



## Household Debt and Economic Growth

Khairunnisa Abd Samad, Siti Nurazira Mohd Daud, Nuradli Ridzwan Shah Mohd Dali

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v10-i4/7154>

DOI:10.6007/IJARBSS/v10-i4/7154

**Received:** 21 February 2020, **Revised:** 24 March 2020, **Accepted:** 30 March 2020

**Published Online:** 28 April 2020

**In-Text Citation:** (Samad et al., 2020)

**To Cite this Article:** Samad, K. A., Daud, S. N. M., & Mohd Dali, N. R. S. M. (2020). Household Debt and Economic Growth. *International Journal of Academic Research in Business and Social Science*, 10(4), 539–551.

**Copyright:** © 2020 The Author(s)

Published by Human Resource Management Academic Research Society ([www.hrmars.com](http://www.hrmars.com))

This article is published under the Creative Commons Attribution (CC BY 4.0) license. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this license may be seen at: <http://creativecommons.org/licences/by/4.0/legalcode>

**Vol. 10, No. 4, 2020, Pg. 539 - 551**

<http://hrmars.com/index.php/pages/detail/IJARBSS>

JOURNAL HOMEPAGE

Full Terms & Conditions of access and use can be found at  
<http://hrmars.com/index.php/pages/detail/publication-ethics>

## Household Debt and Economic Growth

Khairunnisa Abd Samad

Fakulti of Business Management, Universiti Teknologi MARA Cawangan Melaka

Siti Nurazira Mohd Daud

School of Economics Finance and Banking, Universiti Utara Malaysia

Nuradli Ridzwan Shah Mohd Dali

Faculty of Economics & Muamalat, Universiti Sains Islam Malaysia

### Abstract

The current study aims to examine the effect of household debt on growth using a sample of 43 countries for the period from 1980 to 2018. The analysis of the resulting panel data employs an a bias-corrected least square dummy variables (LSDVC). The findings for the sample of panel data confirm that the household debt has detrimental effect on growth. The policy makers can propose measures that reinforce suitable macro-prudential policy to enhance the role of household debt on economic growth. Though household debt in reality causes the economic downturn, the findings help the policy maker to control and manage the household debt wisely.

**Keywords:** Household Debt, Economic Growth, LSDVC, Panel Data.

### Introduction

Rapid increase in household debt has raised concerns over it influences on the financial crisis 2007-2008. Though household debt is assumed as wheels for consumption and geared up the economic growth from an economic perspective, it also can be execrable for growth as well. Consistent with some works of literature, the household debt positively influences economic growth at a certain point and acts negatively subsequently (Cecchetti, Mohantry and Zampolli, 2011; Lombardi, Mohanty and Shim, 2017). Intuitively, household debt is essential to fill the shortage of income for a household in financing their daily expenses for consumption such as personal use, car and property. The growing consumption can spur the economic growth accompanied by active lending practices by the financial institutions.

Household debt plays a vital role in supporting economic growth with the view that the financial institutions vigilant with the lax lending practices (see Agarwal, Chang, & Yavas, 2012; Campbell, 2006) and subprime borrowers (Justiniano, Primiceri, & Tambalotti, 2016). However, the growing demand with expected future asset margin encouraged the financial institutions involved in lax lending regulations for subprime mortgage borrowers. Hence, the high inbred

build-up of household debt in the US explained for the sequential Great Recession in 2007-2008. Consequently, the rising household debt slowed the long-run economic growth for several years. It caused a prolonged economic downturn and recovery at the original pace took longer than desired.

A country's economic health is at risk with the rapid increase in household debt (Aaronson, Agarwal & French, 2012; Campbell, 2006; Hunt, 2015; Khazanah Research Institute, 2014). The aftermath of the crisis had a spillover effect on other countries due to the high inter-linkages among them. According to International Monetary Fund (IMF, 2017), the household debt to GDP has kept increased gradually from 35% in 1980 to about 65% in 2016 for advanced economies, albeit more slowly after the financial crisis (Nolan, 2019). Meanwhile, the ratio for emerging economies is still at a lower level but rising tremendously over a shorter period, from 5% in 1995 to about 20% in 2016. Generally, between 2008 and 2018, household debt increased from 58 per cent of global GDP to 60 per cent (IMF, 2018).

Motivated by the study conducted by Cecchetti et al. (2011) in OECD countries revealed that economic growth was affected, either negatively or positively, by the tremendous increase credit to the household. Hence, the study inspired to investigate the role of household debt on growth. The contribution of this paper is two-fold; first, while several studies conducted in advanced countries such as Cecchetti et al. (2011) in OECD and Gómez-Puig and Sosvilla-Rivero (2017) examines the household debt in ten euro-area countries, this study conducts in wider sample for panel dataset of advanced and emerging economies. Secondly, the study employs a bias-corrected least square dummy variable (LSDVC) appropriated for the unbalanced cross-country dataset of 43 countries following Bruno (2005a,b). Analyses of panel countries are still lacking and this study extends the existing strands of literature.

### **Literature Review**

The effective influence of household borrowing on economic growth has seen a fascinating interest among researchers in the past few years with growing scholars attending to the issue. The idea of economic growth goes back to Solow's (1956) growth model found in the neoclassical growth theory. It functions as a baseline for many models concentrating on growth analyses. The model focuses on two main variables, namely capital and the size of labour. Since the model incorporated the idea of diminishing returns, Swan (1956) and Mankiw, Romer and Weil (1992) extended the model by adding a human resource, physical asset, and technological change defined as exogenous sources of long-run growth.

Later, Romer (1986) and Lucas (1988) contributed to the new or endogenous growth model which asserted that the progress rate of technology determined the speed of per capita growth in the long term. This theory emphasized for the government to promote investments in innovation as well as technological change. Besides, the government should take on the role of providing funds for education, infrastructure, and research and development. Thus, this underlines the reasons why government debt is crucial for economic growth. Barro and Sala-i-Martin (1997) emphasized that technological innovation and the development of human capital permanently drove economic advancement. Thus, the model combines elements of endogenous growth with the convergence implications of the neoclassical growth model. In the long run, the world growth rate is driven by discoveries in those economies that lead in their use of technology.

Inspired by the impact of debt on growth, Checherita and Rother (2012) and Reinhart and Rogoff (2010) furthered the growth model by incorporating the role of government debt. In the framework, the growth model developed was able to measure the influence of external debt on economic growth in the long run. Also considered was the link between private borrowing and economic growth as controlling variables. The growth model is realistic in the relationship between debt and capital finance to assist firm development and paving the way for economic progress.

Existing in the literature are the extensive theoretical and empirical research models that associate debt and growth. However, studies on the link between household debt and economic growth are scarce but gaining importance, nevertheless. The explanations on how household debt could pave the way for economic growth have been suggested. Households borrow to fund their consumption when there are unexpected changes in income and expenditure (Ando & Modigliani, 1963). In particular, household debt funds consumption and boosts the aggregate demand, thus promoting economic growth.

Empirically, some research confirmed the negative role of household debt on economic growth. In a series of studies on micro-data using the US zip code level data from 2002 to 2005, Mian and Sufi (2009) document new findings that the tremendous increase in mortgage credit was correlated with a severe upsurge in defaults in the area of high subprime zip codes. The study was lengthened by Mian and Sufi (2010) from 2002 to 2006 and found that growth in household debt coupled with high credit card borrowing was closely linked to the 2007–2009 economic recession. Also, Mian, Rao and Sufi (2013) analyzed the US's counties panel set and found that the subsequent to housing price slump, counties with high household leverage tended to experience a severe shock during an economic recession compared to low leveraged counties. They extended their work by focusing on the impact on consumption, showing that the magnitudes of the relative drop in consumption in high debt counties were largely subsequent to the crisis combined with the collapse of home prices. The fall in housing price triggered a sudden shock to the household balance sheet, resulting in high deleveraging among the affected households and a significant drop in household consumption.

Cecchetti et al. (2011) analyzed 18 OECD countries from 1980 to 2010 by introducing a spline specification and stipulated that household debt contributed to positive growth but only up to a certain level. Beyond the threshold of 85% of GDP, the impact was deemed highly ambiguous. Lombardi et al. (2017) lengthened the research by including a dataset of 54 economies over 1990 to 2015 and demonstrated that household debt lifted growth in GDP and consumption but had a long-run negative impact on consumption when the household debt to GDP ratio was beyond 60%. Following this research, Gómez-Puig and Sosvilla-Rivero (2017) examines the household debt in ten euro-area countries and proved that the debts play an important role in determining the countries' growth. In a recent study of Park, Shin and Tian (2019) showed that the household debt predicted future crisis. The empirical studies that indicate the linear relationship between household debt on growth that covers both advanced and emerging economies is still lacking. Hence, the study fills the gap by investigating its role using a panel dataset including the advanced and emerging economies.

### Methodology and Data

Following both the relevant economic theory and the previous empirical results, our strategy incorporates the specification and estimation of a growth equation based on the growth literature (e.g., Barro & Sala-i-Martin, 2004) augmented by debt to assess the effect of household debt on growth.

$$y_{it} = a_i + \gamma y_{i,t-1} + \sum_{j=1} \beta_j X_{it} + \beta HD_{it} + \varepsilon_{it} \quad (1)$$

where  $y_{i,t-1}$  is the one-lagged real per capita GDP growth for country  $i$  at lagged with  $\gamma$  to capture conditional convergence of the economy to its steady state.  $\beta_j$ ,  $j= 1, \dots, 7$  are the parameters to be estimated and  $X_{it}$  is a set of explanatory regressors of independent variables; capital input, population growth, human capital, trade openness and inflation.  $HD_{it}$  is the household debt-to-GDP ratio at time  $t$  for country  $i$  following Cecchetti et al. (2011) debt-growth model on panel country.  $\varepsilon_{it}$  represents the error term and  $i$  represent the country specific effect at time  $t$ .

In this study, debt is considered as a critical factor that contributes to sustained economic growth. According to Friedman's (1957) permanent income hypothesis and Ando and Modigliani's (1963) life cycle hypothesis, debt is an apparatus to maintain a stable level of consumption for an individual's life cycle. The hypotheses emphasize that the household makes a loan when earning is lower than expected saves when there is an unexpected increase in income or during its most productive working days. The theory highlights the importance of household debt on economic growth. The model can thus be expanded to include household debt following Cecchetti et al. (2011). The final form of household debt growth-model in the present study is

$$Y_{it} = \beta_0 + \beta_1 Y_{t-1} + \beta_2 GCF_{it} + \beta_3 POPG_{it} + \beta_4 HC_{it} + \beta_5 TO_{it} + \beta_6 INF_{it} + \beta_7 HD_{it} + \varepsilon_{it} \quad (2)$$

where  $Y_{it}$  is real GDP per capita income,  $Y_{t-1}$  is the one-lagged real per capita GDP growth with  $\beta_1$  to capture conditional convergence of the economy to its steady state,  $\beta_2, \dots, \beta_7$  represent the coefficient of independent variables include gross capital formation, population growth, human capital, trade openness, inflation and household debt-to-GDP ratio at time  $t$  for country  $i$ .

According to Keynes (1936), higher savings via increased investments stimulate economic growth. Domestic saving was featured to finance aggregate investments with labour-augmenting technological changes which were exogenous in defining the equilibrium growth of per capita output (Solow, 1956; Swan, 1956). Thus, investment is an important variable for economic growth in this study using gross capital formation GCF. Population growth as a proxy of country size, plays an important role as a control variable (Checherit et al., 2012; Woo & Kumar, 2015). The Malthusian Theory of Population argues that the pressure of increasing population on the food supply will destroy the wellbeing and cause life misery. Moreover, a growing population will lead to limited supply of land, thus lower standard of living (Dao, 2012). So, population growth

POPG negatively affects economic growth (Checherita et al., 2012; Woo & Kumar, 2015). On the other hand, labour input or human capital HC is viewed as an important variable denotes productivity because the expansion of human capital is a reflection of more innovative activities, generating more ideas that will likely attract investors' interest (Grossman & Helpman, 1991). Trade openness TO affects positively economic growth. Seghezza and Baldwin (2008) posited that trade openness boosted labour productivity through knowledge transfer. Inflation has also been debated as an essential macroeconomic indicator of economic growth. Rising inflation INF means is a cost on the firm to place more resource allocation to finance inflating prices (Gokal & Hanif, 2004). Firms and households tend to perform poorly following the conservative investment strategies. Barro (2013) stated that the increases in average inflation were the reduction in the growth rate of real per capita GDP per year. Therefore, inflation is included in the growth model. In addition, Cecchetti et al. (2011) extended the neoclassical growth model by indicating the important role of government, private and household debts HD on economic growth.

### Data

The panel data set used in this study possesses two main dimensions; a cross-sectional dimension consisting of 43 countries (see in Table 1) and a time series dimension spanning from 1980 to 2018. For estimation purposes, data are collected from several sources such as BIS, and the World Bank database.

**Table 1. List of Countries**

1	Argentina**	23	Japan*
2	Australia*	24	Korea**
3	Austria*	25	Luxembourg*
4	Belgium*	26	Malaysia**
5	Brazil**	27	Mexico**
6	Canada*	28	Netherlands*
7	Chile**	29	New Zealand*
8	China**	30	Norway*
9	Colombia**	31	Poland**
10	Czech Republic**	32	Portugal*
11	Denmark*	33	Russia**
12	Finland*	34	Saudi Arabia**
13	France*	35	Singapore**
14	Germany*	36	South Africa**
15	Greece*	37	Spain*
16	Hong Kong**	38	Sweden*
17	Hungary**	39	Switzerland*
18	India**	40	Thailand**
19	Indonesia**	41	Turkey**
20	Ireland*	42	United Kingdom*
21	Israel**	43	United States*
22	Italy*		

\* Advanced economies

\*\* Emerging economies

### Estimation Method

The scope of this study aims at investigating in 43 countries with unbalanced series dataset which deemed fit by employing the bias-corrected Least Square Dummy Variables (LSDVC) estimator, an appropriate method for small number of cross-section groups. There are many advantages using the LSDVC method whereby the potential biases in the estimators resulting from endogeneity related to both reverse causality and omitted variable bias are reduced by incorporating lag-dependant variable in the model be estimated. Proposition for panel dataset estimators; Anderson and Hsiao (AH, 1981) developed two instrumental variables (IV) procedures, while Arellano and Bond (AB, 1991) proposed estimation procedures based on generalized method of moments (GMM) for first-differenced model which depending on a greater number of internal instruments, is more efficient than AH. Then, Blundell and Bond (BB, 1998) proposes system GMM estimator while they observe that with highly persistent data, first-differenced IV or GMM estimators may suffer of a severe small-sample bias due to weak instruments. However, GMM and IV estimators show nice properties when N is large, while become biased with high instrumental variables when the panel is based on a small number of cross-sectional units. So, Bun and Kiviet (2003) and Bruno (2005a,b) proposed LSDVC applicable for a small cross-section and unbalanced panel of the sample. Accordingly, this study uses this approach as implemented by Bruno (2005b) and removing the outliers using Cook's D following Law (2018) to cross check our empirical findings.

### Findings and Discussion

As preliminary analysis, Table 2 provides a summary statistic for the control variables; real GDP growth per capita (GDPPCG), gross capital formation (GCF), population growth (POPG), human capital (HC), trade openness (OPEN), inflation (INF), and household debt (HD). These statistics covered a panel data of 43 countries over the period of 1980 to 2018.

**Table 2. Descriptive Statistics for Model Economic Growth**

Variable	Mean	Std.Dev.	Min	Max
GDPPCG	2.317	2.058	-4.504	10.884
GCF	24.248	4.983	11.828	47.541
POPG	0.826	0.717	-0.432	3.597
HC	76.086	4.88	54.703	84.395
TO	80.942	72.338	12.476	425.158
INF	7.532	27.488	-3.634	446.836
HD	44.822	28.976	0.275	130.3

Notes: GDPPCG = Gross Domestic Product per capita growth, GCF = gross capital formation, POPG = population growth, HC = human capital, TO = trade openness, INF = inflation, HD = household debt.

The real GDP growth per capita is 2.32% on average, with minimum and maximum values of -4.5% (Greece) and 10.88% (China) respectively for the sample countries. Gross capital formation ratio to GDP recorded at 24.25% on average, and its minimum value is 11.83% (Greece) and maximum value is 47.54% (China). The average of population growth is 0.83% with minimum and

maximum value stands at -0.43% (Russian Federation) and 3.6% (Singapore) respectively. The life expectancy rate represents the human capital has overall mean is 76 years and variation of the minimum 54 years in South Africa and maximum 84 years in Hong Kong. The trade openness ratio of GDP has average value at 80.94% with wide variation between minimum and maximum values of 12.48% (United States) and 425.16% (Hong Kong) accordingly. For inflation, the overall mean is only 7.53% with minimum point at -3.63% (Hong Kong) and maximum point at 446.84% (Argentina). The overall average for household debt ratio to GDP is 44.82% with minimum value at 0.28% of GDP for Turkey and maximum value 130.3% for Denmark.

Table 3 presents the correlations matrix for all variables. It is interesting to note that, some of the variables are consistent with the theoretical predictions. For instance, gross capital formation and trade openness are positively correlated with the economic growth. Meanwhile, human capital and household debt have negative correlation with the real growth of GDP per capita. As displayed in the table, human capital and inflation are inconsistent with the underlying assumptions. Though there are some variables have opposite correlation with theoretical predictions, it does not mirror the real causal relationship. Among the determinant of economic growth model, gross capital formation shows the highest correlation with real GDP per capita growth at 0.56.

**Table 3. Matrix of Correlations for Model Economic Growth**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) GDPPCG	1						
(2) GCF	0.555	1					
(3) POPG	-0.02	0.147	1				
(4) HC	-0.27	-0.16	-0.12	1			
(5) TO	0.103	0.048	0.207	0.28	1		
(6) INF	0.074	-0.09	0.089	-0.24	-0.12	1	
(7) HD	-0.26	-0.09	-0.09	0.63	0.157	-0.24	1

Notes: GDPPCG = Gross Domestic Product per capita growth, GCF = gross capital formation, POPG = population growth, HC = human capital, TO = trade openness, INF = inflation, HD = household debt.

Table 4 displays the VIF values of the explanatory variables. The VIF of the variable do not exceed the cut-off of 10 as suggested by Hair, Anderson, Tatham and Black (1995) and Gujarati (2003). The tolerance values are all above 1.408 indicating no serious collinearity problems.

Table 5 provides the main result for the study using LSDVC estimation (AH), LSDVC (AB), and LSDVC (BB) estimations, together with a level of accuracy or precision of 3 and customized the standard errors using bootstrapped standard errors of 50 replications. The analyses begin with a baseline regression analysis, which investigates the linear regression of household debt in growth model presented in models 1a to 1c. For robustness, the models remove outliers presented in columns 1d to 1f. The results in Table 5 show that the lagged dependent variable is positive and are statistically significant at the 5% significance level, suggesting that growth of real GDP is persistent. The coefficients of household debt to GDP variable are -0.039\*\*\*, -0.04\*\*\* and -0.042\*\*\* and are statistically significant at 1% (\*\*\*) significance level in all models 1a to 1c. The estimated coefficient means for every 1% increase in household debt ratio slower the economic growth by 0.04% in accordance to all models.



**Table 4. Variance Inflation Factor**

	<b>VIF</b>	<b>1/VIF</b>
GCF	1.07	0.935
POPG	1.126	0.888
HC	1.921	0.52
TO	1.173	0.853
INF	1.111	0.9
HD	1.916	0.522
Mean VIF	1.408	

Notes: GDPPCG = Gross Domestic Product per capita growth, GCF = gross capital formation, POPG = population growth, HC = human capital, TO = trade openness, INF = inflation, HD = household debt

The outcome is supported with many studies i.e. Cecchetti et al. (2011), Gómez-Puig and Sosvilla-Rivero (2017) and Mian and Sufi (2018). Mian and Sufi (2018) asserts that an increase in debt is associated with a future slow-down in economic growth. The role of household debt in explaining the economic growth can be traced in consumption life cycle model. The debt bridge the budget constrained owned by household to finance their consumption and asset accumulation. Consequently, a higher household consumption spurs aggregate output and upsurges the countries' growth. Nonetheless, debt through deficit financing can boost aggregate demand and output, at least in the short run (Cecchetti et al., 2011, ). In the long run, household realizes the overburden of debt to income caused by interest rate shock or income shock lead to low ability for loan repayment. To compensate the consequence, they start to cut their expenditure and eventually hamper the economic growth. The rising level of debt overburdens the people eventually detrimental growth. Furthermore, Mian and Sufi (2010), Mian et al. (2013) has shown that the sluggish growth in consumption in the years following the 2007–2009 recession can be attributed to the level of outstanding debt in household balance sheets. Mian and Sufi (2009) discovered that US counties with rapidly increasing household debt had prolonged economic downturn as compared to counties with lower household debt. Hence, the empirical outcome in this study confirms the past evidence on the negative effect of household debt on growth.

**Table5. LSDVC Analysis – Household Debt and Economic Growth**

VARIABLES	Full Sample			Sample Without Outliers		
	AH (1a)	AB (1b)	BB (1c)	AH (1d)	AB (1e)	BB (1f)
	Gdppcg	gdppcg	gdppcg	gdppcg	gdppcg	gdppcg
L.GDPPCG	-0.145** -0.062	-0.154** -0.06	-0.104 -0.066	-0.190** (0.084)	-0.198** (0.082)	-0.167* (0.086)
GCF	0.174*** -0.04	0.178*** -0.037	0.180*** -0.043	0.217*** (0.045)	0.220*** (0.043)	0.216*** (0.045)
POPG	-0.897*** -0.278	-0.897*** -0.255	-0.908*** -0.294	-1.039*** (0.300)	-1.037*** (0.291)	-1.028*** (0.303)
HC	-0.533*** -0.136	-0.523*** -0.122	-0.523*** -0.147	-0.073 (0.078)	-0.072 (0.076)	-0.061 (0.081)
TO	0.026*** -0.006	0.026*** -0.006	0.027*** -0.007	0.015* (0.009)	0.015* (0.009)	0.015 (0.009)
INF	-0.040** -0.02	-0.038** -0.018	-0.037* -0.021	-0.019 (0.017)	-0.018 (0.016)	-0.019 (0.017)
HD	-0.039*** -0.01	-0.040*** -0.009	-0.042*** -0.011	-0.040*** (0.010)	-0.040*** (0.010)	-0.043*** (0.010)
Observations	245	245	245	207	207	207
N	43	43	43	43	43	43

Notes: GDPPCG = Gross Domestic Product per capita growth, GCF = gross capital formation, POPG = population growth, HC = human capital, TO = trade openness, INF = inflation, HD = household debt. Significance level: \*\*\* p<0.01, \*\* p<0.05, \* p<0.10.

Turning to control variables, the coefficients of capital stock are 0.174\*\*\*, 0.178\*\*\* and 0.18\*\*\* statistically significant at 1%(\*\*\*) significance level in all models. It has a positive impact on growth, suggesting that a 1% increase in capital stock stimulates growth by 0.174%, 0.178% and 0.18% accordingly. The coefficients of population growth are -0.897\*\*\*, -0.897\*\*\* and -0.908\*\*\* and statistically significant at the 1%(\*\*\*) significance level shown in models (1a-1c) of Table 5. It has a negative impact on economic growth, suggesting that a 1% increase in population growth reduces economic performance in investigated countries by 0.897%, 0.897% and 0.908% respectively. Meanwhile, human capital is negatively correlated with growth in three LSDVC models in investigated countries. Its influence on growth is statistically significant at the 1%(\*\*\*) level with coefficients stand at -0.533\*\*\*(model 1a) and -0.523\*\*\*(model 1b and 1c). It also indicates that a 1% increase in the human capital lessens economic growth by 0.533% and 0.523% respectively. The trade openness is positively correlated with economic growth. The magnitudes of trade openness are 0.026\*\*\*, 0.026\*\*\* and 0.027\*\*\* and statistically significant at the 1%(\*\*\*) confidence level in model 1a to 1c respectively. The results indicate that a 1% increase in trade openness elevates economic performance by 0.026%, 0.026% and 0.027%. Next, the inflation is negative and statistically significant at 5%(\*\*) and 1%(\*\*\*) confidence level based on column 1a to 1c. The coefficients of inflation are -0.040\*\*, -0.038\*\* and -0.037\* suggesting that

a 1% increase in inflation reduces economic growth in investigated countries by 0.040%, 0.038% and 0.037% accordingly.

Further robustness check is required by removing the outliers using Cooks'D (Law, 2018). The values categorized under the Cooks'D for countries; Argentina, China, Greece, Hong Kong, Ireland, Israel, Republic of Korea, Portugal, Russian Federation, Saudi Arabia, Singapore, South Africa and Thailand were removed. The tested baseline model without outliers presents robust results as the household debt is remaining negative in Table 5. The coefficients of household debt are  $-0.04^{***}$ ,  $-0.04^{***}$  and  $-0.043^{***}$  and statistically significant at 1% (\*\*\*) significance level as shown in the column 1d to 1f. The results suggest that a 1% (\*\*\*) increase in household debt lower the economic growth about 0.04%. The magnitudes of control variables are consistent with the earlier results in column 1a to 1c.

### Conclusion

The study aims to examine the role of household debt on growth in 43 countries covers advanced and emerging economies using LSDVC estimator. The study concludes that the increase in household debt is significantly harmful the economic growth. The empirical evidences presented are robust in both estimation methods, signifying that the household debt has negative relationship effects on output per capita growth in investigated countries. It is consistent with Cecchetti et al. (2011) who asserts that the household debt can be harm to economic growth. Taken together, our results suggest that, the appropriate policy formulation must be observed and taken into careful consideration to ease the effect of household debt on growth. The effect of debt on growth can be prolonged with any economic shocks, nonetheless, can be lessen given the government considers careful measures in formulating the macro-prudential policy and educating people in managing the debt wisely.

### Corresponding Author

Khairunnisa Abd Samad,

Affiliation: Universiti Teknologi MARA Kampus Alor Gajah, Km 26 Jalan Lendu, 78000, Alor Gajah, Melaka, Malaysia.

Email: khairunsamad84@gmail.com

### References

- Agarwal, S., Chang, Y., & Yavas, A. (2012). Adverse selection in mortgage securitization. *Journal of Financial Economics*, 105(3), 640–660.
- Anderson, T. W., & Hsiao, C. (1981). Estimation of dynamic models with error components. *Journal of the American statistical Association*, 76(375), 598-606.
- Ando, A., & Modigliani, F. (1963). The " life cycle" hypothesis of saving: Aggregate implications and tests. *The American Economic Review*, 53(1), 55-84.
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies*, 58(2), 277-297.
- Barro, R. J., & Sala-i-Martin, X. (1997). Technological diffusion, convergence, and growth. *Journal of Economic growth*, 2(1), 1-26.

- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics*, 87(1), 115-143.
- Bruno, G. S. (2005a). Approximating the bias of the LSDV estimator for dynamic unbalanced panel data models. *Economics letters*, 87(3), 361-366.
- Bruno, G. S. (2005b). Estimation and inference in dynamic unbalanced panel-data models with a small number of individuals. *The Stata Journal*, 5(4), 473-500.
- Bun, M. J., & Kiviet, J. F. (2003). On the diminishing returns of higher-order terms in asymptotic expansions of bias. *economics Letters*, 79(2), 145-152.
- Campbell, J. Y. (2006). Household finance. *Journal of Finance*, 61(4), 1553–1604.
- Cecchetti, S. G., Mohanty, M. S., & Zampolli, F. (2011). The real effects of debt. *Review of Financial Studies*, 22(September), 1–34.
- Checherita-Westphal, C., & Rother, P. (2012). The impact of high government debt on economic growth and its channels: An empirical investigation for the euro area. *European Economic Review*, 56(7), 1392-1405.
- Dao, M. Q. (2012). Population and economic growth in developing countries. *International Journal of Academic Research in Business and Social Sciences*, 2(1), 6.
- Gokal, V., & Hanif, S. (2004). *Relationship between inflation and economic growth*. Economics Department, Reserve Bank of Fiji.
- Gómez-Puig, M., & Rivero, S. (2017). *Nonfinancial debt and economic growth in euro-area countries*. IREA–Working Papers, 2017, IR17/14.
- Grossman, G. M., & Helpman, E. (1993). *Innovation and growth in the global economy*. Cambridge, MA: MIT Press.
- Gujarati, D. N., & Porter, D. C. (2003). Basic econometrics (ed.). *New York: McGraw-Hill*.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1984). *Multivariate data analysis with readings*, 1995. Prentice Hall, Englewood, NJ.
- Hunt, C. (2015). *Economic implications of high and rising household indebtedness*. Reserve Bank of New Zealand, 78(1), 1–12.
- IMF. (2017). “Household debt and financial stability”. In: *Global Financial Stability Report: Is growth at risk?* 53–89
- International Monetary Fund. (2018). Retrieved from <http://www.imf.org/external/research/housing/>
- International Monetary Fund (IMF). (2017). *Regional Economic Outlook: Asia and the Pacific Region, Regional Economic Outlook: Asia and Pacific, May 2017: Preparing for Choppy Seas*.
- Justiniano, A., Primiceri, G. E., & Tambalotti, A. (2016). A simple model of subprime borrowers and credit growth. *American Economic Review*, 106(5), 543-47. <http://doi.org/10.3386/w21942>
- Keynes, J. M. (1936). *The general theory of employment, interest and money*. London: Palgrave Macmillan.
- Khazanah Research Institute. (2014). *The State of Households*.
- Law, S. H. (2018). *Applied panel data analysis: Short panels*. UPM Press.
- Lombardi, M. J., Mohanty, M. S., & Shim, I. (2017). The real effects of household debt in the short and long run. *BIS Quarterly Report*. Retrieved from <http://www.bis.org/publ/work607.pdf>

- Lucas R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3-42.
- Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, 107(2), 407-437.
- Mian, A., & Sufi, A. (2009). The consequences of mortgage credit expansion: Evidence from the US mortgage default crisis. *The Quarterly Journal of Economics*, 124(4), 1449-1496.
- Mian, A., & Sufi, A. (2010). Household Leverage and the Recession of 2007–09. *IMF Economic Review*, 58(1), 74-117.
- Mian, A., Rao, K., & Sufi, A. (2013). Household balance sheets, consumption, and the economic slump. *The Quarterly Journal of Economics*, 128(4), 1687-1726.
- Midrigan, V., & Philippon, T. (2011). *Household leverage and the recession*. Mimeo: New York University.
- Nolan, P. (2019). Global Finance Since the Asian Financial Crisis. *Critique*, 47(2), 183-198.
- Park, D., Shin, K., & Tian, S. (2019). *Debt and depth of recessions* (No. 579). ADB Economics Working Paper Series.
- Reinhart, C. M., & Rogoff, K. S. (2010). Growth in a Time of Debt. *American Economic Review*, 100(2), 573-78.
- Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, 94(5), 1002-1037.
- Seghezza, E., & Baldwin, R. E. (2008). Testing for trade-induced investment-led growth. *Economia Internazionale/International Economics*, 61(2-3), 507-537.
- Sidrauski, M. (1967). Inflation and Economic Growth. *Journal of Political Economy*, 75(6), 796–810.
- Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70(1), 65-94.
- Swan, T. W. (1956). Economic growth and capital accumulation. *Economic Record*, 32(2), 334-361.
- Woo, J., & Kumar, M. S. (2015). Public debt and growth. *Economica*, 82(328), 705-739.