Global Business and Management Research: An International Journal
Vol. 12, No. 1 (2020)

# The Linkages between Household Debt, Household Consumption and Income Inequality in Malaysia

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**Abstract**
Over the past century there has been a dramatic increase on the effects of income inequality and consumptions that has led to the increases in household debts. Therefore, this study endeavors to analyse the macroeconomic variables that will impact the household debts in Malaysia This methods applied are the OLS Regression, Johansen Co-integration and Granger Causality test to show the co-integration relationship between the household debt, household consumption and income inequality in Malaysia for the period from 1994 to 2017. Furthermore, to meet the dynamic study amongst four variables which are household debts, household consumption, GDP per capita and income inequality, Multiple Linear Regression model is applied. This paper also has determined the result of feedback of household debt to income inequality. The results indicate that there are long-run and short-run relationship between dependent and independent variables. The increase in household debt corresponds to the future declines in the rate of consumption in Malaysia.

**Keywords**: Household Debt, Consumption, Income Inequality, GDP, OLS, Johansen, Granger

## Introduction

Household debt can best be described as the amount of money borrowed by household to purchase properties, motor vehicles, consumer durable, personal use and many others (Malaysia Central Bank, 2013). Over the past century there has been a dramatic increase on the effects of income inequality and consumption that eventually led to the increase in household debts. The rising concerns over the expansion of household debts has been one of the major topic in Malaysia. In fact, Malaysia is recorded as one of the highest in Asian region with a household debt level of 83% in December 2018 (Department of Statistics, 2018). Malaysia's Department of Insolvency (2017) reported that there are around 64 632 Malaysian aged between 18 - 44 years old whom are declared bankrupt over the period of five years. This

indeed is an alarming situation since the rising of number of bankruptcy cases may lead to negative impact towards the Malaysian economy and society in general.

Many literature and empirical evidences suggested a positive impact of consumption and income inequality towards the rising of household debt level, however, few others had highlighted a conflicting idea. Weller and Boushey (2008) pointed out that greater inequality may lead to a larger expansion of credit. Berisha, Edmond & Meszaros (2018) also suggested similar findings that an increases in income inequality and consumption will directly contribute to the increase in household debt. Conversely, there are also few reported studies suggesting negative correlation among debt, income inequality and consumption (Andersen et al., 2014; Bunn and Rostom, 2014).

Therefore, the focal purpose of this study is to analyse the macroeconomic variables that will impact the household debts in Malaysia. The peripheral objectives of this paper are to determine the relationship and to investigate the dynamics of the long term causal relationship between household debt, household consumption, economic growth per capita and income inequality in Malaysia.

**Literature Review**

The rising trend of household debts has raised concerns among the government and household sector. Many studies were done in order to investigate the factors and impact of rising household debts towards the economic as well as social sectors. According to M. Edelberg and Fisher (1997) the term household debts is defined as a debt burden in which the fraction of personal income taken up by service payments on outstanding debt. Modigliani and E. Brumberg (1954) explained that household debt depends on household consumption over time, their lifetime income including initial and future wealth and the level of interest rate. Chucherd (2006) also suggested that there is a link between household debts and consumption based on the studies on Thailand's economy. Debt has a positive impact on consumption and is not harmful for the household and economy since it can help individuals to meet their preferences and lifestyle provided their future consumption is not negatively affected.

Most empirical studies suggested a positive relationship between income level and household debt (Calza, Gartner, & Sousa, 2001; Crook, 2001; Hofmann, 2004; Meng, Siriwardana, & McNeill, 2015; Mokhtar & Ismail, 2013). Consumption is indeed a major reason for household to be in debt. Based on the US households data, Dynan and Kohn (2007) claimed that majority of the household reasons to borrow money is to finance living expenses. This finding is also comparable with Weller and Boushey (2008) which also suggested similar findings. Furthermore, the study also pointed out that greater inequality will lead to larger expansion of credit.

Another relevant finding by Meniago, Mukuddem-Petersen, A. Petersen, and Mongale (2013) in their study on South Africa's economy also came to a similar conclusion that there is a strong positive influence of household consumption on the household debt. Moreover, Khan, Abdullah, and Samsudin (2016) proposed that in the long run, a change in income level, housing price and population leads to a positive impact towards mortgage debt while rise in interest rate and cost of living would exert a negative influence. Besides, Perugini et al. (2013) discovered a positive link between income inequality and private sector indebtedness since 1970 across eighteen economies. Similarly, Fasianos, Raza, and Kinsella (2016) on household debt and income inequality in the US, found out that household debt only responds to positive changes in income inequality, while there is no evidence of falling inequality significantly affecting household debts.

On contrary, several studies also found negative relationship between income and household debt (Livingstone & Lunt, 1992; Meniago et al., 2013; Turinetti & Zhuang, 2011). Ogawa and

Wan (2007) in their studies during the bubble burst period in Japan, detected that debt to asset ratio has a negative influence on consumption. On a different perspective, Coibion et al. (2016), revealed that low income households in high inequality region accumulated less debt (relative to their income) compared to the low income households in lower-inequality region. Moreover, Kumhof, Ranciere, and Winant (2013) also argued that a rise in income inequality among high income household will encourage them to save more and thus, lowering down the interest rates and eventually influencing the lower income households to borrow more.

Few studies also suggested negative correlation between debt and consumption among household. Pardo and Santos (2014), for example, discovered a negative relationship between household debt and consumption. They further explained that this is due to the changes in the household behavior which has utilized the debt as a substitute for stagnant wages in order to support their consumption. Consequently, Andersen, Duus, and Jensen (2016) also proposed negative relationship between household debt during the pre-crisis period with household consumption following the crisis in Danish household. In addition, Bunn and Rostom (2014) conducted a research on the impact of household debt on consumption in the UK. Their studies claimed that there is negative impact of debt towards consumption which is also consistent with a study done by Kim et al. (2014) in the US.

**Method**

This study utilizes data taken from the International Monetary Fund (IMF) website and the Department of Statistic of Malaysia. The collection of data covers both independent and dependent variables. This research focuses in Malaysia only where the data collected cover for the period for 24 years (from 1994-2017).

In this research, E-views is used to analyze the collected data and it provides the result on the relationship between determinants of household debts in Malaysia. A time series data method is also conducted to enhance exploration for a more accurate and reliable data analysis. The hypotheses are tested based on the result in OLS regression and Johansen co-integration.

This study uses annual data on variables namely, Household Debts (DEBTS), Household Debts per capita (DEBTSPC), GDP per capita (GDPPC), Gini Index (GINI) for income equality and Household Consumption (HC) is used to examine a variety of methodology model and test. The model specification of this study is estimated empirically, which begun with the Augmented Dickey-Fuller unit root test to test the stationarity of the variables. In the second step, the OLS Regression test is conducted to determine the relationship between the variables. Further analysis is determined using Johansen's co-integration test to assess whether a long-run equilibrium holds between the research variables.

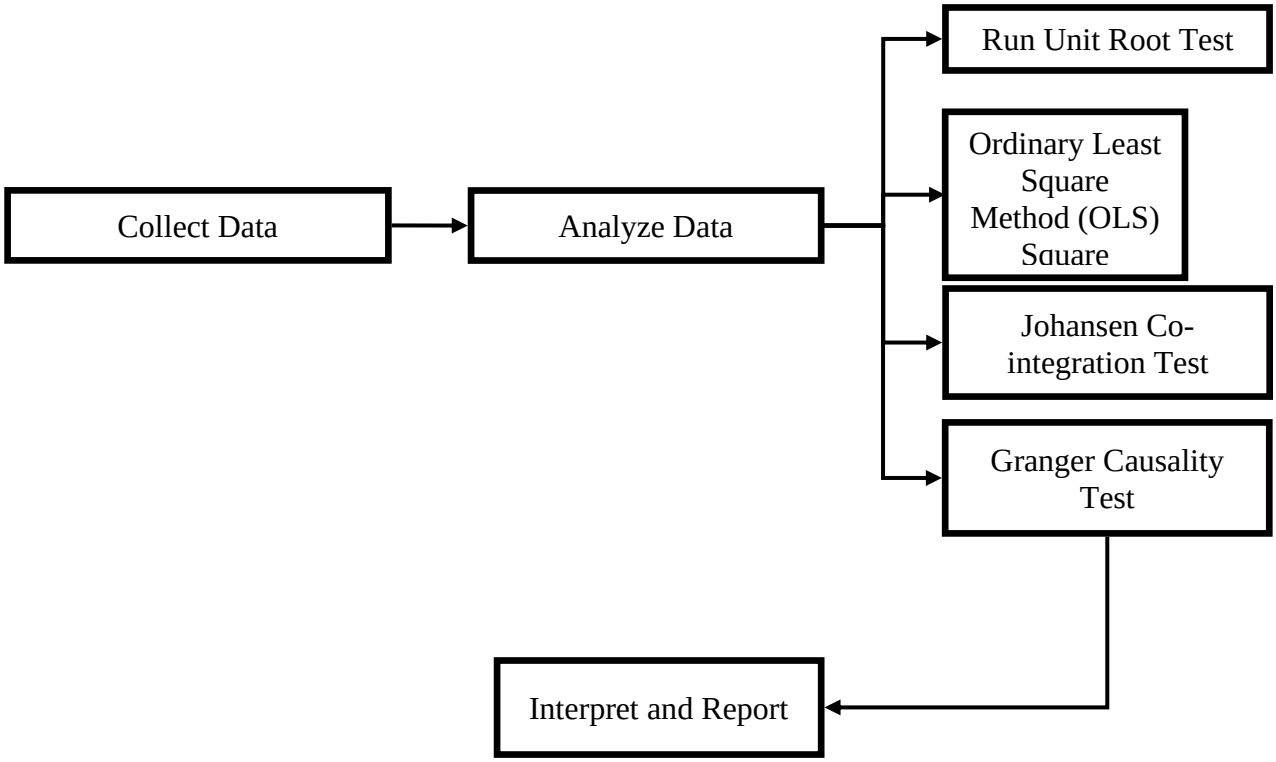


Figure 1: Research Flow

**Findings**

***ADF test***

The hypothesis is as follows:
H0: Data has unit root (non stationary)
H1: Data has no unit root (stationary)

Table 1: Augmented Dickey-Fuller Unit root Test at Level and First Order Difference

| | Level | First Difference |
|---|---|---|
| DEBTS | -5.1176 (0.0024) ** | -6.6640 (0.0001) ** |
| DEBTGDP | -2.6974 (0.2463) | -5.0608 (0.0028) ** |
| GDPPC | -4.7140 (0.0057) ** | -6.5724 (0.0001) ** |
| GINI | -3.8065 (0.0349) * | -3.9919 (0.0306) * |
| HC | -3.1564 (0.1198) | -5.4993 (0.0012) ** |

Notes:
1. Values in the parenthesis are p-value.
2. Asterisk (*, **) denotes rejection at 5% and 1% significant level, respectively.

Based on the ADF test statistics in Table 1, the household debt per capita and household consumption are non-stationary in levels where the p-values are more than 0.05 and failed to reject null hypothesis. Then, the variables are tested again using ADF test which confirmed that the variable are stationary after first order difference where the p-value is less than 0.05. Therefore, it is significant and reject the null hypothesis at 1% significant level. The variables household debt, GDP per capita and Gini index are already stationary at level and reject the null hypothesis at 1% and 5% significant level.

***Multiple Linear Regression***

The hypothesis is as follows:

$H_0$: There are no relationship between household debt per capita, GDP per capita, Gini index and household consumption with household debt.

$H_1$: There are relationship between household debt per capita, GDP per capita, Gini index and household consumption with household debt.

Whereas;

DEBTS = 205.6302 + 0.3380 DEBTSGDP + 0.0038 GDPPC – 3.3248 GINI + 0.0557 HC

(3.0997) ** (0.0297) (-43.6392)** (0.6816)

Figure 2: Relationship of the selected macroeconomic variables

Notes: Asterisk (*, **) denotes rejection at 5% and 1% significant level, respectively

Figure 2 confirmed that there are two independent variables which are significant between household debts per capita and income inequality (Gini index) with household debts. This means that the null hypothesis is rejected at 1% significant level.

Based on the coefficient of household debts per capita variable shows the positive relationship with the household debts. The 1% increase in per capita household debts will cause total household debts increase by 0.33%. While the household consumption also has positive relationship with total household debts in Malaysia. It is supported by the empirical findings by Chucherd (2006), whereas debt has a positive impact on consumption and is not harmful for the household and economy since it can help individuals to meet their preferences and lifestyle provided that their future consumption is not negatively affected. This also follows the economic theory whereas R-squared shows 99.08% the total household debt can be describe by all independent variables (per capita household debts, GDP per capita, household consumption and Gini Index)

***Johansen Co-integration Test (Long Run Analysis)***

Table 2 reports that both trace and maximum eigenvalue test indicated that there are two cointegrating equation at 5% significant level among per capita household debts, GDP per capita, household consumption and income equality (Gini Index) in Malaysia. Since the long run cointegrating relation is found among the variables of the country, this ascertain the existence of long run equilibrium relationship between total household debts, per capita household debts, GDP per capita, household consumption and income equality (Gini Index).

Table 2: Johansen Co-integration Test Results

| $H_0$ | $H_1$ | Trace | 5%C.V. | Max-Eigen | 5% C.V. |
|---|---|---|---|---|---|
| r = 0 | r = 1 | 125.2447** | 69.8189 | 77.3562** | 33.8769 |
| r≤1 | r = 2 | 47.8885** | 47.8561 | 31.6669** | 27.5843 |
| r≤2 | r = 3 | 16.2217 | 29.7971 | 12.4821 | 21.1316 |
| r≤3 | r = 4 | 3.7396 | 15.4947 | 3.1971 | 14.8415 |

Note: Asterisk (**) denotes rejection of hypothesis at 5% significant level.

***Granger Causality Test (Short Run Analysis)***

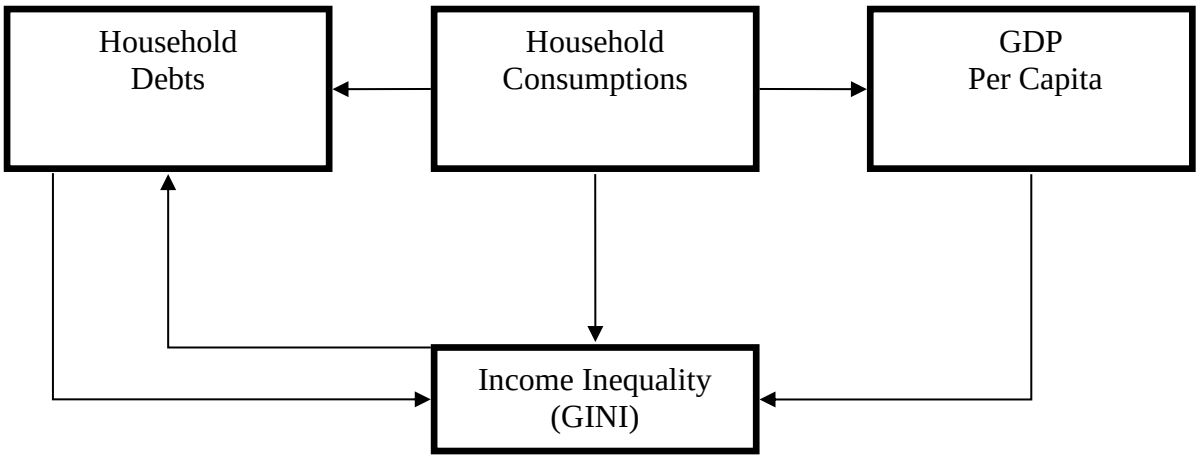


Figure 3: Granger Causality Test Results

Zooming in Fig. 2, the results of Granger Causality analyse the unidirectional and bidirectional causality among the variables are defined. The results had been reveal that there were exists a bidirectional causality running from Household Debts and income inequality (in terms of GINI index). The Household Consumptions (HC) increasing Granger causes Household Debts, GDP per capita and income inequality, therefore asserts a unidirectional causality. The results also indicate that there exists a unidirectional granger causality between Income inequality exists granger causality caused GDP per capita. All the results indicate granger causality caused in bidirectional and unidirectional causality in 5% to 10% significant level.

**Discussion and Conclusion**

The main purpose of this study was to investigate the link between household debt, household consumption and income inequality for the period of 24 years in Malaysia. The model specification of this study was estimated empirically. ADF unit root test allowed to testing for the stationarity level of all variables. OLS Regression is then utilized to determine the relationship between variables. The findings of this study concluded that there are two variables identified to be significant in affecting total household debt in Malaysia, namely household debt per capita and income inequality. Johansen's co-integration test to assess whether a long-run equilibrium holds between the research variables. The result is confirmed that there are long run relationship exists between the total household debts, per capita household debts, GDP per capita, household consumption and income equality (Gini Index). Further study is recommended in the future where the household debt is separated into two sample size consisting of private employees and government servants.

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