LES CAHIERS

Louis Bachelier

INDIVIDUAL AND COLLECTIVE RISK BEHAVIOR

With

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Milo Bianchi
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EDITORIAL

Elyès Jouini

Economic models are constructed on the basis of assumptions that are necessarily simplifying but sophisticated enough to ensure high explanatory and/or predictive power. The ideal model is parsimonious in terms of rules and parameters and rich in conclusions matching observed reality.

The standard economic models have thus introduced rationality on the basis of the individual's supposed ability to take into account all the available information, to deduce from it all possible conclusions and thereby to infer expectations that are adjusted over time and are indefinitely compatible with each other. The individual then unemotionally maximizes its usefulness or profitability, taking into account and weighing up, in accordance with his expectations, all future dates and scenarios.

This paradigm has produced a large number of operational conclusions and intuitions that have made possible further advances, especially in finance and insurance. Indeed so much so that we have ended up by viewing as irrational any individual whose behaviour does not conform to the assumptions or predictions of the theory.

While not disputing their impact, these advances were soon found to be inadequate for explaining the behaviours actually observed, in terms both of actors and of the markets themselves.

Behavioural finance takes the opposite approach: it starts from observed behaviour and the characteristics emphasized, particularly by psychologists and sociologists, and then incorporates these "biases" into economic analysis.

The "Individuals facing risk: analysis and market behaviour" Chair, supported by Groupama, takes this approach and explores, on both an empirical and theoretical basis, individual behaviour and how markets integrate, reflect and fuel such behaviour.

This issue of Cahiers presents some of the work developed within this framework. With Clotilde Napp, we deconstruct the main argument by the proponents of the standard theory: irrational individuals – if they exist – should be able to rapidly discover that rational individuals are more successful than themselves, and should, therefore, model their behaviour on them, thus becoming rational in turn. In fact this is not the case: irrational individuals can lastingly attain greater success than rational individuals and therefore remain rationally irrational.

Milo Bianchi and Jean-Marc Talon focus on ambiguity, that is, situations where there are not only several possible scenarios, as in any risk situation, but where in addition there is uncertainty about the respective probabilities of these different scenarios. They then analyse the impact of ambiguity aversion on investment.

Drawing on the "Household finance and consumption survey", conducted in fifteen countries, Luc Arrondel and his co-authors analyse the variety of household savings behaviour.

Roméo Fontaine, Najat El Mekkaoui and their co-authors focus specifically on the health insurance, retirement and dependency markets. What are the connections between longevity and retirement age? What is the impact on household savings of systems for funding pensions and health spending? How does the perception of dependency risk influence the demand for insurance? Or more broadly and more crucially: how can people take maximum advantage from ever increasing life expectancy?

Enjoy your reading!

Elyès Jouini

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Is finance irrational?

While classical economic theory is largely based on the rationality of individuals in financial markets, observation of reality does not confirm this assumption. In this context, the process of forming financial asset prices also involves psychological parameters.

Key points

- The threat of elimination is not necessarily sufficient to make irrational agents behave rationally.
- In certain situations, irrational agents have greater success than rational agents during their time in the market.
- The heterogeneity of individuals has an impact on the process of formation of financial asset prices. This must be taken into account in theoretical models for future research.

Based on the paper "Live Fast, Die Young" by Elyès Jouini and Clotilde Napp, to be released in Economic Theory, and on an interview with Elyès Jouini.

How do individuals behave in the financial markets? Does rationality lead to better results in the markets? Or conversely, is irrationality, defined by expectations unrelated in varying degrees to economic and financial indicators, a success factor? These questions have again become crucial in the aftermath of the 2008 financial crisis and with the continued volatility of financial markets. This phenomenon has led many researchers and economists to question the process of formation of asset prices, in order to better comprehend the large variations seen in the markets. Far from being new, this issue has been repeatedly theorized in the economics literature.

The neoclassicists are on the wrong track

In neoclassical theory, individuals are consistent and have rational expectations. Furthermore, market information is efficient, shared by all, and leads to the same rational expectations. In reality, however, these assumptions are unfounded. "There is a contradiction between theory and practice. For example, financial analysts and economists may have different opinions, even if they have similar information," Elyès Jouini says. According to the neoclassical school of thought, irrational individuals are always eliminated from the market by rational actors, because the latter get higher returns. Furthermore, rational actors benefit from the irrationality of irrational actors in realizing capital gains.

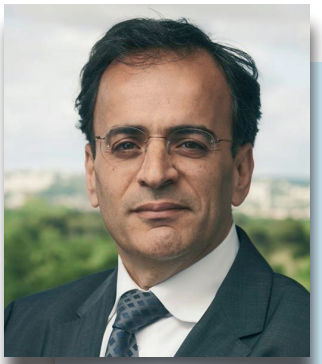
Irrational individuals turn out to be those who perform best in the financial markets

These two phenomena are supposed to lead to mimetic behaviour on the part of irrational actors, who copy the decisions made by rational actors so as to be as successful as them. Put simply, in neoclassical theory, irrational individuals have no impact on the markets.

Irrational actors have a kind of rationality

However, the neoclassical arguments mentioned above have two major limitations. First, it is impossible to estimate how long it will be before irrational actors are eliminated from the market: it might even take hundreds of years.

For example, smokers and high-risk drivers have a higher probability of dying prematurely than "rational individuals", but this does not prevent others following the same "irrational" practices. The second limitation is provided by the authors of the above-mentioned paper: "The threat of



Elyès Jouini

Elyes Jouini is a graduate of the Ecole Normale Supérieure and a holder of the agrégation in mathematics. He is professor of mathematics at Paris-Dauphine University and holds a chair at the Risk Foundation. He is also Director of the Dauphine House of Finance, Director of the Asset Management Master Program and vice president of the Scientific Council of Paris-Dauphine University. Previously he was professor at Paris 1 Panthéon-Sorbonne University, ParisTech ENSAE (National School of Statistics and Economic Administration) and the Stern School of Business (1998-2000). His current research interests concern financial economics, especially the heterogeneity of beliefs, aggregation, long-term risk and the term structure of interest rates.

Methodology

In this paper, the authors enrich neoclassical theory with current work related to behavioural economics. To this end, they carried out a theoretical analysis in the domain of the model using the neoclassical approach – particularly the theory of general equilibrium –, while adding elements such as optimism and pessimism taken from behavioural economics. The findings thus constitute a break with previous work on this topic.

elimination is not necessarily enough to make irrational individuals act rationally: a shorter life can be more rewarding than a longer one." Here reference to the lifestyle of certain rock or film stars may be relevant: their way of life may damage their health and reduce their life expectancy, but their relatively brief lives will have been more intense.

From a dynamic model composed of two groups of individuals – rational and irrational – seeking maximization of their welfare, the authors have obtained results that mark a break with neoclassical theory. Thus the irrational individuals turn out to be those who perform best in the financial markets. And irrational behaviour may persist even if the irrational individuals regularly compare their performance with that of rational individuals.

It is in the interest of irrational individuals to remain so

The authors show that, in certain situations, irrational individuals are more likely to continue their behaviour, because they perform better than rational individuals. These conclusions remain the same when the irrational individuals compare their situation with what would have occurred if they had adopted rational expectations or if they suddenly were allowed to exchange their optimal asset allocation to that of rational individuals. "These results are important because they show that it can sometimes be rational to be irrational and that irrationality and differences of opinion all have their place in the modelling of markets. When we look at a model composed of heterogeneous and irrational individuals and a model composed of individuals who all have the same expectations, it is very different even if we assume that the expectations are on average the same in both models. The equilibrium prices in the two models are different," Elyès Jouini says. "In the model with heterogeneous expectations, it is as if there was an additional risk factor, and volatility is higher. Therefore, prices are higher because of the occurrence of a risk premium resulting from the heterogeneity of irrational individuals." In such conditions, he continues, "the potential heterogeneity of individuals must be taken into account in price determination models."

In their paper, the authors include psychological parameters that are not taken into account in the neoclassical theory. Current work in behavioural finance sheds new light on the functioning of financial markets and the price formation process. In this paper, the authors incorporate these psychological parameters into a neo-classical model, thereby enriching it and making a connection with analyses from behavioural finance.

Find the Elyès Jouini's full article on www.louisbachelier.org

How does ambiguity aversion impact investment?

By means of a field survey, Milo Bianchi and Jean-Marc Tallon show the impact of ambiguity aversion on investment choices and highlight the fundamental differences between risk and ambiguity.

Key points

- Risk aversion and ambiguity aversion lead to different behaviours.
- An ambiguity-averse investor on average takes more risk and achieves a better performance.
- It is therefore essential to include ambiguity aversion in models, so as to obtain a more accurate representation of markets.

Based on the paper "Ambiguity Preferences and Portfolio Choices: Evidence from the Field" by Milo Bianchi and Jean-Marc Tallon, and on an interview with Milo Bianchi.

Economists have long distinguished the level of risk and level of ambiguity. Nevertheless, the debate on the effects of each and their respective influence on investor behaviour continues to preoccupy the academic community.

Can ambiguity be viewed as a specific type of risk, or is it a totally different concept? Can it be incorporated into existing models or does it require specific tools? Will an ambiguity-averse individual make the same choices as a risk-averse individual? These questions are all the more important because in reality the financial markets include a significant degree of uncertainty. Understanding the nature and consequences of ambiguity is therefore essential for determining better how markets operate.

Observing investor choices

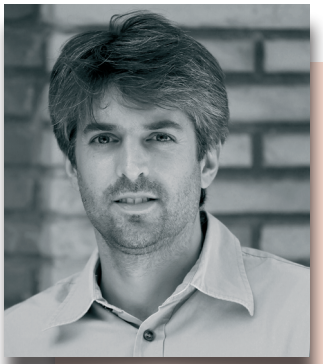
Milo Bianchi has addressed these problems empirically, through analysis of a French insurance group's life insurance contracts, looking at both their composition and their value at time t. Specifically, the study examines the investments made by almost 500 policyholders and the evolution of these investments over an eight-year period. Indeed, each investor divides his money between (non-risky) funds in euros and (more risky) units of account. He therefore chooses his risk exposure and may change it regularly, by reallocating his assets.

Ambiguity aversion and financial skills are not incompatible

In addition, a questionnaire was sent to the policyholders to assess their preferences with regard to risk and ambiguity. By thus aligning data on ambiguity-averse and risk-averse investors, Milo Bianchi analyses and compares the extent of risk-taking, changes in risk exposure over time and the performance of the portfolio.

Less ambiguity and more risk

The first question examined was that of the level of risk taken by holders of life-insurance. Over the panel as a whole, 42% hold risky assets. Risk aversion, like ambiguity aversion, is likely to reduce this percentage. However, the study shows that ambiguity-averse individuals in fact take on more risk than the rest: they are thus 11% more likely to have a highly risk-exposed portfolio, that is, with a higher degree of risk than the average observed. "Because of



Milo Bianchi

Milo Bianchi is an assistant professor at the Toulouse School of Economics (TSE) and member of the Institut d'Economie Industrielle (IDEI). His research interests focus on financial economics, behavioural economics and corporate finance. The holder of a doctorate in economics from the Stockholm School of Economics, he also has qualifications from the Massachusetts Institute of Technology, University College London and Bocconi University.

Methodology

From a methodological standpoint, the main novelty of the study is that it combines administrative panel data coming from the insurance company, data on market returns and data from a survey the authors designed and carried out on investors. The empirical analysis then applies standard tools from panel data econometrics.

their ambiguity aversion, these investors reject certain assets viewed as too uncertain," says Milo Bianchi. "They therefore have a less diversified portfolio. However, reduced diversification implies more risk."

This finding may also explain certain behaviours, such as the relative neglect of international markets in favour of the local market. "Investors are more familiar with the financial products and firms of their own country. They feel that ambiguity is less pronounced and they prefer these assets."

Second, Milo Bianchi examined to what extent preferences regarding risk and ambiguity affect the frequency and amplitude of allocation changes. He found that ambiguity aversion leads to stable risk exposure over time. These investors turn out to be more active in reallocating their portfolios, so as to maintain a relatively constant level of risk. "Our work reveals a relatively sophisticated investment strategy. Ambiguity aversion and financial skills are thus not incompatible."

On the other hand, the study reveals no significant impact of risk aversion on the level of exposure.

Good financial performance

The last question addressed is that of financial performance. Does the rejection of ambiguity adversely affect the return on investment? There are divergent views on this subject. Some argue that ambiguity-averse investors on average perform worse because of the under-diversification of their portfolios. However, the debate on the performance of these investors is linked to the question of how long they remain in the market. If their performance is poor, they will eventually leave the market and will therefore have no further impact on it.

The empirical study shows otherwise. In the panel observed, ambiguity-averse investors performed better than average. This finding is explained partly by the fact that they take more risk in their allocation decisions.
Risk-averse investors, on the other hand, perform less well than average.

Through this work, Milo Bianchi and his co-author highlight the differences between ambiguity and risk. The two preferences lead to opposite behaviour in terms of risk-taking and performance. "We show that ambiguity is a fundamentally different parameter from that of risk, not only from a conceptual standpoint, but also empirically," Milo Bianchi says. "Both should therefore be included in the appropriate economic analysis models."

In terms of application, the research underscores the predictive power of the preference for ambiguity. Its measurement would thus help better understand and foresee savers' investment choices. Including these preferences in life insurance application questionnaires, for example, would certainly prove very informative.

Find the Milo Bianchi's full article on www.louisbachelier.org

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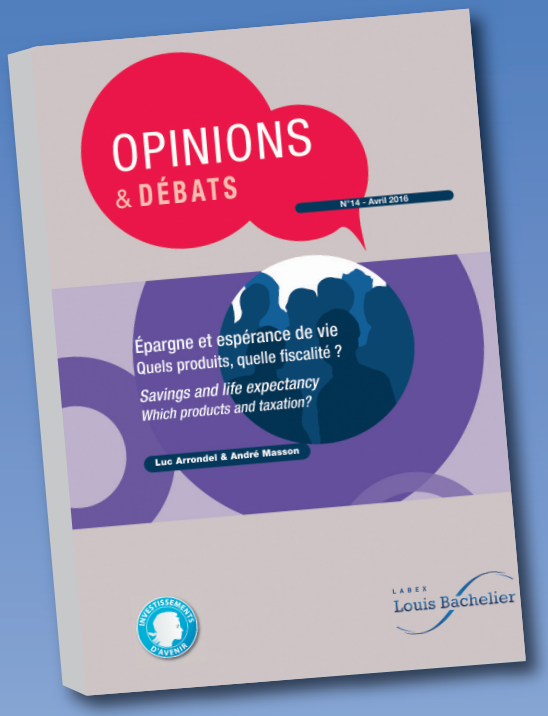
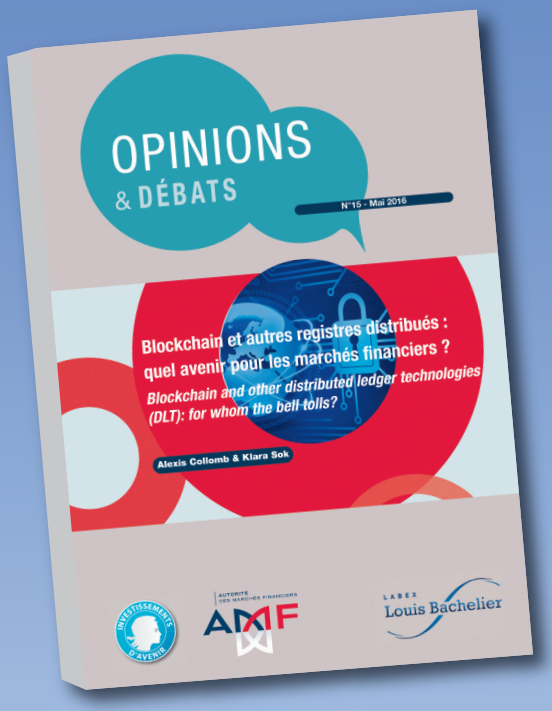
Luc Arrondel & André Masson





Blockchain et autres registres distribués : quel avenir pour les marchés financiers ?
Alexis Collomb & Klara Sok

MATINALE DE PRÉSENTATION LE MARDI 21 JUIN 2016

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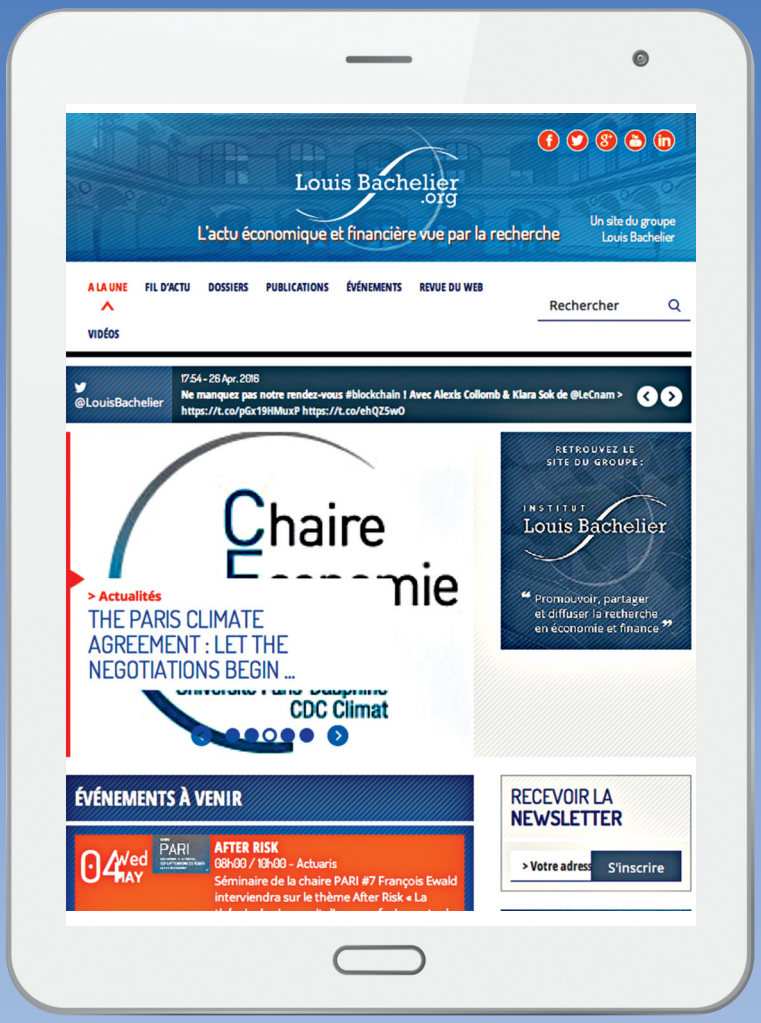

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Assets: how are differences in household behaviour to be explained?

Public and economic authorities alike regularly try to convince savers to invest in long-term financial products. But such assets, deemed risky, though they are nonetheless essential for financing the economy, are often neglected in favour of traditional savings accounts and investment in property. How can we explain such behaviour? What factors influence household savings decisions? Are the French exceptional in this respect within the euro area?

Key points

- Individual characteristics, such as the level of wealth or household composition, greatly influence savings behaviour, especially property purchases and investment in risky financial assets.
- However, the institutional characteristics of each country reinforce or diminish these impacts. They also explain the significant differences in terms of the composition of household assets in the euro area.
- The pension replacement rate and the dynamics of the mortgage market thus have a direct impact on financial and property investments.

Based on the paper "How do households allocate their assets? Stylised facts from the eurosystem household finance and consumption survey", by Luc Arrondel, Laura Bartiloro, Pirmin Fessler, Peter Lindner, Thomas Y. Mathä, Cristiana Rampazzi, Fréderique Savignac, Tobias Schmidt, Martin Schürz and Philip Vermeulen.

Through the "Household finance and consumption survey", conducted in 15 countries of the euro area, Luc Arrondel and his co-authors analyse the differences in savings behaviour among Eurozone households. Specifically, they explore how the individual characteristics of households, as well as the institutional specifics of each country, affect property purchases and investment in risky assets.

Property: the main constituent of household wealth

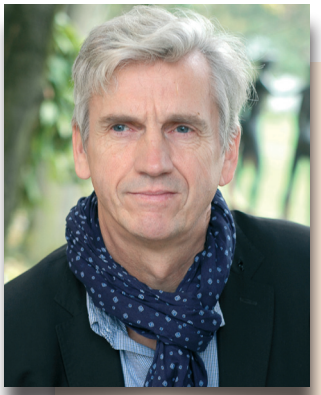
Within the group of fifteen countries surveyed, property on average accounts for 70% of the value of household assets, whereas financial products amount to some 15%, of which less than 4% is in risky assets. Property, therefore, is the main constituent of Europeans' wealth, and, as such, merits special attention. Two aspects were observed: the proportion of property owners in each country, and the average value of the assets held.

While the overall property ownership rate is 60% in the euro area, Germany has the lowest proportion with 44%. Conversely, in Spain, almost three-quarters of households are property owners, while France occupies an intermediate position (55%). In terms of value, the primary residence represents 48% of French household wealth, against 41% for Germans. "Surprisingly enough, German households are among the least wealthy of the Eurozone," says Luc Arrondel. "This is explained by the limited number of home owners and the absence of a property bubble in Germany. But if we remove the housing bubble effect from the calculations, Germans property owners are among the richest in Europe."

There are also considerable differences with regard to ownership of risky financial assets. In France 22% of households hold such assets, and in Germany 23%. The proportion is higher in Belgium, at 31%. These assets account for 11% of the wealth of Belgians, 5% of that of Germans and only 3.5% of French household wealth.

The impact of socio-demographic factors…

Clear differences exist, therefore, between European countries, in terms both of property and of financial investments. The primary cause concerns socio-economic factors. Thus the probability of owning property is highly correlated with the overall wealth le-



Luc Arrondel

Luc Arrondel is a research associate in the TDTE Chair, research director at the CNRS and a researcher at the Paris School of Economics. His research focuses on the theoretical and empirical aspects of savings behaviour. His work concerns the accumulation, composition and transmission of household wealth, as well as the measurement of investors' preferences and expectations. An expert at INSEE for the design and operation of "Heritage" surveys, Luc Arrondel also implements the Pat€r surveys (PATrimoine et Préférences face au TEmps et au Risque) in collaboration with André Masson.

Methodology

The work was carried out on the basis of the first wave of the Eurosystem "Household finance and consumption survey", conducted in fifteen countries of the euro area. The survey, which will be repeated every three years to record changes, provides data on household incomes, the level and composition of households' assets, and socio-demographic factors such as household composition and educational level. The authors assess the impact of socio-demographic characteristics and of the economic and institutional environment on behaviour regarding the allocation of assets.

vel: the more affluent a household, the more likely it is to own property. In addition, at an equivalent level of wealth, couples with children own higher priced homes than single people, because they generally occupy larger accommodation.

Similarly, the overall wealth level influences the ownership of financial products. The richest households, for example, are twice as likely as average to hold risky assets, and to invest larger amounts. The same applies to single people, who invest more in such assets than families.

People's level of education also has an impact on savings choices. The higher it is, the more likely they are to own risky assets. "This finding may be explained by the high cost of information (monetary or otherwise), or again it may stem from the effect of low financial literacy on the diversification of investments," says Luc Arrondel.

Finally, the study highlights a twofold effect of inheritance: one directly on the level of wealth, the other indirectly on behaviour. At the same level of wealth, a person who has inherited is more likely to be a property owner. Similarly, if the person's parents owned risky financial products, he or she has a greater probability of having them him/herself.

…reinforced to a greater or lesser extent by the institutional environment

While the impact of various socio-demographic factors on economic behaviour is significant, it is strengthened or reduced according to the country's institutional profile. The information available plays an important role in households' investment decisions. In countries with good internet access, the marginal effect of the level of wealth on the likelihood of holding risky assets is reduced. "This finding is consistent with the idea that having access to information reduces entry costs and transaction costs in the financial markets," says Luc Arrondel.

Another institutional factor influencing savings choices is the pension system. The lower the replacement rate between earned income and pensions, the more people are inclined to buy riskier assets in order to maintain their standard of living.

Finally, investment in property is closely related to the mortgage market. Indeed housing is often used as collateral for a bank loan. However, the characteristics of the mortgage market vary from one country to another, particularly regarding the possibility of using this method for purchases other than property. The authors of the study thus find a negative correlation between the development of this market and the marginal effect of the wealth level on the purchase of property. In other words, when the mortgage market makes it worthwhile taking out non-property loans against housing, the impact of the wealth level on the probability of owning property is reduced.

By highlighting the various factors affecting choices relating to personal assets, the research allows a better understanding of the behaviour of households and offers guidance regarding possible structural reforms. The experiences of neighbouring countries can thus be a source of inspiration for channelling savings towards long-term products.

Find the Luc Arrondel's full article on www.louisbachelier.org

Health, retirement pensions and longevity: what is their impact on household savings?

Demographic aging will be a huge challenge in the coming decades. Analysis of the interrelations between savings, health, retirement and life expectancy sheds light on the importance of comprehensive and consistent thinking about reform of social security systems.

Key points

- The level of retirement pensions has a disincentive effect on savings. This finding has been clearly established and corroborated by the authors. The impact on the level of health provision on savings is a question that has been less addressed. The authors show it has a similar effect.
- Reforms regarding retirement and health cannot therefore be considered in isolation. The findings confirm the need for a more integrated policy framework.

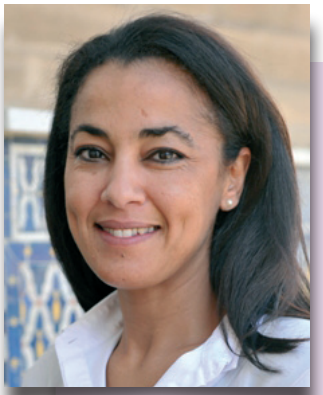
Based on the paper "Health, pension benefits and longevity: How they affect household savings?" by Najat El Mekkaoui de Freitas and Joaquim Oliveira Martins published in the Journal of the Economics of Ageing.

Faced with demographic aging and the continuous increase in life expectancy, OECD countries face major challenges. To respond to this situation, social protection systems need to adapt. Far-reaching reforms are being devised in many of these countries. But what kinds of reforms should be introduced? Given that public deficits are widening, how should the steady increase in health spending relative to GDP be addressed? How can pensions be funded now that the current systems have become unsustainable?

In this context of demographic aging, Najat El Mekkaoui de Freitas and Joaquim Oliveira Martins have sought to analyse the impact of systems for funding pensions and health spending on household savings. Najat El Mekkaoui has worked extensively on the topic of retirement pensions and savings behaviour. For his part, Joaquim Oliveira Martins has carried out in-depth studies in the field of health, in particular projections regarding public health expenditure. In this paper, they decided to pool their work. While there is extensive academic research on the analysis of savings behaviour, the two researchers have here adopted a different approach, placing the issues of funding for retirement, health and aging within the same analytical framework.

The health system is also a key determinant of savings

To carry out the work, the researchers combined theoretical modelling and an empirical study. They draw on the theory of "life cycle", widely used in economics to understand consumer and savings behaviour in relation to age. People's rational behaviour leads them first to reduce their debts and then to build up savings for use during retirement, so as to maintain their standard of living. On the basis of the life cycle model, the researchers equated longevity, retirement pensions and public spending on health to examine the level of household savings. In theory, there is a negative correlation between the level of pension and health provision and savings incentives. In other words, between countries, the greater the replacement rate (percentage of earned income retained by the employee when he claims his pension rights) and the higher the level of public health benefits, the less households are motivated to save. This model was empirically tested on a sample of 22 OECD countries over a period running from 1970 to 2009. The results tend to confirm the theoretical hypotheses.



Najat El Mekkaoui de Freitas

Najat El Mekkaoui de Freitas is senior economist and associate professor in economics at Paris-Dauphine University. She is also a researcher in the LEDa (Laboratory of Economics Dauphine) and the Dial UMR. Her research focuses on the economics of aging, longevity risk and issues around household savings and insurance.

Joaquim Oliveira Martins

Joaquim Oliveira Martins heads the Regional Development Policy department in the OECD. The holder of a Ph.D. in economics from the University of Paris I, Panthéon-Sorbonne, he is currently an associate professor at Paris-Dauphine University. He started as a research associate at the CEPII (Centre for Prospective Studies and International Information) before joining the OECD as a senior economist and then becoming head of the Structural Economic Statistics department.

Methodology

The researchers developed a "life cycle" model incorporating the impact of replacement rates, health spending and life expectancy. They formalized an "aggregate equation of household savings" that allowed them to make an empirical specification. Their work is based on a set of data for 22 OECD countries over the period between 1970 and 2009.

Estimates suggest that health systems are a major determinant of savings behaviour. An increase of one percentage point of GDP on public health spending results, on average, in a 0.95 per cent decrease in the household savings rate. A reform of pension systems that does not take into account health systems may not, therefore, have all the desired effects on household savings.

The authors also draw other conclusions. Increased life expectancy should lead to an increase in savings. In addition, the model also suggests that a high replacement rate combined with a significant proportion of the elderly in the total population could explain a tendency to continue saving when older. This excess savings could point to a wish to pass on one's wealth or to guard against the risk of dependency (that is, the inability to carry out the tasks of day-to-day life).

Their findings are also in line with Ricardian equivalence. Thus public deficits can provide an incentive for households to save because they expect a tax increase.

More consistency and synergies in the reforms

The main lesson from this research paper is that reforms must be implemented within a more integrated framework. Changing the pension system without taking into account the health system or the labour market would be ineffective. The findings argue in favour of more complementarities and synergies between the policies enacted.

These links also concern the financial markets. Up until now "pay as you go" systems have allowed individual longevity risk to be mutualized. Savings incentives must go hand in hand with more developed annuities markets.

How can we succeed in taking advantage of our increasingly long and healthy lives? This question of the management of longevity is one of the major challenges facing our societies.

Find the Najat El Mekkaoui de Freitas and Joaquim Oliveira Martins's full article on www.louisbachelier.org

How do people react to dependency risk?

With the aging of the French population, funding for dependency is an increasingly important issue. In this context, a better understanding of insurance behaviour with regard to dependency risk is crucial for designing fair and effective public measures.

Key points

- Preference for the present is a decisive element in people's decision whether or not to take out insurance cover. This preference inherently hinders the growth of dependency coverage.
- People are not fully aware of the risk of dependency. To reverse this situation, educational and communication initiatives need to be implemented by the public authorities and/or insurance companies.
- The dependency insurance market is extremely heterogeneous. The government could consider creating certification to clarify the provision available, thereby enabling people to get a clearer view of it.

Based on the papers "Dans quelle mesure les préférences individuelles contraignent-elles le développement du marché de l'assurance dépendance?" ("To what extent do individual preferences constrain the development of the dependency insurance market?") by Roméo Fontaine, Manuel Plisson and Nina Zerrar, and "Comment la perception du risque de dépendance influence-t-elle la demande de couverture? Premiers enseignements de l'enquête ESPS" ("How does perception of dependency risk influence the demand for insurance? First lessons from the ESPS survey") by Roméo Fontaine, Marc Perronnin, Nicolas Sirven and Nina Zerrar, and on an interview with Roméo Fontaine.

How should management of the loss of autonomy be funded in France? How do individuals view this relatively distant possibility? What initiatives would enable the dependency insurance market to develop? All these and other questions need to be addressed by the government, insurance companies and individuals themselves in a context of aging populations and the increasing costs of dependency management. In 2050, the funding needs for dependency risk will be higher than those of retirement risk, according to estimates made in 2011 by DREES (Direction de la recherche, des études, de l'évaluation et des statistiques).

Households have to dip into their own pockets

Also according to DREES, the financial resources needed to support dependent elderly people stand at 28.3 billion euros, or 1.41% of national GDP. Of this colossal amount, the public authorities fund 75%, or 21.1 billion euros. The remaining 7.2 billion euros are thus covered by the elderly themselves and their families. However, the amount households are responsible for has been underestimated due to a lack of statistics on the subject and the failure to take into account the indirect costs associated with support provided by the family.

> *People's preference for the present is the most important determining factor with regard to taking out dependency insurance*

To guard against the risk of dependency, the elderly can take out specific insurance, but the dependence insurance market is struggling to develop, with only two million people aged 50 and over fully insured. What are the reasons for this limited number? First, the provision of insurance against dependency is imperfect, and the products are heterogeneous, complex and expensive. The creation of certification by the government would homogenize this market, Roméo Fontaine maintains. Second, people misperceive the risk of dependency to varying degrees. It is precisely this last point that Roméo Fontaine and his co-authors have examined: "The aim of our empirical work is to find out,

Roméo Fontaine

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Methodology

Roméo Fontaine and his co-authors conducted empirical studies and applied micro-econometric work on the basis of two surveys of the general population, containing information on their insurance cover, state of health, and individual preferences. Then they developed econometric models allowing them to identify the determinants of taking out dependency insurance and the perception of dependency risk.

on the one hand, how individuals perceive dependency risk and, on the other, what motivates them to insure themselves against this risk," Roméo Fontaine says.

Individuals are unaware of their coverage

The researchers made use of two surveys of the general population: "Patrimoine et préférences vis-à-vis du temps et du risque" ("Inheritance and preferences regarding time and risk") conducted by Luc Arrondel (CNRS, PSE) and André Masson (CNRS, EHESS, PES), which in 2011 included a "dependency" questionnaire developed by the Médéric Alzheimer Foundation; and the 2012 "L'enquête santé et protection sociale" ("Health and welfare survey") by IRDES. They thus found, among other things, that nearly 25% of individuals do not know whether they have insurance against the risk of dependency, while 64% of respondents were sure they were not to be covered. In Roméo Fontaine's opinion, in order to raise awareness of dependency risk, educational and communication initiatives could be taken by the public authorities and/or insurance companies.

In their work, the authors have analysed the socio-economic determinants, and more originally, the individual preferences structuring people's expectations regarding dependency.

Preference for the present is a key factor

The likelihood of people insuring against dependency depends on their perception of the risk. This may be played down (an optimistic view of the future) or emphasized (a pessimistic outlook) based on the personality of the individual concerned. Thus the optimists insure much less against dependency, since they are characterized by a kind of myopia, or are even in denial, with regard to the risk. Surprisingly, the pessimists don't insure themselves much more either. "One of the hypotheses that can be formulated in relation to this observation is that these individuals claim that they cannot get past the stage of insurance companies' health questionnaires or that the premium is too high," Roméo Fontaine says.

In fact, the authors' empirical analysis shows that people's preference for the present is the most important factor when taking out dependency insurance. Given that the risk of dependency lies far ahead, it is logical that preference for the present plays a major role in people's choices.

Furthermore, altruism is also a factor that affects people's willingness to insure against dependency. The more altruistic the individual is, the more likely he or she is take out insurance, the aim being to limit the burden on family caregivers and/or to protect the inheritance for descendants.

Finally, the analysis is able to reveal the socio-economic profile of those most likely to take out dependency insurance. "The middle class is more likely to insure, because low-income households cannot afford it, while the wealthy are able to absorb the costs of care. Moreover, the higher the education level, the more people take this risk into account. The same applies to single persons without children, who are more likely to be alone in the event of dependency. On the other hand, we find that women do not insure themselves any more than men, once individual preferences are taken into account, although they have a higher risk of dependency," Roméo Fontaine says.

Find the Roméo Fontaine's full article on www.louisbachelier.org

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