

Belanová, Katarína; Gertler, L'ubomíra; Sivák, Rudolf

## Article

# "Too much debt will kill xou" : although not in Central Europe, yet

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## Kontakt/Contact

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics  
Düsternbrooker Weg 120  
24105 Kiel (Germany)  
E-Mail: [rights\[at\]zbw.eu](mailto:rights[at]zbw.eu)  
<https://www.zbw.eu/>

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## **“Too Much Debt Will Kill You”: Although Not in Central Europe, Yet<sup>1</sup>**

Katarína BELANOVÁ – Lubomíra GERTLER – Rudolf SIVÁK\*

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### **Abstract**

*We take an evidence-based approach and confirm that a high level of household debt is detrimental to consumption, disposable income, and hence economic growth in the medium term. Using a panel setting with both fixed and time effects, we isolate the effect of an excessive household debt level and show that an additional one percentage point could be associated with a 0.1% drag on GDP growth over the next three years. Although we confirm this relationship on a panel of advanced economies, we show that emerging economies such as Central and Eastern European economies, possess structural characteristics (a shallow capital market, less finance and more social cohesion) that so far prevents such a demand constraint from materializing.*

**Keywords:** *wealth inequality, secular stagnation, household debt*

**JEL Classification:** E51, H31, R21

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### **Introduction**

We paraphrase the lyrics of the famous song by Queen to enforce our point that although easy access to finance had a clear positive effect on welfare in the past decades, if the debt levels become too high, then the ultimate consequences could endanger the life of an economy. As findings in a recent paper of Burriel et al. (2020) suggest, highly indebted countries are usually poorly equipped to withstand future asymmetric shocks and are exposed to higher output losses,

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\* Katarína BELANOVÁ – Lubomíra GERTLER – Rudolf SIVÁK, University of Economics in Bratislava, Faculty of National Economy, Department of Finance, Dolnozemska cesta 1, 852 35 Bratislava 5, Slovakia; e-mail: katarinabelanova@centrum.sk; Lubka.Gertler@gmail.com; Rudolf.Sivak@euba.sk

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a longer period at the zero lower bound, greater effects of spillovers, less stable private debt and consequently less scope for counter-cyclical fiscal policy.

Negative real interest rates are a new normal worldwide, resulting from excessive financial deepening and abundant liquidity in the economy. On the one hand, they helped to ignite economic activity, but on the other hand, also generally led savers to save more and debtors to owe more. Financial liberalisation therefore led to more income inequality.<sup>2</sup>

We frame this topic as a follow-up to our previous findings (Gertler, Sivak and Kyselakova, 2017) that house prices in the medium to long run are fuelled by credit to households and their share of disposable income. In other words, if households are becoming excessively indebted, then house prices rise more rapidly. This result is not surprising. In persistently good times, interest rates decrease, and demand for housing is higher and more stable. Housing supply is not flexible, and therefore, prices adapt predominantly to demand.

This outcome, however, has a flipside. In a longer lasting period of economic growth, lending conditions steadily improve. Mortgages are more accessible and reach to wider set of households more easily. Some households that were previously ineligible become the main target of credit supply, especially in the later stage of good times. However, at this stage, house prices have already reached high levels. Such cyclicity makes the most vulnerable class of households even more worse off. Having purchased their housing late in the economic boom, their disposable income suffers and becomes sensitive to the downturns that lie ahead.

Some remedies to this natural race to more wealth and income inequality set up with macro-prudential measures that limit less-endowed households' engagement in mortgage contracts. Although some reduction of borrowing by the most vulnerable has surely been achieved, this process still exists. Mian, Straub and Sufi (2020) recently revisited the issue in a study that coins the notion of diminishing disposable income of certain classes of households as '*indebted demand*'. In summary, sensitive borrowers reduce spending due to the elevated interest costs and are trapped in a situation in which they can only afford a limited increase in their demand in good times and need to find alternatives to reduce their spending in bad times. In bad times, alleviating accommodative policies tends to generate a debt-financed short-run boom at the expense of indebted demand in the future.

In this study, we aim to gather some evidence and investigate how the story of indebted demand and the race to the inequality equilibrium differs in Central Europe. Given the long-run data availability, it is natural that to conduct this

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<sup>2</sup> This line of argument dates back mainly to the post-Global Financial Crisis period. Stiglitz (2012) presents a rich description and multiple dimensions of this process in his book.

kind of research on advanced economies. However, we currently have up to 25 years of relevant historical data series in emerging economies to exploit.

Most of the literature on the effects of debt on economic growth is naturally focused on advanced economies. In this regard, this study is one of the first to examine this relationship in Central and Eastern European (CEE) countries. In addition, private (rather than public) sector debt gained more attention only recently. This study brings the effects of household sector debt on growth to the frontline. It also considers whether household debt accumulation added a drag on the growth of CEE economies, or – on the contrary – served as a catalyst for further development in the medium term.

Our hypothesis is that despite the apparent economic convergence of CEE countries and the rapid increase of corporate and especially household indebtedness due to low interest rate environments and global financial liberalisation, some important factors that propel this process are unidentified.

In advanced economies, the rising divide between savers and debtors is accelerated by the presence and accessibility of capital markets, which are largely missing or inefficient in CEE. Additionally, these countries have a higher degree of solidarity than in the traditional Anglo-Saxon world (perhaps except the Nordic countries), resulting in a lower Gini coefficient; that is, a more homogenous society. Last, in CEE economies, a large majority of households live in owner-occupied housing, which makes for most of all household assets. We draw upon these lines to show that the vicious circle of rising inequality, so much present and felt nowadays in the western hemisphere, is not affecting emerging European economies to such great extent yet.

Yet, the playing field may change after the second wave of COVID-19 pandemic, which hit Central Europe in full strength and again led to multiple weeks of economic standstill. A second supply shock within 6 months is fertile ground for heightened uncertainty in the labour market, consumption patterns and the ever-increasing pile of debt. However, the way out of this pandemic and its consequences could follow widely different trajectories, which are barely possible to foresee.

This article is structured as follows. In the following section, we take on the literature and provide a review of related studies on wealth and income inequality and how this literature feeds into the current discussion of diverging wealth inequality. In the second section, we provide the economic story that motivates the hypothesis. In the third section, we introduce the modelling framework and provide the results for the advanced economies, which broadly align with the existing literature. In the fourth section, we incorporate CEE economies into the analysis and through the lenses of structural indicators, we show why the earlier findings do not yet apply to these countries. The last section concludes.

## 1. Literature Review

This strand of research aims to connect the observed decline in real interest rates with the concept of ‘secular stagnation’, which Summers (2014) was among the first to mention. Researchers identified and analysed several drivers of this development. First, population aging is the source of the changing balance between the aggregate desire to save and to consume. The point here is that older agents expect to shoulder only a portion of the financial burden arising from the mounting debt, and therefore expect the future generation to service it.<sup>3</sup> Second, varying patterns in savings can be explained by different levels of income risk and income inequality. Uninsurable risks may thus prevent agents from adjusting their consumption, thus making households savvier in general (e.g. Straub, 2019). The global saving glut, as described by Bernanke (2005), is the third possible explanation. The rising costs of healthcare and social care motivate agents to plan more for future safety. Whether this is through existing social security systems (Western European and Nordic societies) or having their own plan in their absence (Anglo-Saxon societies), the precautionary saving channel is gaining traction.<sup>4</sup> Lastly, the existing supply of investable financial assets, which agents use as insurance against economic shocks, explains declining real interest rates and secular stagnation. Large quantities of government debt were purchased in monetary operations worldwide, thus contracting the volume of available safe assets in the market. What remains must therefore be of higher risk in general. The changing composition of household asset holdings may then potentially have a large real effect on saving behaviour (Caballero and Fahri, 2017).

The listed causes of the changing propensity to save and consume provide general answers, but do not tell us much about structural aspects, such as which classes of entities save, and which do not. On this front, Kumhof, Ranciere and Winant (2015), using a two-agent endowment model of an economy, conclude that income inequality leads to more debt and a higher chance of financial crisis. In their world, preferences are heterogenous depending on the activity and income of the household. More specifically, households on labour income have higher saving rates than borrowers so, but still have lower saving rates than those saving out of financial income. Here however, the higher debt taken on by borrowers, who save the least, motivates more demand, reduces income inequality, and reverts the system in equilibrium.

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<sup>3</sup> Eggertsson, Mehrotra and Robins (2019), among others, elaborate on the ageing channel in a modelling framework in detail.

<sup>4</sup> Caballero and Fahri (2018), Caballero et al. (2016), and others, analyse this channel in a model framework.

On the other hand, Mian, Straub and Sufi (2020) portray the system as a dual equilibrium where less wealthy borrowers take on the most debt and have less or even negative savings. On the contrary, the savings of the wealthy are channelled into the new funds used for new borrowing offered to the poorer. Less wealthy debtors, after a reasonable period of this life cycle, form a critical mass of the population. Thus, the debt service is heavy enough to depresses their demand and given the magnitude of this mechanism, it has consequences for the aggregate economy.

To complete the review of the relevant research streams, we need to mention the rich empirical literature on the origins and consequences of high debt. Various subdisciplines of this vast topic are connected and extensively explained in Abbas, Pienkowski and Rogoff (2019).

However, several papers by Schularick and Taylor (2012), Jorda, Schularick and Taylor (2016) are central to this area in more detail, documenting historical episodes of debt accumulation and its effect on investment, lending, interest rates and inflation, as well as its link to the depth of financial crises and the speed of the recovery that follows.<sup>5</sup>

This article tries to fill the gap by providing an evidence-based approach to the *indebted demand* hypothesis. We work out a simple model in a panel setting, confirm the hypothesis and identify that the hypothesis does not have to be universally valid due to structural characteristics that tend to disassemble the mechanics behind the argument.

## 2. Economic Background

A declining interest rate in the long run and a low interest rate environment, coupled with an increase in credit, is a defining feature underlying the build-up of debt in recent decades. This is also the main driving force of structural changes that have differing effects on the debtors that add to new credit and the savers that participate in financing new claims.

Debt financing has occurred in large volume since the financial liberalisation of the mid-1980s and unconstrained capital flows, predominantly in advanced economies. Some small breaks are visible as the consequence of the mid- and late-1990s crises and the Global Financial Crisis in 2007 – 2008. Debt has been building up in the background of persistently falling real interest rates in the past three decades.

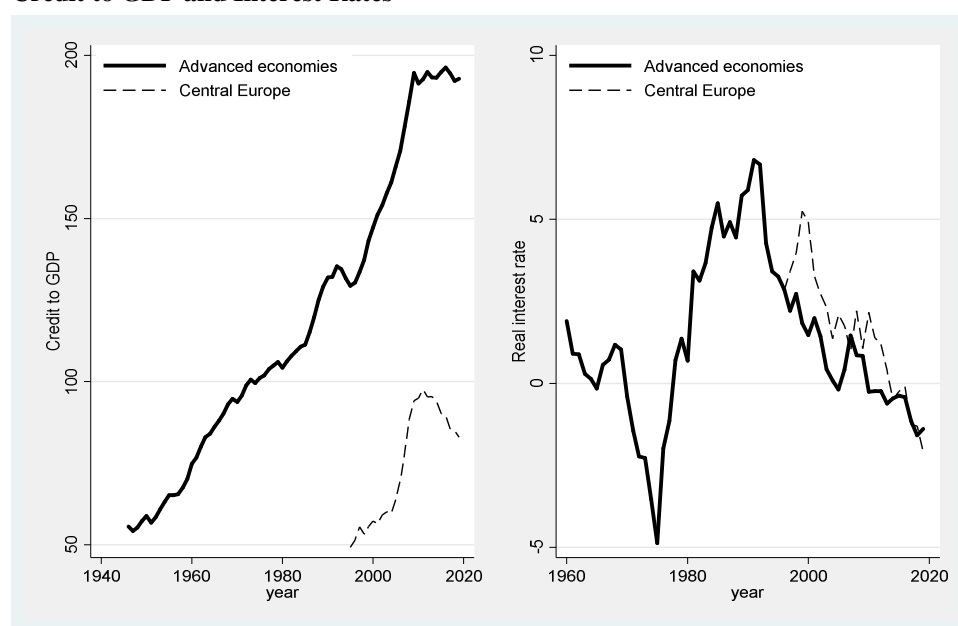
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<sup>5</sup> We also use the Schularick and Taylor Macrohistory Database to back cast our existing time series. This allows us to work with a sample of annual data between 1945 and 2019 (a consecutive 75 years of history).

The CEE economies adopted this trend soon after 2000 when they completed their economic transformation and entered the European Union single market in May 2004. Despite a quick upswing in the build-up of debt by some 50% of GDP (a pace similar to that in advanced economies), the total indebtedness of all sectors is less than half of that in advanced economies. This all occurred against the background of declining real interest rates on a very similar scale.

The rapid build-up of debt in advanced economies was fuelled by all sectors. The debt share to GDP roughly doubled in each of the three sectors between 1980 and 2008. However, the quickest path of growth occurred in credit to households in the late 1990s and the following decade until the Global Financial Crisis, as well as in government debt, especially since the crisis.

**Figure 1**  
**Credit to GDP and Interest Rates**



*Notes:* Cross-country average of private-sector credit over GDP. The 17 countries that represent advanced economies are: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States. The countries that represent Central Europe are the Czech Republic, Slovakia, Poland, Hungary, and Slovenia.

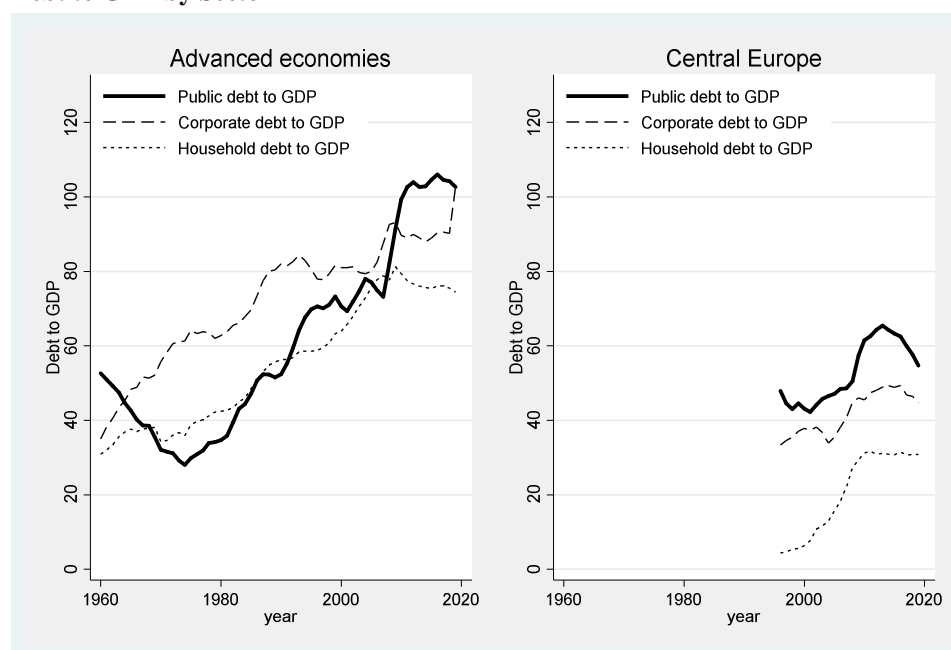
*Source:* Own calculations.

In Central European economies, debt built up especially in the household sector, while corporate sector debt remained rather flat and government debt increased somewhat after the crisis but reverted to lower levels in recent years. Stable debt levels in the corporate sector is largely tied to domestic investments to GDP, which also remained rather flat. Fresh credit was not needed because the

corporate sector was largely funded by foreign direct investment or the expansion of foreign companies into the new markets after the single market grew. In the advanced economies, the flatter pattern of corporate debt is linked to a low and declining investment to GDP ratio.

Traditionally, in a circular flow of income, which is a main building block of Keynesian models, businesses and governments lend resources from households, and this lending then triggers investment and productivity growth. What we see, however, is that the excessive rise of household debt is used to finance personal consumption and government expenditures. As we can also see clearly in the current post-COVID world, credit expansion is used to increase aggregate demand rather than supply.<sup>6</sup>

Figure 2  
Debt to GDP by Sector



Notes: Cross-country average private-sector credit over GDP, weighted by GDP in 2000. For a fuller picture, see the breakdown of advanced and emerging (V4) countries' debt to GDP in Annexes A1 and A2.

Source: Own calculations.

We are also beginning to see empirically that demand remains muted because the debt levels are simply too high. At moderate levels, debt improves welfare

<sup>6</sup> Again, as in previous crises, the current crisis will test the flexibility of heavily indebted countries and companies. As economies respond to the pandemic, their debt will certainly increase. Global growth is projected at -4.9% in 2020; -8.0% for advanced economies and -3.0% for emerging markets (IMF, 2020).



and supports growth. However, as some, such as Cecchetti, Mohanty and Zampolli (2011) are already highlighting, debt may become a drag on growth when it reaches certain thresholds. Their estimated thresholds come at 85% of GDP for the government and 90% for the corporate sector. Similarly, Arcand, Berkes and Panizza (2012) indicate that financial depth derails growth once credit to the private sector exceeds 100%. As we can also see in Figure 2, we have now exceeded these thresholds considerably.

Are we now at the point where private (and public) debt levels are too high, and are dragging our medium to long run growth down? Worse, would we be able to escape the current crisis only by piling further debt? To answer these questions, we run a fixed effect model with both country and time effects and investigate the effect of households' private debt level on economic growth, income, and consumption.

### **3. The Impact of Debt in the Model**

We first review some statistics of debt ratios and savings, consumption, and growth before we turn to empirical investigation of these questions. We use an annual dataset of 17 advanced economies and 5 Central European economies. We use credit series from the BIS, financial series from the IFS and national accounts and real economy series from the OECD. Where needed and available, we back casted these time series with the historical series of the Macroeconomic History Database from Jorda, Schularick and Taylor (2017).

First, we address the main point of our line of argument and verify whether increases in household debt tend to reduce growth.

We depart from the model specification of the per capita output growth rate dependent on indebtedness and other country-specific information following Solow's neoclassical growth model used by Barro and Sala-i-Martin (2004), among others. We also add some other financial and non-financial measures and vary the use of indebtedness in different sectors.

In such a traditional model, per capita income growth depends in the initial level of output (or capital-both human and physical), and in the medium to long-run convergence to the steady state. The steady state depends positively on the saving rate and negatively on factor inputs, such as labour force or technology.

Since this family of models worked with regional or cross-country differences, we instead transform this model specification to a panel setting to estimate a panel regression with country-and time-specific fixed effects. This approach produces a clean measure of impact in terms of which factor (in our case indebtedness) affects growth within a country.

We model the growth of per-capita income of a country  $\bar{g}$  in the following specification:

$$\bar{g}_{i,t+1,t+k} = \phi y_{i,t} + \beta' X_{i,t} + \mu_i + \gamma_t + \varepsilon_{i,t,t+k}$$

where the dependent variable is the  $k$ -years forward average annual growth rate of output;  $y_{i,t}$  represents logarithm of contemporary real per-capita output;  $X_{i,t}$  stands for a set of regressors, including debt measures, saving rate, asset prices or real interest rate; and  $\mu_i$  and  $\gamma_t$  are the country- and time-specific dummies, respectively, which capture common effects across countries and time. We also add a dummy for the Global Financial Crisis in 2008.

We alter this model in several directions as follows. First, we modify the extent of indebtedness to see how heavy the debt burden in the individual sectors is. Second, we modify output growth with households' disposable income or real consumption to obtain more direct information about the effect of debt on the behaviour of households. Third, we estimate a mirror model of Central European countries to see whether the debt level has a similarly negative effect on the welfare of households or there is still enough time to raise awareness.

In the baseline model, we investigate whether household indebtedness affects output per capita. We can indeed confirm that both public and household debt have a negative effect on the future medium-term economic growth. More specifically, an average one percentage point increase in household debt is associated with 0.05% less economic growth in the three years to come. For public debt, the effect for the 17 advanced economies in the post-war period is double, at 0.1% of GDP.

Both the fixed and time effects are in place and all other explanatory variables have the expected signs (Table 1). The positive sign with the house prices relates to the wealth effect, where rising house prices tends to encourage consumer spending and leads to higher economic growth. This relationship works both ways, although not necessarily symmetrically. If house prices drop, they tend to do so sharply and adversely affect consumer confidence, which leads to low or negative economic growth.

Mian, Sufi and Verner (2015) also report a negative relationship, finding that the negative effects of household debt on income to be particularly pronounced for countries facing monetary policy constraints. Mika and Zumer (2017) present similar results. They find that increasing indebtedness in the private sector has a negative effect on growth rates in the near future. This could be explained by the fact that households and non-financial corporations are perceived to be over-borrowing. On the other hand, rising private sector indebtedness is associated with rising income levels over the long run, as debt allows for consumption and

investment smoothing. Overall, as they state, accumulating more debt is a way of financing as well as obtaining funds to finance investments. Households and non-financial corporations are expecting to be better off in the future, and hence are not afraid of borrowing more in the present. Efficient use of such borrowing stimulates the economy. When considering the effects of deleveraging, Chen et al. (2015) find that the quicker the private sector deleverages, the greater the positive effects on growth in the medium term.

Table 1  
Baseline Estimate

| Dependent: Three-year forward average per-capita GDP |                    |                     |                                  |
|--|--------------------|---------------------|----------------------------------|
|  | <i>coef.</i>       | <i>st.dev</i>       | <i>t-val</i>                     |
| Log of output  | −0.1117***         | (0.0079)            | 0.000                            |
| Public debt  | −0.0010***         | (0.0001)            | 0.000                            |
| Household debt                                       | −0.0005***         | (0.0002)            | 0.008                            |
| House price inflation                                | 0.1130***          | (0.0319)            | 0.000                            |
| Real interest rates                                  | −0.0013*           | (0.0008)            | 0.084                            |
| D(GFC)   | 0.3258***          | (0.0484)            | 0.000                            |
| Number of  | GROUPS             | OBSERVATIONS        |                                  |
|  | 17                 | 927                 |                                  |
| R-square   | R2 within<br>0.806 | R2 between<br>0.032 | R2 overall<br>0.195              |
| Statistics   | F(74,836)<br>46.80 | Prob > F<br>0.000   | Corr( $u_i$ , $X_b$ )<br>−0.8879 |

Note: Standard errors in parentheses; \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Own calculations.

Similarly, a negative effect of the real interest rate on economic growth is a long-standing premise of economic theory, dating back to the seminal contribution of McKinnon (1973) and the following literature on the benefits of financial liberalisation. Much of this literature investigates how the decreasing level of real interest rates, which is a manifestation of financial liberalisation, supports economic growth in the long run. In our baseline, estimate this materialises in 0.13% more economic growth thanks to a real interest rate lower by 1 percentage point. As later literature also points out, (e.g. De Gregorio and Guidotti, 1995), this relationship is far from linear, which is already obvious in the current environment of negative real interest rates, where further declines are likely to weigh on economic activity in future. However, we are interested in the story of excessive debt levels and the extent to which they weight future economic growth. To have a better picture, we estimate the same model for the cases when debt exceeds certain thresholds.

As it stands out from Table 2, the higher the indebtedness level of households, the more drag to economic growth in general. As we mentioned earlier, the results convey that the channel works through the compression of available disposable

income, which can be used for consumption. In other words, if both public and household debt are high (above 60% of GDP), then the effect of further increases in household debt almost quadruples the drag on output, to close to 0.2% of GDP in the three years to come, while the effect of public debt remains roughly the same.

Table 2

**Higher Household Debt as a Burden**

| Dependent: Three-year forward average per-capita GDP |                        |                        |                        |                       |
|--|------------------------|------------------------|------------------------|-----------------------|
|  |                        | >40%                   | >50%                   | >60%                  |
| Log of output  | −0.1117***<br>(0.0079) | −0.1311***<br>(0.0209) | −0.1600***<br>(0.3832) | −0.1310*<br>(0.0733)  |
| Public debt  | −0.0010***<br>(0.0001) | −0.0005***<br>(0.0001) | −0.0009***<br>(0.0002) | −0.0008*<br>(0.0050)  |
| Household debt                                       | −0.0005***<br>(0.0002) | −0.0005*<br>(0.0003)   | −0.0008***<br>(0.0003) | −0.0019**<br>(0.0008) |
| House price inflation                                | 0.1130***<br>(0.0319)  | 0.1287***<br>(0.0422)  | 0.1869***<br>(0.0495)  | 0.1830**<br>(0.0865)  |
| Real interest rates                                  | −0.0013*<br>(0.0008)   | −0.0025*<br>(0.0011)   | −0.0006<br>(0.0015)    | 0.00004<br>(0.0029)   |
| D(GFC)   | 0.3258***<br>(0.0484)  | 0.3908***<br>(0.0817)  | 0.5266***<br>(0.1380)  | −0.101*<br>(0.0385)   |
| Number of observations                               | 927                    | 397                    | 241                    | 123                   |
| Number of groups                                     | 17                     | 17                     | 15                     | 11                    |
| R2 within  | 0.806                  | 0.798                  | 0.726                  | 0.747                 |
| R2 between   | 0.032                  | 0.012                  | 0.015                  | 0.372                 |
| R2 overall   | 0.195                  | 0.072                  | 0.078                  | 0.166                 |
| F(.,.)   | 46.80                  | 18.49                  | 9.55                   | 4.92                  |
| Prob > F   | 0.000                  | 0.000                  | 0.000                  | 0.000                 |
| Corr(u <sub>i</sub> , X <sub>b</sub> )               | −0.8879                | −0.9719                | −0.9901                | −0.9922               |

Note: Standard errors in parentheses; \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

Source: Own calculations.

The disappearing effect of the real interest rate that we observe in Table 2 also aligns well with the past literature. A handful of studies provide evidence that higher real interest rates may be a drag on economic output (e.g. Taylor, 1999). Later studies (e.g. Shaukat, Zhu and Khan, 2019) add that this is mainly the case for transition economies or economies in the early stage of financial deepening, where the real interest rate, through its multiple channels, may become detrimental. Recent studies also find non-linearity and provide the thresholds at which this is no longer detrimental. However, they are united in their conclusion that in the current low interest rate and low inflation environment, the relationship between the real interest rate and output disappears (e.g. Bosworth, 2014).

On the other hand, asset prices apparently fuel the economic growth in the current environment of low inflation, low interest rates and high debt levels. The higher effect of house prices on economic output in our panel estimate confirms the wealth effect in our data.

Corporate debt seems not to have any negative effect on growth (see Annex, Table A1), as there is no reasonable channel that would compress households' disposable income or consumption. It is likely due to the global environment and foreign financing and other forms of funding that does not require corporations to look for excessive amounts of credit. However, in countries with higher corporate debt levels (France, the Netherlands, Belgium, Sweden and Norway), we can still observe some positive effects on economic activity.

Cross-checking the same model specification with a possibly more direct effect of household debt, we replace economic growth with disposable income. Interestingly, we see very similar results with a similar magnitude (Table 3).

Table 3

**Higher Household Debt as a Drag on Disposable Income**

| Dependent: Three-year forward average per-capita disposable income |                        |                        |                        |                       |
|--|------------------------|------------------------|------------------------|-----------------------|
|  |                        | >40%                   | >50%                   | >60%                  |
| Log of output  | −0.1550***<br>(0.0112) | −0.1330***<br>(0.0257) | −0.1477***<br>(0.0447) | −0.1402*<br>(0.0784)  |
| Public debt  | −0.0007***<br>(0.0001) | −0.0003**<br>(0.00015) | −0.0006***<br>(0.0002) | −0.0004<br>(0.0008)   |
| Household debt   | −0.0005***<br>(0.0002) | −0.0005*<br>(0.0003)   | −0.0009***<br>(0.0003) | −0.0016**<br>(0.0008) |
| House price inflation  | 0.0991***<br>(0.0342)  | 0.1112**<br>(0.0481)   | 0.1589***<br>(0.0552)  | 0.1664*<br>(0.0934)   |
| Real interest rates  | −0.0021*<br>(0.0009)   | −0.0018<br>(0.0013)    | −0.0008<br>(0.0017)    | 0.0005<br>(0.0032)    |
| D(GFC)   | 0.6304***<br>(0.0699)  | 0.0663<br>(0.0707)     | 0.0031<br>(0.0669)     | 0.0268<br>(0.1084)    |
| Number of observations   | 717                    | 397                    | 225                    | 114                   |
| Number of groups   | 17                     | 17                     | 15                     | 10                    |
| R2 within  | 0.832                  | 0.798                  | 0.679                  | 0.731                 |
| R2 between   | 0.072                  | 0.012                  | 0.008                  | 0.163                 |
| R2 overall   | 0.167                  | 0.072                  | 0.071                  | 0.122                 |
| F(...)   | 50.93                  | 18.49                  | 9.29                   | 4.99                  |
| Prob > F   | 0.000                  | 0.000                  | 0.000                  | 0.000                 |
| Corr( $u_i$ , $X_b$ )  | −0.9316                | −0.9719                | −0.9876                | −0.9903               |

Note: Standard errors in parentheses; \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Own calculations.

If we continue further to examine the factor that should constitute the most direct effect; that is, that of debt on household consumption, we naturally find the highest coefficients and the most robust results (Table 4). All coefficients are in the same ballpark, although real interest rates become insignificant at higher debt levels.

The estimates portrayed a consistent picture of a channel through which the debt drag operates. In brief, household debt (and to a minor extent, public debt) weighs on the household budget and affects consumption, and therefore also

economic activity in general, through which we may also see effects on disposable income and economic growth. In addition, we show that as the levels of household and public debt increase, their drag on consumption, disposable income or/and economic output increases.

Table 4

#### Higher Household Debt as a Drag on Consumption

| Dependent: Three-year forward average per-capita consumption |                        |                         |                        |                        |
|--|------------------------|-------------------------|------------------------|------------------------|
|  |                        | >40%                    | >50%                   | >60%                   |
| Log of output  | −0.1421***<br>(0.0076) | −0.0959***<br>(0.1715)  | −0.0695**<br>(0.0447)  | 0.0095<br>(0.0487)     |
| Public debt  | −0.0009***<br>(0.0001) | −0.0003***<br>(0.00010) | −0.0004**<br>(0.0002)  | −0.0001<br>(0.0003)    |
| Household debt   | −0.0010***<br>(0.0001) | −0.0005**<br>(0.0002)   | −0.0008***<br>(0.0003) | −0.0021***<br>(0.0006) |
| House price inflation  | 0.11761***<br>(0.0273) | 0.1657***<br>(0.0368)   | 0.2204***<br>(0.0450)  | 0.2067*<br>(0.0691)    |
| Real interest rates  | −0.0031***<br>(0.0007) | −0.0032***<br>(0.0010)  | −0.0015<br>(0.0014)    | 0.0017<br>(0.0230)     |
| D(GFC)   | 0.4889***<br>(0.0527)  | 0.0127<br>(0.0485)      | −0.0935**<br>(0.0456)  | −0.1125*<br>(0.0657)   |
| Number of observations                                       | 731                    | 357                     | 231                    | 118                    |
| Number of groups   | 16                     | 16                      | 15                     | 10                     |
| R2 within  | 0.891                  | 0.792                   | 0.705                  | 0.784                  |
| R2 between   | 0.064                  | 0.093                   | 0.018                  | 0.076                  |
| R2 overall   | 0.180                  | 0.077                   | 0.112                  | 0.165                  |
| F(...)   | 84.85                  | 24.36                   | 10.82                  | 6.96                   |
| Prob > F   | 0.000                  | 0.000                   | 0.000                  | 0.000                  |
| Corr(u <sub>i</sub> , X <sub>b</sub> )                       | −0.9177                | −0.9548                 | −0.9541                | −0.6796                |

Note: Standard errors in parentheses; \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

Source: Own calculations.

## 4. Structural Factors behind the Drag on Growth

How universal are these findings for non-advanced economies? Applying these estimates to Central European economies, we do not find much significance, especially for the variables related to asset markets and finance in general. There is indeed a ratio to this observation. Small, very open economies are market takers and depend closely on their trading partner countries. They operate in environments with certain interest rate levels and are exposed to the liquidity provided in the partner economies. Hence, these countries are, to a large extent, integrated and destined to have similar levels of real interest rates and asset market developments to those of their trading partner countries.

Some countries, such as Slovakia and Slovenia, are not only a single market, but also have a common monetary policy that keeps these countries exposed to common policies. However, a large part of society remains unaffected, since it is

not engaged in the financial market. The level of real interest rates is therefore uninteresting to the vast majority of households across Central Europe, because their portfolios consist of illiquid self-occupied housing, some investment tradeable goods, and deposits. Asset or house price inflation is therefore orthogonal to households or corporate resources. On the other hand, large corporations are mostly foreign owned and able to fund horizontally within their supranational network, or through other sources.

Table 5

## CEE Countries' Debt Burden to Consumption, Disposable Income, and Output

|                        | Consumption            | Disposable income      | Economic growth        |
|------------------------|------------------------|------------------------|------------------------|
| Log of CON, HDI, GDP   | −0.6523***<br>(0.0859) | −0.8678***<br>(0.1301) | −0.6182***<br>(0.0975) |
| Public debt            | 0.0003**<br>(0.0001)   | 0.0024<br>(0.0020)     | −0.0002*<br>(0.0001)   |
| Household debt         | −0.0005***<br>(0.0001) | −0.0009***<br>(0.0020) | −0.0006***<br>(0.0001) |
| Deflator inflation     | −1.2315**<br>(0.5208)  | −0.3464<br>(0.7562)    | −0.7617<br>(0.5858)    |
| Saving rate            | −0.0146***<br>(0.0022) | −0.1213***<br>(0.0032) | −0.0141***<br>(0.0025) |
| Number of observations | 51                     | 49                     | 51                     |
| Number of groups       | 3                      | 4                      | 4                      |
| R2 within              | 0.964                  | 0.944                  | 0.954                  |
| R2 between             | 0.999                  | 0.990                  | 0.997                  |
| R2 overall             | 0.165                  | 0.152                  | 0.164                  |
| F(...)                 | 24.69                  | 14.17                  | 19.15                  |
| Prob > F               | 0.000                  | 0.000                  | 0.000                  |
| Corr( $u_i$ , $X_b$ )  | −0.9983                | −0.9989                | −0.9982                |

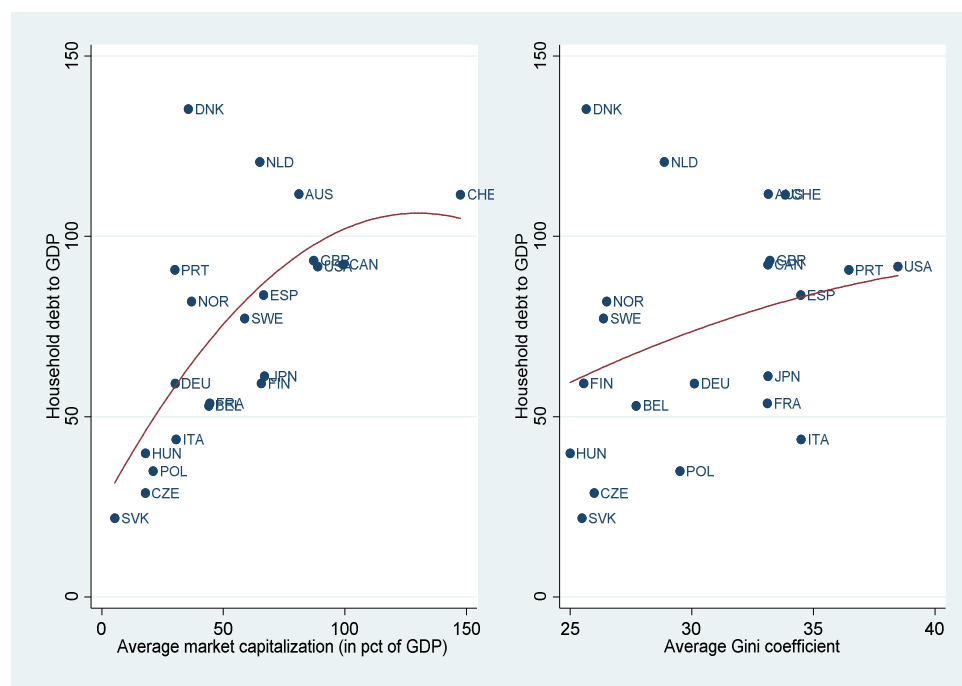
Note: Standard errors in parentheses; \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Source: Own calculations.

For this reason, we supplement house prices with deflator inflation and add a measure of the saving rate, which better characterises the investment climate in emerging markets. Nevertheless, debt levels are rather low in Central Europe, and it would be difficult to draw a line between the observed household debt levels of 20% to 40% of GDP. However, as we pointed out, the depth of the financial market seems to matter for the level of debt and hence for debt dependency. Although to a lesser extent, such characteristics may be attributed to redistribution and/or social justice. The more social justice is in place, the less need for debt in a society, since more wealth is redistributed systematically. First and foremost, these characteristics are of a structural nature and indicate an economy with a low level of debt.

We represent financial market depth with market capitalisation and social justice with the Gini coefficient. Figure 3 above makes the point.

Figure 3  
Structural Factors behind Lower Debt Levels



Note: Both the market capitalisation index and the Gini coefficient are from the World Bank database and are the average country values between 1975 and 2017.

Source: Own calculations.

All representatives of Central Europe are grouped at the left bottom segment of both figures, which indicates the structural characteristics behind the lower household debt levels. Combined with the estimated relationship between the levels of debt and output/disposable income/consumption, we can conclude that we have evidence suggesting that the structural characteristics of Central European economies yet provide a shield, which prevents their debt levels from being a burden on consumption and growth so far.

## Conclusion

We revisited the *indebted demand* hypothesis, which suggests that high levels of debt and the consequent interest costs become a constraint on household consumption and hence on aggregate demand. In other words, the large and still increasing debt already affects a critical mass of society and is a sustained drag on economic growth in the medium term.



We used a simple panel data setting with fixed and time effects based on a Solow-style growth framework to isolate the effect of household debt on household consumption, disposable income, and economic growth. Using annual data of 17 advanced economies for the past 50 years and 5 emerging economies for the past 25 years, we confirmed our hypothesis and showed that 1% household debt can be associated with 0.1% in GDP growth in the three years to come. Moreover, we found that this effect almost doubles when household and general government (public) indebtedness exceeds 60% of GDP each.

Further, we noted some structural differences between the advanced and emerging economies of Central Europe, namely the shallower financial markets and more redistribution, which indicates the higher social cohesion (measured by Gini coefficient) and prevents household debt from rising dramatically. Holding debt levels relatively low and experiencing worse access to financial markets paradoxically helps these economies by preventing the negative effect of reduced consumption and growth.

Mika and Zumer's (2017) findings support the conclusion on structural differences, as they also claim that country-specific thresholds exist, beyond which the effects of debt on growth become more negative. These thresholds depend on the country's indebtedness level and its other characteristics. This has important policy relevance, as the policy implications and recommendations in this context are country-specific rather than '*one size fits all*'.

Ideally, our analysis could be supplemented by a model that combines the short- and long-run specifications, as in the analysis by Eberhardt and Presbitero (2015). This would allow us to directly determine the long- and short-term impact of indebtedness on output growth. Moreover, the effect of the current global recession will provide an opportunity to test this assumption in such a model in the future.

Thus, although we see specific structural characteristics which still protect Central Europe against being constrained by excessive debt, things may change to mirror advanced economies if current trends persist. Escaping the debt trap then is difficult, but not impossible.

One way would be to reduce incentives to finance business with debt and use more equity financing instead. One eventual remedy is to reshuffle preferences by modifying tax systems. It is also possible to shift from debt to equity financing in the area of housing.

However, one opportunity available currently is to replace government lending to companies in the COVID-19 crisis with equity purchases. Indeed, with the current ultra-accommodative interest rate policies, governments could create instantaneous sovereign wealth funds at reasonable terms.

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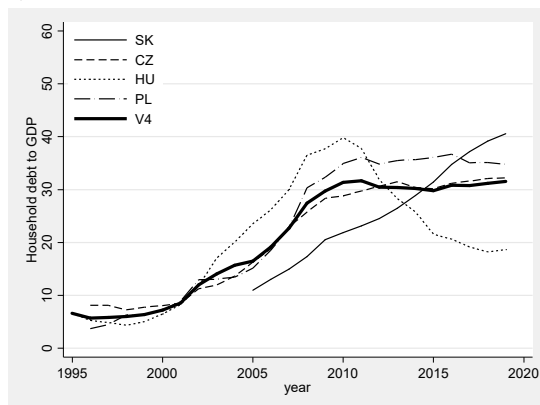
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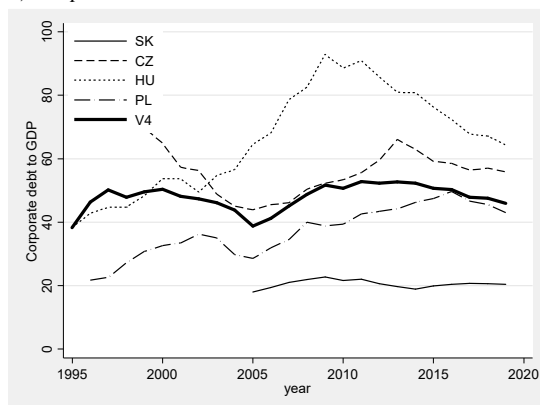
## Annex

Figure A1  
Debt to GDP in Central Europe

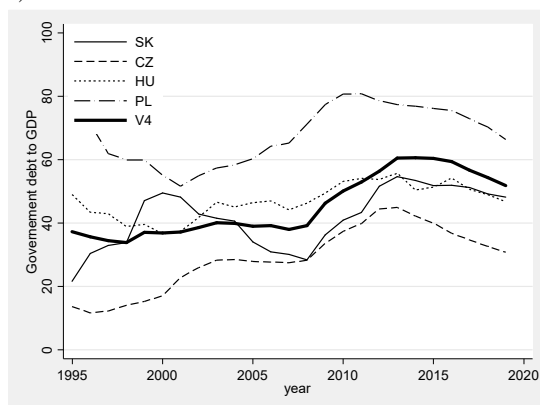
a) *Households*



b) *Corporate sector*



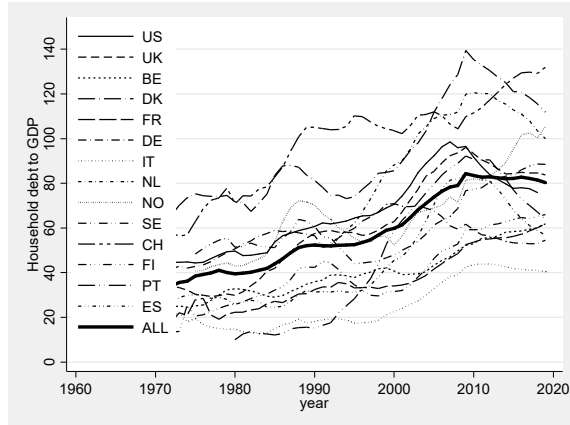
c) *Government*



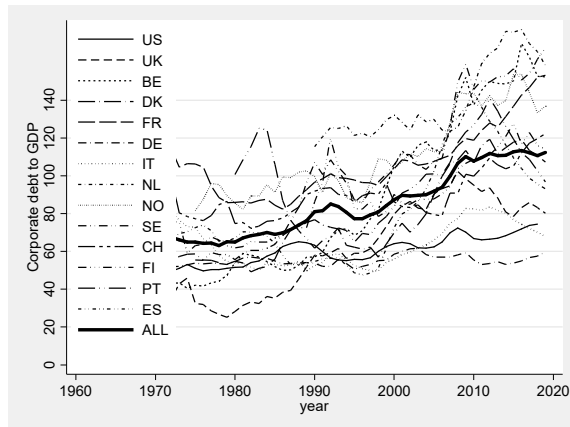
Source: Own calculations.

Figure A2  
Debt to GDP in Advanced Economies

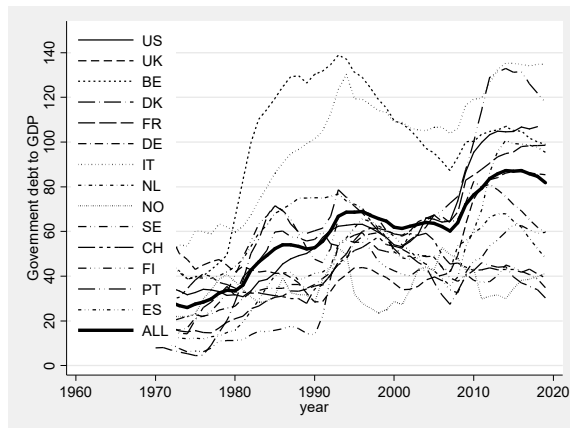
a) *Households*



b) *Corporations*



c) *Government*



Source: Own calculations.

Table A1

**Alternative Estimate with Corporate Debt**

| <b>Dependent: Three-year forward average per-capita GDP</b> |                    |                     |   |
|---|--------------------|---------------------|---|
|   | <i>coef.</i>       | <i>st.dev</i>       | <i>t-val</i>                                      |
| Log of output   | −0.1105***         | (0.0079)            | 0.000   |
| Public debt   | −0.0010***         | (0.0001)            | 0.000   |
| Household debt  | −0.0006***         | (0.0002)            | 0.005   |
| Corporate debt  | −0.0001            | (0.0001)            | 0.663   |
| House price inflation                                       | 0.1076***          | (0.0321)            | 0.001   |
| Real interest rates   | −0.0014*           | (0.0008)            | 0.072   |
| D(GFC)  | 0.3235***          | (0.0482)            | 0.000   |
| Number of   | GROUPS<br>17       | OBSERVATIONS<br>923 |   |
| R square  | R2 within<br>0.808 | R2 between<br>0.033 | R2 overall<br>0.199                               |
| Statistics  | F(74,836)<br>46.60 | Prob > F<br>0.000   | Corr(u <sub>i</sub> , X <sub>b</sub> )<br>−0.8864 |

Note: Standard errors in parentheses; \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

Source: Own calculations.

Table A2

**Alternative Estimate for the CEE**

| <b>Dependent: Three-year forward average per-capita GDP</b> |                    |                     |  |
|---|--------------------|---------------------|--|
|   | <i>coef.</i>       | <i>st.dev</i>       | <i>t-val</i>                                     |
| Log of output   | −1.367***          | (0.2327)            | 0.000  |
| Public debt   | −0.0005            | (0.0140)            | 0.726  |
| Household debt  | −0.0065***         | (0.0011)            | 0.000  |
| House price inflation                                       | −0.0939            | (0.1873)            | 0.623  |
| Real interest rates   | −0.0035            | (0.0008)            | 0.391  |
| D(GFC)  | 0.5440             | (0.0717)            | 0.460  |
| Number of   | GROUPS<br>4        | OBSERVATIONS<br>33  |  |
| R square  | R2 within<br>0.952 | R2 between<br>0.569 | R2 overall<br>0.154                              |
| Stats   | F(74,836)<br>21.15 | Prob > F<br>0.000   | Corr(u <sub>i</sub> , X <sub>b</sub> )<br>−0.999 |

Note: Standard errors in parentheses; \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

Source: Own calculations.