

DEVELOPMENTS IN THE HOUSEHOLD DEBT-TO-GDP RATIO ACROSS THE OECD COUNTRIES SINCE THE GLOBAL FINANCIAL CRISIS

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ABSTRACT

The paper aims to investigate the developments in the household debt-to-GDP ratio across OECD countries over the period 2007–2017 from the standpoint of the individual tendencies in the numerator (household debt) and denominator (GDP) of the ratio, and to identify the groups of countries exhibiting similar patterns in the post-crisis evolution of these variables. The investigation employs a comparative analysis of the average rates of change in household debt and GDP in the sample, as well as *k*-medians clustering aimed at identifying similarities. The results of the research reveal significant disparities in the development of the household debt-to-GDP ratio across the examined countries in the analysed period driven by the dominant tendencies in its numerator and denominator, which in turn appear to be related to the pre-crisis levels of household sector indebtedness and GDP per capita, as well as the depth of recession that affected each of the particular economies.

Key words: households, debt, global financial crisis, economic growth

JEL codes: E21, E51, D14, G01

INTRODUCTION

Since the beginning of the twenty-first century, household debt across the globe has been exhibiting an overall rising trend. In many developed countries household debt-to-GDP ratios have already reached extremely high levels and the emerging economies are quickly catching up. Even though in the wake of the recent global financial crisis household sectors in some countries managed initially to deleverage, over the recent years this tendency has started to backtrack. Simultaneously, in many emerging and developing economies, household debt has been generally on the rise throughout the entire decade, remaining largely unaffected by the turmoil in the global financial market. This broad access to credit, acquired relatively recently, has been fuelling consumption and economic growth, thus enabling these countries to reduce the distance that separates them

from more developed economies [Hays 2018]. The combination of the above processes has given household debt a new impetus (Fig. 1). According to Hays [2018], this renaissance of credit expansion might have significantly contributed to the recent improvements in economic growth rates observed around the globe.

The extent of household indebtedness in a given economy is often assessed by the relation of total outstanding debt to GDP. Naturally, variations in the household debt-to-GDP ratio result from differences in the direction and relative magnitude of changes in its numerator (household debt) and denominator (GDP). The value of the ratio increases (declines) when household debt grows faster (slower) than GDP, or when GDP declines faster (slower) than the amount of debt. Another, however much less likely, possibility is when the amount of debt rises during a recession (falls during an expansion).

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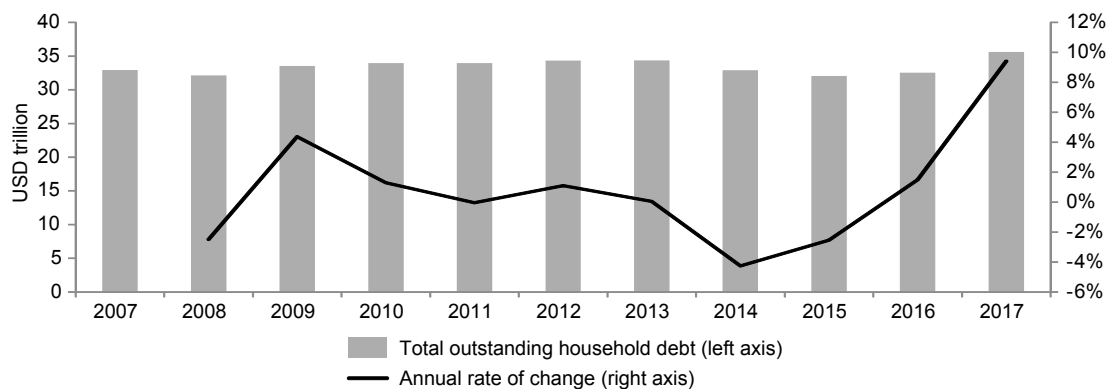


Fig. 1. Total outstanding household debt in OECD countries over the period 2007–2017

Source: Author’s own elaboration based on the OECD [2019b].

Given the above, the paper aims to investigate developments in the household debt-to-GDP ratio across OECD countries over the period 2007–2017 from the standpoint of the individual tendencies in its numerator and denominator, and to identify the groups of countries exhibiting similar patterns in the post-crisis evolution of these variables. To the author’s knowledge, no prior study has attempted to address these issues empirically, hence the present paper seeks to fill this apparent gap in the related literature.

The evidence in the relevant literature, discussed in detail in the next section of the paper, allows to formulate the following hypothesis: “The disparities in the post-GFC (global financial crisis) developments in the household debt-to-GDP ratio across OECD countries result from differences in the evolution of its numerator and denominator, determined by the initial levels of household sector indebtedness and GDP per capita as well as the severity of recession that affected each of their economies”.

The remainder of the paper is composed of three sections. Section 2 provides a review of the relevant literature on household sector indebtedness with a particular focus on the linkages and feedbacks between the accumulation of debt and performance of the economy. Section 3 discusses the details of the data selection procedures and the methodological framework of the paper. The main findings of the study are given in Section 4. The paper closes with conclusions summarising its key findings and providing some suggestions on directions for future research.

LITERATURE REVIEW

The evidence in the relevant literature indicates that household indebtedness is driven by a complex set of macroeconomic, socio-demographic and psychological factors. The surge in household debt prior to the recent global financial crisis is often attributed to the widespread liberalisation of financial regulations [Aron and Muellbauer 2000] which increased the appetite for risk, intensified competition among lenders, and fostered financial innovation, leading to eased lending standards and greater accessibility of credit [Dyan and Kohn 2007, Barba and Pivetti 2009, Bloxham and Kent 2009]. According to Zinman [2014], this process involved various advances in ‘loan production technology’, including the development of advanced risk management techniques, reduction of distribution costs, as well as a rapid evolution of financial services marketing and the ‘technology of persuasion’.

In addition, the years preceding the great recession were characterised by a relatively low macroeconomic volatility that dampened risk aversion perceived by both lenders and borrowers. The combination of a decent pace of economic growth with low inflation, unemployment, and interest rates strongly favoured the debt-driven model of development.

A considerable bulk of empirical studies reports a positive association between the nominal level or the rate of growth in GDP and the extent of household indebtedness [Meng et al. 2011, Mason and Jayadev 2014, Rubaszek and Serwa 2014] which likely results

from the pro-cyclical nature of lending and borrowing activities. In times of expansion growing incomes improve households' creditworthiness and optimism about their debt-paying ability. Not surprisingly, therefore, in the micro-level studies current and expected future incomes are often listed among the most important drivers of household debt [Del Rio and Young 2006, Magri 2007, Brown and Taylor 2008, Anioła-Mikołajczak 2016]. Simultaneously, the increase in debt-levered expenditure boosts the aggregate demand and ultimately accelerates GDP.

Another feedback emerges between the supply of credit and the prices of assets due to collateral and wealth effects. As growing demand for assets fuels debt and pushes their prices up, the increased value of collaterals reduces credit constraints and facilitates equity withdrawals. This feedback seems particularly pronounced in the case of mortgage loans and residential property prices [Oikarinen 2009, Gimeno and Martinez-Carrascal 2010, Anundsen and Jansen 2013, Turk 2015, Moore and Stockhammer 2018].

Several studies suggest, however, that a long-run growth in GDP before the crisis might have failed to translate adequately and uniformly into labour compensation. According to Barba and Pivetti [2009], the surge in U.S. household debt had been strongly driven by a persistent stagnation in real wages and retrenchments in the welfare state that inclined many Americans to reach for an easily available debt in order to fill the gap between their income and consumption needs. In this way, debt actually became a substitute for productivity-enhanced labour compensation, allowing households to simulate their social class and create the 'debt-driven illusion' of prosperity [Leicht 2012]. Such a substitutive relationship between labour compensation and household debt is not limited to the U.S. economy, but appears to be widely spread across both developed and emerging economies around the world [Bolibok and Matras-Bolibok 2018]. In a similar vein, the results of many studies indicate that as income inequality increased, poorer households were forced to take on debt to keep up with social consumption standards in spite of stagnating or declining real incomes [Frank et al. 2014, Stockhammer 2015, Klein 2015, Malinen 2016].

An elevated level of household debt has some serious macroeconomic implications. Even if, on its own,

it might not generate adverse shocks to an economy, it definitely increases the sensitivity of the household sector to changes in interest rates, labour compensation, and asset prices [Debelle 2004]. From the standpoint of the monetary transmission mechanism, it also increases the probability of asymmetrical responses of an aggregate demand to changes in interest rates, i.e. when the household sector is significantly indebted, a contractionary impact of an increase in interest rates is expected to be much stronger than an expansionary effect of an equal-sized rate cut [Zabai 2017].

Jordà et al. [2016] examined a long-run dataset covering disaggregated bank credit for 17 advanced economies since 1870, demonstrating that throughout the 20th century the share of mortgages on bank balance sheets roughly doubled, primarily due to a sharp rise of mortgage lending to households. Moreover, in the post-WWII era bank loans have become a specific source of financial instability in advanced economies, as a high rate of credit extension seems to be a reliable indicator of an increasing risk of a financial crisis. They also argue that financial crisis recessions tend to be significantly more costly than others, since credit booms (in particular, mortgage booms) are associated with deeper recessions and slower recoveries.

Having examined an unbalanced panel of 30 countries over the period 1960–2012, Mian et al. [2017] report that increased household debt-to-GDP ratios predict slower economic growth and higher unemployment in the medium and long run. Their results also highlight the importance of credit supply shocks by demonstrating how low mortgage spreads lead to an increase in the household debt-to-GDP ratio and a decline in subsequent GDP growth. Also, Alter et al. [2018] analysed a sample of 80 advanced and emerging economies over the period 1950–2016 and found that over the medium term, high growth in household borrowing is negatively associated with economic growth. On average, a one standard deviation increase in the household debt ratio is associated with a 1.2 percentage point lower output growth over the following three years, with the effect being stronger for advanced economies.

The results of the aforementioned studies generally suggest that an expansion of household debt results in a trade-off between fuelling short term growth and

placing a significant drag on long-run demand [Hays 2018]. Accumulation of debt forces households to allocate an increasingly higher share of their incomes to its service which, *ceteris paribus*, imposes a downward pressure on consumption, especially if monetary policy in a given country is tightened or real labour compensation declines.

An attempt to classify some major economies according to the level and trend in their household debt-to-GDP ratio after the global financial crisis was made by Zabai [2017]. From that standpoint she distinguishes four broad categories of countries, in which household debt relative to GDP is:

- high (above 60% of GDP) and rising (Australia, Canada, Korea, Norway, Sweden, Switzerland),
- high and flat/falling (the Netherlands, Spain, the United Kingdom, the United States),
- low (below 60% of GDP) and rising (Belgium, Brazil, China, France, Singapore),
- low and flat/falling (Germany, India, Italy, Japan, Mexico).

The above approach, however, does not take into account the tendencies exhibited separately by the numerator and denominator of the ratio. Despite relatively abundant literature on the relationships between household debt and GDP, to date apparently no study has attempted to investigate the patterns of evolution of the household debt-to-GDP ratio in the international context from the standpoint of the individual trends in its numerator and denominator. The present study attempts, therefore, to fill this gap with a special regard to the factors that had likely affected the above tendencies in the post-GFC period.

MATERIAL AND METHODS

The first stage of the research involved a comparative analysis of the average annual rates of change in the household debt-to-GDP ratio, as well as in its numerator and denominator across OECD countries in the period 2008–2017. According to OECD methodology, household debt is defined as all liabilities that require future payments of interest or principal to the creditor [OECD 2019a]. Therefore, in the present study, the household debt-to-GDP ratio for a given country and year has been measured as the relation of total outstanding loans to households to GDP.

The second stage aimed at identifying similarities in the patterns of evolution of the ratio across the sample from the standpoint of the tendencies in the annual real rates of change in total loans to households and GDP. The investigation was based on a cluster analysis with the *k*-medians algorithm to control for the presence of outliers and minimize error over all clusters. The number of centroids was arbitrarily set at 8 to reflect the number of combinations of tendencies that might theoretically exist in the numerator and denominator of the ratio. Following the evidence in the relevant literature discussed in Section 2, which suggests that the evolution of the household debt-to-GDP ratio is likely influenced by the overall level of incomes and performance of a given economy, as well as the initial indebtedness of the household sector, the identified clusters were compared with respect to the median values of pre-crisis GDP per capita and household debt-to-income ratios, as well as the medians of the average rates of growth in the post-GFC period.

The examined sample covers all (36) OECD member countries. The data on household debt, inflation (CPI), GDP (including per capita GDP in thousand USD) and its growth rates were extracted from the OECD.Stat database [OECD 2019b].

RESULTS AND DISCUSSION

Figure 2 illustrates the differences in the average rates of growth in total loans to households to GDP across the examined sample over the period 2008–2017. The majority of the examined countries exhibit a growing tendency in the household debt-to-GDP ratio in the period succeeding the global financial crisis (GFC). The composition of this group, however, is quite diversified. Apart from the emerging economies, where a fast increase in the ratio likely reflects a low-base effect, many developed economies with much higher initial indebtedness experienced a steady growth in this ratio, as well. The highest average annual rates of growth have been found in the Slovak Republic, Poland, and Chile. Among the advanced economies the fastest average growth in the relation of household debt-to-GDP occurred in Scandinavian countries – Norway, Sweden and Finland, while the slowest growth took place in Italy, New Zealand and Denmark.

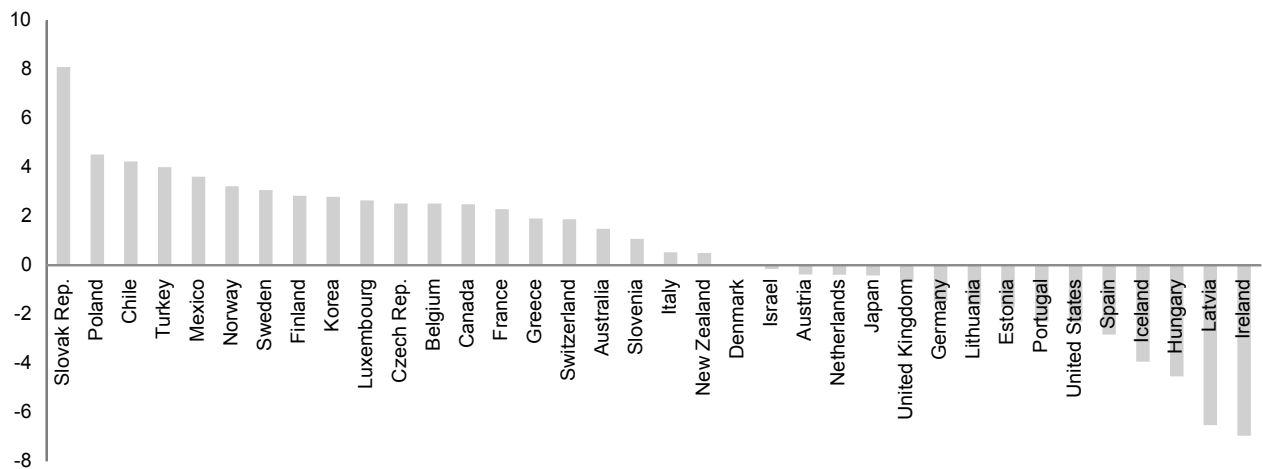


Fig. 2. Average rate of change in household debt-to-GDP over the period 2008–2017

Source: Author’s own elaboration based on OECD [2019b].

The deleveraging of the household sector was observed in both some advanced and developing economies. Among the advanced economies, the fastest decline in household debt-to-GDP ratio occurred in Ireland, Iceland, and Spain, while the latter group comprises the post-transition economies of the Baltic states and Hungary.

In the next stage of the research a cluster analysis was employed to identify similarities in the patterns of post-crisis evolution of the investigated ratio in the sample, from the standpoint of the general tendencies in the numerator and denominator (Fig. 3).

The median values of pre-crisis GDP per capita and household debt-to-GDP ratios, as well as the medians of the average rates of

growth in GDP and household debt in the post-GFC period for each of the identified clusters are given in the table.

The majority of the investigated economies exhibit growth in both total loans to households and GDP (first quadrant of the coordinate system in Fig. 3). Except for Austria, the amount of debt in those countries had been growing faster than output, which resulted in a gradual

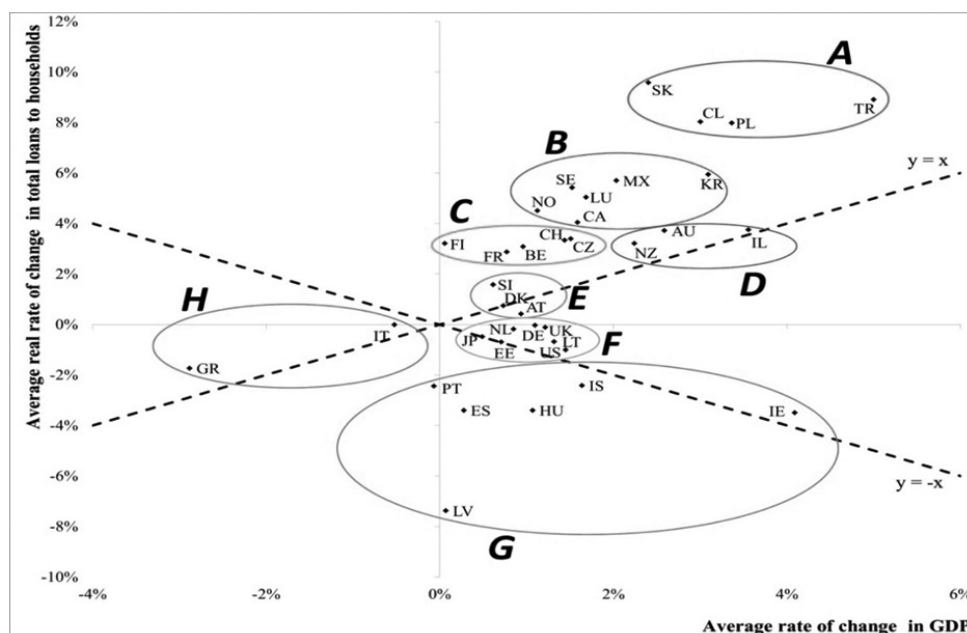


Fig. 3. Clusters of countries according to average rates of change in household debt and GDP in 2008–2017

Source: Author’s own elaboration based on OECD [2019b].

increase in the household debt-to-GDP ratio. According to the results of the cluster analysis, the countries where both numerator and denominator of the ratio increased can be categorized into five groups. Cluster A encompasses quickly developing emerging economies that experienced a rapid growth in household debt in the examined period. These outcomes are largely attributable to a low-base effect, as the median values of the pre-crisis household debt-to-income ratio and GDP per capita in this cluster are significantly lower than in all the others. Additionally, these economies were less severely affected by the impact of the global financial crisis, or were even, as in the case of Poland, able to avoid recession.

Clusters B and C comprise countries in which household debt also was growing considerably faster than GDP, leading to a pronounced growth of the ratio. The main differences between these two groups regard the median values of the average rates of growth in each of the examined variables and the initial indebtedness of the household sector. The countries in Cluster B were generally recovering from the 2009 recession much faster than those in Cluster C, which allowed their household sectors to accumulate debt at a higher pace, even though (with the exception of Mexico) they were beginning the analysed period with significantly higher average indebtedness and GDP per capita.

The countries in Clusters D and E exhibited similar rates of growth in both numerator and denominator of the investigated ratio, which allowed them to keep it at relatively stable levels. Similarly, as in the case of Clusters B and C, the key difference between them lies in the average rates of growth in both determinants of the ratio. In general, the countries in Cluster E were hit by the recession much harder and were recovering slower than those in Cluster D, which seemingly discouraged their household sectors from taking on more debt. The composition of each cluster appears, however, to be significantly diversified in terms of the pre-crisis levels of GDP per capita and household debt-to-GDP ratio. In the case of Cluster D they ranged, respectively, from 27.3 thousand USD (PPP) and 43.4% for Israel to 39.6 thousand USD and 101.5% for Australia, while in Cluster E from 27.5 thousand USD and 41.1% for Slovenia to 39.0 thousand USD and 100.9% for Denmark.

The next broad category of economies encompasses countries in which the household sectors managed to deleverage and decrease the stock of debt while their economies were gradually recovering from recession (fourth quadrant of the coordinate system in Fig. 3). According to the results of the conducted analysis these countries can be classified into two clusters: the first characterised by a slowly decreasing amount of debt combined with a modest growth in GDP (Cluster F),

Table. Median values of the selected features of the identified clusters of countries

Cluster	Countries	Household debt-to-GDP in 2007 (%)	GDP per capita in 2007 (thous. USD)	Average annual real rate of growth of household debt (%)	Average annual rate of growth in GDP (%)
A	Chile, Slovakia, Poland, Turkey	19.9	16 831.12	8.5	3.2
B	Canada, Korea, Luxembourg, Mexico, Sweden, Norway	68.0	40 086.39	5.2	1.6
C	Belgium, Czech Republic, Finland, France, Switzerland	48.4	36 871.59	3.1	0.9
D	Australia, New Zealand, Israel	72.5	29 308.17	3.7	2.6
E	Austria, Denmark, Slovenia	51.4	38 978.77	0.7	0.7
F	Estonia, Germany, Japan, Lithuania, Netherlands, United Kingdom, United States	60.5	35 409.52	-0.5	1.1
G	Hungary, Iceland, Ireland, Latvia, Portugal, Spain	83.8	29 148.14	-3.4	0.7
H	Greece, Italy	42.3	31 543.25	-0.9	-1.7

Source: Author's own elaboration based on OECD [2019b].

and the second with a considerably faster decline in debt along with very diversified economic growth (Cluster G). With the exception of post-transition economies of the Baltic states and Hungary, the countries in both clusters had relatively high pre-crisis levels of household indebtedness. The average incomes in 2007 tended to be significantly higher in Cluster F, as it included mostly the advanced economies. The countries in Cluster G had on average lower initial levels of GDP per capita, but at the same time usually larger amounts of household debt relative to output. Additionally, they were usually hit by the impact of the global financial crisis much harder than those in Cluster F.

Finally, the last Cluster (H) encompasses the countries in which both the amount of household debt and output were generally declining in the post-crisis period, i.e. Italy and Greece. Paradoxically, the average rate of decline in GDP in these countries turned out to be greater than the corresponding reduction in indebtedness, which led to an overall increase in the household debt-to-GDP ratio. In the case of both countries, the pre-crisis levels of the ratio were rather low, however, in the case of Greece the severe recession it suffered brought the ratio much closer to the average level in developed economies, despite the struggle many households went through to deleverage.

CONCLUSIONS

The findings of the research generally support the formulated hypothesis and indicate that significant disparities in the development of the household debt-to-GDP ratio across OECD countries since the global financial crisis result from differences in the evolution of its numerator and denominator, which in turn seem to be related to the pre-crisis levels of household sector indebtedness and GDP per capita, as well as the depth of recession that affected the particular economies.

Despite the initial attempts to deleverage, in the majority of the examined countries household debt-to-GDP ratio was gradually increasing in the post-crisis period. In most cases this growth resulted from a faster accumulation of debt relative to the rate of economic growth. Paradoxically, however, it could also have been caused by an overall downward trend in GDP that outpaced the real rate of decline in the amount of debt, as in the case of Greece.

The findings of this study strongly suggest that investigation of the developments in household debt-to-GDP requires focusing not only on the changes in the value of the ratio itself but also on the individual trends revealed by its numerator and denominator. Given the above and the fact that the present study is limited to the OECD countries, future research might, therefore, attempt to explore the above issues in a broader international context.

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ZMIANY W POZIOMIE WSKAŹNIKA ZADŁUŻENIA GOSPODARSTW DOMOWYCH DO PKB W KRAJACH OECD PO WYBUCHU GLOBALNEGO KRYZYSU FINANSOWEGO

STRESZCZENIE

Celem artykułu jest ocena zmian w poziomie wskaźnika zadłużenia gospodarstw domowych do PKB w krajach OECD w okresie 2007–2017 z perspektywy tendencji występujących w jego liczniku i mianowniku oraz identyfikacja grup krajów cechujących się podobnym przebiegiem tych zjawisk po wybuchu globalnego kryzysu finansowego. Zastosowane metody badawcze obejmują analizę porównawczą przeciętnego tempa zmian zadłużenia gospodarstw domowych oraz PKB w próbie oraz analizę skupień z użyciem algorytmu *k*-median, zorientowaną na identyfikację powyższych podobieństw. Uzyskane wyniki wskazują na silne zróżnicowanie kierunków zmian zachodzących w poziomie badanego wskaźnika w analizowanej grupie krajów w badanym okresie, wynikające z odmiennego przebiegu zjawisk kształtujących wielkości ujęte w jego liczniku i mianowniku, determinowanych zarówno przez poziomy zadłużenia sektora gospodarstw domowych i PKB per capita w okresie poprzedzającym wybuch kryzysu, jak i przez głębokość recesji, jaka dotknęła poszczególne gospodarki.

Słowa kluczowe: gospodarstwa domowe, zadłużenie, globalny kryzys finansowy, wzrost gospodarczy