Can Income Inequality Affects Household Debt?

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Abstract

The present study aims to evaluate the influence of income inequality on household debt by applying the dynamic GMM estimator to a database covering advanced and emerging countries over the period 1994 to 2019. The result shows that income inequality promotes the growth of household debt. Furthermore, higher house prices and financial development increase the household debt. Meanwhile, the economic growth, interest rate and unemployment have negative and significant effect on household debt. The finding of the study suggests the involved authorities formulate suitable policies and initiatives in order to monitor the increase in household debt. Indirectly, this measure can be useful to consider as an early warning signal for crises.

Keywords: Household Debt, Income Inequality, Panel Data.

Introduction

The past years have shown the tremendous increase in household debt and it keep to grow despite the pandemic crisis. Presently, the risk that stems from elevated household indebtedness has caused a number of harmful effects on economic health. Regarding this matter, economists have long debated the real threats of susceptibilities in the banking crisis which are mainly caused by the expansion of household credit. Consequently, this leads to the decline of economic growth; for example, the financial turmoil that occurred in the United States in 2008 (Jappelliet al., 2013; Mianet al., 2015; Samad et al., 2022). Albeit all these concerns, household debt continues to increase year after year, particularly in developing economies. Additionally, controversial debates on the factors that lead to a further increment of household debt have been a matter of ongoing discussion. Accordingly, there is empirical evidence showed that income inequality and household debt have strong relationship (Vita and Luo, 2020). Therefore, this issue demands an urgent investigation on the matters.

- Research Objectives: The study aims to examine the factors that influence the changes in household debt.

To date, several studies have shown the determinants on the rising household debt but Samad et al (2022) conducted extensive studies on the matter. However, Samad et al (2020) does not covers the factors of income inequality. Nowadays, luxurious and lucrative lifestyles pictured in social media motivates desire to spend like a rich among the low-income group. Consequently, to bridge the higher consumption and low income is by getting more loans. Hence, cause the household debt to increase. Therefore, this has encouraged the present study to consider the important role of income inequality which is able to provide a pivotal impact on household debt. The findings of the current research showed that higher income inequality is associated with rising household debt. Accordingly, the present study provides a significant contribution to the tenet of work on the subject through the appraisal of the authority chemistry between household debt and income inequality. The remaining part of the paper proceeds as follows: Section II presents the literature review and model specification and data in section III, while Section III discusses the econometric methodology. Next, Section IV provides an analysis of the empirical results, followed by the overall conclusion of the research presented in Section V.

Literature Review
Following the modernised framework of the life cycle theories and permanent income hypothesis, Rubaszek and Serwa (2014) analysed the factors of household debt in dynamic panel sample. Following the model, recent study Samad et al (2022) has concluded that the increasing of household debt was affected from higher financial development, house prices, and lending interest rate in emerging economies. Meanwhile, unemployment rate and inflation are negatively associated with household debt. Specifically, the study augmented the framework by analysing the wider panel data and longer span of a year using the two-step system GMM. Contrastingly, the research does not include income inequality.

Wildauer and Stockhammer (2018) claimed rising inequality was led by the desire to lower-income groups to spend like rich people by poor people that according to the expenditure cascades theory, causing them getting more loans. Hence, poor household involved in debt to increase their happiness to be relevant with rich social circles. Rashid et al (2017) demonstrated that household debt rises as the income gap widens. Luxurious lifestyles lead to heavy consumption cause for more credit among low-income group. So, there is high possibility that higher income gap lead household debt to increase.

Jappelli and Pagano (1994) argued that household debt is dependent on liquidity constraints. Nevertheless, the theory is argued to be capable of enhancing the shortcomings of the life cycle and permanent income hypothesis despite the failure of the two hypotheses to consider the income inequality. The study fills the gap by extending the current model with the influence of income inequality.

Methodology
Model Specification and Data
The current research extended the famous lifecycle theory and permanent-income model which were respectively developed by Ando and Modigliani (1963); Friedman (1957) by integrating financial development in a panel form into the model modernised by Samad et al (2022) as follows:

$$HD_{i,t} = \alpha_0 + \alpha_1 LHD_{i,t} + \alpha_2 GINI_{i,t} + \alpha_3 GDPG_{i,t} + \alpha_4 INT + \alpha_5 UN_{i,t} + \alpha_6 HP_{i,t} + \alpha_7 FD_{i,t} + \varepsilon_{i,t}$$

where HD_i refers to the household debt to *GDP* in the country i and t time index which is dependent on, while α_0 represents constant measure, followed by $\alpha_1, \alpha_2, \alpha_3, \alpha_{4,} \alpha_5, \alpha_6, and \ \alpha_7$ which are the coefficients with respect to lag household debt *LHD*, *GINI* is income inequality, *GDPG* representing the growth rate of gross domestic product, *INT* describes the interest rate, *UN* is unemployment, *HP* is house prices, and *FD* stands for financial development. Finally, $\varepsilon_{i,t}$ is defined as the error term which involves the effect of a time-constant country.

Table 1
Data Description

Variable	Abbreviation	Description	Source
Household debt	HD	Credit to household percentage of GDP	BIS
Income inequality	GINI	Gini Index	SWIID
Growth of Gross Domestic Product	GDPG	GDP per capita growth (annual %)	WDI
Interest rate	INT	Real interest rate (%)	IMF
Unemployment	UN	Unemployment, total (% of total labor force) (national estimate)	WDI
House prices	HP	Residential property prices	BIS
Financial development	FD	Financial development Index	IMF

The study employs an unbalanced panel data that covers 39 countries spanning the years 1994 to 2019. The data retrieved from a combination of the several database such as Bank International Settlement (BIS), World Bank's World Development Indicators database (WDI), and International Monetary Fund (IMF) database and The Standardized World Income Inequality Database (SWIID) as presented in Table 1. Regarding this matter, the elucidation that links the control variables with the rapid increase of household debt can be found in numerous studies (Cecchetti et al., 2011; Meniago et al., 2013; Mian et al., 2015; Rashid et al., 2017). Besides, the data is averaging 5 years following (Samad et al., 2020).

Econometric Methodology
The current research adopted the GMM estimator to estimate the household debt. First, the model was analysed using first-differenced GMM estimator developed by Arellano and Bond (1991); Holtz-Eakin et al., 1988). However, it is important to note that the results are more likely to incline to one side considering that the explanatory variables in level regression tend to be more constant over time, which leads to issues related to weak instruments. Hence, the model was regressed using system GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998). Specifically, the GMM system is perceived as the most efficient due to its excellent performance for panel data with small cross countries (Soto, 2009). Meanwhile, one of the limitations of GMM applications refers to instrument proliferation, especially on small panel data with low cross countries. Therefore, the estimator that was instrumented variables compared to the number of observations may weaken the over-identification test (Bowsher, 2002). Regarding this matter, consistent estimates can only be

achieved by a GMM estimation after passing two types of tests, namely Second Autocorrelation AR(2) and Sargan test.

Empirical Results
Descriptive Analysis
Table 2 presents the pairwise correlation between variables. Household debt is significantly negative correlated income inequality. Besides, GDP growth, interest rate, and unemployment have negative correlation with household debt. Whereas house price and financial development have positive correlation with household debt. Here, financial development has strong correlation to household debt, still income inequality somehow has contrast evidence to the theory hypothesis.

Table 2
Correlation Analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) HD	1.000						
(2) GINI	-0.366	1.000					
	(0.000)						
(3) GDPG	-0.264	0.106	1.000				
	(0.000)	(0.103)					
(4) INT	-0.219	0.217	-0.137	1.000			
	(0.001)	(0.001)	(0.045)				
(5) UN	-0.203	0.325	-0.253	0.159	1.000		
	(0.002)	(0.000)	(0.000)	(0.019)			
(6) HP	0.202	0.103	-0.085	-0.151	-0.177	1.000	
	(0.004)	(0.145)	(0.230)	(0.039)	(0.012)		
(7) FD	0.795	-0.253	-0.182	-0.248	-0.154	0.262	1.000
	(0.000)	(0.000)	(0.005)	(0.000)	(0.018)	(0.000)	

Level of Confidence in Parentheses

We also show that there is possibility that income inequality and household debt has negative relationship across the country as shown in Figure 1.
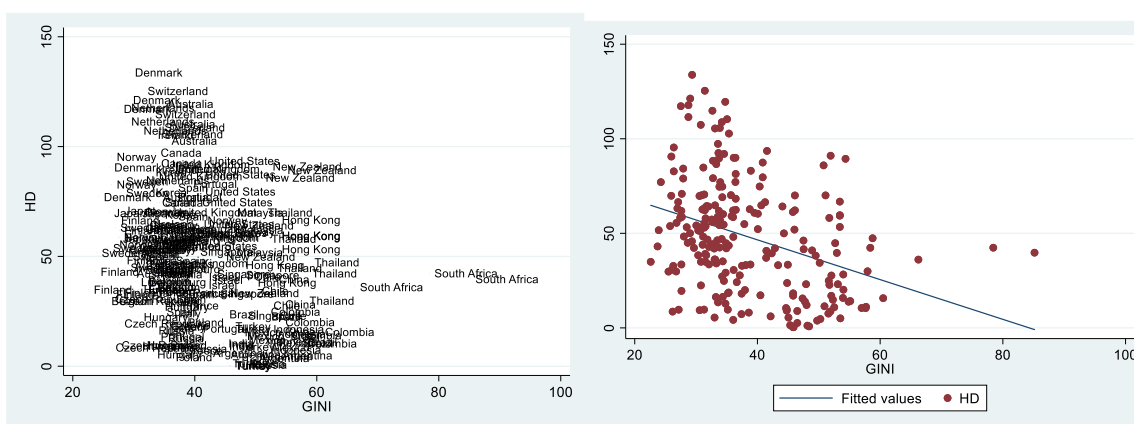

Figure 1: Scatter plot household debt and income inequality

The table presents the results analysed using two-step system GMM and system GMM. The research also employs LSDV method for robustness test. For diagnosis test, the sargan test and AR(2) for the purpose of carrying out the validity test. Overall, it can be concluded that the tested since passed the validity test of both sargan test and second order auto-correlation. The negative coefficient of lag household debt signifies that the model is suitable for dynamic second-generation panel data analysis.

The results show that income inequality has significant impact on household debt. Higher income inequality induced household debt to increase. House price index and financial development have positive and significant effect. Meanwhile, economic growth and unemployment are negative and significantly effect on household debt.

Table 3
Factors influencing household debt

	Abbreviation	GMM		LSDV	
		Coefficient	Standard Deviation	Coefficient	Standard Deviation
		Dependent variables - Household debt			
Independent variables					
Lag Household debt	LHD	0.434***	-0.058	0.489***	-0.083
Income inequality	GINI	0.493***	-0.147	0.612***	-0.208
Growth of GDP	GDPG	-1.783***	-0.214	-2.108***	-0.302
Interest rate	INT	-0.146	-0.119	-0.038	-0.242
Unemployment	UN	-0.483***	-0.177	-0.695**	-0.34
House price	HP	0.109***	-0.024	0.105***	-0.028
Financial development	FD	0.393***	-0.08	0.442***	-0.087
Constant		-2.421	-7.419	-5.265	-9.425
Observations		131		131	
Number of code		39		39	
No. of instruments		23		23	
AR2 p-value		0.0792			
Sargan p-value		0.2584			

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10

This finding is consistent with the previous studies which state that the higher income gap cause the household debt to increase. Moreover, this implies that the loan for an unemployed individual is less likely to be approved. In other words, the higher the unemployment rate, the less is the household debt. Meanwhile, in the context of economic growth, the lower growth rate will cause the household debt to increase due to the inability to repay the accumulated debt during the crisis. The model analyzed using LSDV shows consistent result. Therefore, it has been confirmed that income inequality plays an important role in the increasing trend of household debt.

Conclusion

The present study evaluates the influence of income inequality on household debt, extension of the recent model by (Samad et al., 2020). GMM estimation method was employed on the dynamic panel data model managed to achieve the objective of the present study. Apart from that, GMM estimator was utilized to regress the model for robustness check and endorse the results obtained from the LSDV estimation. Finally, the findings of this study concluded that income inequality has a significant influence on household debt across 39 countries in the panel sample of this research. We conclude that, the current development shows that credit with the initial aim of becoming a wheel of trade has been diverted to finance consumption, investment, and speculative activities reflected through income inequality.

Following the lifecycle theory and permanent-income theory, the study contributes to the current literatures and proves that the bigger gap of income inequality has significant effect on the rising household debt. The income inequality is an indicator the rising demand for to lucrative lifestyles against the income capability that resorting to the need for borrowings. As such, bridge the shortage income and demand more for productivity is favorable to the country's growth, but the household capability of debt repayment is that matter. The household debt is an issue that could not be curb but manageable. Hence, the policy maker such as Central Bank to initiate more activities and programs of financial education to increase the awareness among the society in managing their daily finances and be the wise judgment to differentiate the need and the wants.

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