

Risks to Romanian financial stability stemming from the household sector¹

Florian Neagu² and Angela Mărgărit³

1. Economic behavior of households and consequences for financial stability

1.1 Household consumption and savings

Usually, households' consumption represents the most important component of aggregate demand. Understanding households' consumption behaviour, especially in response to exogenous shocks, is an important source of information in assessing short term volatilities, long term economic trends and also the patterns of external trade as reflected by the balance of payments.

From a financial stability point of view, observed changes in the dynamics of and the breakdown of households' consumption into sub-groups are of key importance in considering their impact on households' indebtedness.

Looking at Table 1.1, the ratio of households' consumption to GDP (average propensity to consume) has been a steadily growing after its 2002 low (when the growth of final consumption was smaller than that of previous year and the contribution of net export to GDP was positive).

Table 1.1

Dynamics of households' propensity to consume

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Average propensity to consume | 0,832 | 0,830 | 0,789 | 0,785 | 0,772 | 0,779 | 0,794 |
| Marginal propensity to consume | – | 0,828 | 0,702 | 0,776 | 0,726 | 0,808 | 0,853 |

Source: National Institute of Statistics and own estimations.

The contribution of consumption to GDP might grow in the future due to: (i) the downward trend of interest rates, (ii) the expectations of budget deficit restrictions for the coming years, and (iii) the appreciation path of domestic currency. The likelihood of this scenario is sustained by the more recent trends (since 2003) of the marginal propensity to consume compared to the average propensity to consume (Table 1.1).

¹ The opinions expressed in this paper are those of the authors and do not necessarily represent the views of the National Bank of Romania, nor do they commit the Bank in any way.

² National Bank of Romania, Financial Stability Department, e-mail: Florian.Neagu@bnro.ro.

³ National Bank of Romania, Financial Stability Department, e-mail: Angela.Margarit@bnro.ro.

Table 1.2

Average monthly gross salary at the end of 2004, EUR

| EU-10 Countries | EU-15 Countries |
|-------------------------|---------------------------|
| Slovakia - 462,8 | Spain - 1641,14 |
| Poland - 594,8 | France - 2274,5 (in 2002) |
| Czech Republic - 652,08 | Ireland - 2434,03 |
| Hungary - 668,6 | Germany - 2507 |

Source: IMF (SDSS), central banks websites and own estimations.

The assumption that households' consumption expenses will grow and even significantly, is further supported by the analysis of households' economic behaviour based on the life-cycle and permanent income theories of Modigliani and Friedman (Box 1). Thus, the European integration process acts as an essential trigger for permanent income growth of Romanian households. Expectations of higher disposable income will be perceived by households as a permanent shift in the utility level provided by consumption growth. On the other hand, such a shift in consumption is more likely to be achieved in the near term by increasing indebtedness or by using accumulated resources.

Box 1

Life cycle theory and permanent income hypothesis

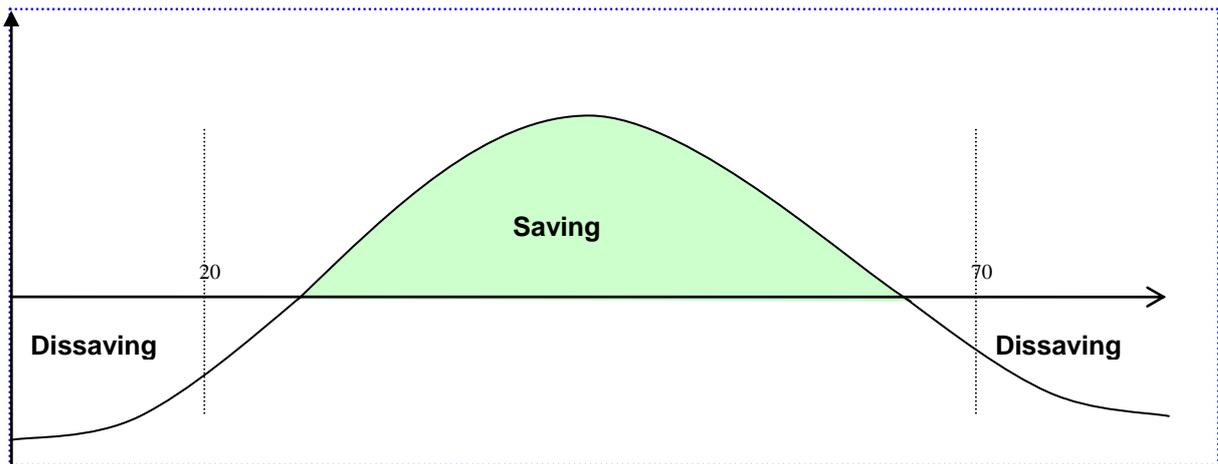
Keynes' theory on consumption (1936) established a bound between global consumption and income: "The fundamental psychological law that we certainly can count on, a priori, due to knowledge about human nature and, at the same time, a posteriori, due to detailed information resulting from experience, is that on average and most of the time, people tend to increase consumption as their income grows, but not with an equal amount". As consequence, Keynes considered that, as the income grows, people save more, resulting in an increase of savings as a percentage of income.

Kuznets (1942) showed that Keynes' theory could not be sustained by US historical data: although household income had significantly grown, savings (as a percentage of GDP) had not. This contradiction regarding savings behaviour was analysed by Modigliani and Brumberg, who developed a new theory on savings published in 1954 - life-cycle theory. The main hypothesis of this theory is that saving incentive of households savings behaviour derives from the need to ensure resources for consumption needs after retirement. Thus, household saving is not only influenced by the current level of income, but also by its wealth, expectations of future income and age.

At a macroeconomic level, this theory asserts that: (i) savings depend on the income growth and not on the level of current income; (ii) savings are affected by the population growth, and also by its age breakdown; (iii) savings are influenced by the wealth of households, and, as a consequence, by the structure of interest rates.

Friedman (1957) developed a permanent income hypothesis, arguing that households establish their consumption pattern on the basis of permanent income, and not on current income. Permanent income is computed as a sum of current income and the weighted average of future incomes. The weights decrease as we go further into the future (adaptive expectation hypothesis).

A conclusion from both Modigliani and Friedman's theories is that in the first and the last part of their lives, households consume more than they save in order to maintain a relatively constant life standard. This theoretical behaviour is modified in real life by some liquidity constraints further details in this and in the third section).



Expectations of future income may follow a steep and increasing slope due to significant differences between Romanian average gross salary income (at the end of 2004 the average Romanian gross salary was only 233.7 EUR) and the corresponding values of EU countries (Table 1.2).

Changes in consumption behaviour could increase the risk to financial stability by increasing levels of indebtedness or dissaving. The other aspect to consider is the change in the composition of consumption. An increasing share of consumption out of the household income could trigger a decrease in the weight of goods that are considered as “normal” (goods that have positive but lower than unity income elasticity - for example food products) in favour of “superior” goods (goods described by marginal higher than average propensity to consume). These goods are more prone to be financed by loans compared to “normal” goods, thereby increasing households’ indebtedness. Moreover, if the Romanian economy is not able to supply these products (and services) at the required qualitative and quantitative levels, consumption might be satisfied through imports, further affecting the current account deficit. Financing those goods with foreign currency loans raises also the issue of households’ ability to manage foreign currency risk.

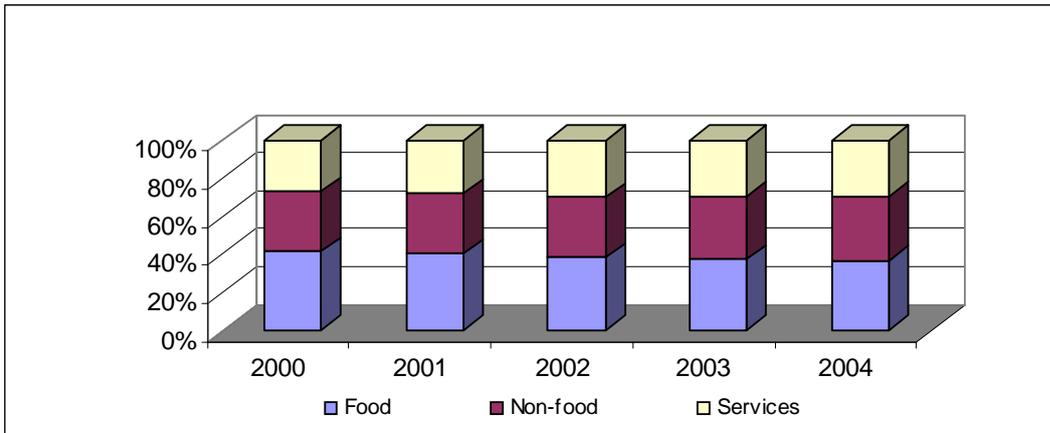
The structure of households’ money expenditure has altered with the weight of expenditure on food decreasing in favour of services and non-food expenses. Graphs 1.1 and 1.2 reveal a continual decrease of food expenses by 2.8 pp, between 2000 and 2004, in favour of non-food expenses (increasing from 31.8% to 33.6% between 2000 and 2004) and services expenses (26.9% in 2000 compared to 27.9% in 2004). Analysis of employees’ consumption budget shows that the decrease of food expenses was slightly higher (4.6 pp) than services expenses (growing by 2.3 pp up to the level of 29.5% of total consumption in 2004) and non-food expenses.

We anticipate that these changes in the structure of the households’ money expenditure will go on even further, for at least the following reasons:

- On one hand, the process of European integration enhances Balassa-Samuelson effect which leads to an increase in the cost of services while the quantity of consumed services will continue to grow (as a consequence of higher standard of living). A distinct case comes from expenditures on utilities as their prices will have to adjust to the similar levels of EU by I 2007, which will lead to a hike in these prices;
- It is possible that the prices of food products will grow at a smaller pace considering these circumstances and due to decreasing trend of inflationary expectations. Thus, the weight of food product expenses in total households’ consumption will diminish even further;

Graph 1.1

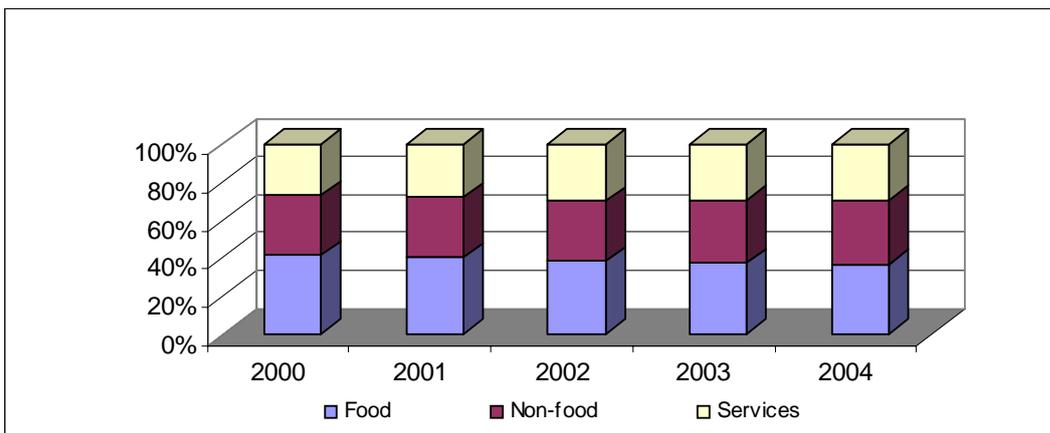
Structure of money expenditure for households' consumption - total



Source: National Institute of Statistics.

Graph 1.2

Structure of money expenditure for households' consumption - employees



Source: National Institute of Statistics.

- We consider that non-food expenditures will also grow as the households' consumption will be directed towards improvement in their standard of living by increasing the consumption of durable goods (see section 2).

Regarding the household savings, its current unfavourable dynamics could affect financial stability if the specific functions of savings cannot be fulfilled. These functions act at two levels: at macroeconomic level, households' savings represent an important source of financing companies' investments and in reducing budget deficit; at microeconomic level, lower savings could negatively impact household standard of living, specially of the retired people.

Considering the significant amount of capital inflows of the recent years that are sterilized by National Bank of Romania (NBR), we can conclude that for the moment, there is no significant risk at a macroeconomic level.

However, there is some risk at microeconomic level as the number of contributors to the actual pension system is significantly lower than the number of beneficiaries. In this respect, there is a need of speeding up the implementation of Pillar II and III for private pension funds (Box 2).

It should be noted that the savings placed in public pension funds are weak substitutes for wealth since they are not liquid. Savings as contributions to the public pension funds cannot be used as collateral before retirement and cannot have the function of safety saving. Thus, optimal household savings should be higher than the savings in the public pension funds.

So far, the pension system in Romania, as a defined benefit system, has been a reliable source of income for retirement which meant that there was a lower incentive to have additional savings during the active working life. At the same time, households did not need to actively manage the financial risks for the amounts saved through the public pension fund. The process of restructuring the current pension system will highlight those two aspects, which raises the issue of initiating measures to improve households' financial education.

Box 2

Restructuring the current pension system in Romania

For the moment, the Romanian pension system is exclusively based on Pillar I, the usual term for public pension system. The features of this pension system creates inefficiencies in its ability to fulfil its role of granting social benefits to the retired people. The public pension system also includes other types of short term social benefits, such as: maternity leave, medical leave, child rearing, death benefits, etc. These characteristics, when combined with a significant increase in the number of retired people in the last decade as well as the increase in arrears of social contributions, have resulted in a severe underfinancing of the system, which in a medium term could impose serious constraints on social insurance budget.

The alternative solution for improving the pension system and in avoiding a major crisis is to develop private pension systems. In 2004, Pillar III and II have been introduced by Law no. 294 regarding occupational pensions (in force by 2005) and Law no. 411 regarding private managed pension funds (in force by 2006).

Pillar II, represented by private managed pension funds, is mandatory for people up to 35 years and optional for people between 35 and 45 years. A percentage of the contribution collected by the public pension system is used to fund this pillar. Over the short and medium term, the social insurance budget deficit could grow as a consequence of applying the new Pillar, with an impact on the consolidated budget.

Pillar III comprises of optional occupational pensions. The contributions of employees and employers are not predetermined. The law only establishes that both partners qualify for a yearly fiscal deductibility for individual contributions of 200 EUR. For Pillar III there are no limits on the age of contributor, but the law provides a minimum contribution period of 5 years.

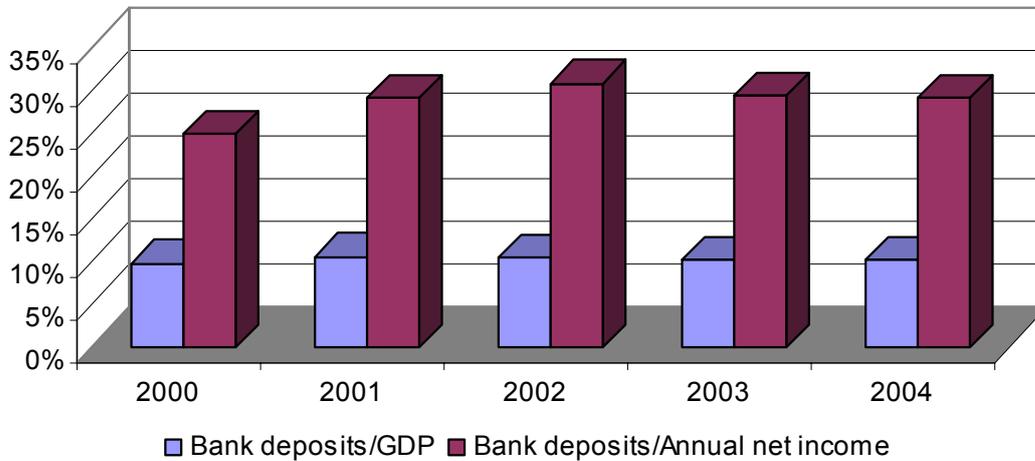
Although the private pension system has developed with a significant delay compared to other Central and Eastern-European countries, we should appreciate the benefits of this system. A first qualitative consequence is the abandoning of "defined benefits" approach in favour of "defined contributions" approach: in other words giving up the strategy of promising certain amounts for the future pensions in favour of establishing the level of contribution without benefits guarantee.

The system of private pensions will encourage positive behavioural and educational changes with a forward-looking and responsible attitude towards retirement. Acknowledgement of the fact that the public system cannot offer comprehensive financial solutions for retiring people could trigger further development of the private pension system.

The private pension system will produce important capital flows that could be channelled to viable projects and would stimulate economic growth. A sound development of private pension system could also overcome the pressure on public budget.

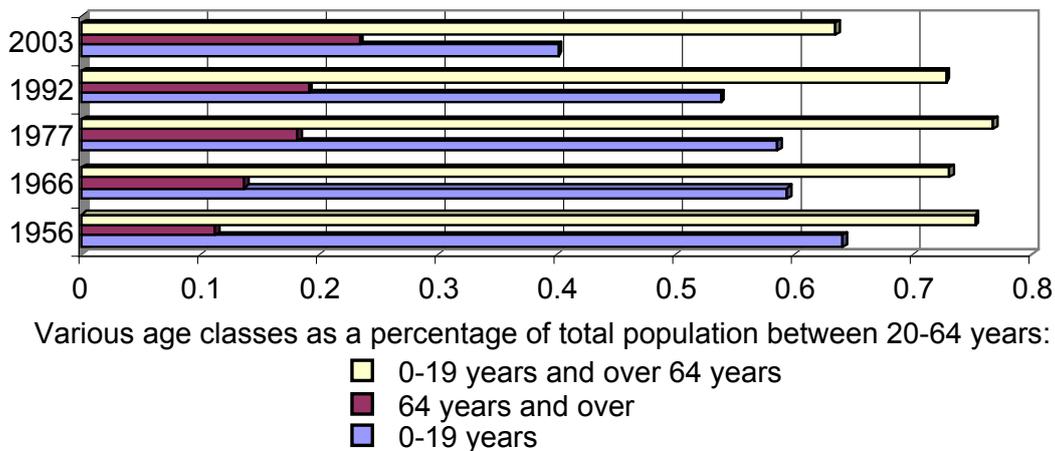
Bank deposits of households stabilized at around 10% of GDP and 29% of net income (Graph 1.3). Comparing the last value with the average of UE (9.25%) we may conclude that either the net income of Romanian households is significantly undervalued, or the future dynamics of net income will be much more pronounced than the savings rate.

Graph 1.3
Households' savings



National Institute of Statistics and own calculations.

Graph 1.4
Demographic pressure of ageing and young people



Various age classes as a percentage of total population between 20-64 years:

- 0-19 years and over 64 years
- 64 years and over
- 0-19 years

From a financial stability point of view, the second hypothesis raises more concern since there are some aspects of the macro economy that sustain the need for increasing savings. Given the Romanian *demographic evolution*, higher savings is necessary as the increasing weight of older people in the population comes with a decline in savings, as the propensity to save among the retired people tends to be lower.. Similarly, an increase in the number of young people not yet working, diminishes the savings rate since the parents would assign a significant part of their income to support the children. From Graph 1.4, the evolving demographic proportion of ageing population as well as the changing dynamics of under aged population groups can be seen. *Average life expectancy* of Romanian population could be another factor in favour of an increasing the savings rate of households during the active working life of the earning members in order to maintain a constant level of consumption over the long run.

Interest rate has a double effect on savings. First, diminishing interest rate encourages present consumption and does not favour saving for future consumption. Second, lower interest rates

require a higher saving rate in order to achieve an established savings threshold. The implications of substitution and income effects will be further considered in the next section.

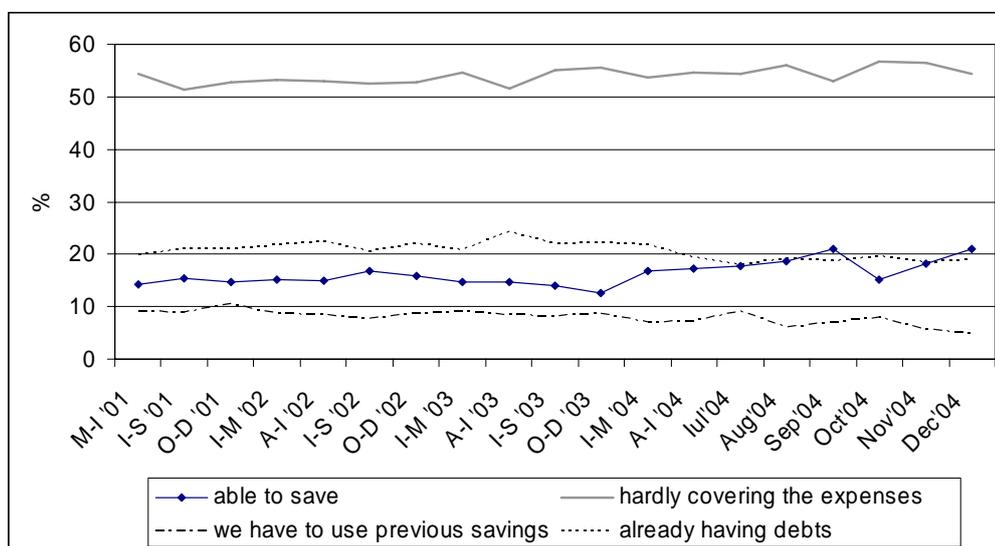
It is also necessary to consider the impact of the *spread* between loan and deposit interest rates. In Romania, these spreads are quite significant. The higher the spread, the more inefficient it becomes for households to be both debtor and creditor at the same time, since the households need to have a higher savings rate in order to remain net creditors.

Households *wealth* is another aspect that influences saving behaviour. The market value of wealth could change either due to a different saving behaviour, or due to the volatility of the asset prices. The latter effect is likely to be more important for the households' non-financial assets (mostly housing), considering the low weight of financial instruments in the wealth of households. Moreover expectations of a decreasing trend of interest rates would not lead to higher savings income.

The expectations of higher costs for medical assistance and education could become another reason of concern for the households. We expect that the effort of the Romanian households to provide for these expenditure will be much more significant in the future. The IMF (2005) warns about cutting of the governmental subsidies for medical care and education expenses in the context of pressure for lower budget deficits. From a financial stability perspective, monitoring the impact of medical assistance and educational expenses is important as these expenses are weighing more and more in the households' budget. Households will be forced to change their consumption and saving behaviour in order to provide for these expenditure. Taking into account the demographic profile presented in Graph 1.4, we can conclude that, in the short and medium run, a higher impact could come from the changes in medical assistance expenses rather than education.

Graph 1.5

The sentiment on family financial stance



Source: GfK Romania, 2005.

As a consequence, there is a strong need for increasing the households' savings in order to efficiently cope with higher required resources. The households' sentiment towards the ability to save (Graph 1.5) is slightly increasing, but still remains to a low level (21% of total, December 2004). Most people modelled their current expenses such as to be covered by income (almost 55%, December 2004), while households that were in deficit or were perceived as net debtors accounted for 19% at the end of 2004.

1.2 Household balance sheet and disposable income

At a microeconomic level, households play a double role:

- As a creditor, household decisions of reallocating the financial assets portfolio between bank deposits, securities or other forms of investments, such as those offered by insurance companies, mutual funds etc., encourages competition for households' resources. The impact of such decisions have consequences for financial stability especially when: (i) competition between entities induces a higher risks in the financial system that cannot always be efficiently managed and (ii) rapid turnover of financial assets portfolio causes liquidity pressure and price volatility.
- As a debtor, households are usually indebted through consumer credit or mortgage loans. If the indebtedness ratio and the exposure to different creditors reach a critical point, households' incapacity to service the debt is passed on through the channel of creditors' balance sheets, affecting financial stability.

Table 1.3
**Households' income and expense statement
and balance sheet**

| Income and expense statement | Balance sheet |
|--|---|
| 1. Wages and salaries from employment | 7. Total assets (= 8 + 11) |
| 2. Property income | 8. Non-financial assets (= 9 + 10) |
| 3. Current transfers (e.g. from government) | 9. Commercial and residential real estate |
| 4. Other income | 10. Other assets |
| 5. Less taxes including social security contributions and other current transfers made | 11. Financial assets (= from 12 to 16) |
| 6. Gross disposable income | 12. Currency and deposits |
| | 13. Debt securities |
| | 14. Shares and other equities |
| | 15. Financial derivatives |
| | 16. Other assets |
| | 17. Total liabilities (= 20 + 21) |
| | 18. Loans |
| | 19. Other loans |
| | 20. Debt |
| | 21. Financial derivatives |
| | 22. Net wealth |
| | 23. Balance sheet total (= 17 + 22 = 7) |

Source: IMF, *Compilation Guide on Financial Soundness Indicators*, 2004.

Households should be considered as entities that follow the same rules of management as other companies. The most important aggregate indicators that characterize households' financial health are: (i) net wealth and (ii) gross disposable income. These indicators are synthetically summarized by households' income and expense statement and households' balance sheet (Table 1.3).

1.2.1 Household balance sheet

There are two features to discuss regarding households' balance sheet: the size and the risk of each item of the balance sheet and the risk mitigating possibilities by diversification effect. Thus, if the assets from the portfolio are negatively correlated, the general risk is reduced.

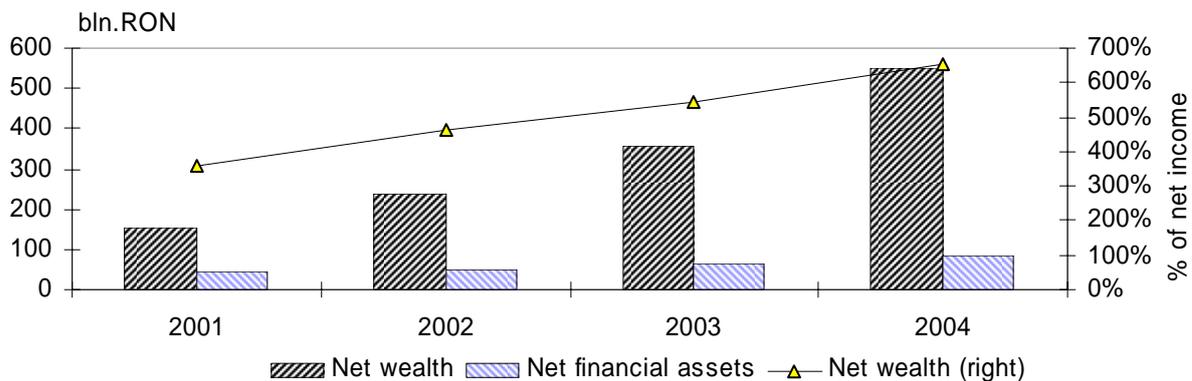
Net wealth

The households' net wealth is composed of financial and non-financial assets. These assets can be divided into: (i) market sensitive, e.g. equities, bonds, mutual funds or real estate and (ii) less market sensitive, e.g. bank deposits.

The net wealth grew significantly in the last years (Graph 1.6). This outcome should be further analyzed for at least two reasons:

- (i) The lack of statistical data on capital and real estate market entails the use of a number of working hypotheses⁴. The hypotheses have been chosen following a prudent approach towards financial stability, therefore underestimating assets and overestimating liabilities.
- (ii) The favourable dynamics of net wealth is especially caused by the hike in non-financial assets value; However, Romanian real estate market has very low liquidity thereby generating distortions in assessing effective net wealth.

Graph 1.6
Net wealth and net financial assets



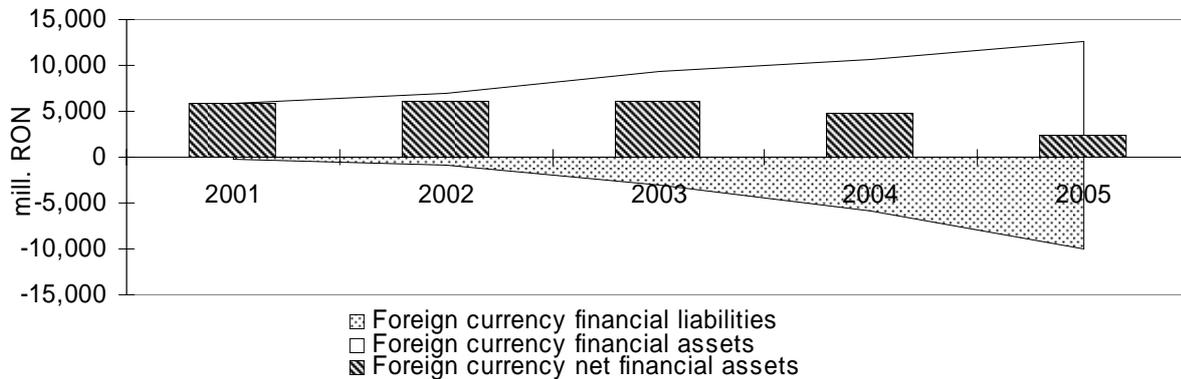
Source: Own calculations.

Net financial assets

The financial assets portfolio has very low diversification with currency and bank deposits accounting for 86% of total financial assets as of March 2005. Direct and indirect holdings of money market instruments were even higher because the portfolio of mutual funds has currently a risk adverse orientation. This conservative structure of financial assets protects households against possible negative volatility of the capital market.

⁴ For example, we consider that households hold 10% of BVB and RASDAQ market capitalization, starting from households investment of 15% into OPCVM net assets in December 2004 and that companies and financial institutions are much more involved in capital market transactions compared to mutual funds.

Graph 1.7

Households' foreign currency position

On the other hand, this structure could cause problems when the interest rate decreases, as the market value of assets would increase at a slower pace compared to liabilities. Using duration as a tool for analysis, it could be perceived that, by the end of March 2005, the duration of households' assets was 0.458 years, whereas the duration of liabilities was 0.736 years⁵. The modified duration of assets was smaller than that of liabilities which could cause systemic risks when the indebtedness ratio increases⁶.

The evolution of assets and liabilities sensitivity by simulating a reduction of up to 5.4 % for assets and 6.6 % for liabilities is presented in Table 1.4.

Table 1.4

The duration of assets and liabilities

| | Assets | | | | Liabilities | | | |
|-----------------------|--------|-------|-------|-------|-------------|-------|-------|-------|
| | 10.4 | 8.0 | 7.0 | 5.0 | 24.6 | 22.0 | 20.0 | 18.0 |
| Interest rate (%) | 10.4 | 8.0 | 7.0 | 5.0 | 24.6 | 22.0 | 20.0 | 18.0 |
| Duration (years) | 0.458 | 0.460 | 0.460 | 0.461 | 0.736 | 0.736 | 0.736 | 0.736 |
| Modified duration (%) | 0.415 | 0.426 | 0.430 | 0.439 | 0.590 | 0.603 | 0.614 | 0.624 |

Source: Own calculations.

Another important issue for financial stability is the foreign currency risk faced by households. Households hold more foreign currency denominated assets than liabilities which results in a long but descending foreign currency position. An appreciation of the domestic currency has a negative impact on the households' financial wealth. The recent appreciation trend, especially starting from 2004, promoted the increase of foreign currency

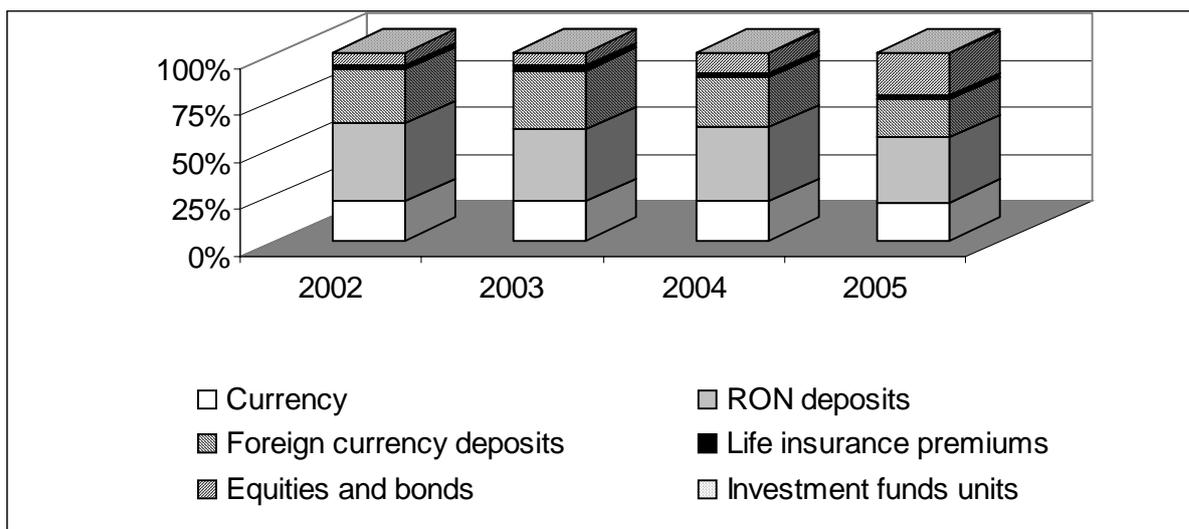
⁵ We considered that the value of liabilities and assets with a maturity of less than one month is not significantly affected by interest rate volatility. Moreover, loans and deposits with a maturity higher than one year have been considered as having an effective maturity of less than one year, since usually fixed interest rate contracts provide a "resetting" clause that is activated periodically in order to cover money market volatility.

⁶ The sensitivity of liabilities could be even higher in reality compared to assets as in computing duration we used interest rates reported by banks and not effective interest rates (including different fees) which are higher.

denominated liabilities, leading towards the reduction of long position in foreign currency. We think this trend is going to last (Graph 1.7) and it could result in an increase of domestic currency denominated deposits and foreign currency loans.

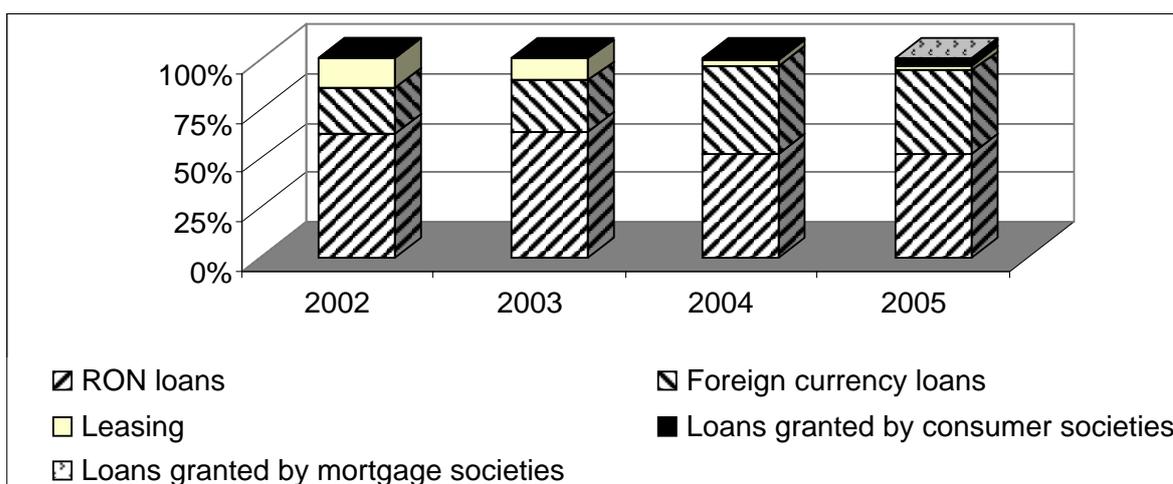
The breakdown of assets reveals some changes between December 2002 and March 2005 (Graph 1.8): (i) a significant growth of equity and bond holdings, and (ii) a slight increase in domestic currency denominated bank deposits. Holdings of currency and life insurance premiums stabilized at a relatively constant level (20% and 1.9% of total).

Graph 1.8
Financial assets breakdown



Source: CNVM, CSA, BVB, RASDAQ, own calculations.

Graph 1.9
Financial liabilities breakdown



Source: CNVM, CSA, BVB, RASDAQ, own calculations.

Comparing the structure of Romanian households' financial assets (for 2004) with the similar Euro area figures (for 2003) reveals significant differences:

- (i) Currency and bank deposits holdings of the Romanian households account for 86.3% of total financial assets compared to 33% for the Euro area;
- (ii) Financial equity was almost 30% for the Euro area, while the Romanian households had invested 11% of their balance sheets in this type of asset;
- (iii) The largest spread comes from the life insurance premiums portfolio: in Euro zone households it accounted for 28% of financial assets, while in Romania the level is very low (2%);
- (iv) The units of investment funds represented 10% in the Euro zone, while the same investments in Romania represented 0.18% of households' balance sheet.

The structure of households' assets will further alter as the Romanian financial market develops and the confidence level increases. Changing the households' portfolios entails some risks which need to be properly managed, which is another argument in favour of authorities' involvement in improving financial education of households.

The structure of households' financial liabilities changed in a more significant way (Graph 1.9). Foreign currency loans doubled their weight in total liabilities (reaching 53.7%). The weight of RON denominated loans follows a decreasing trend, possibly caused by a strong real positive level for loan interest rates.

In conclusion, the structure of households' financial assets and liabilities raises some financial stability concerns arising from interest rate (signalled by duration) and foreign currency movements (signalled by foreign currency position). The current trend of increasing weight of equities and bond holdings in households' balance sheets could introduce additional risk arising from capital market volatility. Regarding holdings of non-financial assets (real estate), the increasing price of those assets improved households' net wealth. On the liability side, there is an increasing trend of indebtedness through growing mortgage commitments.

1.2.2 Disposable income

Wages are the main component of total net income of the Romanian household, increasing from 56% to 62% between 2000 and 2004 (Graphs 1.10 and 1.11). Other income comes from holding financial or non-financial assets (interest, dividend or rent) or from government budget transfers (pensions, allowance for children etc.).

The monthly net income of households grew (Table 1.5), in both nominal and real terms, especially due to significant increases in the flows of wages and social provisions.

As we mentioned in section 1.1, households expect that the growth trend of wages will be maintained or even gain higher momentum. These expectations on the demand side of labour market could cause problems on the supply side by transferring potential systemic risk from households to employers. For the moment, the upward trend of wages is correlated with the industrial labour productivity (Graph 1.12). Extending the analysis to all the sectors of the economy reveals the need to carefully monitor the movement of these two factors.

The Romanian households face an increase in risks on both the asset and liability side. The risks emerging from the asset side are mainly due to the changes in the portfolio structure and the increase in volatility of prices and yields. The risks stemming from the liabilities side are due to the growth of indebtedness ratio. This is very important from a financial stability point of view and we will further analyse these issues in subsequent sections.

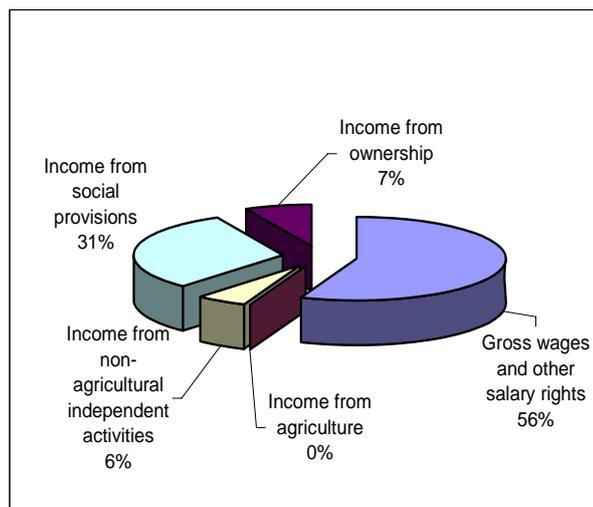
Table 1.5

Total income and disposable income (millions RON)

| | 2000 | 2001 | 2002 | 2003 | 2004* |
|---|----------------|----------------|----------------|----------------|----------------|
| Total income | 2798.68 | 4052.51 | 4986.09 | 6170.28 | 7976.32 |
| Money income of which: | 1903.10 | 3015.06 | 3799.40 | 4621.54 | 6045.75 |
| Gross wages and other salary rights | 1015.92 | 1819.57 | 2313.54 | 2764.28 | 3556.04 |
| Income from agriculture | 0 | 0 | 204.42 | 259.15 | 326.42 |
| Income from non-agricultural independent activities | 100.75 | 129.68 | 124.65 | 160.42 | 251.06 |
| Income from social provisions | 565.33 | 790.23 | 977.27 | 1184.69 | 1537.61 |
| Income from ownership | 128.73 | 162.10 | 14.95 | 18.51 | 46.93 |
| Equivalent value of income obtained by employees and receivers of social provisions | 22.38 | 36.47 | 54.84 | 104.89 | 195.57 |
| Equivalent value of consumption of agricultural products from own resources | 873.19 | 1000.97 | 1131.84 | 1443.84 | 1734.99 |
| Money expenditure on taxes, contributions, dues, fees | 168.63 | 521.50 | 690.79 | 721.66 | 964.40 |
| Net income | 2630.05 | 3531.00 | 4295.30 | 5448.61 | 7011.91 |

Source: National Institute of Statistics, 2004; * provisional data.

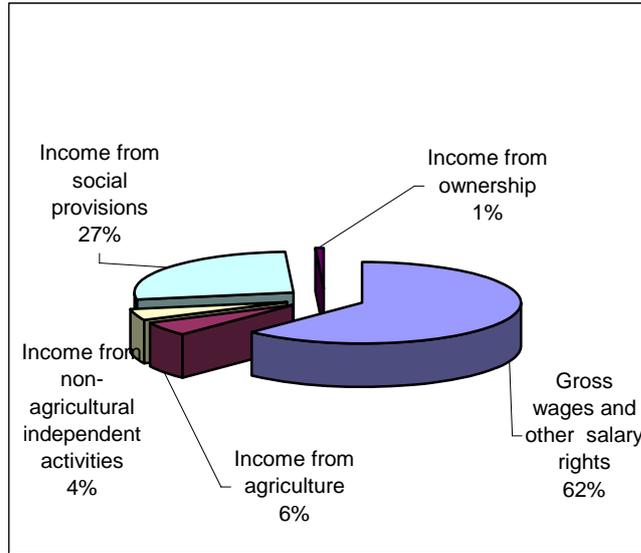
Graph 1.10

The structure of money income, 2000

Source: National Institute of Statistics.

Graph 1.11

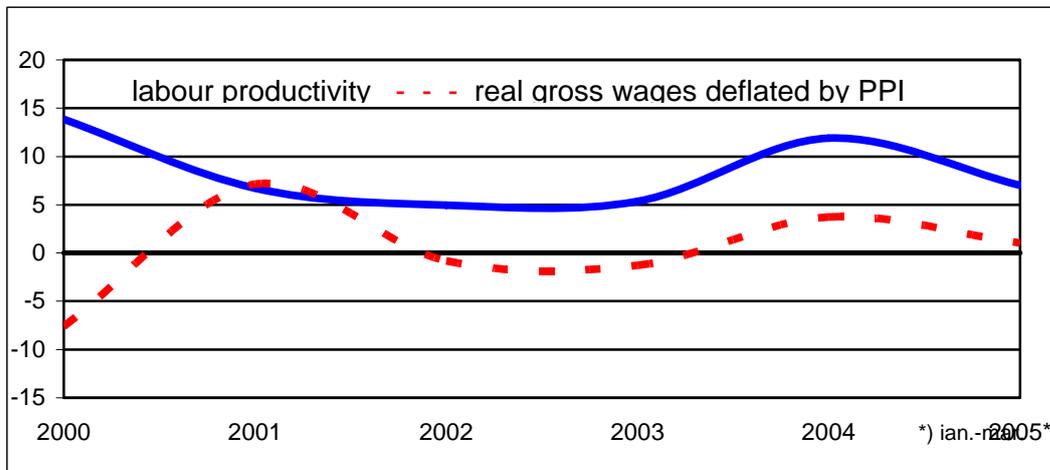
The structure of money income, 2004 (provisional data)



Source: National Institute of Statistics.

Graph 1.12

Real wages and industrial labour productivity



Year to year percentage change. Source: National Institute of Statistics.

2. Household indebtedness ratio - trends, risks and challenges

2.1 Dynamics and trends of household indebtedness ratio

In our view, the focus should be more on the risks emerging from the liability side of the households, rather than the asset side. The current trend of increasing indebtedness ratio could increase the probability of households' default, with negative effects on the creditors' balance sheets and on the aggregate demand.

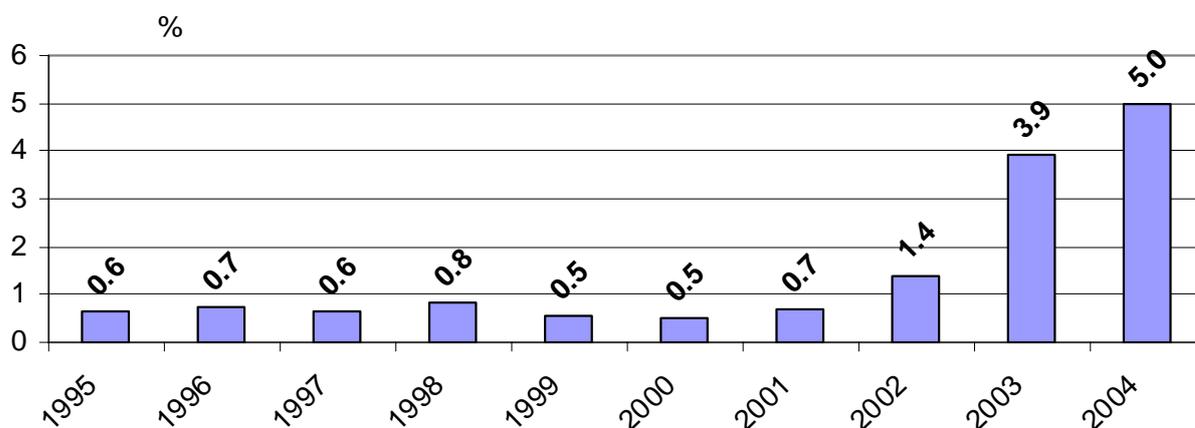
It is not the level of indebtedness so much as its rate of growth. The share of credit to GDP counted for almost 5% by end 2004, significantly lower than the EU values. The pace of

household credit growth registered booming values as compared to the EU thresholds, ie almost eight times (as a share of GDP) between 1995 and 2004 (Graph 2.1 and 2.2).

Households achieved this level of indebtedness especially through consumer credit. The structure of indebtedness does not change significantly (in March 2005 consumer credit represented 70.7% out of total household credit, falling from 73.3% reached in January 2004 - Graph 2.3). In the EU countries, the structure of indebtedness is typically the opposite (Graph 2.4). In Romania there is plenty of scope for the mortgage loans to expand, changing the above-mentioned proportion. These developments, despite some positive effects, may raise concerns from a financial stability point of view, as an increase in the demand for real estate will be passed on to even higher increase in real estate prices.

Graph 2.1

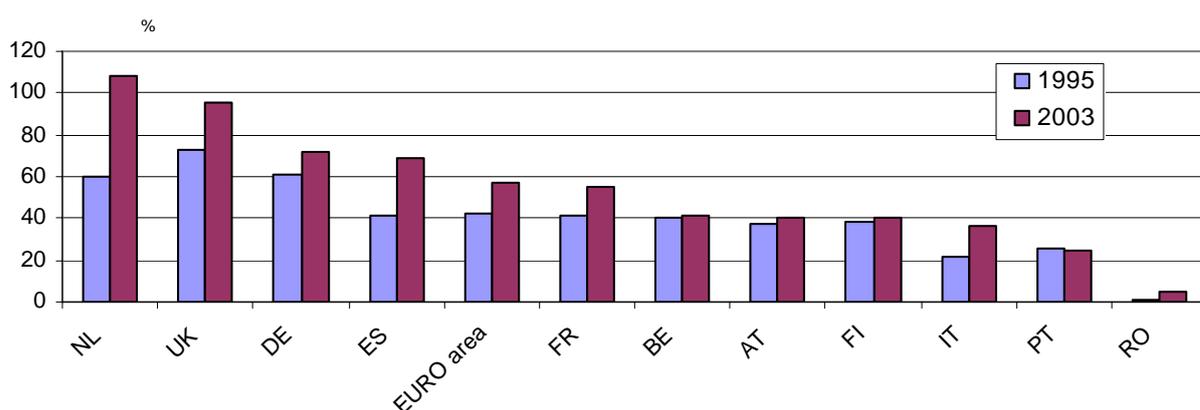
Romanian household loans as a percentage of GDP



Source: Own calculations.

Graph 2.2

Household loans as a percentage of GDP in some European countries



Source: ECB Financial Stability Review, 2004; own calculations.

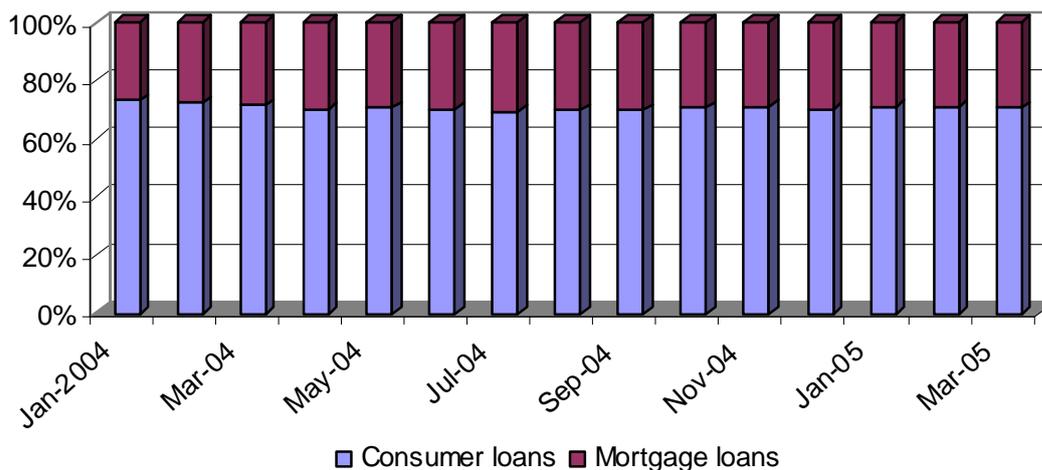
In the short run, however, we anticipate that households will continue their indebtedness in order to meet their consumption and durable goods needs. As the household incomes rise and the housing supply continues to grow, a shift to mortgages can be expected.

However, banks are not very interested in a sudden major change in the household indebtedness structure, because consumer loans, though less secure and with a theoretically higher risk profile, brings greater profitability due to higher interest rates. Moreover, consumer credit elasticity is weaker given the decreasing interest rates (the typical example being credit cards). This also explains why banks are strongly financing this area.

The worst case scenario for mortgage loans, from the financial stability point of view, is a significant correlation between the increase in the interest rate, the decrease in real estate prices and the corresponding decrease in the ability of households to service the debt.

Graph 2.3

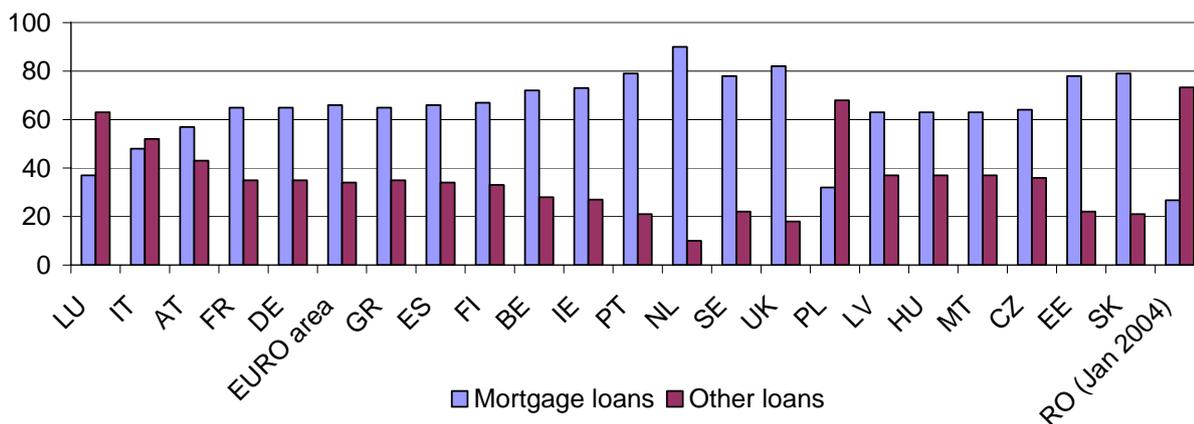
The structure of household loans in Romania



Source: NBR own calculations.

Graph 2.4

Household loans breakdown for EU and Romania (December 2003) %



Source: ECB (2004); NBR calculations.

2.2 Factors contributing to the increase of household indebtedness ratio

Both demand and supply factors triggered the evolution of indebtedness. The main factors are further discussed below.

2.2.1 On the credit demand side

2.2.1.1 The low level of households' endowment with durable goods and real estate

International statistics rank Romania among the last in the EU as regards household durable goods endowment (Table 2.1). However, the improving economic environment allows for fulfilling this type of needs. Credit suppliers are already exploiting the niche of financing electronics, home appliances and cars, fuelling the dynamic of the consumer loans.

Table 2.1

Household endowment with durable goods

| Country | TV Sets/1000 inhabitants in 1999 | Computers/1000 inhabitants in 2002 | Automobiles/1000 inhabitants in 2001 |
|----------------|----------------------------------|------------------------------------|--------------------------------------|
| Romania | 366 (2003) | 69.19 | 118 (2003) |
| Bulgaria | 372 | 51.92 | 264 |
| Hungary | 503 | 108.35 | 244 |
| Poland | 239 | 105.65 | 272 |
| Czech Republic | 366 | 177.44 | 344 |
| Estonia | 373 | 210.33 | 298 |
| Latvia | 394 | 171.75 | 249 |
| Lithuania | 554 | 109.75 | 326 |
| Cyprus | 275 | 269.89 | 399 |
| Malta | 660 | 255.05 | 497 |
| Euro area | na | 317.16 | na |

Source: National Institute of Statistics, Eurostat, Joint research Centre, World Bank.

2.2.1.2 The increase in wealth and disposable income of households

As highlighted in the previous section, the net wealth of households has increased during the last few years with the price effect for real estate contributing significantly to this trend. The price variations might influence the decision to consume and invest, through income and balance sheet effect.

- (i) the wealth effect decreases the will to save against a background of increasing asset prices. The households feel more secure and tend to consume more, thus resorting to credit.

In the future, this effect might become more important for Romanian households, taking into account the future increase in real estate prices (having a high share of the household wealth). However, up to now, we have certain doubts on the wealth effect in Romania because the fungibility of this type of wealth is debatable. The owners benefit from the increase in prices, but they can transform them to a liquid asset only if they trade them. Thus, there is a need for a third party willing to trade the asset. A solution to this problem is the development of a liquid secondary market, which could give the owners the possibility to direct their wealth returns to current consumption, turning to secondary mortgages or credits collateralized by that particular asset.

- (ii) the balance sheet effect is felt especially in the case of the debtors borrowing in a foreign currency. It can be seen that, whenever a real appreciation of the national currency occurs there is a corresponding increase in the domestic value of the assets denominated in foreign currencies, and a reduction in the debt to asset or debt to disposable income ratio, giving the households a greater indebtedness

capacity. This effect can be seen in Romania, as it is propelled by the trend of real appreciation of the RON with respect to USD and EUR.

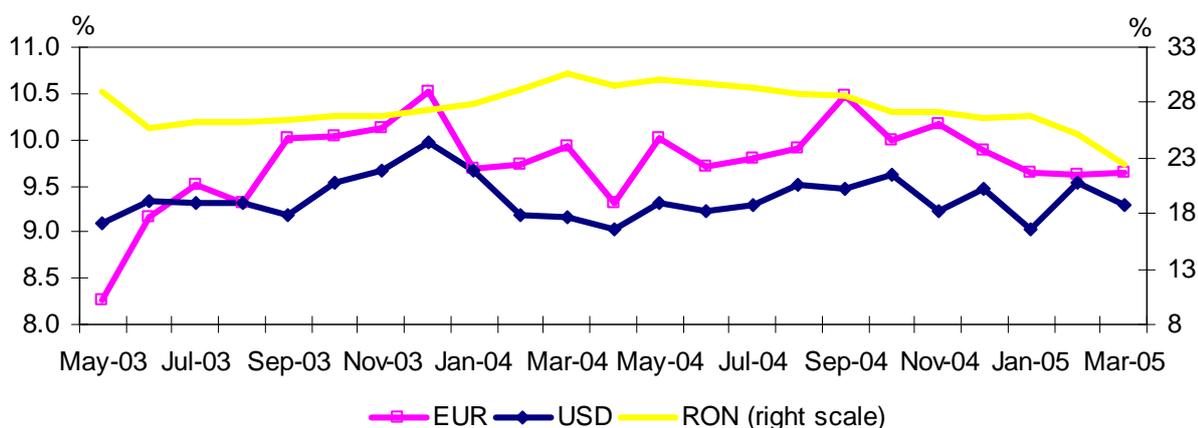
2.2.1.3 The improvement in macroeconomic conditions, especially diminishing interest rates

Loan interest rate is the cost of the borrowed funds and is the key element in determining the indebtedness ratio. Nominal interest rates specific to households' financing have maintained a high level (Graph 2.5), both for RON loans and for foreign currency loans as well, risk premium being considered significant. Effective interest rates are higher, especially for consumer loans and where the share of additional banking fees and commissions is important. It might be an explanation why the indebtedness dynamic has not reacted as expected with the change in nominal or real interest rates (see section 3).

A high inflation rate determines a high value for the nominal interest rates. Thus, the debt service as a share of income will increase as inflation grows. This ratio has a greater value at the beginning of the repayment process in a scheme with fixed constant instalments. Hence, the households' capacity to service debt, which is constrained by the ratio of debt service to disposable income, will increase as inflation decreases. However, beyond a certain threshold, a decrease in inflation rate will diminish less and less the nominal value of debt. At this point, the debt service to disposable income ratio remains more or less constant level as compared to the decreasing level of the ratio in a more inflationary environment.

Graph 2.5

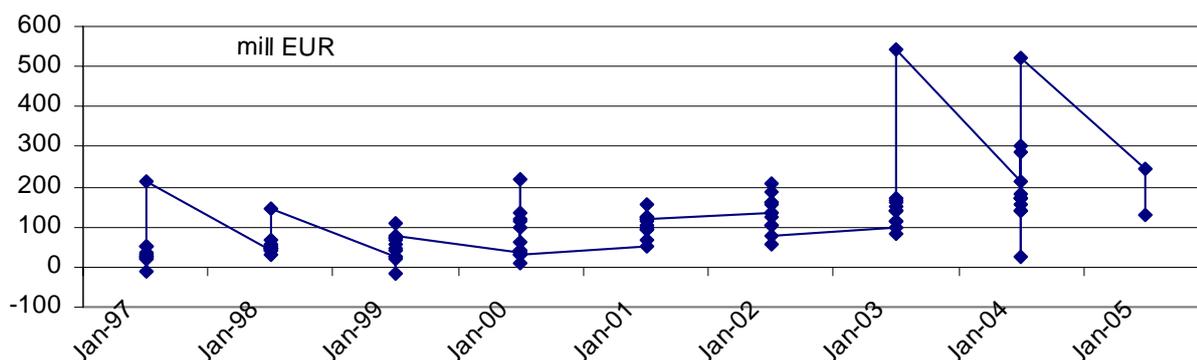
Household loans interest rates



Source: NBR.

Graph 2.6

Monthly current transfers



The effect of real interest rates on the level of indebtedness of households depends on the relative size of the income effect vis-à-vis the substitution effect. A decrease in the real interest rates reduces the income generated by the assets held by households, but it also lowers the cost of indebtedness and increases the value of discounted future incomes. If we take into account the demographical structure of Romania, we estimate that the decrease in the real interest rates has a positive effect on the households because the number of (i) elderly persons who live on savings compared to those dependent on pensions, (ii) those who dispose of a significant net wealth and (iii) those who are at the threshold retirement, is lower than the number of (a) young people, those who (b) contracted credit and (c) those who will contract credit in the future.

Further, economic growth and diminishing inflation have a positive impact on the expectations of the households. These developments further improve labour market conditions by encouraging the consumption through indebtedness.

2.2.1.4 The role of remittances

The amount of current transfers continuously increased in the recent years (Graph 2.6) reaching 2.5 billion of EUR at the end of 2004. The income sent by residents working abroad correspond to a stable source of capital inflow which has no procyclical pattern unlike other short term inflows. Moreover, the remittances autonomously finance the current account deficit.

Empirical research shows that remittances have the ability to improve the budget position of the receiver thereby sustaining the increase of food and durable goods consumption. However, from our point of view, it is still unclear whether the remittances cause an increase in indebtedness ratio (representing, for example, a down payment for obtaining a loan) or there is a negative causality (in sense that households do not borrow anymore since their consumption is covered by remittances). Moreover, the volume and dynamics of remittances have a particular importance for financial stability because the significant and sustained inflows of remittances could also have some negative impact through: (i) reducing the incentive to work; (ii) considerable appreciation of exchange rate and the real estate prices; (iii) decreasing the activity of national sectors involved in producing food and non-food products (*Dutch disease*).

2.2.2 On the credit supply side

2.2.2.1 Increased competition to gain higher market share

Household debt mainly stems from the banking sector (97%, by end 2004). Leasing and loan intermediary societies are relative new competitors for banks. These players are not yet specifically regulated and do not provide detailed statistical data, but have started to be very visible in consumer loans.

The competition between banks, fuelled by excess liquidity arising from foreign capital flows, lowered the limit for household to access credit. The low concentration ratio of assets, loans and deposits at the Romanian banks slightly reduced in 2004 compared to 2003, resulting in an expanding credit supply.

2.2.2.2 Retail loans profitability and the connected risks

The profitability divided by risk (Sharpe ratio) is higher for household loans than for companies. If we add up the additional fees and commissions, the conclusion points to a very profitable activity in lending to households. As we will further detail in section 2.3, the risks embedded in the household banking loans are decreasing.

2.2.2.3 Availability of Information about debtors

Along with the information available at the National Bank of Romania through a Public Credit Register, the banking sector has set up a private bureau to broaden the data on individuals. This data reduces information asymmetry on household financing. The creditors can better assess the risk profile of the debtor, reducing credit risk and increasing credit supply.

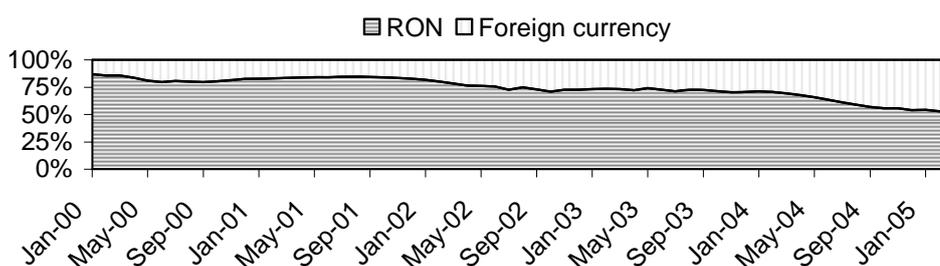
2.3 Risks arising from increased household indebtedness

Changes in the household indebtedness structure and volume could have important implications for financial stability. We found three trends worth focusing on:

(a) a significant increase in the ratio of foreign currency loans to total household loan (Graph 2.7). We expect the trend to continue, sustained by higher carry trade and domestic currency appreciation, triggering down the cost of foreign currency loans. However, it raises a concern that a scenario of significant and lasting depreciation of domestic currency might occur, which would affect the ability of the borrowers to service the debt, especially for the unhedged borrowers. In such a scenario, a higher weight of foreign currency loans in the creditors' balance sheet would amplify systemic risks⁷.

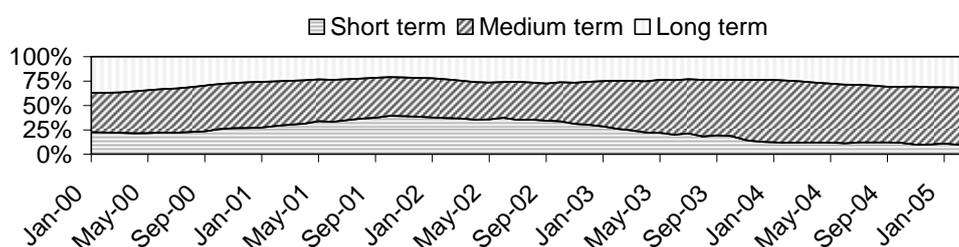
Graph 2.7

Currency breakdown of household loans



Graph 2.8

Maturity breakdown of household loans

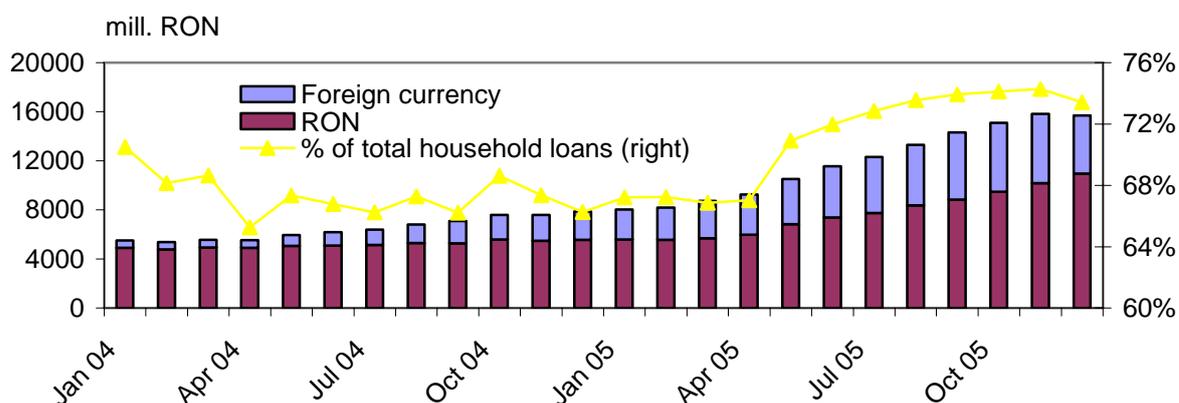


Source: NBR.

⁷ The situation for leasing companies could be worse, because almost all the loans are foreign currency denominated.

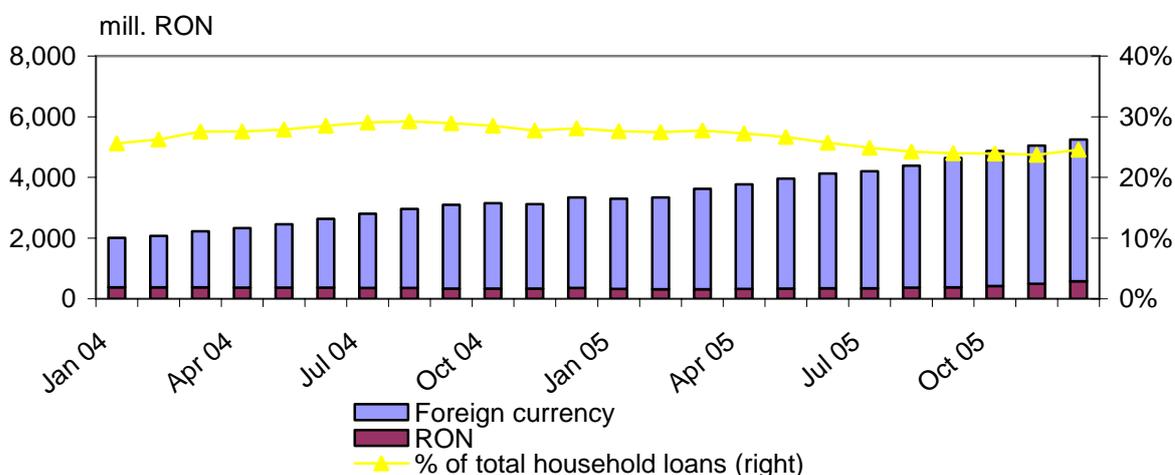
Mortgage loans have the largest exposure on foreign currency, while consumer loans have the highest growth (Graph 2.9, 2.10). The negative effect caused by unhedged borrowers is smaller in the case of mortgage loans compared to consumer loans for two reasons: (i) mortgage loans are granted mostly on long term, (ii) sometime around 2014 Romania intends to adopt Euro.

Graph 2.9
Consumer loan dynamic



Source: NBR.

Graph 2.10
Mortgage loan dynamic



(b) the maturity of loans is expanding:

The loans granted in the medium term (1-5 years) had the highest increase, reaching 56% of total household loans, by the end of March 2005. Long term loans (over 5 years) sum up to a third of total. Increasing maturity involves some risks, such as:

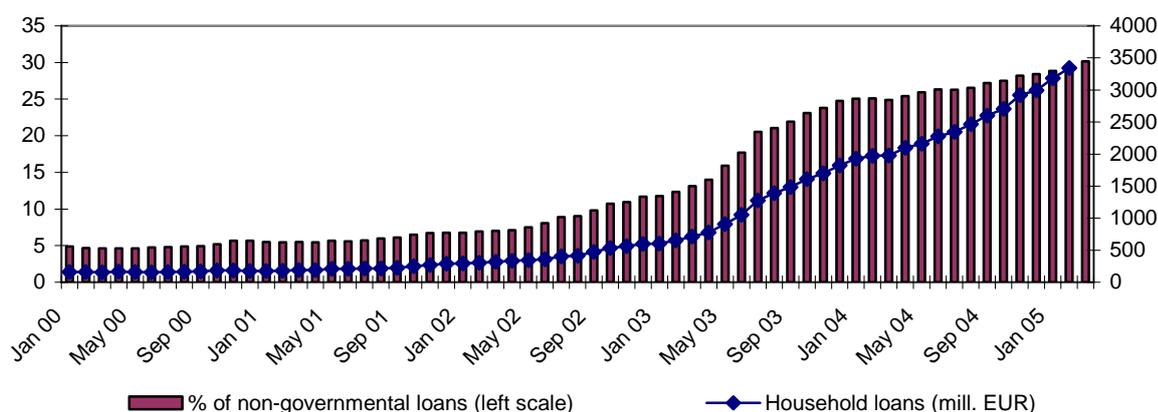
- (i) Banks lack medium and long term resources which should finance long term loans. This could entail a potential maturity mismatch.
- (ii) The larger the maturity, the higher is the probability of debtors' "myopia"; they tend not to care about interest rate and unemployment rate dynamics on the medium and long term.

(iii) Obtaining a loan with a larger maturity allows for a higher indebtedness since the debt service burden decreases. This behaviour, characterized by an increase of the current consumption rather than the future one, could cause problems after a critical point.

(c) The weight of household loan in non-governmental debt continuously increases.

The percentage of household loans to total non-governmental loans grew significantly, even exponentially in 2003 (Graph 2.11). The percentage climbed from a very low level of 4.8%, in January 2004, to almost 30% in March 2005.

Graph 2.11
Household loan dynamics



Source: NBR, own calculations.

Although the dynamics of loans granted by Romanian banks is starting to match that of EU banks (where household loans reached 54.7% of non-governmental loans, March 2005), we consider that for the moment the households financial strength is not comparable with that of non-financial companies as to justify a rapid convergence with the European characteristics. Accordingly, we estimate that a more prudent approach for Romanian banks would be to focus in the future on corporate financing. In this case the household loans may grow, but not as much as corporate loans.

Besides the three possible risks described, we further present the risk profile of household loans by using the following indicators:

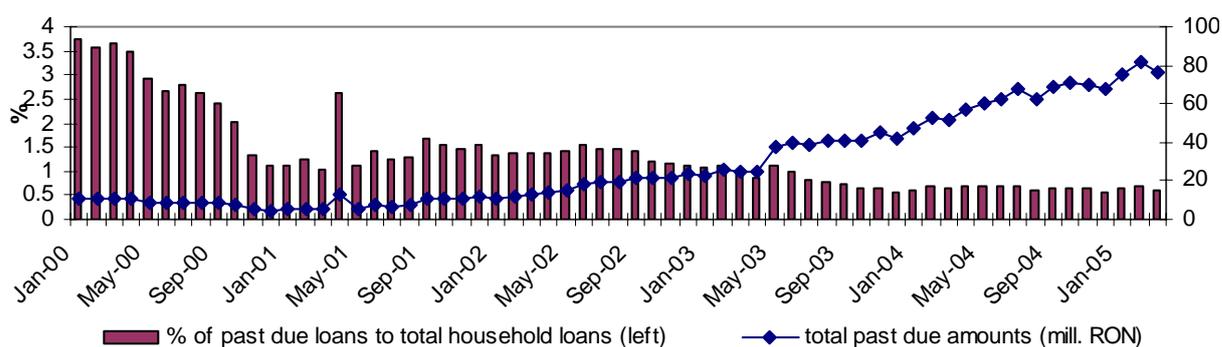
2.3.1 Past due loans

The past due loans (as a percentage of household loans) followed a downward trend bottoming at the level of 0.58% at the end of March 2005 (Graph 2.12).

These statistics should be cautiously interpreted since the ratio of past due loans could be currently underestimated as, household loans have recently grown strongly. These loans are usually longer term loans and are usually sound, being classified as standard credits. Therefore, newly granted loans lower the ratio of past due loans in total loans. Another reason for a prudent approach is the lag between the moment of granting the loan and the moment when the loan becomes past due.

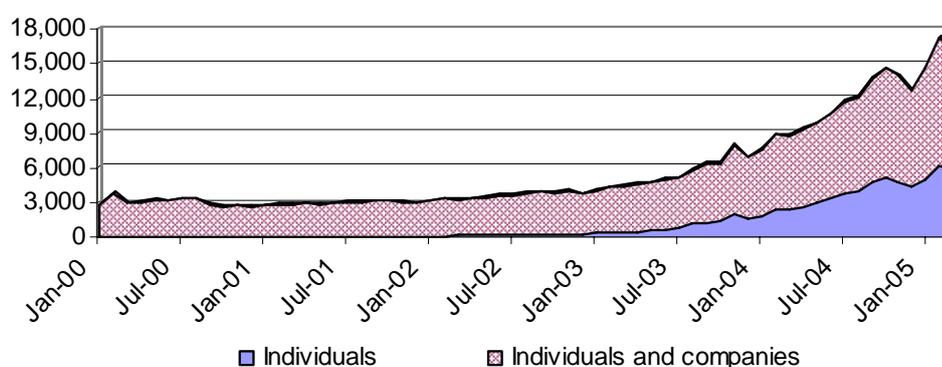
Using modern risk management methods to assess the credit risk for retail credit, like probability of default, could be difficult because of the lack of statistical data.

Graph 2.12

Household past due loans

Source: NBR, own calculations.

Graph 2.13

Number of individuals with past due loans

The number of individuals with past due loans significantly increased starting mid-2003, reaching 6000, representing 56.5% of total debtors with past due loans (Graph 2.13).

2.3.2 Geographical and institutional concentration

Geographical and institutional concentration of households' credit risk is diminishing. The Herfindahl index shows the geographical concentration decreased from March 2004 to March 2005 (Table 2.2), especially for the consumer loans. Household loans are still below the critical threshold (literature recommends a threshold of 1800 units). The strongest concentration is in Bucharest, which does not bring up significant concerns from a financial stability point of view, since in this location debtors have the highest incomes in the country.

Table 2.2

Geographical concentration of household loans

| | Household loan | | | Corporate loans | Total non-governmental loans |
|------------|----------------|----------|----------|-----------------|------------------------------|
| | Total | Consumer | Mortgage | | |
| March 2004 | 1174,5 | 1190,2 | 1158,7 | 2490,9 | 2117,1 |
| March 2005 | 997,9 | 880,8 | 1337,9 | 2329,7 | 1875,8 |

Source: NBR, own calculations.

Using the same approach for institutional concentration we find that the concentration was relatively constant (but high) from March 2004 to March 2005 (Table 2.3). This dynamic was due to increased consumer loan concentration and decreased mortgage loan concentration.

Table 2.3
Institutional concentration of the household loan

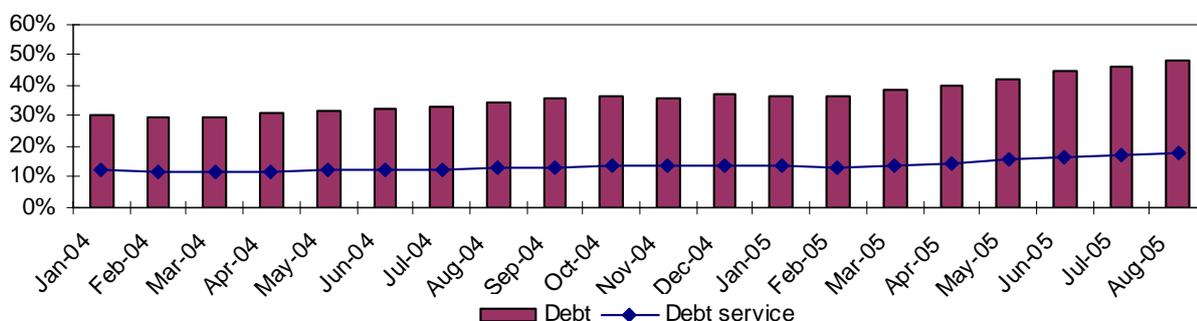
| | Household loan | | | Corporate loan | Total non-governmental loan |
|------------|----------------|----------|----------|----------------|-----------------------------|
| | Total | Consumer | Mortgage | | |
| March 2004 | 1622,5 | 1589,5 | 2049,3 | 1103,9 | 1182,1 |
| March 2005 | 1620,6 | 1692,4 | 1654,1 | 1073,7 | 1188,8 |

Source: NBR, own calculations.

2.3.3 Evolution of debt service capacity

Household debt (as a percentage of annual wages) was relatively constant until early 2005, with the indebtedness growth being balanced by the increase in income (Graph 2.14). Household debt service burden (as a percentage of annual wages) also maintains a value around 13% and does not cause concern.

Graph 2.14
Household debt and debt service burden as a percentage of annual wages



Source: NBR, own calculations.

However, a relatively constant debt service burden maintained in an environment of decreasing interest rates and upward trend of disposable income, confirms that indebtedness ratio had an expansionary evolution. A hypothetical reverse of the current trends could significantly affect the ability of households to service their debt, which raises concerns from a financial stability point of view. In the next section we detail a quantitative approach in order to identify the reasons that trigger changes in the dynamic profile of indebtedness ratio, and to assess the performance of different liquidity constraints.

3. Quantitative analysis of household indebtedness ratio

We quantify an econometric relationship between household indebtedness ratio and its determinants, with a special focus on the impact of the interest rates on curbing loan growth. Furthermore, using simulations procedures, we analyse the impact and effectiveness of different liquidity constraints on the growth of household debt.

3.1 Econometric modelling of household indebtedness ratio

Empirical estimations using the following monthly time series:

- Total household indebtedness ratio (computed as the share of total loans granted to households in the annual net wages);
- Mortgage indebtedness ratio (computed as the share of household mortgage loans⁸ in annual net wages);
- Real annual net wages (CPI deflated);
- Interest rate for household RON denominated loans⁹;
- Interest rate for household foreign currency denominated loans¹⁰;
- Overdue payments ratio for household loans;
- Unemployment ratio.

All these variables have been transformed in natural logarithm and have been marked as: *Gr_indat_total*, *Gr_indat_ipotecar*, *Sal_reale*, *Dob_lei*, *Dob_val*, *R_restante*, *R_somaj*. The time series covered the interval January 2000 to February 2005.

Unit root tests (Augmented Dickey Fuller and Phillips-Perron) show all the variables are non-stationary, I(1). Lack of stationarity for the mentioned time series would suggest cointegration. Thus, a long term relation for the household indebtedness ratio and its determinants was obtained using multivariate Johansen procedure for testing the cointegration¹¹.

The first model estimates the long term relation for total household indebtedness ratio and its determinants (previously detailed). The model comprises only some of the most important

⁸ The source of data for mortgage loan is Public Credit Register.

⁹ Up to April 2003 banks' interest rate for non-bank non-governmental loans was used. Starting with 2003 the interest rate used was that specific to current household loans.

¹⁰ Interest rate for foreign currency household loans was obtained by equally weighting interest rate for EUR denominated household loans and USD denominated household loans.

¹¹ The non-stationarity characteristic of the time series is very important in determining a long run relationship. Modelling long run relations was especially developed by Engle and Granger (1987). Their methodology is based on a single error correction equation. Cointegration is defined as a stationary long term relation between non-stationary variables.

The main disadvantage of a single equation approach is that the models with more than two variables could have more than one cointegration equation, not just one linear combination. Johansen (1990) rules out that disadvantage. Estimating a vector error correction (VEC) reveals information on both short and long term adjustments of variables. The optimum number of lags in a VEC is obtained by testing the optimum number of lags in a Vector Auto-Regressive (VAR) as follows: if the VAR has optimum lags, the VEC is estimated with $p - 1$ lags. It is necessary to distinguish between stationary long term relations (including cointegration vectors) and non-stationary relations (including common trends). Johansen's procedure suggests testing the reduced rank, therefore identifying the cointegrating vectors of the model. Another disadvantage of this method is the impossibility of quantifying the speed of adjustment to the long run equilibrium.

factors. Including the factors in the cointegration was conditioned by the availability of statistical data and their economic and econometric relevance. The coefficients of the regression could be interpreted as elasticities since all the variables are in their logarithmic form.

Cointegration relation - model 1 (t-statistic in brackets)

$$\text{Gr_indat_total} = 4.126 * \text{Sal_reale} - 2.415 * \text{Dob_lei} + 4.112 * \text{R_restante} - 2.178 * \text{R_somaj} \\ [-4.515] \quad [1.869] \quad [-6.780] \quad [2.669] \\ -70.078$$

Johansen procedure indicated only one cointegration vector with statistically significant coefficients. A VEC is estimated to determine the cointegration relation: we use four lags and an exogenous dummy variable that improved the quality of the equation. This dummy variable takes the value of one starting with February 2004, signalling a regulatory structural break as prudential rules regarding consumer credit and mortgage loans were introduced by the NBR¹². Residual tests indicate lack of autocorrelation and heteroskedasticity, but the normality is not confirmed. However, Lütkepohl (1992) proves that applying Johansen approach does not strictly require the normality hypothesis.

The cointegration relation shows that in a long term equilibrium, a 1% growth of real annual net wages involves an increase of 4.126% of total household indebtedness. The direct relation between the two variables follows the theory. The coefficient of real wages is above one and stands for the highest elasticity in the equation. These facts underline the economic framework of the analyzed interval, characterized by a higher growth of the household loan compared to the real growth of the wages. It also reveals the important impact of this variable on indebtedness.

The decreasing trend of the interest rate for RON denominated loans has the ability of significantly enhancing the indebtedness.

The positive relation between overdue payments ratio and indebtedness ratio does not follow the economic theory. The explanation might come from the minuscule amount of past due loans not yet alarming banks' risk management and from the banks' appetite to widen or consolidate the market share.

Expectations on future income are captured by the unemployment rate. The coefficient confirms the theory: an increase in unemployment implies a decrease of indebtedness, since households expect the income to diminish and thus do not stimulate indebtedness.

The speed of adjustment to the long run equilibrium is -0.076 (t-statistic -5.076), showing that if in the previous month the household indebtedness is higher than the equilibrium level, in the current month will decrease. The deviation of total indebtedness ratio from the long run equilibrium is adjusted in almost 13 months.

The second model reveals the long term determinants of household mortgage indebtedness. The VEC was estimated using two lags, including as exogenous variable the same dummy for the regulation change. Johansen's procedure indicates only one cointegration relation.

Cointegration relation - model 2 (t-statistic in brackets)

$$\text{Gr_indat_ipotocar} = 0.986 * \text{Sal_reale} - 5.545 * \text{Dob_val} - 0.904 * \text{R_restante} - 0.228 * \text{R_somaj} \\ [-1.453] \quad [3.988] \quad [3.100] \quad [0.633] \\ -40.789$$

¹² Norm no. 15 from 18/12/2003 of limiting credit risk for consumer loan and Norm no. 16 from 18/12/2003 that changes the Methodological Norms no. 3/2000 for applying Law no. 190/1999 regarding mortgage loan. All those norms came into force by February 2004 and tried to reduce the growth of current account deficit, considering that most of household loans are used for buying imported products.

Lack of significance for the unemployment rate indicates an optimistic perception of household income growth. Currently, people who borrow for buying or building a house have medium or high wages and can make the down payment for the mortgage.

Real net wages has some significance for mortgage indebtedness ratio. Firstly, the explanation comes from the expectations of households regarding wage increase according to permanent income theory, sustaining the decrease in the debt service burden. Secondly, higher maturity of mortgage loans generates a smaller share of debt service in income and is also of less importance for long term indebtedness.

Considering that in 2005 almost 90% of mortgage loans were foreign currency denominated, the dominant influence of this interest rate for household loans is justified. The interest rate is the variable that differentiates the choice for the loan currency denomination, and its relation with the indebtedness ratio is negative.

The overdue payments ratio also significantly influences mortgage indebtedness. The negative relation suggests a prudent approach of the banks towards this type of loan covering maturities larger than 15 years.

The speed of adjustment to the equilibrium is -0.083 (t-statistic -2.965). Accommodating mortgage indebtedness ratio to the long run relation with its determinants takes almost twelve months, quicker compared to total indebtedness ratio.

Overall, the ability of interest rates to influence the credit growth is noticeable especially for the foreign ones. The explanation might be relative small share of the nominal domestic interest rates in the total effective interest rates. In this environment, it is needed a consistent move in the nominal domestic interest rates to charge an effect towards the dynamic of household indebtedness.

3.2. The impact of liquidity constraints on household indebtedness

As discussed the first section, Modigliani's and Friedman's theories of permanent income and life cycle are very important in identifying the future trend of household indebtedness. However, in Box 1 we underlined the fact that the emerging reality in Romania suggests relaxing some of the assumptions of the mentioned theories, such as considering the liquidity constraints on household indebtedness. That type of restrictions coming from market regulation or banks' policy will diminish the capacity of households to borrow the optimum amount from the point of view of intertemporal budgetary constraints specific to life cycle theory.

The liquidity constraints play a dual role from a financial stability point of view: (i) allowing for a maximum potential indebtedness of households and (ii) serving as an instrument of the authorities used either for stimulating or for reducing household loans.

Practically, the liquidity constraints are of two types:

- (i) a maximum limit for the weight of debt service (principal and interest) in the current household disposable income - subsequently signalled by **z**.
- (ii) a maximum limit for the ratio of loan to the value of the collateral or the guarantee (**LTV**), representing, in fact, a minimum limit for the down payment.

Next we follow Debell (2004) that computes the maximum amount of mortgage loan that could be borrowed by households considering the liquidity constraints. We extend the idea as to obtain both the maximum amount of consumer and mortgage loan and the currency breakdown of household indebtedness ratio. We considered the following variables:

- (i) V_t - household disposable income at the moment t , approximated by net annual wages;

- (ii) D_t - household bank deposits standing for the savings needed for the down-payment in order to obtain the loan;
- (iii) z_i, z_c - maximum weight of debt service in disposable income for the mortgage, respectively consumer loan;
- (iv) LTV_i, LTV_c - loan to value: the maximum weight of mortgage, consumer loan respectively, in the value of collateral or guarantee; equivalent to (1 - down payment percentage);
- (v) i_{lei_t}, i_{val_t} - nominal interest rate for RON denominated household loans, foreign currency denominated loans respectively, at the moment t;
- (vi) α_i, α_c - ratio of mortgage loans, consumer loans respectively, to total household loans;
- (vii) β_{lei}, β_{val} - ratio of RON denominated loans, foreign currency loans respectively, to total household mortgage loans;
- (viii) $\gamma_{lei}, \gamma_{val}$ - ratio of RON denominated loans, foreign currency loans respectively, to total household consumer loans.

$$\begin{aligned} \text{Maximum potential loan} = & \alpha_i * \left[\beta_{lei} * \min \left\{ D_t * \frac{LTV_i}{1-LTV_i}; z_i * \frac{V_t}{i_{lei_t}} \right\} \right. \\ & + \beta_{val} * \min \left\{ D_t * \frac{LTV_i}{1-LTV_i}; z_i * \frac{V_t}{i_{val_t}} \right\} \left. \right] \\ & + \alpha_c * \left[\gamma_{lei} * \min \left\{ D_t * \frac{LTV_c}{1-LTV_c}; z_c * \frac{V_t * [1 - (1 + i_{lei_t})^{-2.5}]}{i_{lei_t}} \right\} \right. \\ & + \gamma_{val} * \min \left\{ D_t * \frac{LTV_c}{1-LTV_c}; z_c * \frac{V_t * [1 - (1 + i_{val_t})^{-2.5}]}{i_{val_t}} \right\} \left. \right] \end{aligned}$$

The first term of each minimum function indicates the possible credit amount that could be obtained considering the liquidity constraint of down payment. The second term indicates the maximum loan amount given the present value of future cash flows at moment representing the debt service. Mortgage loans have longer maturities which allows for the use of the limit in the present value formula of debt service. Consumer credit has not the same property: the proxy for the maturity is 2.5 years.

These liquidity constraints show that household indebtedness could change along the institutional structure of financial markets. The median value for LTV is 80% in developed countries, although in some countries there are ratios of 100% or even more (Netherlands, USA etc).

In Romania, the rapid growth of household loans, that started in 2003, was attempted to be slowed down by imposing prudential regulations requesting banks to apply (i) maximum limits for the ratio of debt service to net income (computed as a difference between total income and declared expenses) and (ii) minimum limits for down payment (respectively maximum limits for LTV). These liquidity constraints have been differentiated by the type of loan in the following way:

- (i) For mortgage loan: $z_i = 75\%$ and $LTV_i = 35\%$.
- (ii) For consumer loan: $z_c = 30\%$ and $LTV_c = 100\%$ if the loan is not for acquiring goods, but is guaranteed by third parties and/or collateral; in case of loans for buying goods an LTV_c of 75% is imposed. Generally, for the consumer loan the banking system preferred not to request a down payment over collateral or guarantees.

Applying the model for the Romanian case at the moment t (considered to be March 2005) we obtain the maximum potential credit that could be granted to households. Also, we were

interested in simulating changes in variables that imply liquidity constraints (z , LTV and interest rates for RON and foreign currency loans) in order to determine the growth of household loans. The values of the variables are presented in Table 3.1.

Table 3.1
The variables of the model for March 2005

| | |
|--|---|
| Household loans (mill. RON) | 13 053.12 |
| α_i - % of mortgage loan | α_c - % of consumer loan |
| 29% | 71% |
| β_{lei} - % RON denominated mortgage loans | β_{lei} - % of foreign currency mortgage loans |
| 9% | 91% |
| γ_{lei} - % of RON denominated consumer loans | γ_{val} - % of foreign currency consumer loans |
| 65% | 35% |
| D_t - Household bank deposits (mill. RON) | 26 046.67 |
| V_t - Annual net wages (mill. RON) | 38 550.86 |
| i_{lei_t} - nominal interest rate for RON denominated household loans | 24.6% |
| i_{val_t} - nominal interest rate for EUR denominated household loans | 10.2% |
| z_i | 35% |
| z_c | 30% |
| LTV _i | 75% |
| LTV _c | 100% |

Source: NBR.

In March 2005 the household indebtedness, computed as the ratio of household loans granted by banks to annual net wages, reached 34%. Considering the liquidity constraints, the results reveal a maximum potential loans of 37 235.47 millions RON. Thus, the households borrowed only 35% of the potential loans. If all the potentially available credit were fully utilised, the potential indebtedness ratio could have scaled up to 97%. However, there are some reasons for the low coverage of potential loans:

- (i) the banks' lending policy is sometimes more restrictive than imposed by the prudential regulation;
- (ii) households do not borrow the maximum loans that could be granted or prefer not to have debt;
- (iii) the percentage of households affected by liquidity constraints (λ) could be significant, but difficult to assess when we have no information on income breakdown of indebted households. In fact, some studies¹³ reveal that in countries

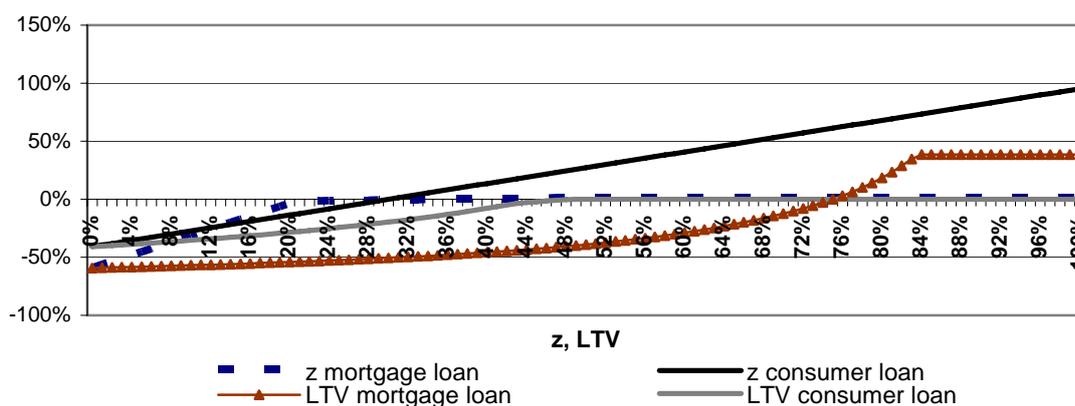
¹³ The liquidity constraints have been usually considered as not confirming the hypotheses of Modigliani's and Friedman's theories regarding savings life cycle. Hall (1978) changed the standard model to include liquidity constraints, thus considering the percentage of households that cannot go in debt (λ) on the basis of income and future wealth, consuming only the current income. Hall and Mishkin (1982) estimated a λ of 20% to 30% for American households. For UK, Bayoumi (1993) estimated a λ of 60% before financial deregulation of the

characterised by a high spread between loan and deposit interest rates, a reduced loan to value (LTV) and a small proportion of young house owners (as in the case of Romania), the value of λ could be very high.

In the second stage, we use the model to determine the change of maximum potential loans compared to the actual potential value considering the liquidity constraints. The results are obtained by simulating different values for z_i , z_c , LTV_i , LTV_c . Each factor take values from 0% to 100%, *ceteris paribus*.

Graph 3.1

Change of simulated potential loans compared to actual potential loans as a function of liquidity constraints



The results of the simulation for March 2005 indicate some interesting conclusions (*ceteris paribus*):

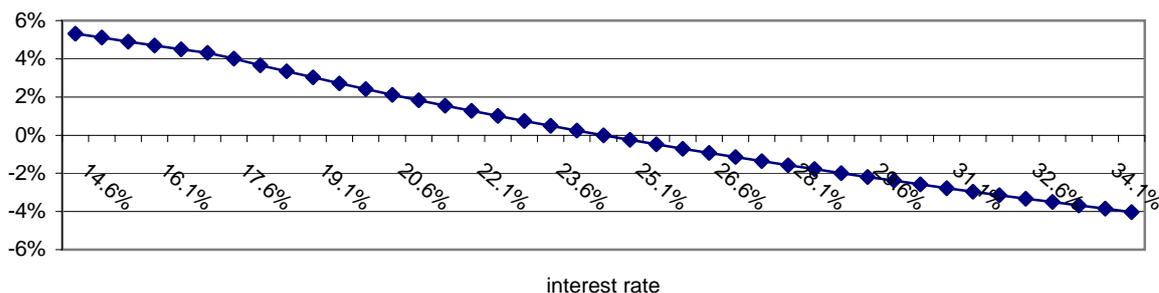
- (i) The most important causal factor for reducing potential household loans is due to an increased percentage of down payment for the mortgage loan, equivalent to reduction of LTV_i ;
- (ii) A LTV_i higher or equal to 84% results in a flatter curve at around 38.37% of the growth of potential loans compared to the actual potential loans and also implicitly flattens the potential indebtedness ratio;
- (iii) At LTV_c equal to or higher than 49%, there is no further impact on maximum potential household loans;
- (iv) A one percentage point increase in the ratio of debt service for consumer credit to annual net wages (z_c) involves a 1.4 pp increase in simulated potential loans compared to actual potential loans;
- (v) A level of z_i higher or equal to 50% produces a constant growth of 1.63% for simulated potential loans compared to actual potential loans. In the case of strong restrictiveness of mortgage loans, using a z_i smaller than 20%, 1 pp increase of z_i leads to a decrease by 2.8 pp of simulated potential loans compared to actual potential loans.

80's and a λ of 30% in 1987. Jappelli and Pagano (1989) proved the existence of liquidity constraints by linking λ to specific institutional features of the credit market.

The inverse relation between interest rates and granted loans was validated by simulating changes in the interest rates for RON and foreign currency loans (Graph 3.2 and 3.3). A higher sensitivity is observed in the case of interest rate for RON denominated loans: a 1 pp decrease involves a 0.4 pp growth of simulated potential loans compared to the actual potential loans. In the case of the foreign currency loan interest rate, a 1 pp decrease generates a 0.3 pp growth of simulated potential loans compared to actual potential loans.

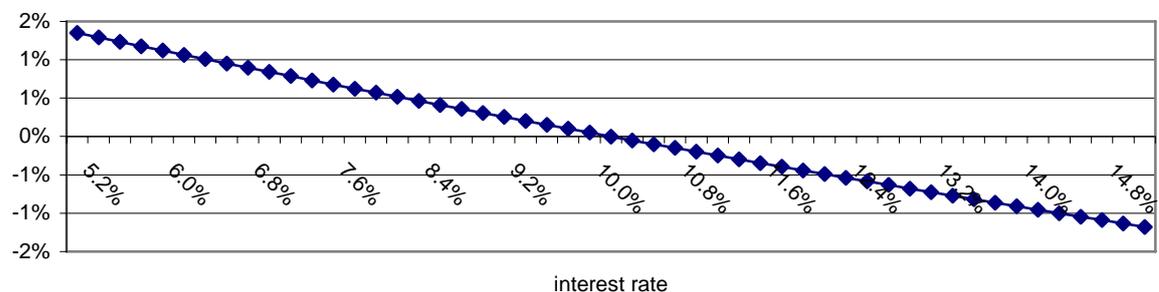
Graph 3.2

Change of simulated potential loans compared to actual potential loans as a function of EUR loan interest rate



Graph 3.3

Change of simulated potential loans compared to actual potential loans as a function of RON loan interest rate



In conclusion, the simulations revealed that imposing liquidity constraints on household borrowing could decrease up to a maximum 60% of potential loans. Keeping in mind that the effective level of current loans is lower than the potential level, imposing liquidity constraints would have no significant impact on the growth of the effective household debt. Thus, in the eventuality of a need for a slowing down of the strong dynamics of household loans, different types of measures could be considered (for example, limits on loans, however with dramatic results). Another conclusion of the simulations shows that reducing household loans could be achieved more effectively by imposing constraints on mortgage loans. The smallest reduction of potential loans is obtained by increasing interest rates (for RON loans and also for EUR loans).

4. Conclusions and possible policy measures

Although the risks stemming from the household sector have increased during the last years, we find no systemic impact on financial stability in the short run. Household assets' returns lead to higher volatility, due to switching towards capital instruments at the expense of currency and bank deposit holdings. On the liability side, an increasing indebtedness draws attention to: (i) unhedged borrowers and (ii) possible scenarios of soaring interest and unemployment rates.

The trends in household consumption and saving are of particular interest for financial stability. Improved macroeconomic framework, easier access to finance and allocating a higher weight of the household budget to satisfy the craving for a higher standard of living are some of the reasons generating a higher growth in consumption, especially for superior goods. The process of European integration encourages expectations of net income growth, being another argument underpinning the hypothesis of turning the potential into effective demand. Nevertheless, when the domestic supply is too inelastic to cope with the change in the structure and volume of the demand, imports might become such an important substitute as to impair the sustainability of the current account deficit.

In the long run, the expansion of household indebtedness might have potentially beneficial effects on financial stability, by enhancing financial discipline. As the ratio of indebted households increases and the coercive mechanism of credit bureaus intensifies, households will be more preoccupied in identifying ways for maintaining and increasing disposable income (labour productivity growth, improving professional skills, finding an additional job etc.).

The percentage of household loans to GDP reached almost 5% at the end of 2004 (starting from a humble 0.63% in 1995), but is still significantly lagging behind the EU values. The determinants of the supply and demand for the household loans both act in the same direction, towards loan expansion. The ratio of defaulted loans to total loans remains at a constant low level. The concentration of household loans has decreased both geographically and institutionally.

The level and the dynamics of the savings process do not attract particular attention at a macroeconomic level due to the level of structural liquidity in the system. However, at a microeconomic level, savings should be more attentively monitored because: (i) the delays in the reform of the pension system, (ii) worsening demographic situation and (iii) a growing probability that a higher percentage from household budget will be allocated in the future to educational and medical expenses.

The net household assets expanded primarily due to increases in real estate prices.

Simulating different scenarios, using liquidity constraints and its impact on credit growth (by a maximum limit for LTV and a maximum limit for the ratio of debt service to disposable income), indicated some impact on potential loans, but the value of the new lower level would be twice the current effective loans. The result also highlights the relatively limited ability of liquidity constraints to control a boom in the household loans.

From the analysis done in this paper we can derive some policy measures that in our opinion might be useful in preserving the financial stability in the long run:

1. We find that the ratio of foreign currency loans granted to households significantly expanded. It is possible to further maintain this trend, as long as the domestic currency appreciates, and the foreign interest rates stay lower than for RON. A long lasting adverse shock on domestic currency might affect debt service burden and impair the ability of servicing the debt, with negative consequences on creditors (mostly credit institutions). When the capital requirements are not sufficient to cover an unexpected loss (ie if the level of regulatory capital is smaller than the economic capital), the credit institutions might find it hard to cope with the situation. We suggest higher risk weights for

unhedged borrowers. This prudent approach is in line with the recommendations of the second Pillar of Basel II. The analysis of an unhedged borrower could be extended by considering not only income, but also other holdings of financial assets (transforming stock variables into flow variables and eventually weighting them with a risk and liquidity coefficient).

2. Lately, many non-bank financial institutions (e.g. leasing, credit intermediation companies) have started granting consumer loans. These entities (i) are not forced to comply with banking activity prudential requirements, thus leading to capital arbitrage possibilities, and (ii) are not forced to report to a credit bureau, which results in an asymmetric information situation adversely affecting the banks. By expanding consumer loans, non-bank financial institutions can increase the growth of household indebtedness. Lack of statistical data regarding these loans could impinge on the financial stability analysis resulting in undervaluation of household liabilities. These drawbacks could be avoided by promoting a regulation stipulating that all bank and non-bank entities should report certain data about their debtors to a credit bureau. Extending the scope of prudential measures on household indebtedness ratio to non-bank companies could also be considered.
3. We expect that as the Romanian financial market develops and the financial products become more complex, households will face higher financial risks and their management process will be more difficult to run. A financial system is said to be stable when it has the ability to efficiently allocate the resources, and the risk is properly assessed and managed by the players. To this end, the authorities' involvement should be more active in improving household financial education. The public sector should also cooperate with the private sector in promoting financial education. Simply feeding households with exhaustive information of different financial products and services does not replace the understanding and financial education. The role of the private sector in that process could materialize in financial support for educational programs and effective education of the customers.
4. Considering the significant discrepancies in the structure of the Romanian households (urban - rural, rich - poor, young - old etc), there is a particular interest for surveys focusing on these structural characteristics. It is possible that indebted households face higher risks than those revealed in our research.

References

Bayoumi, T. (1993): "Financial deregulation and consumption in the United Kingdom", Review of economic statistics, vol 75, pp 536-9.

Debelle, G. (2004): "Macroeconomic implications of rising household debt", BIS Working Paper 153, pp 2-6.

Engle R.F. and C.W.J. Granger (1987): "Cointegration and Error Correction: Representation, Estimation and Testing", Econometrica, 55.

Friedman, M. (1957): "A Theory of the Consumption Function", Princeton University Press, Princeton.

Hall, R. (1978): "Stochastic implications of the life cycle-permanent income hypothesis: theory and evidence", Journal of political economy, December, pp 971-87.

Hall, R. and R. Mishkin (1982): "The sensitivity of consumption to transitory income: estimates from panel data", Econometrica, vol 50, no 2, pp 461-82.

Harris, R.I.D. (1995): "Using cointegration analysis in econometric modelling", Prentice Hall.

- International Monetary Fund (2004): "Compilation Guide on Financial Soundness Indicators".
- (2005): "Household Balance Sheets", Global Financial Stability Report, chapter 3.
- Jappelli, T. and M. Pagano (1989): "Consumption and capital market imperfections: an international comparison", *American economic review*, vol 79, pp 1088-1113.
- Johansen S. and K. Juselius (1990): "Maximum Likelihood Estimation and Inference on Cointegration - with Applications to Simultaneous Equations and Cointegration", *Journal of Econometrics*, 69.
- Keynes, J.M. (1936): "The General Theory of Employment, Interest, and Money", London: Macmillan, chapter VIII.
- Kuznets, S. (1946): "National Income: A Summary of Findings", National Bureau of Economic Research, New York.
- Lütkepohl, H. and H.-E. Reimers (1992): "Impulse response analysis of cointegrated systems", *Journal of Economics Dynamics and Control*, 16, 53-78.
- Modigliani, F. (1986): "Life cycle, individual thrift, and wealth of nations", *American Economic Review*, 76, 297-313.
- Modigliani, F. and R. Brumberg (1954): "Utility analysis and the consumption function: an interpretation of cross-section data", *Post-Keynesian Economics*, ed. K. Kurihara, New Brunswick, NJ: Rutgers University Press.