

# Increasing Threat of a “Total Financial Crisis” in the Upcoming Years

Luboš Smrčka, Markéta Arltová

**Abstract**— Since 2007, the chronic financial crisis has become a standard part of the economic development, merely by changing its shape constantly. Beginning as a crisis caused by the collapse of the US mortgage market and the associated depreciation of financial derivatives derived primarily (although not exclusively) from US household mortgages, it transformed itself into what was predominantly a crisis of banks and financial institutions and their mutual trust in 2008. Since 2009, and with increasing intensity in 2010 and 2011, we have seen it as a government debt crisis that has reached the stage of actual insolvency in many countries. Other countries, including OECD members, will face insolvency in 2012. There is an imminent threat that the crisis may find a new shape before our decade reaches its half point, a crisis that we can call a “general crisis of household debt”. This paper analyses the symptoms of that crisis and assesses its true and potential danger, concluding that this crisis would start a new stage that we may call “total financial crisis”.

**Keywords**— banking sector, eurozone, financial crisis, financial fragility, household debt.

## I. FINANCIAL MARKET SITUATION

IN the dawn of the 21st century, the world economy has experienced two significant financial crises that have proven stronger than the majority of problems that the economic world has ever faced, at least at times of peace.

The first of the two events was the deep and destructive financial crisis of 2007 and 2008, marked with events such as the fall of Lehman Brothers.

The second event is the government debt crisis which is sometimes referred to, albeit somewhat erroneously, as the eurozone crisis. The fact is, however, that it has affected public finance in basically all developed countries of the world. Formally speaking, while the downturn began in 2010, in fact its origins may be traced decades back. And it is only difficult to predict how much longer it is here to stay although the most visible signs of the crisis are likely to persist at least

Manuscript received September 16, 2011. Revised version received December 16, 2011. The article is one of the outputs of a research project carried out by the Faculty of Business Administration, University of Economics, Prague, (Czech Republic) New Theory of Business Economics and Management of Organizations and their Adaptation Processes, file no. MSM 6138439905 and with the support of Grant Agency of the Czech Republic No. P402/12/G097 DYME Dynamic Models in Economics.

L. Smrčka is with the Faculty of Business Administration, University of Economics, nám. W. Churchilla 4, 130 67 Praha 3, Czech Republic (phone: +420-224-098-656; fax: +420-224-098-649; e-mail: smrckal@vse.cz).

M. Arltová, Ph.D., is with the Statistics and Probability Department, University of Economics, nám. W. Churchilla 4, 130 67 Praha 3, Czech Republic (e-mail: arltova@vse.cz).

throughout the period of 2014 to 2015. Whether we are to see a resolution of the issues at its end remains unsure and, actually, highly doubtful. This particular crisis may be referred to as the “public debt crisis”.

What comes next? We are likely to experience a third wave of deep and global financial turmoil, marked by the liquidity crisis of households in developed countries, their incapacity to honor their commitments and widespread insolvency. These three events mark the end of a certain idea of how the global financial markets work and how debtors and creditors act.

Unfortunately, this does not mean that after that there will be a period of low debts, budget discipline, careful family planning and rational treatment of finance in general.

On the contrary: there are many signs, which will be subjected to analysis shortly, that this family debt crisis may, when combined with the unresolved public finance crisis, reach a state that we can now call “total financial crisis” for our own purposes. General mistrust in the possible resolution of the problems will lead to a full and absolute mistrust in assets, and especially in assets that have the form of derivatives or financial receivables. What we will look at is the probability of this crisis actually occurring, and the features that can be understood as signs that the crisis is imminent.

## II. THE GHOST OF GOVERNMENT DEBT

Since at least 2009, throughout 2010 and 2011 (and quite likely until 2015), public budgets in developed countries have been undergoing permanent crisis. While the majority of events marking the crisis have taken place hidden under the surface, this does not change anything about the fact that among developed countries, i.e. a group involving approximately forty countries (besides the 34 OECD members, these include other states such as Liechtenstein), there might be maybe five countries that may consider their public finance consolidated with maybe ten additional ones that are perceived as stable.

The remaining countries have been in a very difficult situation, with some of them on the verge of bankruptcy that would have in some cases materialized as early as 2009 had it not been for international aid. Here we speak of Greece, Ireland, Spain, Portugal and Italy (let alone Iceland that has actually experienced the state of bankruptcy).

Understandably, government debt pro rata GDP is not the sole key aspect of the situation; we must also pay special attention to the development of this debt in time, namely its

development that reflects the current general economic crisis associated with dropping domestic product in virtually all developed countries. The chart below (Fig. 1) shows government debt as percentage of GDP in the EU Member States and Iceland from 2008 to 2010.

It is obvious that the 2010 debt of Greece scored the highest number, namely 144.9% of GDP, with Italy second at 118.4% of GDP. The debts of Belgium and Ireland were quickly approaching 100% of GDP with 96.2% and 94.9%, respectively. According to this methodology, the EU 27's average score was 80.2% of GDP. (Various statistics yield somewhat different results of government debt as percentage of their GDP depending, for instance, on whether the GDP is calculated in purely nominal values or according to purchasing power parity; sometimes, government contributions in international institutions, i.e. uncontested assets, are set off against the debt, etc. However, the fundamental proportions between the states and their debt burdens tend to remain relatively stable.)

First, please note that with the sole exception of Sweden, no EU Member State managed to reduce its debt-to-GDP ratio in the observed period of time at least once.

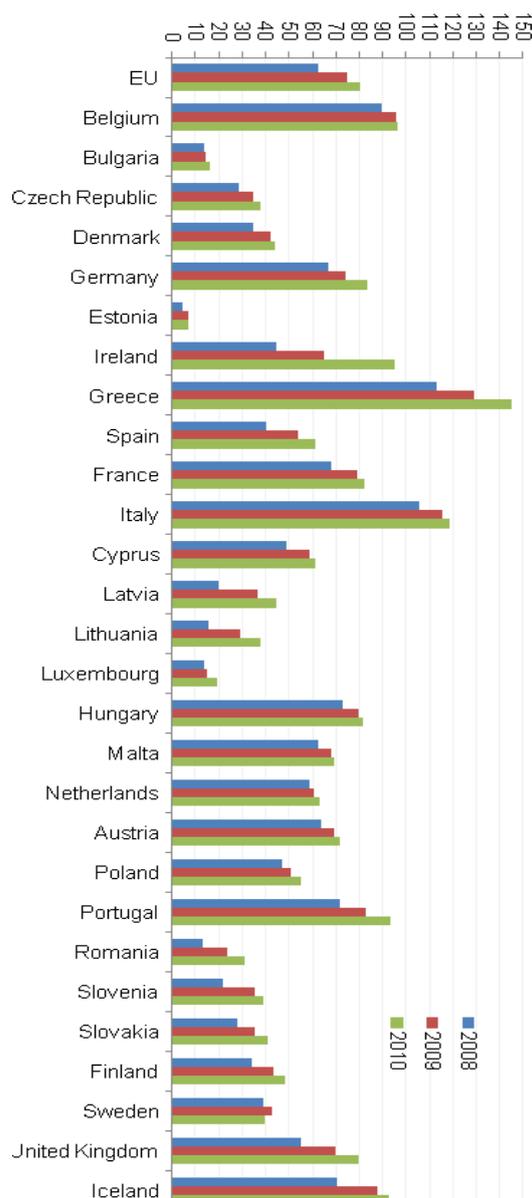


Fig. 1 General government gross debt (% GDP) [1]

Second, let us have a look at this data from a different angle. If we use the Eurostat [1] numbers for the same period and calculate the speed of growth of debt pro rata GDP, we obtain an entirely different ranking.

Table I. General government gross debt in % of GDP, growth rate 2008–2010 (%) [1], own calculations

Country	Growth rate (%)
Lithuania	145.16
Romania	131.34
Latvia	125.76
Ireland	114.22
Slovenia	77.17
EU 27	28.32

This is an interesting comparison – save for the specific case of Ireland, none of the countries in Table I rank among the most indebted, their government debt to GDP ratios not nearly attacking the 50 percent boundary. However, the speed of their debt growth is extreme. The debt of Lithuania represented about 17% of its GDP in 2008, and rose to virtually 40% in 2010 – the speed is just overwhelming. In other words, we can state that the financial and economic crisis has taken the form of a faster growth of debt shown by countries formerly having a firm grasp of their debts than the growth shown by countries with worse economic figures in the long term. We can derive the following conclusion from that: if the formerly economical countries fail to slow down their growing debts and do it fast, they will get into the situation of the states that are unable to finance their debt in the short time of two to four years.

This is illustrated in Fig. 2. The left axis shows the real growth or fall of GDP in 2010; the bottom axis shows debt as percentage of GDP. Sweden, which actually reduced its debt in 2010, witnessed the highest growth. Neither Slovakia nor Poland showed high deficits in the observed year.

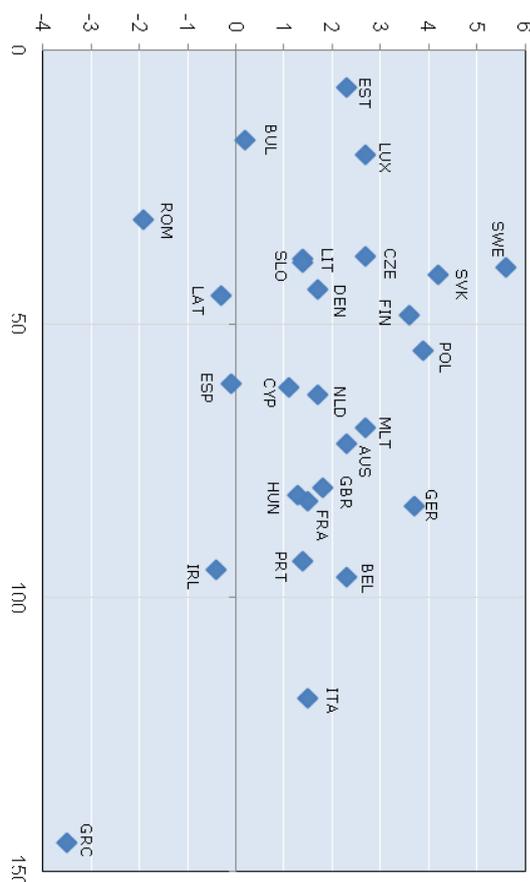


Fig. 2 General government gross debt (% GDP, bottom) and Real GDP growth rate (% change on previous year, left) [2]

Therefore, we get a surprising result: the amount of deficit and debt is not necessarily related to the growth or fall of GDP. The states that showed the worst GDP development

numbers in 2010 included Lithuania, Romania and Ireland, i.e. national economies with very dynamic debt growths, and thus extreme budget deficits. Similarly, Spain, although not ranking among the countries with the fastest rising debt, showed a substantial budget deficit; nevertheless, that did not stop its economic stagnation. Therefore, more debt and excess of expenditures over income did nothing to stimulate the economic performance of the European countries in 2010.

The issue of government debt has become, to a large extent a political one, with some governments in these countries playing down the extent of problems, the fact is that if there had been no aid provided to Greece and Ireland, the resulting conditions on international markets would have led to insurmountable problems in a number of other countries.

Fig. 3 shows to what extent some countries have to consolidate their budgets in the upcoming years in order to get their debts down to or below 60% of their GDP by 2026. As we may see, only several states do not have to change their behaviour; the interesting thing is that these are recruited from among countries with very different levels of redistribution, ranging from those where 30% of GDP passes through the national budget to countries with taxation as high as 55 to 60% of GDP. A number of countries will have to wage dramatic budget battles to decrease their spending, i.e. they will have to significantly restructure their finance. With little surprise, these are headed by the United States, followed by Ireland, Greece, United Kingdom (whose debt levels have risen very dynamically over the recent years), Iceland, Portugal, France and Poland. If we consider the percentage reduction of their spending splurge they are to undergo in order to get their debt to GDP ratio down to maximum 60% by 2026, it is obvious that their economic growth will be significantly affected by the reduced government spending for years to come.

Based on OECD analyses [4], the impacts of the previously applied fiscal policies cannot be “grown out of”, i.e. they cannot be dealt with purely based on economic growth in the debt-plagued countries. Mere stabilization of their debts preventing further growth of debts would require a GDP growth of at least 4% a year which is a rather unimaginable level especially in the group of the most developed countries. Moreover, OECD analysts have pointed out that over the next 15 years, other phenomena will manifest their presence, putting government finance in almost all OECD countries under additional pressure. These will include aging population, with pension systems and healthcare sector presenting the greatest challenges. To compensate for these phenomena alone would require resources equal to approximately 3% of the developed countries’ GDP.

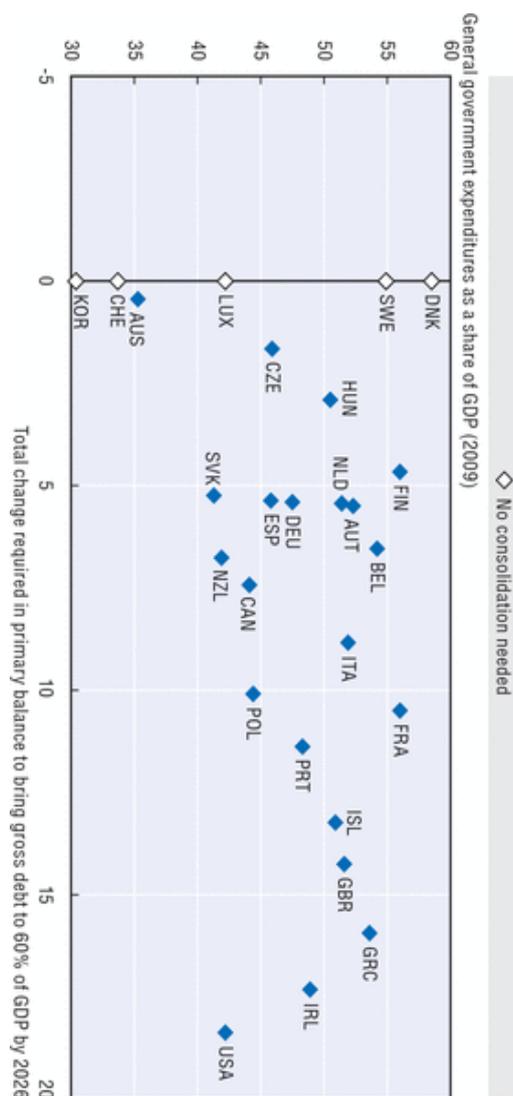


Fig. 3 Countries in need of consolidation [4]

#### A. General Issues of Restructuring Government Finance

The recovery process for the finance of any government, and for that in the developed countries in particular, is economically problematic and politically even more so. The paradox we see here is similar to that apparent in corporate life cycles: a company at the beginning of its existence is more innovative and flexible as to its management style. As the company grows and needs additional capital, two developments ensue: there is some sort of change in the ownership structure, usually resulting in scattered groups of shareholders who manage the company via general meetings, the democratic controlling instrument. As the wealth of the company increases, along with wages and bonuses, employees focus more on how to maintain their employment, with ways of avoiding mistakes becoming their major concern. All this leads to a slowdown of corporate performance. While some companies overcome this problem, others gradually lose power which results in their economic death.

By the same token, developed societies undergo a certain growth of their standard of living, marked with social perquisites and generally improved quality of living. The growth in all these areas of life over the last thirty years has been enormous and, without exaggeration, never before has the increased standard of living extended to masses of inhabitants as large as the case was in the developed countries in the late 20th century and, particularly, over the last three decades prior to the financial crisis (i.e. 1977 to 2007).

However positive this trend may have been, it went hand in hand with a massive increase in the debt of the developed countries as well as of households. The question is: Can we redeem these debts or reduce them significantly without this having a material impact on the standard of living of masses of people?

The answer is: It is very unlikely.

The current debt of the United States is worth the country's annual GDP. In Japan, the debt is twice the amount of the country's GDP, with Greece, Italy, Iceland, Portugal, Ireland and Belgium posting debts higher than their annual GDPs. France, along with several other countries, comes close. The average debt of 31 OECD countries in 2010 stood at 80% of their GDP [4], with all their debts combined totaling staggering USD 30 trillion. The debt to GDP ratio remains the worst problem and the redeeming of debt will claim a lot of sacrifices. Any future attempts at substantially reducing government debts in the developed countries will be accompanied with substantial issues of social and political character, in their extreme forms possibly endangering the very principles of democracy and free market capitalism.

#### B. The Issue of Decreased Standard of Living

The most serious issue arising from reduction of debt in the developed countries is the impacts this may have on the standard of living. Let us now attempt to examine this issue despite the nonexistence of suitable mechanisms for such calculations.

With 3% of GDP spent annually by the developed countries above their annual budgets over the last thirty or so years, the money was mostly redistributed to people via social transfers or via different forms of support. In other words, governments have become indebted in order to "distribute" approximately 3% of non-existent GDP to the inhabitants of their countries. Let us consider this a fact that these transfers amounted to the aforementioned USD 30 trillion, however problematic this thesis may be since, for example, the United States has incurred a large part of its debt in relation to the wars in Iraq and Afghanistan. Yet from a purely financial perspective this statement holds true since if money was spent on wars or any other investments (e.g. bank bailouts) then cuts should have been made elsewhere, such as in social transfers. However, this was not the case.

If a reverse "undoing" process was to materialize with a similar dynamic as the debt increase, the governments would not only have to discontinue to "corrupt" their people with 3%

of non-existent GDP annually but a deficit surplus would also have to be achieved. Currently the governments only pay interests, yet the actual debts stay the same. For the sake of simplification we may say that besides the interest payments that are already considered within budget spending, additional 3% would have to be saved in order for countries to start redeeming their actual debts with creditors.

Providing for even more simplification, it would be necessary to reduce the standard of living of those social classes that receive social benefits or enjoy other forms of budget transfers (which, in developed countries, are basically all people given the wide range of state support ranging from social benefits and subsidies for building society savings schemes, to tax-deductible mortgage interests and tax credits).

It is hardly imaginable that current political representatives would prevail in the developed countries if they were willing to uphold the principles of international cooperation and honor the countries' commitments vis-a-vis creditors both locally and abroad. Iceland is a good example of a country where the state, following a series of referendums, refuses to pay debts inherited from banks in the wake of the banking system collapse. However this may be understandable from a purely human perspective, this non-compliance with the standards traditionally applied in international relations serves as a role-model situation for other indebted countries, with this sudden surge of "direct democracy" in Iceland now serving as an inspiration to various movements in Spain, Portugal, France or Italy, let alone Greece. Also in Israel almost half a million people went to the streets in protest against high prices in early September 2011. The citizens of all these countries, previously voting for governments that indebted their countries, now pretend that the debts are not theirs, claiming they want to have nothing to do with them. And it is just a matter of time before populist groups grasp the topic and put it to their use.

### C. Household Indebtedness

The debts accumulated by governments (or within the total of public budgets) are just one side of the coin. We have seen that the issue of public debts is basically unresolvable as their redeeming would result in a decreased standard of living for large groups of population, which is unlikely to be acceptable to them. Following years of uninterrupted growth of consumption, these groups are not ready to sacrifice a part of their living standard on behalf of debt repayment.

But things get even worse. While the government debts are just one part of the story, the other is family indebtedness in the developed countries that has oftentimes attained amounts comparable to the government debts.

Just to get an idea: U.S. families owe more than 100% of GDP, with their debts thus being more serious than those of the federal government [6]. The Danes owe 145% of their GDP, the Swiss borrowed approximately 120% of GDP, the British some 105%, the Canadians 90%, the Portuguese 80%, the Germans 63% etc. As we are about to use the example of the Czech Republic as a reference in many cases, it is good to

note that with mere 30.8% of GDP in debts, Czech families are the top student in their class [6]. While all these figures do not seem to convey an image of tragedy, it is also important to understand that household debt is more expensive than debts of governments (or the majority of them, anyway); this is even more true for consumer loans, where the difference is substantial, as well as for mortgages.

By the way, family indebtedness is a phenomenon reserved almost exclusively to the developed economies. In countries such as India, China or Russia, debts are at approximately 10 to 12% of their respective GDPs; what is even more important, even at the time of economic boom their debt levels did not grow faster than the countries' GDP so the debt to GDP ratio has remained unaltered.

Despite the household debts attaining soaring heights, with their totals oftentimes significantly exceeding both GDP of the relevant state as well as net income of households, the debt issue is not sufficiently discussed or analyzed. This is also in part due to the fact, that the topic of household debt is overshadowed by continuous and recently also excited discussions on the dangers of public debt. To be fair however, the attention given to government debts is understandable at these times of persistent problems where dramatic attempts are made to save some countries from bankruptcy, with the matters further complicated by the situation on the financial markets.

However, such a comparison woefully neglects family indebtedness. The interesting question is whether family indebtedness and government debt are somehow correlated or whether this correlation is slowly beginning to show

From the formal perspective and from the perspective of economic theory, government debt and family debt should not be correlated: the decision to assume government debt is a political one, while the decision to assume family debt is individual. We can say that the ability to assume both government and family debt is fully market-dependent in developed countries, i.e. unrestricted by other factors beyond price and availability. That is why the rate of government debt to GDP and the rate of family debt to GDP should not be formally correlated.

Fig. 4 and 5 show the correlation between household debt as percentage of GDP and government debt as percentage of GDP is selected EU member states (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Luxembourg, Netherlands, Poland, Portugal, Spain, United Kingdom, Lithuania, Slovakia, Slovenia, Latvia, Cyprus) in 2007 and 2010.

Fig. 4 clearly illustrates that household debt and government debt show no statistically identifiable correlation in these countries in 2007 (i.e. before the debt crisis began).

The same countries show an entirely different distribution of these indicators in 2010 (Fig. 5). Using regressive analysis, a linear correlation between government debt and household debt has been found to have the following form

$$\text{Government debt} = 29.127 + 0.352 * \text{household debt},$$

(7.26)      (0.07)

where the number in parenthesis expresses the standard error in the estimated parameter

The  $R^2 = 59\%$  dependency rate indicates medium dependency. The F-test ( $F = 25.55$ ) and the Durbin-Watson statistics (Durbin-Watson statistics) ( $DW = 1.74$ ) confirm the model's quality. A 0.352 regressive coefficient indicates that the governments in 2010 responded to each 1% growth in household debt by increasing government debt by 0.352% on average. Which, when confronted with the zero value of this coefficient in 2007, actually means an increase by more than a third. The value of the coefficient is not too high; nevertheless, a look at Fig. 5 will reveal that household debt in some countries (namely Belgium and Ireland) approaches 200% of GDP, with government debt approaching the 100% of GDP boundary.

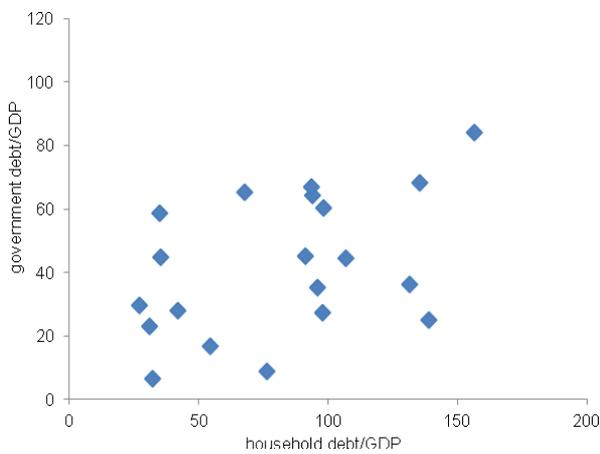


Fig. 4 Household debt as % of GDP and government debt as % of GDP in selected EU Member States in 2007 [5], own calculation

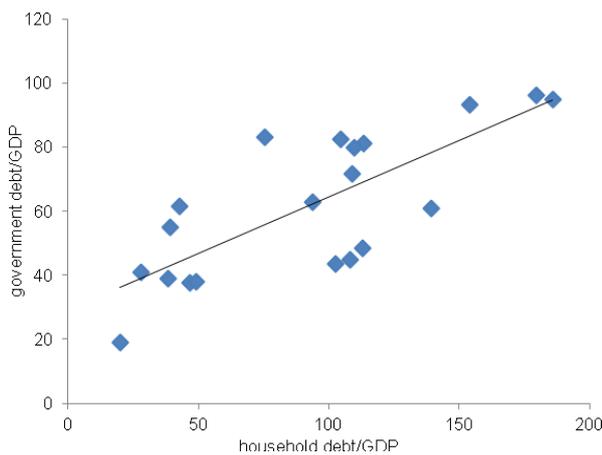


Fig. 5 Household debt as % of GDP and government debt as % of GDP in selected EU Member States in 2010 [5], own calculation

Of course, we will have a substantial problem interpreting this remarkable relation. It would be too easy to formulate a hypothesis that government debt follows household debt; their correlation emerging between 2007 and 2010 shows something rather different: the circumstances forced families and

governments alike to “subsidize” their “standard of living” with new debt that balanced out the increasing pressure of the economic crisis to reduce income and the value of assets. Of course, the dropping GDP values, which would have increased the debt-to-GRP ratio, anyway, played an important part, too. In other words: the crisis has steered governments and families to adopt the same, wrong behaviour.

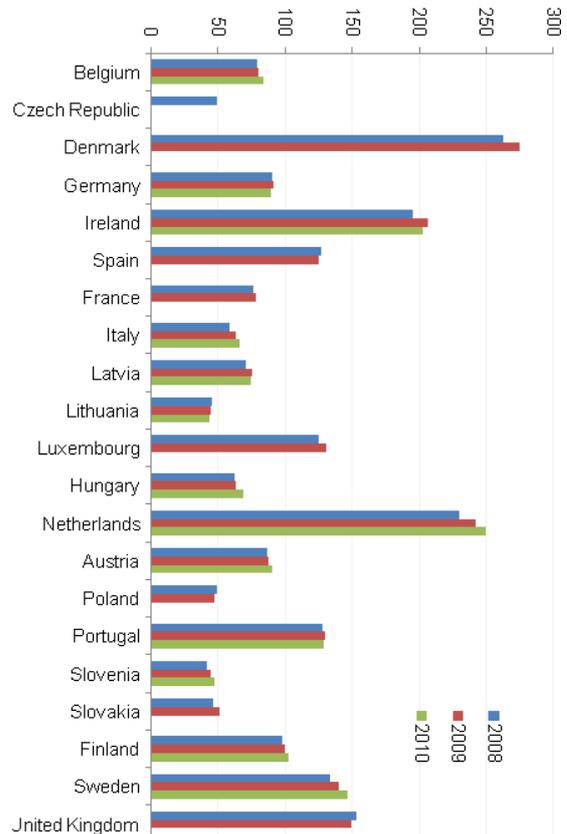


Fig. 6 Gross debt-to-income ratio of households (%) [3]

Fig. 6 shows the credit assumed by households pro rata household income in the EU member states whose statistics are available in the Eurostat database [3]. Income is expressed as gross available income. This ratio reached the highest value in Denmark (275.1% in 2009), the Netherlands (249.49% in 2010) and in Ireland (202.63%). Denmark and the Netherlands do not rank among countries facing the threat of bankruptcy in the government debt overview (Fig. 1). By contrast, Ireland definitely faces the threat of bankruptcy, and can be thus labelled as one of the riskiest countries of the eurozone. Similarly, we could consider the situation of United Kingdom, Portugal or Spain as serious: these countries have been clearly witnessing a “double deficit”, i.e. synchronized development of government and household debt, in the long run.

Table II. Gross debt-to-income ratio of households, growth rate 2008-2010 (%) [3], own calculation

Country	Growth rate
---------	-------------

Slovenia	12.5
Italy	12.2
Slovakia	10.1
Hungary	9.9
Sweden	9.9

Table II shows the growth of gross debt-to-income ratio of households in 2010, as compared to 2008. Compared to the growth of government debt (Table 1), the values are low. However, we should keep in mind that household debts have reached staggering heights in many countries. Nevertheless, Slovenia and Italy witnessed the biggest rise with more than a 12% rise compared to their 2008 figures. Slovakia, Hungary and Sweden finished close second. Of this group, Sweden is apparently facing the toughest situation, its 2010 gross debt-to-income ratio of households reaching 146.5%, the fourth biggest value in the entire EU 27 group. That is why the sustained speed of its debt growth is surprising.

Yet at the same time, the importance of family debt is sometimes underestimated due to several reasons, of which one is worth a more detailed analysis. It is generally believed that in the future the financial stability of families will be higher than that of states as, according to a widely accepted idea, in most countries assets of families are substantially higher than their commitments. In terms of insolvency patterns, families are thus more threatened by insufficient liquidity as opposed to excessive debts.

This opinion is however erroneous due to several reasons:

First of all, insolvency due to insufficient liquidity usually quickly develops into insolvency due to insufficient assets. The very lack of liquidity, which needs to be resolved via another loan or sale of assets, reduces the real value of the debtor's assets; additionally, liquidity crisis usually occurs under unfavorable situation on the asset market and is marked with decreasing prices of assets, with the price of money growing while the cash becomes less available at the same time. At that point, assets of the debtor are put to test which usually reveals that their real market value has decreased, sometimes significantly, and is below their book value or acquisition price.

The second reason for the opinion being ungrounded is the fact that it is based on the idea where the notions of "family" or "household" are not clearly defined. The question here is not whether the family has one, two or more members or consists of several generations but, rather, into what income and asset group such household belongs.

Speaking of financial instability of families, it is important to note that the group is very varied and shows a number of characteristics which make it very heterogeneous. And this is something that makes discussing family finance very different from discussions on the debts of governments; in the latter case we always assess each country specifically. But family groups, defined at the general level by individual states where these families have their domicile, involve families that are absolutely stable, families experiencing no major problems,

families that may possibly experience problems, families that already experience problems or that are highly vulnerable as well as families that are formally or actually insolvent or have excessive debts. What we therefore need to focus more on is to what extent insolvency will become widespread and whether, as a phenomenon, it will occur with a frequency that could put the banking industry, as the major "family creditor", at risk.

The following figure is very illustrative for our purposes.

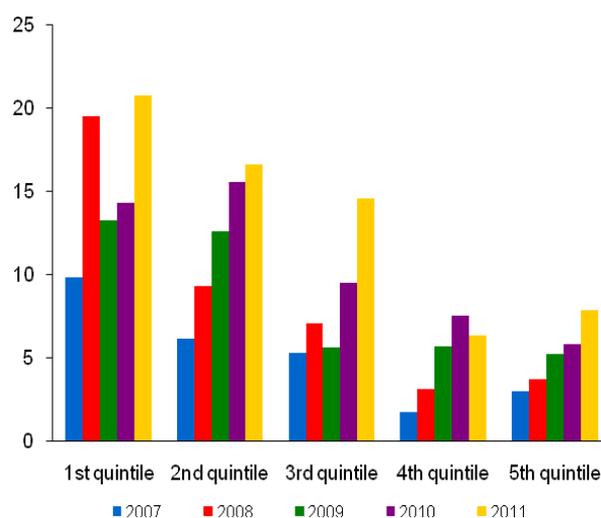


Fig. 7 Shares of insolvent households in total number of indebted households broken down by income category – simulation results [9], the figures for 2010 and 2011 are based on estimates.

We may see that the share of over-indebted families differs greatly depending on individual income quintiles.

Fig. 7 shows over-indebted families as a percentage of "families with debts", i.e. not as a percentage of the entire population of families. More specifically, 20% of Czech families have a consumer loan, with the families usually recruited from the first and second quintile, i.e. from 40% of families with the lowest income.

Applying strict logic, these families should assume no loans as their ability to repay them has been and will be poor. However, contrary to popular belief, banks hardly behave rationally and their business procedures include numerous incomprehensible factors. The following case illustrates the point: "However, the amount of expected sunshine occurring today may be not highly correlated with the amount that will prevail for one week or for one month from today. Is it the case that the results of this paper also apply to the unexpected sunshine case? In a very simple, uniform way regarding sunny weather and its resultant upbeat mood, the answer is expected to be yes. Specifically, if the amount of sunshine having occurred one week or one month from today is averagely uniform, the optimal loan rate set here is a loan rate that exists in a uniform way. In such way, the optimal loan rate influenced by sunny weather associated with upbeat mood remains the same each day. Of course, in a world without such a uniform way, other factors would affect the optimal loan rate

determination. For example, preference may play a very important role, as would more extreme problem of information asymmetries” [10].

Approximately 13% of families have a mortgage, with these families usually belonging to the fifth quintile. In terms of loan totals, the highest sums have been lent in the form of mortgages (CZK 700 million), with consumer loans provided by banks and non-bank institutions amounting to CZK 300 million.

How are we to interpret these figures in connection with the division of families based on their financial fragility and how can this example, specific to the situation in the Czech Republic, may be applied to other developed countries?

Let us begin by clarification of some facts, such as the claim that assets of families in the developed countries are generally significantly higher than their financial commitments. While the value of family assets would be worth a separate study, for which there is not enough space, we have to stick to the basics. First of all, a substantial amount of these assets is in the form of real estate property whose value has been compromised due to the mortgage crisis and the subsequent collapse of real estate prices across the developed world. Secondly, another important sum of money is represented by pension funds and the pension schemes in general; needless to say, however, that their value is not guaranteed, and, due to the set-up of individual pension schemes, these present just a limited liquidity.

Now let us look at some examples from two countries that are distant both geographically and economically. Between 2008 and 2011, real estate prices in the Czech Republic have plummeted 25 to 30% [8]. Based on the latest available data published by the Czech Statistical Office [12], the decrease is likely to continue as family spending has been reduced across the board, even affecting food consumption, an area previously immune to change. The willingness of families to invest in housing is expected to remain low and the conditions are not favorable for prices returning to their original level; in fact, current conditions do not even guarantee that they will remain the same.

As far as the reserves in pension funds and life-insurance schemes are concerned, their value is also tricky. For example, net equity of U.S. households in pension funds went down from the original amount of USD 13.4 trillion in 2007 to 10.4 trillion in 2008 and even as late as 2010 had not yet returned to its original level [6]. This is a general problem that has been subject of past research; nevertheless, its importance and, above all, practical expressions, have risen in the crisis: “The most significant problem of the financial statements and items shown is the complete inconsistency of measurement bases and the application of the historic (acquisition) cost, the fair value and the present value. At present, the principle of measurement based on the historical cost is fading out as it is gradually being replaced by the IFRS trend of reporting fair values, which are, however, difficult to measure in less transparent markets. At the same time, the reporting based on the fair

value includes the hidden danger of future volatility of such values and the consequent impact of the changes on financial statements” [7].

This shows that the issue of financial stability of families remains largely underestimated and seemingly unimportant, yet it is more serious than most might think; how pressing it actually is may become apparent over the next few years.

### III. DEFAULT MODELS

Unlike most other national banks or research organizations, the Czech National Bank (CNB) provides thorough models of financial stability of households in its Financial Stability Reports [9], attempting to predict the household default rate development. Nevertheless if we look back in history, we see that in its 2007 forecast, the bank predicted an increase of 0.5 p.p. over the then-current level of 3% that was expected to take place “if some less favorable scenarios materialize” [13]. In reality the situation was naturally much worse and, as Graph 8 shows, the credit risk (default rate) for households has now surpassed the 5-percent mark and is likely to continue growing.

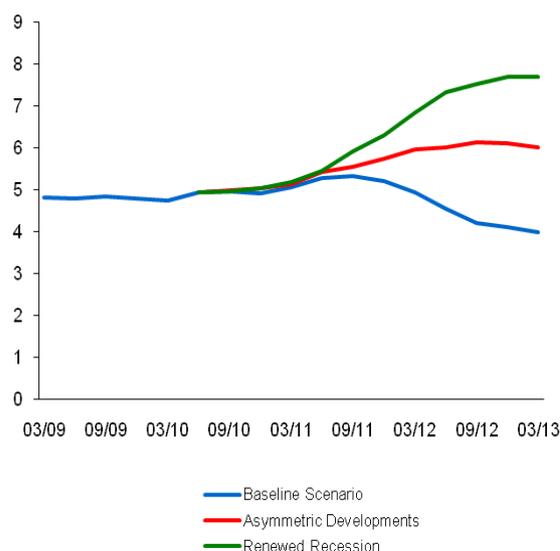


Fig. 8 Twelve-month default rate on bank loans to households [9]

It is natural that predictions do not always turn out the way they are originally expected; but here, just like in any other default forecasts, the difference seems to be due to methodological discrepancies and due to the fact that the models currently applied to predict financial fragility of households do not sufficiently consider some variables. And the fact that between 2007 and 2010 the default rates for Czech households did not change and remained just below 5% makes no difference in this respect.

Applying the Czech experience to the situation in the developed countries within the context of related facts (including information that in the Czech Republic household debts amount to 33.4% of financial assets, while in the Netherlands, Denmark and a number of other states the

indicator hovers well above fifty percent), we have to conclude that the risk of mass default of families especially among families in the first and second quintiles becomes increasingly more threatening a social and financial problem. This is also documented by the fact that while in 2007, 37.5% of bank assets in the Czech Republic was lent to people in the form of loans, currently the number is up at 44.3%.

#### IV. CONCLUSION

The threat of family defaults and excessive family debts, possibly resulting in a crisis of financial stability of households, is a real one. Even if default rates do not develop in a worse way than already predicted by the experts of the Czech National Bank, in 2013 we may expect the household default rate to be at 8%. However, since we consider this estimate affected by various methodological discrepancies, it would be wiser to expect a default rate of approximately 10%, with the segment of consumer loans suffering much more dire consequences than the segment of mortgages. A similar development may be expected also in other developed countries.

Nevertheless, we must keep in mind that if the current suspicions and signals are confirmed and the 2009 and 2010 recession is recycled, we can assume further problems with mortgages, including, without limitation, the reappearing problem of depreciating collateral that will not cover the volume of the loans granted [14]. Mortgage banks will thus face pressure in terms of reserves and provisions, disregarding the fact that they will suffer loss as the number of auctions selling real estate after the original borrowers' default increases.

Therefore, we can make a general statement that the creditors' risk associated with the insolvency potential will witness a dramatic rise in the upcoming years, which will increase the importance of mathematical methods attempting to predict insolvencies [15].

We may in no way rule out the possibility that this process will affect the financial health of the banking sector and will usher in another of the financial crisis of the recent years. While until recently households used to be omitted within discussions on financial crises, based on the belief that they were sufficiently stable financially, now we have to duly consider their position to understand their potential for destabilizing the entire financial sector and for causing a third wave of financial turmoil.

#### REFERENCES

- [1] Eurostat database, General government gross debt [Online]. Available: <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsieb090>
- [2] Eurostat database, Real GDP growth rate - volume [Online]. Available: <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsieb020>
- [3] Eurostat database, Gross debt-to-income ratio of households [Online]. Available: <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tec00104>
- [4] OECD iLibrary. (2011). *Government at a Glance* [Online]. Available: [http://www.oecd-ilibrary.org/sites/gov\\_glance-2011-en/02/02/index.html?contentType=&itemId=/content/chapter/gov\\_glance-2011-6-en&containerItemId=/content/serial/22214399&accessItemIds=/content/book/gov\\_glance-2011-en&mimeType=text/html](http://www.oecd-ilibrary.org/sites/gov_glance-2011-en/02/02/index.html?contentType=&itemId=/content/chapter/gov_glance-2011-6-en&containerItemId=/content/serial/22214399&accessItemIds=/content/book/gov_glance-2011-en&mimeType=text/html)
- [5] ECB. (2011). *Statistical Data Warehouse* [Online]. Available: <http://sdw.ecb.europa.eu/reports.do?node=1000002779>
- [6] OECD. (2011, May). *Economic Outlook No. 89*, (Preliminary Version), [Online]. Available: <http://dx.doi.org/10.1787/888932390234>
- [7] J. Strouhal, L. Mullerova, Z. Cardova, and M. Pasekova, "National and International Financial Reporting Rules: Testing the Compatibility of Czech Reporting from the SMEs Perspective," *WSEAS Transactions on Business and Economics*, vol. 6, no. 12, December 2009, pp. 620–629.
- [8] OECD. (2011). *OECD.StatExtracts, Household assets* [Online]. Available: <http://stats.oecd.org/Index.aspx>
- [9] ČNB. (2011). *Zpráva o finanční stabilitě 2010/2011* [Online]. Available: [http://www.cnb.cz/cs/financni\\_stabilita/zpravy\\_fs/fs\\_2010-2011/index.html](http://www.cnb.cz/cs/financni_stabilita/zpravy_fs/fs_2010-2011/index.html)
- [10] Jyh-Juan Lin, Jyh-Hong Lin, and R. Jou, "The Effects of Sunshine-Induced Mood on Bank Lending, Decisions and Default Risk: An Option-Pricing Model," *WSEAS Transactions on Information Science and Applications*, vol. 6, no. 12, June 2009, pp. 946–955.
- [11] <http://www.realitycechy.cz>, <http://www.realitymorava.cz>
- [12] ČSÚ. (2011, September). *Rychlá informace, Pokles tržeb za potraviny i v běžných cenách* [Online]. Available: <http://www.czso.cz/csu/csu.nsf/informace/cm1090211.doc>
- [13] ČNB. (2007). *Zpráva o finanční stabilitě 2007*, [Online]. Available: [http://www.cnb.cz/miranda2/export/sites/www.cnb.cz/cs/financni\\_stabilita/zpravy\\_fs/fs\\_2007/FS\\_2007\\_2\\_realna\\_ekonomika.pdf](http://www.cnb.cz/miranda2/export/sites/www.cnb.cz/cs/financni_stabilita/zpravy_fs/fs_2007/FS_2007_2_realna_ekonomika.pdf)
- [14] C. G. Bonaci, D. Matis, and Jiri Strouhal, "Crisis of Fair Value Measurement? Some Defense of the Best of All Bad Measurement Bases," *WSEAS Transactions on Business and Economics*, vol. 7, no. 2, April 2010, pp. 114–125.
- [15] M. Răileanu Szelesa, "Introducing an innovative mathematical method to predict the bankruptcy risk. Measures for the financial markets stability," in *Proceedings of the 10th WSEAS International Conference on Mathematical and Computational Methods in Science and Engineering*, Stevens Point, 2008, pp. 481–486.

**Ing. Luboš Smrčka, CSc.** graduated from the Czech University of Life Sciences in Prague in 1984. After 1993 he left the Institute of Experimental Botany at the Czechoslovak Academy of Sciences to start business. Gradually, he acquired several professional specializations: tax advisor (1993), broker (1996), certified balance accountant, (1998), forensic expert in economy, prices, and valuation specialized in the valuation of securities, RM-S and stock exchange and business valuation (2000, extended in 2003), accounting and tax expert (2001).

In the last 4 years, he has worked as a Lecturer in the Department of Business Economics at the Faculty of Business Administration of the University of Economics in Prague. He deals with personal and family finances and insolvency.

**Ing. Markéta Arltová, Ph.D.** graduated from the University of Economics in Prague in 1992, majoring in Economic Statistics. In 1999 she successfully defended her doctoral dissertation in Statistics.

She currently works as a lecturer in the Statistics and Probability Department at the University of Economics in Prague. She focuses on analyses of economic, financial and demographic time series.