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Household Debt and Economic Growth: The Role of Institutional Quality

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ABSTRACT

Household debt has a detrimental effect on economic growth. Thus, this study examines the connection between household debt and growth in institutional quality. The impact of the relationship on economic growth is assessed using a bias-corrected least square dummy variable of 43 nations. We discovered that institutional quality enhances the role of household debt in sustaining economic growth. Household debt is significantly detrimental to growth when institutional quality is low. Its harmful effect can be lessened with medium institutional quality. Interestingly, higher household debt is beneficial in sustaining growth if accompanied by better institutional quality. Household debt and institutions reinforce each other towards sustaining economic stability for countries with higher institutional quality. The findings are expected to assist central banks and other government authorities in formulating the relevant institutional settings for ensuring economic sustainability, such as prudent debt management and macro-prudential policy. Future studies may consider empirical analysis on a distinct split sample of advanced and emerging economies and employ different estimator methods.

Keywords: Bias-corrected LSDV, economic growth, household debt, institutional quality

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INTRODUCTION

Household debt is the wheel of consumption. It gears economic growth through collective demand. However, it can also hinder economic growth. Economic

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experts' research on household debt is steadily gaining attention, suggesting the tremendous increase in household debt accumulation. It may be detrimental to long-term growth (Cecchetti et al., 2011; Daud et al., 2021; Horioka & Niimi, 2020; Kim et al., 2014). Household debt is necessary to compensate for a household's income shortfall in financing everyday consumption expenditures (such as personal care, food, vehicles, and properties). An increase in consumption may stimulate economic growth with strong financial support from banking institutions, particularly for household borrowing. However, rising demands and anticipated future asset margins encourage financial institutions to provide subprime mortgages to customers with slacker lending rules (Justiniano et al., 2016; Mian et al., 2017). As a result, financial development was the primary driver of increasing household debt (Samad et al., 2020), usually resulting in financial crises (Aliber & Kindleberger, 2017).

Household debt continues to rise following the global financial crisis in 2008. According to the IMF (2017), the median debt ratio in developing countries has increased from 15% of GDP in 2008 to 21% in 2016. The rising ratio in advanced countries is comparable to the median debt ratio, which has increased from 52% of GDP in 2008 to 63% in 2016. Increasing household debt in developing countries is worrying since economic shocks may directly increase the burden on people paying the debt. This paper highlights the concern of the continuous upsurge in household debt.

The expansion of the economic growth framework, inclusive of institutional quality as a descriptive variable, is critical to empirically examining the effect of household debt on economic development. Many banking crises are due to weak political and economic institutions that cause macro-economic turmoil (Demirguc-Kunt & Detragiache, 1998). The immediate consequence of poor institutional quality is the reduced welfare of a country (Huang & Wei, 2006). Conversely, high institutional quality provides secure environments and policies that lead to economic development (Kim & Loayza, 2017). It emphasises the critical function of institutional quality on economic development. The overlooked adverse effect of household debt on growth directly points to the credibility of institutional quality, a factor still lacking in empirical research.

Accordingly, this study examines the impact of household debt on economic growth while considering the role of institutional quality. This factor is essentially effective in reducing the problems associated with household debt (IMF, 2012). This study further assesses the interaction between household debt and institutional quality. Lombardi et al. (2017) found that the level of the legal protection of creditors acts as an indicator of institutional quality, causing lower levels of the economy to correspond to higher levels of household indebtedness. Their findings suggest that households only borrow when they have strong faith and confidence in institutions. In addition, households are optimistic about future income when they feel secure in the country's

stability. However, institutional quality has a limited function as a conditional variable in the household debt-growth nexus. Thus, this study focuses on the relationship between household debt and growth while including the role of institutional quality.

This study contributes to the literature in three ways. First, although previous research has addressed the impact of household debt on growth, for instance, Alter et al. (2018), Cecchetti et al. (2011), and Lombardi et al. (2017), this study includes the importance of institutional quality, which is currently under-researched. The research focuses on institutional quality using the ICRG database in response to the study by Khan et al. (2019). They established the critical significance of institutional quality in the evolution of credit growth and financial development. Second, the current study is the first to investigate the long-run macroeconomic effects of debt on growth using a panel dataset that enables the categorisation of institutional quality as an interaction term, which is a different approach from previous research (Demetriades & Law, 2006; Gazdar & Cherif, 2015; Law et al., 2018; Law & Habibullah, 2009). Third, this research uses a bias-corrected least square dummy variable (LSDVC) suitable for the cross-country dataset of 43 countries, according to Bruno (2005a, 2005b). Due to a lack of research on the panel countries, this study contributes to the current body of knowledge.

This article investigates the impact of institutional quality on the connection between household debt and economic growth using a bias-corrected LSDV estimator built for a dynamic panel with cross-sections covering 43 countries from 1984 to 2018. Empirical evidence demonstrates that improved institutional quality increases production growth. Additionally, the adverse impact of household debt on growth deteriorates when institutional quality declines. Interestingly, at a medium level of institutional quality, the impact of increased household debt on growth is both positive and strong. The rest of this article is organised as follows: the debt-growth nexus research, the techniques, and measures used to define the data variables, the major findings, and the conclusion.

LITERATURE REVIEW

A famous theory that highlights the importance of institutional quality can be traced back to the study of Levine (1998), who emphasised the significance of the legal environment for economic advancement and its impact on economic growth. Numerous studies have shown a connection between economic development and institutional quality. Among the scholars, North (1990) highlighted the influence of institutional changes on economic performance. Several measures represent these institutional changes, i.e., property rights, degree of the legal protection of creditors, the amount of accessible information, duration of the resolution, revenue tax rate, lending dependency, government stability, economic freedom, political freedom, bureaucracy quality, corruption, and democratic accountability. Other notable studies, such

as those by Acemoglu et al. (2001) and Hall and Jones (1999), suggested that robust private property rights are linked with greater per capita income growth. "Pro-institution" researchers also claimed that proximate factors (such as physical and human capital) are functions of institutional quality (Acemoglu et al., 2014). Khan (1995) confirmed that institutional factors are tempting to complement the neoclassical growth model. Jappelli et al. (2013) asserted that the negative feature of institutional frameworks, such as weak execution of indentures and the issue of asymmetrical information, curb financial crises and cause higher credit defaults. As a result, it can be argued that institutional quality significantly impacts economic development.

The role of institutions in influencing the financial system and economic growth has also received significant attention throughout the literature. Research has shown a significant positive connection between institutional quality and the rise of financial development. Law and Habibullah (2009) extended the Solow growth model by estimating the factor with the Ordinary Least Square (OLS) and cointegration test. They found that a well-developed institutional quality and financial market leads to an improved GDP per capita in East Asian economies. Similarly, Demetriades and Law (2006) examined a larger dataset of 72 countries from 1978 to 2000 using the mean group (MG) and pooled mean group (PMG) methods. They concluded that countries with an advanced financial system anchored in a sound institutional framework significantly impact economic performance. Law et al. (2018) established the non-linearity of financial development on growth in a panel of 87 countries using the GMM estimator. They demonstrated the significance of institutions in mitigating the financial curse phenomenon. Khan et al. (2019) inspected the effect of institutional quality (IQ) on economic development using the International Country Risk Guide (ICRG) database (i.e., government stability, democratic accountability, bureaucratic quality, corruption, and law & order). It was discovered that institutional quality has a significant impact on the establishment and expansion of credit in 15 developing and growth-leading countries.

Researchers further employed different datasets to measure institutional quality. For instance, Dobbie and Song (2015) found that bankruptcy protection leads to higher income, lower mortality, and fewer foreclosures. In addition, the research indicates that institutional quality enhances the impact of certain other variables in the growth model, such as financial development and credit expansion. Bahadir and Valev (2020) applied the ICRG data to examine institution quality and found that the impact is greater in nations with inferior institution quality. There is also a higher proportion of consumer credit in the total household credit.

The aspect behind the importance of institutional quality, whereby household debt encourages economic growth, is justifiable. In previous works, however, household debt was shown to have a negative effect. The consequence of income shocks may place the individual

in default and lead to repayment issues. In addition, low institutional quality (such as government instability, high corruption, or lax regulations) may not be able to cope with financial market instability. It will consequently negatively affect household debt which will influence growth. However, the effect of household debt can be buffered by setting strict regulations in nations with high institutional quality. When institutions and policies are successful, the effect of increasing the debt-to-GDP ratio on household growth seems to be generally positive. However, when institutions and policies are ineffective, it tends to be negative regardless of household debt levels (IMF, 2017). Thus, this study aims to assess institutional quality on the relationship between household debt and growth.

There are many debates on the impact of institutional quality, especially on economic growth. Unfortunately, empirical data remains lacking on how institutional quality affects the relationship between household debt and growth. This study confirms that possible gaps are present.

DATA AND METHODOLOGY

Data

The panel dataset utilised in this research has two primary scopes: a cross-sectional dimension covering 43 nations[1] and a time series dimension from 1984 to 2018. All variables were averaged across a non-overlapping five-year period to represent the long-term connection between growth and debt fluctuations. Data availability on household debt is a major challenge for some countries, which justifies the study sample. Consistent with Cecchetti et al. (2011) and Lombardi et al. (2017), we used household debt to GDP as the measure for household debt. As for economic growth, we utilised real GDP per capita growth, defined as the increase in gross domestic product per capita at consistent prices, obtained from the World Bank Database. Gross capital creation is a proxy for economic growth-related investments. Data on this component was obtained from the World Bank database. Numerous research (Cecchetti et al., 2011; Gómez-Puig & Sosvilla-Rivero, 2017) have utilised population growth as a substitute for labour input. The data for this factor was mostly obtained from the World Bank database. According to Gómez-Puig and Sosvilla-Rivero (2017), the research used life expectancy at birth as a proxy for human capital, as previously utilised by Sachs and Warner (1997). Data was also obtained from the World Bank database. The total imports and exports quantified openness to trade as a proportion of GDP. The World Bank's database was used to compile the data. Consumer price indexes were also applied to determine the rate of inflation.

METHOD

This research applied the following dynamic panel regression model, with the inclusion

[1] The household debt data is unavailable for all countries, and the Bank for International Settlements (BIS) has the finest database. Since comparable data at the international level are available for only a few countries, obtaining more comprehensive data on the household debt to GDP ratio is thus a worthy cause. Hence, the BIS database, which offers a standard calculation of household debt, is preferable.

of household debt and institutional quality, based on the literature (Barro & Sala-i-Martin, 1997):

$$y_{it} = a_i + \gamma y_{i,t-1} + \beta_1 HD_{it} + \beta_2 INS_{it} + \sum_{j=1} \beta_j X_{it} + \delta_i + \varepsilon_{it} \quad (1)$$

Where y is the real GDP per capita growth, y_{t-1} is a one-lag HD_{it} ged measure of real GDP per capita growth, HD_{it} is household debt, INS_{it} is a proxy for institutional quality, X_{it} signifies other controlled variables for a particular nation i at a given period and δ_i is the country-specific impact. In accordance with Cecchetti et al. (2011), we included a one-lagged risk measure γ into the model to incorporate the economy's conditional convergence to its steady state. The household debt-to-GDP ratio β_1 is included in accordance with Cecchetti et al.'s (2011) debt-growth model for panel countries, which consists of household debt with anticipated negative indications. The relationship between institutional quality and growth is given by β_2, which is the magnitude for INS. The institutional quality shown in the literature has a positive influence on growth. Consequently, β_2 is expected to be positive. β_j, j= 1...,9 are the constraints to be assessed, while X_{it} is the collection of independent variables that act as explanatory regressors: capital, population growth, human capital, trade openness, inflation, and financial crises. The error term is denoted by ε_{it} and the country-specific effect is represented by i.

Equation (1) represents the independent effects of household debt and institutional quality on economic growth. As previously mentioned, the debt-growth nexus dominance is highly dependent on institutional quality. The link between household debt and growth may be institutionally constrained. To determine whether institutional quality balances household debt or acts as a modifying factor in the debt-growth nexus, we expanded Equation (1) by including their interactions as a new variable:

$$y_{it} = a_i + \gamma y_{i,t-1} + \beta_1 HD_{it} + \beta_2 INS_{it} + \beta_3 (HD_{it} \text{x } INS_{it}) + \sum_{j=1} \beta_j X_{it} + \varepsilon_{it} \quad (2)$$

The literature often uses interactive terminology to describe the contingency impact of the relationship between variables of interest. However, according to Brambor et al. (2006), the interpretation of coefficients for β_1 and β_3 of Equation (2) in the model of interaction terms may be misleading. For example, coefficient β_1 effectively summarises the effect of household debt only when institutional quality is zero. Likewise, β_3 efficiently captures the effect of institutional quality on growth only when household debt is non-existent. Thus, the results do not directly interpret the direct signs of β_1 and β_3 and their significance level on the correlation between household debt, the interaction terms, and economic growth. Brambor et al. (2006) reasoned that the marginal impact of institutional quality in sustaining household debt on economic growth might be computed as follows:

$$\frac{\partial y_{it}}{\partial HD} = \beta_1 HD_{it} + \beta_3 HDxINS_{it} \quad (3)$$

β_3 is predicted to be positive from Equation (3). As a reference point or baseline, the effect of household debt on economic growth can be considered as β_1, which is predicted to be negative. With a negative β_1, a positive β_3 indicates the ability of high institutional quality to mitigate the detrimental impact of household debt on a nation's development. In this scenario, institutional changes may be essential to preserve economic stability. We included capital, population growth, human capital, trade openness, inflation, and banking crises as controllable variables in the baseline specifications of Equations (1) and (2). According to Keynes (1936), greater savings promote economic development through increased investments. Domestic savings are used to fund collective investments from external sources in labour-enhancing technological innovations to determine the growth rate equilibrium of per capita output (Solow, 1956; Swan, 1956). Thus, investment is a significant factor in economic growth, as measured by gross capital creation in this research. As a proxy for a country's size, population increase is also a critical control variable (Checherita & Rother, 2012; Woo & Kumar, 2015). According to the Malthusian hypothesis of population, rising population pressure on food supply can erode well-being, resulting in unhappiness. In addition, a growing population will lead to scarcity of land and reduced quality of life (Dao, 2012). Thus, population increase harms economic growth (Checherita & Rother, 2012; Woo & Kumar, 2015).

Conversely, labour input or human capital is regarded as a critical indicator of productivity since it reflects on creative activities which generate more ideas that tend to catch the attention of investors (Grossman & Helpman, 1993). Furthermore, trade liberalisation affects economic development. According to Seghezza and Baldwin (2008), openness to trade increases labour productivity through knowledge transmission. Inflation is also argued to be a critical macroeconomic gauge of economic growth. Increasing inflation burdens businesses, requiring them to reallocate extra resources to fund rising prices (Gokal & Hanif, 2004). As a result, firms and families with conservative investing strategies often perform poorly. According to Barro (2013), the rise in average inflation is caused by a decline in the annual growth rate of real GDP per capita. As a result, inflation is included in the growth equation. Cecchetti et al. (2011) further expanded the neoclassical growth model by emphasising the critical function of government, businesses, and household debt on economic development. As previously mentioned, household debt has received increasing attention following the 2008 financial crisis. Thus, the crisis is included in the model (assuming a zero value over the next five years) and assessed using systemic banking crises. Laeven and Valencia (2013) noted that should a financial crisis occur in one, two, or more of the following five years, there would be no banking crisis, and the values of 1/5, 2/5, and others will remain unchanged.

The vast literature proposed several methods to estimate the panel dataset. However, a suitable estimator depends on the features of the dataset itself (i.e., N cross-sections and small or large T series). This study assesses 43 countries using an unbalanced series dataset deemed fit by the bias-corrected Least Square Dummy Variable (LSDVC) estimator, a technique well-suited for small samples with a limited cross-section group. Numerous benefits exist in adopting the LSDVC approach. One advantage is that possible biases in the estimator (due to endogeneity associated with reverse causality and omitted variable bias) are minimised by adding lag-dependent variables into Equations 3 to 5 for evaluation. According to Bruno (2005a, 2005b) and Bun and Kiviet (2001), LSDVC is appropriate for small N and imbalanced datasets, particularly macro-panel datasets. Anderson and Hsiao (1982) presented two instrumental variables (IV) methods, while Arellano and Bond (1991) provided estimate measures based on the generalised method of moments (GMM) for a first-difference model. It was more effective than Blundell and Bond (1998). However, when dealing with dynamic panel data, first-differenced IV or GMM estimators may exhibit significant small-sample bias due to using inferior instruments. Nevertheless, GMM and IV estimators possess favourable characteristics when N is large. They only become biased when the panel consists of more cross-sectional units. Accordingly, this study employed a bias-corrected LSDV[2] for analysing the panel dataset of 43 countries.

FINDINGS AND DISCUSSION

Descriptive Statistics

Institutional quality is a significant variable in this study. Institutional quality is assessed using five indicators, which efficiently interpret the quality of institutional factors that may strengthen economic growth and raise household debt. Bureaucracy quality, corruption, government stability, law and order, and democratic accountability are the relevant indicators. These indices have been used in the literature to measure institutional quality and were proven to affect economic growth (Khan et al., 2019; Law et al., 2018). According to previous research, institutional quality has a positive impact on growth. The indices were obtained from the International Country Risk Guide (ICRG) database. Table 1 presents the nations examined and the average values of the four key variables in their original forms: institutional quality, real GDP per capita growth rate, GDP per capita income, and household debt. The average values cover each country and are arranged

[2] Some studies employed the bias-corrected LSDV since it reduces bias from small samples and outperforms other dynamic panel analyses such as the Generalized Method of Moment (GMM) (Perić, 2019). In a recent study, Dahir et al. (2019) analysed capital and funding liquidity in bank lending by employing LSDVC on 57 banks in BRICS countries. In another study, Ibrahim et al. (2019) applied the bias-corrected LSDV to a sample of 37 banks in Malaysia to examine competition and bank stability. Chaudron (2018) also utilised the LSDVC for analysing the interest rate and profitability of 41 Dutch banks.

Table 1
List of countries and average values of selected variables

Countries	**Low institutional quality (INS < 25.141)**				**Countries**	**High institutional quality (INS > 25.141)**			
	INS	GDPPCG	GDPPC	HD		INS	GDPPCG	GDPPC	HD
Colombia	18.181	1.892	6082.881	17.733	Spain	25.229	1.728	26022.37	49.045
Russia	18.444	2.716	9191.47	8.444	Israel	25.355	1.805	28400.77	37.972
China	18.721	8.39	5292.301	31.983	Singapore	25.712	3.549	39883.08	42.612
Brazil	18.996	1.09	10119.25	19.006	France	26.532	1.29	36119.06	39.563
Indonesia	19.124	3.895	3122.108	13.225	Japan	27.013	1.711	40206.75	61.985
South Africa	19.167	0.913	7370.313	38.34	Ireland	27.468	3.89	54753.68	76.652
Saudi Arabia	19.31	0.381	19491.24	10.362	Belgium	27.654	1.548	37713.62	42.913
Thailand	19.383	3.652	4359.436	50.073	Germany	27.86	1.491	39728.64	60.19
Mexico	19.758	1.161	9136.289	11.99	Austria	27.93	1.422	44857.45	48.696
Argentina	20.236	1.583	8911.368	4.973	UK	28.402	1.745	33792.2	67.392
Turkey	20.285	3.08	9424.727	7.262	US	28.722	1.657	42206.15	71.472
Malaysia	21.055	3.313	9899.452	61.812	New Zealand	28.753	1.425	31556.36	71.06
Hong Kong	22.112	2.776	27927.92	55.34	Australia	28.836	1.699	43249.92	76.168
Korea	22.118	5.116	14901.19	56.62	Netherlands	29.169	1.646	46708.51	92.473
India	22.9	5.665	1523.092	10.002	Denmark	29.215	1.327	55726.81	102.597
Italy	23.062	1.06	32813.77	27.063	Switzerland	29.302	1.039	71572.5	112.968
Greece	23.445	0.715	23640.36	34.427	Canada	29.35	1.467	39862.59	67.025
Czech Rep.	23.777	2.656	18295.07	20.632	Norway	29.382	1.758	75148.03	68.528
Poland	23.985	4.215	11277.03	21.976	Sweden	29.535	1.671	44060.83	60.752
Chile	24.189	2.675	12665.09	33.08	Luxembourg	29.921	1.285	104000	54.938
Hungary	24.5	2.291	12021.14	18.105	Finland	30.402	1.836	38298.71	44.55
Portugal	24.999	1.856	19017.65	49.557					
Averages	21.261227	2.7768636	12567.416	27.363864	Averages	28.17819	1.761381	46374.668	64.264333

Note: GDPPC: Gross domestic product per capita; GDPPCG: growth of GDP per capita; HD: household debt; INS: institutional quality

from lowest to highest. The countries were categorised as low institutional quality if the values of their institutional quality were below the overall average, which is 25.141. The countries were categorised as high institutional quality if their values were higher than the average. The data indicate that household debt and GDP per capita significantly vary between countries with the poor institutional quality and those with high institutional quality. On average, nations with good institutional quality have a higher level. Advanced countries tend to achieve greater institutional quality and larger household debt accumulation. Most countries have encountered household debt of more than 40% of GDP, except Israel and France. Household debt was found to be much lower in low institutional quality countries; however, some countries have a very high household debt of more than 40%, such as Thailand, Malaysia, Hong Kong, Korea, and Portugal. Therefore, we may discover lower household debt in nations with poor institutional quality and lower GDP per capita income than in other countries.

For both sets, we calculated the pairwise correlations with p-values between the investigated variables, as summarised in Table 2. The table's top diagonal presents the paired correlations for nations with high institutional quality, while the lower diagonal shows the pairwise correlations

Table *2*
*Correlations of main variable*s

Variables	GDPPCG	GCF	POPG	HC	TO	INF	HD	INS
GDPPCG	1	0.382	0.079	-0.398	0.157	0.208	-0.4	0.044
		0	0.313	0	0.048	0.007	0	0.6
GCF	0.581	1	0.176	-0.256	0.01	0.325	-0.23	-0.01
	0.000		0.026	0.001	0.902	0	0.004	0.923
POPG	0.029	0.073	1	0.081	0.418	0.071	-0.02	-0.2
	0.751	0.419		0.304	0	0.365	0.83	0.019
HC	-0.283	-0.071	-0.375	1	0.29	-0.628	0.588	-0.37
	0.001	0.432	0.000		0	0	0	0
TO	0.018	0.045	-0.137	0.397	1	-0.233	0.02	-0.1
	0.84	0.618	0.129	0.000		0.003	0.803	0.223
INF	0.037	-0.142	0.124	-0.169	-0.164	1	-0.51	0.157
	0.681	0.114	0.165	0.058	0.068		0	0.062
HD	-0.093	0.067	-0.257	0.533	0.471	-0.239	1	0.105
	0.299	0.459	0.003	0.000	0.000	0.007		0.212
INS	0.05	0.033	-0.458	0.305	0.156	-0.118	0.177	1
	0.59	0.721	0.000	0.001	0.092	0.207	0.054	

Notes: Lower diagonal: INS < 25.14; upper diagonal: INS > 25.14. The numbers in parentheses are p-values. GDPPCG: Gross Domestic Product per capita growth; GCF: gross capital formation; POPG: population growth; HC: human capital; TO: trade openness; INF: inflation; HD: household debt; and INS: institutional quality

for countries with poor institutional quality. First, connections between household debt and economic growth are less negligible than in nations with strong institutional quality. Consistent with theoretical assumptions, the correlation between household debt and economic growth is negative and significant in high institutional quality countries. Second, the correlation between institutional quality and growth is more robust in low institutional quality countries; however, the p-values of both groups are statistically insignificant. While institutional quality is not significant in either set, a substantial negative relationship between institutional quality and household debt should be anticipated in countries with high institutional quality. As a result, the significance of institutional quality in explaining the connection between household debt and growth may seem complex. Is institutional quality a determinant factor in mitigating the negative impact of household debt on economic growth?

Figures 1 and 2 display the connection between household debt, institutional quality, and economic growth. The fitted line between household debt and economic growth indicates a decreasing trend, consistent with previous research. However, as shown by the fitted line in Figure 2, some uncertainties exist regarding the connection between institutional quality and development. To ensure that our analysis is significant, we continued with a formal analysis followed by further investigations. The generalised method-of-moments was applied to eliminate outliers (GMM), and the regression analysis was conducted on the calculated model using the entire sample dataset.

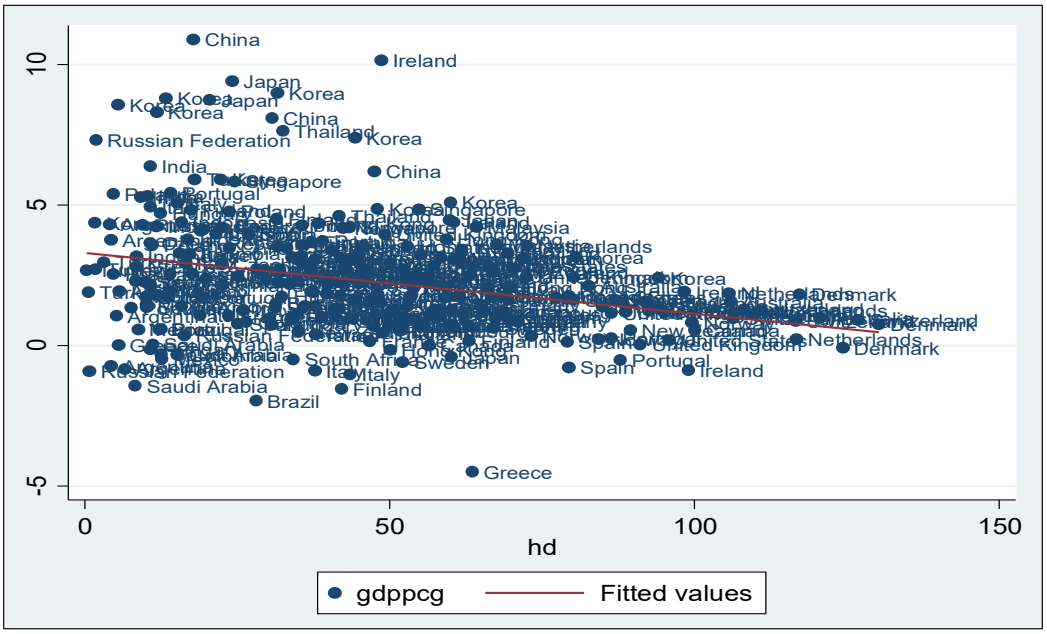

Figure 1. Household debt and real GDP per capita growth

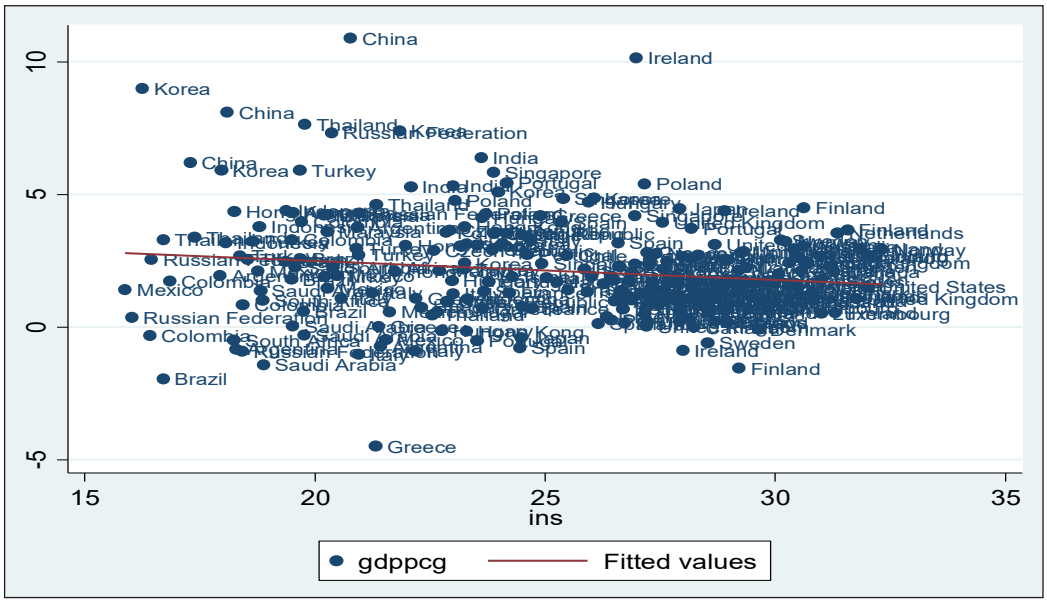

Figure 2. Institutional quality and real GDP per capita growth

Findings

As in Equation (1), we began by examining the independent variables of household debt and institutional quality.[3] Table 3 presents the outcomes with and without the dummy crises (respective to columns 1a to 1f) and the regression analysis using a bias-corrected LSDV in accordance with Anderson and Hsiao (1982), Arellano and Bond (1991), and Blundell and Bond (1998). As shown, the calculated coefficients of lag real GDP per capita growth are negative and statistically significant at a level of 1%, indicating that real GDP per capita growth is suitable and that dynamic panel bias-corrected LSDV is appropriate for this panel data.

Across all regressions, the baseline parameters include a negative and statistically significant coefficient of household debt (1a to 1c). After adjusting the crisis dummy factors, the evidence of the detrimental impact of household debt on economic growth is confirmed (refer to columns 1d to 1f). While the predicted coefficients are small, they remain significant and negative. The present findings confirm those of Cecchetti et al. (2011) and Gómez-Puig and Sosvilla Rivero (2017). It has been predicted that household debt will have a short-run elasticity of -0.042 and a long-run elasticity of -0.034[4] in regression 1a. Thus,

[3] We attempt to show the significant difference in findings without the institutional quality presented in Appendix A. The result shows that the coefficients of the household debt to GDP variable negatively affect the growth but are slightly lower compared to the model with institutional quality. However, our concern aims to explore the effect of institutional quality can be moderating effect on the household debt-growth nexus.

[4] The calculation of long-run elasticity is measured according to Ibrahim and Law (2016) ($\beta\_1/1- \gamma$), where γ is the coefficient of lagged dependent variables.

a 10% rise in household debt results in a 0.4% decrease in economic growth in the short run and 0.34% in the long run, with everything else equal.

We further saw that institutional quality positively contributes to economic growth, as shown by the substantial positive coefficients in all regression analyses, excluding regression 1a (see Table 3). For example, according to regression 1b, a 1-point improvement in the institutional quality score is associated with a 0.028% increase in economic growth. Consequently, the current research adds to the previous literature on the role of institutions in promoting economic stability[5] by including the effect of existing household debt.

[5] Previous studies have examined the role of institutional quality on the relationship between financial development and growth using the ICRG database, e.g., Demetriades and Law (2006), Gazdar and Cherif (2015), Law and Habibullah (2009), and Law et al. (2018).

Table 3
LSDVC Analysis: Institutional quality and economic growth

	AH	AB	BB	AH	AB	BB
	(1a)	(1b)	(1c)	(1d)	(1e)	(1f)
	Independent variable = GDPPCG					
L.GDPPCG	-0.231***	-0.239***	-0.203***	-0.205***	-0.215***	-0.174**
	-0.067	-0.065	-0.069	(0.065)	(0.063)	(0.068)
GCF	0.217***	0.219***	0.219***	0.227***	0.229***	0.227***
	-0.045	-0.043	-0.046	(0.044)	(0.042)	(0.046)
POPG	-1.068***	-1.056***	-1.051***	-0.992***	-0.981***	-0.973***
	-0.326	-0.307	-0.326	(0.309)	(0.291)	(0.317)
HC	-0.074	-0.066	-0.054	-0.224**	-0.215**	-0.211**
	-0.091	-0.085	-0.093	(0.098)	(0.092)	(0.104)
TO	0.026***	0.025***	0.026***	0.029***	0.029***	0.030***
	-0.008	-0.007	-0.008	(0.008)	(0.007)	(0.008)
INF	-0.022	-0.021	-0.021	-0.028	-0.027	-0.028
	-0.019	-0.018	-0.02	(0.018)	(0.017)	(0.019)
HD	-0.042***	-0.043***	-0.046***	-0.033***	-0.035***	-0.036***
	-0.011	-0.01	-0.011	(0.010)	(0.010)	(0.011)
INS	0.027	0.028*	0.029*	0.074***	0.074***	0.077***
	-0.017	-0.016	-0.016	(0.021)	(0.020)	(0.022)
CRISIS				-3.922***	-3.810***	-4.035***
				(1.482)	(1.408)	(1.542)
Observations	228	228	228	228	228	228
N	43	43	43	43	43	43

Notes: A bias-corrected Least Square Dummy Variables (LSDVC) estimator proposed by Bruno (2005b) based on modifications by Anderson and Hsiao (AH, 1982), Arellano and Bond (AB, 1991), Blundell and Bond (BB, 1998). GDPPCG = Gross Domestic Product per capita growth, GCF = gross capital formation, POPG = population growth, HC = human capital index, TO = trade openness, INF = inflation, HD = household debt, INS = institutional quality and CRISIS = Systemic Banking Crises
Significance level: *** p<0.01, ** p<0.05, * p<0.10

These findings are consistent with the study on the panel data by Acemoglu et al. (2001) and Hall and Jones (1999). Klapper and Love (2004) and Law et al. (2018) concluded that institutional quality leads to better operating performance and sustained long-term growth. The explanation linking institutional quality with the debt-growth model can be accentuated since high institutional quality provides secure environments and better policy formulations that lead to economic development (Kim & Loayza, 2017). Better institutional quality, such as good governance and regulations, will strengthen the role of financial institutions and help them withstand the risks inherent in contractionary monetary policies (such as financial liberalisation, deregulation, and innovation). Simultaneously, households' optimism regarding additional loans for future income demands will increase since they will feel secure in the country's stability. Accordingly, improved institutional quality is critical for boosting economic success.

Apart from these results, the influence of the control variables on the growth model has been noted. As shown by the positive and significant coefficients of gross capital creation in all regression models, increasing capital input does lead to increased economic growth. On the other hand, the coefficients of population growth are statistically negative. According to Table 3, the trade openness coefficient is positive and statistically significant. The human capital coefficient is negative and significant in the regression models with crisis dummies, ranging from 1d to 1f. These results contradict Radelet et al. (2001), who found a positive effect between human capital and growth. However, the results are consistent with empirical evidence documented by Barro (2003) and Cervellati and Sunde (2011), who proved that human capital (with life expectancy as a proxy) decreases growth. They explained that improved life expectancy among the ageing population with high health problems consequently leads to low productivity and a reduction in the growth of a country (Cervellati & Sunde, 2011).

INTERACTION EFFECTS OF HOUSEHOLD DEBT AND INSTITUTIONAL QUALITY

The research expands the model by factoring in the role of institutional quality as an interaction term. This subsection applies Equation (2) to determine the effect of household debt and institutional quality on economic growth. While Table 4 presents the empirical model without a crisis dummy (columns 2a to 2c) and with a crisis dummy (columns 2d to 2f). As indicated, the calculated coefficients of lag real GDP per capita growth are negative and statistically significant at 1%. It indicates that real GDP per capita growth is suitable and that LSDVC is appropriate for this dynamic panel data.

It should be mentioned that by including household debt and institutional quality as an interaction term, caution is required when attempting to understand the effects between household debt and institutional quality on economic growth. The effect of household

debt on growth depends on institutional quality. As a result, the coefficients for household debt and institutional quality cannot be directly equated to those in Table 3 without considering the interaction impact. Our discussion will subsequently focus on our central ideas by answering two questions: Is the adverse effect of household debt worsening or improving? Can economic stability be improvised with the function of institutional quality? We reassessed the outcomes of the previous subsection to respond sufficiently to these questions.

The interaction model addressed issues regarding the connection between household debt and economic growth with the conditional role of institutional quality. The connection between household debt and economic growth remains appropriate when the interaction term is included in all regression models presented in Table 4. Furthermore, the empirical evidence indicates that the HDXINS coefficient is substantially positive.

As previously stated, the growth consequences of household debt and institutional quality must be seen in conjunction with their interaction effects. A brief examination of Table 4 revealed evidence that the impact of household debt on growth is conditional depending on the country's institutional quality. Additionally, the regression models demonstrate that household debt harms growth and decreases with improved institutional quality, as shown by the positive coefficient of the interaction components in the six regression models. Similarly, institutional changes may contribute to economic stability. In the interaction model specifications, the direct relationship between household debt and economic growth was consistently negative and statistically significant. However, institutional quality has an insignificant and direct effect on growth. Interestingly, when institutional quality interacts with household debt, it is statistically positive, with a coefficient of 0.004 in all regression models ranging from 2a to 2f. The findings are consistent with Demirguc-Kunt and Detragiache (1998) and IMF (2017). They claimed that institutional variables are critical in moderating the link between increasing household debt and future economic activity.

To further explore these issues, we evaluated the effects of a one-unit increase in institutional quality on household debt and a 1% rise in household debt on the level of institutional quality in various scenarios. In calculating the marginal effect, coefficients in the first condition derivatives can be obtained from the LSDVC estimation, as shown in Table 4, based on Equation (3) using the standard errors recommended by Brambor et al. (2006). The first case is displayed in Table 4, with respect to each regression model (2a to 2f) within the minimum, average and maximum values. As shown in the table, a one-unit mean increase in institutional quality leads to a 0.047% significant decrease in growth when household debt is kept constant. Similarly, at the minimum level of institutional quality (i.e., 15.878), a one-unit increase of institutional quality leads to a 0.084% reduction in growth, making it statistically

Table 4
LSDVC Analysis: Interaction terms

	Full Sample					
	AH	AB	BB	AH	AB	BB
	(2a)	(2b)	(2c)	(2d)	(2e)	(2f)
	Independent variable = GDPPCG					
L.GDPPCG	-0.241***	-0.248***	-0.211***	-0.203***	-0.206***	-0.169**
	(0.065)	(0.063)	(0.067)	(0.066)	(0.065)	(0.068)
GCF	0.196***	0.197***	0.197***	0.186***	0.186***	0.184***
	(0.043)	(0.041)	(0.044)	(0.043)	(0.041)	(0.044)
POPG	-1.142***	-1.136***	-1.128***	-1.048***	-1.044***	-1.030***
	(0.350)	(0.337)	(0.359)	(0.343)	(0.330)	(0.349)
HC	-0.066	-0.061	-0.048	-0.102	-0.097	-0.088
	(0.090)	(0.087)	(0.095)	(0.092)	(0.089)	(0.097)
TO	0.024***	0.024***	0.025***	0.024***	0.024***	0.024***
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)
INF	-0.030	-0.030	-0.029	-0.035*	-0.034*	-0.035*
	(0.019)	(0.019)	(0.020)	(0.019)	(0.019)	(0.020)
HD	-0.148**	-0.150***	-0.154**	-0.136**	-0.138**	-0.140**
	(0.059)	(0.056)	(0.060)	(0.057)	(0.055)	(0.058)
INS	-0.118	-0.119	-0.120	-0.100	-0.100	-0.098
	(0.100)	(0.095)	(0.103)	(0.096)	(0.093)	(0.099)
HDXINS	0.004*	0.004**	0.004*	0.004*	0.004*	0.004*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CRISIS				-3.699**	-3.690***	-3.849**
				(1.463)	(1.415)	(1.508)
Observations	228	228	228	228	228	228
N	43	43	43	43	43	43
Marginal Effect						
Mean	-0.047***	-0.048***	-0.050***	-0.041***	-0.041***	-0.043***
Min	-0.084***	-0.086***	-0.088***	-0.076***	-0.077***	-0.079***
Max	-0.018	-0.018	-0.020	-0.013	-0.014	-0.015

Notes: A bias-corrected Least Square Dummy Variables (LSDVC) estimator proposed by Bruno (2005b) based on modifications by Anderson and Hsiao (AH, 1982), Arellano and Bond (AB, 1991), Blundell and Bond (BB, 1998). GDPPCG = Gross Domestic Product per capita growth, GCF = gross capital formation, POPG = population growth, HC = human capital index, TO = trade openness, INF = inflation, HD = household debt, INS = institutional quality, HDXINS = interaction term and CRISIS = Systemic Banking Crises Significance level: *** p<0.01, ** p<0.05, * p<0.10

significant. It implies that lower institutional quality, as a mediating effect, increases the effect of household debt, hindering economic growth. These results emphasise that lower institutional quality causes household debt to affect economic growth negatively.

In the second case, we inspected the impact of household debt on growth at various levels of institutional quality and

Table 5
Marginal effects of institutional quality and household debt on growth

	INS	HD	ΔGDPPCG/ΔINS	ΔGDPPCG/ΔHD
Lowest INS Colombia	18.181	17.733	-0.030	-0.07***
Highest INS Finland	30.402	44.55	0.074	-0.022*
Lowest HD Argentina	20.236	4.973	-0.079	-0.062***
Highest HD Switzerland	29.302	112.968	0.339**	-0.027**
Threshold INS	<30			-0.024*
Threshold HD		>53.5	0.109*	

Note: The calculation is based on regression model 2f in Table 4. The calculation of marginal effect, ΔGDPPCG/ΔINS, and ΔGDPPCG/ΔHD were derived from Brambor et al. (2006).

vice versa. We compared two groups of nations with the lowest institutional quality (Colombia) and the highest institutional quality (Finland). We also examined the variation in household debt between Argentina and Switzerland (Table 5). A one-unit increase in institutional quality leads to a 0.07% decrease in economic development when all other variables remain constant. Likewise, given that institutional quality is at the highest level (i.e., 30.402 in Finland), a one-point increase leads to a 0.22% decrease in economic growth. By maintaining an average level of institutional quality, the interaction effect of household debt variations is insignificant.

On the contrary, with average institutional quality, a 10% rise in household debt will boost growth by 3.39%. Higher institutional quality contributes to consistent development across nations by mitigating the detrimental impact of household debt. However, it must be noted that the significance of household debt in economic development is conditional, depending on the quality of the institutional environment. Surprisingly, it was found that in Switzerland, which has high institutional quality but the greatest household debt, increasing household debt improves economic growth. These findings highlight the intriguing factor that larger household debt (with a threshold of more than 53.5%) has a strong and significant impact on growth when institutional quality is average, mitigating the detrimental effect of interaction terms when household debt is high.

The empirical evidence proves that lower levels of institutional quality allow household debt to hinder economic growth. The consequence of income shocks may place the individual in default, leading to repayment problems. In addition, low institutional quality, such as government instability, high corruption, and several lax regulations, may result in an inability to cope with financial market instability. It will subsequently contribute to the negative effect of household debt on growth. However, the effect of household debt can be managed with strict regulations in nations with better institutional quality. Hence, this empirical result highlights the importance of maintaining and enhancing institutional quality.

FURTHER ANALYSIS

To determine the validity of our findings, Tables 6 and 7 summarise the results of the regression analyses by employing alternative estimation methods, the first-difference GMM, and system GMM estimators, established by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998). Hence, we modified the two-step GMM standard errors for finite samples according to Windmeijer (2005) and used Roodman's (2009) recommendation for compressing the instruments to keep the

Table 6
First-difference GMM analysis

	(3a)	(3b)	(3c)	(3d)
	Independent variable = GDPPCG			
L.GDPPCG	-0.366***	-0.380***	-0.335***	-0.364***
	-0.016	-0.018	-0.017	-0.022
GCF	0.263***	0.265***	0.251***	0.237***
	-0.03	-0.031	-0.027	-0.029
POPG	-1.293***	-1.311***	-1.217***	-1.223***
	-0.096	-0.098	-0.102	-0.099
HC	0.157***	0.183***	0.111***	0.184***
	-0.045	-0.046	-0.04	-0.053
TO	0.019***	0.019***	0.017***	0.016***
	-0.003	-0.003	-0.003	-0.003
INF	-0.040***	-0.040***	-0.038***	-0.036***
	-0.008	-0.008	-0.005	-0.006
HD	-0.079***	-0.147***	-0.073***	-0.163***
	-0.007	-0.029	-0.006	-0.027
INS	0.109***	0.001	0.092***	-0.03
	-0.028	-0.056	-0.02	-0.048
HDXINS		0.002**		0.003***
		-0.001		-0.001
CRISIS			-2.180***	-1.468***
			-0.413	-0.467
Constant	-14.924***	-14.036***	-10.861***	-12.707***
	-4.091	-3.705	-3.353	-3.782
Observations	185	185	185	185
N	43	43	43	43
Instruments	36	37	36	38
AR2 p-value	0.1063	0.1572	0.2409	0.1322
Sargan p-value	0.6795	0.7167	0.7404	0.7839

Notes: GDPPCG = Gross Domestic Product per capita growth, GCF = gross capital formation, POPG = population growth, HC = human capital index, TO = trade openness, INF = inflation, HD = household debt, INS = institutional quality, HDXINS = interaction term and CRISIS = Systemic Banking Crises
Significance level: *** p<0.01, ** p<0.05, * p<0.10

number of instruments lower than the number of cross-sectional units in the empirical implementation. In addition, two specification tests, the second-order autocorrelation (AR2 p-value) and Sargan's p-value test were conducted to observe whether both difference-GMM and system-GMM estimators are constant. The empirical data in Tables 6 and 7 strongly indicate that institutional quality moderates the household debt-growth relationship in the examined countries. Hence, the findings

Table 7
System GMM analysis

	SYS GMM	SYS GMM	SYS GMM	SYS GMM
	Independent variable = GDPPCG			
L.GDPPCG	-0.338***	-0.375***	-0.320***	-0.349***
	-0.013	-0.015	-0.012	-0.016
GCF	0.270***	0.300***	0.259***	0.274***
	-0.02	-0.02	-0.019	-0.018
POPG	-0.848***	-1.203***	-0.635***	-0.976***
	-0.089	-0.11	-0.095	-0.103
HC	0.187***	0.235***	0.140***	0.179***
	-0.039	-0.037	-0.043	-0.036
TO	0.005***	0.007***	0.005***	0.005***
	-0.001	-0.002	-0.001	-0.002
INF	-0.040***	-0.033**	-0.039***	-0.034***
	-0.012	-0.014	-0.008	-0.01
HD	-0.085***	-0.242***	-0.077***	-0.229***
	-0.004	-0.025	-0.004	-0.026
INS	0.033*	-0.197***	0.043**	-0.187***
	-0.017	-0.039	-0.02	-0.04
HDXINS		0.006***		0.006***
		-0.001		-0.001
CRISIS			-3.189***	-2.387***
			-0.494	-0.576
Constant	-14.187***	-12.644***	-11.075***	-8.330***
	-3.199	-2.939	-3.466	-2.742
Observations	228	228	228	228
N	43	43	43	43
Instruments	37	38	38	39
AR2 p-value	0.2694	0.3571	0.6011	0.576
Sargan p-value	0.1799	0.2507	0.1832	0.2699

Notes: GDPPCG = Gross Domestic Product per capita growth, GCF = gross capital formation, POPG = population growth, HC = human capital index, TO = trade openness, INF = inflation, HD = household debt, INS = institutional quality, HDXINS = interaction term and CRISIS = Systemic Banking Crises
Significance level: *** p<0.01, ** p<0.05, * p<0.10

in the former analysis are robust, and the conclusions obtained by these estimates can be utilised to guide policy decisions.

CONCLUSION AND FUTURE RECOMMENDATION

This study examined the connection between household debt and growth and the impact of institutional quality on a panel of 43 countries from 1984 to 2018. The findings indicate that higher household debt is detrimental to economic growth, while better institutional quality significantly spurs growth. The third outcome indicates that the impact of increased household debt on growth is surprisingly positive and robust at an average level of institutional quality. As a result, proper policy designs must be monitored and carefully considered to reduce the negative impact of household debt on growth. For countries with the highest household debt, such as Switzerland, considerably high institutional quality tends to improve the stability of economic growth. Economic downturn from household debt is lessened once institutional quality is high. Variations in institutional quality with low household debt presented an insignificant effect. Both household debt and institution quality play a key role in maintaining economic growth. These findings suggest the following policy recommendations.

First, though the household debt harms growth, households are still required as a tool for increasing consumption and aggregate output. Hence, institutional quality is needed to observe and manage the impact of debt on growth. Sustaining the beneficial impact of the household debt-growth nexus may be possible if financial institutions exercise caution regarding slack lending practices (see Agarwal et al., 2014) and subprime borrowers (Justiniano et al., 2016). The sole exception is that policy priority should first be given to institutional changes in nations with poor institutional quality. Policymakers may suggest policies that strengthen institutional quality in order to bolster the role of household borrowing in stimulating economic development. Policymakers can introduce measures to control and manage household debt through efficient institutional settings. Also, policymakers can propose measures that reinforce institutional quality, such as a prudent debt management policy to reduce the risk of financial instability and enhance the role of household borrowings in boosting economic growth. Another recommendation is to follow the macro-prudential policies, Basel III, by keeping the dynamic capital buffer. The capital buffer aims to maintain the system resilient throughout the boom and bust of the economic cycle.

Regarding future directions, different options are available. Since this study has analysed a panel dataset that combines advanced and developing countries, future research may offer empirical analysis on the split sample of advanced and emerging economies. Other studies may wish to include different demographic attributes to household debt growth using a micro-dataset. A panel dataset can analyse various demographic changes in the household debt model. The digital technology era has been

popular lately due to the pandemic crisis, which can be further considered in future efforts. More empirical evidence is required to address these issues.

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APPENDIX

Appendix A

Supplementary Table
LSDVC Analysis: Household debt and real GDP per capita growth

Independent Variables	LSDVC			LSDVC (with Crisis Dummy)		
	AH	AB	BB	AH	AB	BB
	(1a)	(1b)	(1c)	(1d)	(1e)	(1f)
L.GDPPCG	-0.193***	-0.205***	-0.154**	-0.158**	-0.167***	-0.115*
	(0.066)	(0.064)	(0.070)	(0.064)	(0.063)	(0.068)
GCF	0.123***	0.126***	0.119***	0.116***	0.119***	0.110***
	(0.040)	(0.037)	(0.042)	(0.039)	(0.037)	(0.041)
POPG	-0.575**	-0.575**	-0.555*	-0.505*	-0.507*	-0.483*
	(0.289)	(0.267)	(0.296)	(0.278)	(0.259)	(0.286)
HC	-0.232***	-0.225***	-0.216***	-0.234***	-0.228***	-0.219***
	(0.070)	(0.064)	(0.073)	(0.068)	(0.063)	(0.072)
TO	0.024***	0.024***	0.024***	0.022***	0.022***	0.023***
	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)
INF	-0.038*	-0.038*	-0.038*	-0.042**	-0.041**	-0.042**
	(0.021)	(0.020)	(0.022)	(0.021)	(0.019)	(0.021)
HD	-0.032***	-0.034***	-0.036***	-0.028***	-0.029***	-0.031***
	(0.011)	(0.010)	(0.011)	(0.010)	(0.010)	(0.011)
CRISIS				-4.074***	-4.023***	-4.246***
				(1.362)	(1.278)	(1.420)
Obs	245	245	245	245	245	245
N	43	43	43	43	43	43

Notes: A bias-corrected Least Square Dummy Variables (LSDVC) estimator proposed by Bruno (2005b) based on modifications by Anderson and Hsiao (AH, 1982), Arellano and Bond (AB, 1991), Blundell and Bond (BB, 1998). GDPPCG = Gross Domestic Product per capita growth, GCF = gross capital formation, POPG = population growth, HC = human capital index, TO = trade openness, INF = inflation, HD = household debt, INS = institutional quality and CRISIS = Systemic Banking Crises. Significance level: *** p<0.01, ** p<0.05, * p<0.10.