Does Income Gap Matter for Household Debt Accumulation?

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Abstract: *The rise in household debt raises the question: what really causes people to take on more debt when they have to serve the cost of borrowings for the rest of their lives? It appears that households are willing to trade their financial freedom for something that is more precious at a time when the gap between the rich and the poor is widening. In this regards, our main objective is to investigate the relationship between household debt and income gap. The understanding of this issue may give good insights as to how household would make decisions to leverage their balance sheet. This is particularly true in the context of "keeping up with the Jones's" which provides the theoretical framework of such phenomenon while greater access to credit would facilitate the process. In this research, the Generalized Methods of Moments (GMM) technique is employed for 55 countries and covers the period from 2000 to 2012. The results showed that there is a significant positive relationship between income gap and household debt. In addition, the level of indebtedness is deemed to be persistent throughout our sample countries, suggesting that households will remain in debt-trap.*

1. Introduction

Rising household debt has been widely discussed among policy makers in recent years. And the repercussions of elevated levels of such indebtedness could only spell trouble should no corrective measures are being put in place (Dynan & Kohn, 2007, International Monetary Fund [IMF], 2012). At the

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same time, income disparities between the high and low income earners continue to widen and access to credit is an essential element for economic growth (Schumpeter, 1911; Rajan & Zingales, 1996; Organisation for Economic Co-operation and Development [OECD], 2011). A desire to emulate the consumption patterns of the rich may also provide some intriguing explanation in the context of conspicuous consumption and social interaction theory. For instance, Becker (1974) postulated that the sum of person's own income which includes monetary income and his or her "social environment" will be used to purchase goods and services as well as the "recognition" of other people. This means that a person is "purchasing" the recognition of others by utilising his or her total income which includes monetary income and social income. Such course of action would inadvertently improve his or her social standing in the community, this could also mean taking credits from various sources such as borrowings from friends, relatives and money lenders in order to improve an individual's position in the social hierarchy. The "keeping up with the Joneses" (Morgan & Christen, 2002). This phenomenon can lead to increased liabilities in the form of bank borrowings. A key note address by Dr William R White of OECD during one of the conferences at Bank Negara Malaysia (BNM) was quite revealing[1] in that it suggests inadequate growth and job creation are solely due to inadequate demand. Such problem has always been addressed through expansionary monetary aggregates. The effect was lower savings rate at an unprecedented level associated with a build-up in household debt.

In this paper, the main intention is to find out if income inequality or income gap has anything to do with the accumulation of debt among the households. If so, what would be the direction of such relationship? This is an important question as income gap continues to widen in many countries. If the relationship between the two variables are positive, then focus should be directed on formulating policy which promotes economic growth with wide spread effects across all income level especially those who are at the lower quartile. In addition, we would also like to investigate whether the past debt levels can have an impact to the present and future debt. After controlling for the level of per capita income, interest rate, access to credit, the state of labour market, households seem to have a choice whether to increase their gearing levels. This is especially true if they feel confident of their income stream in the future and widely available access to credit would make such an endeavour a compelling proposition in order to leverage on their balance sheet.

This paper has three objectives. First, we investigate whether income gap does explain the state of household indebtedness. The prevalence of "keeping up with the Joneses" could exacerbate the rise in household indebtedness at a time when access to credit is greater. For this to happen, we will look at various countries with different income levels in order to assess the

relationship. We will look at factors such as GDP per capita, credit ratio, interest rate and unemployment rate as the controlling variables. It is interesting to note that economic growth has always been high on every government's agenda while lower interest rate environment post Great Recession in 2008 and 2009 have resulted in credits becoming more accessible to borrowers.

Second, we are curious whether previous indebtedness would have some implication on the level of current household debt. Households with steady and predictable income streams would have better sense in their ability to repay their financial commitments. Should this be the case it is likely consumers would then resort to higher borrowings in order to consume more goods and services; in particular, when easy credit environment would increase the success rate for loan application. We have seen mortgage refinancing had been widely used in US during the credit boom as households attempt to extract the positive equity from their house values. Apart from that, credit card revolvers as well as refinancing of existing personal financing facilities could also be seen as a means to extract cash which then can be used for consumption. Furthermore, fierce competition among financial institutions to improve their bottom line would exacerbate such phenomenon. From this, we can see the autoregressive nature of the model by incorporating lag data to the equations.

Third, to establish the relationship between financial development and the rise in household debt. It is interesting to note that financial development can help to spur the growth in household debt. This would show that savings are being intermediated by financial institution to the borrowers. Some of the countries in this study are considered emerging economies in which the development of financial infrastructure is very much lacking in comparison with developed countries.

Therefore, our contribution to the existing literature is by associating the social aspect of a human being into the financial problems in the most efficient manner. This is made possible by employing Generalised Methods of Moments (GMM) as the lag dependent data will be incorporated as part of the explanatory variable. In addition, the incorporation of multiple countries into one equation will make the assessment more meaningful especially when developed and developing economies are part of the dynamic panel data analysis. This is particularly important when research in this area has been US centric which primarily relates to the Sub Prime Mortgage crisis (Stockhammer, 2013; Barba & Pivetti, 2008).

This study is divided into six sections. The first is the introduction and the second part is a review of relevant literature as well as the theoretical framework. The third and fourth section analyses data and methodology respectively. Section five and six discusses the empirical results and concludes the paper respectively.

2.   Literature Review and Theoretical Framework

Stockhammer (2013) states the US Subprime Crisis can be related to the rising income inequality. Apart from causing downward pressures to the aggregate demand, such income inequality will result in burgeoning of household debt and economic growth, albeit momentarily. While the economy would thrive following the debt-led growth model, it may prove to be unsustainable in the event of economic shock. Mian and Sufi (2011) highlighted that the US counties which experienced elevated levels of household debt prior to the US Subprime Crisis tend to contract more severely compared to those which had modest growth in household indebtedness. Therefore, rising income inequality and ensuing household debt is a recipe for disaster.

While the rise in income disparity can be seen as the conduit for household debt accumulation, there could also be a psychological factor at play. For instance, Goldberg, Gorn, Peracchio, & Bamossy (2003) indicated a sense of materialism have been ingrained since childhood such as having a lot of money is the sole goal for adolescents as they join the workforce. Consequently, such indoctrination will shape the spending pattern of these adolescents, leading them to seek certain stature in the social hierarchy. By the same token, spending behaviour as demonstrated by parents could, in some way, influence the adolescent learning process on consumption. Churchill & Moschis (1979), they inferred that adolescents observed their parents' consumption pattern which also includes aspects that relates to materialism. Similarly, Moore and Mochis (1981), which examined the way family's communication, also suggests that certain styles can be socially oriented that promote conformity to other's view. This ultimately will set the stage for materialism to become more prevalent when there is a need to be on par and accepted according to the benchmark set by others. Nonetheless, Chaplin and John (2010) believe positive values exhibited by parents to their offspring such as self-esteem would actually reduce the need for materialism. Such positive values would alter their children's world view which then can have implication on decision making once they enter into the labour force. Therefore, choices that a person makes to improve their social income are based on social aspect such as the standard of living of others and certain human qualities. Conspicuous Consumption theory which was developed more than a century ago by Thorstein Veblen in 1899 provides the necessary building blocks for this research[2]. Veblen (1899) states "conspicuous consumption of valuable goods is a means of reputability to the gentlemen of leisure". Essentially, the basis for reputation ultimately hinges upon the monetary strength which would lead to a good name. As such, it is an attempt by society to be well accepted by their surrounding and social circle. The word "conspicuous" is an act to claim certain amount of attention by

consuming goods and services which are most apparent and command certain values as well as qualities. Additionally, it also connotes efforts by a society to emulate other people's consumption pattern.

Becker (1974), however, made an important remark by suggesting that the analysis of interactions between the behaviour of some individuals and different characteristics of other persons have been largely ignored in the modern economic literature. The central concept in Becker (1974) is "social income" which is the sum of a person's own income and the monetary value to an individual of the relevant characteristics i.e. the social environment. This will have implications on individual behaviour and allocation of scarce resources; such as to engage in activities that could improve one's standing. In this regard, Becker (1974) proposed a set of production function which includes an individuals' perception of others. Such relationship will be manifested as follows:

$$Z_{j=} f_j^i\left(x_j, t_j, E^i, R_j^1, \dots\dots R_j^r\right) \tag{2.1}$$

where:
$Z_{j=}$ goods and services that will satisfy basic needs and wants.
x_j = are quantities of different market goods and services.
t_j = are quantities of one's own time.
E^i = stands for his education, experience, and "environmental" variables.
$R_j^1 \dots\dots R_j^r$ = opinions of i held by other persons.

Note that R_j^r is the opinion of other people which, in conventional wisdom, is beyond *i's* control. Nonetheless, Becker (1974) pointed out that the individual is able to control R_j^r by not engaging in criminal activities, achieve distinction by working diligently at his occupation, giving to charities, or having a nice home ; or relieve his envy and jealousy by talking meanly about or even physically harming his neighbours. R_j^r. Given that R_j^r can be controlled by the individual; the utility function will be expressed as follows:

$$U_i = Z(x, R) \tag{2.2}$$

The utility function has two goods i.e. x and R whose consumption yield a certain level of satisfaction or utility, U_i. While the consumption of goods x can be understood in the context of utility maximising consumer, R, we need to dissect R in order to understand its relationship in maximising the utility of a particular individual. Essentially, other people's perception as represented by R can be decomposed into two parts:

$$R = D_i + h \qquad\qquad (2.3)$$

where:
D_i = is the level of R when individual makes no effort.
h = is the level of R when individual showed his efforts.

We can also construct the budget constraint as follows:

$$P_x X + P_R h = I_i \qquad\qquad (2.4)$$

$P_x X$ = is the price an individual for goods *X*.
$P_R h$ = is the price an individual pays for *R* which in this case is h since we would like to take a view if a person take an action.

Note that Morgan & Christen (2002) attributed $P_R h$ as the amount spent on conspicuous consumption in the community or a person surroundings can be influenced by individual *i* through the consumption of positional goods, h. In fact, conspicuous consumption by others will exert certain pressures on individual *i*. Should he or she decide not to respond, it can reduce the community's respect for the individual concerned.

In order to grasp the concept of social interaction the following equation was formulated:

$$P_x X + P_R R = I_i + P_R D_i = S_i \qquad\qquad (2.5)$$

where:
S_i = is the sum of individual's money income and social income.

Here an individual's reaction can take the form of life style imitation through bank borrowings to allow the purchase of appropriate goods and services. While emulation and income inequality are seen to be the main catalyst for increases in household borrowings Beck, Demirgüç-Kunt, and Peria (2008) highlighted that it takes more than USD700 to open a bank account in Cameroon, which is more than the country's GDP per capita. And it costs USD50 to transfer USD250 internationally in the Dominican Republic while most people in developed world take access to banking services for granted. Campero and Kaiser (2013) found that formal and informal credit sectors serve different segments of the population and that informal sector seems to have a complementary role. In the context of widening income gap, one could also deduce that envious feeling could easily seep in especially when such situation is deemed to be "unfair". This eventually will lead to human quest for the resources necessary for successful

survival[3]. Basically, the envious individuals would invest his time and energy so that he could outperform his rivals. A sense of materialism could lead a person to resort to bank borrowings to facilitate the consumption of luxury goods and services. This ultimately will improve his standing in society, earning recognition from peers and friends.

3.   Data

This study aims to find the effect of income gap on household debt. In this regard, income gap will be represented by **Gini Coefficient** which measures the extent of income gap between high and low income level. The Gini Coefficient was developed by Italian statistician named Corrado Gini in 1912. The coefficient has two extreme - 0 and 100 - whereby 0 indicates perfect equality in income distribution while Gini Coefficient of 100 suggests that income distribution is perfectly inequality.

Where the coefficient is rising, it means the income gap between the low and high income earners are generally widening, which policy makers of any country would like to avoid. The same is also true if the index descends lower, which essentially means the gap between high and low income is narrowing. Ideally, any country would strive to have lower income gap to ensure a more sustainable economic growth. Data is sourced primarily from Word Development Indicator by World Bank and International Monetary Fund (IMF). Our preference of using Gini Coefficient has been substantiated by the numerous literature when researching in areas relating to socio economics. Forbes (2000) suggested that income gap has moved in tandem with economic growth. Gini Coefficient Index is used to represent the gap in income level for 45 countries and panel data analysis is employed to come up with such estimates. For **household debt** data was collected from CEIC Database, a renowned data base service provider with an annual subscription fee. The household debt would generally cover mortgages, hire purchase loans, credit cards and any other forms of consumer loans. It does make sense for mortgages to account the largest share in household debt composition since house value is generally more expensive compared to other products. And to a large extent, it is the most important investment for an individual. Owning a house can be deemed as a success since it requires stable income and job security in order to qualify for mortgage application. In some sense, such success is also important to gain social status be it within family members or among peers.

Data on household debt is divided with nominal Gross Domestic Product (GDP), yielding a household debt ratio as percentage of its economic output. Such computation is very much similar to Jappelli, Pagano, and Di Maggio (2008) when household debt-to-GDP ratio is used to examine the

determinants of household debt using cross sectional data for 45 countries. The same data will also be applied for the lag dependent data which will represent our second research objective. Information gathering on household debt-to-GDP data is in itself a useful contribution since internationally comparable data exist for only small set of countries. A total of 55 countries will be used with a yearly time series commencing from the year 2000 until 2012.

Data on private sector credit to GDP ratio which will be denoted as **credit** will be used to represent our third objective. Such data set was commonly cited by Khan and Semlali (2000), Kappel (2010) and Rachdi (2011). It also worth highlighting that the areas of financial development studies and how it affects economic growth have received numerous interests from various scholars such as Gurley and Shaw (1955), Goldsmith (1969) and Hicks (1969).

Next independent variable will be **lending rate**. This should represent the cost of borrowing whenever households decide to incur liabilities which need to be paid together with the principle amount. The figure is obtained from Word Development Indicator. Since our research initiative was triggered by event that unfolded in the US during the Sub Prime Crisis in 2007 and 2008, interest rate is a must-have ingredient when researching the dynamics of households' indebtedness. The low interest rate period in the US post dot com bubbles in 2001 have resulted in increase in house prices and home owners to extract positive equity on the value of their dwellings (Mian & Sufi, 2011; Dynan, 2012)

We also believe that income plays an important role in determining the level of indebtedness among households. This is given the fact that financial institutions need to assess the credit worthiness of a potential borrowers especially their ability to repay the debt obligation. In this regard, **GDP per capita** represents income for households in which, currency denomination will be based on US dollar in nominal terms. Data is sourced from IMF World Economic Outlook Database. In the same vein, **unemployment rate** will also serve as a signal to development in labour market. We believe that lower unemployment rate will lead to higher household debt as labour market is in good condition. This will ensure stability in household income stream which indicates strong ability to repay the debt obligation.

Jappelli et al. (2008) use cross-section or pooled data regression estimates to analyse the determinants of household debts for 45 countries. However, we note that the determinant has not incorporated previous debt level as part of the controlling variable since the model is not built to handle such input. This is given the fact that it may result in autocorrelation problem. In addition, there is no instrumental variable in pooled data analysis which would make regression estimates more meaningful. As such, we will resort to household debt model as proposed by Kumhof, Lebarz, Ranciere, Richter,

and Throckmorton (2012) who use Generalised Method of Moment (GMM) as their estimation technique. The testable equation is aimed at finding the cause of widening of current account deficits, which then can be related to household debt. The widening of current account balance can be directly linked to rising household debt as consumer liabilities are being funded by domestic as well as foreign source. Other controlling variables include income gap represented by the Top 5% income share and Top 1% income share as well as private credit-to-GDP ratio. In addition, the lag data for current account balance as percentage of GDP was used as the autoregressive parameters. A total of 55 countries will be considered in our study, 26 from the OECD with a yearly series between 2000 and 2012.

From equation 2.5, we derive the Marshallian demand function for household debt, whereby S_i will be the budget constraint for the utility function i.e. equation 2.2. This is particularly true when an individual responds to R, the perception of others. If the particular individual decides to take debts in order to be seen or to be on par with his or her surroundings, it will be treated as h as depicted in equation 2.3. This is given the fact that the person is making an effort in order to elevate his or her social status. Our model, which is based on Kumhof et al. (2012), is as follows:

$$Y_{it} = \alpha Y_{it-1} + x'_{it}\beta + \mu_{it}, \tag{3.1}$$

whereby,
Y_{it} = Household debt as percentage of GDP (hhd).
Y_{it-1} = Household debt as percentage of GDP in the previous period (hhd L1).

and $x'_{it}\beta$ will include:

X_2 = Gini coefficient (gini).
X_3 = Credit ratio (credit).
X_4 = GDP per capita (income).
X_5 = Lending rate (ir).
X_6 = Unemployment rate (unemp).
μ_{it} = the error terms.

We expect Y_{it-1}, X_2, X_3, and X_4 should have positive coefficient while X_5 and X_6 would give negative relationship.

4.   Methodology

We will employ generalised method of moments (GMM) dynamic panel estimator which was first introduced by Holtz-Eakin (1988) and subsequently extended by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). In equation 3.2, we expand it as follows:

$$Y_{it} - Y_{i,t-1} = (\alpha - 1)Y_{i,t-1} + \beta_1 gini_{i,t} + x'_{it}\beta_2 + \eta_i + \varepsilon_{i,t} \qquad (4.1)$$

where Y is household debt as percentage of GDP, x represents a set of controlling variables which affect household debt, η is an unobserved country-specific effect, and ε is the error term. Similarly, equation 4.1 can be written as:

$$Y_{it} = \alpha Y_{i,t-1} + \beta_1 gini_{i,t} + x'_{it}\beta_2 + \eta_i + \varepsilon_{i,t} \qquad (4.2)$$

Arellano and Bond (1991) indicate a suggestion for a first-difference transformation with a view to eliminate the country-specific effects such as this:

$$Y_{it} - Y_{i,t-1} = \alpha\left(Y_{i,t-1} - Y_{i,t-2}\right)Y_{i,t-1} + \beta_1\left(gini_{it} - gini_{i,t-1}\right) + \beta_2(x'_{it} - x'_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \qquad (4.3)$$

In order to fix the simultaneity bias of explanatory variables and the correlation between $(Y_{i,t-1} - Y_{i,t-2})$ and $(\varepsilon_{i,t} - \varepsilon_{i,t-1})$, Arellano & Bond (1991) recommend that the lagged levels of the regressors are used as instruments. This is valid under the assumptions (i) the error term is not serially correlated, and (ii) the lag of the explanatory variables are weakly exogenous. Given Arrelano and Bond (1991), the following moment conditions are put forward:

$$E\left[Y_{i,t-s} \cdot (\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \; for \; s \geq 2; \; t = 3, ..., T \qquad (4.4)$$
$$E\left[gini_{i,t-s} \cdot (\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \; for \; s \geq 2; \; t = 3, ..., T \qquad (4.5)$$
$$E\left[X_{i,t-s} \cdot (\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \; for \; s \geq 2; \; t = 3, ..., T \qquad (4.6)$$

Although the difference estimator above is able to alleviate some of the problems encountered in estimating dynamic panel model, it nevertheless has one major shortcoming. Alonso-Borrego and Arellano (1999) and Blundell and Bond (1998) demonstrate that when the explanatory variables are persistent, the lagged levels of the variables become weak. They show

that weak instruments may lead to biased parameter estimates in small samples and larger variance asymptotically. Prior to that, Arellano and Bover (1995) suggested an alternative system estimator that combined the difference in Equation (4.3) and the level Equation (4.2). Blundell and Bond (1998) show that this estimator is able to reduce biases and imprecision associated with difference estimator. Owing to Arellano and Bover (1995), the instruments for the regression in differences are the same as above. The regression in levels uses lagged differences of the corresponding variables as instrument. Such action is valid when one assumes there is no correlation between the differences in explanatory variables and the country-specific fixed effect. The additional moment conditions for the second part of the system (the regression in levels) are given by:

$$E\big[(Y_{i,t-s} - Y_{i,t-s-1}) \cdot (\eta_i + \varepsilon_{i,t})\big] = 0 \; for \; s = 1 \qquad (4.7)$$
$$E\big[(gini_{i,t-s} - gini_{i,t-s-1}) \cdot (\eta_i + \varepsilon_{i,t})\big] = 0 \; for \; s = 1 \qquad (4.8)$$
$$E\big[(X_{i,t-s} - X_{i,t-s-1}) \cdot (\eta_i + \varepsilon_{i,t})\big] = 0 \; for \; s = 1 \qquad (4.9)$$

The consistency of the GMM estimator depends on two specifications tests. The first is Hansen (1982) *J* test of over-identifying restrictions. Under the null joint validity of all instruments, the empirical moments have zero expectation, so the *J* statistics is distributed as a X^2 with degrees of freedom equal to the degree of over identification (i.e. number of instruments minus the number of independent variables). If the errors are believed to be homoscedastic, the J-test is the classic Sargan (1958) statistic. The second test examines the hypothesis of no second-order serial correlation in the error term of the difference Equation (3.4) (Arellano & Bond, 1991). Failure to reject the null hypothesis of both tests supports the proposed model.

The GMM estimators are typically applied in one- and two step variants (Arellano & Bond, 1991). The one-step estimators use weighting matrices that are independent of estimated parameters, whereas the efficient two-step GMM estimator uses the so-called optimal weighting matrices where the moment conditions are weighted by a consistent estimate of their covariance matrix. This makes the two-step estimator asymptotically more efficient than the one-step estimator. However, the use of the two-step estimator in small samples, such as in this study, has several problems resulting from the proliferation of instruments that makes some asymptotic results about the estimators and related specifications test misleading (Roodman, 2009). The first problem relates to standard errors of the two-step estimators. When instruments are numerous, the asymptotic standard errors of the parameter estimates are severely downward biased because of imprecise estimate of the optimal weighting matrices (Windmeijer, 2005). As a result, the efficiency gain over the one-step estimator may be small and this makes the two-step

estimate a poor guide for hypothesis testing. Windmeijer (2005) devises a correction procedure for the covariance matrix and consequently makes the two-step estimator more efficient than the one-step estimator, particularly for the system GMM. Before this correction procedure became available, researchers routinely relied on the one-step result in making inferences. The second problem is that the instrument proliferations can generate results that are invalid yet appear valid because of weakened Hansen over identification test. In Monte Carlo simulations of difference GMM on N=100 panels, Bowsher (2002) show that the test is clearly undersized once T reaches 13 (66 instrument). At T = 15 (91 instruments), it does not reject the null of joint validity at 0.05 or 0.10, rather than rejecting it 5% and 10% of the time as a well-sized test would. The final problem is that numerous instruments can over-fit the instrumented variables and consequently failing to filter out the endogenous component. This will result in biased coefficient estimates. In a simulation of different GMM estimator on a 8 x 100 panel, Windmeijer (2005) shows that the average bias in the two-step estimates of parameter drops by 40% when the instrument count is reduced from 28 to 13. However, one problem faced by empirical economists when applying the GMM estimator is that the theory is not explicit enough about how many instruments are considered 'too many'. Arellano and Bond (1998) show that the approximation of the optimal weighting matrix with limited data can be singular when *J* approaches *N*. This has contributed to the idea that *N* is a key threshold for safe estimation. In this paper, we use several variants of the GMM estimator to highlight potential problems as a result of the proliferation of instruments. This is particularly important for the present study given a small size of our sample.

5.   Empirical results

In order to get reliable readings, we adjust the data series into a two-year average. This is in line with Law and Singh (2014) whereby the averaging of the data sets tends to smooth the business cycle effect while at the same time, giving large number of cross-section units with small number of time periods. Thus, we will have six-time series data since we have to omit the year 2000. The data series will be in the following years – 2002, 2004, 2006, 2008, 2010 and 2012. Additionally, we will generate two types of GMM models i.e. System and Difference. From there on, we will observe which model would give satisfactory results in order to draw our conclusion. Please refer Table 1 for discussion on the empirical results.

All four equations fulfil the GMM requirement given the acceptable readings on AR (2) and Sargan test. However, equation 3 and 4 are more convincing given that the coefficient of lag HHD is less than unity. Between

these two, equations 4 are more preferable as it has higher t-statistics compared to equation 3. There are four independent variables which are considered as statistically significant – lag HHD, Gini index, credit ratio and unemployment rate. The lag HHD does not suffer high persistence problem when the reported coefficient stood at 0.5627 and considered statistically significant when the t-statistic value at 2.06. This means that for every 1% increase in the past debt level, it will result in 0.5627% increases in the present debt level. The results are in line with Yoo and Hwang (2013) whereby it is very difficult to escape from the loan market once a person is already in the system. Borrowers tend to refinance the existing mortgage in order to extract positive equity which can then be utilised to fund consumption. This is well described by Deep and Domanski (2002) with reference to the Sub Prime Crisis in US. Similarly, one could opt to pay the minimum balance for the credit cards which essentially allows the credit card user to postpone the repayment of balance while at the same time allowing him or her to enjoy the current income. Figures from Malaysia's credit counselling agency, AKPK (2015), support such view when one of the reasons for default in household debt is due to loss of control on usage of credit cards.

The Gini index coefficient stands at 0.2688 and t-statistic value at 1.82. This suggests that when the Gini index increases by 1%, the resultant effect will be higher indebtedness by 0.2688% and is considered statistically significant at 10% significant level. Such relationship is very much aligned to Stockhammer (2013), Kim (2013), Barba and Pivetti (2008) and Morgan and Christen (2002). Therefore as the income gap gets widens and reflected by the rise in Gini index, households appear to have reacted by increasing their leverage to increase their happiness among their social circle.

Meanwhile, credit ratio is also moving in the same direction with household debt when the coefficient stands at 0.1254. This implies that every 1% rise in the credit ratio translates into 0.1254% increases in household debt. The t-statistic value of 1.95 indicates that the result is statistically significant at 10% significant level and therefore, it can be accepted. This is in line with Rajan and Zingales (1996) whereby financial development facilitates growth via higher spending by the households while debt-led growth (Stockhammer, 2013) may support such argument. The labour market plays a significant role with negative coefficient of -0.7505. This suggests as unemployment rate decline by 1%, the level household debt will increase by 0.7505% and vice versa. The t-statistic value of -4.66 is significantly higher than the critical value which means that the relationship is deemed to be statistically significant. Therefore, the state of labour market is critical for the accumulation of debt among the households as job security become less of an issue for loan application to be approved. Such argument supports the findings of Neumark and Postlewaite (1998) and Bowles and

Park (2005) whereby the state of labour market has important bearing on social standing. The AR (1) and AR (2) test indicates that there is no auto correlation problem with P-value stands at 0.944 and 0.272 respectively. Meanwhile, Sargan test also indicates that there is no over identification problem with P-value of 0.096 which is significantly higher than the critical value.

Lending rate was never a significant factor given that all of our four models depicted lower values in *t*-stat. This can be an interesting observation within the context of managing the level household's debt via monetary policies. From this exercise, one may say that interest rate is not the right tool for managing household indebtedness, although it may seem compelling to do so in order to adjust the gearing level among the households. This supports White (2014) in which he suggested that monetary policy is guided by a flawed theory which had led to the crisis in 2007.

Table 1: GMM results

		One-step Sys. GMM	Two-step Sys. GMM	One-step Diff. GMM	Two-step Diff. GMM
hhd L1	Coef	1.2423***	1.2882**	0.5280*	0.5627**
	t-stat	12.8100	8.4800	1.9000	2.0600
gini	Coef	-0.1216*	-0.2018**	0.1970*	0.2688**
	t-stat	-1.8500	-2.6500	1.7200	1.8200
credit	Coef	-0.0443	-0.0476	0.1012	0.1254**
	t-stat	-1.4100	-1.0300	1.4100	1.9500
income	Coef	-0.0002**	-0.0003*	-0.0002	-0.0002
	t-stat	-2.0000	1.7800	-0.8200	-1.3500
ir	Coef	0.0179	0.0186	-0.0717	-0.0336
	t-stat	0.2500	0.1800	-0.7100	-0.5000
unemp	Coef	0.0433	0.0428	-0.7809*	-0.7505**
	t-stat	0.5400	0.3300	-4.9500	-4.6600
cons	Coef	7.6009**	11.2997**		
	t-stat	2.6900	2.7700		
No. of group		49	49	38	38
No. of instrument		22	22	17	17
AR (1)		0.6730	0.7010	0.8140	0.9940
AR (2)		0.2260	0.2670	0.1650	0.2720
Sargan		0.1160	0.1160	0.0960	0.0960
Hansen		0.2260	0.1060	0.5210	0.5210

Notes: **The coefficient is statistically significant with significance level of 5%. * The coefficient is statistically significant with significance level at 10%. For AR (1) and AR (2), Sargan and Hansen test, the P value will be at 0.05.

6.   Conclusion

Earlier studies showed that household debt is highly influenced by macroeconomic stability, financial sector development, and government policies as described by Endut and Toh (2008). This paper attempted to understand if other factors could also have caused rising levels of household indebtedness.

Based on the Difference GMM estimation, we have found that Gini index has a positive relationship with the level of household debt thereby indicating that as income gap or disparity increases it will lead to the increase in the household indebtedness. Therefore, it can be concluded that widening of income gap would incentivise households to increase their leverage in order to make purchases to alleviate their status in the social circle. Such purchases may include acquisition of assets such as expensive houses, big cars or spending on costly entertainment.

It was also observed all GMM estimation showed that once the households enter the loan market, it would be hard for them to exit thus leading them to remain indebted for long periods.

It was also shown access to credit can determine the level of household debt. Macro prudential measures such as lowering the loan-to-value ratio for mortgage financing, higher down payment for vehicle loans as well as shortening the duration of unsecured facilities are among the key measures prescribed by the central banks in order to address financial imbalances,

Although such policy responses maybe more reactive. A more inclusive growth strategy such as investing in human capital, conditional direct transfer and spending on physical infrastructure should help to reduce the income gap and lower household's borrowings.

Inculcating spirit of modesty and moderation too could help control the desire for excessive borrowings. Future research aimed at finding the optimal level of household indebtedness would be useful and by establishing the "right size" of household debt, interest rate could be used to complement existing policy.

Notes

[1.]   This conference was held at Bank Negara Malaysia's Sasana Kijang, Kuala Lumpur on May 21, 2014. Attendees were mostly from private economists, central bankers, Bank for International Settlement (BIS), IMF. World Bank and OECD.

[2.]   The theory of leisure class. Journal of Political Economy, September 1899 by Thorstein Veblen.

[3.]   Hill S.E. and Buss, D.M. "The Evolutionary Psychology of Envy".

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