

Debt in Relation to the Standard of Living Enjoyed by the Population of Developed Countries

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Abstract— The paper attempts to analyze the effects of the cumulated public sector debt, in this relation essentially government debt and family debt, primarily on the development of the population's standard of living. In this regard, the paper quantifies the impact of debt on the real standard of living – whether we define it merely as the ability to consume, or whether we define it widely as the sum of multiple criteria, including, for instance, the quality of the environment. This quantification uses the data from the economy of the Czech Republic; however, this method can be in principle used for other national economies but must be adjusted to reflect the specific features of their development. Using the analysis of time series, the paper investigates some other aspects of the debt situation of families in the Czech Republic, especially the development of the relationship between the families' savings and debt, and finds that debt prevails over savings in the long run. Several conclusions for the future can be derived from these results. These conclusions can be summarized in a statement that future political representations will have to continuously bridge the divide between the need to reduce the standard of living of large groups of the population on one side and the need to make sure that the necessary reforms are politically viable on the other side.

Keywords— debt crisis, eurozone crisis, gross domestic product, mortgage crisis, public budgets, standard of living.

I. FINANCIAL CATAclysm

THE financial crisis that hit the entire developed world in 2007 has been slowly gaining the dimensions of an Ancient tragedy. The inevitability of its development resembles Oedipus Rex by Sophocles.

The efforts to avert the forecasted development have only lead to further tragedies. The standout feature of Ancient plays is the inevitable faith that crushes the individual characters. Similarly, all that is now happening in the developed economies has been long foretold. We did not see our future because we simply did not want to see it; and now we are

unsure why we did not see the end. Just like Oedipus cannot avert his own destiny and despite all the effort and fear of the future, he becomes the murderer of his father and the husband of his mother for his quick temper, indebted developed countries have inevitably plunged to the point where they must meet their destiny.

In economic terms, we have witnessed two financial crises in the past years, each with its own, distinct character. Another cataclysm will inevitably follow.

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 2009, 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 throughout the period of 2010 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 honour 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.

Quite the contrary: Let us formulate a hypothesis that for various economic and political reasons, developed countries will be unable to consolidate public budgets, and their societies will be unable control their family budgets to a mass degree that can be deemed as having destructive societal effects. We can formulate a crucial and undoubtedly almost heretical idea: these states and their citizens are unable – for various reasons – to reduce their standard of living by gradual steps so as to gain the ability to repay their public and family debts. However, this would imply that if no rational outlook for an evolutionary resolution of the situation exists, a revolutionary resolution, i.e. a solution in the form of “a giant

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leap”, must inevitably follow. For our purposes, we can call it a process of “financial cataclysm”.

II. BEGINNINGS OF CRISES IN THE DEVELOPED COUNTRIES

If we take a look at the nature of the individual components of the financial crises that have been shaking the world economy since 2007 with at least some care, we can get a glimpse of their causes.

Let us take first the US mortgage market crisis, which was, without a shadow of doubt, caused by an entirely ineffective regulation of the whole system, combined with the governmental agencies’ drastic (albeit sometimes indirect) subsidies to the mechanism.

In addition to tax reliefs, semi-governmental organisations provided guarantees for the loans granted. The federal government thus pumped at least USD 3.5 billion into the system (from 2000 to 2007) [1]. And while that’s a mere estimate of only the demonstrated costs or the guarantees truly made, the question remains what money was injected in real estate thanks to the cheap money policy promoted by the Federal Reserve system.

In any case, it was this exact money that helped trigger two parallel phenomena: first, the creation of the real estate bubble that meant a substantial overvaluation of real estate, and second, the fact that hundreds of thousands of households incurred debts, including households that would not have had any chance of obtaining a loan in light of their economic performance under standard conditions. An entirely perverse system of subsidies to real estate ownership created absurd situations in which families took on mortgage loans designed, by a political decision, to ensure home ownership “for everyone”, although they had been the owners of the mortgaged property long before. Therefore, “home ownership” remained the same but the family obtained a loan for its own consumption, i.e. to improve its real standard of living beyond the standard of living given by the economic performance of the family through debt, albeit debt that was formally guaranteed and in reality made cheaper by governmental policy.

The developed countries’ debt crisis and the real estate crises in the USA and in dozens of other countries share many common features. Let us have a look on debt per capita figures in the individual OECD member states, for instance.

Table I. Gross public debt per person (USD PPP) [2]

	2007	2010
Estonia	1545	2549
Korea	7310	9924
Australia	5351	10089
Slovak Republic	6861	10738
New Zealand	7200	11377
Czech Republic	8285	12149
Poland	8674	12305
Slovenia	8166	13388
Hungary	13909	18047

Luxembourg	9864	18218
Switzerland	20028	18530
Sweden	18987	19480
Finland	14968	21123
Denmark	12958	21636
Spain	13585	21648
Israel	20660	22326
OECD31	18702	25947
Portugal	18255	26425
Norway	31569	28134
United Kingdom	16861	29507
Netherlands	20992	29972
Austria	23823	31428
France	24074	32606
Germany	23301	32961
Canada	25512	33208
Belgium	31367	37850
Ireland	13043	40141
Greece	31884	41353
Italy	35971	41986
Iceland	19804	43232
United States	28856	44616
Japan	56090	67423

Over In 2010, the OECD countries’ purchasing power parity averaged at USD 25,947. Please note that the countries hit by the crisis the hardest rank at the very bottom of the table, i.e. their 2010 debt per capita ranked among the highest.

Of course, the dramatic growth of debt between 2007 and 2010 is a fact of similar importance – only two OECD states managed to reduce their debt between those years – Norway and Switzerland. All other countries chose not to combat the effects of the crisis by balanced budgets and discipline, but by a dynamic growth of debt. This is well illustrated by the following table:

Table II. General government gross debt as a percentage of nominal GDP [2]

	2010	2007	2000
Japan	199.7	167.0	135.4
Greece	147.3	112.9	115.3
Italy	126.8	112.8	121.6
Iceland	120.2	53.3	72.9
Portugal	103.1	75.4	60.2
Ireland	102.4	28.8	39.4
Belgium	100.7	88.1	113.7
France	94.1	72.3	65.6
USA	93.6	62.0	54.5
Germany	87.0	65.3	60.4
Hungary	85.6	72.5	60.8
Canada	84.2	66.5	82.1
UK	82.4	47.2	45.1

Austria	78.6	63.1	71.1
Israel	76.1	77.7	84.5
OECD31	74.2	55.6	59.4
Netherlands	71.4	51.5	63.9
Spain	66.1	42.1	66.5
Poland	62.4	51.7	45.4
Finland	57.4	41.4	52.5
Denmark	55.5	34.3	60.4
Norway	49.5	57.4	32.7
Sweden	49.1	49.3	64.3
Slovenia	47.5	30.0	33.7
Czech Rep.	46.6	33.7	30.5
Slovak Rep.	44.5	32.8	57.6
Switzerland	40.2	46.8	52.4
N. Zealand	38.7	25.7	36.9
Korea	33.9	27.9	19.0
Australia	25.3	14.2	24.6
Luxembourg	19.7	11.7	9.2
Estonia	12.1	7.3	9.4

III. DEBT AND STANDARD OF LIVING

By now, i.e. by November 2011, Iceland, Ireland, Greece and Portugal have undergone a de facto state bankruptcy, with Italy, potentially Spain and very probably Belgium next in line. France and other countries are in serious danger. Two developed countries have not become insolvent by a mere coincidence: the United States because they can print a virtually unlimited quantity of new dollars, and as long as the dollar remains the reserve currency, they can export their problem overseas. In addition, the USA can rest assured that although the dollar is retained as the reserve, the influx of dollars from overseas in the US economy will not dry out because the dollar cannot be ultimately realised anywhere else. The second country that enjoys a rare and extraordinary advantage is Japan. Its astronomical debt is owned primarily by the citizens; the government keeps drawing from household savings that are extremely high due to a combination of various factors. The Japanese public debt is not exposed to the turbulent markets, with only six percent of the debt denominated in foreign currencies. Therefore, with the low yen rates, the debt service is very cheap. According to OECD data, the Japanese government spent only 2.5 percent of the country's GDP on debt service both in 2007 and in 2009 (newer data is unavailable). Just to compare, Iceland spent 6.6%, Greece 5.3%, Italy 4.6%, Hungary 4.5% of its GDP on debt service in 2009, and the list goes on.

A. Principle of the Public Budget Crisis

Whatever the specific reasons of the individual components of the cascading financial crisis, their essence always remains the same – the truly achieved standard of living clashes with the living standard that would match the true economic performance of the given country. The Czech Republic can serve as the perfect illustration.

We rely on the hypothesis that any government debt, or public debt in general, will sooner or later lead to a growth of the households' available income. This is given by the principle of debt consumption – if the debt is drawn to retain the state's ability to make, for instance, pension or social benefit payments, or to fulfil its duty to pay wages to civil servants or governmental organisation or institution employees, the debt will always pass on to the available income directly. If the debt is drawn for building projects or for similar "development" projects, it is used to implement projects or purchase goods that would not have been implemented or purchased otherwise. Nevertheless, domestic product that would not have otherwise come into existence is created, and similarly, wages that would not have been paid otherwise are paid, or profit that would have been lower or non-existent without the public sector debt is generated. Therefore, public sector debt will always be transformed into available income.

The scope of this transfer is open to discussion. However, this discussion lacks corresponding content – we do not know what payments would have been sacrificed if the government (or municipality) had been unable to borrow the money; therefore, we can easily say that the debt is used to pay pension or social benefit payments or to make transfers to households in general, or to pay wages, i.e. that it is transformed to available income of households in direct and in absolute terms.

If debt is not incurred as a result of rising expense but of dropping income, e.g. by reduced tax burden, the effect remains the same. If taxes fall without the state adequately curtailing outgoing payments, the public sector pays more money to individuals and corporations alike without reducing the comfort created by the state (or course, we can debate indefinitely whether this comfort is beneficial or ineffective – but this question is irrelevant in this case). This comfort supplied by the state is also an expression of the standard of living – be it in the form of unemployment benefits or a specific number of students in a standardised elementary school class, i.e. in the number of teachers available to the education system. Reduced tax increases net income, i.e. it is directly reflected in the standard of living by means of higher available income.

It is thus irrelevant whether public budgets incur debt through rising expense or reduced income – in all standard situations, debt is a direct subsidy to the standard of the citizens' living. (Of course, there are rare exceptions, e.g. foreign military ventures by states purchasing weapon systems and other equipment from foreign suppliers; nevertheless, this surely is not the case of any of the countries facing a debt crisis at the moment.)

Debt is sometimes spun as "investment" aimed to increase the economy's future resistance and to kick-start economic development in general. However, as proved beyond any doubt, extremely indebted countries do not boast any substantially higher proportion of hi-tech economy than countries with significantly lower debt indicators [3].

B. Inflation is not a Solution

We have thus come to the conclusion that the accumulated public debts have spurred a growth in their citizens' standard of living, and that their "true" standard of living, i.e. the standard truly experienced by the citizens, exceeds the standard that would have been experienced by the same citizens were it not for the public budget deficits. Of course, this conclusion hardly comes as a surprise.

For instance, Michael Pento, senior economist at Euro Pacific Capital, Inc., wrote the following in his article, emotively entitled "Say Goodbye to Your Standard of Living, Inflating Away America's Future": "The consequences for the future economy are clear: Living standards are set to decline dramatically, especially for those who have the least time to prepare. We must balance our budget, boost the value of the dollar, lower inflation, cut taxes, reduce regulations and introduce competition back into our educational system. That is the best hope for America's future. Since the bond vigilantes are currently busy over in Europe, the U.S. may have a little bit of time remaining" [4]. We can find many similar warnings in what is essentially journalistic writing. Nevertheless, this issue has been neglected by scientific research in economics.

However, another, often forgotten, fact must be pointed out in this context: all debt repayment methods are detrimental to living standards, although some methods may defer this detrimental effect to some extent or partially mask it as the result of other factors. Be it debt monetisation or repayment through inflation, or even if we forced the investors to write off a part of the debt, the problem will still boil down to the key point of all our considerations one way or another. If the investors write off a part of the debt, it will primarily mean that the assets will be written off by the banks with the full impact of this step – the need to strengthen capital, to suffer substantial loss that will be ultimately transferred to the states and the bank's shareholders and, in the form of rising fees or interest differential, to all banking sector clients who will have to pay the increased cost. Even inflation triggered to reduce the actual debt by depreciating currency will in reality always reduce the standard of living, disregarding the fact that the banks will suffer again, which will again put public budgets under increased pressure as the banks' capital will have to be again strengthened. And so on.

However, the time has come to ask whether we can somehow foresee the extent to which the living standard in developed countries will have to be reduced so that these countries' sovereign debt, or a part thereof, could be repaid?

C. To what Extent is the Standard of Living Artificial?

Therefore, we must identify the extent to which the current standard of living in the developed countries exceeds the standard that would match their economic performance.

In doing so, we will have to tackle the first problem – lack of consensus as to the indicators by which a term of such vagueness as the "standard of living" can be measured.

The fundamental dispute is whether the standard of living can be in principle measured separately by real purchasing

power, or whether a more complex system of values and parameters must be defined (e.g., safety and crime level, quality of the environment, enforceability of law etc.). Without engaging in this debate, it will suffice for our purposes to perform a basic comparison through the quantity of money available to an average household, i.e. using the available income.

This indicator is expressed in national units, just like debt, which allows us to compare government budget deficits to household available income.

So far, we have not mentioned another type of debt, which has already grown to enormous proportions and which will only grow in the future – household debt. One cannot ignore the fact that household debt in the developed countries has witnessed a dramatic growth in the past two decades or so. If we look at the impact of household debt on the standard of living, this correlation is purely direct and even less prone to argument than the relation between public budget deficits and the citizens' standard of living. Household debt clearly constitutes direct purchase of a standard of living in excess of present income. Families mostly assume their income to grow in the future, i.e. that the repayment will not be as painful and will not entail drastic savings; nevertheless, this model is fragile, and depends on the development of the household's economic situation. In today's cascading, systemic financial crisis, one cannot assume the household income in the developed countries to witness a dramatic growth in a few, let us say five, years ahead. Therefore, a model based on debt repayment through growth, which formed the basis of the strategy adopted by millions of families in the developed countries, now seems very unlikely.

In an attempt to express the "artificial" portion of the standard of living, we will analyse the situation in the Czech Republic.

D. Impact of Sovereign Debt on the Standard of Living in the Czech Republic

To identify the extent to which assumption of debt by the public budgets and by households affects the standard of living, we must primarily compare the debt development with the development in the available income of households. We have concluded that the volume of household debt constitutes the direct price paid to "purchase a standard of living", i.e. that the debt becomes a direct accelerators of the living standard. In this respect, the situation is perfectly clear.

We have already mentioned the question to what extent can we deem public debt to form a part of family income. We have also concluded that the assumed government debt will, sooner or later, become a part of the income available to families – the question is not if, but when. Nevertheless, to reflect this impact and bearing in mind that some public budget deficits will not inevitable end up in household economy but may serve to pay for imported goods and services, we will reduce public budget debt to 0.75 of its true figure.

Table III. Budget deficit (75 percent) and household debt pro rata available income of households [5], [6]

Year	2001	2002	2003	2004	2005
Available income	1293	1348	1409	1474	1551
State budget deficit (0.75)	51	34	82	71	42
Family debt balance	17	41	57	76	101
Deficit + debt balance	68	75	139	147	143
Share in available income	5.3	5.6	9.9	10.0	9.2
Year	2006	2007	2008	2009	2010
Available income	1675	1833	1987	1976	2000
State budget deficit (0.75)	74	50	14	144	117
Family debt balance	133	222	157	74	28
Deficit + debt balance	207	272	171	218	145
Share in available income	12.4	14.8	8.6	11.0	7.3

As indicated by Table III, the share of government budget deficit (reduced to 75% of its original amount) and the positive balance of debt assumed by Czech households has reached substantial amounts throughout the years. Please note that this share climaxed during the biggest economic growth mainly due to the high household debt numbers. By contrast, the crisis years of 2009 and 2010 saw a dramatic increase in the effect of social benefits and redistribution of funds, i.e. the rising importance of budget deficit.

Let's go back for a few moments to the chosen coefficient of 0.75 – this way, we will reduce the effect of government debt on the rise of the standard of living based on the assumption that not all the money spent by the government from its budget deficit will translate directly into artificial growth of the standard of living. This three-quarters effect is a purely theoretical index, and the real proportion may probably be higher; however, as general precaution, it is better to use a figure that may be less likely but that does not entail the risk of artificially increasing the effect and the need to index the original figure in any way.

The 75% proportion is based on the proportion of the imports to the gross domestic product created by the Czech economy in 2010: total imports of goods reached CZK 2.4 billion, while the gross domestic product totalled at CZK 3.7 billion. However, the fact that the state is not primarily a major importer had to be taken into account, too.

E. Some Comments on Other Aspects of Debt

We have shown that the debt of families and government, which went on to witness substantial growth in the Czech economy especially in the new Millennium was, and still is, likely to have a very decisive effect on the overall standard of

living enjoyed by the population. Of course, this leads to many other questions.

For instance, we could argue that this impact on the living standard is visible only if we understood this indicator in terms of pure consumption, i.e. as the ability to consume. In other words, if we understood “standard of living” as a phenomenon mechanically connected to the sums that the population is able to pay for its consumption in the broad sense of the word, i.e. that this “argument by debt” does not entail questions like the quality of the environment, safety etc.

This objection is meritless. If we used a very naïve but practical analogy in this case that all the debt was consumed to improve the environment and to increase safety, we would achieve a certain standard of living in these areas. If the funds were used correctly, we could probably say that the air is cleaner, the waters healthier, smaller quantities of heavy metals pollute the nature, and some species have been saved from extinction. Similarly, we could argue that murders, thefts and other crimes were on the decline. Nevertheless, environmental preservation and protection of safety have their own expenses to be spent in the future. These expenses are clearly derived from the level currently achieved and are related to the current funding of environmental protection mechanisms (e.g. wages paid to the competent officers) or to the funding of security corps and their equipment, the technologies used and their usable life. High past expenses inevitably lead to high future expenses depending on the achieved quality of the public estate.

The proportion between past and future expenses will understandably vary widely depending on the characteristic features of the cases at hand. For instance, future costs of funding security corps can be a priori labelled as constantly growing costs, if only because inflation must be eliminated and demands for the growth of real wages can be expected. Similarly, the price of equipment used by the security corps will inevitably witness a constant growth. The same will apply to wages and common equipment of the environmental officers; however, the situation will differ for necessary investments, which usually enjoy a relatively long usable life. However, when looking at a relatively long timeframe, we can see the costs of preserving the status quo grow in the future, too.

In other words – if we want to reduce the accumulated debt that would be incurred (in our theoretical world) by funding the quality of environmental protection and safety, we will have to stop providing sufficient funding to these areas in the future, which, however, will reduce both parameters. And given that we included these parameters in the evaluation of the overall standard of living, the end of sufficient funding will translate into a corresponding drop in the standard of living measured in this holistic manner.

Therefore, we can see it is irrelevant whether we define “standard of living” to include only the ability to consume or add other aspects of life – the need to repay debt will always be reflected in any definition we may choose.

IV. MATHEMATICAL ANALYSIS OF SOME ASPECTS OF DEBT

One of the extremely interesting circumstances of the growth of government and family debts is its relationship to the development in the primary deposits of families, i.e. to the development of the families' financial assets.

On first sight, the relationship to government debt escapes us, of course. Nevertheless, quite an interesting thought offers itself: can government debt and family debt share any features in terms of their development in time? Already some of the relations shown in Table III. are interesting and raise many questions. For instance, we can see that household debt and government debt are mutually "complementary". Periods of high growth in family debt witness slower growth of government debt. It works the other way around, too – if government debt shows a truly dynamic growth, we can see the family debt growth slow down. This phenomenon is probably related to the economic cycle: we see faster growth of debt of the Czech Republic primarily in periods when the economy slows down, and later stops or even enters recession.

However, it is not as easy as that. If we were to carefully analyse the family debt development, we would see a dynamic growth that continued to gain speed until 2007; new debt was still enormous in 2008 and while it slowed down in 2009, it was still high.

In this context, we have to realise that Czech budget deficits were marginal and government debt was not worth mentioning throughout the nineties. It was the crisis of the Czech crown in 1997 and the subsequent recession of 1998 through 2000 that motivated Miloš Zeman's cabinet in power at the time to support the economy with a budget deficit; however, this deficit was still hardly significant and in looking back, the volumes of debt were essentially marginal. However, later governments failed to control this development, which can be seen as a trend that mirrored the development of family debt – Czech households in 2000 had no debt to speak of, and the dynamic assumption of debt seemed to follow the "example" set by the government.

We can speculate whether the beginning of the era of deficit-based government funding helped Czech families break the psychological barriers by "legitimising" debt.

A. Mathematical Analysis of Families' Financial Savings and Debt

Speaking of family debt, it is undoubtedly interesting to look at its relationship to savings. This comparison offers an interesting array of conclusions.

Figure 1 shows the volume of credit and deposits of Czech households in 1990–2010 (in millions of Czech crowns).

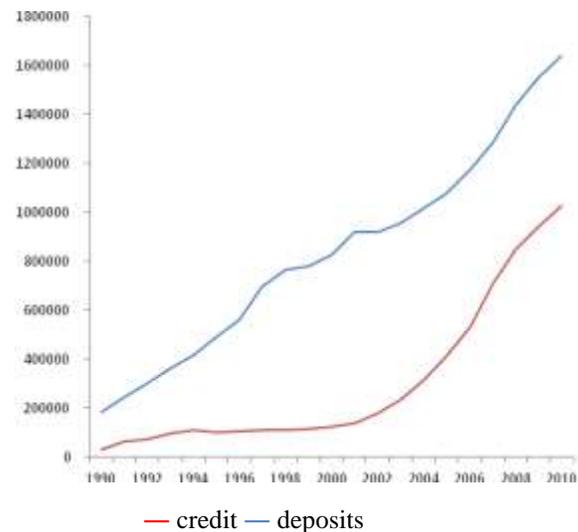


Fig. 1 1990–2000 household credit and deposits in the Czech Republic (in CZK mil.) [7]

Both time series are characterised by pronounced, almost exponential, growth. Comparing the dynamics of the two indicators, the average rate of growth clearly shows that the average growth of household credit (18.9%) exceeds that of deposits (11.6%). While household deposits have been growing continuously throughout the observed period, household credit, overcoming the initial stagnation, did not witness fast growth until 2000, when it grew by 23.7% per year on average.

Of course, inflation must be added to this picture: inflation had a substantial impact on all monetary and financial indicators of the Czech economy primarily in the first half of the nineties. Therefore, it is important to realise that although deposits nominally doubled in size between 1990 and 1994, real deposits remained the same or may have even witnessed a drop, as 1990 and 1991 in particular saw substantial currency depreciation due to the process of price liberalisation. Even the data for the subsequent five years is affected by the high rate of growth in consumer prices. By contrast, after 2001 inflation can be no longer deemed a serious enemy of the Czech economy, which actually had to face deflation tendencies at times.

A look at the proportion of household credit to deposits is also interesting (Fig. 2).

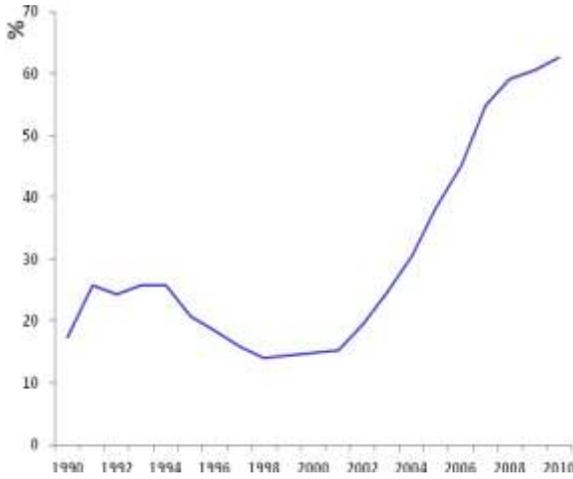


Fig. 2 Proportion of household credit and deposits in the Czech Republic from 1990 to 2010 in % [7], author's calculation

The development of this proportion can be divided into three stages: from 1990 to 1994, the proportion grows from 17 to 25.8%, then drops from 18 to 14% between 1995 and 2001, and witnesses a sharp rise up to 63% from 2002 on.

We can define the first stage as the first period of reforms, a radical transformation of the Czech economy from a centrally planned system to a market economy. Banking services were dramatically underdeveloped, and the governments of that time followed the official policy of an essentially balanced budget. The citizens had no opportunity or desire to take on debt; in addition, the high inflation meant that money was relatively expensive in real terms, too. On the other hand, the "small privatisation" and other privatisation efforts were under way in that period, which increased the demand for credit aimed in that direction. Significant portions of these credits were assumed by private individuals and thus acted as family debt. That was the main reason why the volume of money deposited by the citizens in banks, which were in turn loaned by the banks back to citizens, witnessed a growth in that period.

The years 1995 through 2001 saw a stagnation of credits, and the proportion of deposited funds used to provide credit to households dropped as a result. Again, this follows perfect logic. The wave of privatisation was over, and families still had no motivation to take on debt. Money was still expensive and, in addition, the Czech crown went through a small, local monetary crisis in 1997. The crown's exchange rate faced immense pressure from speculators, and one of the results of the crisis, aggravated by a slowdown and later even recession of the economy, was the temporary sharp increase of the key rates of the Czech National Bank and a stricter setup of the general conditions on the banking market. The Czech banking sector went through a tough healing process, with more than ten banks disappearing from the market in the second half of the nineties.

The period after 2002 can be defined as the true boom of household debt – the truth remaining that most of these loans

were drawn for housing purposes. Nevertheless, we can see that at the end of 2010, no less than 63 percent of the total household deposits were used for credits.

If we were to analyse the relationship between credit and deposits of Czech households on the basis of quantitative analysis, we would conclude that although Figure 1 might indicate a relatively strong relationship between the two indicators, we would find that the relationship is only a spurious relationship, called "spurious regression" in the literature (e.g. [8], [11]).

For this reason, we will try to add a third indicator in this relationship – the registered unemployment rate – which could help capture the unexplained dynamics of the rest of the model.

A simple linear regression has been used for the model, which complies with [9] in this case because unit root tests [10] have shown that all the used time series are non-stationary (deposits $tADF = 1.638$ Prob. = 0.999, credit $tADF = 0.863$ Prob. = 0.773, unemployment rate $tADF = -1.809$ Prob. = 0.363), while their linear combination is stationary ($tADF = -4.439$ Prob. = 0.004).

Table IV. Model of the dependency of credit to unemployment rate and deposits in 1993 through 2010, author's calculation

Dependent variable CREDITS				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-244498.7	55746.5	-4.3859	0.0005
UNEMPLRATE	-52487.0	9216.45	-5.6949	0.0000
DEPOSITS	1.0075	0.0607	16.5990	0.0000
$R^2 = 0.95$		F-stat = 153.65		Prob. = 0.000
Breusch-Godfr. Ser. Corr. LM test = 1.408				Prob. = 0.302
Heteroskedasticity Test = 1.4103				Prob. = 0.253
Jarque-Bera Test = 0.277				Prob. = 0.871

The impact of the unemployment rate (UR) and deposits (DEP) on credit (CR) can be thus expressed by the following model

$$CR_t = -244\,498.7 - 52\,487 UR_t + 1.0075 DEP_t + \epsilon_t$$

A diagnostic examination of the model (for more details, see [9]) indicates that the non-symmetrical component at has the features of the white noise process (Table IV.).

The results of the model show that household credit and deposits in the Czech Republic are directly proportional, with an increase in deposits by CZK 1 million leading to an increase in credit by CZK 1.007 million; by contract, credit and the unemployment rate show a relationship of inverse proportion: an increase in the unemployment rate by one percentage point will reduce credit by CZK 52 485 million on average. We will interpret these relationships later.

V. BASIC CONCLUSIONS

The submitted data and facts imply one fundamental conclusion: the standard of living of Czech families was substantially subsidised by two types of debt in the past years.

First, it was subsidised by sovereign debt, expressed as state budget deficit. We have only used 75 percent of this debt to formulate our conclusions, stating that a part of the debt did not have to be inevitably transferred to family incomes, and could have been used for imports of goods and services for the public sector instead.

Second, it was subsidised by direct family debt, obtained from banks and other financial institutions.

All in all, we have found out that these transfers of debt ranged between 5.3 percent and 14.8 percent of available household income. The average share of debt in the available income of Czech families amounted to 9.44 percent in the ten years covered by our study.

With some overstatement, we can claim that the living standard of Czech households has exceeded the standard that would have been possible given the true condition of the Czech economy, work productivity and effective use of resources by about ten percent in the long run.

On top of that, we have some conclusions derived from the mathematical analytical models that must be interpreted. First of all, what we have here is a sharp and documented growth of the proportion between the funds loaned to families and the families' financial savings. This growth has gained enormous speed in the last years, and it is difficult to shake off the feeling that for some groups of the population, it must have a fatal impact on the stability of their family budgets.

Of course, all the figures used have been strongly generalised and as such do not allow for the families' analysis based on social, regional or other criteria. However, it is obvious that many families, especially from the lowest income groups (the first quintile), are very unlikely to have any savings whatsoever and that, on the contrary, their budget is encumbered by substantial debt, at least compared to their regular income. Moreover, many families belonging to high-income groups are very likely to have assumed so many liabilities (especially mortgage-related liabilities) that they have lost their ability to repay primarily as the real wages have dropped due to the economic crisis. Both these conclusions are confirmed by the data on the development of family defaults in the Czech Republic and, above all, the data on the number of executions and various types of auctions.

Therefore, it will be necessary and very useful to analyse data not generally but with emphasis on distribution among the individual income groups – either by quintiles or deciles – in future research.

VI. FOLLOW-UP CONCLUSIONS AND CRITICISM

The interpretation of the conclusions ensuing from Table IV. must be clear as day. In the entire time series from the beginning of the reforms until the end of 2010, each growth in household deposits goes hand in hand with growth in credit obtained – although the margin by which credits prevail over deposits is relatively small, it is nevertheless of paramount importance in the long run.

Credit prevailing over deposits is a characteristic sign for the Czech Republic despite the demonstrable pressure of the unemployment rate over household credit, as indicated by the

results summarised in Table IV. We can see the result of this pressure primarily in the years 2009 and 2010 in figure 2 when we look as further rate of growth in the proportion between deposits and credit provided to households slows down.

Linking this data and these results to the theory that the growth in the standard of living enjoyed by Czech households was fed by debt to a substantial degree (we mentioned ten percent) in roughly the last ten years, the results of the mathematical analyses summarised in Table IV. create a logical unit with this theory.

This conclusion could be applied to a number of other countries, especially the countries that witnessed a dramatic increase in sovereign or household debt. We must not forget that if we disregarded the crisis years of 2008 through 2010, sovereign debt of most developed countries would stagnate or drop, i.e. budgets would be in principle balanced or the deficits lower than debt service. However, the debt of families rose and eventually exceeded the GDP and reached the double of the annual available income of families in many countries in the same period of time. A thorough analysis would be required for more accurate conclusions.

What further conclusions can be drawn from the statement that about ten percent of the standard of living of Czech families has been made possible by increasing (sovereign or family) debt in the past decade? If we could say that household income will witness a dynamic rise and that the states' gross domestic product will grow in general to the degree that these states will not be forced to reduce the households' available income through taxes, this finding would not be very important. However, from today's perspective (in November 2011) we must foresee a different scenario: continued stagnation and the governments requiring its citizens to pay higher taxes to settle their liabilities.

This means that neither sovereign nor household debt can be settled in the upcoming years otherwise than through a reversal of the trend witnessed in the past decade, i.e. by debt repayment at the expense of the citizens' true standard of living.

Of course, this leads to many questions that move from the domain of economics to the domain of politics and partly political science. The most important of these questions is the relatively simple question whether political representations of developed countries will be able to defend the need to reduce the standard of living before the citizens and thus whether they can obtain sufficient electoral support for this need of their national economies - as we have already seen, the process of reducing public and family debt will entail, on one side, a change in the standard of living, primarily for a significant portion of the population of the countries that have taken on major government and family debts. In addition, strong pressure for a compensation of the dropping standard of living suffered by the relatively poorer groups by a redistribution of wealth through budgets, which, however, must inevitably negate any efforts to reduce government debts.

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