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Article

Determinants of household debt in emerging economies: A macro panel analysis

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Determinants of household debt in emerging economies: A macro panel analysis

Khairunnisa Abd Samad^{1*}, Siti Nurazira Mohd Daud² and Nuradli Ridzwan Shah Mohd Dali³

Abstract: A rapid increase in household debt is undeniably a main concern among policymakers. Studies indicating the damaging effect of rapid rise in household debt towards economic growth attracted many researchers to determine its reasons. The risk from high household debt is not only applicable to advanced economies, but also inherent in emerging economies. Thus, the present study examines the leading causes of household debt in emerging economies. The study employs a bias-corrected least square dummy variable for the period of 1995–2018. The results show positive and significant effects of financial development, house prices, and lending interest rate. Meanwhile, unemployment rate and inflation are negatively associated with household debt. The study therefore urges policymakers, relevant authority and financial institutions to employ suitable and effective policy to mitigate the factors identified in the rise of household debt.

Subjects: Statistics for Business; Finance & Economics; Economics and Development; Economics; Econometrics

Keywords: household debt; emerging economies; panel data; LSDVC

1. Introduction

Household debt has been historically high in many countries. The Organisation for Economic Cooperation and Development (OECD) defined household debt as an obligation or liability to pay interest or principal by household arising from borrowing money on credit. Two major categories of

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PUBLIC INTEREST STATEMENT

Household debt refers to secured debt such as mortgage debt and unsecured debt such as car or credit card loans. Household debt is one of vital tools to smooth consumption when income remains relatively substandard. Despite its detrimental effect on growth as shown in many studies, household debt accumulation continues to rise particularly in emerging economies. Hence, this study investigates factors that cause rising household debt. The findings can be helpful for policy formulation in reducing the harmful effect of rise in household debt. This study suggests that higher household debt is caused by financial development, higher house prices and higher lending interest rate, followed by lower inflation and unemployment rate. Thus, these three factors should be considered highly in government policies and formulations so that emerging countries can pursue sustainable economic development.

household debt were identified, namely secured debt and unsecured debt (Girouard et al., 2006). Secured debt refers to the debt backed by an underlying asset such as mortgage debt. Mortgage debt is collateralised by houses, buildings, or land. Unsecured debt, however, negates the condition that a creditor holds no prerogative over the assets of the defaulting borrower. Credit card, personal loan or motor vehicles loans are among the debtor's assets exempted from the claim. This study justified the operational definition of household debt by referring to the Bank for International Settlements' (BIS) definition.

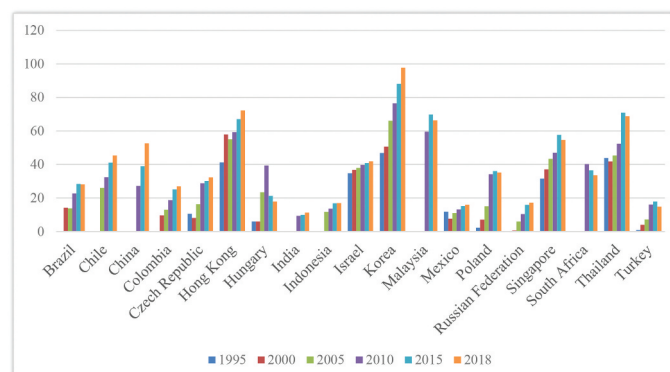
The financial crisis in 2008 has served as a warning towards the detrimental effect of rapid rise in household debt. The effect of high household debt trigger policymakers to be more cautious and to try and discover the root cause of household debt growth, vigilantly attempting to be more watchful of any changes. The risk stemming from rising household debt carries a wave of apprehension in the emerging countries as shown in Figure 1. The tremendous rise in Chile, China, Hong Kong, Korea, Malaysia, Singapore and Thailand in which the household debt ratio to GDP was amplified by more than 40% between 1995 and 2018. Based on the BIS statistics, Korea, Hong Kong, Thailand and Malaysia posed the highest credit to the household ratio since 2010 among the emerging countries. Most countries showed the same increasing trend of household debt except Hungary and South Africa. This rapid increase in household debt sparks the question: why do people accumulate debt?

Regarded as a determinant in the onset of financial crisis in 2008, many studies attempt to explain the root cause to the rise in household debt in emerging economies. Debt is important for some people to finance their constraints. Economists have analysed the macroeconomic factors causing household debt changes include income per capita, unemployment rate, consumption and inflation rate. Per say, these are factors from the demand side. In addition, progressive household debt is associated with the desire to own an asset as an investment (Barnes & Young, 2003). In lieu of this, the optimistic view about the economic future, together with rising house prices, has encouraged financial institutions to provide more lending. Besides this, the rapid increase in household debt was led by financial liberalization, particularly low interest rate (Jha, 2019). Hence, the role of supply side is highlighted to influence the household debt. In fact, almost all of past studies found that the rise in household debt is associated with escalating house prices and low interest rate. Nonetheless, few studies discussed the role of financial development empirically, thus motivates this study.

A well-established fact associates the financial development reflecting differences in financial innovation, financial depth and inclusion by referring to financial development index of International Monetary Fund (IMF). Sviryzdenka (2016) shows that the debt level is highly correlated with financial development index in European countries. Furthermore, another study validated that financial deregulation, relaxing financial constraints and financial innovations

Figure 1. Household debt in emerging economies.

Data retrieved from BIS statistics. Data on household debt in Malaysia start in 2006, India in 2007, and South Africa in 2008.



significantly eased the household sectors' access to credit (Campbell, 2006; Debelle, 2004). Campbell and Hercowitz (2005) found that the relaxing restriction of financial lending to household caused debt growth and triggered the volatility of outputs to fall significantly. In Canada, Turdaliev and Zhang (2019) reveal that the household debt fluctuations are mainly driven by housing demand and banking sector shocks. Their analysis highlights that the leveraged household are more vulnerable to contractionary monetary policy shock. The discussion shows the different aspects of financial institution as important factor in affecting the household debt which can be referred as financial development.

The paper contributes to the growing empirical literature on determinants of household debt which covers the macro panel dataset in emerging economies. Firstly, unlike previous attempts, it uses a wider database of emerging economies containing 19 countries to investigate the macro determinants of household debt. Secondly, the paper examines the macroeconomic factors of rising household debt in emerging economies despite experiencing the financial crisis in 2008. The household debt-to-GDP ratio amplified more than 40% in many emerging countries, causing a concern as it inherent the downside risk to economic growth. Thirdly, the paper investigates the impact of different financial development variables on household debt. The relationship between the financial development index (FDI) using the IMF database and household debt is less investigated in the literature than the relationship between credit supply and debt. All three ratios indicate different mechanisms for how indebtedness spills over into consumption. The results of the paper reveal that the different proxies of financial development have different effects on household debt. Moreover, the household debt is influenced by income, interest rate and house price.

The following discussion in this paper will focus on review of literature in Section II, descriptive account of the econometric model and data in Section III, regression results in Section IV and conclusion in Section V.

2. Review of literature

There are several studies which attempt to understand the factors determining the growth in household debt. Fisher (1930) provided empirical evidence that consumption was greatly affected by household debt. According to Fisher, insufficient earning to financial consumption caused the household to borrow. Another study by Modigliani and Brumberg (1955) proposed the life-cycle hypothesis (LCH) which posits households may, during their earlier years, have a desired or required level of consumption which exceeds their current income. Furthermore, Ando and Modigliani (1963) stated that LCH proposes the idea that individuals save at an early age, accumulate wealth in the middle age, and dis-save at retirement days. The household accumulates wealth, particularly owning the asset for investment; thus, debt becomes important to finance the budget constraint for wealth as well. In a parallel attempt, Friedman (1957) proposed the concept of permanent income hypothesis (PIH) which argued that individuals are driven to make consumption decisions based on their projected earnings prospect rather than the earning they have already received, especially when it is minimal. The gap mentioned in LCH during individuals early age can be financed by consumer borrowing to be repaid out of future income. The LCH and PIH concepts then view debt as an apparatus for a person's stable life-cycle consumption and maintenance and highlight that the household obtains a loan when earning is lower than expected. Based on LCH and PIH, the household debt can be explained through consumption and income. In other words, debt is a useful tool to increase consumption.

Nevertheless, limited studies have suggested the appropriate function of household debt. Some researchers have challenged that it has limitations. The model has been extended with the role of its own lagged, house price, interest rate, inflation rate and unemployment. Hartropp (1992) asserted that the change in the stock of debt is regressed on its own lagged value. Ortalo-Magne and Rady (1998) extended the framework by including the variable of housing price in the life-cycle theory. Besides, Iacoviello (2008) stated that household debt increases because households want to smooth out their consumption with uncertain conditions; it is not due to

a significant gap between income and expenditure. Still, the decision for household to spend their money may infer the interest to take up loans.

Meanwhile, Tudela and Young (2005) highlighted that the long-run increase in debt relative to income has mainly been associated with the rise in homeownership and the reduction in the level of inflation over the 1990s. In macro panel view, Rubaszek and Serwa (2014) asserted that the model of household debt was a function of interest rate spread, unemployment rate, GDP per capita and housing price.

On the other hand, there are contemporary literature studies discussed the possible causes of increasing debt. Numerous study analysed the macroeconomic factors such as income per capita, unemployment rate and inflation rate; causing household debt changes. The studies conducted in countries such as the US, UK, OECD, EU and other advanced countries (Barnes & Young, 2003; Coletta et al., 2019; Crawford & Faruqi, 2011; Debele, 2004; Mian & Sufi, 2014; Meng et al., 2013; Moore & Stockhammer, 2018; Rubaszek & Serwa, 2014; Tudela & Young, 2005), as well as in emerging countries such as Malaysia, South Africa, and Asian countries (see Ho et al., 2016; Kusairi et al., 2019; Meniago et al., 2013).

Meng et al. (2013) analysed the Australian households via the Cointegrated Vector Autoregression (CVAR) model and found that the level of household borrowing was significantly influenced by the rate of interest. Domestic debt was further positively affected by population in the economy, GDP, and house prices. Hence, the rapid increase of household debt is related closely with high house price as resulted by low interest rate. In the Korean context, data from Kim et al. (2014) revealed that the favourable funding conditions by financial institutions along with the careless behaviour towards lending among banks and the increase in house prices led to the upsurge in domestic indebtedness. All of these factors are accounted by the stock of household debt accumulation.

Meanwhile, Meniago et al. (2013) conducted a study in South Africa and claimed that GDP, house price, household consumption, expenditure and savings, as well as inflation negatively depended on household income and prime rate. Nonetheless, some variables were found insignificant (i.e. house prices, real prime rate, saving) based on the findings of their long-term co-integration analysis. Contrastively, changes in real debt were shown to negatively depend on GDP and changes in house price based on the short-term analysis via the error correction model (ECM). Nagano and Yeom (2014) investigated the household debt determinant in Japan and found the degree of regional bank market competition and the state of bank management soundness influence the aggressiveness of the residential mortgage loan business. Ho et al. (2016) analysed 8 Asian developing countries and found income, working age, interest rate, unemployment, inflation and house price significantly affected the household debt. The sign of interest rate differed according to country. Kusairi et al. (2019) examined the macro panel data from Asia Pacific countries for the period of 1994 to 2016 by focusing on labour market. They found that household consumption, housing price index, and labour force have a long-run positive relationship with household debt. In contrast, the unemployment rate and dependency ratio have a long-run negative relationship with household debt.

In accordance to these previous literature surveys, either individual or cross-countries analysis, household debt change is consistently driven by the housing prices. This review asserts that there are a limited number of studies on the role of financial development in explaining household debt. In addition, the current previous studies highlight the household debt increased led by the low interest rate and high house prices and few focuses on the financial development.

In our review of extant literature as depicted in Table 1), two gaps are identified: firstly, lack of studies offer empirical research from the macro panel data standpoint; and secondly, scarcity of empirical evidence proving the role of financial development in stimulating the growth of household debt accumulation. A limited picture of financial development relationship with household

Table 1. Summary of studies on determinant factors of household debt in emerging economies

	Au thor	Sam ple	Esti ma tion me thod	Oth er fac tors	Ma cro eco nomic fac tors	In come	Demo graphic	IR	UN	INF	CON	HPI	FD
1	Meniogo et al. (2013)	South Africa	CVAR	Household saving	Yes	-		-		+	+	+	
2	Nagano and Yeom (2014)	Japan	OLS	Bank compe tition (+) and soundness (-)	Yes		+		-			+	-/+
3	Kim et al. (2014)	Korea	OLS/2SLS	Supply side	Yes	+		-		+		+	Dep+
4	Khan et al. (2016)	Malaysia	ARDL	Dependent variable; mortgage debt (MD) and consumer debt (CD)	Yes	CD + MD +	CD + MD + (WP)	CD + MD -		CD + MD -		MD+	
6	Ho et al. (2016)	8 Asian countries	OLS	Individual country	Yes	-	- (WP)	-/+	-	+		+	
7	Kusairi et al. (2019)	Asia- Pacific	MG, PMG	Labor market	Yes	+	-		-		+	+	

Notes: IR = interest rate, UN = unemployment, INF = inflation, CON = consumption, HPI = house price, FD = financial development, Dep = Financial deposits, Credit = Credit supply, CVAR = cointegrated VAR, OLS = Ordinary Least Square, ECM = Error Correction Model, 2SLS = two-stages least squares, ARDL = Autoregressive Distributed Lag, GMM = generalised method of moments, POLS = pooled OLS, MG = mean group, PMG = pooled MG, WP = working population.

debt is painted by studies by Nagano and Yeom (2014) on bank's efficiency, and Kim et al. (2017) using financial deposits. The studies found the positive signs between financial activities and household borrowings, and thus implying that banks' overall attitude toward household loans during the period is highly aligned. Though there are vast studies arguing the causes for rising household debt led by the supply side, few had proved empirically, and particularly in this study, by using financial development index (FDI).

3. Data and methodology

Based on the review of theory and previous studies, the following model of consumer debt is suggested:

$$HD = f(GDPPC, UN, WPOP, INF, LIR, CON, HPI, FD)(1)$$

where household debt (HD) is a function of GDP per capita income (GDPPC), unemployment (UN), working population (WPOP), inflation rate (INF), lending interest rate (LIR), household consumption (CON), house prices (HPI) and financial development (FD).

To capture the effects of income, unemployment, working population, inflation rate, lending interest rate, household consumption, house price and financial development, the study proposes the household debt model as follows:

$$HD_{i,t} = \rho HD_{i,t-1} + \alpha_0 + \alpha_1 GDPPC_{it} + \alpha_2 UN_{it} + \alpha_3 WPOP_{it} + \alpha_4 INF_{it} + \alpha_5 LIR_{it} + \alpha_6 CON_{it} + \alpha_7 HPI_{it} + \alpha_8 FD_{it} \varepsilon_{it} \quad (2)$$

Where $HD_{i,t}$ is household debt as dependent variables at country i at time t , α_0 is constant term, HD_{t-1} is the one-lagged of household debt percentage of GDP with ρ to capture conditional convergence of the economy to its steady state. The model incorporates a one-lagged risk measure in the model following the literature related to convergence within the stock of debt (Hartropp, 1992). α_j ($j = 1 \dots 5$) as coefficients for explanatory variables income $GDPPC$, unemployment UN , working population $WPOP$, inflation INF , lending interest rate LIR , household consumption CON , house price HPI and financial development FD .

The life-cycle model emphasises that households make loans when earnings are lower than expected with the intention of allocating to the best possible way of consumption throughout their lifetime. Thus, income and household debt are expected to have a negative relationship. Household debt is increased by low rate of unemployment signalled by the good labour market, subsequently indicating the strong ability to pay off debt obligations as there is stability in household income generation. Unemployment is therefore expected to have negative effect in determining the changes in household debt. The life-cycle model posits that the household will borrow more during working age and save less during the retirement period. Hence, a positive sign between working population and household debt is expected. Higher inflation rate depicts the higher cost of borrowing and consumption for durable and non-durable goods. Thus, it can be either a negative or positive effect on household debt changes. The cost of holding loans on borrowing from the bank which is adjusted for inflation refers to real interest rate. Hence, a rise in domestic lending is expected when real interest rate is lower. An increase in household debt is associated with growing household expenditure to finance the consumption. Thus, consumption is expected to positively affect household debt. In addition, purchasing assets through borrowing is made attractive when there is growth in income (Barnes & Young, 2003). Furthermore, households' decision for asset accumulation results in household indebtedness. Therefore, house prices and debt should link positively. Previous studies have found possible association between credit growth and house price amplified by broad money in financially deregulated markets, creating financial excess (Goodhart & Hofmann, 2008; Mian & Sufi, 2017). Hence, financial development is expected to have positive influence on household debt.

The dataset for this study involves the observations of panel data for 19 emerging economies; Brazil, Chile, China, Colombia, Czech Republic, Hong Kong, Hungary, Indonesia, India, Malaysia, Mexico, Poland, Russian Federation, Singapore, South Africa, Thailand, and Turkey. Data for household debt and house prices were retrieved from the Bank of International Settlements. Data for unemployment rate, inflation, GDP per capita, working population, and household consumption were sourced from World Bank Database. Lending interest rate was gathered from the International Financial Statistics (IFS), OECD statistics, and World Bank database.

The available data consists of unbalanced panel data since 1995 to 2018 and the empirical analysis uses overlapping averages of five years. For robustness test, the study analyses using Generalized Method of Moment (GMM). Data was then transformed into log following Rubaszek and Serwa (2014). Since the panel data in this study consist of unbalanced cross-sections in which N is 19 and considered small, the suitable method of estimation is thus one proposed by Bruno (2005a) which deems it fit to use the corrected Least Square Dummy Variables (LSDVC) estimation.

There are many advantages of the LSDVC method. Firstly, the incorporation of lag dependent variable in the estimated equation will reduce potential estimator biases which may result from endogeneity in both omitted variable bias and reverse causality. Secondly, Anderson and Hsiao (Anderson & Hsiao, 1981) developed two instrumental variable (IV) procedures, while Arellano and Bond (Arellano & Bond, 1991) proposed estimation procedures based on generalised method of moments (GMM). Both methods serve as another proposition for panel dataset estimators. However, GMM and IV estimators show nice properties when N is large, but become biased with high instrumental variables when the panel is based on a small number of cross-sectional units. Hence, LSDVC is favourable. Thirdly, Judson and Owen (1999) proposed the Least Square Dummy Variables (LSDV) estimator to solve the problem of biasness for small N along with small T. However, LSDV is merely suitable for balanced dataset. Investigators have examined biases which result from various dynamic panel estimators (see Bun & Kiviet, 2003; Judson & Owen, 1999; Kiviet, 1995). Employing Monte Carlo experimentations, the results of their studies propose that the use of LSDVC would allow a lagged endogenous variable even with the presence of a small cross-section of the sample. In line with this method, this study therefore adheres to Bruno's (2005b) approach for empirical analysis in finding out the determinants of household debt in emerging economies.

4. Empirical discussion

4.1. Descriptive analysis

A summary of the statistical analysis for all variables in the model for 19 countries is provided in Table 2. The descriptive analysis includes household debt to GDP (HD), GDP per capita (GDPPC),

Table 2. Descriptive analysis

Variable	Mean	Std. Dev.	Min	Max
HD	32.575	20.116	1.82	93.3
GDPPC	14175.64	11306.32	889.772	55909.3
UN	7.199	5.686	0.588	31.326
WPOP	68.193	4.124	60.421	78.505
LIR	11.348	10.79	1.986	59.866
INF	5.312	5.13	-3.634	35.121
CON	55.804	8.23	36.036	69.266
HPI	99.108	24.019	45.508	170
FD	0.516	0.145	0.204	0.86

unemployment (UN), working population (WPOP), inflation (INF), lending interest rate (LIR), house prices (HPI) and financial development (FD).

As demonstrated in Table 2, the overall mean of household debt ratio to GDP is 32.58%, with minimum and maximum values of 1.82% (Russian Federation) and 93.3% (Korea) respectively. The GDP per capita recorded at USD 14,175 on average and its minimum value is USD889.772 (India) and maximum value is USD55,909 (Singapore). For unemployment, mean is 7.2% and minimum value at 0.59% (Thailand) and highest at 31.3% (South Africa). The average value for working population is 68.19% with the lowest value at 60.42% (Israel) and the highest value is 78.51% (Singapore). The mean value for lending interest rate is 11.35%, with range minimum and maximum at 1.99% (Hungary) and 59.87% (Brazil) respectively. Brazil experienced economic recession in 2015 and there was a lack of competition among banks resulted from high bank lending interest rate. The average of inflation rate is 5.31% with minimum and maximum value stands at -3.63% (Hong Kong) and 35.12% (Turkey) respectively. Turkey experienced economic crisis in 2001 caused by the unstable political landscape and led by huge capital outflow by foreign investor. The overall mean for consumption is 58.8% with variation of the minimum 36.04% in Singapore and maximum 69.27% for Colombia. House price index has considerable variation, ranging index from 45.51 point in Russian Federation to 170 point in India and Hong Kong with mean value of 99.11. Lastly, the average value for financial development is 0.52 with the highest to Korea at 0.86 and the lowest to Colombia at 0.204.

Table 3 reports the correlations analysis for all the regresses. The indicators for house prices, GDP per capita, working population and financial development positively correlate and are statistically significant with household debt to GDP. Meanwhile, inflation, unemployment rate, and the interest rate of lending negatively correlate and are statistically significant with the growth in domestic lending. Among the variables in the table of correlation matrix, financial development has the most significant correlation with household debt at 0.85. The VIF values of the explanatory variables shown in Table 4 do not exceed the cutoff of 10 and stand at 1.89, indicating no serious collinearity problems.

4.2. Result and discussion

This section reports the analysis of dynamic baseline regressions of factors which influence household debt based on the estimators of LSDVC (AH), LSDVC (AB), and LSDVC (BB). Employing the bootstrap procedure to generate the estimated standard errors, a total of 50 repetitions were replicated. Table 5 shows baseline regression in each column (1a to 3 c) based on LSDVC; AH, AB and BB respectively.

Table 3. Correlation matrix

Variables	HD	GDPPC	UN	WPOP	INF	LIR	CON	HPI	FD
HD	1.000								
GDPPC	0.485	1.000							
UN	-0.188	-0.142	1.000						
WPOP	0.458	0.431	-0.356	1.000					
LIR	-0.383	-0.244	0.259	-0.304	1.000				
INF	-0.516	-0.342	0.260	-0.384	0.617	1.000			
CON	-0.310	-0.342	0.357	-0.527	0.366	0.303	1.000		
HPI	0.211	0.009	-0.200	-0.008	-0.281	-0.204	0.108	1.000	
FD	0.850	0.571	-0.233	0.620	-0.279	-0.457	-0.404	0.061	1.0

Table 4. VIF

	VIF	1/VIF
GDPPC	1.83	0.547
UN	1.65	0.607
WPOP	1.92	0.521
INF	2.26	0.442
LIR	2.46	0.407
CON	1.64	0.608
HPI	1.29	0.777
FD	2.12	0.472
Mean VIF	1.89	

The resulting findings in Table 5 suggest that although household debt is persistent, it does not converge in the long run as the lagged dependent variable is positive and significant at the 1% significance level. As it is persistent, this implies that the household debt is sustained from one year to the next. In relation to the determinants of household debt (columns 1a to 3 c), unemployment and inflation are negatively correlated with household debt. Meanwhile, lending interest rate, house prices and financial development are positively related with it.

Financial development has positive coefficient and is statistically significant at 1% significance level as shown in Table 5 (2a-3 c) using both proxies. As financial development expands by 1-point, the household debt is increased by 0.99% or 0.43% relating to FDI or credit supply. The focus variable financial development showed the most significant variable in explaining the household debt. Notable literatures found that the huge accumulation of household debt is caused by the financial system. The rapid increase in household debt has been significantly related to banks' lax attitude toward household lending, and growth in financial institutions' deposit (Kim et al., 2014). On the contrary, the countries with developed integrated support system of financial institutions and financial markets in terms of their depth, access, and efficiency indicate that they have the capacity to control and manage the moral hazard and risk efficiency, eventually boosting confidence and ease to provide more financing to the household. Besides, the easier the access to financial institutions for people, the merrier the financing they can obtain. Financial access indicates the ability of individuals and companies to access financial services (Sviryzdenka, 2016). In this regard, the growth in household debt could represent greater access to consumer credit offered by financial institutions (Debelle, 2004). Thus, the results prove the positive relationship between financial development and household debt.

For the next explanatory variable, the interest rate of lending is found to correlate positively with household debt at 1% significance level. The results suggest that the household debt rises about 0.3% as a result of a 1% increase in the interest rate. Ho et al. (2016) and Anderson et al. (2014) obtained similar finding in their investigation of interest rate and household debt. Revealing the phenomenon of the economic boom phase, the studies found a vigorous demand for debt to finance the high consumers' expenditure for asset investment. Given the strong demand for loans, the household is less sensitive to the increase in lending interest rate by the financial market which enjoys the profit margin during the prosperous economy (Debelle, 2004). Additionally, emerging economies were affected during the pre-global financial crisis due to the shock in international trade while asset investment is highly demanded locally. To offset the slower aggregate demand from trade openness, the household enjoys the asset price margins. Households with good credit profiles may obtain standard-interest-rate loans, whereas households with a poor credit profile are allowed to have access sub-mortgage credit which heightens the burden of debt servicing and incurs a substantial interest rate (Mian & Sufi, 2009). Thus, the household debt increases with the increase in lending interest rate.

Table 5. LSDVC results

VARIABLES	1a		1b		1 c		2a		2b		2 c		3a		3b		3 c	
	HD	AH	HD	AB	HD	BB	HD	AH	HD	AB	HD	BB	HD	AH	HD	AB	HD	BB
LHD	0.358*** (0.070)		0.357*** (0.065)		0.392*** (0.071)		0.302*** (0.052)		0.302*** (0.049)		0.337*** (0.065)		0.230*** (0.064)		0.227*** (0.060)		0.263*** (0.073)	
GDPPC	-0.034 (0.234)		-0.032 (0.222)		-0.105 (0.274)		-0.052 (0.186)		-0.052 (0.181)		-0.123 (0.254)		0.193 (0.190)		0.199 (0.181)		0.126 (0.241)	
UN	-0.171* (0.088)		-0.170** (0.086)		-0.178* (0.106)		-0.016 (0.080)		-0.016 (0.078)		-0.025 (0.106)		-0.216*** (0.073)		-0.215*** (0.070)		-0.218** (0.090)	
WPOP	1.008 (1.286)		1.000 (1.258)		1.132 (1.555)		-1.269 (1.195)		-1.277 (1.173)		-1.096 (1.576)		0.545 (1.062)		0.529 (1.024)		0.717 (1.311)	
LIR	0.374*** (0.090)		0.373*** (0.088)		0.372*** (0.108)		0.345*** (0.072)		0.345*** (0.071)		0.346*** (0.097)		0.269*** (0.079)		0.267*** (0.076)		0.275*** (0.097)	
INF	-0.158*** (0.043)		-0.158*** (0.042)		-0.162*** (0.052)		-0.115*** (0.035)		-0.115*** (0.034)		-0.118** (0.046)		-0.131*** (0.037)		-0.131*** (0.035)		-0.135*** (0.046)	
CON	0.165 (0.404)		0.167 (0.394)		0.116 (0.486)		-0.258 (0.354)		-0.258 (0.347)		-0.298 (0.477)		0.255 (0.339)		0.259 (0.326)		0.201 (0.414)	
HPI	0.392*** (0.150)		0.390*** (0.145)		0.434*** (0.168)		0.465*** (0.125)		0.465*** (0.122)		0.503*** (0.165)		0.229* (0.132)		0.226* (0.126)		0.268* (0.154)	
FD							0.986*** (0.248)		0.987*** (0.244)		0.974*** (0.328)							
PCDM													0.426*** (0.092)		0.428*** (0.089)		0.404*** (0.111)	
Obs	66		66		66		66		66		66		66		66		66	
N	19		19		19		19		19		19		19		19		19	

Note: ***, ** and * denote rejection of non-stationary null hypothesis at 1%, 5% and 10% significance levels.

Relating to unemployment, it has negative coefficient and is statistically significant at 10% and 1% significance level as related to columns 1a-1 c and 3a-3 c. As unemployment is lower by 1%, household debt ratio of GDP is increased by 0.17–0.2%. The result can be supported by previous researchers, Meng et al. (2013) and Kusairi et al. (2019) who claimed that unemployment rate has negative relationship with household debt. Household debt is increased by low rate of unemployment as indicated by good labour market. Low unemployment rate portrays a positive income and cash flow and this is expected to increase their expenditure and demand for credit as the household has higher purchasing power. They are getting more loans on the basis of strong ability to pay off debt obligations as there is stability in household income generation. On the contrary, the sudden shock of losing job may also influence households' decision on debt. Hence, a lower unemployment rate significantly affects the change in household debt.

Also, the estimated coefficient of inflation is negative and statistically significant at 1% confidence level. The results suggest that a 1% increase in inflation reduces household debt in investigated countries between the range 0.11 and 0.15%. This finding is consistent with Debele (2004), Meng et al. (2013), and Ho et al. (2016) who found that the rise in household debt can be explained by the decline in inflation. The studies suggested that low inflation could be a reason for rising household debt because it may decrease the financial constraints on households.

House prices further affect the growth in household debt. The coefficients of house price are positive and statistically significant at 10% and 1% confidence level. Household debt will grow by at least 0.39% (as shown in 1a) as house prices increase by 1 point. The result is supported by previous studies (Ho et al., 2016; Kim et al., 2017; Kusairi et al., 2019; Meniago et al., 2013; Nagano & Yeom, 2014). They concluded that the house price positively influences household debt. Household behaviour, other than increasing their borrowings to finance non-durable expenditures, also increases their borrowings for investments backed by asset. Indeed, Minsky argued that the debt-financing for investment increases during the economic boom.

For robustness testing, Table 6 shows the regression analysis using GMM estimator. The lagged household debt is statistically significant at 1% confidence level. Factors such as financial development, house price, income, and lending interest rate show positive coefficients and are statistically significant. On the contrary, negative and statistically significant coefficients are shared between unemployment and inflation rate. The results are thus robust and consistent with models in Table 5. However, the coefficients of working population and consumption are inconsistent throughout the model when analysed with financial development. The coefficients of consumption are positive and statistically significant in accordance to the theoretical assumptions of LCH as households increase their debt to finance expenditures particularly for working population. However, the impact of financial development is greater and absorbs the influences of the demographic and consumption. Thus, the empirical evidences presented in Tables 5 and 6 signify that the household debt has a negative relationship with unemployment rate, and inflation rate in the investigated countries. Meanwhile, the household debt is positively related with financial development lending, house price and lending interest rate.

5. Conclusion

The empirical evidences clearly explain the nature of household debt which continues to rise in emerging countries as a result of high financial development, inflated house price, and higher lending interest rate. Debt is negatively affected by low unemployment and inflation rate. The results offer an implication to the policy for emerging economies to further their awareness of actively-rising household debt, especially when history has shown the nature of the debt cycle which may cause financial shocks undermining economic health. On the other spectrum, the study has shown that debt accumulation is rooted in the active financial development and households' interest to own assets as investment regardless of the higher interest rate. The findings help policy-makers to be more careful of and be responsive to the rapid surge of household debt while maintaining focus on factors for growth-enhancing strategies and long-run economic benefits. Future studies should consider the

Table 6. Robustness test: GMM results

VARIABLES	HD	HD	HD
L.HD	0.271*** (0.026)	0.339*** (0.040)	0.323*** (0.051)
GDPPC	0.321*** (0.086)	−0.128 (0.115)	0.219** (0.086)
UN	−0.169*** (0.037)	−0.073** (0.036)	−0.140** (0.297)
WPOP	1.171*** (0.400)	−0.115 (0.273)	−0.222 (0.499)
LIR	0.210*** (0.056)	0.270*** (0.057)	0.240** (0.048)
INF	−0.121*** (0.010)	−0.122*** (0.010)	−0.121*** (0.122)
CON	0.633** (0.286)	−0.264 (0.326)	0.317 (0.255)
HPI	0.151** (0.067)	0.444*** (0.071)	0.356*** (0.063)
FD		1.008*** (0.204)	
PCDM			0.159*** (0.032)
Constant	−8.673*** (2.463)	3.288 (2.356)	−2.49 (1.961)
Observations	66	66	66
Number of country1	19	19	19
No. of instruments	19	17	17
AR2 p-value	0.101	0.1556	0.8211
Sargan p-value	0.4468	0.1676	0.1603

Note: ***, ** and * denote rejection of the null hypothesis at 1%, 5% and 10% non-stationary levels of significance.

factors of mounting debt in terms of the threshold. In addition, future research may analyse the non-linearity effect of house prices and different level of demographic in the household debt model.

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Highlights

- Despite repercussions of household debt believed to be the main culprit for global financial crisis in 2008, the household debt in emerging economies continue to increase, which causes concerns.
- The paper investigates the macroeconomic factors of household debt for cross-country analysis in a sample of emerging economies.
- The dataset for this study involves observations of panel data for 19 emerging economies for a period of 1995–2018.

- The findings suggest that the main causes of high household debt in emerging economies are financial development, high house prices and lending interest rate.

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