

THE CONSUMPTION EFFECT OF HOUSEHOLD DEBT: EVIDENCE FROM INDONESIA

Pihri Buhaerah

Research Center for Macroeconomics and Finance -
National Research and Innovation Agency
pihri.buhaerah@gmail.com

Abstract

This paper empirically examines the relationship between household debt and household consumption growth in Indonesia using the ARDL model. This paper employs quarterly time series data on Indonesian household consumption expenditures and household debt from 2002 to 2017. The results of regression analysis showed negative relationships between household debt and consumption growth in the long run, while positive linkage was found in the short run. Specifically, in the long run, a 10 percentage points increase in household debt was associated with decreasing household consumption growth by 6 percent. In contrast, in the short-run, a 10 percent increase in household debt was associated with increasing consumption growth by 29 percentage points. Thus, although the effect of household debt on consumption growth is positive in the short term, it is negative in the long term. Interestingly, the positive effect is seen to decrease when the ratio of household debt to GDP is above 12.2 percent.

Keywords: consumption growth, household debt, autoregressive distributed lag, cointegration relationship

JEL Classification: C22, D12, E21

INTRODUCTION

Household consumption is undeniably playing an important role in boosting Indonesia's economic performance. Household consumption remains the largest component in gross domestic product (GDP) distribution. Data from the Central Statistics Agency (BPS) shows that the contribution of household consumption to GDP formation in the last 5 years was 56.2 percent on average. Compared to 2014, the contribution of household consumption in 2018 slightly decreased to 55.7 percent from 56 percent. The decline was also seen in four other main components such as government spending, investment, and exports and imports. From 2014 to 2018, the contribution of all four components of GDP decreased slightly (see table 1).

Table 1 also shows that despite a slight fall, overall household consumption remains the main driving force of national economic growth. The implication as the main driver of economic growth is that if this variable decreases, even if only slightly, the performance of economic growth will most likely be affected. The performance of the national economy in the last 5 years has at least emphasized the important

role of household consumption in the GDP structure. The national economic growth rate in 2018 reached 5.17 percent with a of household consumption growth rate of 5.05 percent or grew slightly because it was lower than 2014 which reached 5.15 percent. Although declined slightly, with a relatively stable growth rate of 5 percent, household consumption was able to maintain a stable rate of national economic growth at 5 percent.

Due to the dominant role of household consumption, it is important to look at the potential factors that can affect sustainable consumption growth. One of the main factors is household debt (Lee & Lim, 2015). The global financial crisis strengthens this argument. Before the crisis occurred, household debt in advanced economies experienced a significant increase in both the amount of debt and the proportion of national income such as GDP. In developed countries, the household debt ratio was above 80 percent of GDP (Lombardi et al., 2017). The same case also happens in the Asia Pacific economies where their aggregate household

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Table 1. GDP Distribution (%)

Main Elements	2014	2015	2016	2017	2018
1. Household consumption expenditure	55.96	56.31	56.66	56.14	55.74
2. NPIH consumption expenditure	1.18	1.14	1.17	1.18	1.22
3. Government consumption expenditure	9.43	9.75	9.53	9.09	8.98
4. Gross fixed capital formation	32.52	32.81	32.58	32.17	32.29
5. Export of goods and services	23.67	21.16	19.09	20.19	20.97
6. Import of goods and services	24.41	20.78	18.33	19.17	22.06

Source: BPS (2019)

debt ratio reached around 60 percent of GDP (Lombardi et al., 2017). Interestingly, while developed countries experienced a downward trend in the ratio, household debt ratios in the Asia Pacific countries continued to increase over time (Lombardi et al., 2017).

Indonesia as one of the Asia Pacific economic emerging markets also experienced the same thing. The Bank for International Settlements (BIS) reported that the household debt to GDP ratio in Indonesia was at 17 percent. This rate was far lower compared to Malaysia (66%) or Thailand (67%). Despite the ratio appears to be lower as shown in Figure 1, this study argues that it does not mean a lower macroeconomic risk behind Indonesia's household debt. One of the possible reasons behind the figure is low financial inclusion. Figure 2 shows that only 48.4 percent of adults in Indonesia have an account at financial institutions. This number was almost half of Malaysia and Thailand. This may indicate limited access to financial institutions for households (Nuryakin et al., 2018). This lower financial inclusion may lead to a relatively low household debt ratio.

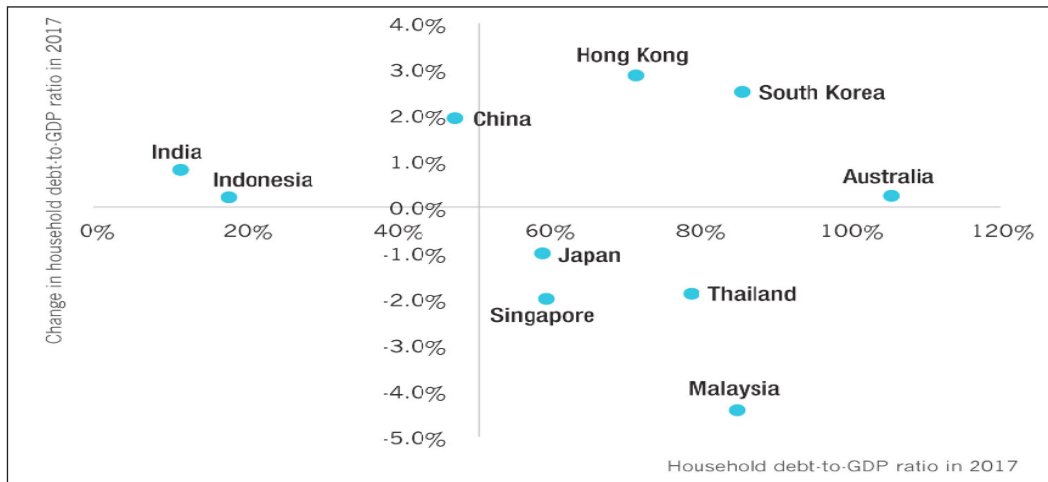
Furthermore, the percentage of households taking loans from non-banking institutions was recorded at around 14 percent (Susenas, 2018). This indicated that the percentage of household debt ratio was actually high. Ironically, at the same time, the percentage of low-income workers in Indonesia was also high. A report from the International Labour Organization/ILO (2015)

showed that 66.4 percent of regular workers in Indonesia still earned below the average wage and caused their median wage was far below the rate. Moreover, the incidence of low wages in Indonesia remains high because one in three permanent workers (33.6 percent) in Indonesia still receive low wages or two-thirds of the median wage (ILO, 2015). Therefore, given the low level of income in Indonesia, this raises questions about the sustainability of household debt.

As we know, a better households ability to repay debt comes from decent working conditions. Unfortunately, decent work conditions have not improved as reflected by high incidence of low wages in Indonesia. Increasing household debt will potentially to disrupt sustainable consumption both in the short and the long term because it is not followed by repayment capacity of households. Overall, the rise of household debt burden is likely to occur which in turn could disrupt macroeconomic performance. This case is not only true but also relevant in Indonesian case. Therefore, up to this point, it is necessary to investigate the effect of household debt on consumption growth both in the short and the long-run and to what extent household debt has begun to undermine consumption growth.

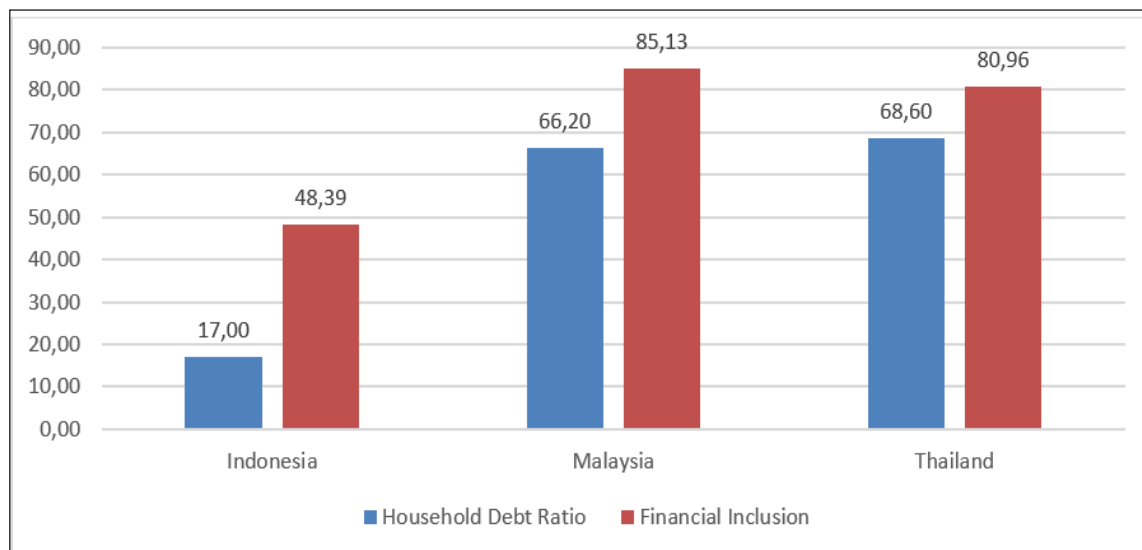
LITERATURE REVIEW

Since household debt is supposed to be the main trigger of the latest global financial crisis, some economists have been trying to raise this issue



Source: Asian Bankers Research (2018)

Figure 1. Household Debt Ratio in Selected Asia Pacific Economies (%)



Source: BIS & Global Findex Database (2019)

Figure 2. Household Debt and Financial Inclusion in 2017 (%)

into public debate. For example, Kim (2013) uses vector autoregression (VAR) and vector error correction models (VECM) to empirically distinguish the short and the long-run impact of household debt on real GDP. In his model, prior to 1982, household debt in the United States had a negative impact on output. However, after 1982, household debt began to undermine output. Kim's more recent research also reinforces his previous studies. Kim (2016) incorporated household debt into a VECM and showed that

in the long-run, household debt in the United States had a significant and negative relationship with output or supports for the long-run view of a debt-driven business cycles.

Similarly, Mian et al. (2015a) argued that higher household debt to GDP leads to economic growth in developed countries because of increasing share of consumption to output, worsening current account balance, and increasing share of imported consumption goods. They also revealed that a country with higher household

debt to GDP is expected to hurt economic growth, especially for countries with household debt cycle that strongly correlates to the global household debt cycle. Furthermore, Mian et al. (2015b) claimed that their study is a supportive evidence of the credit supply hypothesis as credit availability is considered as a driver of higher household loans. By employing panel VAR, they found that in 30 countries during 1960-2012, in the medium-term, higher household debt to GDP was forecasted to result in lower rates of economic growth and higher rates of unemployment.

All the above studies reveal that despite debt-financed household expenditure can generate substantial macroeconomic stimulus, it can also produce a serious economic downturn as later occurred in the US and other advanced economies. However, there are not many empirical studies that investigate the consumption effect of household debt. Lombardy et al. (2017) filled the gap by conducting an empirical study that analyzed the effect of household debt on both economic and consumption growth. Lombardi et al. (2017) tried to examine the short and long-term effects of household debt levels on output and consumption growth using a cross-section autoregressive distributed lag (CS-ARDL) model in 54 economies (23 advanced economies and 31 emerging market economies). They found that in the short term, household debt was proven to boost consumption and economic growth rates. In contrast, in the long run, household debt had negative impact on economic growth and consumption.

Recent studies also dominantly explore the cases of household debt in developed countries such as in the United States ((Barba & Pivetti (2009), Kim, (2013, 2016), and Cynamon & Fazzari (2008)), England (Brown et.al, 2005), South Korea (Lee & Lim (2014), and Kim & Hwang (2016), and so on. It is important to study the household debt ratio, especially in developing countries such as Indonesia, because household consumption remains a major factor driving Indonesia's economic growth. In addition, the global financial crisis explained how high household debt not only caused a contraction in private-sector consumption but can also

developed into systemic risks in the economy because problems in the household sector will in turn also spread to financial institutions (Mian & Sufi, 2010). That is why it is still important to study the relationship between household debt and consumption growth especially in the current Indonesian context.

CONCEPTUAL FRAMEWORK

Consumption theories have been widely reviewed by macroeconomic experts. Unfortunately, macroeconomic theory that explores how household debt affects consumer behavior is still scarce. Some of the most popular consumption theories in current macroeconomic literature are Keynes consumption theory, Friedman's permanent income hypothesis, and Modigliani's life cycle hypothesis. However, these consumption theories have not been able to explain in more detail how debt in the household sector can be transformed into the main trigger of consumption decisions such as disposable income.

A debt deflation theory developed by Irving Fisher in the 1930s can be used as an initial theory to explain the relationship between consumer debt and consumption. Fisher (1933) argued that over-investment and over-speculation are often important but would not have serious effects if these two economic diseases did not arise from excessive borrowing. King (1994) then further developed the debt-deflation theory in investigating the effect of distributional shocks on household consumption levels. According to King (1994), debtors tend to have a higher marginal propensity to consume wealth than creditors. Therefore, reduced consumption can be recognized as a realistic form of compensation from the view of consumers in the face of the negative shocks from expected future returns (King, 1994).

Similarly, Kim et.al (2014) argued that initially, a normal increase in the amount of borrowing by working households will boost total consumption. This formally can be written as:

$$\frac{dC}{dC^T} = \beta \left(1 + \frac{[1 - \beta]c_w \hat{\sigma}_p}{1 - [1 - \beta]c_w \sigma_p} \right) > 0$$

Where C is aggregate consumption, C^T is the target level of consumption, c_w is a propensity to consume of working households, and σ_p is the share in the total income of production and non-supervisory workers. Meanwhile, increasing indebtedness raises the debt-servicing commitments of working households, which diminishes their disposable income and therefore reduces total consumption. Formally:

$$\frac{dC}{d(L_w - D_w)} = -(1 - \beta)c_w i \left(1 + \frac{[1 - \beta]c_w \sigma_p}{1 - [1 - \beta]c_w \sigma_p} \right) > 0$$

Where L_w is a loan of working households, D_w is a deposit of working households and i is the interest rate.

Moreover, from the two equations, it can be seen that an increase in household debt will generate aggregate consumption (*ceteris paribus*). However, if a higher accumulation of debt stock is accompanied by an increase in the debt-service burden of working households they will reduce total consumption, *ceteris paribus*. Thus, as long as workers consume at a moderate share of their disposable income (gross wage income minus debt servicing), an increase in household debt will result in aggregate household consumption remain at a positive level. This can be interpreted that a decrease in household consumption while household debt is increasing indicates that there has been an over borrowing case for the household sector.

In conclusion, the possibility of household facing over borrowing conditions tend to be higher because households or debtors have a higher marginal propensity to consume than creditors. To reduce their burden, consumers then increase the debt repayment levels which reduces their purchasing power due to their disposable income is lower than the previous period. In other words, as a consequence of having higher accumulated debt, households should immediately reduce their consumption level to avoid income risk.

DATA AND METHODOLOGY

Data

To investigate the relationship between household debt and consumption growth, the following model referred to the simple model used by Lombardi et.al (2017) may be estimated:

$$C_t = \alpha_0 + \alpha_1 HHD_t + \alpha_3 X_t + u_t$$

Where C_t is consumption growth; HHD_t is household debt ratio; X_t is additional independent variables. This study uses quarterly data ranging from 2002Q1 to 2018Q4 covering the period before and after global financial crisis. The key variables here are private consumption growth and the level of household debt ratios. Growth in private consumption and household debt is defined as growth in final consumption expenditure of households and non-profit institutions serving households (NPISHs) and the share of credit to households and NPISHs to GDP respectively.

Following Lombardi et.al (2017), the model adds other independent variables such as nominal residential property prices, debt service ratio for private non-financial sectors, and the ratio of gross domestic saving to GDP are also involved. These variables are involved to verify robustness which can also explain long-run consumption trends and their relationship to household indebtedness. The data on household and non-profit institutions serving households consumption and consumer price index to calculate private sector consumption growth were obtained from International Financial Statistics (IFS) – IMF while the data on household debt ratio to GDP, nominal price of residential property, debt service ratio were collected from BIS. Meanwhile, domestic gross savings were collected from BPS. All variables were in percentages except the residential property index.

Econometric Methodology

This study employed a cointegration approach to assess the long-run relationship between variables of interest. The literature on cointegration

approaches began with the work by Granger (1981), Engle and Granger (1987), Johansen and Juselius (1990), and Johansen (1991). The most popular used in previous work was the Johansen cointegration technique. However, Johansen and Juselius approach to cointegration procedure cannot be applied when one cointegrating vector exists (Nkoro & Uko, 2016). Also, like other cointegration techniques, this technique requires all variables was integrated with the same order or all variables integrated with order 1 or more (Pesaran et al, 2001). To overcome such problem, in a number of paper series, the ARDL model is introduced by Pesaran and Shin (1996) and then extended by Pesaran and Smith (1998) and Pesaran et al. (2001).

According to Pahlavani et al. (2005), there are several main benefits of using the ARDL model. First, the ARDL model is statistically proven to be more significant in a single cointegration relationship between underlying variables in a smaller sample size while the Johansen cointegration technique requires a larger sample size. Second, the ARDL model can be applied whether variables are integrated of a different order, $I(0)$, or $I(1)$, or mutually cointegrated. Third, the ARDL model can avoid many choices in estimating the model as in the Johansen cointegration technique such as how many endogenous and exogenous variables are involved, the handling of key elements, the sequence of VAR, and the optimal number of lags to use. Finally, the ARDL model opens up the use of different lag because it is possible that the variables entered into the model have different lags.

For these reasons, this study employed ARDL approach to investigate the relationship between household debt and consumption growth. The ARDL model can be expressed as follows:

$$\Delta C_t = \alpha_0 + \alpha_1 t + \sum_{i=1}^p \alpha_2 \Delta C_{t-i} + \sum_{i=1}^p \alpha_3 \Delta HHD_{t-i} + \sum_{i=1}^p \alpha_4 \Delta X_{t-i} + \alpha_5 C_{t-1} + \alpha_6 HHD_{t-1} + \alpha_7 HHD_{t-1} + \alpha_8 X_{t-1} + \mu_t$$

where C_t is household consumption, HHD_t is household debt ratio to GDP, X_t are additional variables namely debt service ratio and residential

property index, Δ is first difference operator and p is the optimal lag length. This technique required two steps. The first step was to determine the long-term relationship between variables using the F-test. After that, the coefficient of the long-run relationship was estimated. The last step was then estimated the short-run coefficient of variables by looking at the error correction representation of the ARDL model.

EMPIRICAL RESULTS

Long-run effects

In this section, the long-run relationship between household debt and consumption growth will be analyzed by employing the econometric method detailed description above. Several key variables such as the ratio of debt service for the private non-financial sector and residential property prices were also involved. The estimation results of the long-run effects involving these variables are reported in Table 2.

The estimation results above show that in the long run, all variables involved except for property residential prices may reduce the growth rate of household consumption as reflected in their negative coefficient value. All explanatory variables involved are significant but they have different signs. The household debt ratio in all models shows that this variable significantly lower consumption growth in the long-run. As an illustration, having a coefficient value of -0.6 indicates that in the long-run, an increase in the household debt ratio by 10 percent will reduce consumption growth by 6 percent.

The debt service ratio is another important because it has a higher negative coefficient value. The coefficient value of the debt service ratio is -2.1 indicating that in the long-run, an increase in the debt service ratio by 10 percent will lower consumption growth by 21 percent. This can be translated that a higher debt service ratio can lead to significantly decrease consumption growth in the long-run. This indicates that in the long-run, household debt and debt service ratio negatively influence on consumption growth. Thus, highly accumulated debt along with increasing debt

Table 2. The Estimation Results of Long-Run Effect

Dependent Variable: Consumption Growth (D.CG)		
Independent Variables	Coefficient Values	P-Values
Model 1		
Household debt ratio (L1.HHDR)	-0.632 (0.099)	0.000
Model 2		
Household debt ratio (L1.HHDR)	-0.342 (0.164)	0.042
Gross domestic saving ratio (L1.GDSR)	-0.397 (0.177)	0.029
Model 3		
Household debt ratio (L1.HHDR)	-1.417 (0.319)	0.000
Gross domestic saving ratio (L1.GDSR)	-0.390 (0.137)	0.001
Residential property prices (L1.RPP)	0.163 (0.046)	0.001
Debt service ratio (L1.DSR)	-2.142 (0.713)	0.005

service burden can lower consumption growth in the long-run.

Short-Run Effects

Besides the long-run effects, the main advantages of the ARDL model compared to other cointegration models are this model provides the short-term estimation results of the explanatory variables involved in the model. The results of the short-term coefficient estimation of the ARDL model used in this study are shown in Table 3.

The estimation results of short-term coefficients for household consumption growth show that except for the gross domestic saving ratio, all the independent variables involved have positive relationships. In the short term, most explanatory variables involved are significant. This means that most explanatory variables have a positive and significant influence on the growth of household consumption. The difference is, in the long run, the household debt effect is negative while in the short run, the effect of household debt on consumption growth is positive and significant. This is also applies to the debt service ratio.

In addition, household debt and debt service ratio have a higher impact on consumption growth

in the short-run, as reflected in the coefficient value. Interestingly, the coefficient value of the household debt is higher in the short term than in the long term, indicating that the impact of an increase in household debt on consumption growth is greater in the short term than in the long run. The estimation results of long-run and short-run effects also show that an increase in household debt can initially boost consumption but then can reduce disposable income.

Therefore, an increase in the burden of debt service in the short run will be compensated by reducing household pending in the long run. This occurs if a decrease in household purchasing power is followed by an increase in the portion of household income used to repay their principal debt and interest rate. In the end, this will lead to a decrease in the level of aggregate consumption.

Autoregressive Distributed Lag (ARDL) Bounds Test

To assess the long-term relationship between household sector debt and consumption growth, this study employed the ARDL bounds cointegration test. The estimation results using this method can be seen in Table 4. The table shows that the F value is higher than its critical

Table 3. The Estimation Results of Short-Run Effect

Dependent Variable: Consumption Growth (D.CG)		
Independent Variables	Coefficient Values	P-Values
Model 1		
Household debt ratio (D1.HHDR)	2.981 (0.956)	0.003
Model 2		
Household debt ratio (D1.HHDR)	2.362 (0.931)	0.015
Gross domestic saving ratio (D1.GDSR)	-0.353 (0.132)	0.011
Model 3		
Household debt ratio (D1.HHDR)	1.885	0.041
Gross domestic saving ratio (D1.GDSR)	-0.431	0.002
Residential property prices (D1.RPP)	0.180	0.001
Debt service ratio (D1.DSR)	3.265	0.129

Table 4. ARDL Bounds Test Result

Model	F-stat	Critical Value 5% Level		P-Values	t-stat	Critical Value 5% Level		P-Values
Model 1	42.240	I(0)	5.032	0.000	-9.100	I(0)	-2.874	0.000
		I(1)	5.963	0.000		I(1)	-3.247	0.000
Model 2	34.064	I(0)	3.933	0.000	-7.729	I(0)	-2.871	0.000
		I(1)	5.117	0.000		I(1)	-3.560	0.000
Model 3	26.439	I(0)	3.012	0.000	-9.026	I(0)	-2.830	0.000
		I(1)	4.448	0.000		I(1)	-3.980	0.000

value and the t value is lower than its critical value. These indicate that the null hypothesis which states that there is no cointegration relationship between variables in the model can be rejected. In other words, it can be concluded that there is indeed a cointegration relationship between household debt and consumption growth.

Threshold Effects

In the previous section, the relationship between household debt and consumption growth in both the long and in the short-run was examined. In this section, the threshold for household debt alone is estimated by adopting a procedure similar to the

one employed by Greenidge et al. (2012) which follows the threshold estimation approach as described by Hansen (1996, 2000). The threshold framework is estimated as follows:

$$y_t = \gamma_1(1 - I_t^{D^*})(D_t - D^*) + \gamma_2 I_t^{D^*}(D_t - D^*) + \varepsilon_t$$

$$I_t^{D^*} = \begin{cases} 1 & \text{if } D_t > D^* \\ 0 & \text{if } D_t \leq D^* \end{cases}$$

where D^* is the threshold level of household debt ratio to GDP and I is dummy variables that take a value of 1 when the household debt to GDP ratio surpasses a certain threshold and zero otherwise.

The result from the above equation is reported in table 5. It can be seen from the table that there is a threshold relationship between household debt and consumption growth. The threshold impact seems to begin when the ratio of household debt to GDP is above 10.9 percent. If household debt as a share of GDP is in the range of 10.9 % and 12.2 %, an increase in the ratio of household debt remains negative but does not have significant impact on consumption growth. However, as the ratio of household debt to GDP increases to above 12.2 percent, the negative effect of household debt on consumption growth has begun to increase. Thus, at this point, household debt begins to undermine consumption growth as the marginal effect has become more negative and significant with the threshold value is larger than 12.2 percent. Consequently, the household debt ratio must be lower below 12.2 percent to recover household demand.

Table 5. Threshold Regression using Hansen Model

Consumption Growth			
Threshold		Coefficient	P-Value
Region 1	< 10.9	4.159	0.000
Region 2	10.9 – 12.2	0.391	0.831
Region 3	> 12.2	-1.577	0.000

Additional Statistical Tests

To see the feasibility of the model, it is necessary to add several post estimation statistical tests such as multicollinearity, autocorrelation, normality and Autoregressive Conditional Heteroscedasticity (ARCH) test. The results tests are shown in table 9 below. It can be seen that Variance Inflation Factor (VIF) is 1.59 or lower than 10, indicating that there is no high multicollinearity

problem in the model. Table 6 also shows that autocorrelation, normality and ARCH problems do not exist in the model because all three tests do not reject the null hypothesis. That is, the model used does not contain serial correlation and ARCH effects. At the same time, their error terms are also normally distributed. Therefore, the model can be considered as a parsimonious model.

CONCLUSION

The purpose of this study was to examine the effect of household debt on household consumption growth in Indonesia. This study used the ARDL model for several reasons. First, the ARDL model provides information and equations in both long-run and short-run effects simultaneously. Second, the period of the sample used is not too long. Third, the equation used to estimate the cointegration relationship between household debt and consumption growth is a single equation. The estimation results using the ARDL model showed that statistically, the effect of household debt on consumption growth is negative and significant in the long-run but it is positive and significant in the short-run. This indicates that the increase in household debt can boost household consumption in the short-run but can also reduce the growth rate of household consumption in the long-run. In addition, this study also applied threshold regression where the estimation results showed that if the ratio of household debt to GDP remained below 12 percent to GDP, the positive effect of household debt on consumption growth can outweigh its negative impact. Conversely, consumption growth has begun to decline when the household debt to GDP ratio exceeded the threshold value of 12 percent.

Tabel 6. Additional Postestimation Tests

Regression Diagnostics	Statistical Test	Values
Multicollinearity	Variance Inflation Factor	1.5900
Autocorrelation	White noise Q	0.1033
Normality	Shapiro-Wilk	0.2304
Heteroscedasticity	ARCH	0.4847

POLICY IMPLICATION

As explained in the previous section, the impact of the household sector debt on household consumption growth was statistically positive and significant in the short run but negative sign in the long run. This indicated that the level of debt in the household sector in Indonesia has spread to aggregate demand, which is characterized by a slowdown in consumption growth. In order to prevent a sustained decline in consumption growth, efforts should be made to reduce the household debt burden, such as lowering the interest rate or consumption tax. Lowering consumption taxes may increase consumption without generating interest payments for households. Another option is to increase household purchasing power by keeping lower inflation rates and supporting increasing real wage growth for lower-income households because they have a higher marginal propensity to consume than higher-income households.

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