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Household Financial Decisions Over the life-cycle

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Abstract

The purpose of this thesis is to examine the household decisions making process in order to maximize their welfare converge at some risks for economic environment has become more volatile than in the past and conditions deteriorate sharply, particularly in times of financial crisis.

For these reasons, we focus on the role of governments and the legal framework as well as privatization movements and the role of information in order to protect households.

Households finance deserves a prominent place in the field of financial economics which requires not only finance and economics but further knowledge about psychology, sociology, industrial organization and the law.

Furthermore, households' financial accounts, balance sheet and income statement, may provide several important insights about the risks related to them and how these factors interact with the wealth accumulation of households units.

Maintaining a well diversified portfolio enables households to mitigate risks related mainly to liquidity, investment horizon, inflation sensitivity, regulation, tax and accounting considerations as well as unique needs.

The main concern of households is the ability to maintain a satisfying amount for their future needs. For this reason we present two applications: inflation- indexed bonds, more specifically TIPS and private funded pension funds.

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Introduction

The motivation of this thesis is to examine how decisions are taken by households over their life- cycle converges at some risks.

These risks are largely due to economic environment has become recently very volatile because of crisis. New complicated financial products have created and the assets/ liabilities of households have been many and complicated.

This implies that households need to make an effort for asset- liability management, for this reason is necessary a comprehensive framework for recording and analyzing risks.

For this reason we made an analysis of all the components of the balance sheet and income statement of a typical household with the risks that affect them.

The conclusion is that the risks are greater than shown. Trying to protect from some of them, new risks are created. It is important to mention here that Murphy's Law exist, when we need to be protected from some risks all of them appear together.

For this reason we present two applications: inflation- indexed bonds, more specifically TIPS and private pension funds.

Households buy TIPS to protect themselves from inflation. The protection taken by households is not the expected, new risks are created such as country risk. Countries with high inflation tend to have poor economic management and large fiscal debts.

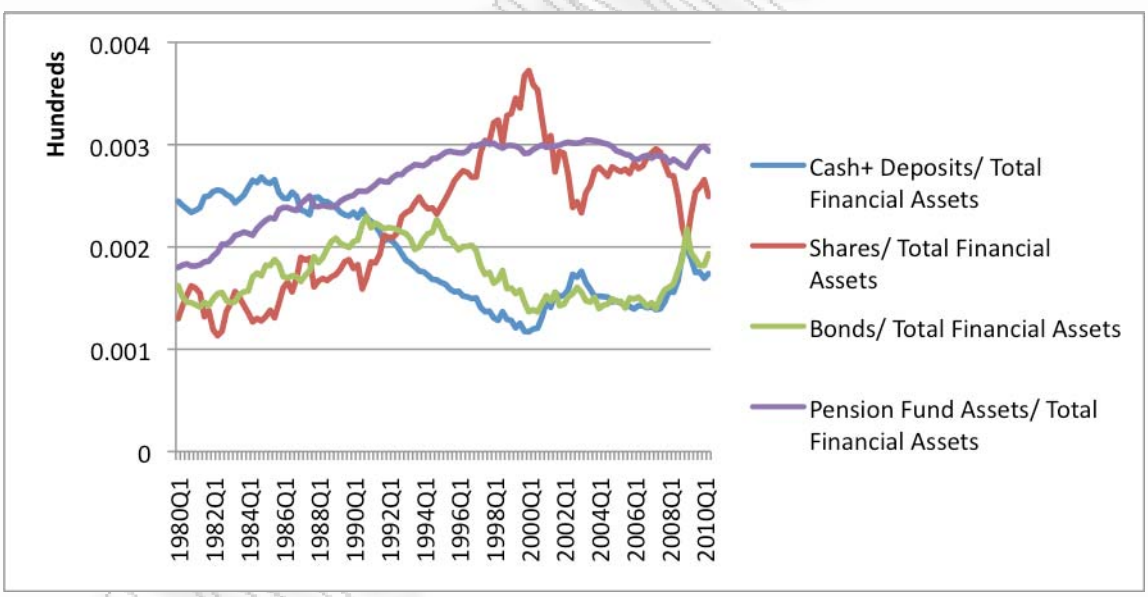
In times of crisis the private pension funds fails to provide the expected protection, for this reason government intervention is necessary.

Also we mention that the role of government is that they should focus in providing public security needs and establish laws that reflect and serves the interests of households, as well as, the role of information should serve as a protective shield for the risks and returns of households and reduce the asymmetric information.

Because all the risks affect the same all the households, we choose to present you graphically how deposits, shares, bonds and pension funds held by households could change over time for economic environment has become more volatile than in the past.

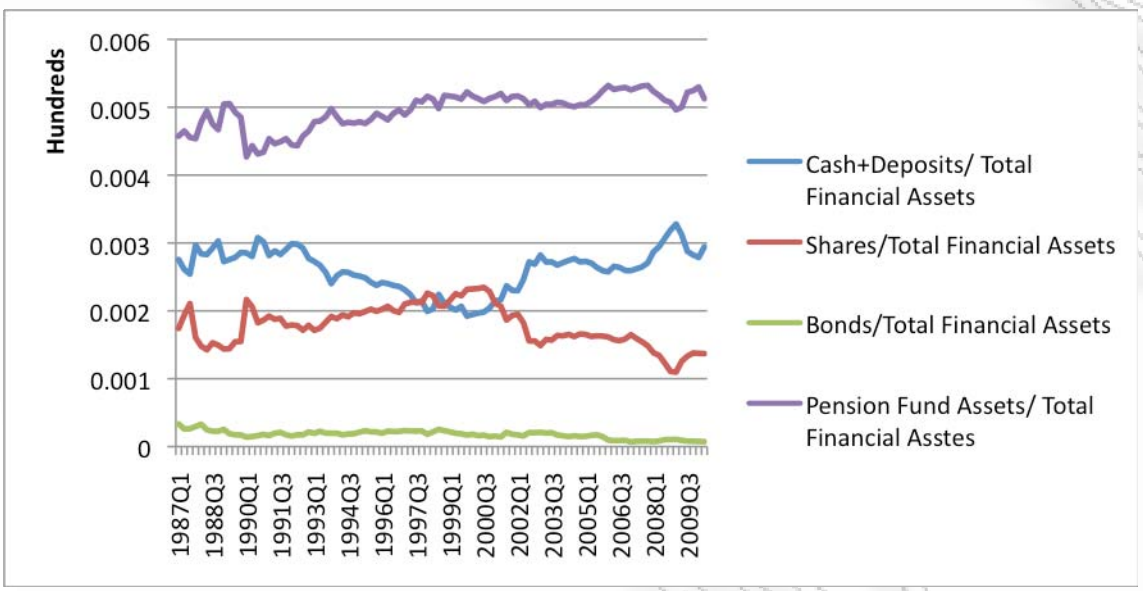
For this reason we present you how US and UK household portfolios change in the last three decades. It is important to mention that in times of crisis, between 2007-2008, an important significant decrease was mentioned in shares and pension funds and an increase in deposits and bonds. This confirms that households in times of crisis become more risk- averse.

Figure 1: Portfolios for US Households from 1980 to 2010



Sources: ECB and Eurostat.

Figure 2: Portfolios for UK Households from 1987 to 2009



Sources: ECB and Eurostat.

More specifically for US household portfolios, pension funds rose for almost three decades from less than 20 percent up to slightly more than 30 percent as shown in figure 1. In the elation of financial crisis in late 2007, pension funds showed the largest drop in recent years which approached less than 30 percent, shares moved downward as well amount to 20 percent. During the same period, a significant increase was mentioned in deposits and bonds reaching their higher points slightly higher than 20 percent. After this year the high peaks begin to normalize.

The same path was mentioned and for UK household portfolios, with different percentages due to different household preferences. More specifically, pension funds rose throughout three decades from less than 50 percent to more than 50 percent, as shown in figure 2. Shares rose from less than 20 percent in 1987 to 25 percent in 2000 before settling back to almost 10 percent in 2008. In times of crisis, in late 2007 and early 2008, pension funds showed a drop back to 50 percent. Bonds maintained almost a steady course across decades reaching 0 percent in times of crisis. Deposits recorded a largest decline in 2000 reaching 20 percent and in times of crisis reached the 32 percent.

Chapter 1: Household Sector

1.1. Understanding the behavior of households

The household sector is not explicitly a defined subfield within financial economics.

The events of the past few years, however, should make it quite clear that the financial products offered to households, the financial decisions they make, and their relationship to financial markets have profound effects on the economy. Making quite clear that households finance cannot and should not be ignored.

Recognizing the roles of households, businesses, and regulations, a more expansive definition of the field might be as follows: Households finance more specifically consumer finance is the study of institutions to satisfy the financial functions of households, how households make financial decisions, and how government action affects the provision of financial services [Tufano P. (2009)].

Four primary factors are necessary for better understanding consumer finance sector:

1) Moving funds: In the consumer sector, the payments function would include cash, checks, debit and credit cards, postal and private money orders with transfers, remittances, payroll systems and the infrastructure that supports all of these activities. These products are delivered by various organizations such as government, institutional organizations such as banking and non-banking organizations (i.e check cashing stores).

2) Managing risk: A variety of products and services have been created to offset risks, insurance, put options and precautionary savings are some of these. From the perspective of businesses that serve households, risks are managed through credit scoring models, credit risk practices, as well as by assembling a diversified portfolio against default.

3) Advancing funds from the future to today: This function is embodied in household credit, which ranges from unsecured both short-term and long-term to secured borrowing. The provision of credit can take place through the formal and the informal

sector and through various hybrid organizations (i.e. person-to-person lending web sites). Implicit borrowing is built into various derivative products, including options and forwards.

4) Advancing funds from today until a later date: Savings functions are embodied in a host of products and services, including bank products (i.e. savings accounts and time of deposits), mutual funds, variable annuities, retirement programs and social security. These products vary based on the intended time horizon, level and type of risk made by households and tax treatment.[Tufano P.(2009)]

To deliver payment services, manage risk and move funds backward and forward in time, a financial system must also deliver a set of ancillary functions:

1) Pooling: is present in most borrowing and lending transactions, giving in this way access to economies of scale from households, diversification benefits and professional management and administration.

2)Providing financial information to facilitate decision making: the current interest deals primarily with the quality of household-level decision making with the help of formal and informal financial education, marketing activities of product vendors, news from the financial press to lead to better decisions.

3) Dealing with information asymmetries and incentive conflicts: having multiple parties involved leads to potential conflicts of interest, which each party- as well as government- seeks to mitigate. A fiduciary's duty of loyalty is intended to establish norms for behavior between certain providers of financial goods and services and households. [Tufano P. (2009)]

Thus we conclude that, households who want to borrow money do not necessarily begin with a single product i.e. credit card, or even a single institution. They will look across a variety of formal financial institutions i.e banks, insurance companies, and may also consider informal institutions i.e brokerages, as well.

Household finance deserves a prominent place in the field of financial economics. Recent economic events have demonstrates this importance as well. Rising home values, new mortgage products, securitization, federal policies to encourage homeownerships, low interest rates, poor business practices and poor consumer decision making all combined to produce over- leverage in the household sector.

Furthermore, household finance requires an understanding of not only finance and economics but also psychology, sociology, industrial organization and the law. Because of the difficulty to observe and measure household activity, there is little data on transactions that are restricted also by privacy considerations making in this way all surveys inherently suspect.

High-level guidance for households must be provided, calculating an optimal portfolio given time- varying investment opportunities and concluding that households should hedge shocks to their wealth as well as to expected returns on that wealth .[Tufano P.(2009)]

Economists have begun to understand household financial decision making beyond psychology, manifesting an interest in sociology. Because household finance typically reflects decisions of multiple households together, this perspective, long understood in consumer sciences, is explicable. At a more fundamental level, economists have begun to appreciate biology, neuroeconomics attempts to explain decisions, such as financial risk taking, to underlying biological factors. Although these approaches to understanding the household- facing perspective are varied, they are linked in that they all attempt to address two fundamental questions: what decisions should and do households make? What should and can explain these choices? [Tufano, P.(2009)].

Furthermore, government plays an important role in regulating many parts of the economy realizing that household finance needs more attention.

Finally, it should be noted that the failure to carefully understand households' financial decisions can lead to the problems of insufficient retirement savings, excess leverage, and poorly designed mortgage products.

1.2. The role of governments and the advantages of modern democracies

Nowadays, the trend of the entire world economy is that it connotes movement toward free, private markets. In particular, financial markets almost everywhere have needed to be freed from government domination and are more closely connected with the idea of trusting households to make their own decisions.

This modern elective democracy can be seen as the most durable institutionalization of limited government. The role of government should focus in providing public security needs and establish laws that reflect and serves the interests of households in their pursuit of happiness.

The flourishing of private markets is closely connected to this deeper political evolution. Private markets are synonymous with emerging ones that are almost by definition, locations of high investment opportunities and access to global financial markets, so that, they reduce financing costs and permits greater diversification by households because they reduce the risk premium component of the cost of funds. Furthermore, emerging markets take the strongest interest in pressing for legitimacy, pushing the government to limit its taxes and be responsible for the use of tax proceeds.

Government must set strong, well-conceived legal foundations for emerging markets to function, the only desirable government control or intervention that may diminish economic performance is for the purpose of environmental protection. Furthermore, it is worth noting that business decisions are made strictly to maximize firm value, which in most cases contributes to economic growth. Politicians often favor certain regions, industries or firms for any number of possible reasons, and may try to direct business and employment accordingly.

Private household decisions are quickly rewarded or penalized by the market. Governments can perpetuate their mistakes with further subsidies, which frequently reduce economic growth. That is why successful modern democracies try to separate business from government. The payoff for this separation is both a stronger economy and a limitation on the power of government.

In a fully developed, competitive economy the financial system includes not only banks but also security firms, specialized intermediaries such as finance companies and mortgage brokers, institutional investors such as insurance companies, pension funds and mutual funds. Such a financial system plays a large and sophisticated role; it encourages and mobilizes private saving and investment, and channels the capital so created into its most productive uses. It creates a diverse menu of saving and investment options for households- some at higher risk, some at lower risk, some for the long term, and some for a shorter term.

When financial intermediation is performed effectively, financial companies compete for savings by offering financial returns in various forms. The competition not only benefits households but also causes capital to flow toward its greatest creation of value. The result is that households' savings are being put to the best possible uses, while households are offered the most desirable feasible combinations of high expected return, low risk, and high liquidity. One way to connect savings and investment is through securities market intermediation, the other way is through bank intermediation.

Bank and securities markets cannot function properly unless their institutional foundations are strong. Governments can play a critical role in creating or strengthening those foundations and not neglect core institution building, even more weaken the core legal and economic institutions on which financial intermediation depends.

1.3. The importance of privatization

The massive turn away from government economic control or government domination of productive assets is a trend of considerable breadth and power, affecting all countries of the world.

The privatization movement reflected a fundamental shift in thinking about the benefits of market allocation and global openness, because government policy is used to act intentionally in ways contrary to the interests of average households.

Actually the central problem is inefficiency, public enterprises often lose money, absorb a disproportionate share of capital, and require substantial subsidies from taxpayers. Their loss-making performance is sometimes a primary reason behind the pervasive inability of country governments to control their fiscal deficits.

On average, public enterprises everywhere are less efficient than private enterprises. The latter gained in profitability and value as well.

Liberalization encourages the building of political institutions, the construction of a modern legal system, the introduction of free prices of all goods, the opening of the economies to world trade, and the reconstruction of the human habits that make economies work- the work ethic, which depends on the confidence households must have that their efforts will be rewarded, and the courtesies and reciprocities of business relationships. Fiscal deficits can be a powerful motivating force for accelerating the pace of privatization, particularly for an emerging market government hungry for foreign reserves.

The privatization transactions are closely associated with inflows of capital, not only in the sense that foreign companies buy some of the privatized firms, but also that the entire process of privatization attracts more investment than is needed just to buy the firms being sold. Although joint ventures may not be stable for the long run, they are often the most acceptable compromise in the short run between a political desire to favor local households and an economic desire to bring in foreign technology and management expertise.

Privatization is so important to economic success and economic growth. We should start thinking in terms of privatization of pensions, as well. The goal is growth per se and is defined as an increase in per capita GDP, which represents the total production of goods and services per household within the economy. If this number grows larger, it seems self-evident that households are on average better off, since on average each household has more goods and services available to them. Growth is costly and often risky because growth requires the expenditure of resources- the cash needed to purchase productive equipment and to carry a growing quantity of inventories and accounts receivable.

In a well- functioning market, capital is available only at a substantial cost because capital is supplied by households who require a certain minimal expected return on their investment in financial companies. Accepting that households are risk-averse, their expected return rises with the risk of their investment. Markets impose a distinct discipline. Financial companies that disappoint capital markets by earning less than the cost of capital must turn themselves around promptly or be cut off from the sources of funding. The system transfers funds to financial companies that can credibly be expected to earn returns above the cost of capital.

The mass privatizations illustrate clearly the need for intermediary financial institutions, whether banks or funds. Also, regulation is needed to protect households from fraud, particularly during the transitional phase when financial institutions and contracts are being established. Privatization and liberalization, to be successful, must be part of the broader and more fundamental set of reforms to the economic and legal environment.

1.4. The significance of the legal system

Legal system is of more fundamental importance to the effective operation of a financial system that functions alongside it and protection of households.

Without an effective legal system, households will be unwilling to raise their wealth and their purchasing power, resulting in shortage of funds to finance investment reducing thereby the country's economic growth. Legal system presupposes an environment in which laws are adhere to and fairly enforced. From this it is presume that a reliable legal system exists when the rule of law is upheld.

The rule of law means that all households are governed by the same rules and have the same protection in their financial transactions, so that the rich and powerful ones may not exempt themselves from the rules that others are supposed to follow. So, the judicial system is not afraid to punish those who break the rules based solely on their wealth and power. In particular, the rule of law means that government itself is constrained and cannot treat households arbitrarily. Government needs to play a strong role in establishing and managing fair and uniform procedures for enforcing law and resolving disputes.

For the rule of law to hold it must be feasible, and not too costly, for households to use the legal and political systems to define and protect a well-understood set of economic and political rights. That requires an effective legislative body and a complete judiciary system.

Is common acceptance that households would need enforces and physical protection, particularly against fraud. The creation of strong legal institutions and traditions increase the confidence of households. Households will only be treated differently insofar as differences among them are logically and appropriately connected to the differences in treatment.

There seems to a connection between rule of law, confidence in government and economic well-being. Modern economies are so complex that they cannot function

well without known, enforceable rules that encourage arm' s- length dealings in the marketplace.

Specifically, households' debts can be secured by specific collateral. Collateral makes credit available to households that otherwise might not be able to borrow, especially where there is poor information about the households' true credit risk. If financial institutions does not entirely trust the financial statements of the households and the total picture of them is cloudy, then financial institutions can nevertheless lend if the collateral is good. The simplicity and clarity of collateral helps to solve problems of imperfect and nonexistent financial information. However, secured lending cannot play these roles unless the legal framework supports it. Furthermore, the repossession of real estate is a far more emotional issue than the repossession of households' property because land is such a permanent asset, literally underpinned households and defining national identity.

Despite the limits to mortgage lending and despite the much greater lack of liquidity in real estate compared with households' property, mortgage lending has been an important source of finance for households. Legal institutions available for mortgage foreclosure have encouraged the development of mortgages as an important means of households finance.

When households fail to meet their debts a good alternative is to renegotiate them. One way is through liquidation, households' assets are sold and liabilities are discharges as far as possible, an alternative way is through restructuring (whether voluntary or court imposed) households recognize losses and typically exchange their claims for new ones of a reduced amount. Most legal systems provide for both liquidation and restructuring.

Consequently, countries that want to have value- creating growth need strong financial systems to allocate capital. Strong financial systems in turn need strong legal foundations, which must be explicitly constructed with a view to protecting households so that they will be encouraged to invest.

1.5. The role of information

Problems arise from the lack of information and control about the risk and return opportunities in securities markets faced by households. When households delegate decisions to mutual or pension fund managers without being able to closely observe what, how, and why money managers invest on their behalf, money managers may have incentives to invest in suboptimal ways, which in turn may account for some market anomalies. [Beim, D. and Calomiris, C.(2001)].

Information on households is of little value without credible control mechanisms. Such control mechanisms include appropriate contracts and courts to enforce them, corporate governance rules, and financial intermediaries mainly banks willing to act as corporate monitors. Increased control may reduce the amount of information households need to collect or may reduce the cost of collecting it.

The main problem of information is asymmetric information. Asymmetric information tilts households toward debts, despite the existence of debt contracts, as well as toward banks, short maturities and secured loans. Thus we can understand that high reliance on debt can magnify the effects of economic shocks, particularly when that debt is short term.

Furthermore, the distinction between two distinct kinds of information- related tasks: screening and monitoring, is very useful for households investments.

Actually, screening is necessary before an investment decision is made. It refers to the basis for making investment decisions when investment quality cannot easily be observed which is subject to the problem of adverse selection.

A fuller interpretation was given by George Akerlof in his classic article about information asymmetries concluded that adverse selection has two negative effects on debt markets: it makes them more expensive, and it closes them off to borrowers above a certain level of risk. This corresponds to two well-known features of debt markets: their real interest rates often seem extremely high, and the markets periodically shut down. [Beim, D. and Calomiris, C.(2001)].

Moreover monitoring refers to the task of following the fortunes of an investment after it is made. Households need to be assured that their decisions would not prove detrimental to their interests.

As financial markets develop, banks tend to play a smaller role and securities market become increasingly important. Securities market growth encourages the development of institutional investors to perform screening and monitoring functions on behalf of their less- informed households' clients. Such institutional investors include insurance companies, pension funds, mutual funds, and, increasingly in recent years, private equity funds. Although these institutions often invest in private placements (i.e. securities that are not publicly traded), even this activity depends on the presence of an active markets for public securities to benchmark its prices and terms.

Securities markets cannot possibly work unless households have access to substantial information about the issuers of securities as well as they have access to variables that explain cross- country differences in sovereign ratings including the amount of debt outstanding, GDP per capita, GDP growth, inflation and debt repayment history. These variables all make sense- either as indicators of a country's ability or willingness to repay its international debt or willingness to repay its international debt- but these measures either are not observable or do not vary sufficiently month to month to make them useful for predicting sudden changes in sovereign risk. Predicting sudden change is quite difficult, particularly when relevant information is withheld for long periods of time. Furthermore, households should have access to quality financial data which pose important information, also should have access on a daily basis regarding the earnings and prospects of hundreds of companies since timeless of information is as important as accuracy of information.

1.6. Household investment risk- A unified approach

The main concern of households is to maximize their wealth by holding assets and liability management. Assuming there is more than one asset available, households' holdings faces a problem of portfolio choice, i.e. selection among a range of instruments to maximize utility.

Derivation of portfolio choice then faces the problem that as long as all assets are not risk free, households face uncertainty over the exact return to be received from the portfolio. Households may also be risk averse, even cash is not risk free in real inflation adjusted terms.

Furthermore, asset holdings faces cross- country differences as well, related to a combination of two different aspects. One is variation in risks and returns (net of taxes and inflation) and the other is variation in the characteristics of portfolio demands (relating to aspects of overall financial structure such as the system of housing or pension financing as well as differing regulations and attitudes to risk).

From this distinction, we conclude that, the overall size of the wealth portfolio is exogenous. The determination of this depends on the cumulated difference between income and expenditure, plus or minus any capital gains and losses, and in real terms taking account of the impact of inflation.

To maximize the wealth of households facing some constraints related to liquidity, investment horizon, inflation sensitivity, regulations, tax and accounting considerations and unique needs. More specifically risks faced by households are:

1) Liquidity based constraints link to the need to withdraw funds as a lump sum, or for regular disbursement,

2) The investment horizon relates to the planned liquidation date of the financial investment, and is often measured by the concept of effective maturity or duration,

3) Inflation sensitivity relates to the need to hold assets as inflation hedge,

4) Tax considerations may change the nature of the trade-off separately from underlying returns and risks,

5) Accounting rules can generate different 'optimal' portfolios,

6) Financial regulations affect in particular financial institutions but generally do not affect the non financial sectors.

Trying to manage uncertainty and control these risks, banks provide liquid deposits which are insulted by bank capital from volatility of the value of the loans (liquidity insurance). Accordingly, households gain liquidity from banks and diversification indirectly via the assets held in banks' portfolio. In markets, the provision of such insulation may require the use of derivatives.

In recent days, the wealth of households has increased, and a larger proportion of households are making portfolio investments as it previously stated in introduction. This partly results from changing demographics, i.e. ageing of the population, which in itself has increased the average wealth of households, but also from changes in pension systems in a number of countries from pay-as-you-go to a funded basis. The political climate has become more household friendly. The increase in financial wealth relates closely to the shift towards a securitized face of financial markets. Direct holdings of securities by households, owing to superior possibilities of diversification, specialization in information collection, sharing of asset management expertise and reduction in transactions costs for large trades have created.

An evolution is leading to a reduction in transaction costs for market intermediation, via securitization of loans, commercial paper, electronic trading etc.

Furthermore, it is necessary to note that after each financial crisis elements such as trust, implicit contracts and mutually consistent expectations which underpin relationship especially banking would be very difficult to rebuild.

1.7. The behavior of households

Households' optimal plan is not to consume all of one's lifetime resources in one single period, but to have an approximately constant level of consumption across one's lifetime, since the benefit from an extra unit of consumption in any single period declines with consumption.

A constant level of consumption is maintained by saving a proportion of income in various financial assets. Deposits, equities, life insurance and pension funds are shown to be the major assets held by households. Assets are held for retirement, consumption or as bequests. It is important to mention here, that households' liabilities mainly include consumer credit and housing loans.

In the real world households face several additional constraints on lifetime optimization. In particular, capital markets are not perfect- this is especially due to the difficulty of pledging the present value of the return on households' wealth as a security on loans. Therefore, households may not borrow freely and on an unsecured basis at the market rate of interest. Moreover, many households have often faced direct limits on borrowing and are liquidity constrained.

Liquidity constraints imply that welfare losses are incurred by constrained households, even though consumption can be made up later in the life-cycle, owing to forced inter temporal rearrangement of consumption hence the release of liquidity constraints offers welfare gains. Constraints may apply even to households with substantial assets if these are illiquid, i.e. either costly to encash or unacceptable as collateral for short-term loans. Pension rights, used households durables, houses, equities and bonds fall, or have historically fallen, into at least one of these categories.

Liquid assets will be most important for the determination of consumption and has a major implication for the indebtedness of households. To the extent that liquidity constraints were once binding, then a loosening of these constraints following financial liberalization will be marked by a sharply rising debt/ income and to a lesser degree debt/ wealth ratio and falling saving [Byrne, J.and Davis, E.(2003)].

It is very important to view households as a sector of containing different groups. Mankiw and Weil (1989) found that the age distribution of the population may affect asset holding. More specifically, they found that housing demand is high for those aged 20-30, thus their borrowings tend to exceed their purchases of financial assets. Households aged 40-60 tend to provide credit to financial markets via personal pension accounts, and households over the age of 60 tend to draw from the financial markets as a result of using accumulated assets to fund consumption at retirement. [Byrne, J.and Davis, E.(2003)].

Moreover, collateral for house purchase tends to reduce the credit- market problems arising from information asymmetry and incomplete contracts as well as the overall level of financial wealth has increased, the level of liquidity required as a percentage of total wealth has decreased.

1.8. An effort to better understanding of household finance

Household finance and consumption's survey data have contributed substantially to our understanding of both households' behavior and the evolution of aggregate variables. Household- level data make it possible to evaluate the impact of shocks, policies and institutional changes across households, and thus allow a better understanding of the implication of shocks for macroeconomic variables. These information yield important insights about issues like monetary policy transmission and financial stability.

Furthermore, information on the behavior of subgroups of households is essential for such an understanding. For instance, the recent financial crisis has demonstrated that a relatively small fraction of households that are highly indebted can have important effects on market outcomes. Data on the average debt levels of households as well as their distribution across income and age classes have provided central banks with relevant information as to whether the increase in overall debt levels raises concerns about financial stability.

The dynamics of economic aggregates are determined not only by macroeconomic variables, but also by household- specific factors. This is true, particularly, for household consumption, savings and balance sheets, which are to a large extent driven by expectations about future households' income, demographic and social characteristics. Because households' specific factors remain hidden in aggregate statistics, their relevance can only be assessed with micro- level data. While we know a priori that microeconomic conditions matter considerably, households' level data are crucial for quantifying the size and relevance of these effects.

The resulting changes in the composition of the asset- holder pool and their potential implications for welfare, wealth distribution, the relative impact of policies on different household groups and the ultimate effect on macroeconomic variables can only be judged with micro data. Reliable data on households' wealth, income, and consumption can provide important input into central banks' policies, ranging from

monetary policy to financial stability and payments systems policy [Monthly Bulletin-ECB (2009)].

The recent developments in housing prices have re-ignited the interest in how asset price affect the real economy. Most of the existing estimates from aggregate data are quite imprecise, and subject to at least two limitations. First, household heterogeneity cannot be investigated. In particular, heterogeneity with respect to income, age, indebtedness and ownership status is likely to play an important role in determining the size of the response of consumption to wealth shocks.

Second, variations in households' asset prices are difficult to account for adequately. This problem is much less severe in micro data because almost all variations of consumption at the household level are almost the same. Household level data are thus crucial for estimating structural relationships between consumption and wealth.

The recent run-up in real estate prices has been associated with more household mortgage credit and higher overall indebtedness. Micro data are essential for analyzing this structure, assessing the mismatch between assets and liabilities of households and identifying how many households have accumulated too much debt and what risks such over- accumulation poses to their finances and ultimately to economy. The key purpose for survey about household debt from Central Banks is to better understand financial conditions of households and to examine their degree of indebtedness.

Specifically, Bank of Greece taking into account demographic characteristics, income and wealth of households compared with the difficulties that encountered in servicing their loan obligations and in obtaining borrowing. This kind of surveys is the only statistical sources available which combine information on income, assets and liabilities of Greek households. Micro-data have been used to study household borrowing, the loan burden, the cost of servicing, factors that determine loan obligations and whether households service their debt properly [ECB No.100 (2009)].

The insights from the survey have repeatedly informed about households' indebtedness and vulnerability and have been helpful for issuing guidelines for the approval of loan applications to commercial banks [ECB No. 100(2009)].

Although, the maintenance of a stable curve of debt service of loans might also be partly attributed to more effective credit risk management by commercial banks, in line with the guidelines of the Bank of Greece calling for the implementation of a longer- term and more forward- looking policy in this sector beyond the one that competition forces the banks to implement. At the same time, households should asses carefully their borrowing needs and ensure that the amount of loans they are about to take up is in line with their debt- servicing capacity [ECB No. 100(2009)].

1.9. The external financing of households especially during financial downturns

Bank credit standards and the cost of financing have tightened considerably during financial turmoil which now affects households, thus making credit less available.

The structure and development of the external financing of households is closely connected with the structure of the financial system. As the financial system is more bank- based especially in the euro area loans on the balance sheets of banks have a much greater importance in the external financing of households.

The role of external financing is that it delivers interesting insights about the need for this financing in the context of economic developments, household disposable income, saving ratios and investment developments. Furthermore, the structure of external financing provides information about the relative importance of financing instruments and about financial innovation, such as the growing importance of securitization.

The dominant role of banks in financing and the smaller scale of securitization activities, especially in the euro areas, have limited the scope for re-intermediation and possible substitution into bank lending from non-bank and market- based funding in the wake of the financial turmoil.

During this period, with house prices declining and interest rates increasing the market for privately issued residential mortgage- backed securities dried up. The generation of internal funds declined, reflecting the deterioration of the general economic outlook whereas securitization and syndicated loan activity played an increasing role. In particular, the opportunity to undertake securitization activities in order to create collateral may have helped to maintain a certain financing flow.

Moreover, lower household debt levels and higher saving ratios should make euro area households less dependent on external financing for sustaining consumption and less sensitive to variations in asset values.

Chapter 2: The usefulness of financial accounts

At this stage we will try to define the elements that influence the behavior of households, how they affect each other, the risks they face and possible ways to mitigate them.

Understanding the financial behavior of households is very important, especially for researchers and policymakers. They give them the ability to interpret and predict the likely behavior of households in different economic situations and potentially help remove distortions in financial markets.

Whereas the behavior of households is closely linked to financial decisions and using corporate financial accounts: 1) the balance sheet, 2) the income statement, is a very important step for understanding household finance, for both short- term and long-term financial situations. Using corporate financial accounting as a conceptual framework for the analysis of household finance does have several advantages.

First, corporate financial accounts help the researcher better define financial variables and also clarifies the distinction between household assets and household wealth and also they help them systematically categorize many sub-items of the main variables in each account. The definitions and measurements of these variables may provide several important insights for the researchers about the financial situation, the analysis of short- term behavior of the households enables them to understand more the risks and liquidity related to households and how these factors interact with the longer term performance and wealth accumulation of household units.

Second, data on household financial assets are used by governments in setting social protection policies, especially pension provisions, as they give an indication as to how well- prepared households are for the future. On the other hand, data on household financial liabilities can give information about how many years it would take for households to pay off their debt if they used part or all of their income, thus may help researchers give an indication of how households would be able to cope with an economic downturn.

Third, they allow the researchers to have consistent metrics that can be used to compare and contrast the performance and financial situations of small and medium households with the performance and financial situations of larger households [Samphantharak, K. and Townsend, R. (2010)].

The first step is to present detailed items that make up the balance sheet and statement of income of households.

For households, the balance sheet it consist of three major items, household assets, household liabilities and household wealth. Household assets meaning various production activities in which households are involved. On the other hand, household liabilities are referred to debts, borrowed from both financial institutions and people, formally and informally. As a conclusion, comes the wealth of households, the residual claim of households over the household assets in excess of household liabilities.

From the household balance sheet below shows clearly that the true identity of household total assets equal to the sum of household total liabilities and household wealth.

Balance Sheet of Household

Cash-in-hand	**Accumulated Savings**
Stocks	**Total Liabilities**
Bonds	Credit Cards
Deposits	Consumer Loans
Gold	Mortgage Loans
Mutual Funds	
Pensions Funds:	
-Private	
-Public	
Fixed Assets	
Households/ Real Estate Assets	
Art	
Total Assets	**Total Liabilities and Wealth**

The income statement presents the revenues, cost, profits and losses that face households over a period of time ending with savings (debts) during the period. An increase (decrease) in household wealth from the balance sheet must equal the sum of household savings (debts), where savings (debts) are the difference between accrued net income (expense) and household consumption from the income statement.

Savings derived from total revenue minus total costs. Revenues are generated from the business and investment activity of households and costs incurred by households mainly in their process of generating revenues.

Income Statement of Households

Labor Income

+ Investment Income

-Living Expenses

-Interest Payments

Period Savings (or Debts)

The next step is to mention the risks that affect the items in both the balance sheet and income statement of households and make a short description of what they relate about.

The most important risks are the following:

1) Inflation Risk: affects every investments and the effect it has on households are mostly negative. It reduces the real value of money and other monetary items over time, uncertainty over future inflation may discourage investment and savings, and high inflation may lead to shortages of goods if households begin hoarding out of concern that prices will increase in the future.

2) Investment Risk: is the possibility that the investor will get back less than his investment or his expected return or that he will get less than he could have had if he had invested his money elsewhere, opportunity cost.

3) Interest Rate Risk or Market Risk: affects every interest-bearing asset, such as a loan or a bond, due to variability of interest rates. In general, as rates rise the price of a fixed rate bond will fall, and vice-versa. Interest rate risk is commonly measured by the bond's duration.

4) Liquidity Risk: becomes particularly important to parties who are about to hold or currently hold an asset, since it affects their ability to trade, due to lack of liquidity in the market.

5) Default Risk (is a type of Credit Risk): becomes when the issuer will default on its payments, which jeopardizes both interest and principal.

6) Foreign Exchange Risk: becomes when households are placed in a long position in foreign currency and is underestimated compared to the domestic currency.

7) Sovereign Risk (synonymous with Political Risk and Country Risk): is associated with the laws of the country, or to events that may occur in a country.

8) Insolvency Risk: refers to the inability of households to pay off their debts. Balance sheet insolvency means that households hold negative net assets, in other words liabilities exceed assets. Actually households hold illiquid assets, particularly against short term debt that it cannot immediately realize if called upon to do so. Insolvency is not a synonym for bankruptcy, which is a determination of insolvency made by a court of law with resulting legal orders intended to resolve the insolvency.

9) Volatility Risk: is the actual risk exposure to a portfolio of several currencies.

10) Regional and International Risks: risks faced by households which are due to events in the country or worldwide.

At this stage, we will try to quote a table with the above risks showing which of them affect each component of the balance sheet and the income statement of a household (we have to mention that country risk, regional and international risk tend to affect respectively all items).

More precisely, in the first column we present all components of the balance sheet and income statement and the remaining columns appear all the risks that affect them, i.e. cash-in-hand affected by inflation, foreign exchange, sovereign (political and country risk) and from regional and international risk.

Table 1: Kinds of risks that affect each item of balance sheet and income statement

Items \ Risks	Inflation	Investment	Interest Rate(or Market Risk)	Liquidity	Default (is a type of credit risk)	Foreign Exchange	Sovereign(Po and Co Risks)
Cash-in-hand	☑					☑	☑
Stocks	☑	☑	☑	☑		☑	☑
Bonds	☑	☑*	☑*	☑	☑		☑
Deposits	☑	☑	☑	☑		☑	☑
Gold				☑			
Mutual Funds	☑	☑	☑		☑	☑	☑
Private Pension Funds	☑	☑	☑		☑	☑	☑
Public Pension Funds	☑	☑	☑		☑	☑	☑
Real Estate	☑	☑	☑	☑			☑
Art	☑	☑		☑		☑	☑
Consumer, Mortgage Loans and Credit Cards	☑		☑			☑	☑
Labor Income	☑					☑	☑
Investment Income	☑	☑	☑			☑	☑
Living Expenses	☑					☑	☑
Interest Payments	☑		☑			☑	☑

*come up when the investor do not want to hold the bond until maturity date

It is important at this point to mention what factors affect risks to each component of households' balance sheet and income statement separately and what measures we can take to mitigate them.

Cash-in-hand

Risks	Sources	Mitigations
1. Inflation	Rising commodity prices, decrease in purchasing power	Inflation hedges
2. Foreign Exchange	Rising Interest Rates	FX swaps(in specific cases only)
3.Sovereign,Political and International	Reduce the real value of money	Investment in gold or foreign currencies i.e dollars

Stocks

Risks	Sources	Mitigations
1. Inflation	Gives low return on your invested money	Investment in foreign stock markets
2. Investment	Lose your purchasing power	Spread your money in various assets as bonds, foreign stocks and money-market funds, increase your insurance protection.
3.Interest Rate	Reducing Interest Rates	Investment in foreign stock markets
4.Liquidity/Default	Not able to get out your investment at a reasonable price/at all	Well-diversified portfolio, stock selection.
5. Foreign Exchange	Rising interest rates	Investment in foreign stock markets
6.Sovereign, Political, Country/Regional and International	Lose your money	Well-diversified portfolios encompassing investments in a variety of countries and region.

Bonds

Risks	Sources	Mitigations
1. Inflation	Rising interest rate and reduce the price of the bond	TIPS, protect investors against inflation by increasing the principal of the bond
2.Investment	Interest rates are declining	Reinvest their interest income and any return of principal, whether scheduled or unscheduled, at lower prevailing rates
3.Interest rates	Rising interest rates	Invest on bond funds with short durations
4.Liquidity	Forced to sell at a significant discount to market value	A well- diversified portfolios
5.Default	Weakness of the bond issuer to make interest or principal payments when they are due	Credit ratings, a well- diversified portfolios
6.Sovereign/Regional and International	Bringing the value of bonds down	A well- diversified portfolios

Deposits

Risks	Sources	Mitigations
1. Inflation	Gives low real return on your money	Certificates of deposits
2.Investment	Interest rates are declining	Portfolio diversification, investment guarantees/credit enhancement
3. Interest rate	Interest rates are declining	Certificate of deposits
4.Liquidity	Loose your money	Deposits in other currencies
5.Foreign exchange	Falling home currency	Deposits in other currencies
6.Sovereign, regional and international	Lose your purchasing power	Public insurance

Gold

Risks	Sources	Mitigations
1.Liquidity	difficult to liquidate, prices remain mostly stable	channel these savings into more productive financial assets

Mutual Funds

Risks	Sources	Mitigations
1.Inflation	Rising interest rates	Well-diversified portfolio i.e on bonds with different maturities
2. Interest rate	Lower investment returns	Hedge funds, well-diversified portfolio
3.Investment	Lower potential return	A well- diversified portfolio
4.Default (a type of Credit risk)	Lose some or all of the money you invest(principal)	Have a complete view about funds ranking and rating
5. Foreign Exchange	Lose purchasing power if portfolio valuation begins to decline	Diversify your portfolio
6. Sovereign, regional and international	Reduce the expected return	A well- diversified portfolio
7. Volatility	Low or negative returns	Invest in a fund with a lower volatile history

Private Pension Funds

Risks	Sources	Mitigations
1.Inflation	Low return on your money	Inflation adjusted annual premium payments
2. Investment	Lose some or all of the money you invest(principal)	Portfolio diversification
3. Interest rate	Lower interest rates	Hedging interest rate risk
4.Default	Lose your investment	Investment programs with a minimum guaranteed annual interest rate for the duration of insurance
5. Foreign Exchange	Lose purchasing power	Hedge derivatives
6.Volatility	Low returns	Portfolio diversification
7.Sovereign, international and regional	Reduce the expected return or even more lose your investment, expropriation	Tighter legal framework for the stability of macroeconomic environment

Public Pension Funds

Risks	Sources	Mitigations
1.Inflation	Low investment return	The rate of inflation is calculated as a fixed percentage each year and governments count already this figure to their plans
2.Interest Rate	Decrease in pension funds value	Portfolio diversification
3.Investment	Reduce the capacity of funds	Develop various investment risk management guidelines or standards from the side of government
4.Default	Completely lose your investment	Diversification by investing in private insurance from the side of households
5.Foreign Exchange	Lose purchasing power	Invest in currency swaps
6. Volatility	Lower returns	Portfolio diversification
7.Sovereign, international and regional	Decline the value of funds	Should develop the regulatory framework for the pension industry from the side of government

Real Estate

Risks	Sources	Mitigations
1.Inflation	Rising house prices	TIPS or assets with a lower tracking error like invest in gold or bonds
2.Investment	Rising house prices	Investments in gold, bonds.
3.Interest rates	Decrease in demand	Alternative investments in gold, bonds.
4. Liquidity	Rising transaction costs such as VAT, stump duties, registration fees, taxes	New housing policy
5.Sovereign, international and regional	Higher taxes	Alternative investments in gold, bonds.

Art

Risks	Sources	Mitigations
1.Inflation	Decrease in prices	TIPS, find higher return investments like bonds.
2.Investment	Lower rate of return	Portfolio diversification
3.Liquidity	Lower profitability	Alternative methods of investment like bonds.
4.Foreign Exchange	Rising prices	Insurance policy
5.Sovereign, international and regional	Lower purchasing power	Implement an infrastructure offering higher levels of protection from the side of investors.

Loans (Consumer, Mortgage and Credit Cards)

Risks	Sources	Mitigations
1.Inflation	Increase the real value of debt (for loans with float rate)	Ability to change interest rates, extending the duration of the loan.
2.Interest rate	Higher interest rates	Extending the duration of the loan.
4.Foreign Exchange	Higher interest rates	Ability to change the currency of the loan.
5.Insolvency (the inability of households)	Higher interest rates for loans both in domestic and foreign currencies	Negotiation for the loan tranche.
6.Volatillity	Higher interest rates for loans both in domestic and foreign currencies	Ability to change the currency of the loan.
7.Sovereign, international and regional	Higher interest rates	Negotiation for the loan tranche.

Labor Income

Risks	Sources	Mitigations
1.Inflation	Reduce real income	Insurance policy.
2.Foreign Exchange	Reduce income	Ability of payment to the domestic currency.
3.Sovereign, international and regional	Reduce income	Insurance policy.

Investment Income

Risks	Sources	Mitigations
1.Inflation	Reduce the real return on investment	TIPS.
2.Investment	Reduce the purchasing power	Hedge the risk using swaps or derivatives.
3.Interest rate	Interest rate cut	Portfolio diversification.
4.Foreign Exchange	Interest rate cut	Portfolio diversification.
5.Sovereign, international and regional	Lower the rate of return	Implement an infrastructure offering higher levels of protection.

Living Expenses

Risks	Sources	Mitigations
1.Inflation	Increase prices	Adoption of laws for the ceiling price.
2.Foreign Exchange	Increase prices	Rules for protection of households especially in exchange rates.
3.Sovereign, international and regional	Inability to meet your obligations	Increased measures to protect households.

Interest payments

Risks	Sources	Mitigations
1.Inflation	Higher payments	TIPS.
2.Interest rate	Higher interest rates	Changing repayment schedules.
3.Foreign Exchange	Higher interest rates	Pressure on governments to raise protection.
4. Sovereign, international and regional	Higher payments	Rules to protect households.

Chapter 3: Hedge Households risks- Two Examples

3.1. Inflation-indexed bonds and TIPS

Different households have different objectives, some of them save for their future pension and medical care they may need in old age, while others save for their children' education.

Consequently, some are concerned about whether the amount of future pensions will meet future needs and about their future prices of medical care, while others are more concerned about the future prices of higher education. Furthermore, a primary vehicle for wealth accumulation is the acquisition of a real estate, especially for households who plan to become first- time home buyers in a few years.

Systematic trend in the overall price level is significantly increased due to inflation. According also to the quantity theory, inflation enters as a cost of holding money which in turn affects the amount of actual cash held. There is of course, always a possibility that prices will decline, this happens when there is a deflation and is usually seen as a negative result of a poor economy.

In our case, the rate of inflation in our country in recent months is the largest since 2000 particularly the last two months brought in 5.4% and 5.2% with market participants consider certain the explosion at 6.0%. Estimates of the FEIR are shared by the European Commission indicate that inflation on an annual basis will be closed for Greece to 4.5% this figure is a direct loss of income for each Greek household. Taking also into account that inflation is notoriously difficult to forecast, especially over long horizons.

Monetary policymakers find it difficult to gauge households' expectations about future inflation and their perceptions about how monetary policy actions will affect inflation. Although monetary policymakers already have indirect measures of inflation expectations based on yield curves for existing conventional Treasury securities, these estimates are imprecise. Policymakers rarely have up-to-date measures of market expectations of inflation or of short- run changes in expected

inflation. For this reason, households will be able to construct portfolios that offer inflation- protected returns by holding a suitable blend of stocks and bonds. The certain real return will be attractive to households who are particularly risk averse. It will also be attractive to those households who want to predict their savings from being eroded by inflation.

More generally, inflation- indexed bonds can be useful in diversifying any portfolio of assets, reflecting the fact that are particularly attractive to new households that tend to buy the bonds and hold them until they mature. This new security is designed to protect the purchasing power of households' savings by indexing interest and principal payments to consumer prices. If prices go up, so do their payments from an indexed bond.

When there is deflation, the inflation- adjusted principal and nominal interest payments on inflation- indexed bonds will fall. The inflation- adjusted principal could end up being less than the principal value when the bond was issued [Dudley, Rush and Ezer (2009)].

Inflation- indexed bonds reduce households' inflation risk. This benefit has implications for each household as well as for the broader economy. By enabling households to insure against inflation risk, the government allows them to choose the amount of inflation risk they hold, resulting in a more optimal allocation of risk among households with different tolerances [Dudley, Rush and Ezer (2009)].

Risk-free inflation- indexed bonds (in terms of real rate of returns) are those held to maturity, otherwise these bonds are subject to random capital gains (losses) if sold prematurely.

To compensate for low volume of trading activity and the small size of the indexed bond market (market size), holders of indexed bonds may demand a premium in the form of a higher real return. Consequently, indexed bonds yields require the measurement of liquidity risk premium as well as expected inflation the measurement of inflation risk premiums.

With regard to the liquidity risk premium, when investors are worried about their ability to resell inflation- indexed bonds in a liquid secondary market, they require compensation for holding the securities compared with more liquid alternatives. This illiquidity premium tends to drive up indexed bonds yields. Inflation risk works in the opposite direction. To the extent that investors are willing to pay for inflation protection, they would purchase indexed bonds at a price above that implied by their expected payment yields.

The net benefits and costs of the indexed programs is considerable, they provide important advantages to households with real saving objectives as well as valuable information for policymakers whose directive is to contain inflation. Actually, households' investors may seek compensation for the effects of expected inflation on their after- tax yields in the form of higher before- tax yields on the indexed bonds.

More comprehensively, indexed bonds in general, and treasury inflation protected securities (TIPS) in particular, are designed to achieve particularly three important policy objectives:

1) To provide households consumers with a class of assets that allows for hedging against real interest rate risk,

2) To provide households holders of nominal contracts a means of hedging against inflation risk, and

3) To provide everyone with a reliable indicator of the term structure of expected inflation [Barnes, Bodie, Triest, Wang and (2009)].

Tips have the potential to be the backbone asset underlying inflation- indexed annuities, but to facilitate these annuities the maximum duration of TIPS would need to be extended. Indexed bonds tend to have been most popular when the purchasing power of a country's currency has been most unstable or unpredictable. Both counterparties, borrowers and lenders, also have agreed to index their contracts when they wished to hedge specific risks, especially when their payments vary according to the value of a commodity, currency or security.

In particular, indexed bonds are suitable for countries experiencing high rates of inflation. In this category include developing countries which are trying to foster the growth of their capital markets. The results are not apparent for countries that only recently have begun offering these securities.

Even in countries with a history of stable currencies and comparatively constant relative prices among goods and services, indexed bonds may offer a greater degree of security.

The main concern of governments that adopted the inflation- indexed bonds to finance their outstanding long-term debt was to avoid paying high rates of interest, reduce inflation and the growth of the money stock. On the other hand, households expect to earn a specific real return by adding several premia to this real rate of interest to determine the nominal rate of interest they require for their investments. In addition to the inflation premium that compensates them for their loss of purchasing power, they also require a premium for any income tax liabilities that accrue on their interest income. Investing in inflation- indexed bonds of countries, beyond that it sounds risky they can offer high credit quality, income and diversification benefits for households.

3.2. Pension funds

It is evident in recent years that have been raised concerns about the sustainability of the biggest social policy issue, through which households finance significant transfers to the elderly on the assumption that future households will do the same based on the method of pay- as- you- go funding, under this contract households provide funding to a social security system, and in exchange they receive benefits from the system during their nonworking years, generally during old age or prolonged illness (disability), concerns are also expressed and on private pension funds as well.

Therefore came to light the need for development a more comprehensive framework with which to assess the sustainability of their pension systems. Main concerns of the policymakers were to reform the pension systems so as to provide adequate, affordable, sustainable and robust retirement income to the full breadth of the population. Thereby achieve both financial stability and intergenerational equity as well. A first point that policymakers should bear in mind is that households face several risks and some of these risks pull in opposite directions.

A second point is that various retirement products have their own characteristics and suffer from important shortcomings. For these reasons policymakers should develop different retirement products such as mixed pension schemes, highlighting their main features, their cost and their performance.

Regarding the risks faced by households, the main risk is defined to be the longevity risk. More specifically, is the risk of living longer than anticipated at the time of retirement. If this happens, even very large savings may be exhausted and prove inadequate. Furthermore, depending on how their savings are invested, households are exposed to investment and inflation as well as liquidity and bequest risks. All these risks are present throughout households' life and relate to the inability to use in an emergency households' annuitized wealth.

Retiring households also face annuitization risk, i.e. the risk that at the time of their retirement financial markets may be depressed, lowering the value of accumulated

balances, as well as long- term interest rates may be low, implying a high cost of fixed annuities.

An important characteristic of the risks faced by households is that they often pull in opposite directions. Thus, the bequest risk works counter to the longevity risk and the risk of outliving households' savings. In a similar way, the investment risk points in an opposite direction in terms of desirable financial instruments to the liquidity risk. For these opposing implications, policymakers should adopt a cautious approach favoring a reasonable level of annuitization. At this point it is worth noting how necessary and accessories is the role of governments in addressing the financial risks of households.

For reducing households' exposure to financial risks as well as bankruptcy risk which relates to the fate of institutions providing a particular pension product is one of the reasons that governments provide mixed pension schemes with the guarantee of a minimum return. The guarantor would always be able to hedge its exposure perfectly by trading the underlying securities.

Guarantee schemes would ensure a return on households' contributions consistent with their risk preferences. In particular, if the guaranteed rate were linked to nominal GDP, schemes would safeguard future pensioners during the accumulation period against inflation, in particular real shocks to households sector of the economy.

Furthermore, households would also be protected against macroeconomic risks that are otherwise hard to diversify and that could weigh down market returns for protracted periods. At the same time, these schemes would allow households to continue to benefit when the net returns on their financial investments exceed the minimum return over the accumulated period.

For the financial sustainability of guarantee schemes, households must pay a risk-based premium. For these to be economically advantageous as well, the premiums should depend both on the level of the minimum return and on the percentage of risky securities in the portfolio.

The existence of a safety net against stock market collapse could of course encourage households to hold excessively risky portfolios, as in the case of households close to retirement who are dissatisfied with their returns.

It is important to mention that the basic rationale for governmental provision of the guarantee is to guard against extreme financial market risks that are not otherwise insurable. In times of systemic shocks, private sector forces are not likely to be able to provide affordable insurance against massive investment risks, so government intervention to protect prospective households close to retirement becomes necessary.

It could be argued that, in such extraordinary circumstances, government can always step in to rescue those households, especially when participation is not voluntary but compulsory. Rescues are necessarily an extreme remedy, because they are costly for taxpayers and may encourage future opportunistic behavior by pension funds. For taxpayers a public guarantee scheme funded by risk- based premiums would be efficient as the guarantee fund would distribute the burden evenly over time and different cohorts of households.

Finally, it is important to mention that the investment choices of asset managers as well as the governance of the public guarantee fund should be adequately regulated.

Conclusion

The conclusion from this thesis and the study of relevant literature is that the risks are not completely mitigated whatever measures are taken by households. It is evident that risks are everywhere, they can't be eliminated.

The greater use of inflation- indexed bond from households, more specifically the TIPS can reduce the risk of inflation but they increase on the other hand the credit risk of the country.

Furthermore, rising inflation in a country is due to poor governance. Financial institutions cannot hedge in the long term, as well. From the above highlights the importance has to be given in asset liability management because all risks are interrelated.

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