Labuan Bulletin of International Business &Finance
Volume 23 Issue 2 eISSN 2600- 7894

UMS
UNIVERSITI MALAYSIA SABAH

HOUSEHOLD DEBT AND FINANCIAL ACCESS: EVIDENCE FROM PANEL ANALYSIS

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ABSTRACT
This study provides a comprehensive analysis of household debt in 46 countries throughout the period from 2015 to 2021. This study aims to understand the factors that affect household debt, focusing on the effects of economic indicators such as income levels, access to financial resources, and macroeconomic policies. This study using panel data analysis to examines the relationship between household debt and economic factors. The findings show a significant correlation between household debt and factors such as household income, financial access, interest rates and total reserves. This study will contribute to a better understanding of household debt in various forms of economy and offer valuable insights for policy makers and financial institutions. These findings are important to inform policies aimed at managing household debt levels, promoting financial access, and ensuring economic stability, especially in a rapidly changing global economic landscape.

***JEL classification**: G5, E2*
***Keywords**: household; financial access; debt.*

Received: December 20, 2024
Revised: March 14, 2025
Accepted: March 19, 2025

1.0 INTRODUCTION
1.1 Background of the study
The term "household debt" refers to all of the liabilities that households have, which includes loans (mostly mortgage loans and consumer credit) and other accounts payable. This form of debt is measured as a percentage of the net income that households have available to spend. There is a significant amount of variation in the amount of household debt across countries. Within the context of the current global economic environment, the ever-increasing levels of household debt have emerged as a prominent topic of concern and discussion. This phenomenon extends across continents and across rich economies, encompassing both developed and developing

nations. It is a phenomenon that transcends rich economies. Over the course of the last few decades, there has been a substantial rise in the total amount of debt that family households have accumulated. A wide range of economic, social, and policy-related factors have all played a role in shaping this trend. This increase has been attributed to a number of factors, including the expansion of global financial markets, the relaxation of credit systems, and the introduction of new financial products. As a consequence, debt has become a prevalent aspect of the financial situation of modern households.

There are a variety of different aspects that contribute to the complexity of the economic consequences that result from rapidly increasing household debt. Increases in debt are essential to the expansion of the economy. It makes it possible for households to direct resources toward areas such as education, housing, and health care, which in turn encourages the growth of human capital and stimulates consumer spending, which is an essential factor in the activity of the economy. However, there is a disadvantage that cannot be denied despite this. On a personal level as well as on a broader scale, being financially vulnerable can be the result of having an excessive amount of debt. This vulnerability was brought to the forefront during the global financial crisis that occurred in 2008, when high levels of household debt led to widespread defaults and, as a consequence, a complete collapse of the financial system.

Based on the data from 2015 to 2021, there have been some changes in the household debt as a percentage of GDP for various countries. According to the IMF's Global Debt Database, the household debt for Canada was 102.39% of GDP, for the United Kingdom it was 83.17%, and for the United States it was 74.44%. The GDP weighted global rise in household debt from 2015 to 2021 was 6.4 percentage points. China and South Korea both experienced substantial increases in household debt through 2021. In the United States, total household debt increased to $17.29 trillion, led by mortgage, credit card, and student loan balances, which increased to $12.14 trillion, $1.08 trillion, and $1.6 trillion, respectively. The global debt rose by 28 percentage points to 256 percent of GDP in 2020, with borrowing by governments accounting for slightly more than half of the increase. Private debt from non-financial corporations and households also reached new highs.

The most recent StRAPs covered the fiscal years 2019-2022. Regarding household debt, the Federal Reserve Bank of New York reported that aggregate household debt balances increased in the first quarter of 2019 for the 19th consecutive quarter, reaching $13.67 trillion, which was $993 billion higher than the previous peak in 2008. Mortgage balances as of March 31, 2019, stood at $9.2 trillion, an increase from the fourth quarter of 2018. Student loan debt also increased, reaching $1.49 trillion in the first quarter of 2019. From 2015 to 2021, Argentina's household debt as a percentage of GDP experienced fluctuations. According CEIC Data, an all-time high of 7.4% in June 2018. This is in addition to the results that were previously mentioned. It has been determined that high inflation rates, currency devaluation, and a lack of access to credit are the factors that have contributed to this increase in debt. Data from *statista* stated that inflation in Argentina was 54% in 2019, before falling to 42% in 2020. The Argentine peso also saw significant depreciation against major currencies, particularly the U.S. dollar, from 2013 to 2022.

Australia's household debt as a percentage of GDP fluctuated from 2015 to 2021. According *CEIC Data*, the data reached an all-time high of 129.4% in September 2016. Despite the government's efforts to manage the rising household debt through financial education programs and tighter lending standards, the level of debt remained high relative to the country's GDP. The Australian Bureau of Statistics reported that

average household debt was $261,492 in 2021-2022, while average household gross disposable income grew by 3.7% to $139,064. Mortgage debt continued to account for most household debt, with owner-occupiers' debt outstanding amounting to over 1.4 trillion Australian dollars as of December 2022. The International Monetary Fund (IMF) also noted that Australia's household debt was 111.75% of GDP.

According to Trading Economics, the household debt to GDP ratio in Brazil reached 34.70% in the first quarter of 2023. However, for the year 2019, the household debt to GDP ratio was lower. According to data from the International Monetary Fund (IMF), the household debt to GDP ratio for Brazil was 34.56% in 2019. This indicates that there was a slight increase in the household debt to GDP ratio from 2019 to 2023. The National Bureau of Economic Research (NBER) also noted that the rise in household debt in Brazil was mostly fueled by private banks. The International Monetary Fund (IMF) reported that the household debt to GDP ratio for Brazil was 34.56%. The Central Bank of Brazil also noted that after the global financial crisis, government banks in Brazil boosted credit provision to households, generating a sharp increase in household debt, which was followed by the most severe recession in recent Brazilian history in 2015-2016.

Over the course of the last seven years (2015-2021), the amount of debt held by households in Canada has been steadily growing, with mortgage debt constituting the dominant portion of household debt. According to *CTV News*, in 2020, household debt in Canada was equivalent to 177.3% of disposable income, and in 2021, it rose to 185% of disposable income. This increase in household debt has been largely driven by high home prices, with 75% of Canada's household debt coming from mortgages. From 2015 to 2021, India's household debt as a percentage of GDP has seen a steady increase. The State Bank of India research indicated that household debt rose sharply to 37.3% in the financial year 2021 from 32.5% in 2020. The Reserve Bank of India reported that household debt in India has been growing at an annual rate of approximately 12-15% over the past decade. The composition of this debt includes loans for housing, education, vehicles, and personal consumption. However, the rise in household debt is not without its concerns. While household debt can stimulate consumption and investment, thereby boosting economic growth, it also poses risks to financial stability and individual prosperity. If the share of household debt in the GDP crosses 60%, it can have a negative impact on the economy. As of now, this percentage in India is reported to be between 30%-40%.

Since 2015, Mexico's household debt has been steadily climbing, and it is projected to reach a new all-time high of 47.5% of GDP in the year 2020. Several factors, including easy access to credit, low interest rates, and a lack of financial education, have been cited as contributing factors to the rise in debt. According to Trading Economics, the household debt to GDP in Mexico reached an all-time high of 17.4% in the first quarter of 2021. A lack of financial education has been another contributing factor. According to a study by SciELO México, a significant portion of the Mexican population lacks the skills needed to take advantage of the country's financial system. The study found that 52.9% of the population has no relationship with financial institutions, 47.5% only have informal savings, and 44.9% do not believe they have sufficient income to acquire financial products. Efforts have been made to increase financial education levels in Mexico, but these have been limited by high levels of indebtedness and inequality.

Over the course of the last decade, the amount of debt held by households has been steadily growing in a number of countries, with the total amount of household debt reaching $17.29 trillion in the third quarter of 2023. This increase in debt can be

attributed to a number of different factors, including the ease with which financing can be obtained, the expansion of the economy, and the consumer spending. There are two possible outcomes for the economy that can result from household debt: positive and negative. The expansion of the economy and the smoothing out of consumption are two benefits that can result from increased consumer spending and production. The other side of the coin is that high levels of debt can result in financial crises and recessions, as was seen in the recent economic crises that occurred in Europe. There are a number of strategies that can be utilized to reduce household debt. Some of these strategies include repayment of debt over a period of time using income or savings that have been accumulated, debt write-down or refinancing through negotiation, and the implementation of financial education and awareness programs.

1.2 Statement of the research problem

The research problem pertaining to household debt between 2015 and 2021 is significant, and its complexity is further exacerbated by its multifaceted nature. There is a worrying trend of neglecting to fully comprehend and tackle the consequences of household debt on public health and well-being. Given the extensive consequences that household debt has on individuals, families, and the overall economy, it is crucial to possess a thorough comprehension of the intricacies of household debt. Given the significant consequences associated with household debt, including the substantial $12–13 trillion debt burden carried by households in the United States, it is crucial to conduct research to fully understand the repercussions of household debt and develop effective policy measures. This is due to the fact that household debt plays a substantial role in the overall economy. From 2015 to 2021, the study of household debt has seen a decline in research attention. This topic is significant due to the potential consequences involved, the changing nature of research and development, and the urgent necessity to comprehend its influence on the overall economy and its immediate and long-term effects. All of these factors are interrelated. Addressing this research problem is crucial to accomplish the objectives of informing evidence-based policies, identifying research deficiencies, and comprehending the ramifications of household debt on economic indicators such as income levels, financial access, and macroeconomic policies.

An important issue related to household debt is its effect on individuals' income levels. Under the income level effect, the growth of consumption is influenced by the accumulation of household debt. Contrary to the common belief that increased debt levels result in greater consumption growth, especially when the ratio of household debt to GDP is low, the evidence suggests otherwise. An example is a report published by the World Bank which showed that in specific economies, a 10% rise in household debt was associated with a decline in consumption growth of around 1.5% in the subsequent years. This specific correlation was noted in the subsequent years. This finding illuminates the potential inverse correlation between the expansion of household earnings and the level of debt accumulated by households. Low-income households often face exorbitant borrowing expenses, exacerbating income inequality. The escalating level of household debt is a contributing factor to this deteriorating situation. A recent study published in the journal "Income Wealth" revealed that households with low incomes in specific regions faced borrowing costs that were two to three percent higher compared to households with higher incomes. The researchers made this discovery. The presence of this discrepancy in the expenses associated with obtaining loans contributes to the continuation of a cycle of economic disadvantage, which in turn contributes to the expansion of income inequality.

There are serious concerns about the sudden rise in the level of debt held by households in developing economies. According to a report published by the International Monetary Fund (IMF), a 5% rise in the household debt to gross domestic product (GDP) ratio has the capacity to initially boost economic growth and employment. There is a potential for a decrease in growth of up to 1.25% within the next three to five years, which may also raise the probability of financial crises. The research conducted by the Bank for International Settlements (BIS) elucidates both the adverse and favorable facets of household debt. Initially, it was discovered that a 10% rise in the proportion of household debt to GDP could potentially enhance economic growth by around 0.5% in the immediate term. This was initially discovered. Conversely, this is often accompanied by an economic downturn, which can impede growth by up to 0.7% in the long run, underscoring the potential for financial crises. This is a frequent phenomenon.

Access to financial resources plays a crucial role in the accumulation of household debt, which is a key aspect of the research problem that requires attention. The Financial Access Survey (FAS) conducted by the International Monetary Fund reveals a significant rise in the number of individuals with access to financial services. This is mainly attributed to the widespread adoption of digital financial services. During the COVID-19 pandemic, microfinance institutions have played a crucial role in addressing the financial requirements of vulnerable populations who are especially prone to the effects of the pandemic. Between 2019 and 2022, there was a documented increase of over thirty percent in the number of microfinance-related activities. This exemplifies the sector's ability to efficiently react in times of crisis. The International Monetary Fund (IMF) places great importance on the crucial role of financial inclusion in achieving both economic growth and income equality. Various strategies have been implemented to facilitate individuals' access to financial services. The strategies have primarily focused on reducing transaction costs, which have decreased by an average of 5% from 2015 to 2022, enhancing account quality, and promoting digital financial services, which have experienced a growth of approximately 40% in user adoption during the same period.

The gradual reduction of emergency support measures, such as credit guarantees, which peaked in 2020, is an additional factor that aligns with the decrease in commercial bank loans. This factor is a factor that coincides with the decline in commercial bank loans. Due to these necessary measures, which were crucial in addressing the heightened need for available funds and averting financial emergencies, more than $500 billion was provided in guarantees and other types of assistance worldwide. This was undertaken to offer global aid. An effective resolution of the issue of financial resource accessibility requires the implementation of a comprehensive strategy. The objectives of policies should be twofold: firstly, to address the gender disparity in financial access, which is approximately 20% in numerous economies, and secondly, to leverage the advancements in digital financial services, which have witnessed a substantial 40% growth in user numbers from 2015 to 2022. Furthermore, these policies should strive to leverage the advancements achieved in digital financial services.

From 2015 to 2021, the global economy experienced significant fluctuations, largely due to the impact of the COVID-19 pandemic. According to the World Bank and IMF data, the global GDP growth rate was 3.08% in 2015, 2.81% in 2016, 3.39% in 2017, 3.29% in 2018, 2.59% in 2019, -3.07% in 2020, and 6.02% in 2021. The negative growth in 2020 was due to the global economic downturn caused by the COVID-19 pandemic. However, the economy rebounded in 2021 as countries began

to recover. In terms of household debt, the Federal Reserve Bank of New York reported that total household debt rose by 1.3 percent to reach $17.29 trillion in the third quarter of 2023. This debt includes mortgage, credit card, and student loan balances, which increased to $12.14 trillion, $1.08 trillion, and $1.6 trillion, respectively.

The role of fiscal policy in promoting economic growth has been crucial, particularly during the COVID-19 pandemic. The United States government implemented fiscal support measures in response to the pandemic, which accounted for a significant portion of the country's gross domestic product. For instance, the U.S. Department of the Treasury launched the Coronavirus State and Local Fiscal Recovery Funds in 2021, providing $350 billion in emergency funding for eligible state, local, territorial, and Tribal governments. The taxation rates levied on corporations play a crucial role in economic policy, influencing multiple facets of the economy such as investment and growth. A report published by the Tax Foundation in 2021 reveals significant variation in corporate tax rates worldwide. The global average corporate tax rate in 2021 stood at around 23.54%. The fiscal policy's impact on the economy is not just limited to taxation. It also involves government spending, which can stimulate economic activity. For example, when the government runs a budget deficit, it is said to be engaging in fiscal stimulus, spurring economic activity. This sort of expansionary fiscal policy can be beneficial when the economy is in recession, as it lessens the negative impacts of a recession, such as elevated unemployment and stagnant wages. However, fiscal policy can also have unintended consequences. For instance, fiscal stimulus during the COVID-19 crisis boosted the consumption of goods without any noticeable impact on production, increasing excess demand pressures in goods markets and contributing to price tensions.

1.3 Objectives of the study

To examine the factors influencing household debt across different countries, focusing on the impact of economic indicators such as income levels, financial access, and macroeconomic policies such as interest rate, and total reserves. The econometric techniques will be used to provide answers to these study issues. The approach that will be used is the Pooled Ordinary Least Squares, Fixed Effects Model and Random Effects Model on a Panel Data set of 46 countries across the world from 2015 until 2021. Household Debt *(lnHHD*) is the dependent variable, while Household Income *(lnRGDP)*, Financial Access *(lnNI)*, Interest Rate *(LI)*, and Total Reserves *(lnTR)* as the independent variable.

1.4 Significance of the study

The purpose of this study is to provide a comprehensive understanding of the factors that influence household debt across 46 countries from the years 2015 to 2021. An in-depth analysis of the various factors that contribute to household indebtedness is provided by this study. This is accomplished by analyzing the relationship between household debt and a variety of economic indicators, including income levels, access to financial resources, and macroeconomic policies. The importance of this broad scope cannot be overstated when it comes to comprehending the intricate dynamics of household debt in a variety of economic settings. In the study, one of the most important aspects is the investigation into the ways in which household debt influences economic growth, consumption patterns, and income inequality. This study investigates the complex relationship that exists between household income and debt, revealing both positive and negative correlations depending on the specific

circumstances. The importance of this aspect of the study cannot be overstated when it comes to comprehending the complex ways in which debt factors into broader economic trends and the financial well-being of individuals. The findings of this study highlight the significant role that financial access and liberalization play in the accumulation of debt among households. This article investigates the repercussions that alterations in interest rates, innovations in the financial sector, and consumer behaviours have on the levels of debt. Understanding how different economic policies and market developments contribute to the rise in household indebtedness across different countries is essential, and this insight is critical for understanding how these factors contribute.

Using a variety of econometric models, such as Pooled Ordinary Least Squares, Fixed Effects and Random Effects, the study ensures that it is methodologically rigorous and accurate. To gain a reliable understanding of the interaction between the various factors that influence household debt, this all-encompassing approach provides the key. The findings have significant implications for policy, which includes assisting in the development of evidence-based strategies to effectively manage household debt levels. This is especially important when taking into consideration the specific economic contexts of various countries of the world. Not only does the study provide novel viewpoints, but it also serves as a roadmap for future research endeavours by pointing out areas of overlap in the existing body of research on household debt. Because it examines economies that are advanced, emerging, and developing, it makes it possible to make valuable comparisons between different countries. Through the use of this comparative approach, it is possible to gain knowledge from a variety of experiences and implement the most effective methods for managing household debt. In conclusion, the comprehensive analysis of rising household debt around the world that was conducted in this study is extremely helpful in informing policies that are intended to reduce excessive levels of debt while simultaneously promoting financial access and economic stability. In a global economic landscape that is rapidly changing, the findings of this study are extremely important for policymakers, researchers, and financial institutions that are working to understand and mitigate the challenges that are posed by household indebtedness.

2.0 LITERATURE REVIEW

2.1 Theoretical review

2.1.1 Household debt relative to GDP

Household debt can be considered as an economic growth accelerator. In a lot of countries, household debt levels relative to GDP have climbed dramatically during the last decade. According to a study that applied data from 54 economies, household debt increases consumption and GDP growth in the short run, typically within a year. In contrast, a 1% increase in the household debt to GDP ratio tends to reduce long-run growth by 0.1% point (Lombardi et al., 2017). Excessive family debt may thus limit economic growth if households get burdened with debt, resulting in lower spending and increased fragility in their finances. High household debt, on the other hand, can limit economic growth in the medium run, potentially raising the possibility of systemic turmoil (Kurihara, 2015). Household debt has a significant bias towards housing-related debt, with mortgages accounting for the lion's share of debt (Hunt, 2015). Changes in home values can influence consumer confidence and spending, affecting overall economic activity. A high debt-to-GDP ratio may raise concerns about financial stability, especially if households are heavily leveraged and face challenges in meeting their debt obligations. Comparing household debt-to-GDP

ratios across countries provides insights into differences in financial behaviors, economic structures, and policy environment. Hence, it is critical to determine whether households have built up buffers that can help minimize the impact of debt obligations. At the individual level, the amount of debt a household can sustain is often tied to its income. Similarly, at the aggregate level, the ratio of household debt to GDP is a key metric.

2.1.2 Household debt and household sector income

Understanding the macroeconomic impact of household debt requires an understanding of household debt in relation to GDP and household sector income. According to a study, household debt is typically used for financing for asset ownership, like homes, rather than loans for consumption (Honohan, 2006). Lower-income households' raising borrowing is mostly responsible for the rise in household debt, which in turn contributed significantly to the preservation of aggregate demand. The study additionally points out how vital it is to analyse the relationship between debt, distribution, and demand as well as how households' consumption varies with their income. Furthermore, the household debt-to-income ratio is a key indicator of household debt, and determining whether households can manage the associated debt burdens without financial suffering is important. According to the findings of a study, greater individual earnings are closely associated with a greater number of household sector. This shows that revenue, as a resource-related feature of consumer innovation potential, is important in generating household innovation (Chen et al., 2020). Thus, the current study anticipates that lower-income households will have more household debt.

2.1.3 Household debt and financial access

Several research have been conducted to do theoretical evaluations on the relationship between household debt and financial access. The degree of household debt and its influence on growth may differ between nations, and it is critical to analyse whether households have built up hedges to deal with the effects of debt loads. Furthermore, the impact of household debt on economic growth is an important field of research, and studies have been conducted to evaluate the potential nonlinear impact of household debt on GDP growth. Financial access can influence households' ability to evenly spread spending, but it is not a key factor of consuming in and of itself (Lusardi et al., 2011). Household debt levels and their influence on GDP may differ between countries, and it is crucial to determine whether households can manage the ensuing burdens of debt without financial suffering. A well-developed financial system provides a variety of financial products allowing households to choose products that suit their needs. This means that having financial access may have a positive effect on household debt. The significance of assessing the debt-distribution-demand link as well as the overall distribution of consumption across households in relation to income should be emphasized.

2.1.4 Household debt and interest rate

Household debt and interest rates have a complicated and varied relationship. Low levels of interest rates can contribute to larger levels of household debt, and monetary policy can have a big impact on household expenditure and consumption. The composition of household debt, particularly housing-related debt, is critical in understanding how interest rates affect the economy. Based on one study, when the central bank raises its interest rate by 1% point, the average household with debt

equivalent to one experience a decrease in spending (Friedman & Kuttner, 2010). Interest rates directly influence the cost of borrowing for households. Higher interest rates typically result in higher borrowing costs, making it more expensive for individuals to take on debt. According to the Bank for International Settlements (BIS), household debt can influence spending choices in a variety of ways, including loan servicing costs as interest rates vary (BIS). Lower interest rates, in theory, provide a greater incentive for people to take out loans and use money, which could help the economy, whereas higher interest rates may have the reverse impact. As a result, it appears that the relationship between household debt and interest rate is substantially associated.

2.1.5 Household debt and total reserves

Household debt and total reserves have a unique relationship given that household debt has no direct influence on total reserves. Changes in household debt levels, on the other hand, will affect both credit demand and credit supply. Jonathan Crook examined how household debt affects credit demand and supply across countries and discovered that current income is adversely connected to the likelihood of being credit limited. According to the study, a household is liquidity limited if it is unable to borrow against future earnings above a specific level, which can be positive or zero. One clear disadvantage of having limited credit is that a household may request for a loan that they have no reasonable prospect of repaying (Crook, 2006). When households borrow, fresh deposits are made, and the credit-creation cycle continues, based on the original increase in total reserve. To summarise, household debt will affect credit demand and supply, as well as the overall level of reserves in the economy.

2.2 Empirical review

2.2.1 Empirical review household debt and household sector income

Dynan and Kohn (2007) found in their study "The Rise in U.S Household Indebtedness: Causes and Consequences" that the increase in household debt in the United States is closely related to income, particularly relative to income from the previous five years. Mokhtar and Ismail (2013) through "Shariah Issues in Managing Household Debt: The Case of Malaysia", employing the Vector Error Correction Model (VECM), indicate that income plays a significant role in explaining the increase in household debt levels in the country. Wasberg et al. (1992) through "The use of credit cards and the burden of household consumer debt" used regression analysis between 1982 and 1986 to study the factors that affect the amount and changes in consumer debt held by households and found that household debt and income. is positively related, which indicates that as household income increases, household debt will also increase. This finding is also supported by Calza et al. (2003) through "Modelling the demand for loans to the private sector in the euro area" by using the cointegration analysis method to study the determinants of loans to the private sector in the euro area found that an increase in household income will lead to an increase in debt levels in the euro area.

On the other hand, Turinetti and Zhuang (2011) through "Exploring the determinants of U.S. household debt." studied the factors that affect household debt in the United States by using the time series nature of the data and found that the amount of household income in the United States has a negative relationship with the level of household debt in the country where it explains that an increase in household income will reduce the level of debt household. This is also supported by Chien and DeVaney (2001) in "The effects of credit attitude and socioeconomic factors on credit

card and installment debt" using the Survey of Consumer Finances 1998 method found that there's an negative relationship between income and certain kinds of debt, such as credit card debt. Therefore, the connection between a household's income and its debt levels may vary depending on the specific category of debt involved.

2.2.2 Empirical review household debt and financial access

The relationship between household debt and financial access has been a topic of significant interest among economic researchers, especially since the 1990s. Bertola & Hochguertel (2007) through "Household Debt and Credit: Economic Issues and data problems" Highlighted the increase in household debt in terms of the number of households with high liabilities, the availability, and usage of credit instruments, and the ratio of debt to income. Their study underscores the role of an expanding credit market in escalating household debt. This is also supported by Maki (2000) through "The growth of consumer credit and the household debt service burden" found a positive relationship between the growth in household loans and future household consumption, suggesting a strong link between credit availability and household debt. Additionally, Chantarat et al. (2020) through "Household Debt and Delinquency over the Life Cycle" use credit bureau data to analyze the patterns of indebtedness and delinquency rates across different age groups, loan products, and lenders found that innovations in financial products, government development initiatives, microfinance institutions, enhanced financial literacy, and the creation of credit bureaus have all contributed to the rise of household debt worldwide. Cai et al. (2020) in their research "Household Debt and Household Spending Behavior: Evidence from Malaysia", found that Malaysians tend to use debt as a substitution for income to finance the rising cost of living. This indicates that access to financial access, such as loans, plays a role in influencing household debt in response to the increasing cost of living. Cai et al. (2020) also indicate that the banking sector responds to increasing demand for loans to finance consumption, especially for housing mortgages. Ahmad et al. (2014) suggested Total reserves, financial access, and household income all significantly affect household debt, according to the estimation results of the fixed effect model and GMM model. Nonetheless, household debt is not significantly impacted by the interest rate in the fixed effect model. To reduce the risk of a financial crisis brought on by consumer debt from an unstable financial system, liquidity in credit constraints must be controlled.

2.2.3 Empirical review household debt and interest rate

According to Samad et al. (2020) in their research entitled "Determinants of household debt in emerging economies: A macro panel analysis", which involves the observations of panel data for 19 emerging economies, the findings indicate that the interest rate correlates positively with household debt at 1% significance level. The results of their study show that household debt increases by about 0.3% because of a 1% increase in interest rates. This finding, which is significant at the 1% level, aligns with similar observations made by Ho et al. (2016) in their research entitled "Household debt, macroeconomic fundamentals and household characteristics in Asian developed and developing countries" and Anderson et al. (2014) in their research entitled "The potential impact of higher interest rates on the household sector". The research highlights that during times of economic expansion, there's a heightened demand for borrowing, primarily to fund substantial consumer expenditures and asset investments. This trend suggests that during prosperous economic periods, households show less concern about rising interest rates, as banks

and financial institutions typically experience higher profit margins (Debelle, 2004). Additionally, Khan et al. (2020) through "The impact of interest rates on household debt accumulation in Malaysia: a structural break analysis" investigates the longterm impact of the cost of borrowing on household debt accumulation in Malaysia found that the expected that the historical low interest rate policy has resulted in high debt accumulation in the country

Additionally, Samad et al. (2020) also stated that before the global financial crisis, emerging economies experienced a jolt due to disruptions in international trade, even as there was a strong local demand for investing in assets. To compensate for the reduced overall demand resulting from openness to trade, households benefitted from the margins in asset prices. Households with strong credit scores could secure loans at standard interest rates. However, those with weaker credit histories were limited to higher-interest sub-mortgage credit options. This situation led to a heavier debt servicing load and significant interest rates (Mian and Sufi, 2009). Consequently, household debt tended to increase alongside rises in lending interest rates. This is also supported by Meng et al. (2013) which is 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.

2.2.4 Empirical review household debt and total reserves

Zabai (2017) through "Household debt: recent developments and challenges" indicate that total reserves contribute to the increase of household debt developed since the Global Financial Crisis (GFC). This is also supported by Brown and Taylor (2008) through "Household Debt and Financial Assets: Evidence from Germany, Great Britain and the USA" saying that the actions of central banks, such as the Federal Reserve, can have an impact on household debt levels indirectly through their influence on financial markets and interest rates. According to Brown and Taylor (2008) also through the findings of their study, the availability of total reserves in the banking system can affect liquidity and the ability of financial institutions to extend credit to households. Changes in total reserves may influence the ease with which households can access credit, potentially impacting their ability to service existing debt or take on new debt. Furthermore, Auron & Muellbauer (2000) extended their study by using South African Reserve Bank data to estimate the effects of financial liberalization on household consumption and debt. They found that financial liberalization and fluctuations in asset values have significant implications for consumer spending and increased household debt in South Africa. This is also supported by Kishan and Opiela (2000) through "Bank Size, Bank Capital, and Bank Lending Channels" through a detailed empirical analysis of credit channels and bank lending channels for monetary policy in the United States from 1980 to 1995 which gives focus on how bank loan supply changes, depending on asset size and capital leverage ratio. Their research findings highlight the sensitivity of smaller, undercapitalized banks to monetary policy changes, leading to volatile lending conditions for households, and impacting their ability to manage debt effectively.

3.0 METHODOLOGY

3.1 Model specification

The purpose of this paper is to examine how household debt, represented as the dependent variable, is influenced by various aspects of financial access and financial liberalization in a selection of countries. Our study argues that a singular dependent variable, household debt, cannot be sufficiently explained by a single independent

variable alone (Brooks, 2008). To obtain a clearer understanding of the impacts, we incorporate multiple independent variables into our analysis. These include household sector income, measured by real GDP per capita, financial access indicated by the density of financial institutions, and aspects of financial liberalization such as interest rates and total reserves. This comprehensive approach allows us to examine the determinants affecting household debt in 46 countries over the period 2015 to 2021. In the regression model, the equation is as follows:

$$lnHHDi,t = \beta 0 + \beta 1 lnRGDPi,t + \beta 2 lnNIi,t + \beta 3 LIi,t + \beta 4 lnTRi,t + \varepsilon i,t \quad (1)$$

where,

$lnHHD_{i,t}$ = Logarithm of Household Debt relative to GDP
$lnRGDP_{i,t}$ = Logarithm of Household Sector Income
$lnNIi,t$ = Logarithm of Financial Access
$LI_{i,t}$ = Interest Rate
$lnTR_{i,t}$ = Logarithm of Total Reserves
i (i=1, ..., N) = Country
t (t=1, ..., T) = Time Period
β_0 = Constant Value
$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients of the independent variables
$\varepsilon_{i,t}$ = Error term

3.2 Method estimation

In this study, we evaluated five variables using stata16 software. To thoroughly investigate the relationship between household debt (the dependent variable) and various financial indicators (the independent variables), we employed several econometric models in EViews12. These included the Pooled Ordinary Least Squares (Pooled OLS), Fixed Effect Model and Random Effect Model. Each of these models offers a unique perspective in analyzing panel data, and by running them in EViews12, we were able to generate results for comparison. This comparative analysis aims to determine which model most effectively explains the relationship between household debt and factors like household sector income, financial access, interest rates, and financial liberalization in our selected countries over the specified period. The outcome of this analysis will provide insights into the most appropriate econometric approach for understanding the dynamics of household debt in relation to these financial variables.

3.2.1 Pooled OLS model specification

The Pooled OLS model treats the dataset as a single large cross-section, ignoring individual (country) effects and focusing on the overall average effect of the variables across all countries. This approach is most appropriate when the impact of independent variables is assumed to be uniform across all countries. It is particularly useful in scenarios where individual country effects are either nonexistent or negligible. In our "Household Debt and Financial Access" study, the Pooled OLS model is utilized to assess the average effect of financial access on household debt across the entire panel of countries. By treating the dataset as a large cross-section, this model helps in identifying general trends and relationships, assuming that the influence of financial access on household debt is consistent and uniform across all countries in the study.

3.2.2 Fixed effects model specification

The fixed effects model is employed in this study to examine the impact of 46 countries on household debt, addressing bias from "time-varying covariates" in the research, aided by the standard deviation to overcome smaller error findings. Additionally, these fixed effects model is also used to control for heterogeneity issues. In our study, we focus on the unique impact each country has on household debt, accounting for the specific, time-invariant characteristics of these nations. This model is particularly relevant in our study for isolating the effects of financial access on household debt within each country, thereby providing insights into how country-specific factors interact with financial access to influence household debt levels.

3.2.3 Random effects model specification

The Random Effects model assumes that differences across countries (entities) are random and uncorrelated with the independent variables. This model is suitable when we believe that individual country characteristics might influence the dependent variable but are not correlated with the predictors. It allows for individual-specific effects, providing a balance between the Pooled OLS and Fixed Effects models. The Random Effects model is particularly useful for analyzing variations within entities (countries) while also considering the variations between them. However, if the random effects are correlated with the independent variables, this model may produce biased estimators. So, in this study, the Random Effects model is employed to capture both the within-country and between-country variations in the relationship between financial access and household debt. This model is particularly useful for exploring how individual country characteristics, assumed to be random, impact household debt while simultaneously considering the overall average effect across the panel. It offers a balanced approach in analyzing the dynamics of household debt in relation to financial access, taking into account both specific country effects and overarching trends.

3.3 Data description

This study conducts a panel data estimation on 46 countries from 2015 to 2021. Four models are involved to examine the relationship between household debt and variables from household sector income, financial access, and financial liberalization, including interaction terms. Household debt is used as the dependent variable, proxied by the household debt to GDP ratio obtained from the International Monetary Fund (IMF). The independent variable representing household sector income is the real GDP per capita in US dollars, also sourced from the IMF. Additionally, the financial access factor is acquired from the IMF, using a trial package that calculates the number of financial institutions in each country as (number of institutions + branches) * 1,000 / country's land area in square kilometers, including commercial banks, credit unions, and financial cooperatives, as well as microfinance institutions. Furthermore, the interest rate factor is obtained from the World Bank's World Development Indicator using the base lending interest rate for 40 countries. For countries like Denmark, Ireland, the Netherlands, Portugal, Spain, and Sweden, the interest rate is proxied by the seven-month interest rates from OECD statistics. Another financial liberalization factor included is the total reserves of a country, sourced from the World Bank's World Development Indicator.

4.0 EMPIRICAL FINDINGS

4.1 Descriptive statistic

Table 1: Descriptive statistics

	lnHHD	lnRGDP	lnNI	LI	lnTR
Mean	3.6544	9.8430	2.6097	7.1825	24.6886
Median	3.8751	9.9504	2.7479	4.08	24.7836
Maximum	4.9016	11.8125	7.1940	67.2542	27.9716
Minimum	1.0198	7.2273	-1.5257	0.385	20.2735
Std. Dev.	0.8697	1.1161	1.7118	8.4420	1.6335
Skewness	-0.9941	-0.4992	0.0491	3.7067	-0.3819
Kurtosis	3.6075	2.3191	3.2125	19.6197	2.8456
Jarque-Bera	57.8019	19.53031	0.7330	4429.444	8.1198
Probability	0	0.0001	0.6932	0	0.0173
Sum	1173.062	3159.599	837.7011	2305.575	7925.048
Sum Sq. Dev.	242.0613	398.6471	937.6498	22805.37	853.8929
Observations	321	321	321	321	321

In this study, the table of descriptive statistics above reveals insightful trends and distributions for our key variables. The household debt (lnHHD) exhibits a mean value is 3.6544 and the median is 3.8751, indicating a left-skewed distribution. The range from a minimum of 1.0198 to a maximum of 4.9016 shows significant variability. The standard deviation is 0.8697, skewness is -0.9941, and kurtosis is 3.6075, all pointing to a nonnormal distribution as confirmed by the Jarque-Bera test with a probability of 0. For lnRGDP, the household sector income, the descriptive statistic shows a mean of 9.8430 and a median of 9.9504, indicating a distribution with a slight left skew. The range spans from 7.2273 to 11.8125, with a standard deviation of 1.1161, suggesting notable variability. The skewness of -0.4992 and a kurtosis of 2.3191, being less peaked than a normal distribution, point towards a platykurtic distribution.

The Jarque-Bera test result, with a probability of 0.0001, suggests the distribution is not normally distributed. For lnNI, the financial access, the mean is 2.610, and the median is 2.7479, indicating a distribution that's close to symmetric. The data ranges from -1.5257 to 7.1941, with a standard deviation of 1.7118. The skewness is slightly positive at 0.0491, and the kurtosis of 3.2125 suggests a distribution near normal. The Jarque-Bera test, showing a probability of 0.6932, supports the possibility of a normal distribution. Next, interest rate (LI), the mean is significantly higher at 7.1825 compared to the median of 4.08, reflecting a highly skewed distribution. The extreme ranges from 0.385 to 67.2542 and a large standard deviation of 8.4420 indicate substantial variability. The pronounced right skewness of 3.7067 and a very high kurtosis of 19.6197 are evident. The Jarque-Bera test result, with a probability of 0, strongly suggests a non-normal distribution. Lastly, for lnTR which measures the total reserves, shows a mean of 24.6886 and a median of 24.7836, hinting at a slight left skew. It varies from 20.2735 to 27.9716, with a standard deviation of 1.6335. The negative skewness of -0.381852 and a kurtosis of 2.8456

indicate a modestly left-skewed and moderately peaked distribution. The Jarque-Bera test, with a probability of 0.0173, points towards non-normality in the lnTR distribution.

4.2 Empirical result

We carry out this study to investigate the relationship between household debt and several key economic indicators across different countries. This analysis is grounded in economic theories that emphasize the influence of income levels, interest rates, financial access, and reserve policies on household borrowing behaviors. There are a total of 321 observations covering 46 countries. Household Debt is the dependent variable, and the data ran from 2015 until 2021. The independent variable is the Household Sector Income, Financial Access, Interest Rate, and Total Reserves.

Table 2: Empirical results

VARIABLES	(1) POOLED	(2) RANDOM	(3) FIXED
lrgdp	0.4803***	-0.0458	-0.278***
	(0.0377)	(0.0462)	(0.0517)
lni	0.0124	0.115***	0.0824**
	(0.0203)	(0.0317)	(0.0362)
lli	-0.260***	-0.0889***	-0.0561**
	(0.0568)	(0.0280)	(0.0260)
ltr	0.0416**	0.0359	0.0955***
	(0.0198)	(0.0264)	(0.0281)
Constant	-1.350**	3.062***	3.909***
	(0.654)	(0.654)	(0.680)
Observations	321	321	321
R-squared	0.571		0.147
Breusch-Pagan LM test		889.65 (0.000)***	
Hausman test			69.44 (0.000)***
Multicollinearity (Vif)			1.45
Heteroskedasicity (x^2 – stat)			8752.23 (0.000)***
Serial Correlation (F- stat)			54.960 (0.000)***

4.2.1 Pooled Ordinary Least Squares (Pooled OLS)

In the Pooled OLS model, which considers the aggregate data across all countries without distinguishing between them, we find notable relationships between the explanatory variables and household debt. Household sector income (lnRGDP) is significant at 1% and positively related to household debt, indicating that an increase in income correlates with an increase in debt. Specifically, a 1% increase in household sector income results in a 48.03% increase in household debt. This could be

interpreted as households in higher-income brackets feeling more confident and capable of managing debt. This is also support by Mokhtar and Ismail (2013) which indicate that income plays a significant role in explaining the increase in household debt levels in the country.

Financial access (lnNI) also shows a positive relationship with household debt. An increase of 1% in financial access leads to an increase of 1.24% in household debt. These findings support the idea that improved access to financial services allows households to borrow more, possibly due to increased availability and ease of credit options. However, in this model, the financial access is not significant, which indicates that the data does not provide strong evidence that financial access (lnNI) affects household borrowing or debt in the country.

However, the interest rate (LI) shows a negative relationship with household debt, where a 1% increase in the interest rate leads to a 26.0 % decrease in household debt. This trend is in line with the economic principle that higher borrowing costs as a result of the increase of interest rate generally decrease the demand for loans. This is similar to research by Khan et al. (2020) who found in their study that the expected that the historical low interest rate policy has resulted in high debt accumulation in Malaysia.

Lastly, the total reserves (lnTR) are positively associated with household debt. A 1% increase in total reserves results in a 4.16% increase in household debt. This relationship is because a high number of reserves shows the strength of the financial system, giving institutions the ability to lend and contribute to household debt. This is supported by Zabai (2017) saying that total reserves contribute to the increase of household debt developed since the Global Financial Crisis (GFC).

4.2.2 Fixed effects model

In the Fixed Effects model, which captures the variation within each country, the regression analysis reveals several different relationships between household debt and several economic factors. First, household sector income (lnRGDP), is significant and has a negative relationship to household debt with a coefficient of -0.278. This shows that a 1% increase in household income in a country will cause a 27.8% decrease in household debt. This may reflect the tendency of higher-income households to save more and therefore rely less on debt. Higher income generally leads to higher savings and reduced dependence on debt. With increased income, households can allocate more resources to savings instead of relying on credit (Schumpeter & Keynes, 1936).

Second, financial access, indicated by the lnNI variable, shows a significance at a 1% level and a positive relationship with household debt with a coefficient of 0.0824. This shows that an increase of 1% in financial access leads to an increase of 8.24% in household debt, indicating that when households have better and easier access to financial services, their borrowing levels increase. This is in line with the theory that better access to finance can facilitate borrowing by creating a record of credit history. Pérez-Armendáriz and Morduch (2006) indicate that increased financial inclusion builds a credit history that enables further borrowing and financial growth.

Next, the interest rate, denoted LI, has a small and statistically significant negative relationship with household debt with a coefficient of -0.0561, indicating that higher interest rates will slightly inhibit borrowing, possibly due to increased borrowing costs. Higher interest rates are said to boost financial pressure on high-debt households, making it worse for borrowers and savers (Yahaya, 2019).

Finally, the variable representing the number of reserves (lnTR) shows a positive association with household debt which is 1% increase in total reserve will lead to an increase 9.55% in household debt. However, in this model, total reserve (lnTR) is

statistically not significant with household debt, indicating that the data does not provide strong evidence that the number of reserves affects household borrowing in the country.

4.2.3 Random effects model

A Random Effects Model, which includes both within-country and between-country variation, provides a more nuanced understanding of the relationship between variables and household debt. Household sector income (lnRGDP) has a negative relationship with household debt in this model. A 1 unit increase in income leads to a 0.0458 unit decrease in household debt, indicating that within and across countries, higher levels of income can contribute to reduced reliance on debt. This is a similar statement that has been stated by Schumpeter & Keynes (1936) which is as income increases, households tend to save more and become less reliant on debt. However, in this model, household sector income (lnRGDP) is statistically not significant with household debt, indicating that the data does not provide strong evidence that the increase in household income will lead to a decrease in household borrowing in the country.

Financial access (lnNI) continues to show a significant positive relationship with household debt, with a 1% increase in financial access leading to a 11.5% increase in household debt. These findings reinforce the role of financial institutions that are easily accessible to households in facilitating borrowing across different national contexts. This is supported by Chantarat et al. (2020) which indicate that innovations in financial products, government development initiatives, microfinance institutions, enhanced financial literacy, and the creation of credit bureaus have all contributed to the rise of household debt worldwide.

However, the interest rate effect (LI) is slightly negative, and it is significant at a 1% level towards household debt, with a 1% increase in interest rates leading to a 8.89% decrease in household debt. This suggests that although interest rates influence borrowing decisions, the effect may vary by country. In this context, an increase in interest rates will cause the cost of borrowing to increase, and this will reduce debt from households same as stated by (Yahaya, 2019).

Total reserves (lnTR) also show a positive relationship with household debt. A 1% increase in total reserves will cause a 3.59% increase in household debt. This shows that when a country's total reserves increase, the ability of banks to provide loans to households increases, which has the potential to increase debt for the household sector. This is supported by the findings of Zabai (2017), Brown and Taylor (2008), Auron & Muellbauer (2000), and Kishan and Opiela (2000). These studies suggest that increases in total reserves can contribute to the increase of household debt, either through the influence of central banks on financial markets and interest rates, the availability of total reserves in the banking system affecting liquidity and credit accessibility for households, or the sensitivity of smaller, undercapitalized banks to monetary policy changes leading to volatile lending conditions for households. However, this is similar to the Fixed Effect model, the total reserve (lnTR) is statistically not significant with household debt, indicating that the data does not provide strong evidence that the number of reserves affects household debt in the country.

On the other hand, The Hausman test is used to decide between a Fixed Effects Model and a Random Effects Model in panel data analysis. Essentially, it helps to determine if the unique errors (or disturbances) in the panel data are correlated with the regressors, an issue known as the *endogeneity problem*. Based on the result, the *p-*

value of the Hausman test is 0.000 which is lower than 0.05 *(p-value < 0.05)*. This means that we reject the null hypothesis and accept the alternative hypothesis. Therefore, this indicates that the independent variable explaining the dependent variable is effective using the fixed effect model. Therefore, the Fixed Effects Model is the more effective choice for analyzing the relationship between independent and dependent variables in this study.

5.0 CONCLUSION

5.1 Summary of study

Using the data from 2015 to 2021, we focus on the correlation of household debts with sector income, financial access, interest rate, and total reserves. The Pooled OLS Model is used at first, followed by the Fixed Effects Model (FEM) and Random Effects Model (REM). All four variables are found to have significant effects with variance among 46 countries. The Pooled OLS Model results indicate a positive connection between household debt and household income, financial access, and total reserves. The interest rate yields a different outcome because it is inversely related to household debt. The FEM and REM results indicated the same relationship for every variable, with financial access and total reserves having a positive effect on household debt while household sector income and interest rate showing a negative impact. The findings of this study strongly suggest that if a country wants to avoid worsening household debts, it should carefully analyse its specific conditions.

The empirical findings revealed a strong connection between Income and household debt. Household debt is driven by household income, thus as household income rises, so will household debt. However, the empirical findings revealed that the increase in household debts is not simply related to income growth but can also be influenced by credit loans. Furthermore, the interest rate has a significant impact on household debt. When interest rates expand, the amount of household debt rises. Those with poor credit histories, on the other hand, were restricted from applying for loans, however this situation making it easier for those with good credit to obtain loans.

5.2 Policy implication

Household debt has the potential to have a considerable impact on monetary policy and financial stability. According to the Bank for International Settlements (BIS), household debt can influence consumption decisions through a variety of channels, including loan servicing costs as interest rates vary. The sensitivity of household debt to interest rates, showing that household debt has accumulated and become a major vulnerability component of the financial system through interactions with asset prices. Exact macroprudential methods, such as debt-toincome or loan-to-value limitations, that can be utilised to reduce debt accumulation during expansions should also be examined. Because the policy consequences of household debt are complicated and varied, it is critical to consider many elements such as interest rates, debt composition, and income when developing household debt policies.

5.3 Limitations and suggestions

The current study has certain limitations. The panel data used in this analysis includes a diverse range of countries, and some have promulgated very few regulations, which may cause bias. Furthermore, we chose 46 countries to examine the impact of four variables on household debt, with the goal of providing cross-country implications. The number of nations is a constraint for us since we must assure the accuracy and dependability of data from all countries. The validity of the findings and the

generalizability of the conclusions might be influenced by the quality of the data gathered and the procedures utilised for data collecting and analysis. Future research should consider employing sophisticated analysis techniques like the Generalised Method of Moments (GMM) to investigate the effects of household income, financial access, interest rates, and total reserves on household debt. Aside from that, we may not have explored all conceivable future study options, allowing possibility for additional research and potential breakthroughs in the subject. As most previous research did not fulfil our expectations on several issues, there was a limitation in the theoretical framework and empirical analysis. For example, the study's policy implications are unclear, making detailed policy suggestions based on the findings challenging. Furthermore, several previous research sample sizes and sample representativeness are unjust, limiting the generalizability of the conclusions. Further study is consequently needed to conduct in-depth investigations of factors influencing family debt, with a focus on specific instruments and optimal policy combinations.

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