Investors' attitude towards risk in periods of high market volatility

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1. Introduction

Over the last decades and, particularly since the introduction of the single currency in 1999, financial markets experienced high level standards of integration and development, especially among the members of the eurozone.

Under this new context, of a free movement of capital and global stock markets, financial institutions need to understand how investors' behavior would be affected, namely in terms of their exposure to the binomial risk-potential return, with the aim of make available financial instruments according to investors' preferences towards uncertainty.

In the economic and financial literature, investors' portfolio allocations are commonly used as a reliable indicator of attitude towards risk. Portfolios' theory started out as a tool of understanding only financial portfolio allocation, which according to McCarthy (2004) is an incomplete perspective of the reality since financial assets are a relatively small proportion of households' portfolios except for very young households.

Some of these models, driven by an interest in asset pricing, in particular in the equity risk premium puzzle, have been used as a foundation for later models of portfolio development. In particularly, they have reduced the importance of many of these issues by increasing the number of assets that an household may invest in, have included restrictions on households' portfolios and have incorporated many aspects – such as the existence of the presence of labor income and cost to investing – that influence the portfolio that households choose to hold.

However, even for these newer models, there still exists a gap between the theory and empirical results. According to the same author households' portfolios differ by wealth, by country in which the household lives in and by various households' characteristics such as age, education and birth years. Schooley (1996), in his study concludes additionally that, at the time of purchase, investors' behavior and their perception of risk are formed by factors that include: expert advice from management consultants, past investment experiences (investors who have experienced losses make new investment decisions bearing such in mind), financial and economic news and other sources of information.

Since 2008, more particularly following the advent of the worldwide financial crisis, investors' perception of risk and uncertainty has increased, leading to the adoption of a more cautious attitude when making investment decisions. This is even more true if we consider that each time more households are taking the responsibility of the assets' allocation of their portfolios and that periods of financial instability are linked with investors' risk aversion (Papadamou, 2008).

The aim of this paper is to develop an empirical analysis in order to understand how the perception of financial events that led to the current turmoil, by Portuguese investors, was incorporated in their exposure to risk and, consequently, in their investment decisions.

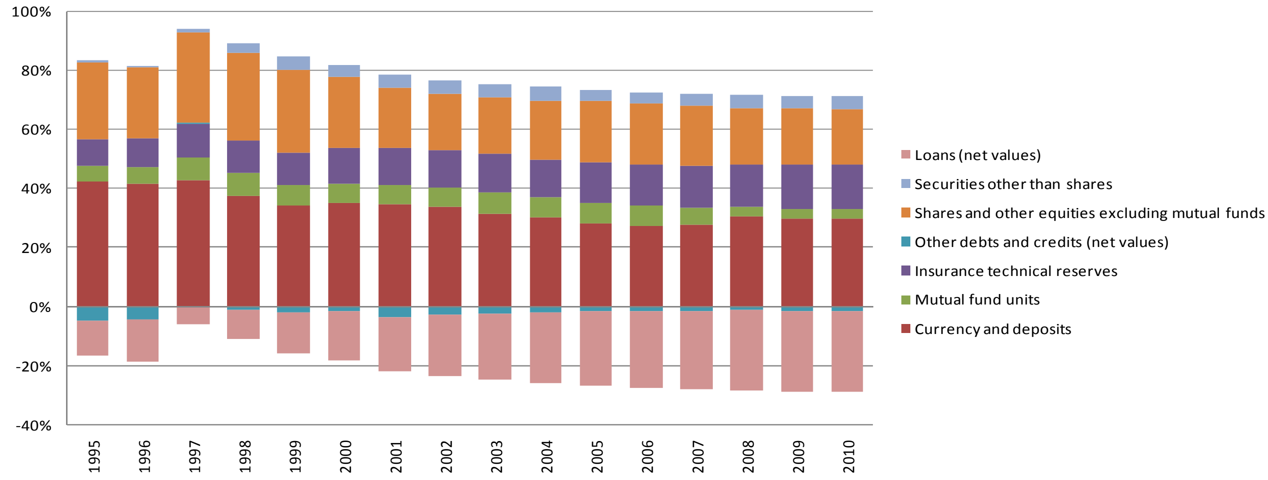
This paper is organized as follows. In Section 2 a brief characterization of the Portuguese economic environment is presented. In Section 3 the impact on households' portfolios is described and general conclusions of this work are summarized in Section 4.

2. The crisis and the Portuguese market characterization

During the last 30 years a set of changes have occurred in the Portuguese economy. Before the participation in the European Union (EU), in 1986, the Portuguese financial sector was relatively undeveloped. The process of financial liberalization that culminated in 1992, implemented a set of reforms in the Portuguese banking sector: privatization of state-owned financial institutions; interest rates and credit were no longer administratively controlled; increased the diversity of banking products and improved the competition across financial institutions.

Economic and Monetary Union (EMU) brought about low interest-rates, low inflation and a sustained economic growth. The combination of these factors led to strength investors' risk appetite and contributed to the underestimation and under-pricing of the risk, to which financial institutions answered with innovative financial instruments.

Figure 1 – *Households' portfolio composition (annual stocks)*



Source: *Banco de Portugal*

Figure 1 confirms that, despite the relative stability of some instruments (for instance, during all the period under analysis, assets were predominantly "currency and deposits"), the financial portfolio of a typical household suffered significant changes during the last two decades. These changes were essentially the increased investment in risky assets during the late 90's and the credit *boom* at the beginnings of the 00's, which can be the result of the falling transaction costs and new financial investment instruments or may reflect the internalization of expectations of future rates of return derived from the global economic environment.

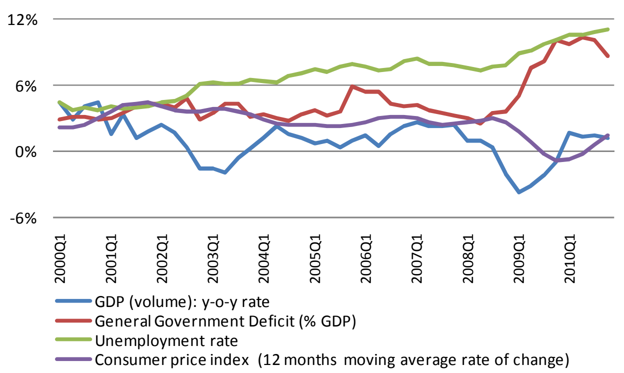
After years of robust economic performance[1], the same global economic environment began to pose difficulties for several countries in the wake of the intensification of the global financial turmoil and the subsequent global economic recession. This global financial turmoil erupted in August 2007 in the United States (US), with the sub-prime mortgage market at is epicenter and was intensified by the collapse of Lehman Brothers, in September 2008. The turmoil was characterized by immediate and substantial spillovers from financial developments in the US to financial markets and banking sectors in other advanced economies by a loss of confidence and by negative feedback loops between the financial sector and the real economy resulting in a global recession.

In particular, the Portuguese economy faced a particularly demanding set of challenges which

[1] Between 1999 and 2007, GDP growth in real terms, in average, 1,5 percent in Japan, 2,8 percent in USA and 2,3 percent in the Euro Area.

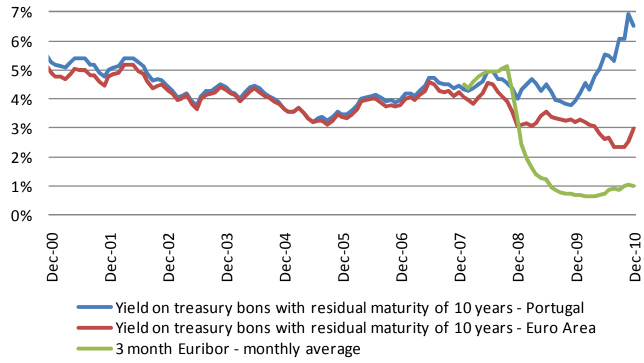
conditioned the decisions of the national agents.

***Figure 2** - Portuguese activity and labor market indicators*



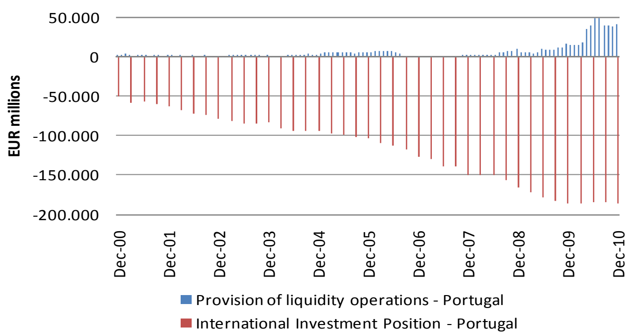
***Source**: INE*

***Figure 3**– Interest rates*



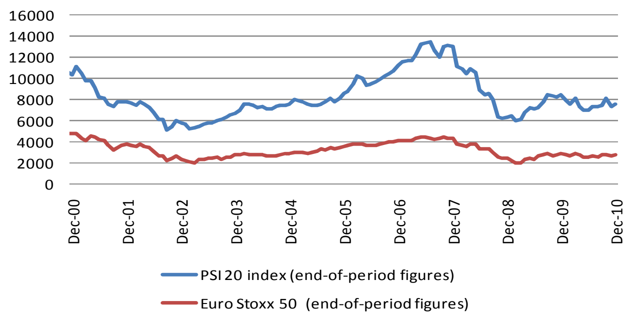
***Source:** Reuters*

***Figure 4** – Provisions of liquidity and International Investment Position*



***Source:** Banco de Portugal*

***Figure 5** – Stock Market Indices*



***Source:** Reuters*

Since the end of the 2009 a strong instability and a sovereign risk differentiation has increased markedly across the euro area, penalizing economies with larger fiscal and external imbalances and more significant structural problems, including Portugal. This situation was reflected in very sharp increases in the yields on Treasury bonds with residual maturity of 10 years (Figure 3). By the end of April 2010, a sizeable impact on the Portuguese banks' financing capacity was installed, which was already weakened since the collapse of Lehman Brothers. These circumstances led to very tight quantitative constraints in the access to international wholesale debt markets: the Portuguese ongoing expansion of the banking system activity started to depend on a large-scale to the access to ECB liquidity providing operations, particularly since May 2010 (Figure 4).

This situation led, additionally, to the adoption of supplementary fiscal consolidation measures, beyond those announced in January in the State Budget for 2010 and in the successive updates of the Stability and Growth Programmes (SGP). At last, on 6th April 2011, the Portuguese government decided to give the European Commission a request for financial assistance in order to ensure financing conditions to Portugal, and on 4th May 2011 Portugal has reached an agreement with the Troika of the European Commission (EC), the ECB and the International Monetary Fund (IMF) for a three-year 78 000 euro million bail-out, granted at a 5,7 percent average interest rate.

The main features of the Portuguese economy in 2010 result from the combination of several inter-connected factors, namely the GDP growth of 1,3 percent in 2010, after a sharp drop in 2009 (-2,5 percent), as shown in Figure 2. According to the Eurostat's data, GDP growth will be lower in Portugal than in the Euro Area. Thus the Portuguese economy will again diverge in real terms, in line with the evidence of the past decades (the GDP growth forecast is of -1 percent in Portugal against 1,5 percent in the Euro Area and 1,7 percent in the EU).

The interest rate decrease was justified by real interest rate developments, resulting from weak economic growth prospects, and very low inflation expectations, both of which are now at low levels by historical standards.

After a significant valuation (of 30 percent) in 2009, between the end of the referred year and late May 2010, the PSI-20 index declined by 16,4 percent. This is in line with developments in the Euro Stoxx-50 index, which fell by 12 percent over the same period. However, as of the end of June both stock indices started to recover and, in December 2010, the PSI-20 index was only 10,3 percent below the level seen at the end of 2009, while the euro area index declined by 6 percent over the same period (Figure 5). In this context, in the first half of 2010 issuance of quoted shares was not significant by either financial corporations or non-financial corporations.

In the first half of 2010, developments in financial markets were mainly determined by worries about sovereign credit risk. The situation intensified in January 2010, in the wake of downward revisions of the credit rating of Greek public debt and contagion to other European countries with high fiscal deficits and structural fragilities, particularly Portugal, Ireland and Spain, which have also undergone some downward credit rating revisions. In this context, international financial market volatility has risen significantly and investors' confidence has deteriorated markedly, also on account on the uncertainty surrounding economic recovery. The spreads between government debt interest rates of Portugal and Euro Area have widened to reach a peak since the start of the Stage Three of the EMU, with Portugal facing the most significant increase in ten-year government yield vis-à-vis Euro Area. In December 2010 ten-years spread stood at 357 basis points (b.p.).

Unemployment is expected to remain at high level standards. The unemployment rate reached another historical peak: 11,1 percent at the end of 2010, maintaining the trend observed in the two last decades (Figure 2).

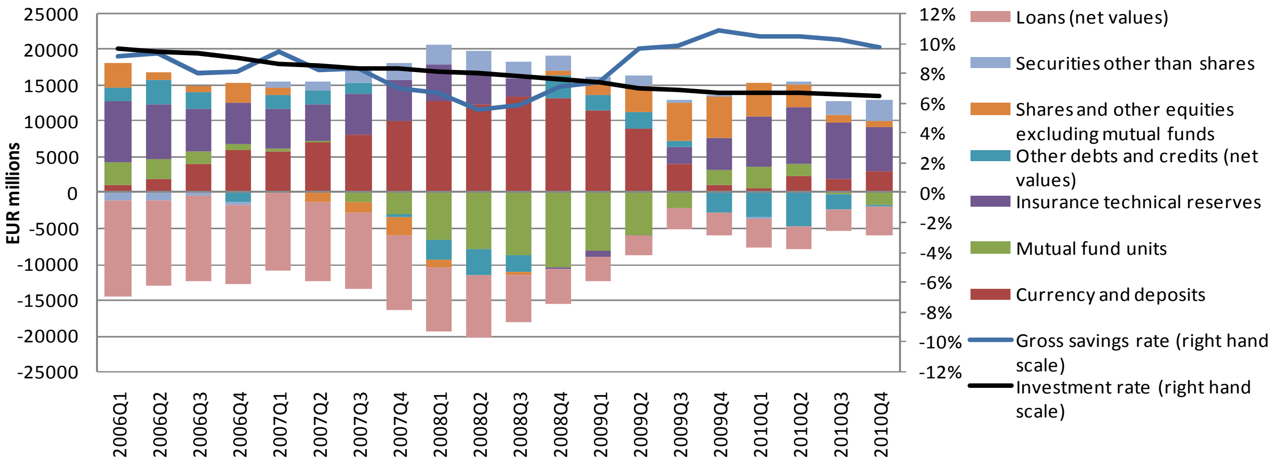
3. Changes in Households' Portfolios

All the features described above, once incorporated in households' expectations, could determine their perception of risk and uncertainty and be transmitted to their portfolios, for instance through the adoption of a more cautious attitude when investment decisions are made.

While some authors (Corter (2010)) argue that, an individual shows a higher or lower propensity to risk, others argue that risk-tolerance or risk-avoidance is specific situation with little consistency across task and domains. These authors argue, additionally that, while "risk" denotes situations in which the probabilities of outcome are known or at least made explicit, "uncertainty" denotes situations in which the probabilities of outcome are unknown and, hence, uncertainty could be one such potential source of risk aversion on investment decisions, with most investment decisions involving uncertainty rather than risk.

Figure 6 evidences the adjustments done by households to their balance sheets under this context of uncertainty.

Figure 6- *Changes in households' portfolio composition (transactions, cumulative four-quarters)*

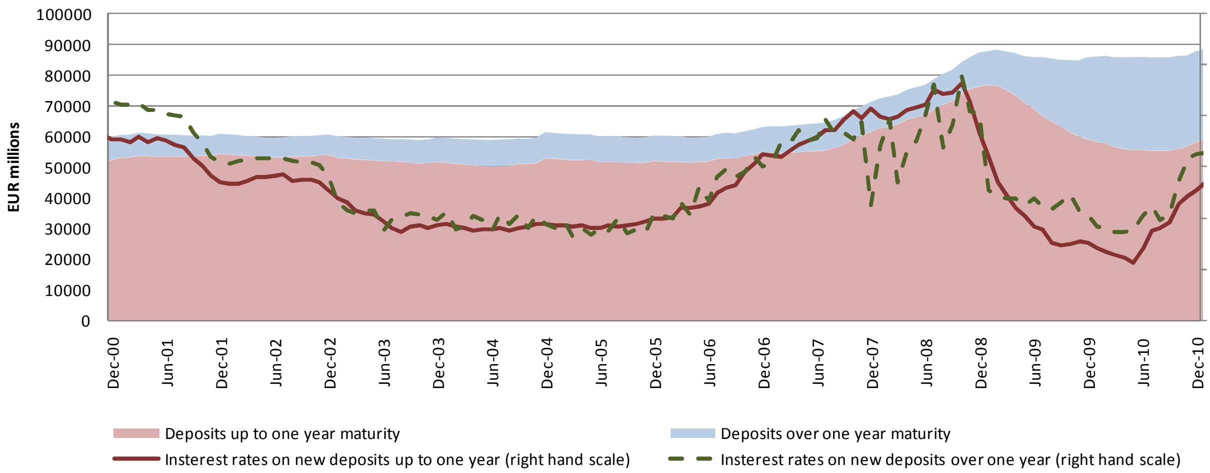


Sources: *Banco de Portugal, INE*

Households' net lending has increased significantly only from 2009 onwards, reflecting a higher gross savings rate and a continued downward trend of the investment rate, which currently stands at a low historical level.

3.1 Deposits

Figure 7- *Households' deposits*



Source: *Banco de Portugal*

As shown in Figure 7, in nominal terms, the stock of deposits held by households remained quite stable until 2007 when it started an upward trend until the beginnings of 2009. Since the second half of 2009, the stock of households' deposits recovered its stability, although a change of preferences, in terms of maturity, has taken place.

Developments in deposits should be analyzed in the light of two arguments, already mentioned: changes occurred in households' portfolios derived from the adoption of a more cautious attitude, and the developments in banks' financing strategy in a context of liquidity scarcity and constraints in the access to international wholesale debt markets.

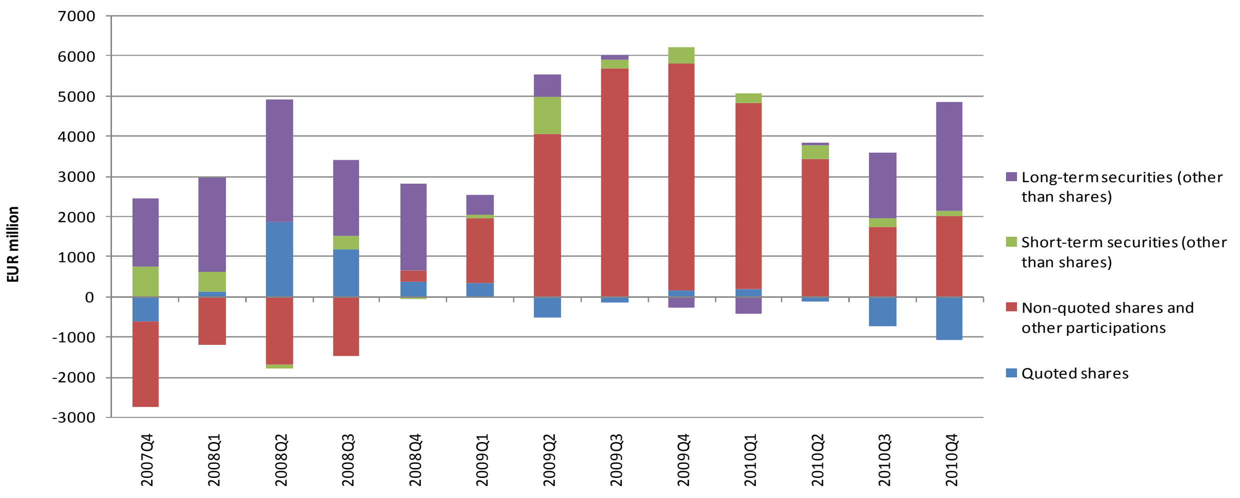
In what concerns the first argument, the upward trend verified in the beginnings of 2007 is justified, essentially by the deterioration in the financial markets. This situation made riskier investments less attractive, despite the start of a downward trend interest rates, with shorter maturities remunerations falling sharper during 2009. In the second half of 2009, with interest rates still at historical levels and with a slight rebound of the main stock indices, households turned, again, to invest in riskier products until the mid of 2010.

The historical preference by deposits up to 1 year maturity (excluding overnight deposits) over deposits with longer maturities changed since June 2009 onwards, with an increase demand of deposits with longer maturities, which represents nowadays about 31 percent of the total, 18 percentage points (p.p.) more than until March 2009. This reallocation may be linked to funding problems and higher loan-to-deposit ratios. Under this context, banks started pushing to increase more stable financing sources, offering more attractive conditions with a view of strengthening their market instability. Interest rates on new deposits started to run above 3 percent in higher maturities, with a differential between the shorter and longer maturities, at the end of 2010 of about 70 b.p..

Despite the stability of the stock, the new business volume of deposits started to increase in the second half of 2010, which seems to indicate that investors are transferring savings from lower interest rates to these new products offered by banks.

3.2 Shares, Other equities excluding mutual funds and Other securities

Figure 8 – *Shares, other equities excluding mutual funds and other securities (transactions, cumulative four-quarters)*



Source: *Banco de Portugal*

Figure 6 shows households' movements in shares and other securities. The year of 2007 was markedly characterized by a clear disinvestment in shares, much in line with the strong drop observed in the stock market indices, namely PSI 20 index, as shown in Figure 5.

Quoted-shares showed a slightly recovery during 2008, following again a close relationship with the national stock Index trajectory.

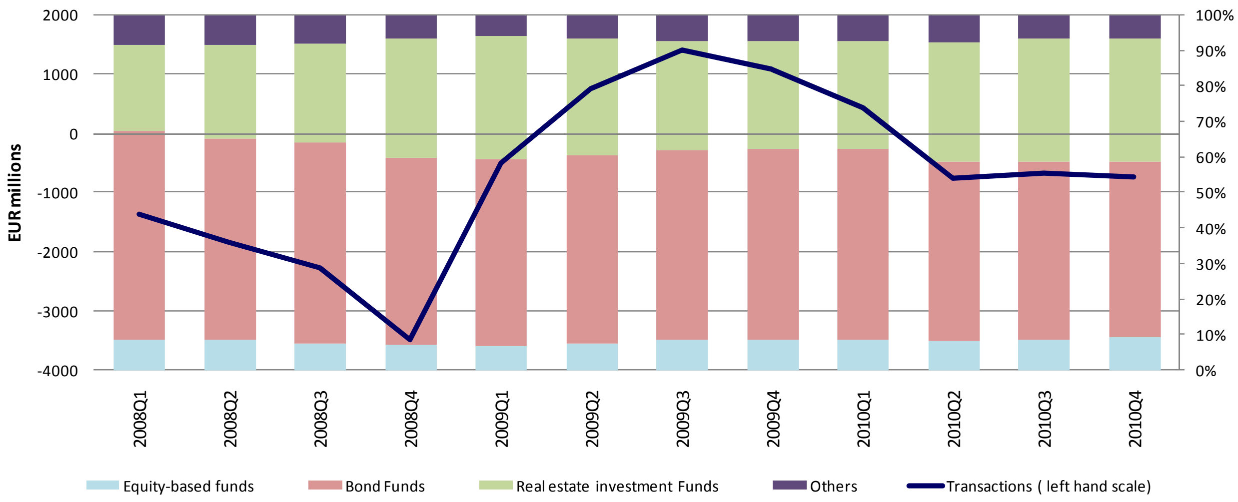
The investment in non-quoted shares increased significantly since 2009 with Non-financial corporations as the main issuer sector.

The amount of securities other than shares reached a certain expression during 2007 and 2008, having declined after the second quarter of 2009. Over the second half of 2010 this kind of investment started a recovery reaching, in terms of cumulative transactions, an amount of about 2 900 Eur millions. Until the beginnings of 2009, households' investment was concentrated in long-term securities issued by the Monetary and Financial Institutions (MFI). The rebound in the second half of 2010 was justified not only by bonds issued by MFI but also by the General Government. This change could be related to the very sharp increase in the yield on Treasury bonds with residual maturity of 10 years, as shown in Figure 3.

The investment in short-term securities is relatively stable over the period under analysis. Non-financial corporations were the more relevant counterpart sector (Figure 8).

3.3 Mutual funds

Figure 9 *– Mutual fund units (transactions, cumulative four-quarters)*



Source: *Banco de Portugal*

The households' portfolios are comprised, essentially, by Bond Funds and by Real estate investment Funds. Between them it is possible to find a substitution effect essentially since the beginnings of 2009 (for instance, in March 2008 the relative weigh of Bond Funds was about 60% against 24% of Real estate investment Funds while in December 2010 the relative weight was of 49% against 35%. Equity-Based Funds remained quite stable all over the period under analysis (about 9%)).

The amount of units held by households fell down in a systematic and strong way since January 2008 until the end of the first quarter of 2009, with the cumulative value of rescues and value changes (devaluations) ascending to -12 194 Eur millions. Since this date a reversal in the downward trend could be observed but only until the end of the first quarter of 2010. Since then onwards, a new disinvestment in mutual funds by households took place, much in line with the course of the Portuguese stock index, PSI-20, as shown in Figure 5.

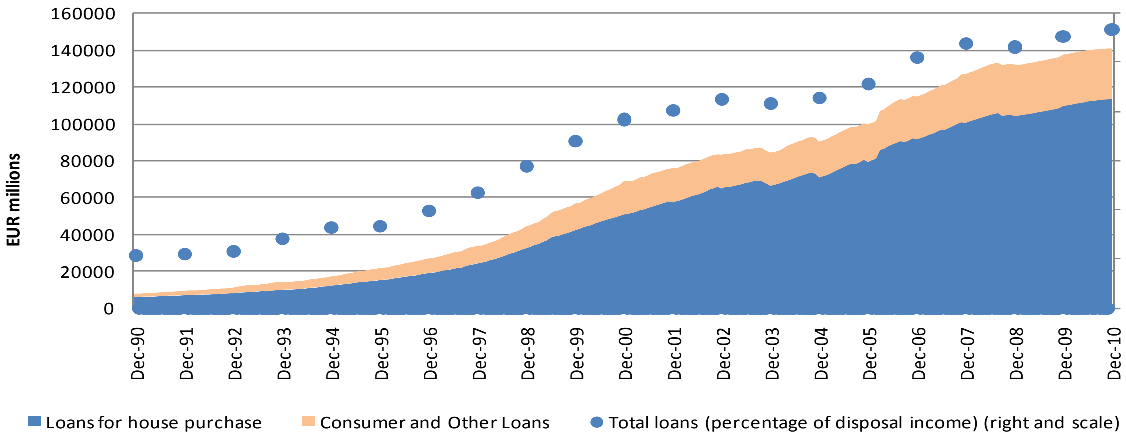
3.4 Insurance technical reserves

As shown in Figure 6, investments in "insurance technical reserves", gained increased importance since the end of 2008. Additionally to the perception of the necessity of having a complement to the public social security schemes, households start to see products offered by Insurance Companies as an alternative source of investment, mainly due to the diversifications of products offered by this kind of companies.

The evolution of life insurance also reflects the fact that this type of insurance is required by credit institutions for house purchase loans.

3.5 Real estate investment

***Figure 10 –** Households' Loans*



***Sources:** Banco de Portugal, INE*

As mentioned above, reducing households' investments to financial assets is an incomplete perspective, since households do not use, only, their savings and borrowings to purchase financial and non-financial assets, but also because financial assets are a relatively small proportion of households' wealth except for the youngest ones (McCarthy (2004)). Details on the distribution of non-financial assets are scarce, mainly due to the lack of appropriate data (Farinha (2008)). However, a study carried out by Ynesta (2008) shows that, for a set of countries[2], non-financial assets are split between dwellings[3] and land[4]. Despite Portugal doesn't be included in the referred study, Farinha (2008) states, in her study that real estate has a significant weight on Portuguese wealth. Thus, do not consider this kind of investment would be, not only to ignore a significant share of households' wealth, but also to assume that changes in real estate valuations do not have any impact on households spending decisions.

Considering that, over the last decades, loans granted to house purchase[5] represent almost 80 percent of the total loans granted to households, Figure 10 shows the increase in real estate investment since the beginning of 2000, in line with Eurostat statement: in Portugal, in 2007, more than 75 percent of households owned their own property.

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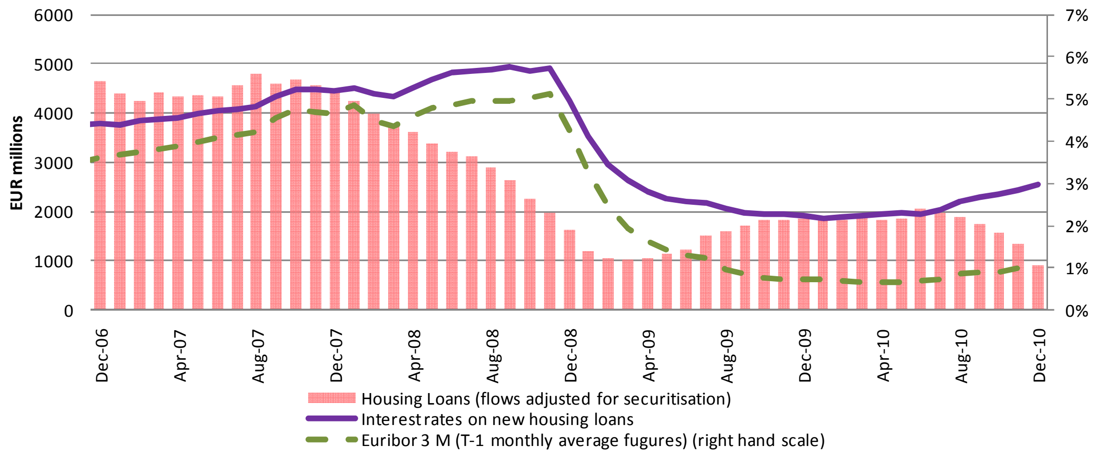
[2] Australia, Canada, Czech Republic, France, Germany, Italy, Japan, Netherlands, United Kingdom and United States.

[3] According to OECD, dwellings are defined as buildings that are used entirely or primarily as residence, including any associated structures, such as garages.

[4] According to OECD, land is defined as the ground itself, including the covering soild and any associated surface waters over which ownership rights are enforced.

[5] It includes credit extended for the purpose of investing in housing, including building and home improvements (ECB/2008/32)

Figure 11*-Real estate investment*



Sources: *Banco de Portugal, INE*

Although growing in nominal terms, loans to households for house purchase started to decline, as shown in Chart 11. This downward trend reflects not only the increase in interest rates observed until the end of 2008, but also a higher volatility in housing price. Given that real estate assets are used as collateral in loans, real estate valuations are liable to affect credit market developments.

Despite the drop in interest rates on new loans for house purchase[6], this segment of credit market maintained its downward trend until the beginnings of 2009 when, under a context of lower interest rates, started a slight recovery although remaining at a relatively low level.

Since the second half of 2010, with interest rates starting to increase, housing loans started, again, a slow down trajectory, reaching at the end of 2010, an historical minimum.

These results are consistent with those published in the Bank Lending Surveys[7], which sustained that this credit adjustment is being done by banks once they, gradually, have higher tightening credit standards since the summer of 2007. In line with growing sovereign risk differentiation in euro area debt markets, some factors explain this tightening in credit standards applied to loans. Specifically the higher financing costs, tighter constraints in banks' balance sheet and risks associated with expectations regarding developments in general economic activity. Turning to households demand for loans, although surveyed banks have reported an improvement between late 2009 and early 2010, more recently demand was reportedly lower, particularly in loans for house purchase. This seems to have been mainly due to the deteriorating housing market prospects.

These higher boundaries to the credit granted are also reflected in the increased spread between bank loans and reference market rates. Despite of this, Portuguese household indebtedness, in percentage of disposable income, remains high reaching, in 2010, values above 120 percent which contrasts with levels of 20 percent in the beginnings of the 90's.

4. Conclusions

Since 2008, more particularly following the advent of the worldwide crisis, investors' perception of risk and uncertainty has increased, worsened by the set of challenges being faced by the Portuguese economy, as a consequence of the economic and fiscal instability.

Under this context, and taking into account that periods of uncertainty are, usually linked with low

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[6] After the historical high reached in the second half of 2008, interest rates fall almost 360 b.p. until June 2010.

[7] The Bank Lending Survey is done by *Banco de Portugal* to a sample of five banking Portuguese groups.

investors' risk appetite, a set of adjustments are being done by households in their investments, consequently in their portfolio's composition.

Therefore, an increase in deposits took place since the beginnings of 2007 essentially due to the deterioration in the financial markets situation, which made riskier investments, such as, shares and mutual fund units less attractive, even despite the start of interest rates falling.

Following the PSI-20 trajectory, this kind of investments slightly recovered in 2009, falling again in the last semester of 2010. Indeed, the end of the last year was characterized by a new growth in deposits, at this time with longer maturities. This was a consequence of higher remunerations offered by banks under a context of liquidity scarcity, as well as an increase in investment in securities issued by MFI and General Government in line with the rise observed in the yields. Riskier investments, such as shares and mutual funds units suffered, again, a disinvestment.

Although the maintenance of a higher indebtedness, as a percentage of disposal income ratio, loans, especially those for house purchase (used as a *proxy* of real estate investment) started a down trend, reaching, at the end of 2010, an historical minimum. This situation is explained by a demand decrease and by the supply side, in line with the higher financing costs, and risks associated with expectations regarding developments in general economic activity.

The concerns, not only of households but of investors, in general, regarding the sustainability of national finances against the background of continued structural fragilities of the Portuguese economy in the international financing market, as also as the impact of fiscal consolidation package of measures defined to Portugal, will continue to determine investment decisions, during the following years.

The evolution in 2010 will result from declines in both the domestic saving rate and in the investment rate. However, the current situation is not sustainable, in particular given the persistence of constraints on the external financing of the economy. Thus, the process of fiscal consolidation, which cannot be postponed, must coexist with a deleveraging process in the private sector, desirably associated with a rise in domestic savings, which currently stand at historical lows.

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