non-consumption expenditures and the fall in social security benefits and in labour income have a negative effect on disposable income. However, a decrease in consumption expenditures counterbalances disposable income and causes the flow of savings to decline as much as disposable income (-9%), thus resulting in a 0 percentage points change in the saving rate.

Given the changes in disposable income of the different groups, we can say that the rise in social security contributions and in direct taxes, which is necessary for increasing the financing of the elderly-related expenditures, as we have seen in chapter 2, does not cause the income of the groups under 29 and 30-39 to decrease because of higher labour income and social security benefits, compared to the past. On the other hand, the older groups could not count on a gross income's growth and social security benefits were lower for households aged 60-69 and 70 or over. Nevertheless, the fall in consumption expenditures exceeded the change in disposable income for all the groups except the oldest one, and thus their saving rate was higher.

We saw that consumption decreased for all the age groups. Looking at consumption for different items relative to total consumption expenditure, we notice that the proportion of "food" increased in all the households, while the percentage of "others" (including social expenses) fell for all the households (see Appendix II for consumption patterns). Moreover, young people experienced a rise in other essential goods such as "housing" and "electricity, gas and water". Even if housing expenditures as a percentage of total consumption has increased for the group under 29, the absolute value decreased, probably because of the higher access to mortgages (housing expenditures do not include loan repayments). Overall, we can say that households in 2019 consume less and focus more on essential goods compared to 2000.

Until now we have seen how did savings and the saving rate change for the same age category over the years. But what can we say about the differences in savings and in the saving rate among distinct groups? We will consider years 2000, 2015 and 2019 to see the change over time among the categories. There was not a big change in the cross-section profile between 2000 and 2015, but since we want to make a comparison with Italy in chapter 3 and given that Italian data are available until year 2016, we will consider year 2015 to have an idea of how the two countries' cross section profiles were different in that period.

Concerning the difference between the group 29 and under and 30-39, in 2000 the second group's saving rate was 6,1 percentage points higher. This was due to the fact that, while disposable income was higher by 24%, savings exceeded those of the group 29 and under by 53% (see Appendix II). The gap in disposable income was caused by a higher gross income (+26%), despite more non-consumption expenditures (+43%). In relation to gross income, the higher level was the result of greater labour income (+28%). Indeed, social security benefits did not have an impact on the discrepancy in income. With respect to the divergence in the flow of savings, while the higher level of consumption (+14%) has a negative effect on the savings of the group 30-39, the rise in disposable income counterbalances it (consumption accounts for -73% of the divergence, while disposable income explains +173% of it). Consumption expenditures of the group 30-39 are higher mainly because of food, recreation, education and others (including social expenditures). Later, in 2015, the saving rate of households whose head is aged 30-39 surpassed that of the younger group by 7,3 percentage points. The pattern of the disparity is not very dissimilar to 2000. Disposable income of the second group is 21% higher than households whose head is aged 29 and under, while the flow of savings is larger by 54%. As in 2000, the positive influence of gross income outpaces the negative consequences of the increase in non-consumption expenditures. Moreover, consumption of the group 30-39 is again more than that of the younger group, but disposable income outweighs it. In 2019, the

cross-section profile of these groups is altered. The saving rate of the older group is 6,9 percentage points lower than that of households aged 29 and under. This happened because disposable income of the group 30-30 was larger (+16%) but it was accompanied by less savings (-2%). In effect, since this group displayed extremely bigger consumption (+30%), this variable generated the lower level of savings compared to the group 29 and under. The items that push the consumption of the group 30-39 up, compared to the younger group, are the same as year 2000 in 2015 and 2019.

Regarding the groups 30-39 and 40-49, in 2000 the saving rate of the latter was 3,1 percentage points lower than that of the former. This situation derived from the fact that, although disposable income was 19% higher than that of the group 30-39, the flow of savings was only 7% larger. In 2015 and 2019, the saving rate of households whose head is aged 40-49 was 4 percentage lower compared to that of households aged 30-39. In both years the disposable income of the older group exceeded that of the younger (+12% in 2015 and +9% in 2019), but the flow of savings was smaller (-1% in 2015 and -2% 2019) because of higher consumption expenditures, mainly related to food, education and others. In every year the older group exhibited more non-consumption expenditures than the younger, but the impact on disposable income was more than offset by gross income, driven by higher wages.

The saving rate of households whose head is aged 50-59 fell below the value of the group 40-49 in all the three years considered (-1,9 points in 2000, -4,4 points in 2015 and -0,9 points in 2019). While in 2000 and 2015 disposable income of the older group was higher but the flow of savings was lower, in 2019 both variables were larger than the younger group. However, insomuch as the positive gap in savings was lower than that in disposable income (+4% and +7% respectively), the saving rate of the group 50-59 was under the level of households aged 40-49. The consumption of the older group is higher than that of the younger in all the three years considered, primarily because of transportation and communication and others.

This last pattern of the saving rate applies between the groups 50-59 and 60-69 too: the value showed by the older group is lower (-9,9 percentage points in 2000, -20,4 points in 2015 and -13,5 points in 2019). In this case, the disposable income and the flow of savings of households whose head is aged 60-69 were always lower compared to households whose head is 50-59 years old (and the percentage difference in savings exceeded the one in income). Even if non-consumption expenditures of the second group were lower and social security benefits were higher, the disparity in labour income could not be counterbalanced, resulting thus in the disposable income's discrepancy that we have seen. The lower labour income is probably due to the "mandatory retirement" process that we have seen in chapter 2. Indeed, if workers retire at age 60 and get rehired, their wage is lower compared to before. Concerning the flow of savings, the group 60-69 consumed less than the group

50-59 in all the three years, but the degree of this positive influence was not enough to counteract the consequences of lower income. Interestingly, housing expenditures are considerably higher for the group 60-69 compared to the group 50-59 (except for 2019). This could mean that while before 2019 many people who worked after age 60 probably needed to pay a rent, working at an advanced age is now common for more people.

Finally, the group 70 or over presented higher saving rates compared to group 60-69 in the three years (+6,3 points in 2000, +19,2 points in 2015 and +4,2 points in 2019). In 2000 and in 2019 the disposable income of the older group was lower than that of the younger, but savings were higher thanks to lower consumption. On the other hand, in 2015 households aged 70 or over showed higher disposable income (+4%) and more savings (+369%) compared to the group 60-69. The level of disposable income exceeded that of the younger households despite lower gross income, as a result of a reduction in non-consumption expenditures (-30%). Nonetheless, it is the effect of lower consumption that accounts for most of the positive gap in savings (it explains +82% of the change, while higher disposable income justifies +18% of it).

Again, we have to recognize the limits of an analysis simply based on cross-section observations. In the case of FIES, panel data are not available, so we use again the repeated cross-section method that we have deployed also for Italy in chapter 3. Figures 4.5, 4.6 and 4.7 show respectively the age profile of disposable income, consumption and saving rate for different cohorts. Here, cohorts are defined by a birth year interval of five years. Unfortunately, the FIES stopped reporting data by five years intervals for groups under age 34 in 2015, so the youngest cohort that we can track is the one born between 1976 and 1980. The period between 2015 and 2019 is four years long, while the other years are separated by a five-year interval. While it would be more accurate to represent only data from years separated by the same period of time, given that only the youngest households of the cohorts should be cut out of the group in 2019 (for example, those who were born in 1980 are 39 instead of 40 in 2019, but they are represented in the group 40-45), data from the 2019 FIES were included as well.

As we can see from figures 4.5 and 4.6, both disposable income and consumption reach their peak when the household's head is either in the 45-49 or in the 50-54 age group for almost all the cohorts that we can track during the middle years of their life. Concerning the saving rate (Figure 4.7) the movements are less steady but we can still see a sort of reversed-U shape until age 60-64. Moreover, all the cohorts that were 55-59 and 60-64 in the period examined showed a decrease in the saving rate during the passage from the former to the latter age group. Similarly, their saving rate increased again from 60-64 to 65-69 and then to 70 or over (except for the cohort 1931-1935, who became 70 or over
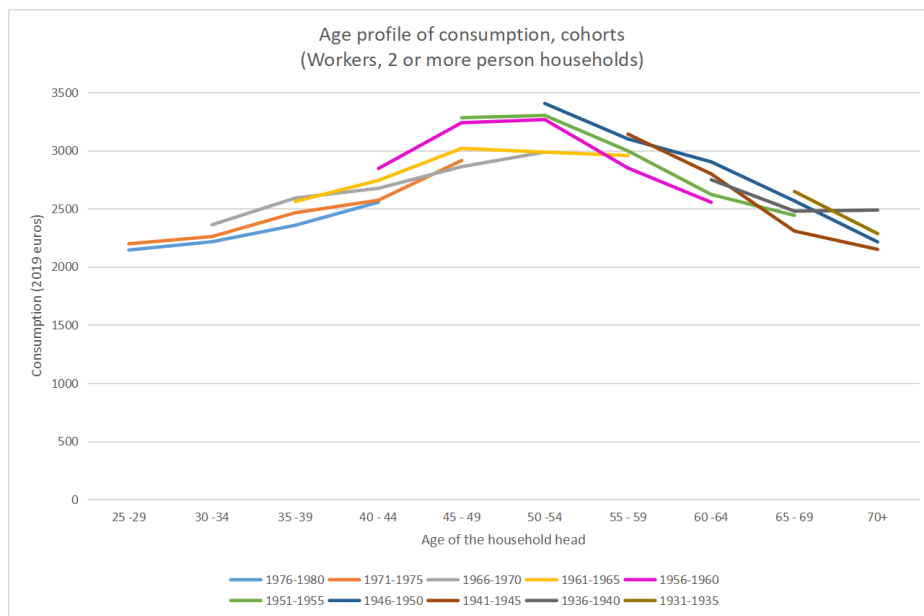
in 2005). This happens because the fall in income is not offset by consumption in the first passage, while after age 60-64 households adapt their expenditures to the lower level of entries.
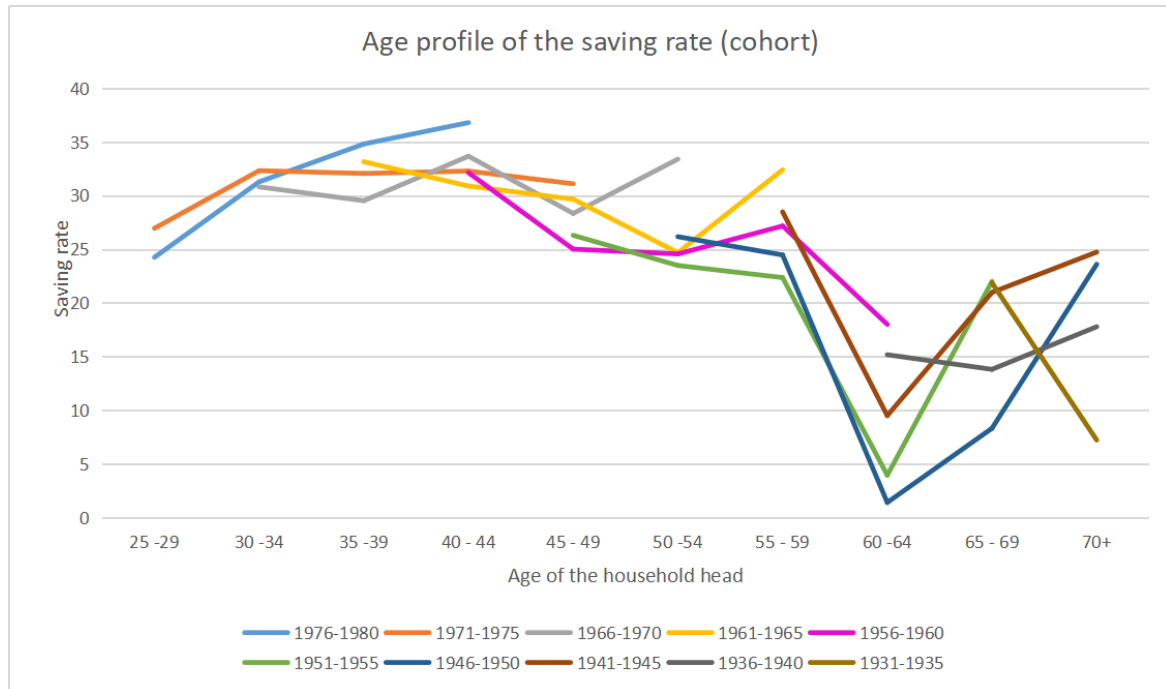
Figure 4.5: Disposable income by cohort
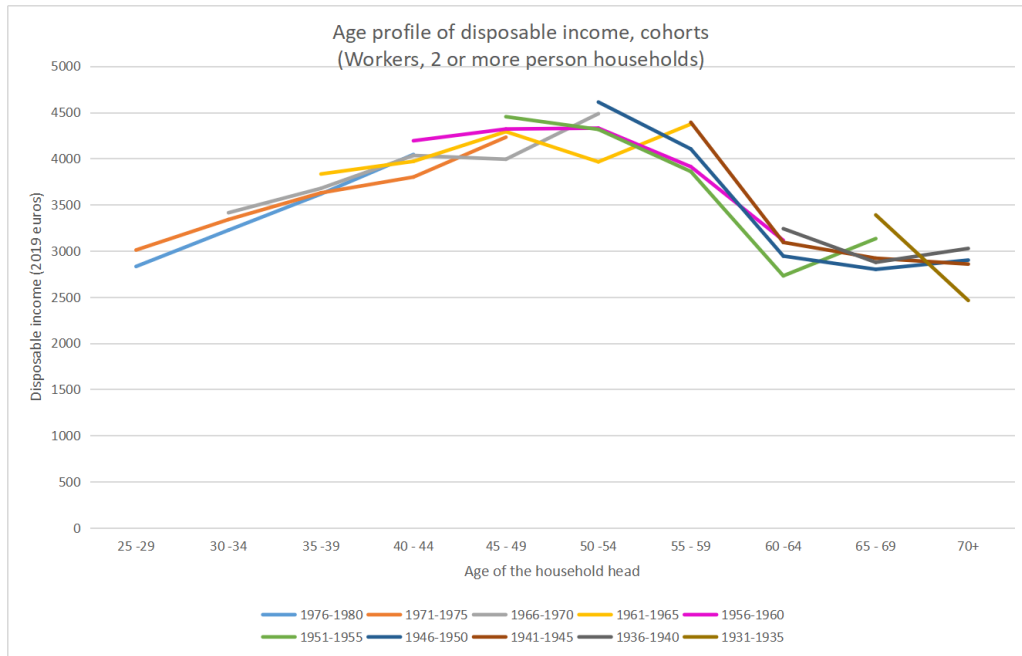
Figure 4.6: Consumption expenditure by cohort

Figure 4.7: Saving rate by cohort

Age profile of the saving rate (cohort)

4.3.2 Income, Consumption and Savings of the elderly based on their occupation status

In the previous paragraph, we examined the change of saving over life for workers' households. However, in order to have a more complete picture of saving over life, we have to consider how does the saving rate change during retirement. Tables 4.5 to 4.9 report the disposable income, social security benefits, consumption expenditure, saving flows and saving rate of households whose head is classified as elderly, based on the head's occupation status.

Table 4.5: Disposable income of the eldery, by their occupation status (euro 2019)

Year	65+ worker	65 + retired	75+ retired
2000	3343	1883	1762
2005	2789	1767	1745
2010	2951	1684	1759
2015	2822	1538	1519
2019	3050	1747	1708

Table 4.6: Social security benefits of the elderly by their occupation status (euro 2019)

| Year	65+ worker	65 + retired	75+ retired
2000	1357	1835	1737
2005	1029	1747	1767
2010	1253	1715	1810
2015	1126	1536	1554
2019	1311	1674	1678

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.7: Consumption expenditure of the elderly by their occupation status (euro 2019)

Year	65+ worker	65 + retired	75+ retired
2000	2598	2053	1833
2005	2433	2086	1882
2010	2355	2093	1893
2015	2458	2049	1900
2019	2360	1981	1824

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.8: Saving flows of the elderly by their occupation status (euro 2019)

Year	65+ worker	65 + retired	75+ retired
2000	745	-171	-71
2005	357	-319	-136
2010	595	-409	-134
2015	364	-512	-381
2019	690	-233	-116

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.9: Saving rate of the elderly by their occupation status

Year	65+ worker	65 + retired	75+ retired
2000	22,3	-9,1	-4
2005	12,8	-18	-7,8
2010	20,2	-24,3	-7,6
2015	12,9	-33,3	-25,1
2019	22,6	-13,4	-6,8

Figure 4.8: Disposable income of the elderly by their occupation status (euro 2019)
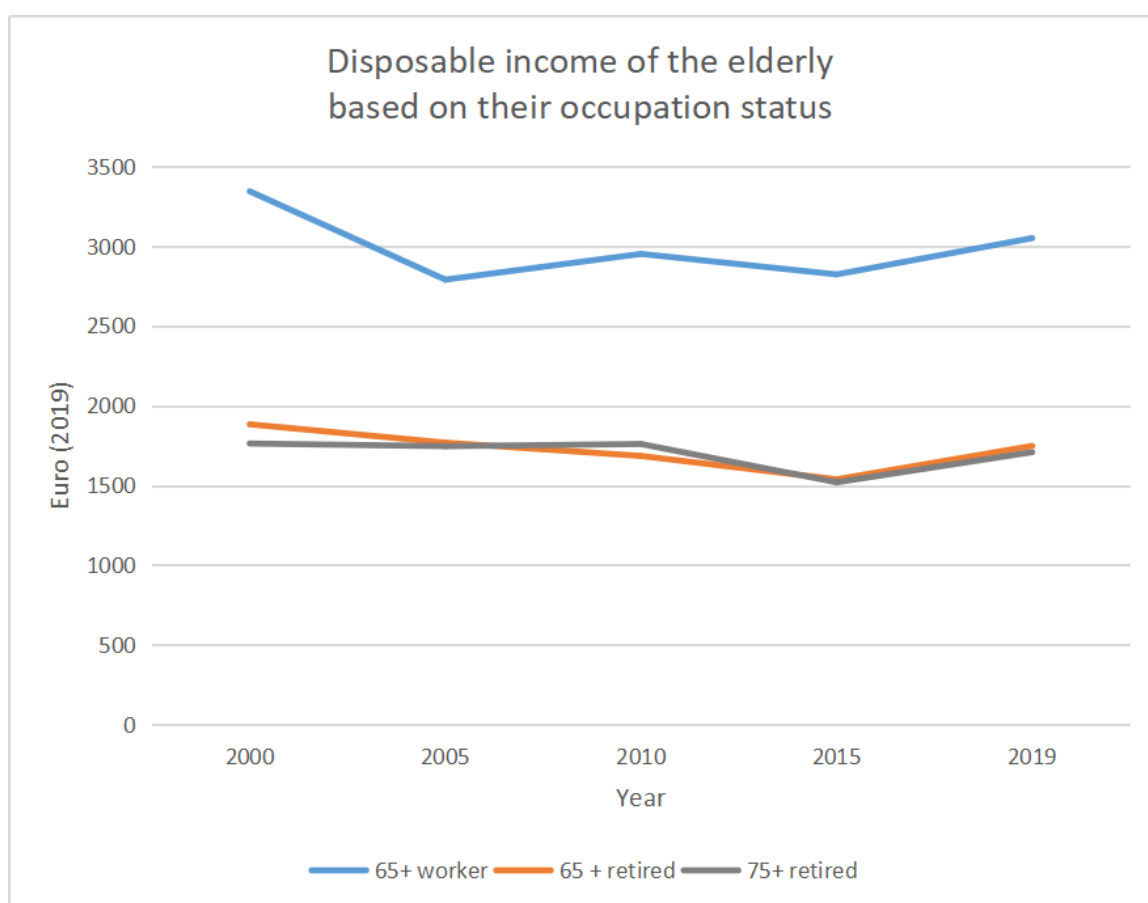
Figure 4.9: Consumption expenditure of the elderly by their occupation status (euro 2019)
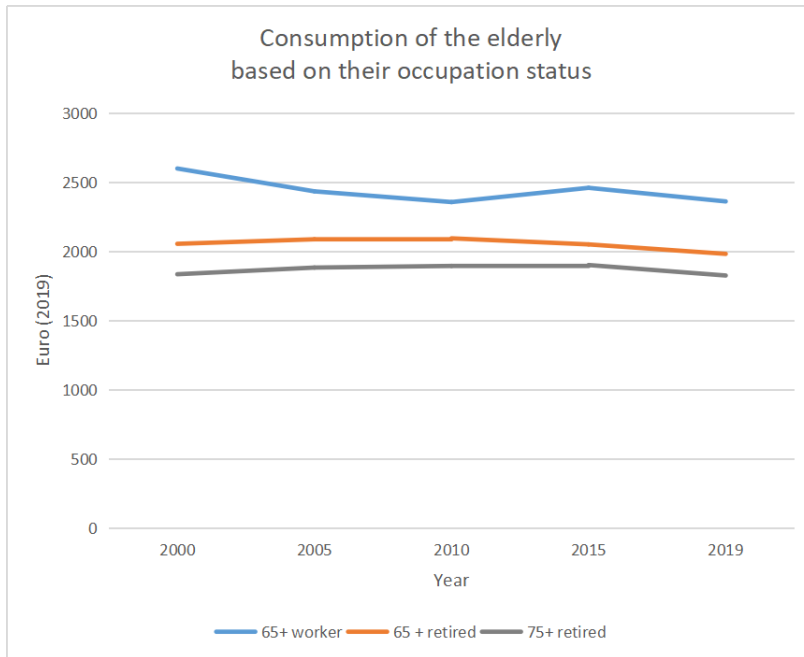
Figure 4.10: Saving rate of the elderly by their occupation status
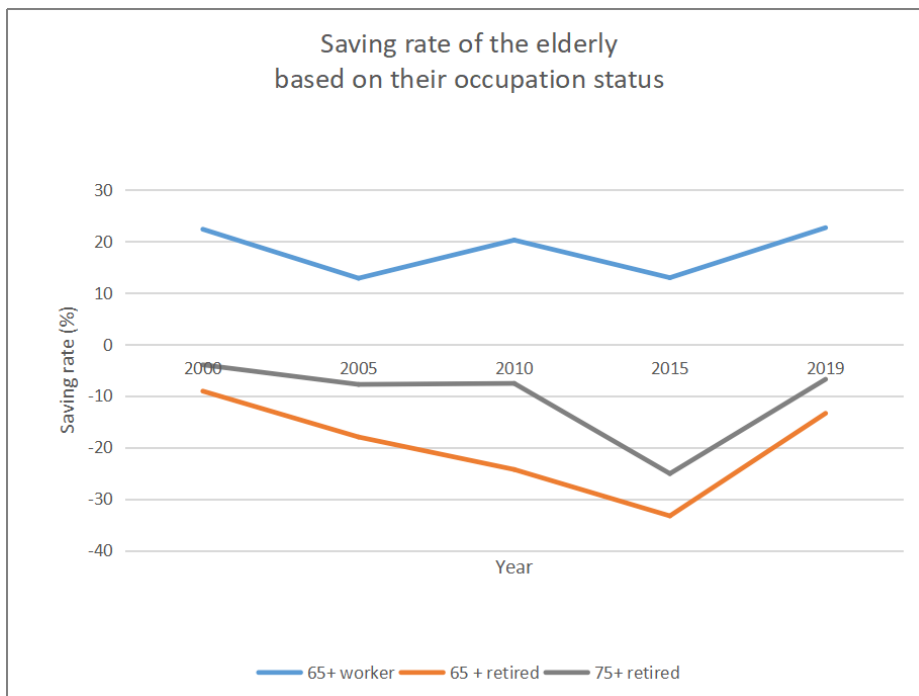
The graphic representation of disposable income, consumption and saving rate of these households is given by figures 4.8 to 4.10. As we can see from table 4.5 and figure 4.8, disposable income of households whose head was a worker aged 65 years or over decreased remarkably from 2000 to 2005

(-17%). This was due to a decline in labour income (-10%) and in social security benefits (-24%). The flow of savings dropped by a higher rate compared to disposable income (-52%) and this caused the saving rate to decline (Figure 4.10). Consumption expenditures (-6%) had a positive effect on the saving flow but they were outpaced by the fall in disposable income. Social security benefits explain a higher percentage of the change in the flow of savings compared to labour income (see Appendix II for details). Later, the saving rate increased and decreased alternatively, following the change in disposable income and in the flow of savings. In all the periods, the change in social security benefits accounts for a higher percentage of the rise or fall in saving flows compared to labour income. Moreover, the percentage change in labour income is always lower than the change in social security benefits. In the end, however, if we compare data about 2000 and 2019, labour income has gone through a higher percentage change (-6%) compared to social security benefits (-3%). From 2000 to 2019, both disposable income and the flow of savings diminished (-9% and -7% respectively), but since the flow of savings has decreased less than disposable income, the saving rate is 0,3 points higher compared to 2000 (table 4.9). Considering the whole period, labour income explains a higher proportion of the decline in the flow of savings than social security benefits. On the other hand, consumption (-9%) had a positive effect on the saving flow. As regards the fall in disposable income, it was caused by both the decline in gross income (-5%), that accounts for 60% of the decrease, and the rise in non-consumption expenditures (+32%), which explains 40% of the change in disposable income. Particularly, non-consumption expenditures increased because of social security contributions, given that direct taxes decreased for this group.

Concerning households whose head is retired and aged 65 years or over, the saving rate is negative for all the period examined, but it declined steadily between 2000 and 2015. Later, it rose between 2015 and 2019, but it was still lower than the 2000 level. Between 2000 and 2015, disposable income of these households diminished by 18%, while the flow of savings went down by 200%. This caused the saving rate to fall by 24,2 percentage points between 2000 and 2015. By looking at direct effects, we see that the change in the saving flow is totally explained by the decrease in disposable income, since consumption did not change between 2000 and 2015. The main cause of the change in disposable income is the fall in gross income (which accounts for 81% of the decrease), while the rise in non-consumption expenditures (+35%), mainly due to social security contributions, explains 19% of the variation. Gross income was affected by the change in social security benefits (-16%) but it also experienced the positive influence of the rise in other sources of income. Indeed, if we calculate the percentage of social security benefits to gross income, we find out that it passed from 88,5% in 2000 to 85,5% in 2015. Later, from 2015 to 2019, disposable income rose by 14%, consumption declined by 3% and the saving flow increased by 54%. This pattern produced a 19,9 percentage points

growth in the saving rate. However, the rate was 4,3 points lower than in 2000, due to the reduction in disposable income (-7%) and in the flow of savings (-36%) compared to 2000. Disposable income was eroded by the fall in gross income (explained by the drop in social security benefits) and by the increase in non-consumption expenditures, that had a slightly higher effect than gross income. Consumption fell below the 2000's level (-4%) and had a positive effect on the flow of savings, but it was outpaced by the negative change in disposable income.

Finally, the saving rate of households whose head is aged 75 years or over and retired underwent negative change from 2000 to 2005, and, by a higher rate, from 2010 to 2015. It later rose again from 2015 to 2019. From 2000 to 2005, disposable income declined by 1%, while the flow of savings experienced a fall by 92%. The change in savings was thus explained mainly by the rise in consumption expenditures (+3%) despite the decrease in disposable income. Afterwards, from 2010 to 2015, disposable income lowered by 14% while consumption did not change. This resulted in a drop in the flow of savings by 184% and in the saving rate by 17,5 percentage points. The variation in disposable income is completely explained by the fall in gross income, which is in part due to the negative growth of social security benefits (-14%). From 2015 to 2019 the rise in disposable income and the fall in consumption expenditures caused the flow of savings and the saving rate to grow. However, these variables were lower than in 2000, mainly because of the decline in disposable income caused by a rise in non-consumption expenditures (+53%) and which was not accompanied by a significant decrease in consumption.

We might think that the fall of social security benefits that affected retired households is the result of the policies that we have seen in chapter 2. Nonetheless, the real values of the full monthly pension benefits declined only after 2013, while these data show a fall after 2000 and a rise after 2015. Given that the data do not reflect the changes of the pension amounts that we have seen in chapter 2, we can assume that they are more influenced by years of contributions rather than by the policies implemented. Regarding the effects of other policies that we have examined in chapter 2, we notice that the growth of social security contributions, necessary for financing increasing social security related public expenditures, have targeted not only working age households but also retirees.

Concerning consumption expenditures of these three groups, we have seen that, while the variable decreases from 2000 to 2019 for the groups "65+ worker" and "65+ retired", it does not change much for the households "75+ retired". However, all the groups show an increase in the percentage of consumption of goods such as: food, water, gas and electricity charges, medical expenses and transportation and communications (see Appendix II). Items included in the category "other" decrease in relation to total consumption for all the groups, while the percentage of consumption in reading

and recreation falls for "65+ worker" and "65+ retired". Thus, similarly to the other workers' households, we assist to a higher percentage of consumption in essential goods. It is true that higher relative and absolute (the latter is not shown) expenses for transportation and communication are partly due to an increased purchase of cars, which are not essential goods, but most of the expenditure in this category is represented by car maintenance. In relation to other consumption items, medical expenditures grew in real terms for all the elderly groups compared to 2000 (not shown). Given that the Japan's consumer price index, in contrast with Italy, considers pharmaceuticals' co-payments instead of full prices, we cannot link this phenomenon to the increased share of self-burden expenditures that we have seen in chapter 2. Nevertheless, since upper limits for maximum co-payments are not reflected in the consumer price index, given that it grew for certain income groups, it is possible that this process led to an augmentation of medical expenditures that is not captured by inflation and which is thus included in our real term data.

4.3.3. Net financial wealth

Table 4.10 and 4.11 show respectively the outstanding savings, liabilities and net financial wealth for workers' households by the age of their head and for households whose head is classified as elderly, based on their occupation status. Figure 4.11 and 4.12 represent the net financial wealth from tables 4.10 and 4.11.

Concerning workers, as we can see from table 4.10 and figure 4.11, net financial wealth declined gradually for all the age groups between 2005 and 2019 and it became negative for young households. Household's whose head was under 29 displayed a decrease in net financial wealth by 1029% between 2005 and 2019. Liabilities increased for all the period, while outstanding savings decreased until 2015. While between 2005 and 2010 the fall in net financial wealth is mostly explained by the decline in savings, the change between 2010-2015 and 2015-2019 is primarily accounted for by liabilities' growth (see Appendix II for details). In the end, considering the whole 2005-2019 period, the rise in liabilities (+184%) produces 98% of the change, while outstanding savings (-3%) describe 2% of the variation in wealth.

The group 30-39 shows a similar pattern, but outstanding savings declined until 2010. The variable rose again after 2010, but the growth in liabilities outpaced the positive effect on wealth. In all the periods, liabilities account for a higher proportion of change compared to outstanding savings. Between 2005 and 2019 wealth declined by 3049% and 97% of the fall is due to the 85% growth in liabilities (while savings decreased by 3%).

In the case of households whose head is aged 40-49 years, savings declined until 2015 and increased by only 1% between 2015 and 2019. On the other hand, liabilities increased in every period. Ultimately, wealth declined by 118% between 2005 and 2019. The 27% increase in liabilities explains 57% of the change, while the 15% decrease in savings accounts for 43% of the variation.

Table 4.10: Savings, Liabilities and Net Financial Wealth by age of the household's head, workers (2019 Euro)

Outstanding Savings						
Year	-29	30-39	40-49	50-59	60-69	70+
2005	30.196	60.996	101.372	141.921	190.235	180.572
2010	23.762	54.114	93.833	137.454	186.452	208.652
2015	22.154	56.012	85.773	137.020	178.318	175.559
2019	29.260	59.094	86.632	141.628	174.986	156.708
Liabilities						
Year	-29	30-39	40-49	50-59	60-69	70+
2005	25.537	62.808	72.470	45.208	18.722	12.423
2010	27.924	74.667	82.386	46.049	21.073	10.927
2015	42.719	87.445	90.622	50.160	16.553	7.691
2019	72.535	116.138	91.796	54.176	18.769	5.573
Net financial wealth						
Year	-29	30-39	40-49	50-59	60-69	70+
2005	4.659	-1.812	28.902	96.713	171.513	168.149
2010	-4.163	-20.553	11.447	91.405	165.379	197.725
2015	-20.565	-31.433	-4.849	86.860	161.765	167.868
2019	-43.275	-57.044	-5.164	87.452	156.217	151.135

Source: The 2005, 2010, 2015 and 2019 FIES

Households whose head is between 50 years old and 70 years old or over show only a small drop in wealth between 2005 and 2019. The group 50-59 displays a fall in wealth by 10%, due to the fact that liabilities increased by 20%, while savings remained almost unchanged. In the case of households whose head is 60-69 years old, the growth rate in liabilities between 2005 and 2019 was almost 0%, while savings fell by 8%. This caused a decline in financial wealth by 9%. Finally, the group 70 or over exhibits a decline in wealth by 10%, caused by the drop in savings (-13%) that outpaced the positive effect of the decrease in liabilities (-55%).

The analysis of all the working groups shows that liabilities increased for all the units, except for those aged 70 or over, and that the process affected remarkably households aged 29 or under and 30-

39. Since most of the debt is linked to mortgages (not shown), this phenomenon is due to the easier accessibility to credit market that we have identified in chapter 2.

Since in the case of savings and liabilities the age groups are not divided by 5 years intervals, we cannot construct cohorts as we did for flow measures. However, if we look at figure 4.11, we see that the shape of the wealth-age profile is similar among different years, except for the difference between the groups 60-69 and 70 or over. In this last case, net financial wealth was higher for households whose head is 70 or over in 2010 and in 2015, while it was lower than the group 60-69 in 2005 and 2019. Given that the wealth-age profile does not change a lot over the years, we can assume that, even if it is based on cross-section data, it reflects the passage from one age group to the other. Wealth rises with age during the working life, especially after age 40-49. Increased accessibility to credit market will probably cause the financial wealth of young cohorts to be lower than old cohorts when they will reach an older age, but the curve of wealth will probably have the same shape.

Table 4.11: Savings, Liabilities and Net Financial Wealth of elderly households by their occupation status (Euro 2019)

Outstanding Savings			
Year	65+ worker	65+ retired	75+ retired
2005	200.501	209.387	199.725
2010	169.975	192.696	177.086
2015	176.228	201.977	196.292
2019	153.512	181.788	178.428
Liabilities			
Year	65+ worker	65+ retired	75+ retired
2005	16.306	5.953	4.141
2010	15.783	5.724	3.729
2015	10.366	4.264	3.177
2019	13.933	4.426	3.114
Net financial wealth			
Year	65+ worker	65+ retired	75+ retired
2005	184.195	203.434	195.584
2010	154.192	186.972	173.357
2015	165.862	197.713	193.115
2019	139.579	177.362	175.314

Source: The 2005, 2010, 2015 and 2019 FIES

With respect to households whose head is classified as elderly, the three categories show similar changes: a decline in wealth between 2005 and 2010, a rise between 2010 and 2015, and the another fall between 2015 and 2019.

The group that shows the highest rate of decrease in wealth from 2005 to 2019 is "65+ worker" (-24%). Savings of these households decreased in all the periods except 2010-2015, while liabilities fell until 2015 and then augmented. Eventually, the 23% drop in savings between 2005 and 2019 outpaced the positive effect of the 15% decrease in liabilities and caused net financial wealth to decline.
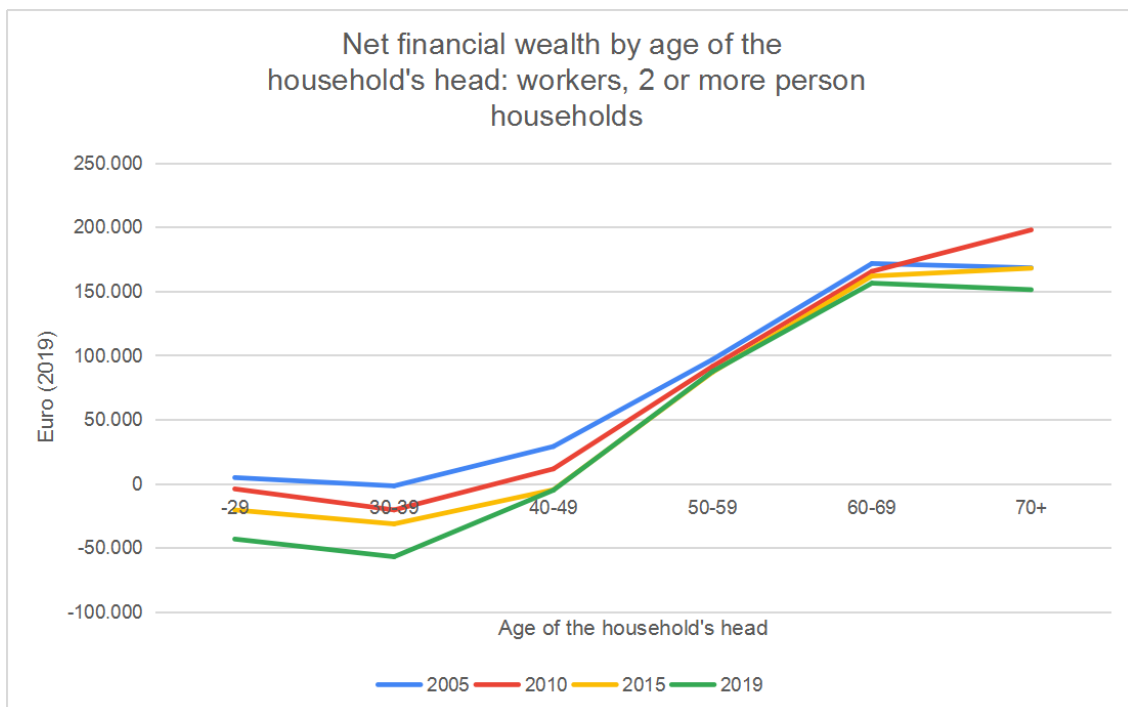
Figure 4.11: Net financial wealth by age of the household's head, workers

Source: The 2005, 2010, 2015 and 2019 FIES
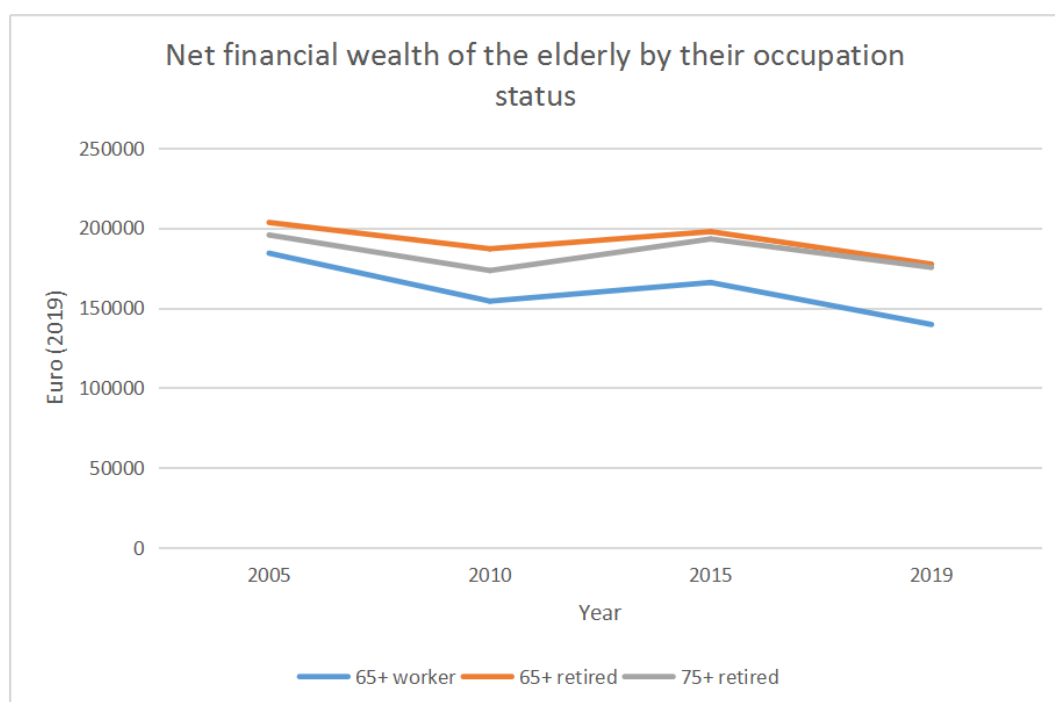
Households whose head is 65 years old or over and retired experienced a 13% drop in wealth between 2005 and 2019. The pattern of change of savings and liabilities over the years is the same as the group "65+ worker". In the end, savings decline by 13% and cause net financial wealth to decrease, despite a 26% fall in liabilities.

At last, the group 75 or over and retired exhibits a decline in liabilities for all the periods. However, since also outstanding savings decline (except for 2010-2015), wealth is 10% lower in 2019 compared to 2005 (the total fall in savings over the whole period is -11%, while liabilities decline by 25%).

It is interesting to notice that the financial wealth of households whose head is still working is lower compared to retired households. This is due not only to a higher level of liabilities, but also to a lower level of outstanding savings. Thus, households who are still working when the head is aged 65 or over have saved less in life compared to retired households but at same time have more debts to pay. While knowing that the retirement span would be shorter than other households should push the saving rate down (because the household needs less money to finance retirement), the higher debt could produce larger saving rates for precautionary motive.

What do we observe from the comparison between flow and stock measures? If we assume that households whose head is a 70 or over aged worker in 2015 represent households of the group 60-69 in 2005, we notice a decrease in both outstanding savings and net financial wealth. However, if we

look at the saving rates for the same period, the variable is positive and increases from 10,7% to 24,7% of disposable income. This contrast between flow and stock measures could be explained by the presence of intergenerational transfers, but also by a different composition of the groups since working households aged 70 or over are less than 60-69 due to retirement. Another interesting data is given by the fact that while we have seen that workers' households whose head is 65 years old or over show lower outstanding savings and net financial wealth compared to retired households, their saving rate is positive, while that of retired households is negative. Therefore, elderly workers' households have saved less compared to retired households but are still savings (and have more debts), while retired households have saved more but are consuming their wealth (this is shown by flow data, while we cannot demonstrate it through stock data since we cannot construct cohorts).

4.4 Conclusion

The aim of this chapter was to examine how does saving change over life in Japan and how did it change for different age groups from 2000 to 2019. We have seen that the saving rate did not change much until 2015 for workers' households whose head was between under 29 and 59 years old. However, from 2015 to 2019, the saving rate increased for all the households and in a very remarkable way for households whose head is under 29 years old. By analyzing the change in all the variables that affect saving, we notice that the rise in the flow of savings of this group is caused by both a large decline in consumption and an increase in disposable income. The group 30-39 shows a similar pattern to the group under 29, while all the other groups have experienced a drop in both income and consumption (but only the group 70 or over exhibits a decline in the saving flow and a 0 percentage points growth in the saving rate). The groups 60-69 and 70+ displayed remarkable changes in the saving rate also before 2015. This is due to the fact that they are more vulnerable to variations in social security benefits. If we look at non-consumption expenditures and consumption expenditures, we notice that the former increases for all the age groups while the latter falls. Consumption patterns reveal that not only do households consume less, but they focus more on essential goods.

Concerning the differences between age groups, we noticed that consumption increases until age 50-59, but it is supported by a steep rise in income. It is true that the saving rate falls after age 30-39, but only slightly until age 50-59. After this age, the decrease in income, probably due to the mandatory retirement system, is not offset by lower consumption and the saving rate declines considerably.

In order to confirm our assumptions based on cross-section data, we also constructed cohorts to see effectively how do the variables change over life. We observed that consumption and disposable

income have the shape of an inversed U (both variables reach their peak between 45-49 and 50-54). The change in the saving rate is less steady but we can still see a sort of reversed-U shape until age 60 and we remarked a drop in the variable in the passage from age 55-59 to 60-64 and then a new rise until age 70 except for one cohort. Overall, the multiplied cross-section data reflect our assumptions based on cross-sections.

Concerning elderly households by their occupation status, we see that the variation of the saving rate for workers' households is not steady and it changes following the path of disposable income (that is strongly influenced by social security benefits). On the other hand, retired 65+ households show a constant decline in the saving rate between 2000 and 2015, while the same variable drops significantly for retired 75+ households between 2010 and 2015. The main reason of this decline is a decrease in disposable income due to the fall of social security benefits and a rise in non-consumption expenditures, while consumption either slightly increases or doesn't change. However, from 2015 to 2019 social security benefits rise again, together with other sources of income, causing the saving rate to increase. The fact that social security benefits do not reflect the change of the full sum monthly pension that we have seen in chapter 2 makes us think that the movements of the variable are rather influenced by contribution periods. Between 2000 and 2019 we assist to a decline in consumption expenditures for the groups "65+ worker" and "65+ retired" (while the variable does not change for "75+ retired") but all the households show higher percentages of essential goods relative to total consumption.

Later, we examined stock measures and we saw that net financial wealth decreased and became negative for young workers' households between 2005 and 2019. This was mainly caused by the rise in liabilities due to the increased access to credit market. The same variable accounted for most part of change in financial wealth for the group 50-59 as well, but the decrease in wealth was much weaker than for young groups. On the other hand, workers' households whose head is 60-69 or 70 or over experienced a decline in financial wealth because of a drop in outstanding savings. The same pattern (decline in financial wealth because of a drop in savings) applies to all the elderly households for the period 2005-2019.

Finally, the comparison between stock and flow measures produced interesting results. There is a contrast between the stock and the flow measures for workers households in the passage from the group 60-69 to the group 70 or over: while the saving rate is positive, net financial wealth declines. This could be caused by intergenerational transfers or by the different composition of groups. Moreover, if we look at data for elderly households, we find out that while the saving rate of elderly workers' households is positive and that of retired households is negative, both outstanding savings and net financial wealth of the former are lower than the latter. This means that elderly workers

households have saved less than retired households and continue to save (they also have higher debts), while retired households consume their savings.

Appendix II

Table 4.12: Determinants of the change in savings workers' households under 29

Entries	2000-2005	2015-2019	2000-2019
Savings	ΔS= -11%	ΔS= +89%	ΔS= +92%
Direct effects			
Disposable income	ΔYD= -6%; Percentage of ΔS= -206%	ΔYD= +14%; Percentage of ΔS= +58%	ΔYD= +12%; Percentage of ΔS= +49%
Consumption	ΔC= -4%; Percentage of ΔS= +106%	ΔC= -14%; Percentage of ΔS= +42%	ΔC= -17%; Percentage of ΔS= +51%
Indirect effects			
Gross income of which: Labour income (YL) Social security benefits (SSB)	ΔY= -6%; Percentage of ΔS= -232% ΔYL= -6% Percentage of ΔS= -233% ΔSSB= +3% Percentage of ΔS= +2%	ΔY= +11% Percentage of ΔS= +56% ΔYL= +9% Percentage of ΔS= +43% ΔSSB= +67% Percentage of ΔS= +13%	ΔY= +12% Percentage of ΔS= +59% ΔYL= +9% Percentage of ΔS= +40% ΔSSB= +272% Percentage of ΔS= +23%
Non-consumption expenditures (NCE) of which: Direct taxes (T) Social security contributions (SSC)	ΔNCE= -5% Percentage of ΔS= +26% ΔT= -6% Percentage of ΔS= +11% ΔSSC= -6% Percentage of ΔS= +21%	ΔNCE= -2% Percentage of ΔS= +2% ΔT= -8% Percentage of ΔS= +2% ΔSSC= 0% Percentage of ΔS= 0%	ΔNCE= +15% Percentage of ΔS= -10% ΔT= +14% Percentage of ΔS= -3% ΔSSC= +16% Percentage of ΔS= -7%

Source: The 2000, 2005, 2015 and 2019 FIES

Table 4.13:Determinants of the change in savings workers' households 30-39

Entries	2000-2005	2015-2019	2000-2019
Savings	ΔS= -8%	ΔS=+20%	ΔS= +22%
Direct effects			
Disposable income	ΔYD= -3%	ΔYD= +9%	ΔYD= +4%
	Percentage of ΔS= -134%	Percentage of ΔS= +130%	Percentage of ΔS= +58%
Consumption	ΔC= -1%	ΔC= +3%	ΔC= -4%
	Percentage of ΔS= +34%	Percentage of ΔS= -30%	Percentage of ΔS= +42%
Indirect effects			
Gross income	ΔY= -3%	ΔY= +8%	ΔY= +7%
	Percentage of ΔS= -161%	Percentage of ΔS= +149%	Percentage of ΔS= +113%
of which:			
Labour income (YL)	ΔYL= -4%	ΔYL= +7%	ΔYL= +3%
	Percentage of ΔS= -162%	Percentage of ΔS= +119%	Percentage of ΔS= +47%
Social security benefits (SSB)	ΔSSB= +15%	ΔSSB= +44%	ΔSSB= +267%
	Percentage of ΔS= +9%	Percentage of ΔS= +26%	Percentage of ΔS= +56%
Non-consumption expenditures (NCE)	ΔNCE= -4%	ΔNCE= +6%	ΔNCE= +23%
	Percentage of ΔS= +27%	Percentage of ΔS= -19%	Percentage of ΔS= -54%
of which:			
Direct taxes (T)	ΔT= -7%	ΔT= +1%	ΔT= +20%
	Percentage of ΔS= +19%	Percentage of ΔS= -2%	Percentage of ΔS= -19%
Social security contributions (SSC)	ΔSSC= -2%	ΔSSC= +10%	ΔSSC= +25%
	Percentage of ΔS= +8%	Percentage of ΔS= -17%	Percentage of ΔS= -35%

Source: The 2000, 2005, 2015 and 2019 FIES

Table 4.14: Determinants in the change of savings, workers' households 40-49

Entries	2000-2005	2015-2019	2000-2019
Savings	ΔS= -9%	ΔS= +19%	ΔS= +11%
Direct effects			
Disposable income	ΔYD= -4%	ΔYD= +6%	ΔYD= -4%
	Percentage of ΔS= -176%	Percentage of ΔS= +114%	Percentage of ΔS= -128%
Consumption	ΔC= -3%	ΔC= +1%	ΔC= -11%
	Percentage of ΔS= +76%	Percentage of ΔS= -14%	Percentage of ΔS= +228%
Indirect effects			
Gross income	ΔY= -4%	ΔY= +6%	ΔY= -0,2%
	Percentage of ΔS= -183%	Percentage of ΔS= +132%	Percentage of ΔS= -8%
of which:			
Labour income (YL)	ΔYL= -3%	ΔYL= +6%	ΔYL= -1%
	Percentage of ΔS= -148%	Percentage of ΔS= +124%	Percentage of ΔS= -43%
Social security benefits (SSB)	ΔSSB= 0%	ΔSSB= +18%	ΔSSB= +110%
	Percentage of ΔS= 0%	Percentage of ΔS= +10%	Percentage of ΔS= +52%
Non-consumption expenditures (NCE)	ΔNCE= -1%	ΔNCE= +4%	ΔNCE= +21%
	Percentage of ΔS= +6%	Percentage of ΔS= -18%	Percentage of ΔS= -119%
of which:			
Direct taxes (T)	ΔT= -6%	ΔT= -1%	ΔT= +11%
	Percentage of ΔS= +19%	Percentage of ΔS= +2%	Percentage of ΔS= -27%
Social security contributions (SSC)	ΔSSC= +5%	ΔSSC= +8%	ΔSSC= +30%
	Percentage of ΔS= -12%	Percentage of ΔS= -19%	Percentage of ΔS= -92%

Source: The 2000, 2005, 2015 and 2019 FIES

Table 4.15: Determinants of the change in savings workers' households 50-59

Entries	2000-2005	2015-2019	2000-2019
Savings	ΔS= -18%	ΔS= +43%	ΔS= +19%
Direct effects			
Disposable income	ΔYD= -7%	ΔYD= +13%	ΔYD= -2%
	Percentage of ΔS= -138%	Percentage of ΔS= +112%	Percentage of ΔS= -33%
Consumption	ΔC= -3%	ΔC= +2%	ΔC= -9%
	Percentage of ΔS= +38%	Percentage of ΔS= -12%	Percentage of ΔS= +133%
Indirect effects			
Gross income	ΔY= -7%	ΔY= +13%	ΔY= +2%
	Percentage of ΔS= -168%	Percentage of ΔS= +149%	Percentage of ΔS= +57%
of which:			
Labour income (YL)	ΔYL= -6%	ΔYL= +13%	ΔYL= +3%
	Percentage of ΔS= -150%	Percentage of ΔS= +139%	Percentage of ΔS= +57%
Social security benefits (SSB)	ΔSSB= -8%	ΔSSB= +32%	ΔSSB= +57%
	Percentage of ΔS= -2%	Percentage ofΔS= +6%	Percentage of ΔS= +16%
Non-consumption expenditures (NCE)	ΔNCE= -7%	ΔNCE= +16%	ΔNCE= +22%
	Percentage of ΔS= +29%	Percentage of ΔS= -37%	Percentage of ΔS= -90%
of which:			
Direct taxes (T)	ΔT= -12%	ΔT= +15%	ΔT= +8%
	Percentage of ΔS= +26%	Percentage of ΔS= -15%	Percentage of ΔS= -16%
Social security contributions (SSC)	ΔSSC= -1%	ΔSSC= +18%	ΔSSC= +36%
	Percentage of ΔS= +3%	Percentage of ΔS= -22%	Percentage of ΔS= -74%

Source: The 2000, 2005, 2015 and 2019 FIES

Table 4.16: Determinants of the change in savings workers' households 60-69

Entries	2000-2005	2005-2010	2015-2019	2000-2019
Savings	ΔS= -43%	ΔS= -45%	ΔS= +302%	ΔS= +7%
Direct effects				
Disposable income	ΔYD= -8% Percentage of ΔS= -106%	ΔYD= -3% Percentage of ΔS= -65%	ΔYD= +13% Percentage of ΔS= +80%	ΔYD= -5% Percentage of ΔS= -418%
Consumption	ΔC= -0,5% Percentage of ΔS= +6%	ΔC= +2% Percentage of ΔS= -35%	ΔC= -3% Percentage of ΔS= +20%	ΔC= -8% Percentage of ΔS= +518%
Indirect effects				
Gross income of which:	ΔY= -8% Percentage of ΔS= -119%	ΔY= +0,45% Percentage of ΔS= +11%	ΔY= +14% Percentage of ΔS= +99%	ΔY= -1% Percentage of ΔS= -90%
Labour income (YL)	ΔYL= -6% Percentage of ΔS= -65%	ΔYL= +4% Percentage of ΔS= +78%	ΔYL= +14% Percentage of ΔS= +80%	ΔYL= +5% Percentage of ΔS= +385%
Social security benefits (SSB)	ΔSSB= -21% Percentage of ΔS= -73%	ΔSSB= -3% Percentage of ΔS= -15%	ΔSSB= +11% Percentage of ΔS= +14%	ΔSSB= -23% Percentage of ΔS= -485%
Non-consumption expenditures (NCE) of which:	ΔNCE= -6% Percentage of ΔS= +13%	ΔNCE= +22% Percentage of ΔS= -76%	ΔNCE= +15% Percentage of ΔS= -18%	ΔNCE= +25% Percentage of ΔS= -328%
Direct taxes (T)	ΔT= -20% Percentage of ΔS= +23%	ΔT= +38% Percentage of ΔS= -47%	ΔT= +12% Percentage of ΔS= -6%	ΔT= -2% Percentage of ΔS= +15%
Social security contributions (SSC)	ΔSSC= +11% Percentage of ΔS= -10%	ΔSSC= +16% Percentage of ΔS= -29%	ΔSSC= +17% Percentage of ΔS= -12%	ΔSSC= +57% Percentage of ΔS= -344%

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.17: Determinants of the change in savings workers' households 70+

Entries	2000-2005	2005-2010	2010-2015	2000-2019
Savings	ΔS= -76%	ΔS= +202%	ΔS= +31%	ΔS= -9%
Direct effects				
Disposable income	ΔYD= -23% Percentage of ΔS=-126%	ΔYD= +23% Percentage of ΔS= +156%	ΔYD= -6% Percentage of ΔS= -100%	ΔYD= -9% Percentage of ΔS= -429%
Consumption	ΔC= -6% Percentage of ΔS= +26%	ΔC= +9% Percentage of ΔS= -56%	ΔC= -14% Percentage of ΔS= +200%	ΔC= -9% Percentage of ΔS= +329%
Indirect effects				
Gross income	ΔY= -22% Percentage of ΔS= -133%	ΔY= +27% Percentage of ΔS= +202%	ΔY= -6% Percentage of ΔS= -125%	ΔY= -6% Percentage of ΔS= -319%
of which: Labour income (YL)	ΔYL= -14% Percentage of ΔS= -44%	ΔYL= +17% Percentage of ΔS= +77%	ΔYL= 0% Percentage of ΔS= 0% ΔSSB= -17%	ΔYL= -5% Percentage of ΔS= -126%
Social security benefits (SSB)	ΔSSB= -33% Percentage of ΔS= -89%	ΔSSB= +43% Percentage of ΔS= +126%	Percentage of ΔS= -150%	ΔSSB= -8% Percentage of ΔS= -182%
Non-consumption expenditures (NCE)	ΔNCE= -13% Percentage of ΔS= +7%	ΔNCE= +59% Percentage of ΔS= -45%	ΔNCE= -10% Percentage of ΔS= +25%	ΔNCE= +23% Percentage of ΔS= -109%
of which: Direct taxes (T)	ΔT= -34% Percentage of ΔS= +13%	ΔT= +81% Percentage of ΔS= -33%	ΔT= -20% Percentage of ΔS= +31%	ΔT= -14% Percentage of ΔS= +45%
Social security contributions (SSC)	ΔSSC= +33% Percentage of ΔS= -5%	ΔSSC= +37% Percentage of ΔS= -13%	ΔSSC= +6% Percentage of ΔS= -6%	ΔSSC= +108% Percentage of ΔS= -155%

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.18: Under 29, determinants of change in disposable income

Entries	2000-2005	2015-2019	2000-2019
Disposable income (YD)	ΔYD= -6%	ΔYD= +14%	ΔYD= +12%
Gross income (Y)	ΔY= -6%; Percentage of ΔYD= -112%	ΔY= +11%; Percentage of ΔY =+97%	ΔY= +12%; Percentage of ΔY = +120%
Non-consumption expenditures (NCE)	ΔNCE= -5%; Percentage of ΔYD= +12%	ΔNCE= -2%; Percentage of ΔYD= +3%	ΔNCE= +15%; Percentage of ΔYD= -20%

Source: The 2000, 2005, 2015 and 2019 FIES

Table 4.19: 30-39, determinants of change in disposable income

Entries	2000-2005	2015-2019	2000-2019
Disposable income (YD)	ΔYD= -3%	ΔYD= +9%	ΔYD= +4%
Gross income (Y)	ΔY= -3% Percentage of ΔYD= -120%	ΔY= +8% Percentage of ΔY = +115%	ΔY= +7% Percentage of ΔY = +194%
Non-consumption expenditures (NCE)	ΔNCE= -4% Percentage of ΔYD= +20%	ΔNCE= +6% Percentage of ΔYD= -15%	ΔNCE= +23% Percentage of ΔYD= -94%

Source: The 2000, 2005, 2015 and 2019 FIES

Table 4.20: 40-49, determinants of the change in disposable income

Entries	2000-2005	2015-2019	2000-2019
Disposable income (YD)	ΔYD= -4%	ΔYD= +6%	ΔYD= -4%
Gross income (Y)	ΔY= -4% Percentage of ΔYD= -103%	ΔY= +6% Percentage of ΔY = +116%	ΔY= -0,2% Percentage of ΔY = -6%
Non-consumption expenditures (NCE)	ΔNCE= -1% Percentage of ΔYD= +3%	ΔNCE= +4% Percentage of ΔYD= -16%	ΔNCE= +21% Percentage of ΔYD= -94%

Source: The 2000, 2005, 2015 and 2019 FIES

Table 4.21: 50-59, determinants of the change in disposable income

Entries	2000-2005	2015-2019	2000-2019
Disposable income (YD)	ΔYD= -7%	ΔYD= +13%	ΔYD= -2%
Gross income (Y)	ΔY= -7% Percentage of ΔYD= -121%	ΔY= +13% Percentage of ΔYD = +133%	ΔY= +2% Percentage of ΔYD = +172%
Non-consumption expenditures (NCE)	ΔNCE= -7% Percentage of ΔYD= +21%	ΔNCE= +16% Percentage of ΔYD= -33%	ΔNCE= +22% Percentage of ΔYD= -272%

Source: The 2000, 2005, 2015 and 2019 FIES

Table 4.22: 60-69, determinants of the change in disposable income

Entries	2000-2005	2005-2010	2015-2019	2000-2019
Disposable income (YD)	ΔYD= -8%	ΔYD= -3%	ΔYD= +13%	ΔYD= -5%
Gross income (Y)	ΔY= -8% Percentage of ΔYD= -112%	ΔY=+0,45% Percentage of ΔYD = +17%	ΔY= +14% Percentage of ΔYD = +123%	ΔY= -1% Percentage of ΔYD = -22%
Non-consumption expenditures (NCE)	ΔNCE= -6% Percentage of ΔYD= +12%	ΔNCE= +22% Percentage of ΔYD= -117%	ΔNCE= +15% Percentage of ΔYD= -23%	ΔNCE= +25% Percentage of ΔYD= -78%

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.23: 70+, determinants of the change in disposable income

Entries	2000-2005	2005-2010	2010-2015	2000-2019
Disposable income (YD)	ΔYD= -23%	ΔYD= +23%	ΔYD= -6%	ΔYD= -9%
Gross income (Y)	ΔY= -22% Percentage of ΔYD= -106%	ΔY= +27% Percentage of ΔY = +129%	ΔY= -6% Percentage of ΔY =-125%	ΔY= -6% Percentage of ΔY = -74%
Non-consumption expenditures (NCE)	ΔNCE= -13% Percentage of ΔYD= +6%	ΔNCE= +59% Percentage of ΔYD= -29%	ΔNCE= -10% Percentage of ΔYD= +25%	ΔNCE= +23% Percentage of ΔYD= -26%

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.24: Differences between age groups, 2000

Year 2000				
Entries	30-39 compared with 29 and under	40-49 compared with 30-39	50-59 compared with 40-49	60-69 compared with 50-59
Differences	Savings: +53% Disposable income: +24% Labour income: +28% Social security benefits: -5% Direct taxes: +73% Social security contributions: +28% Consumption: +14%	Savings: +7% Disposable income: +19% Labour income: +20% Social security benefits: +23% Direct taxes: +42% Social security contributions: +18% Consumption: +24%	Savings: -3% Disposable income: +4% Labour income: +6% Social security benefits: -4% Direct taxes:+32% Social security contributions: +8% Consumption: +7%	Savings: -54% Disposable income: -27% Labour income: -46% Social security benefits: +1206% Direct taxes: -39% Social security contributions: -50% Consumption: -17%
Direct effects				
Percentage of the difference in savings explained by YD	Percentage of $\Delta S=$ +173%	Percentage of $\Delta S=$ +800%	Percentage of $\Delta S=$ +577%	Percentage of $\Delta S=$ -186%
Percentage of the difference in savings explained by C	Percentage of $\Delta S=$ -73%	Percentage of $\Delta S=$ -700%	Percentage of $\Delta S=$ -677%	Percentage of $\Delta S=$ +86%

Source: The 2000 FIES

Table 4.25: Differences between age groups, 2015

Year 2015				
Entries	30-39 compared with 29 and under	40-49 compared with 30-39	50-59 compared with 40-49	60-69 compared with 50-59
Differences	Savings: +54% Disposable income: +21% Labour income: +24% Social security benefits: +8% Direct taxes: +65% Social security contributions: +26% Consumption: +9%	Savings: -1% Disposable income: +12% Labour income: +16% Social security benefits: -15% Direct taxes: +35% Social security contributions: +24% Consumption: +18%	Savings: -14% Disposable income: +1% Labour income: +3% Social security benefits: -36% Direct taxes: +10% Social security contributions: +4% Consumption: +8%	Savings: -85% Disposable income: -30% Labour income: -45% Social security benefits: +668% Direct taxes: -44% Social security contributions: -42% Consumption: -11%
Direct effects				
Percentage of the difference in savings explained by YD	Percentage of ΔS= +144%	Percentage of ΔS= +2678%	Percentage of ΔS= +29%	Percentage of ΔS= -136%
Percentage of the difference in savings explained by C	Percentage of ΔS= -44%	Percentage of ΔS= -2778%	Percentage of ΔS= -129%	Percentage of ΔS= +36%

Source: The 2015 FIES

Table 4.26: Differences between age groups, 2019

Year 2019				
Entries	30-39 compared with 29 and under	40-49 compared with 30-39	50-59 compared with 40-49	60-69 compared with 50-59
Differences	Savings: -2% Disposable income: +16% Labour income: +22% Social security benefits: -7% Direct taxes: +81% Social security contributions: +38% Consumption: +30%	Savings: -2% Disposable income: +9% Labour income: +15% Social security benefits: -30% Direct taxes:+32% Social security contributions: +22% Consumption: +16%	Savings: +4% Disposable income: +7% Labour income: +10% Social security benefits: -28% Direct taxes: +28% Social security contributions: +13% Consumption: +8%	Savings: -58% Disposable income: -30% Labour income: -44% Social security benefits: +545% Direct taxes: -45% Social security contributions: -43% Consumption: -15%
Direct effects				
Percentage of the difference in savings explained by YD	Percentage of $\Delta S=$ +1633%	Percentage of $\Delta S=$ +1002%	Percentage of $\Delta S=$ +496%	Percentage of $\Delta S=$ -154%
Percentage of the difference in savings explained by C	Percentage of $\Delta S=$ -1733%	Percentage of $\Delta S=$ -1102%	Percentage of $\Delta S=$ -396%	Percentage of $\Delta S=$ +54%

Source: The 2019 FIES

Table 4.27: Determinants of the change in savings 65+ workers

Entries	2000-2005	2005-2010	2010-2015	2015-2019	2000.2019
Savings	ΔS= -52%	ΔS= +67%	ΔS= -39%	ΔS= +90%	ΔS= -7%
Direct effects					
Disposable income	ΔYD= -17% Effect on ΔS= -143%	ΔYD= +6% Effect on ΔS= +68%	ΔYD= -4% Effect on ΔS= -56%	ΔYD= +8% Effect on ΔS= +70%	ΔYD= -9% Effect on ΔS= -533%
Consumption	ΔC= -6% Effect on ΔS= +43%	ΔC= -3% Effect on ΔS= +32%	ΔC= +4% Effect on ΔS= -44%	ΔC= +30% Effect on ΔS= +30%	ΔC= -9% Effect on ΔS= +433%
Indirect effects					
Gross income of which: Labour income (YL) Social security benefits (SSB)	ΔY= -15% Effect on ΔS= -142% ΔYL= -10% Effect on ΔS= -58% ΔSSB= -24% Effect on ΔS= -85%	ΔY= +9% Effect on ΔS= +117% ΔYL= +6% Effect on ΔS= +53% ΔSSB= +22% Effect on ΔS= +94%	ΔY= -4% Effect on ΔS= -60% ΔYL= -2% Effect on ΔS= -19% ΔSSB= -10% Effect on ΔS= -55%	ΔY= +12% Effect on ΔS= +73% ΔYL= +0,6% Effect on ΔS= +4% ΔSSB= +16% Effect on ΔS= +56%	ΔY= -5 % Effect on ΔS= -320% ΔYL= -6% Effect on ΔS= -236% ΔSSB= -3% Effect on ΔS= -84%
Non-consumption expenditures (NCE) of which: Direct taxes (T) Social security contributions (SSC)	ΔNCE= 0% Effect on ΔS= 0% ΔT= -26% Effect on ΔS= +16% ΔSSC= +50% Effect on ΔS= -16%	ΔNCE= +32% Effect on ΔS= -49% ΔT= +42% Effect on ΔS= -31% ΔSSC= +23% Effect on ΔS= -18%	ΔNCE= -2% Effect on ΔS= +5% ΔT= -11% Effect on ΔS= +12% ΔSSC= +7% Effect on ΔS= -7%	ΔNCE= +2% Effect on ΔS= -3% ΔT= -4% Effect on ΔS= +2% ΔSSC= +7% Effect on ΔS= -5%	ΔNCE= +32% Effect on ΔS= -213% ΔT= -10% Effect on ΔS= +44% ΔSSC= +111% Effect on ΔS= -257%

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.28: Determinants of the change in savings 65+ retired

Entries	2000-2015	2015-2019	2000-2019
Savings	ΔS= -200%	ΔS= +54%	ΔS=-36%
Direct effects			
Disposable income	ΔYD= -18% Effect on ΔS= -101%	ΔYD= +14% Effect on ΔS= +75%	ΔYD= -7% Effect on ΔS= -218%
Consumption	ΔC= -0,2% Effect on ΔS= +1%	ΔC= -3% Effect on ΔS= +25%	ΔC= -4% Effect on ΔS= + 118%
Indirect effects			
Gross income of which: Social security benefits (SSB)	ΔY= -13% Effect on ΔS= -82% ΔSSB= -16% Effect on ΔS= -88%	ΔY= +12% Effect on ΔS= +77% ΔSSB= +9% Effect on ΔS= +50%	ΔY= -3% Effect on ΔS= -99% ΔSSB= -9% Effect on ΔS= -260%
Non-consumption expenditures (NCE) of which: Direct taxes (T) Social security contributions (SSC)	ΔNCE= +35% Effect on ΔS= -20% ΔT= +11% Effect on ΔS= -3% ΔSSC= +60% Effect on ΔS= -17%	ΔNCE= +2% Effect on ΔS= -2% ΔT= -4% Effect on ΔS= +2% ΔSSC= +8% Effect on ΔS= -4%	ΔNCE= +39% Effect on ΔS= -118% ΔT= +6% Effect on ΔS= -8% ΔSSC= +72% Effect on ΔS= -110%

Source: The 2000, 2015 and 2019 FIES

Table 4.29: Determinants of the change in savings 75+ retired

Entries	2000-2005	2010-2015	2015-2019	2000-2015	2000-2019
Savings	ΔS= -92%	ΔS= -184%	ΔS= +70%	ΔS= -437%	ΔS= -63%
Direct effects					
Disposable income	ΔYD= -1%	ΔYD= -14%	ΔYD= +12%	ΔYD= -14%	ΔYD= -3%
	Effect on ΔS= -26%	Effect on ΔS= -98%	Effect on ΔS= +71%	Effect on ΔS= -78%	Effect on ΔS= -121%
Consumption	ΔC= +3%	ΔC= +0,2%	ΔC= -4%	ΔC= +4%	ΔC= -0,5%
	Effect on ΔS= -74%	Effect on ΔS= -2%	Effect on ΔS= +29%	Effect on ΔS= -22%	Effect on ΔS= +21%
Indirect effects					
Gross income	ΔY= +1%	ΔY= -12%	ΔY= +11%	ΔY= -9%	ΔY= +2%
	Effect on ΔS= +26%	Effect on ΔS= -96%	Effect on ΔS= +74%	Effect on ΔS= -53%	Effect on ΔS= +70%
of which:					
Social security benefits (SSB)	ΔSSB= +2%	ΔSSB= -14%	ΔSSB= +8%	ΔSSB= -11%	ΔSSB= -3%
	Effect on ΔS= +45%	Effect on ΔS= -104%	Effect on ΔS= +47%	Effect on ΔS= -59%	Effect on ΔS= -131%
Non-consumption expenditures (NCE)	ΔNCE= +21%	ΔNCE= +1%	ΔNCE= +3%	ΔNCE= +49%	ΔNCE= +53%
	Effect on ΔS= -52%	Effect on ΔS= -1%	Effect on ΔS= -3%	Effect on ΔS= -25%	Effect on ΔS= -190%
of which:					
Direct taxes (T)	ΔT= +8%	ΔT= -2%	ΔT= -10%	ΔT= +26%	ΔT= +13%
	Effect on ΔS= -10%	Effect on ΔS= +1%	Effect on ΔS= +4%	Effect on ΔS= -7%	Effect on ΔS= -23%
Social security contributions (SSC)	ΔSSC= +35%	ΔSSC= +3%	ΔSSC= +13%	ΔSSC= +71%	ΔSSC= +93%
	Effect on ΔS= -42%	Effect on ΔS= -2%	Effect on ΔS= -7%	Effect on ΔS= -19%	Effect on ΔS= -167%

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.30: Determinants of disposable income 65+ workers

Entries	2000-2005	2005-2010	2010-2015	2015-2019	2000-2019
Disposable income (YD)	ΔYD= -17%	ΔYD= +6%	ΔYD= -4%	ΔYD= +8%	ΔYD= -9%
Gross income (Y)	ΔY= -15% Effect on ΔYD= -100%	ΔY= +9% Effect on ΔY = +172%	ΔY= -4% Effect on ΔY = -109%	ΔY= +7% Effect on ΔY = +104%	ΔY= -5% Effect on ΔY = -60%
Non-consumption expenditures (NCE)	ΔNCE= 0% Effect on ΔYD= 0%	ΔNCE= +32% Effect on ΔYD= -72%	ΔNCE= -2% Effect on ΔYD= +9%	ΔNCE= +2% Effect on ΔYD= -4%	ΔNCE= +32% Effect on ΔYD= -40%

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.31: Determinants of disposable income 65+ retired

Entries	2000-2015	2015-2019	2000-2019
Disposable income (YD)	ΔYD= -18%	ΔYD= +14%	ΔYD= -7%
Gross income (Y)	ΔY= -13% Effect on ΔYD= -81%	ΔY= +12% Effect on ΔY = +103%	ΔY= -3% Effect on ΔY = -46%
Non-consumption expenditures (NCE)	ΔNCE= +35% Effect on ΔYD= -19%	ΔNCE= +2% Effect on ΔYD= -3%	ΔNCE= +39% Effect on ΔYD= -54%

Source: The 2000, 2015 and 2019 FIES

Table 4.32: Determinants of disposable income 75+ retired

Entries	2000-2005	2010-2015	2015-2019	2000-2015	2000-2019
Disposable income (YD)	ΔYD= -1%	ΔYD= -14%	ΔYD= +12%	ΔYD= -14%	ΔYD= -3%
Gross income (Y)	ΔY= +1% Effect on ΔYD= +100%	ΔY= -12% Effect on ΔY = -99%	ΔY= +11% Effect on ΔY = +104%	ΔY= -9% Effect on ΔY = -68%	ΔY= +2% Effect on ΔY = +58%
Non-consumption expenditures (NCE)	ΔNCE= +21% Effect on ΔYD= -200%	ΔNCE= +1% Effect on ΔYD= -1%	ΔNCE= +3% Effect on ΔYD= -3%	ΔNCE= +49% Effect on ΔYD= -32%	ΔNCE= +53% Effect on ΔYD= -158%

Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Table 4.33: Determinants of financial wealth, workers under 29

Entry	2005-2010	2010-2015	2015-2019	2005-2019
Net Financial Wealth	ΔW= -189%	ΔW= -394%	ΔW= -110%	ΔW= -1029%
Outstanding Savings	ΔS= -21%	ΔS= -7%	ΔS= +32%	ΔS= -3%
	Percentage of ΔW= -73%	Percentage of ΔW= -10%	Percentage of ΔW= +31%	Percentage of ΔW= -2%
Liabilities	ΔL= +9%	ΔL= +53%	ΔL= +70%	ΔL= +184%
	Percentage of ΔW= -27%	Percentage of ΔW= -90%	Percentage of ΔW= -131%	Percentage of ΔW= -98%

Source: The 2005, 2010, 2015 and 2019 FIES

Table 4.34: Determinants of financial wealth, workers 30-39

Entry	2005-2010	2010-2015	2015-2019	2005-2019
Net Financial Wealth	ΔW= -1034%	ΔW= -53%	ΔW= -81%	ΔW= -3049%
Outstanding Savings	ΔS= -11%	ΔS= +4%	ΔS= +6%	ΔS= -3%
	Percentage of ΔW= -37%	Percentage of ΔW= +17%	Percentage of ΔW= +12%	Percentage of ΔW= -3%
Liabilities	ΔL= +19%	ΔL= +17%	ΔL= +33%	ΔL= +85%
	Percentage of ΔW= -63%	Percentage of ΔW= -117%	Percentage of ΔW= -112%	Percentage of ΔW= -97%

Source: The 2005, 2010, 2015 and 2019 FIES

Table 4.35: Determinants of financial wealth, workers 40-49

Entry	2005-2010	2010-2015	2015-2019	2005-2019
Net Financial Wealth	ΔW= -60%	ΔW= -142%	ΔW= -6%	ΔW= -118%
Outstanding Savings	ΔS= -7%	ΔS= -9%	ΔS= +1%	ΔS= -15%
	Percentage of ΔW= -43%	Percentage of ΔW= -49%	Percentage of ΔW= +273%	Percentage of ΔW= -43%
Liabilities	ΔL= +14%	ΔL= +10%	ΔL= +1%	ΔL= +27%
	Percentage of ΔW= -57%	Percentage of ΔW= -51%	Percentage of ΔW= -273%	Percentage of ΔW= -57%

Source: The 2005, 2010, 2015 and 2019 FIES

Table 4.36: Determinants of financial wealth, workers 50-59

Entry	2005-2010	2010-2015	2015-2019	2005-2019
Net Financial Wealth	ΔW= -5%	ΔW= -5%	ΔW= +1%	ΔW= -10%
Outstanding Savings	ΔS= -3%	ΔS= -0,3%	ΔS= +3%	ΔS= 0%
	Percentage of ΔW= -84%	Percentage of ΔW= -10%	Percentage of ΔW= +779%	Percentage of ΔW= 0%
Liabilities	ΔL= +2%	ΔL= +9%	ΔL= +8%	ΔL= +20%
	Percentage of ΔW= -16%	Percentage of ΔW= -90%	Percentage of ΔW= -679%	Percentage of ΔW= -100%

Table 4.37: Determinants of financial wealth, workers 60-69

Entry	2005-2010	2010-2015	2015-2019	2005-2019
Net Financial Wealth	ΔW= -4%	ΔW= -2%	ΔW= -3%	ΔW= -9%
Outstanding Savings	ΔS= -2%	ΔS= -4%	ΔS= -2%	ΔS= -8%
	Percentage of ΔW= -62%	Percentage of ΔW= -225%	Percentage of ΔW= -60%	Percentage of ΔW= -100%
Liabilities	ΔL= +13%	ΔL= -21%	ΔL= +13%	ΔL= 0%
	Percentage of ΔW= -38%	Percentage of ΔW= +125%	Percentage of ΔW= -40%	Percentage of ΔW= 0%

Table 4.38: Determinants of financial wealth, workers 70+

Entry	2005-2010	2010-2015	2015-2019	2005-2019
Net Financial Wealth	ΔW= +18%	ΔW= -15%	ΔW= -10%	ΔW= -10%
Outstanding Savings	ΔS= +16%	ΔS= -16%	ΔS= -11%	ΔS= -13%
	Percentage of ΔW= +95%	Percentage of ΔW= -111%	Percentage of ΔW= -113%	Percentage of ΔW= -140%
Liabilities	ΔL= -12%	ΔL= -30%	ΔL= -28%	ΔL= -55%
	Percentage of ΔW= +5%	Percentage of ΔW= -15%	Percentage of ΔW= +13%	Percentage of ΔW= +40%

Table 4.39: Determinants of financial wealth, elderly 65+ worker

Entry	2005-2010	2010-2015	2015-2019	2005-2019
Net Financial Wealth	ΔW= -16%	ΔW= +8%	ΔW= -16%	ΔW= -24%
Outstanding Savings	ΔS= -15% Percentage of ΔW= -102%	ΔS= +4% Percentage of ΔW= +54%	ΔS= -13% Percentage of ΔW= -86%	ΔS= -23% Percentage of ΔW= -105%
Liabilities	ΔL= -16% Percentage of ΔW= +2%	ΔL= -34% Percentage of ΔW= +46%	ΔL= +34% Percentage of ΔW= -14%	ΔL= -15% Percentage of ΔW= +5%

Source: The 2005, 2010, 2015 and 2019 FIES

Table 4.40: Determinants of financial wealth, elderly 65+ retired

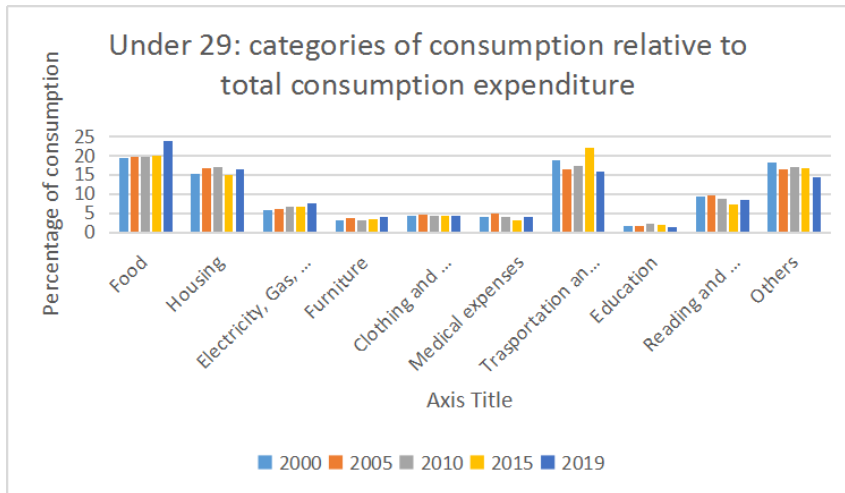| Entry	2005-2010	2010-2015	2015-2019	2005-2019
Net Financial Wealth	ΔW= -8%	ΔW= +6%	ΔW= -10%	ΔW= -13%
Outstanding Savings	ΔS= -8% Percentage of ΔW= -101%	ΔS= +5% Percentage of ΔW= +86%	ΔS= -10% Percentage of ΔW= -99%	ΔS= -13% Percentage of ΔW= -106%
Liabilities	ΔL= -4% Percentage of ΔW= +1%	ΔL= -26% Percentage of ΔW= +14%	ΔL= +4% Percentage of ΔW= -1%	ΔL= -26% Percentage of ΔW= +6%

Source: The 2005, 2010, 2015 and 2019 FIES

Table 4.41: Determinants of financial wealth, elderly 75+ retired

Entry	2005-2010	2010-2015	2015-2019	2005-2019
Net Financial Wealth	ΔW= -11%	ΔW= +11%	ΔW= -9%	ΔW=-10%
Outstanding Savings	ΔS= -11% Percentage of ΔW= -102%	ΔS= +11% Percentage of ΔW= +97%	ΔS= -9% Percentage of ΔW= -100%	ΔS= -11% Percentage of ΔW= -105%
Liabilities	ΔL= -10% Percentage of ΔW= +2%	ΔL= -15% Percentage of ΔW= +3%	ΔL= -2% Percentage of ΔW= 0%	ΔL= -25% Percentage of ΔW= +5%

Source: The 2005, 2010, 2015 and 2019 FIES

Figure 4.13: Consumption patterns, workers' households under 29

Figure 4.14: Consumption patterns, workers' households 30-39
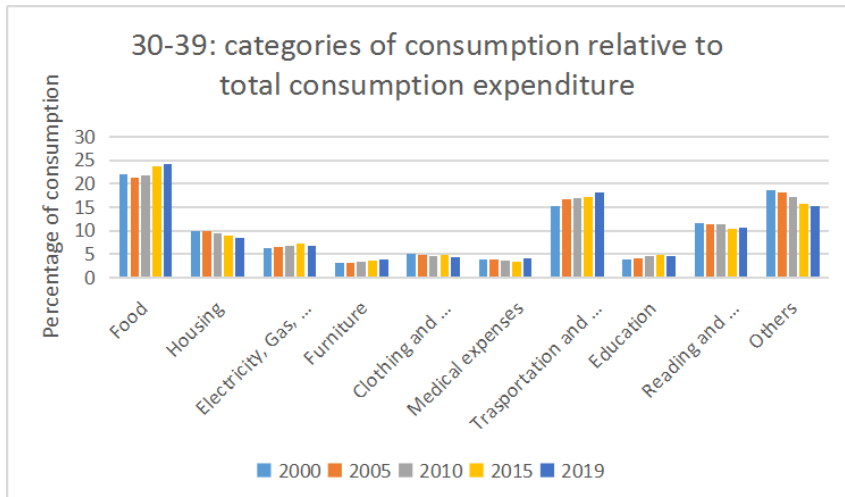
Figure 4.15: Consumption patterns, workers' households 40-49
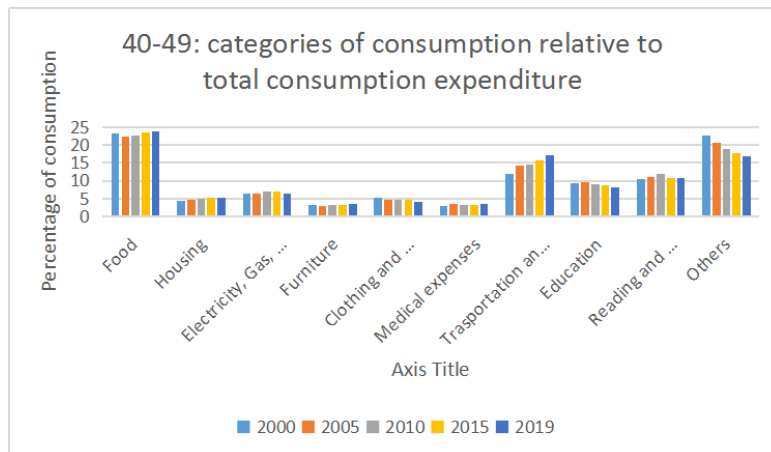
Figure 4.16: Consumption patterns, workers' households 50-59
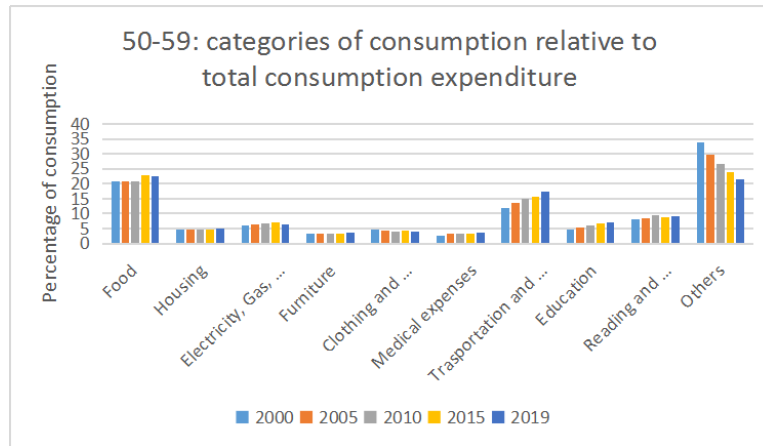
Figure 4.17: Consumption patterns, workers' households 60-69
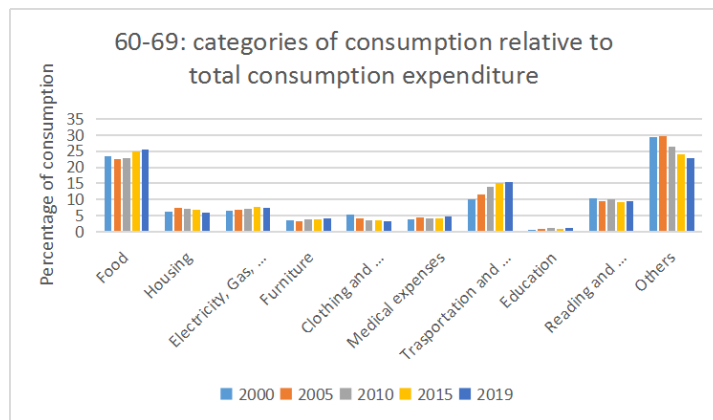
Figure 4.18: Consumption patterns, workers' households 70+
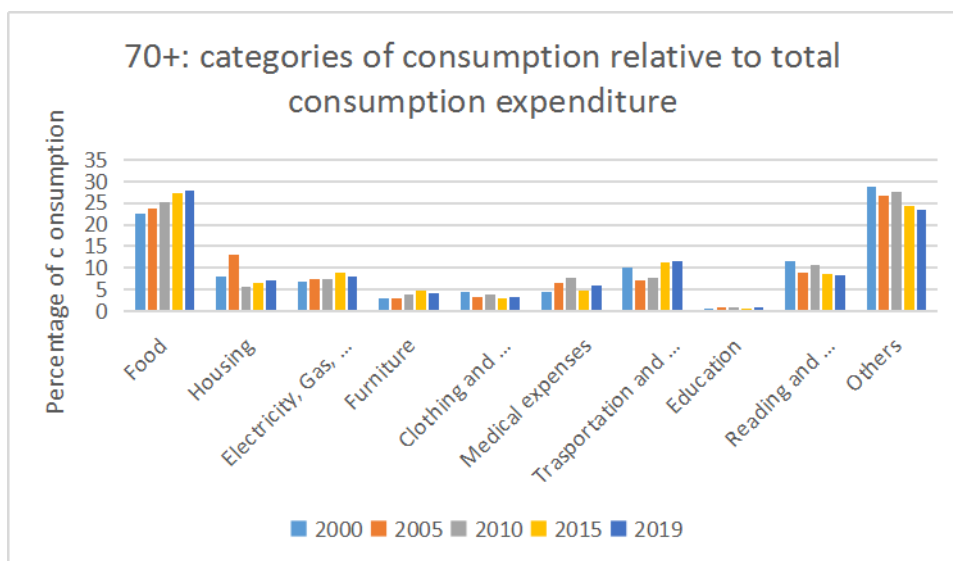
Figure 4.19: Consumption patterns, elderly households 65+ worker

65+ workers: categories of consumption relative to total consumption expenditures
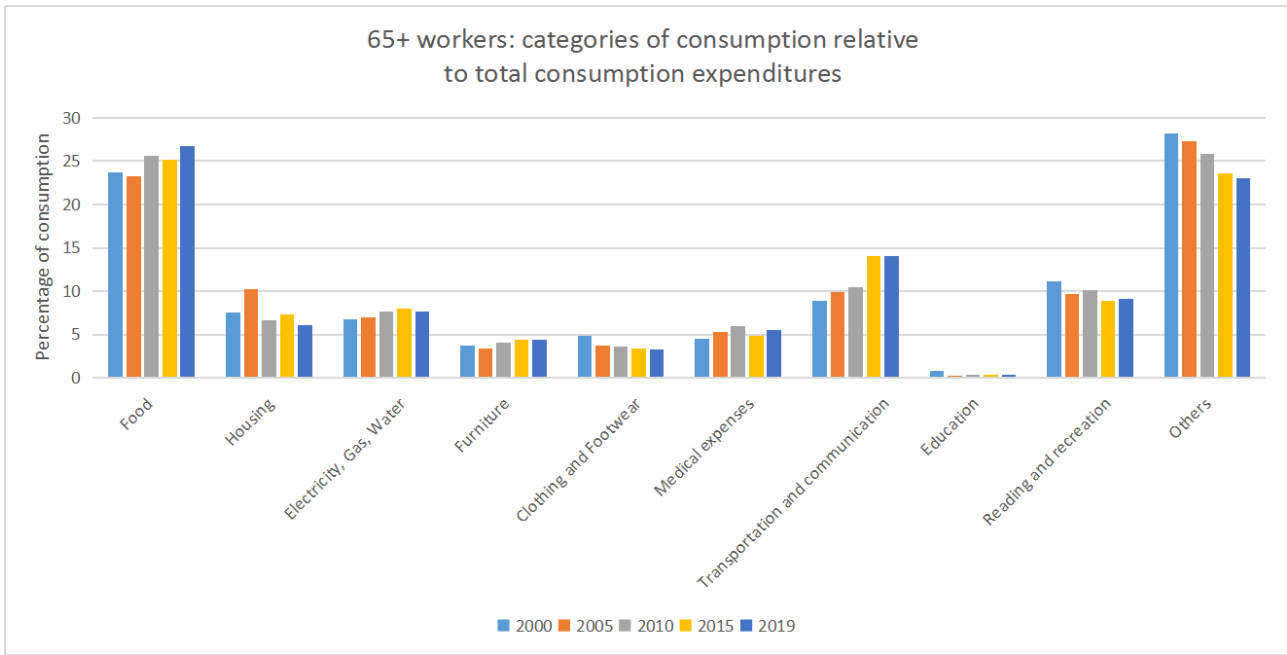
Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Figure 4.20: Consumption patterns, elderly households 65+ retired

65+ retired: categories of consumption relative to total consumption expenditures
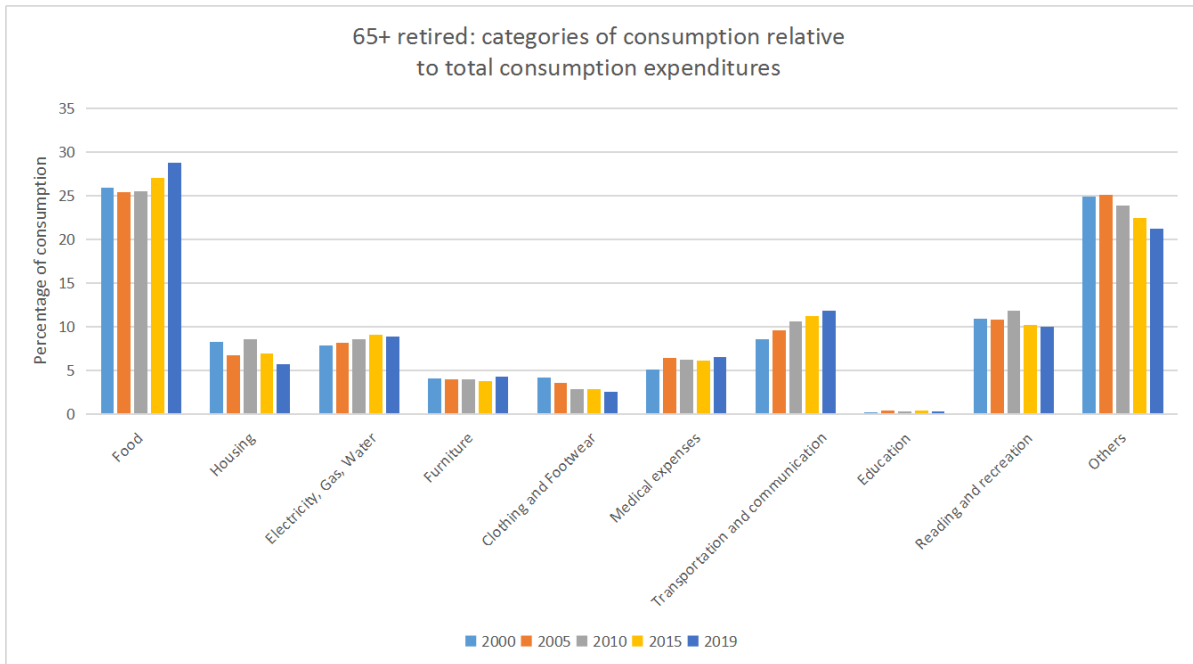
Source: The 2000, 2005, 2010, 2015 and 2019 FIES

Figure 4.21: Consumption patterns, elderly households, 75+ retired

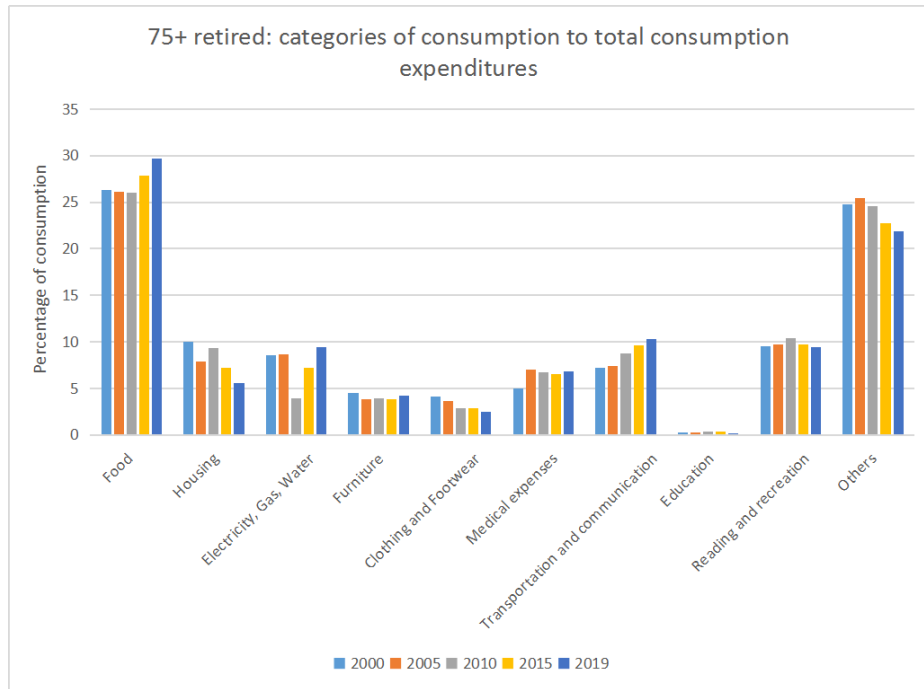75+ retired: categories of consumption to total consumption expenditures

Conclusion

In this dissertation, we have analyzed some institutional characteristics that could influence saving and the life cycle of saving in Italy and Japan and tried to see if there are effects reflected in the data. In the institutional part, we have seen that both countries underwent an increase in the number of temporary or atypical contracts, while in the past they had been characterized by high employment security. While in Italy job security was ensured by the Law 300/1970, and did not reflect a particular corporate governance method based on institutional complementarities, in Japan lifetime labour was linked to an inter-connected system whose components were the main-bank financing system, the contract not focused on a specific job and seniority wage increases. For this reason, in Japan lifetime employees could count on a significant income growth over life, whereas in Italy the salary was, and still is, based mainly on the job function. Concerning the evolution of the system in Japan, even if seniority is now less important in determining wages, labour income still rises considerably over the working life. Another common element between Japan and Italy is that early retirement of workers was used to cut down labour costs: in the case of Japan the reason was the high level of salary of the old employees; in Italy it happened because rigidity prevented firms to scale down younger human resources and, before early retirement, workers were put in *cassa integrazione* (a condition of reduced working hours with the grant of a percentage of salary). The rigidity of the labour market was then addressed by expanding the share of atypical contracts but while in Japan indefinite contracts were not modified, in Italy they were made less strict, but only for new entrants.

The transformations of the labour market pose problems concerning the pension system. In Japan, the pre-existence of a scheme that granted more than one level of benefits only to full time employees raised the issue of future pension benefits' adequacy for non-regular employees. Nevertheless, Japan took actions such as the expansion of EPI coverage to solve this condition, even if the provision was applied only from 2016, 12 years after the first recommendation, and more stringent measures for smaller enterprises were envisaged only in 2020 (to be applied from 2024). On the other hand, not only Italy did not consider the problem of the relation between atypical work and low pension benefits, but it worsened the problem by itself. Indeed, the pension benefits of these kind of workers would have been lower than regular employees also in the case of the defined-benefit system, but the defined-contribution computing method exacerbates the problem. In addition, even if contributions are not invested, they are treated as such, given the use of a capitalization rate based on GDP nominal growth which is unlikely to improve the value of pension benefits in a country characterized by a low level of productivity and innovation. Moreover, the contributions of working

cohorts in Italy finance completely the high pension benefits received by current retirees, because taxes do not cover any part of the system. On the other side, in Japan, taxes cover half of the basic pension and the consequence is that pensions are not completely paid by the working population. Nevertheless, before considering financing also a part of Italian pensions through taxes, a reform of the fiscal system is required, given the high tax evasion and the burden on employees. Another difference in the pension system between Italy and Japan is that both countries reduced pension benefits, but the former chose a very long transition period, while in the latter the decrease already began. The result is that in Italy the inequality between the past/present and future level of benefits is stark, while higher pensions could have been granted to younger cohorts by reducing the past/present amounts. Moreover, the two countries are trying to encourage occupational and private pension plans. In Japan enterprises had an important role in providing pension benefits in the past but, given the institutional transformations, a reinforcement of their involvement is unlikely (indeed the data demonstrate that companies' pension plans cover less employees compared to the 2000s). With respect to Italy, plans are sector-based and not company-based, but it is difficult to believe that a private sector that competes on costs can grant a decent level of benefits. Rather than the occupational pension, the private pension sector is increasing in Japan, while in Italy people might not have enough economic resources to participate in it. Furthermore, funded pension presents problems linked to inflation, investment and longevity risk.

In relation to the health care system, in Italy it is financed mainly through indirect taxes and there is no social security contribution to it, as opposed to Japan. In the latter, the introduction of a social security contribution directly paid by the elderly reduced the disposable income of this group, while in Italy the financing is more indirect (through other direct or indirect taxes). Regarding co-payments, in Italy there is no distinction among age groups, while in Japan the elderly pay a lower share, unless their income is the same as working generations. Long-term care is another sector in which Japan presents a compulsory insurance, while in Italy the system is financed through the State's budget. In the former case, insurance covers from 90% to 70% according to the income of the recipient but housing costs are excluded, whereas in Italy the State covers 50% of the expenditures, associated to health care (thus 100% of non-housing costs), while the remaining 50% related to housing can be partially covered by municipalities. With respect to the availability of service, in Italy the number of beds in facilities is very low and concentrated in the Center-North of the country, while in Japan it is higher but it was reduced in the recent years. For this reason, it is probable that both countries are still relying on the internalization of care and in the Italian case also on the grey market.

Another aspect that we have examined is the accessibility to credit market. In both countries this market was highly regulated until the 1990s and it was thus necessary for households to accumulate savings or to be supported by family members in order to purchase a house. After the liberalization of the market, the increase of households' liabilities was higher in Japan than in Italy, maybe because of better social capital or economic conditions.

Finally, the institutional analysis ended with a part dedicated to the fiscal system. In Japan and in Italy population aging was accompanied by a rise in public expenditures. While the past extremely generous policies in Italy caused an increase in public debt before the 1990s, later all the expenses were covered through taxes and contributions, while the persistent deficit was due to the repayment of debt. On the opposite side, in Japan the fiscal system was underdeveloped and debt remains one of the primary sources of financing public expenditures. In both countries the revenue was increased, but the main targets of this provision were the social security contributions and the consumption tax, two non-progressive financing sources. In Italy social security contributions weigh exclusively on the working population (especially employees), while we have already said that in Japan part of it is paid by the elderly, given the insurance-nature of the health-care and long-term care system. Consequently, even on the fiscal level, Italy is advantaging retirees (but also self-employed workers) and high-income households, while in Japan the redistribution of the burden among generations is higher compared to Italy. Nevertheless, we can say that Japan is placing some burden on future generations because of the increase in public debt. For now, the debt service is very low in Japan but it is necessary to raise the tax revenue in order to avoid future problems and, even if consumption tax is not high and thus there is room to increase it, more redistributive financing sources should be taken into account too. The fiscal system needs to be reviewed also in Italy, in the first place because of tax evasion and the unbalanced burden, and in the second place because of high debt service costs.

How does the first part of the dissertation reflect in the second part, dedicated to the empirical analysis? Concerning the change of variables over time for different age groups, the saving rate of working generations in Italy is lower in 2016 compared to 2000 for all the age groups except the one aged 40-49. On the other hand, in Japan, the saving rate in 2015 is higher than in 2000 for the groups aged under 29, 30-39 and 40-49. The variable of the group 50-59 is slightly lower than in 2000, while that of the group 60-69 is considerably below the level of the past. With respect to income, in Italy in 2016 the value is lower than in 2000 for all age groups except the one aged 60-69, whereas in Japan, in 2015, all the groups exhibit a variable below the level of 2000 but the gap is higher from age 40-49. Moreover, in 2019, income of young groups in Japan is higher compared to 2000, while from age

40-49 it is lower. Regarding consumption, in Italy the variable is lower for all age groups except for the one aged 60-69, while in Japan the reduction concerns all employees' households. In relation to retirees, in Italy their income in 2016 is higher than in 2000, but their saving rate declined because of an increase in consumption. On the other side, in Japan, consumption in 2015 did not change for retired people aged 65 or over, while it increased slightly for the group 75 or over. Disposable income diminished for all the retirees, both because of a fall in social security benefits (but we have seen that it might reflect more the length of contribution period rather than the policy applied) and an augmentation of social security contributions and taxes. In Japan, therefore, the saving and the saving rate of the elderly declined for the opposite reason compared to Italy. This means that, as we have hypothesized, the present effect of policies in Japan redistributes the consequences of restrictive fiscal provisions among generations by a higher degree compared to Italy. This fact is confirmed also by data on stock measures. Indeed, in the case of working households, in Italy net financial wealth was over the 2000 level in 2016 only for the groups under 29 and 60-69, but financial assets declined for all the groups except the latter (which also had higher liabilities in contrast with the others). In addition, Italian retirees have higher net financial wealth compared to 2000. In Japan, net financial wealth in 2015 was lower than in 2005 for all the working households, but especially for the groups under 29, 30-39 and 40-49. Nonetheless, the main reason for this phenomenon is the increased access to credit market for the purchase of housing, even if also outstanding savings declined. Japanese retirees, in contrast to the Italian ones, display lower net financial wealth compared to 2005 in both 2015 and 2019. This is caused by lower outstanding savings, whereas liabilities decreased.

What about the differences in the cross-section profile in Japan and in Italy? Let us consider the years 2000 and 2015-2016. In 2000, in both countries, consumption increased until age 59 and decreased afterwards. In Japan, households could support higher consumption thanks to wage increases with age. It is true that the saving rate declined after age 30-39 because consumption grew more than income, but the fall was not drastic until age 50-59. On the other hand, in Italy, the decline in the saving rate was considerable until age 40-49. This happened because the growth in consumption was not accompanied by a rise in income between age 29 and age 30-39, while before age 40-49 income grew only slightly. Then, the saving rate increased until age 50-59 thanks to income, which was led by both higher wages and pension and transfers. Finally, in Japan and in Italy income and consumption fell between age 50-59 and 60-69 but in Italy it decreased more than income and thus the saving rate augmented, while in Japan the opposite occurred. The cross-section differences between Japan and Italy in 2015-2016 were similar to the one we just described. The only variations are that in Italy, contrary to 2000, income rose between age 40-49 and age 50-59 because of labour and not due to pension and transfers, but this last variable caused disposable income to grow between

age 50-59 and 60-69, while in 2000 the figure was lower for the oldest group. Even if these observations are based on cross-section data, which are not suitable to see the change with age, we have seen that constructing cohorts through multiplied cross-sections confirms the trends. We can identify some institutional characteristics in the discrepancies between Japan and Italy. Indeed, even by looking at the figures presented in the empirical chapters, we see that the increase in income over life is much flatter in Italy compared to Japan and this could be linked to the features of the labour system. While a big part of wage is still determined by age in Japan (because of both seniority and skills-related pay), in Italy people need to wait until their 50s to experience a significant growth in their income. In addition to low wage increases related to age, this could also be linked to job instability for a significant part of the working life.

To conclude, institutional characteristics have an effect on saving and the life cycle of saving because they determine not only how income changes over life, but also how the burden of population aging is distributed among different age groups. Both in Italy and Japan retired households have negative saving rates and are consuming their wealth, but for different reasons. In Italy, the effect of population aging will be a lot worse when cohorts affected by the pension and the labour market's reforms will retire. In addition, this big negative effect on households' aggregate saving rate will be accompanied by the already existing declining trend involving active employees' households. In Japan, the likely further decrease of pension benefits risks to deteriorate the situation too, while the working generation will probably experience a fall in the saving rate if they cannot reduce consumption further when taxes will be increased. Nevertheless, our predictions for the future aggregate households' saving rate are limited if we do not estimate the potential effect of redistributive policies on the macro-variable. In this study, we could not even examine the distributive impact of the current policies due to the inadequacy of Japanese data but, as we said in chapters 1 and 2, it is likely that such a problem exists at the micro-level, given the non-progressive nature of the main current financing sources. Another limit of this research is that, because of time constraints, it was not possible to study the changing role of family and how it affects the life cycle of saving. Thus, a topic of future research is the variation of the life cycle of saving for different household types and professional status, especially for single women and widows, who are rarely considered in studies about saving.

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