

Gábor Szigel and Péter Fáykiss: The effect of indebtedness on the financial and income position of Hungarian households*,¹

During the credit boom prior to 2008, a substantial quantity of cash flowed from the banking sector to Hungarian households. With the emergence of the crisis, however, the direction of the cash flow has reversed, due to a net lending related factor and an income-related factor. First, in terms of the net lending, households turned from net borrowers to net repayers. But there is a second, less often analysed, income-related aspect of the process: the volume of interest payable by households has also increased as a result of the strong growth of credit in the pre-crisis years. This was further aggravated by the effect of the depreciation of the forint on FX loans, and, to a lesser extent, by unilateral interest rate increases by banks after 2008. As a consequence, the net interest balance of households deteriorated significantly, reducing both their disposable income and consumption. As a further novel aspect of our analysis, we also carried out an EU-wide comparison of interest burden on households. This has revealed that although the ratio of (bank-related) household credit to GDP is relatively low in Hungary in comparison to other European countries, the related interest-to-GDP ratio is high.

INTRODUCTION

Our analysis consists of four parts. The first part briefly summarises problems caused by (over)indebtedness examined in the literature, and underlines the relevance of analysing the topic. The second chapter discusses recent developments in Hungarian households' financial balance sheet and net interest income in connection with their indebtedness. In the third chapter, taking advantage of more detailed data, we still examine households' balance sheet and net interest rate income, but limit the scope to assess the relationship between households and banks, presenting a sort of a cash flow between the banking sector and households. The fourth and last chapter examines the ratio of Hungarian household debt to GDP and disposable income in an EU-wide comparison, and here we also introduce an indicator which is less widely discussed in the literature: the ratio of *interest payments* to GDP and disposable income.

TOPICAL RELEVANCE: WHY CAN INDEBTEDNESS BE A PROBLEM?

Lending is essential for economic growth, but over-indebtedness of economic participants may also become an impediment to growth. The relationship between growth and debt is a much discussed topic in the theoretical and empirical literature. The study by Reinhart-Rogoff (2010) is an example of the latter; it shows with simple statistical indicators that indebtedness above a certain level significantly reduces the growth prospects of a national economy.

The investment and growth reducing effect of over-indebtedness was first described on a micro level in the often referenced theoretical article by Myers (1977) in relation to companies. He made the general argument that companies with a critically high level of debt² invest less, as returns on investment are mostly paid to creditors. In other

* The views expressed in this article are those of the author(s) and do not necessarily reflect the official view of the Magyar Nemzeti Bank.

¹ The authors wish to thank Béla Simon for the compilation and availability of the household interest balance and Zsuzsa Kékesi and Regina Kiss for their assistance provided in connection with the financial instruments of households and their disposable incomes.

² Specifically, companies expected to have negative shareholders' equity due to high leverage.

words, debt – similarly to taxes – distorts the allocation of resources and the decisions of economic participants, which may negatively affect growth.³

The above model has also been applied to household indebtedness: Melzer (2010) proves with empirical data that mortgage loan debtors with a loan-to-value ratio of over 100 per cent, i.e. with negative equity⁴, spend proportionally less on home maintenance and renewal, as the increased value of their property would essentially increase the coverage of the bank's loan, while the net equity of the debtor might remain still negative. In the referenced research, the correlation was also valid to households *with no liquidity constraints*, i.e. to households that could have afforded home renewal based on their income position. This obviously has a negative effect on household (home) investments, real estate prices and economic growth as well. Although our recent paper does not explore this mechanism in detail for Hungary (moreover, comparison of US data used by Melzer with Hungarian data should be treated with caution, due to different legal-institutional environments⁵), we should note that this balance sheet structure related problem may also be relevant in Hungary. Due to the weakening of the forint exchange rate, namely, the amount of the loan has grown above the value of properties serving as collateral in the case of a substantial portion of FX mortgage loans (at least for 25 per cent of loans)⁶, and the average LTV ratios have increased significantly. In parallel with the above (see Annex, Chart i), (home) investment by households also declined in recent years (although this is clearly not attributable exclusively to the high LTV ratios, but also to income trends and stalled lending).

Beyond the distorting effect on (home) investment, the over-indebtedness of households also negatively affects growth prospects through another channel, at least in the short run. In essence, this means that the direction of cash flows between households and their lenders is suddenly reversed in the period following the credit boom: households become net credit repayers from net credit borrowers, and this suddenly and temporarily reduces the income of households disposable for consumption. In periods of recession, this may further aggravate the decline in consumption and increase the time required for the

recovery of consumption. The empirical analysis by Olney (1999) shows that the record level of consumer loans borrowed by US households significantly contributed to the collapse of consumption during the major global economic crisis. Mian et al. (2011) applies micro data from the current US debt crisis to show that consumption declined at a faster rate in regions where household indebtedness was higher. An analysis prepared by the Dutch central bank (van Els et al., 2005) provides an example where not only the reversal of a credit boom, but also its temporary slowdown may cause a decline in consumption and an economic downturn.

In relation to Hungary, studies published so far on the indebtedness of households have predominantly focused on determining whether the rate and dynamics of household borrowing before the crisis was at an equilibrium or excessive level. The study by Kiss et al. (2006) did not perceive a higher than equilibrium level of household indebtedness up to 2005. Using the same methodology and more recent data, however, we identified signs of excessive indebtedness from 2006 (see Annex, Chart ii), although this methodology is not appropriate for doubtless identification. In another study (Brown and Lane, 2011) prepared by the World Bank, analysing the level of indebtedness in emerging European countries on the basis of GDP-proportionate credit stock data, the conclusion is drawn that the Hungarian household sector, similarly to sectors in other countries in the region, does not show excessive indebtedness. This study, however, only analysed stock data and not the interest burden, and it disregarded further substantial growth in the volume of FX loans since 2009 due to the exchange rate effect. The draft analysis by Endrész and Virág (2012) takes into account this latter effect as well and observes a high level of indebtedness of Hungarian households and its negative effects on consumption.

BALANCE SHEET ADJUSTMENTS AND NET INTEREST INCOME OF HOUSEHOLDS BEFORE AND AFTER THE CREDIT BOOM

In this chapter, we review the two impact channels of indebtedness affecting household income and consumption: balance sheet changes and the net interest income channel.

³ For a more detailed summary of related literature, see Brown and Lane (2011).

⁴ In relation to household mortgage loans, negative equity means that the value of the property (asset) owned by the households, serving as collateral for the loan, is smaller than that of the household loan (funds), therefore the "net asset" of the debtor is negative.

⁵ As a main difference, in many states of the United States, debtors are not liable for the value of the mortgage loan in excess of the value of the property collateral, thus they are not obliged to repay their outstanding mortgage loan debt following the sale of the property, while debtors in Hungary are obliged to do so. However, Melzer's results suggest that debtors with negative equity reduced their home investments by a similar rate in US states, where they were also liable for debt in excess of the value of the property. The behaviour of debtors living in different legal environments, however, did vary in relation to their propensity to repay loans.

⁶ This estimate derives from the database of the MNB Bank Panel, based on data measured in the summer of 2010 (with a 210 HUF/CHF exchange rate).

The trends affecting the balance sheet of the resident household sector are summarised in Chart 1. From 1995 until the early 2000s, households generally saved; borrowing was not widespread. There were two waves of borrowing witnessed in the 2000s: the rise in subsidised forint loans in the first half of the decade and FX mortgage loans between 2005 and 2008. As a result, the consumption rate of households increased significantly, while their investment rate rose at a more moderate level. Thus, by definition, the gross savings rate could not increase and the net savings rate fell to approximately zero.

The emergence of the crisis at the end of 2008 – declining credit demand caused by uncertainty and tightening bank credit standards – put an end to the credit boom, and the net saving rate of households slowly recovered to pre-2001 levels. Due to the cumulated credit stock, however, this was accompanied by a lower gross saving rate and negative credit flow (net credit repayment). Adjustment was observed in the consumption rate and more strongly in the

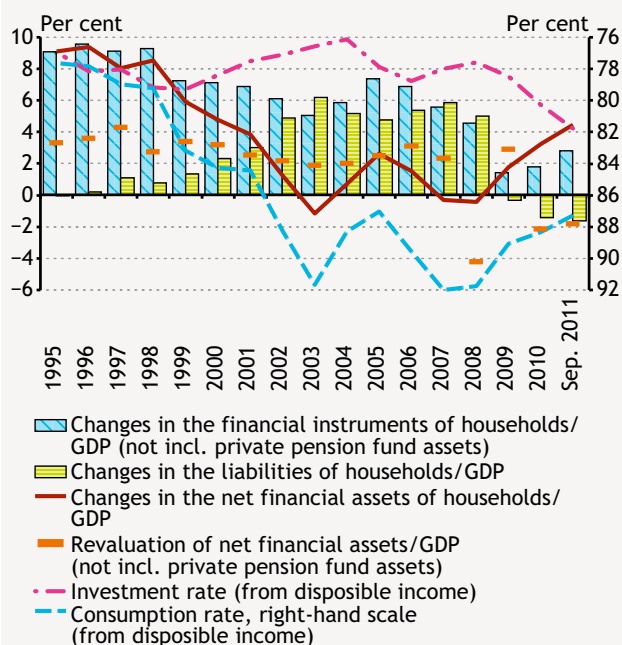
investment rate (although this was also attributed to a decrease in real income).

Improving net savings, however, were significantly offset by the revaluation of net financial assets in 2010 and 2011.⁷ This is principally attributed to the revaluation of FX loans caused by the appreciating Swiss franc. The revaluation exceeded net debt repayment in both 2010 and 2011. Thus, overall, household debt denominated in forints increased, notwithstanding that in the meantime households became net repayers. If we take into account this revaluation effect as well, this “adjusted net saving rate” was even lower in the past two years than during the credit boom in 2006 and 2007 (when the revaluation of households’ financial assets – mainly that of their equity shares – was positive). In other words, the growth of total net financial assets of households *denominated in forints* was even more subdued than during the credit boom.

The above data, however, only reveal changes in the balance sheet of households (balance sheet channel), i.e. the effects of loan flows. These do not take into account

Chart 1

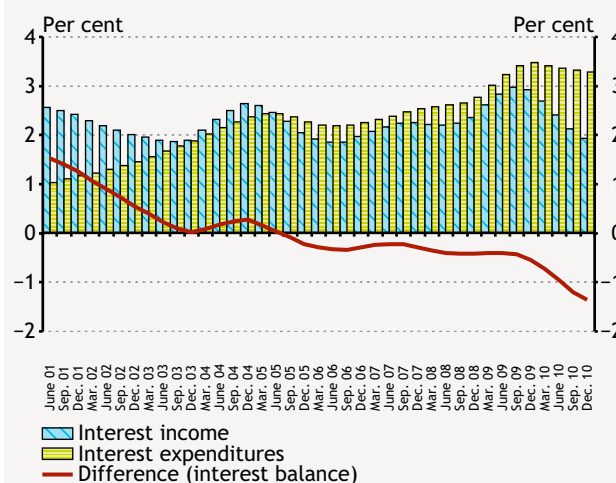
Changes in the financial instruments and liabilities of households (not including private pension fund assets) adjusted for exchange rate changes and revaluation of net financial assets relative to GDP, and investment and consumption rate



Note: Change in financial assets and liabilities, difference between the two and revaluation effect relative to GDP; the consumption and investment rate is based on disposable income. Source: MNB, financial accounts (consolidated).

Chart 2

Interest income-to-GDP ratio, interest expenditures of households, difference between the two (interest balance), 12-month rolling average



Note: The following items are settled among household interest income: interest on deposits (including interest tax), interest on debt securities (e.g. government securities, bank or corporate bonds), all non-exchange gain and revaluation yields from investment units, dividend from share investments. Interest expenditures of households include interest and similar expenditures payable on loans drawn from banks and other participants (financial enterprises, companies, non-residents) (including interest expenditures financed by the government). The data are estimates. Source: MNB Statistics.

⁷ Although the chart only indicates data relating to the first three quarters of 2011, and net repayment sharply increased in the last three months of the year as a result of the preferential total repayment programme, the revaluation effect is still in proportion to net repayment.

that the volume of interest payable on the credit stock also rose (income channel), first, because of the credit boom and the increasing loan volume itself and, later, because of the impact of the weakening forint exchange rate on FX loans. This reduces the *disposable income* of households, which produces a further negative effect on consumption, *in addition* to the balance sheet adjustment and the resulting decline in the consumption rate.⁸

The difference between interest received and paid (interest balance) by households has indeed increased significantly: at a gradual and slower rate during the credit boom and suddenly, at a faster rate after the emergence of the crisis. As indicated by Chart 2, at the end of 2010 the interest balance of households was negative, exceeding 1.4% of GDP, in comparison to the approximately 0 value before the crisis. If projected to disposable income, this net interest balance of households equalled -2.2 per cent in 2010 (in comparison: real wages decreased by approximately 3 per cent in the crisis year 2009). On the basis of preliminary data and bank statistics presented in the next chapter, we may assume that the trend has not reversed in 2011 either. We should add that although the financial income balance of households stated in this study is not complete, we assume that it effectively shows the income dynamics (decline) at work.⁹

The decline in net interest balance is primarily attributed to the steady increase in interest expenditures caused by the credit boom, while the interest income of households shows non-trend related fluctuation. The latter is attributable to the fact that household interest income was generally determined by the current interest environment, although the ratio of the interest bearing stock to GDP also increased at a gradual rate¹⁰. For example, the significant

central bank interest rate increases in the autumn of 2003 and 2008 temporarily increased the interest income (and hence income) of households, but their effect gradually ceased with the beginning of the interest rate easing cycle. Chart 2 clearly shows that the interest rate increase at the end of 2008 and strong deposit competition among banks thereafter temporarily and significantly increased the volume of interest received by households, which temporarily delayed the deterioration in the interest balance.

The rate of interest paid by households, however, was predominantly determined by the credit boom, affected by the flow of credit until 2008 and thereafter by the revaluation of FX loans attributed to the depreciation of the forint exchange rate. From 2001 to September 2011, the household credit-to-GDP ratio increased from 10.7 per cent to 40.6 per cent in Hungary, thus the ratio of interest expenditures of households to GDP rose from 1 per cent to over 3 per cent over the period. In parallel, the average interest rate even decreased over the year 2001, that is, the increase in the volume of payable interest is clearly attributable to the growing credit stock.¹¹

In conclusion, indebtedness before the crisis caused a shock to the income and consumption of households through two channels. First, the direction of cash flows reversed, and households became net credit repayers from net borrowers, and, second, more interest is obviously payable on a credit stock that expanded in previous years to exceed its amount at the beginning of the decade. Interest received on financial savings could not offset this increasing interest burden either, essentially because the rise in the volume of household financial instruments could not adjust to the dynamic rise in the credit stock.¹²

⁸ Disposable income in the national accounts is income available for consumption after production and income distribution. Net borrowing enables households to temporarily consume more than their disposable income (consumption rate > 100 per cent). In consequence, households will eventually need to effect "compulsory savings" of sorts to make net repayments, which reduces the rate of consumption from income at a given level. The balance of paid and received interest, however, reduces (disposable) income itself, and thereby affects consumption. We should note, however, that a portion of household net interest payments is part of consumption, as financial services (FISIM) related thereto, measured indirectly, are included in consumption. In other words, some changes in interest rates do not modify consumption, but only increase or decrease the weight of bank financial services within consumption to the disadvantage of other sectors' products.

⁹ The stated interest balance completely covers the financial liabilities of households, but not their financial savings. This is attributable to the fact that interest received does not include household income originating from insurance technical reserves and participations. Thus, the income balance of households realised on total financial assets may actually be moderately higher than shown in Chart 2. Since, however, the financial savings of households did not undergo substantial restructuring in the past ten years, save for changes in the private pension fund scheme which our calculations have disregarded, the dynamics presented here presumably effectively indicate changes in the total financial income of households.

¹⁰ The interest bearing financial instruments of households – bank deposits, bonds, loans provided, portion of investment units invested in interest bearing instruments – showed slow but continuous growth (rising from 35.5 per cent in 2001 to 44.5 per cent in September 2011). These data do not include private pension fund savings.

¹¹ Interest payable by households also includes interest subsidies on government subsidised mortgage loans. Since the ratio of such loans was higher in the volume of payable interest in the early 2000s, interest actually payable by households grew less in the early 2000s than shown in Chart 2. FX loans, however, are not linked to government interest subsidies, thus the effect of this factor diminished over time.

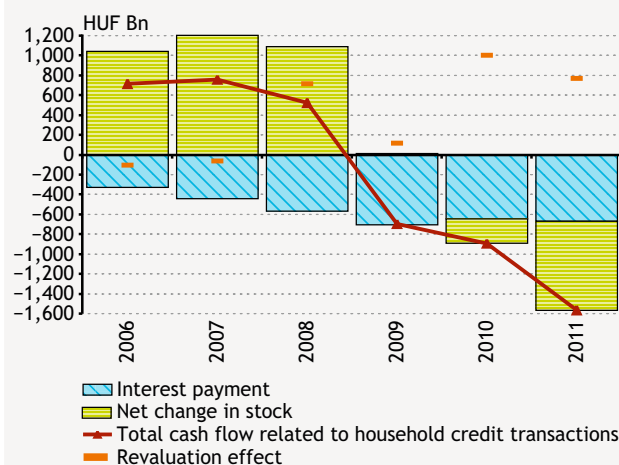
¹² As regards the latter, we should note that even if the GDP-proportionate volume of received interest would have increased, the negative effect on consumption resulting from the heterogeneity of households (deposit interest is received and interest is paid on loans not by the same households) would have been present in some degree. See Mankiw (2000) for details regarding the heterogeneity of deposit holders and borrowers.

BALANCE SHEET ADJUSTMENT AND INCOME EFFECTS IN THE RELATIONSHIP BETWEEN HOUSEHOLDS AND THE BANKING SECTOR

The previous chapter examined the effect of indebtedness on the balance sheet position and net interest income on the basis of a wider range of financial statistics on households. In the following section, we will only analyse the relationship of households and credit institutions (not including the co-operative sector), practically establishing a cash flow – relating to credit and debit transactions – between the two sectors. This has the advantage that more detailed data available from 2006 enable further analysis and comparison on an international scale (see next section). In this chapter, we state cash flow values in HUF billions, so that GDP dynamics do not distort the indicators; but the Annex also contains charts projected to the nominal GDP and the disposable income of households.

Chart 3 shows cash flows related to credit side transactions between banks and households. It reveals trends similar to those described in the previous chapter: the robust credit boom before the crisis is stalled in 2009 and turned into net repayment from 2010. Interest payments of households to banks basically doubled between 2006 and 2009, followed by a very moderate decrease in 2010 and 2011.¹³ The chart also shows that since the crisis, the role of interest payment has been significantly larger than that of stock on the credit side in cash flows between households and the banking sector, although the decline in net stock also picked up at the end of 2011 due to the preferential total repayment option. Overall, the marked change of direction of cash flows on the credit side is also revealed: the difference between annual cash flows on the credit side before and after the crisis well exceeded HUF 1,000 billion (4 per cent of GDP, 7 per cent of disposable income) – even before the preferential early repayment scheme of the Hungarian Government (launched in September 2012). Notwithstanding the above, the bank debt of households even increased as a result of the revaluation of FX loans – in 2010, at a level approximating the credit boom in the 2006–2008 period.

Chart 3
Cash flows between households and the banking sector (not incl. the co-operative sector) related to household credit transactions



Note: Net change in stock is a value adjusted for exchange rate changes. We drew data on household interest payments on bank loans from bank profit and loss accounts, therefore, these contain actual interest payment figures (not including, for example, unpaid interest on non-performing loans). The above data relate to the banking sector exclusive of the co-operative sector.

Source: MNB.

Since the weight of interest flow between households and banks has increased, we also prepared an estimate of the underlying factors, as indicated by Chart 4. Using MNB interest rate and other banking statistics, we distinguished the following effects of changes in interest payment volume. It is important to emphasise that the following results are estimates that effectively show the magnitude and direction of changes, but are not accurate accounting statements, therefore, they should be interpreted with caution¹⁴:

- **Volume and composition effect:** we treated these jointly for technical reasons. In general terms, the *volume effect* means that with constant credit interest and exchange rates the interest volume payable by households *ceteris paribus* automatically increases with the rise in household credit stock. This effect generally explains the rise in

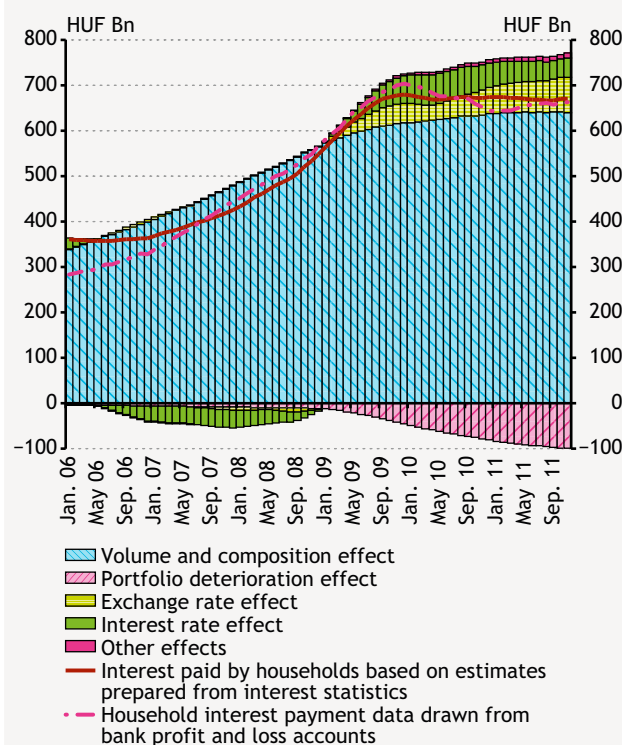
¹³ See Annex for version of Chart 3 relative to the GDP and disposable income.

¹⁴ We estimated the volume of interest paid by households by multiplying average customer interest set for various credit types in the interest statistics of the MNB with the related stock of outstanding credit. Thus, the effect resulting from changes in average customer interest can be easily estimated for the volume of paid interest, and the amount of payable interest relating to FX loans could be calculated even with different exchange rate levels. We approached the portfolio effect by assuming that customers will not fulfil their interest payment obligations overdue more than 90 days and customers with obligations overdue within 90 days will fully effect interest payment. Interest income estimated from interest statistics effectively approximates household interest income stated in bank profit and loss accounts, although the difference between the two may become substantial in certain periods, as shown by Chart 4. This is attributed, among others, to our inability to accurately identify the effect of non-performing debtors, interest income from revolving loans and bank fees charged on principal, not included in interest statistics, in estimation from interest statistics.

credit interest paid by households up to the end of 2009, sustained by the credit boom's effect on 12-month rolled-over data. The volume effect has since become minimal. With the *composition effect*, the weight of certain credit products increases, while that of others decreases. Until 2008, when the weight of the relatively cheaper Swiss franc loans increased within household loans, this effect generally reduced the interest payment volume. After 2008, however, the weight of Swiss franc loans decreased somewhat against more expensive euro loans, generating a moderate increase in the interest burden (the weight of forint loans, dominating new disbursements, within the credit stock has basically remained unchanged since 2008 due to the nominal increase of FX loans caused by the weaker forint exchange rate);

- **Exchange rate effect:** due to the weakening of the forint since 2008, the stock of FX loans has been revalued, thus the value of interest payment calculated on the basis of stock, denominated in forints, has also increased. This effect does not affect forint loans, but due to the weaker HUF rate, in 2011 (average exchange rates: 277 HUF/EUR, 224 HUF/CHF) households paid approximately HUF 80 billion more on interest than they would have paid at exchange rates before 2008 in relation to Swiss franc and euro loans;¹⁵
- **Interest rate effect:** the volume of interest payable depends on the nominal credit interest rate. Since the emergence of the crisis, only interest rates on forint denominated mortgage loans have decreased among the various types of products, while interest rates on FX loans and uncovered forint loans have increased. As a result of the interest rate effects, in 2011 debtors paid HUF 45 billion more than in 2008. We discussed the reasons for interest rate increases by banks in the MNB (2010) publication; we drew the conclusion that the interest rate hikes were not fully supported by the rise in financing costs and credit losses in relation to Swiss franc mortgage loans. The increase in the country risk premium in 2011 H2, proving to be protracted, changed our view in this regard, as the persistence of current risk premia may also significantly raise the funding costs of banks, which would not rule out the necessity of further interest rate increases in relation to Swiss franc loans (see Annex, Chart vii);
- **Portfolio deterioration effect:** non-performing debtors obviously do not pay interest either. Due but unpaid

Chart 4
Decomposition of bank credit interest paid by households based on estimates prepared from MNB interest statistics



Note: Footnote 14 contains the background to the calculations. It is important to emphasise that the decomposed interest payment volume is an estimate which – shown in the chart – varies from actual household interest payment data drawn from bank profit and loss accounts. Therefore, the data shown are not accurate, but well reflect the main trends. The above data relate to the banking sector exclusive of the co-operative sector.

Source: Estimate by the authors based on MNB interest statistics.

interest does not have a cash flow effect or appear in banks' financial statements. The ratio of non-performing debtors increased from 1.5 per cent at the end of 2008 to over 11 per cent, reducing interest payments from households to banks by a total of HUF 90 billion;

- **Other effects:** combined effect of the above partial factors (+HUF 10 billion over the year 2008).

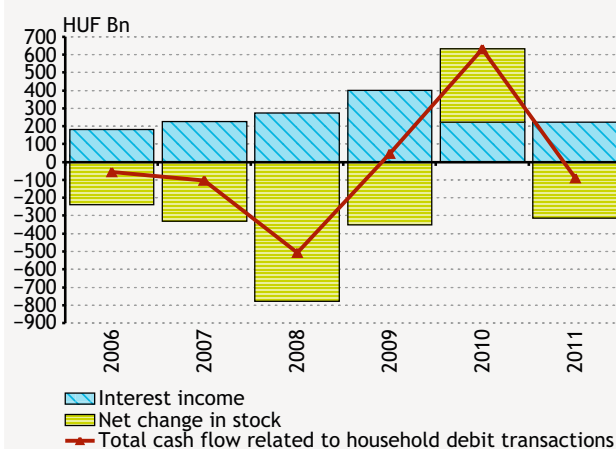
In conclusion, bank interest expenditures of households basically increased in parallel with the rise in credit stock until the end of 2008. Thereafter, however, the rising volume of interest paid was increasingly attributable to the weakening of the forint and interest rate hikes implemented by banks; according to our estimates, this amounted to a total value of approximately HUF 120-130 billion. This fully

¹⁵ This increase may seem small in comparison to the annual interest payment volume of roughly HUF 600-700 billion, considering that the strengthening of the Swiss franc against the forint amounted to 40 per cent at the average exchange rate in 2011 over levels measured before the crisis. In fact, approximately half of credit interest paid by households is linked to forint loans: although the FX loans account for over 70 per cent of the credit stock, interest on forint loans is higher, particularly in relation to consumer loans.

encumbered still performing debtors. *Actual aggregate* interest payments by households, however, did not increase at such a rate, as the volume of interest *not paid* by non-performing debtors also rose sharply. At first glance, this would imply that portfolio deterioration dampened the income reducing effect of household interest payments. However, if we assume that the income of non-performing debtors declined in any case during the crisis, there was no such dampening effect at work¹⁶; the increase in interest payments attributed to the rising exchange rate and interest rates fully decreased the disposable income of households. This amounts to 0.7-0.8 per cent of disposable income, approximately 0.8-0.9 per cent of consumption, based on the above additional interest expenditures of HUF 120-130 billion annually.

Analysis of the debit side, however, is much more difficult and shows a different picture than the one emerging in the previous chapter. This is attributable to the fact that while the majority of household loans are bank loans, only a smaller portion of household savings are bank deposits. Moreover, households reorganise relatively frequently their portfolios between different forms of savings (stock movement is particularly common between investment units and bank deposits). In addition, the market share of the credit union sector – disregarded in our analysis – on the debit side is also much higher than that of loans. All these factors distort the change in the stock of net bank

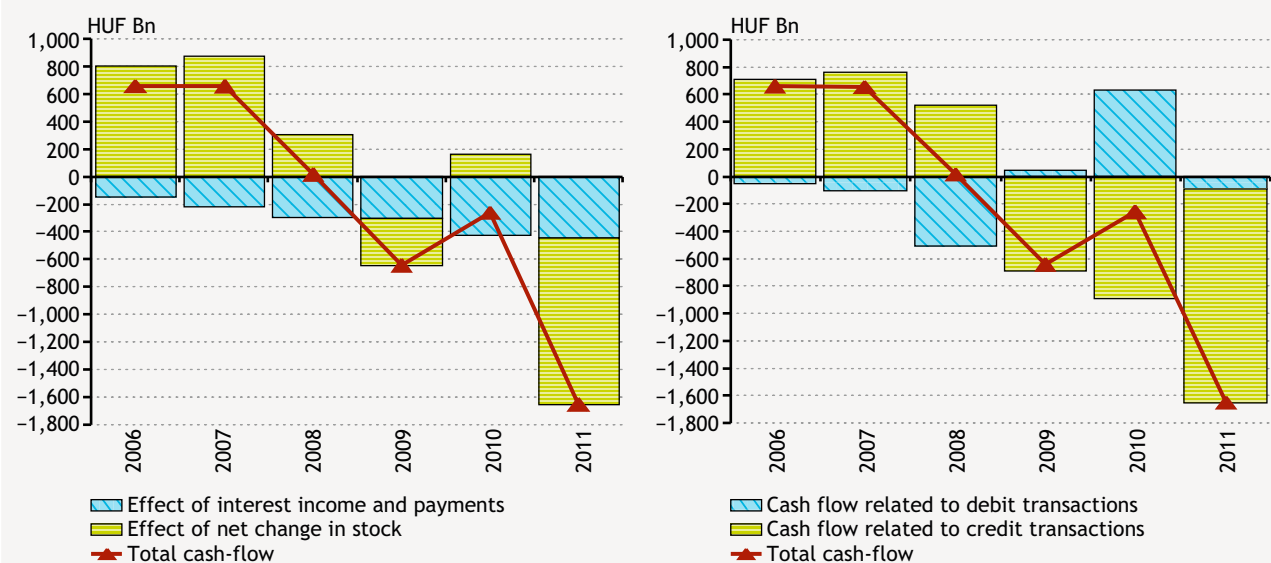
Chart 5
Estimated cash flows between households and the banking sector (not including the co-operative sector) related to household debit transactions



Note: Net change in stock is a value adjusted for exchange rate changes. We estimated interest payment data relating to household bank loans with the help of the MNB interest statistics, as bank profit and loss accounts do not contain relevant data before 2010. The above data relate to the banking sector exclusive of the co-operative sector. Source: MNB.

deposits of households in Chart 5; in 2006 and 2010, for example, a significant amount of deposits flowed into investment units (net deposits are therefore at a relatively low level), while this was reversed at the end of 2008. Income trends, however, are well reflected by this

Chart 6
Estimated total cash flows between households and the banking sector (not including the co-operative sector) related to household credit and debit transactions



Source: MNB.

¹⁶ Moreover, "income smoothing" aggregated in this manner is obviously unsustainable and negatively affects financial stability.

calculation: the 300 basis point interest rate increase by the central bank at the end of 2008 and intensifying deposit competition among banks emerging in early 2009 increased household interest income substantially in 2009 (this was less attributable to new deposits flowing in at the end of 2008).

Chart 6 shows the comparison of debit and credit side cash flows (Chart 3 and 5) between households and the banking sector.¹⁷ We can observe that cash flows between households and banks was generally determined by the change in net stock on the credit side: before the crisis, on the credit side cash flows from banks to households, which was reversed with credit repayments. The interest balance of households also significantly deteriorated as a combined result of the credit boom, the depreciation of the forint exchange rate and rising credit interest rates since 2008 – in line with the results presented in the previous chapter. (The negative interest balance comes as no surprise, as the interest balance of households vis-à-vis banks is typically negative in other European countries as well).

INDEBTEDNESS AND INTEREST BURDEN OF HUNGARIAN HOUSEHOLDS IN INTERNATIONAL COMPARISON

The literature¹⁸ on the debt overhang of households generally focuses on stock data. On the basis of these literature data/reviews, the indebtedness of Hungarian households does not seem high in international comparison. In the previous chapters, however, we observed that rising debt may have a negative effect on household income (and hence on consumption) through a higher interest burden as well, and if we also take into account the volume of interest paid by households, domestic household indebtedness thus measured does not at all seem low in international comparison.

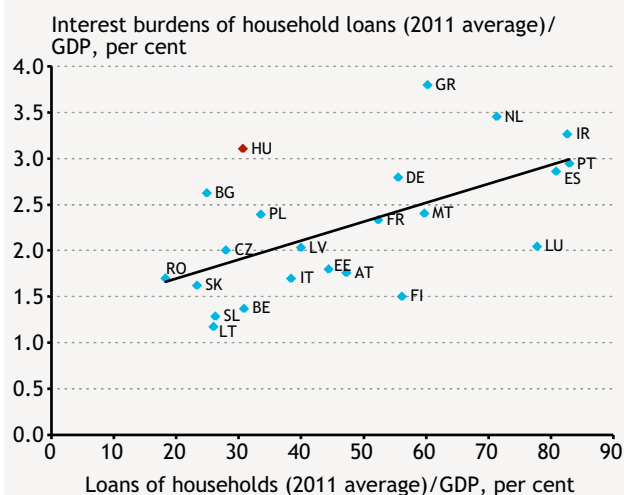
To produce the estimate shown below, we used interest statistics and credit stock data accessible on the websites of the ECB and central banks. Before we discuss the results, we should briefly describe the applied methodology. Below, we focus only on household loans within the banking sector, as comparable data are available in relation to these. This allows us to effectively cover the credit side of households, as household lending is commonly conducted through the banking sector in Europe; other financial intermediaries play a small role (Annex, Chart viii), albeit a somewhat larger one in Hungary. Several other factors, however, limit the international comparison of interest burdens. First, interest statistics are not comprehensive in scope or fully

harmonised, and, second, costs similar to interest but not termed as interest are generally not covered by interest statistics (e.g. principal-proportionate bank fees which are frequent in Hungary in relation to mortgage loans). Furthermore, when using interest statistics, we are unable to take into account the effect of non-performing loans either, although we observed in the previous chapter that this is a major distorting item in national data. Due to the above reason and other distorting effects, estimates stated here in relation to Hungary are not in full harmony with the previous chapter. In view of these estimation related problems, it is important to emphasise that the comparison below should be interpreted with caution.

International comparison indicates that the estimated bank credit interest burden of Hungarian households as a proportion of GDP is among the highest in Europe (Chart 7). In 2011, the ratio of interest payments by Hungarian households to GDP was broadly at the same level as in countries with over twice as large household indebtedness as a proportion of GDP as that of Hungary. The interest payments-to-GDP ratio in Hungary is also higher in comparison with the Central Eastern European region (the possible causes are discussed in greater detail below.)

Chart 7
Ratio of loans and interest burdens of households to GDP

(2011)



Note: the 2011 GDP figure is the current forecast available through Eurostat. We estimated interest burdens with the help of bank interest statistics (with 12 month rolled-over data for 2011, between December 2010 and November 2011). Due to the different methodology (effect of non-performing loans, consideration of co-operative credit institutions, etc.), the national interest burden shown here is roughly similar to, but not an exact match of data shown in the previous chapter.

Source: Web sites of ECB, MNB, Eurostat, various central banks.

¹⁷ The version of Chart 6 showing data relative to the GDP and disposable income is also contained in the Annex.

¹⁸ For example, Brown and Lane (2011) and Kiss et al. (2006) referenced above, and Hudecz et al. (2012).

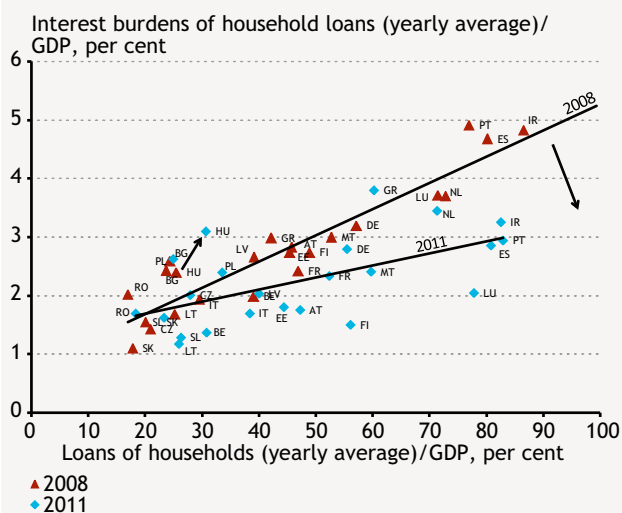
Analysing the dynamics of the indebtedness and interest burdens of households before and after the crisis, we may observe that although the credit stock of households as a proportion of GDP did not decline in most European countries and even increased in some regional countries (Czech Republic, Slovakia, Poland), the ratio of interest payments by households to GDP decreased (Chart 8). This may be attributable to the downward effect on financing costs of central bank interest rate cuts implemented during the crisis. This in turn may have reflected the continuing rise in lending in countries where the interest burden as a proportion of GDP increased (Czech Republic, Slovakia), while the proportionate increase of the interest burden in Greece is linked to the sharp decline in nominal GDP. Hungary is the only country where the interest burden of households as a proportion of GDP increased without either a credit boom or a sharp fall in nominal GDP, for reasons discussed in the previous chapters.

The difference between the ratios of bank credit interest paid by households to GDP in various countries – beyond the difference in credit-to-GDP ratios, i.e. in the volume effect – is attributable to several factors. First, varying interest

burdens may depend on differences in general credit interest rate levels (interest rate effect) and the product type of loans drawn by households (composition effect). With the latter effect, interest rates on less risky loans, particularly mortgage loans and loans for house purchase, are generally lower in all countries and for all debtors than those of uncovered loans. Thus, if debtors in a country have unsecured loans at higher interest rates, the average interest burden will obviously be higher there as well.

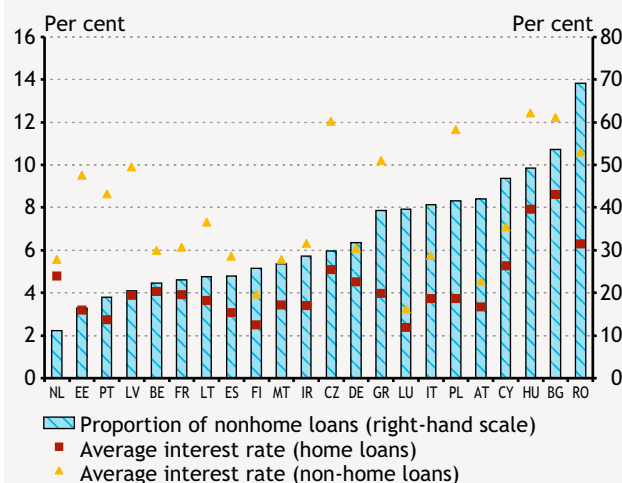
As shown in Chart 9, the ratio of more risky non-housing loans in Hungary is higher within the stock of household loans than in most European countries (excluding Bulgaria and Romania), therefore, the composition effect also increases the interest burden in Hungary. In addition, a general difference in interest rates was also observed in 2011: the nominal interest rate on housing loans is the second highest in Hungary behind Bulgaria,¹⁹ while Hungarian interest rates on non-housing loans are the highest within the entire European Union.²⁰ The latter is somewhat surprising in view of the fact that home equity loans account for a high, 67 per cent percentage of non-housing loans in Hungary, which would, in principle, result in lower nominal interest in comparison to unsecured consumer loans. At the same time, the 15-30 per cent interest rates on unsecured (forint) loans in Hungary are also high.

Chart 8
Loans and interest burdens of households to GDP in 2008 and 2011



Note: the 2011 GDP figure is the current forecast available through Eurostat. We estimated interest burdens with the help of bank interest statistics (with 12 month rolled-over data for 2011, between December 2010 and November 2011). Due to the different methodology (effect of non-performing loans, consideration of co-operative credit institutions, etc.), the national interest burden shown here is roughly similar to, but not an exact match of data shown in the previous chapter. Source: Web sites of ECB, MNB, various central banks.

Chart 9
Distribution of housing and non-housing loans of households in international comparison and average nominal interest rates of such loans (2011)



Note: The distribution of loans is based on an annual average. Source: Websites of ECB, MNB, various central banks.

¹⁹ It is important to note that the composition effect may play a major role in determining the average national interest rates of non-housing loans, as in addition to home equity loans, these include consumer loans, credit card and overdraft facilities and motor vehicle loans, where interest rates – and credit risks – significantly vary.

²⁰ See Annex for interest burden on non-housing household loans.

In conclusion, the high interest burden of Hungarian households is attributable to both the composition effect and the generally higher interest rates. Differences in the latter across various countries may depend on several factors (a more detailed analysis of these goes beyond the scope of this work):

- *Denomination of loans:* since the interest environment varies in different countries, depending on the general economic environment, this may also contribute to the difference in household credit interest rates (as reflected by the higher interest rate on Hungarian forint loans). The relevance of the interest rate level in Hungary is reduced to the extent that a larger portion of total household loans is denominated in foreign currency;
- *Availability and costs of bank funds, particularly in relation to the country risk premium:* since the Hungarian country risk premium is among the highest in the European Union, and the country is heavily reliant on external funds, this factor clearly plays an important role in determining differences in customer interest rates;
- *Rate and volatility of inflation:* nominal credit interest rates in the national currency are also higher in a high inflation environment, and we may observe that household customer interest rates are the highest in three EU countries, where inflation has been relatively high in recent years – Romania, Bulgaria and Hungary (see Annex, Chart xi). It is important to emphasise that although inflation may decrease the real value of the debtor's credit in the long term (although this is not true in relation to loans with variable interest rates), this is in principle not the case in relation to FX loans, as the devaluation of the exchange rate caused by inflation differentials also increases the value of the credit denominated in the national currency. In other words, a high inflation environment does not reduce, but rather increases the (foreign exchange) debt problems of domestic households. (The application of inflation-adjusted income statistics could serve as a possible method for filtering out the effect of inflation)²¹;
- *Other factors, sectoral competition,²² local legal environment, changes in non-performing loans:* among these factors, the significantly higher ratio of non-performing debtors/loans in Hungary compared to the EU

average and the more difficult comparability of interest rates of household mortgage loans may play a role in higher customer interest rates.

Finally, it is possible, that due to the high Hungarian interest rate environment, Hungarian households realise higher interest income as a proportion of GDP on their deposits compared to the EU average, therefore, the net interest balance of households is not exceptionally high – even with higher expenditures on the credit side. Analysis of this assumption, however, is more difficult. This is because, first, a substantial portion of household financial income is not related to deposits within the banking sector, and we did not have available comparable data from other countries for the calculation of net interest income noted in the second chapter. Second, easily comparable international statistics are not available either on bank deposits.

We can, however, carry out a comparison between Hungary and the entire eurozone. As shown in Table 1, on the basis of data for the year 2011, bank interest income of Hungarian households as a proportion of GDP was indeed higher than in the eurozone, as only 20 per cent less household interest income was realised on approximately a third of bank deposit stock. In other words, a higher interest rate environment may produce a compensation effect on the interest payment volume of Hungarian households – higher than the EU average – on the debit/deposit side. We assume, however, that this can only moderately dampen the shock caused by declining net interest income resulting from indebtedness, owing to the heterogeneity of households (most borrowers are not savers). Moreover, this compensation effect was certainly unable to mitigate the adverse dynamics affecting the net interest income of Hungarian households since the crisis. As noted in the second chapter, interest income was insufficient to offset the rise in interest payable, thus the interest balance suffered a substantial deterioration.

Table 1
Ratio of interest on household bank deposits to GDP

	Eurozone	Hungary
Bank deposits of households/GDP	62%	22%
Average (gross) deposit interest rate	1.6%	3.7%
Deposit interest income of households/GDP	1.0%	0.8%

Source: ECB, Eurostat, MNB.

²¹ But this statistics are available only for Hungary at the moment – international comparison is not possible.

²² For details see Corvoisier and Gropp (2002).

SUMMARY

Our analysis aimed at focusing attention on problems arising from the rapidly rising indebtedness of Hungarian households prior to 2008. As a natural consequence of the credit cycle, the direction of cash flows between households and the banking sector reversed after the credit expansion slowed down and stopped: debtors turned from net borrowers to net repayers. Net interest income of households also declined as a result of an increase in the (foreign exchange) credit stock up to 2008, and expanded further in response to the depreciation of the forint exchange rate: at a rate of over 1 per cent of GDP and over 2 per cent of disposable income compared to figures measured in 2006 and 2007. This obviously decreased household income and consumption. In addition, our estimates show that the volume of credit interest paid by Hungarian households as a proportion of GDP is one of the highest in the European Union, and indebtedness thus measured significantly exceeds the value shown through the credit stock-to-GDP ratio. This, however, may be partially offset by proportionately higher interest income earned on savings, attributable to the higher Hungarian interest rate environment, but this effect was presumably unable to offset the decline in net interest income. These data broaden somewhat the picture of the level of indebtedness – regarded earlier to be low – of Hungarian households.

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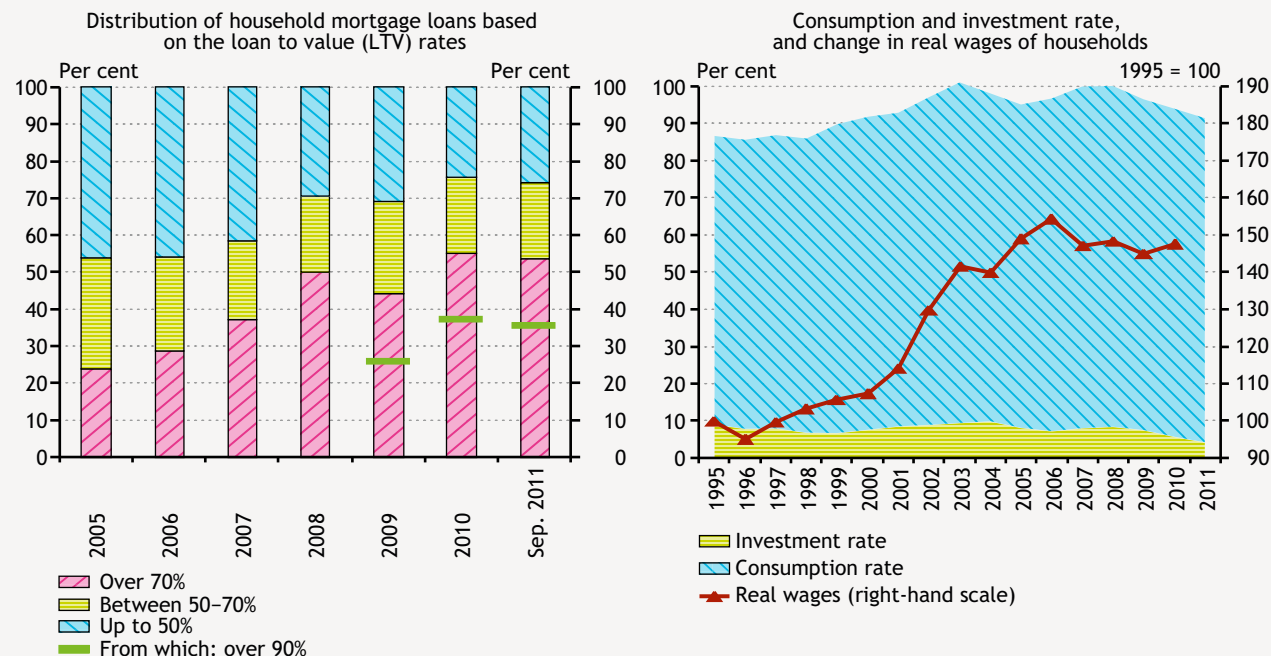
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ANNEX

Chart i

Distribution of household mortgage loans based on loan-to-value (LTV) ratios; consumption and investment rate, and change in real wages of households

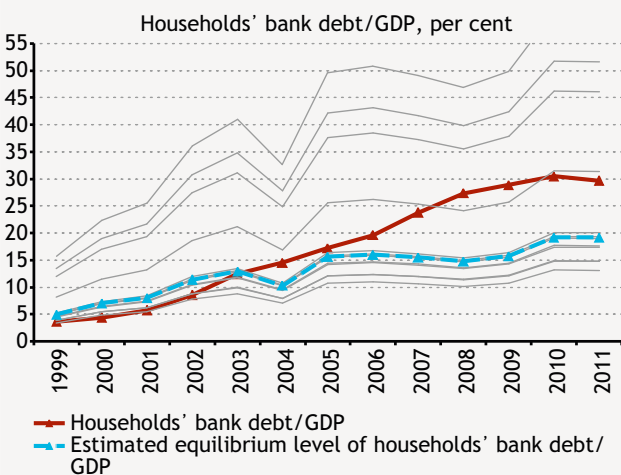


Note: Separate breakdown for loans with over 90% LTV ratio is available only from 2009.
Source: MNB.

Chart ii

Out-of-sample estimates of the equilibrium level of Hungarian households' bank debt to GDP

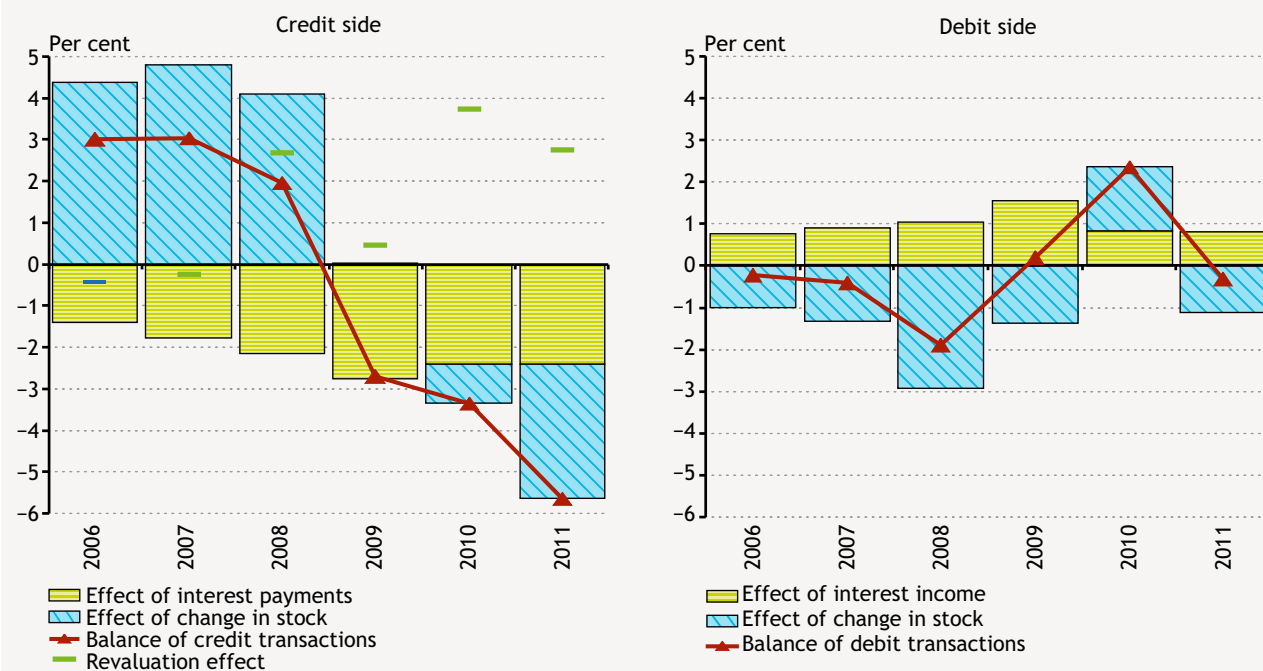
(thin lines indicate equilibrium paths estimated with different country constants)



Note: See a detailed methodology in the referenced literature.
Source: Kiss et al. (2006).

Chart iii
Household cash flows vis-à-vis banks on the credit and debit sides relative to GDP

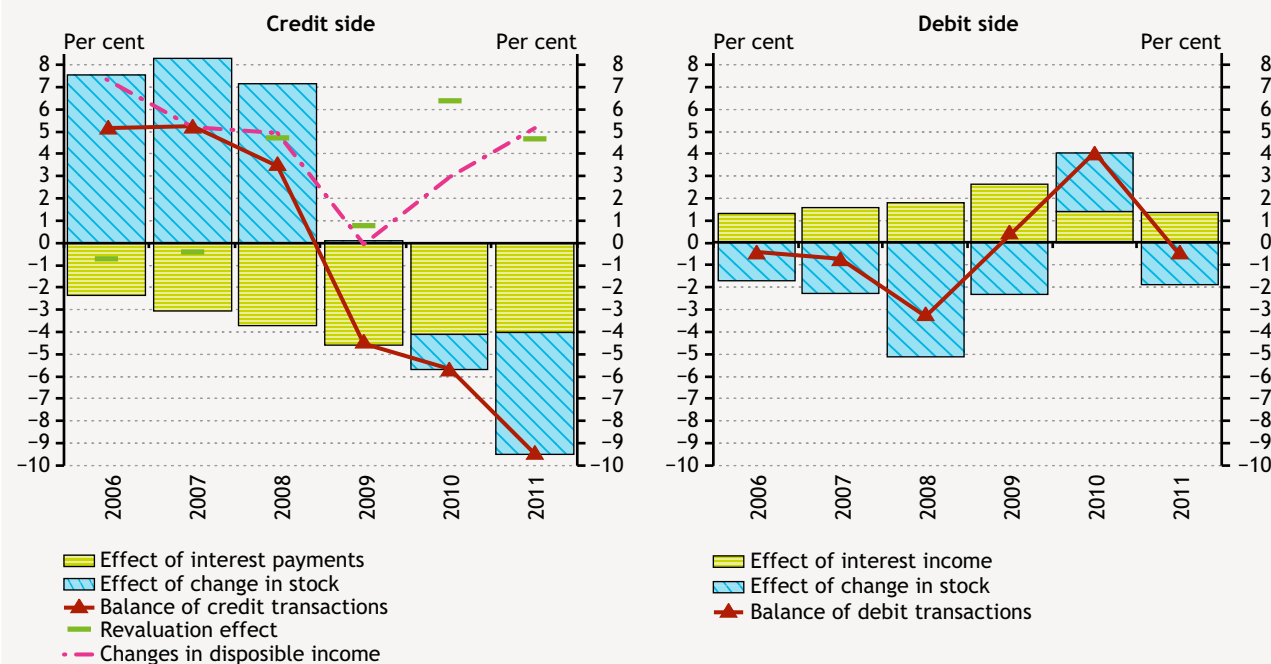
(distribution of values in Charts 3 and 5 to GDP)



Note: GDP for 2011 is calculated with 12-month cumulated GDP as at September 2011.
Source: MNB.

Chart iv
Household cash flows vis-à-vis banks on the credit and debit sides, relative to disposable income of households

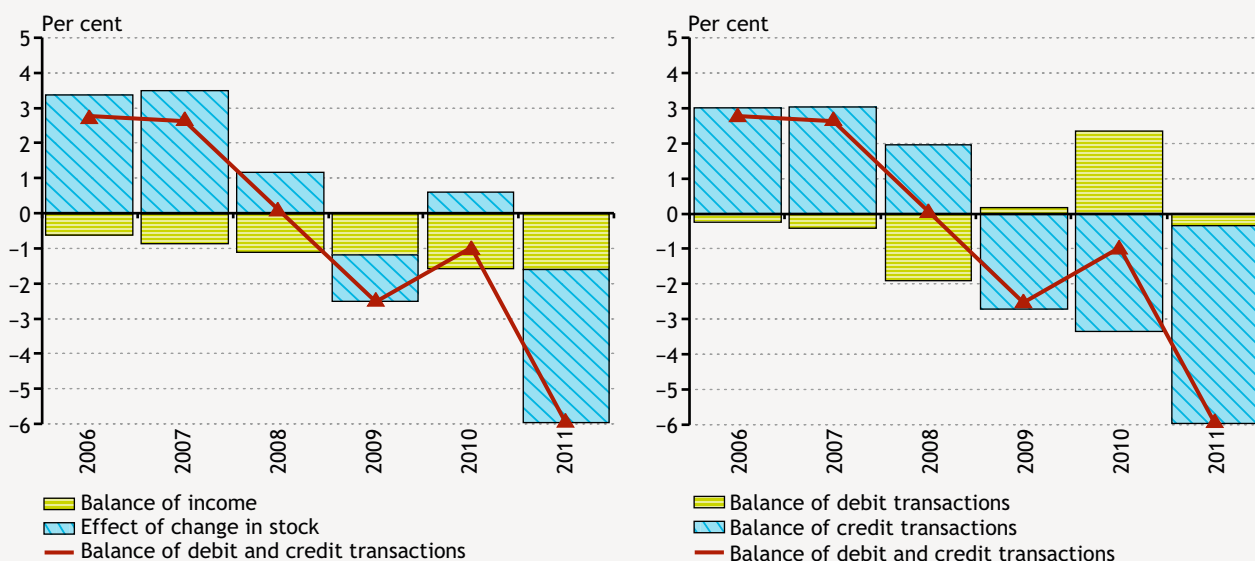
(distribution of values in Charts 3 and 5 to disposable income)



Source: MNB.

Chart v
Household cash flows vis-à-vis banks on the credit and debit sides relative to GDP

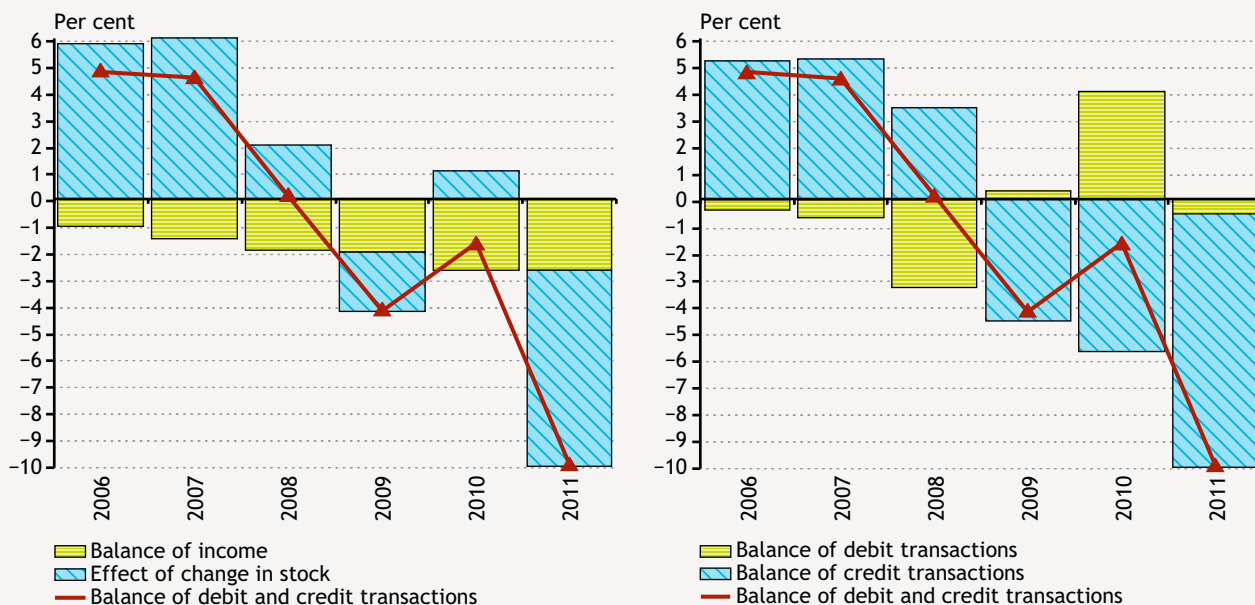
(distribution of values in Chart 6 to GDP)



Note: GDP for 2011 is calculated with 12-month cumulated GDP as at September 2011.
Source: MNB.

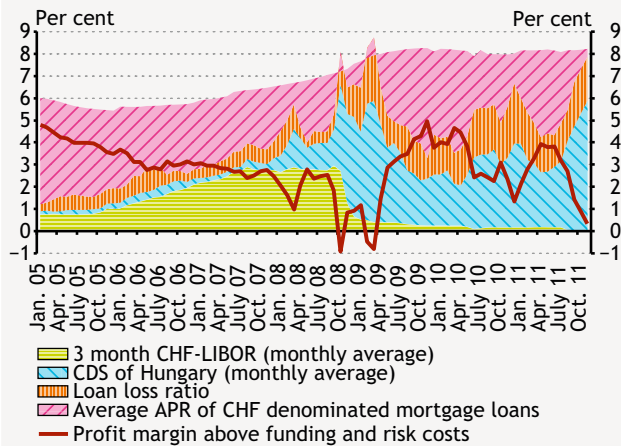
Chart vi
Household cash flows vis-à-vis banks on the credit and debit sides relative to disposable income of households

(distribution of values in Chart 6 to disposable income)



Source: MNB.

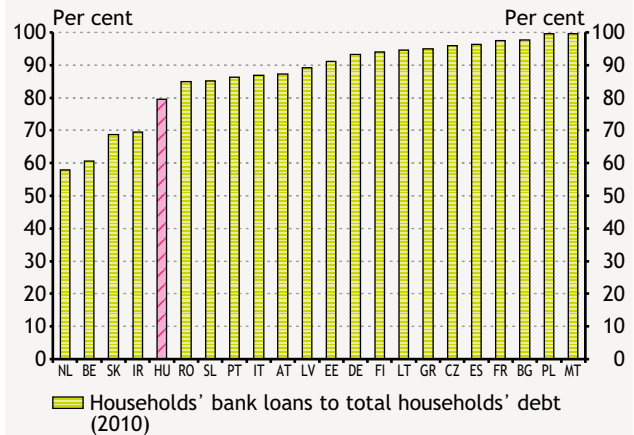
Chart vii
Bank credit interest rates, financing costs, credit losses and margins of Swiss franc mortgage loans in Hungary



Note: See MNB (2010) for a detailed methodology.
Source: MNB.

Chart viii
Ratio of household bank loans to total household debt

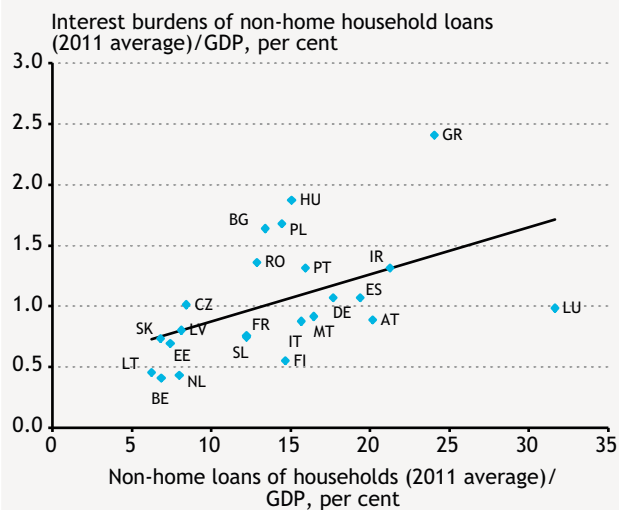
(2010)



Source: Websites of ECB, MNB, Eurostat and various central banks.

Chart ix
Ratio of non-housing household loans and interest burdens on non-housing households to GDP

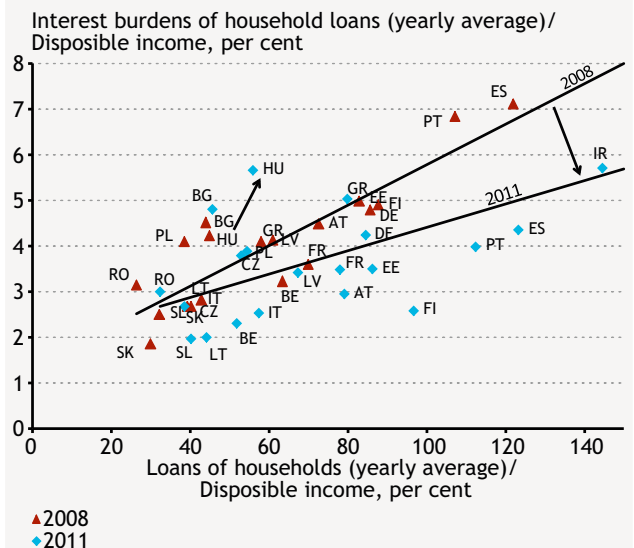
(2011)



Note: The 2011 GDP figure is the current forecast available through Eurostat. We used monthly rolled-over data between December 2010 and November 2011 to calculate the interest burden.
Source: Websites of ECB, MNB, Eurostat and various central banks.

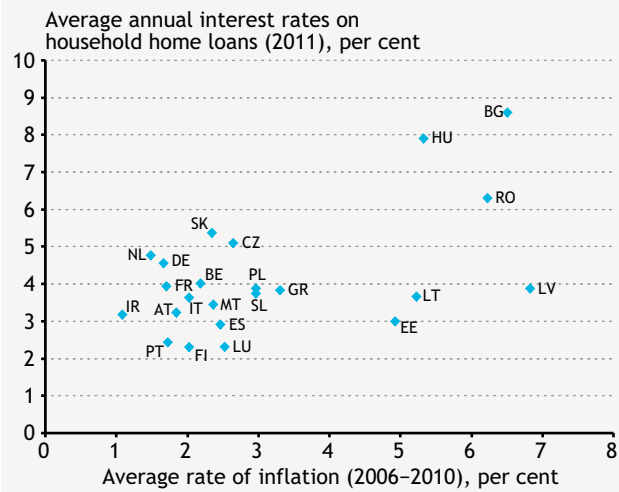
Chart x
Ratio of loans and interest burdens of households to disposable income in 2008 and 2011

(2011)



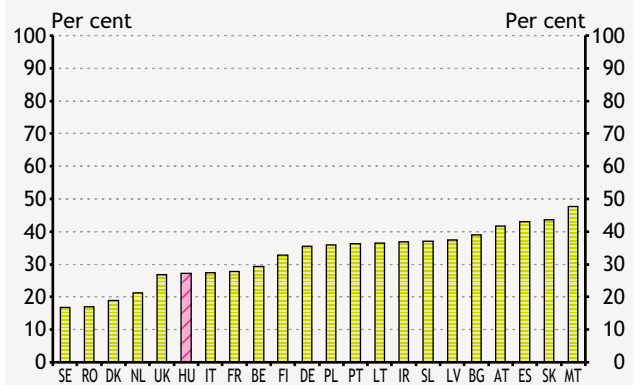
Note: The 2011 GDP figure is the current forecast available through Eurostat. We used monthly rolled-over data between December 2010 and November 2011 to calculate the interest burden.
Source: Websites of ECB, MNB, Eurostat and various central banks.

Chart xi
Correlation between average annual interest rates on household home loans and the average rate of inflation



Source: Websites of ECB, MNB, Eurostat and various central banks.

Chart xii
Ratio of household deposits to total financial assets of households



Source: MNB, Eurostat.