

# Household Financial Literacy: The Case of Nonperforming Consumer Credit in Kenya

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## Abstract

Household financial literacy is integral in the financial planning process of formulating, executing, and monitoring personal decisions into a consolidated plan that directs households to realize their overall financial and life goals. These includes meeting monthly living expenses, and goals in investment, educational, retirement, tax and legacy planning. However, the Kenyan credit market is encountering an increase in defaults and nonperforming loans (NPLs), negatively impacting on household financial planning process. This study examined the effect of financial literacy on nonperforming household credit in Kenya using a fixed effects least squares dummy variables panel data approach. Nonperforming household credit was used as a proxy for financial literacy. Using data from the Central Bank of Kenya, the study analyzed sectoral credit distribution to agricultural, real estate, and household sectors, with the agricultural sector used as the reference period in the formulation of the dummy variables. The results found an inverse relationship between nonperforming loans and lending interest rates and a positive correlation with the gross domestic product growth rate. This indicates that the Kenyan financial system is still underdeveloped and operating in the short-run asymmetric condition, whereby commercial banks cannot fulfill their fiduciary requirements, but continue loading consumers with loans without regard to applicable financial planning practice standards for personal financial planning to enable households meet their financial and life goals. Despite reported economic growth, the increasing level of nonperforming consumer credit necessitates a review of the country's monetary and fiscal policies to ensure that economic growth is consistent with the prevailing macroeconomic indicators of unemployment, interest rates, and nonperforming credit. To increase household financial literacy, the study suggests curriculum development to incorporate personal financial planning education in tertiary institutions and Universities like the American Certified Financial Planning (C.F.P.) to augment courses provided by the Kenya Accountants and Secretaries National Examinations Board (KASNEB).

**Keywords:** Household financial literacy, Nonperforming loans, Household credit, Least squares dummy variable

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## 1.0 Introduction

The Central Bank of Kenya Bank Supervision Annual Report (2019) stated that the proportion of nonperforming household loans has continued to expand despite positive macroeconomic performance. With the increased levels of financial access by most Kenyan households, nonperforming consumer credit is projected to grow, further negatively impacting interest rates, economic growth, and households' personal financial goals. Therefore, this paper sought to determine the relationship between financial literacy and nonperforming consumer credit in Kenya using. Household nonperforming credit is used as a proxy for financial literacy. In Kenya, the Fin Access (2013) survey indicated that financial literacy levels are low among consumers of financial services. Klapper et al. (2016) reiterated Kenya's low financial literacy, indicating that adult financial literacy is 38 percent. On the other hand, the Kenya Financial Access (Fin Access) Household Survey (2019) noted that overall access to formal financial services and products has improved in Kenya to 82.9 percent from 26.7 percent in 2006. Therefore, analyzing how increased financial access and low financial literacy affect consumer debt repayment is crucial.

Hilgert, et al. (2003) in a Federal Reserve Bulletin for cash flow, credit management, savings, and investments, asserted that there is a positive relationship between knowledge and behavior in personal financial decision-making. Courchane & Zorn (2005), utilizing a recursive model that connects financial knowledge to financial behaviors to credit outcomes, found that behavior that is influenced by knowledge had a positive correlation with credit outcomes. Cooper (2016) observed that financial mistakes are more prevalent among those with less education and income. Furthermore, Klapper, et al. (2016) opined that financial illiteracy is

expensive and can cause household consumers to incur huge debts by continuously borrowing and having less savings. Financial knowledge has vital implications for household welfare and is related to an increased rate of return on debt (Lusardi and Mitchell, 2014). Empirical evidence from studies conducted on financial literacy denotes a direct association between financial behavior and debt behavior in household life (Lusardi & Mitchell, 2007). Individual skills in allocating income and debts for expenditure options on commodities, household skills in price information, and personal financial management skills contribute to financial literacy (Lusard, 2008).

Why is consumer financial literacy gaining more traction in many countries' contemporary global macroeconomic policy agenda? According to the American Consumer Financial Protection Bureau's (CFPB) Financial Literacy Annual Report (2013), the bureau was established as the first federal government agency responsible for consumer financial protection. The Dodd-Frank Wall Street Reform and Consumer Protection Act (2010) empowered the bureau to develop and implement a strategy to improve the financial literacy of consumers and initiatives to educate and empower consumers to make optimal informed financial decisions to meet their own life goals (**Section 1021**, p.605). Additionally, the bureau observed that many American consumers still struggle to make financial decisions that serve to meet their life goals despite the availability of a wide range of information about managing money and numerous financial products and services.

Brown et al. (2016) stated that young adults in the U.S. are heavily indebted and have low financial literacy levels. Brown, et al. (2013a), on the other hand, noted that the low financial literacy rates among U.S youth and an effective delinquency rate of over 30 percent on student loans for young borrowers in repayment, along with the well-established correlation between financial literacy and financial well-being, has provoked policy mandarins and other stakeholders to advocate for enhanced financial education. Fernandes, et al. (2014), however, observed that empirical evidence of the causal effect of financial education on debt outcomes for young adults is mainly based on field and natural experiments of modest scales and is varied.

Congressional Research Service (2019) defined consumer finance as the process of saving, borrowing and making investment choices that households transact from time to time. Furthermore, these personal financial decisions are intricate, providing American households with safe and affordable financial services to acquire assets and build net worth, avoid financial difficulties, and achieve personal financial objectives. The report also provides the following reasons why households incur debts: Investments such as home or education, to build future wealth, consumption smoothing (i.e., paying later to consume now), and emergency expenses. Most American households depend on borrowing to finance their expenditures. Ultimately, the Federal Reserve Bank of New York indicated mortgage debt as the leading household debt in America, accounting for 67 percent of total household credit, followed by student loans, auto loans, and credit card loans.

Bucher-Koenen & Lusardi (2011), in their assessment of German financial literacy, noted that knowledge of fundamental financial concepts is low among women, individuals with little education, and those living in East Germany, thereby concluding that economically vulnerable people are impacted negatively by financial illiteracy. According to the Central Bank of Kenya (2019), the level of nonperforming sectoral credit distribution has been burgeoning from 2011 to 2018. The Kenyan Baking Industry Shared Value Report (2019) stated that as of September 2019, total commercial bank lending to the various sectors in Kenya stood at Kenya Shillings 2.53 trillion. The introduction of the Banking (Amendment) Act 2016, with interest controls, stifled the private sector access to credit between 2016 and 2018. According to the Central Bank of Kenya (C.B.K., 2019), the total value of outstanding gross loans and advancements by commercial banks to households and the private sector increased by Kenya Shillings 126 billion from Kenya Shillings 2.36 trillion in June 2017 to Kenya Shillings 2.53 trillion in September 2018. The C.B.K. indicated that personal and trade loans account for 25 percent and 19 percent of the total loan portfolio, respectively. Additionally, with new credit standing at Kenya Shillings 30 billion, Kenya Shillings 27 billion was advanced through mobile platforms. Using debt management as a proxy for financial literacy denotes the prevalence of low financial education for most Kenyan households.

## **2.0 Literature Review**

### **2.1 Financial literacy and education**

Lusardi. (2019) observed that in contemporary times, individuals bear a greater responsibility for managing their personal finances throughout their lives. Furthermore, the prolonged life expectancy has put pressure on pension and social welfare systems, leading to constraints. The researcher stated that a notable trend is the rapid transition from employer-sponsored defined benefit (DB) pension plans to private defined contribution (DC) plans in numerous countries. This the researcher argued transfers the onus of retirement saving and investing from employers to employees. Additionally, Lusardi posits that changes in the labor market have accentuated the importance of skills, resulting in wage disparities between individuals with higher education levels and those with lower educational attainment. Concurrently, financial markets are undergoing swift transformations fueled by technological advancements and the introduction of more intricate financial products. Lusardi (2019)The array of financial products available, ranging from student loans to mortgages, credit cards, mutual funds, and annuities, has evolved significantly, with profound implications for individual well-being. Additionally, the

exponential growth of financial technology (fintech) is reshaping how people make payments, decide on financial investments, and seek financial advice. Lusardi concluded that given this landscape, it becomes crucial to assess individuals' financial literacy and understand the extent to which their financial knowledge influences decision-making in the realm of finance.

Other recent empirical studies, relating financial literacy to household financial behavior include Gholipour, & Arjomandi, (2022) investigated the existence of significant relationship between liquidity, prudential, borrower support (financial literacy), asset quality, and policy rate measures and aggregate NPLs, following COVID-19 pandemic in 2020. Xu et al. (2022) examined the influence of household financial literacy on the financial behavior of individuals, utilizing the China Household Financial Survey Data (CHFS) from 2015 and 2017. The outcomes indicated that financial knowledge holds considerable impact on current, long-term, and dynamic aspects of financial behavior. This discovery underscores the significance of financial literacy as a pivotal factor in shaping and enhancing household financial conduct.

Organization for Economic Cooperation and Development (OECD 2017) stated that financial education and financial literacy have received close attention in World policy discussion as denoted by the high-degree principles on National Strategies for Financial Education established by the OECD/INFE, which were accepted by the G20 Leaders in 2012. OECD (2017) stated that financial education is commonly acknowledged as an essential part of peoples' financial investment and the total stability of the financial system. To bolster the importance of financial education, the G20 Leaders have endorsed three sets of high-level principles: Innovative Financial Inclusion (2010), Financial Consumer Protection (2011), and National Strategies for Financial Education (2012). Furthermore, in 2016, G20 leaders promulgated a new set of principles on Digital Financial Inclusion, with principle number 6 stressing the relevance of financial literacy competencies to enable consumers and small businesses to benefit from the advantages of a digitalized financial environment.

Stolper & Walter (2017) observed that the term financial literacy was initially introduced in the U.S. by the Jumpstart Coalition for Personal Financial Literacy in 1997, terming financial literacy as the ability to.

"Use knowledge and skills to manage one's financial resources effectively for lifetime financial security" p. 588.

Huston (2010), observed that "financial literacy should be conceptualized as having two dimensions- (personal financial knowledge) and use (personal financial application)." p. 306. However, Hung, et al.(2009) combined several definitions and stated financial literacy.

"as knowledge of basic economic and financial concepts as, well as the ability to use that knowledge and other financial skills to manage financial resources effectively for a lifetime of financial well-being" p 12.

However OECD, (2014) provided the most recent definition of financial literacy. The definition comprises the knowledge and application realm.

"Financial literacy is knowledge and understanding of financial concepts and risks, and the skills, motivation, and confidence to apply such knowledge and understanding to make effective decisions across a range of financial contexts to improve the financial well-being of individuals and society and to enable participation in economic life" p. 33.

Financial literacy strategies are an essential policy instrument being used by the Chinese government to include economically susceptible individuals in the financial system (Asian Development Bank, 2016, 2017; Klapper & Singer 2014; Lyons, Grable, & Zeng, 2017; Lyons, Grable, and Joo, 2018; United Nations, 2015; Villagenor, West, and Lewis, 2016; The World Bank, 2014, 2018; Yuan & Jin 2017; OECD / INFE, (2015) and The World Bank (2018), further observed that while the efficacy of financial education is still unknown, financial literacy is now the focus of many countries national policy on financial inclusion. Interestingly, Lyons,et al. (2006) Lyons and Scherpf (2014) revealed that it is difficult to empirically relate financial education solely as being responsible for changes in households' financial behavior and outcomes.

## **2.2 Financial literacy, household consumer credit and debt management**

Lyons, et al. (2019) noted that formal credit in People's Republic of China (P.R.C.), is currently tailored towards serving large- scale government owned enterprises and seldom satisfy credit needs of individuals. Further many Chinese consumer households are not able to access formal credit, in the rural and urban poor jurisdictions. Mehoroitra & Yetman,(2015) and The World Bank (2018), noted that access to formal credit provides an avenue for which economically vulnerable individuals can contribute towards the economic growth of their country, and also acquire pertinent resources to achieve their long term personal financial security goas (buy home, start business or obtain education). Ogbebor and Ighodaro, (2017) using a dynamic panel data found that management of NPLs was instrumental in the macroeconomic stability of African countries.

The Global Center for Financial Literacy (2014) alluded that sound financial planning is a relevant factor in determining the ability of consumers in effective management of finances and debts. Mian & Sufi (2011) and Brown (2013) pointed that financial literacy affects household's degree of indebtedness, and debt repayment

behavior, including helping households avoid insolvency and bankruptcy caused by inability to serve their loans (Brown et al. 2013). Lusardi & Mitchell (2014), on the other hand indicates that financial literacy has significant ramifications for individual welfare and is related with high interest rates of return and debt, implying a positive correlation between financial literacy and debt behavior. Lusardi & Mitchell (2014) describes financial literacy as skills possessed by households in allocating funds and debts for consumption on commodities, budgeting and overall financial management skills.

At the macroeconomic level, Athirah & Mansur, (2018) conducted a case study of the Malaysian banking system using nonlinear autoregressive distributed lag (NARDL) approach and Granger Causality between nonperforming loans and lending interest rates. Their findings indicated that there is an asymmetric relationship in the short-run and symmetric relationship in the long-run. Athirah & Mansur, (2018) further observed that in the asymmetric correlation, banks increase or decrease lending interest rates during economic recession, with the level of nonperforming loans always increasing in the short run because of the prevailing economic conditions. This implies that, even if the banks provided lower interest rates loans, during the financial crisis period, the number of nonperforming loans increases. Conversely, in the long run the level of nonperforming loans is positively correlated with lending interest rates due to symmetry conditions. Athirah & Mansur, (2018) provided the economic principle of lending interest rates, by stating that high interest rates broaden consumers debt burden leading to delinquency. This is because interest rate has an inherent implicit cost on the loan issued by banks with effects on credit default. Espinoza and Prasad, (2010) estimating a panel dynamic model over 80 banks in the Gulf Cooperation Council, found that lower economic growth and higher lending interest rates predispose increase in nonperforming consumer credit.

The European Central Bank (2013) in their econometric analysis of the determinants of nonperforming loans, posits that real G.D.P. growth was the principal factor of nonperforming loan ratios during the last ten years, arguing that global economic recession is the leading risk factor in bank and household asset quality. Ogbobor and Ighodaro(2019) , using fixed and random effects and Generalized Methods of Moments (G.M.M.) dynamic panel data model, established a long run positive relationship between nonperforming loans and financial deepening, while the association between consumer bad debts, inflation, and G.D.P. growth rate were significant albeit inverse.

### 2.3 Household consumer credit and debt

OECD, (2020) defined household debt as the household's total liabilities (plus not for profit organizations serving households) that require payments of principal and interest at fixed periods. Household debt is computed as the total of the following liability classifications: loans (essentially mortgage loans and consumer debt) and other payables. Prinsloo (2002), and Chawla (2013), defined household credit as equity debt in entire residential homes, real estate, consumer credit, credit card, personal debt, guaranteed and unsecured homeowner's equity, and unpaid bills from banks and other financial institutions. Argawal (2013), argued that debt is considered the main cause of household financial crisis. However, paradoxically, debt has historically contributed positively to the welfare maximization of many households. On the contrary Mutezo, (2014) noted that if not properly managed debt can contribute negatively to the financial stability of the consumers. Brayman (2011), supported household debt, by noting that its application enables individuals achieve important financial and personal goals by accumulating capital and that people should be debt-free at retirement ostensible because the cost of borrowing will be higher than their fixed-income portion of their portfolio.

Brayman (2011), suggested that financial planning principles of debt management have not been given prominence over the years, and that financial institutions and lenders are only concerned with their profitability as a versus to their fiduciary responsibility of protecting client's interest. As such consumers continue to receive more credit facilities without consideration for their ability to repay. Debt management is only applied when a holistic view is considered to trying to rescue consumers from overwhelming debt, through debt consolidation. Brayman (2011), further developed a Debt Policy Statement (D.P.S.), with the principal objectives of educating and establishing sound debt management policies, that support institutional and government lending policies and best practices.

Finally, Brayman (2011) debt policy statement has established the following classes of debt: 1); credit card debt.

"Small-cap equity of the debt world. Credit card debt is conventionally unsecured, and subjected to very high interest rates, and therefore very risky to the consumers" p. 42 and

2); unsecured lines of credit, used for lifestyle expenditures with moderate rates of interest compared to credit card debts 3); debt on depreciating assets- credit related to assets that lose value over time such as cars, boats, machinery.

"This type of debt is usually subject to more moderate interest rates and risk as a result of the security of the asset. It usually has a fixed amortization at a rate faster than expected depreciation on the asset pp 42" 4); debt on appreciating assets- "financing used for the acquisition of a fixed asset, such as a home or cottage, that is expected to grow in value. This type of debt, especially as it relates to a home

mortgage, tends to have the lowest interest costs and is usually perceived as the lowest level risk. We need to differentiate between secured lines of credit and mortgages with fixed rates and amortizations, as these have different levels of risk associated with them and will have different effects on interest rate sensitivity analysis" p.42 5); debt on income-earning assets- refers to credit used to obtain income – generating assets such as rental real estate and other financial assets. This class of debt is related to deductible or non-deductible debts 6); equity debt- "not really a debt, but when looked at in the context of net worth, the ultimate and preferred asset class. Equity has no cost and reduces risk, like the risk-free cash return in an investment portfolio" p.42.

Brayman (2011), observed that the debt policy statement, should accord financial planners and advisers a framework or yardstick to help in the formulation of recommendations necessary for certain customers, not pegged on the amount they request but whether their recommendation is sensible to the clients. Furthermore, a conventional loan request contains measures about qualification for assuming credit and needs the following basic client information; 1) a review of the net-worth statement to confirm the assets and liabilities owned or owed by the client; 2) the costs for debt serving already in existence; and 3) income and fixed costs that might influence the customer's cash flow, for instance property tax on home equity.

#### **2.4 Performance of consumer credit in Kenya**

Central Bank of Kenya and Fin Access Household Survey (2019) stated that households are experiencing difficulties in personal debt repayment. This is caused by the fact that personal loans are used for consumption with no expected returns. The survey further showed that 72 percent of the personal loans are used for personal consumption, nine percent for emergency needs, 13 percent settling infrequent expenditures, while only a paltry 6 percent is for production. Equally the survey further stated that, a quarter of the borrowers use more than half of their monthly salary for loan repayment, while 18 percent default monthly. The Fin Access Household Survey (2019) found- that households have resorted to shopkeeper credit in the recent times. Shopkeeper credit has increased from 9.9 percent in 2016 to 29.7 percent in 2019, making it the highest source of consumer credit at 90 percent. Most households prefer shopkeeper credit ostensibly because it is easy to access, non - monetary with no security conditions.

*Table 1* shows the sectoral distribution of gross loans and proportions of nonperforming loans for the year ending December 2018. Household credit constitutes the highest percentage of number of loans (93.63) and gross loans (26.63). *Figure 1* demonstrates sectoral credit allocation by December 2018, and *Figure 2* reflect proportions of sectoral nonperforming credit.

#### **2.5 Overview of mortgage loan portfolio in Kenya**

OECD (2010) definition of household credit includes mortgage loans. However according to Kenyan sectoral loan classification as depicted in *Table 1*, it seems to have been classified under real estate. Central Bank Annual Report (2019) stated that the value of mortgage loan portfolio increased by 0.76 percent or 1.7 billion Kenya shillings from 2017 to 2018, due to high demand for home ownership. During the same period, outstanding value of nonperforming mortgage credit soared from Kenya Shillings 27.3 billion in December 2017 to Kenya shillings 38.1 billion in December 2018. On the other hand, the mortgage nonperforming credit increased from 12.2 percent in December 2017 to 16.9 percent in December 2018. The total number of mortgage loans was 26,504 as at December 2018. An estimated 68 percent of commercial banks financed mortgage loans with loan to value (L.T.V.) of less than 100 percent.

#### **2.6 Mortgage loan characteristics**

CBK (2018) observed that the average mortgage interest rate declined to 12.4 percent in 2018 from 18.7 percent the previous year. Further approximately 88.8 percent of mortgage credit were on variable interest rates in 2018, compared to 78.4 percent in 2017. In the same period, the average mortgage loan maturity period was 10.6 years with a minimum of 4 years and maximum of 22 years. The identified obstacles to mortgage market development in Kenya, includes high cost of housing units, high cost of land for construction, high origination/closing costs, difficulty in property registration and titling, low levels of household incomes, expensive long-term credit, and stringent land law (CBK, 2018).

**Table 1**  
**Overview of Sectoral Credit Distribution and Nonperforming Loans in Kenya December 2018**

Sector	No of Loan Accounts	Percentage of Total (%)	Gross Loans Kshs (Millions)	Percentage of Total (%)	Gross NPLs Ksh (Millions)	Percentage of Totals (%)
Personal/Household	6,728,258	93.63	661,460	26.63	45,672	14.42
Trade	255,409	3.55	475,423	19.14	81,633	25.77
Real Estate	28,050	0.39	376,237	15.15	47,033	14.85
Manufacturing	15,213	0.21	323,817	13.04	51,791	16.35
Transport and Communication	30,455	0.42	164,271	6.61	14,674	4.63
Energy and Water	2,186	0.03	109,613	4.41	6,859	2.17
Building and Construction	10,559	0.15	102,837	4.14	23,692	7.48
Financial Services	14,986	0.21	95,780	3.86	6,049	1.91
Agriculture	95,158	1.32	89,961	3.62	30,452	9.62
Tourism, Restaurants and Hotels	4,548	0.06	72,134	2.90	6,392	2.02
Mining and Quarrying	1,143	0.02	11,987	0.48	2,478	0.78
<b>Totals</b>	<b>7,185,965</b>	<b>100</b>	<b>2,483,518</b>	<b>100</b>	<b>316,712</b>	<b>100</b>

Source: Central Bank of Kenya

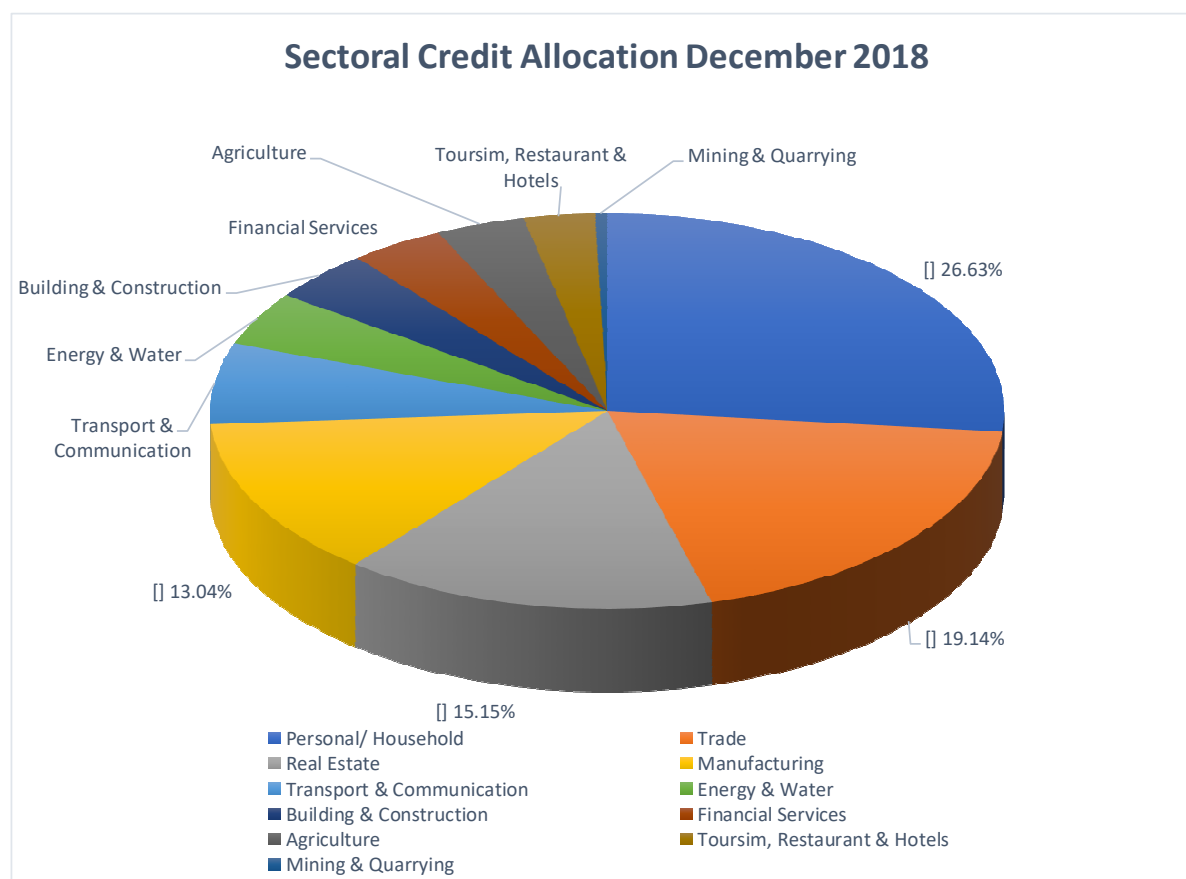


Figure 1  
 Source: Authors calculation from research data

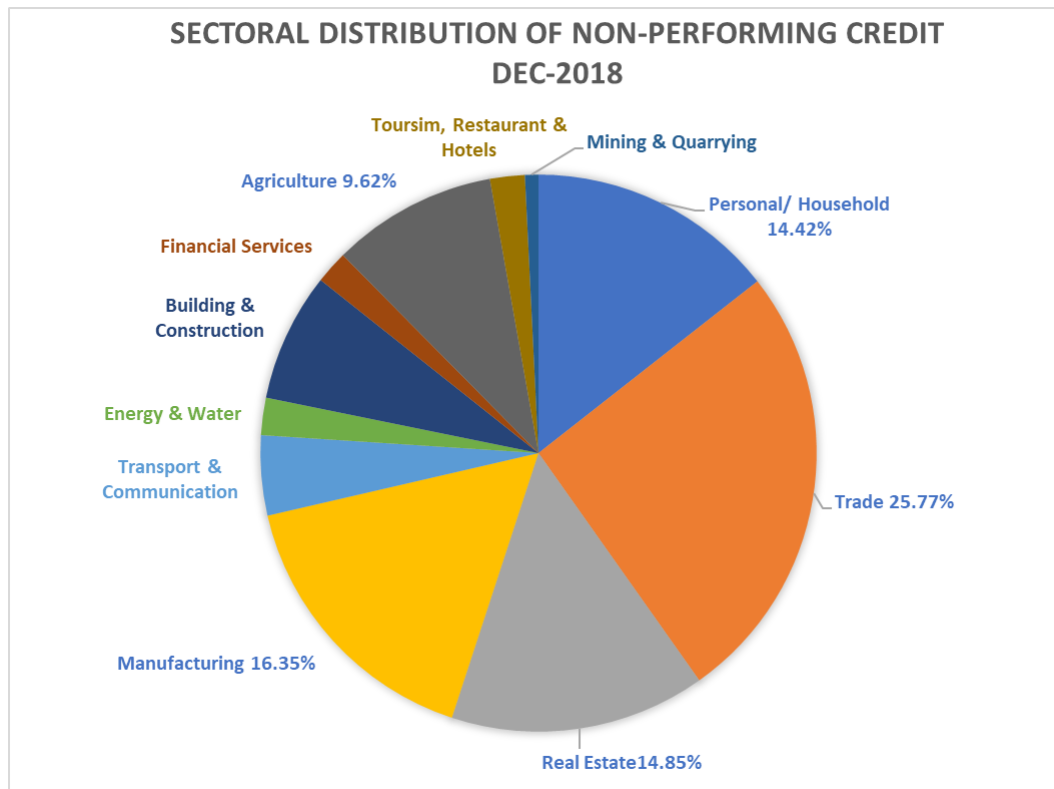


Figure 2  
 Source: Authors Computation from research data Theoretical Framework

### Conceptual framework

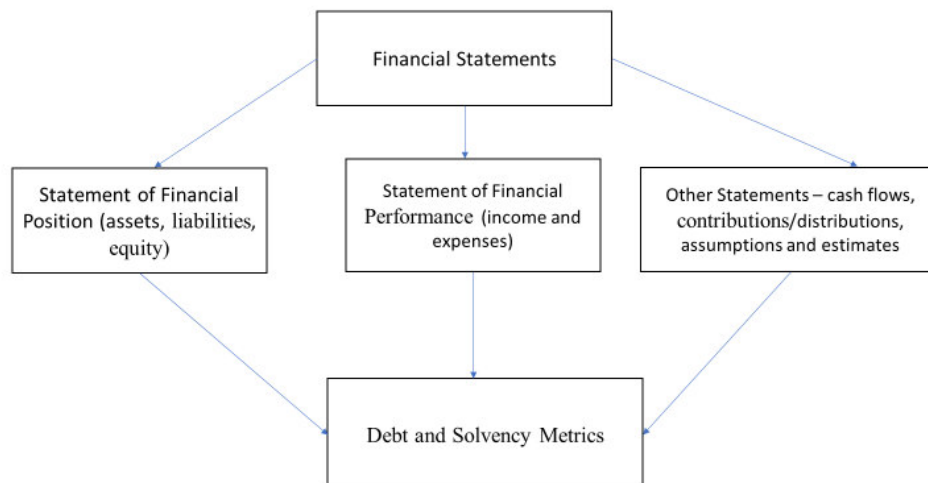


Figure 3: Conceptual framework  
 Source: Modified from International Financial Reporting Standards (IFRS, 2018)

This conceptual framework explains the importance of financial statements and debt and leverage ratios in the financial planning process for loan procurement and monitoring throughout the process of debt repayment.

### 3.0 Materials and Data

#### 3.1 Research design

The study employed a quantitative research design using panel data fixed effects model and estimating parameters using least squares dummy variables (LSDV) approach.

### 3.2 Sampling and data types

Purposive sampling was used due to the convenience, as the study aimed at investigating the impact of financial literacy on household credit. This study used outcome-based proxies for financial literacy (Stolper & Walter 2017) and obtained secondary data from published Central Bank of Kenya banking supervision annual reports. These data include, gross loans, and sectoral credit loans and nonperforming consumer loans, average annual interest rates and annual Gross Domestic Product growth rates for the period 2009 to 2018, relating to agricultural, real estate and household personal sectors.

### 3.3 Model specification

Greene (2009), the general modeling framework for panel data regression model is derived as,

$$y_{it} = X'_{it}\beta + Z'_i\alpha + \varepsilon_{it} \dots \dots \dots (1)$$

$$y_{it} = X'_{it} + C_i + \varepsilon_{it} \dots \dots \dots (2)$$

There are K regressors in  $X'_{it}$ , not including a constant term. From the general panel data model, equation (1), the study used the Fixed Effects variant of the panel data model. The fixed effects model is ideal because of the assumption of the omitted effects  $C_i$ , in the general model.

$$y_{it} = X'_{it} + C_i + \varepsilon_{it} \text{ are correlated with the included variables in a general form, } E(C_i|X_i) = h(X_i) \dots \dots \dots (3)$$

Given that the conditional mean is the same each period, equation (2) can be written as follows,

$$y_{it} = X'_{it}\beta + h(X_i) + \varepsilon_{it} + [C_i - h(X_i)] \dots \dots \dots (4)$$

$$y_{it} = X'_{it}\beta + \alpha_i + \varepsilon_{it} + [C_i - h(X_i)] \dots \dots \dots (5)$$

Any time-invariant variables in  $X'_{it}$ , will mimic the individual specific constant term.

The study then formulated for parameter estimation, the least squares dummy variables (LSDV) model by adding a time specific effect as follows.

$$y_{it} = X'_{it}\beta + \alpha_i + \delta_t + \varepsilon_{it} \dots \dots \dots (6)$$

The model is obtained by an addition of T-1 dummy variables (one of the time effects must be dropped to avoid perfect collinearity-group effects). This formulation produces a symmetry, however, since each of the group effects is a group specific intercept, whereas the time effects are contrasts- that is comparison to a base period (the one that is excluded). In this study, we used sectoral credit distribution to agriculture, real estate and household/personal as the time effects. Further, the agricultural sector was used as the base period, and therefore the dummy variables used were sectoral nonperforming credit to Household/personal and Real Estate/mortgage. The Formulated Fixed Effects Least Squares Dummy Variable Estimator was derived as follows.

$$InBad_{Debts} = X'_{it}\beta + [\beta_{10}Agri + \beta_{11}RealEstate + \beta_{12}Household] + \varepsilon_{it} \dots \dots \dots (7)$$

Where,  $InBad_{Debts}$  = Natural logarithms of Sectoral non – performing credit

$X'_{it}\beta$  = Independent variables, interest rates and Gross Domestic Product growth rates

The fixed effects formulation of the model will absorb the last three terms (bracketed) in the regression in  $\alpha_i$ . The coefficients on the time invariant variables cannot be estimated. This lack of identification is the price of the robustness of the specification to unmeasured correlation between the common effects and the exogenous variable.

$$y_i = X_i\beta + i\alpha_i + \varepsilon_i \dots \dots \dots (8)$$

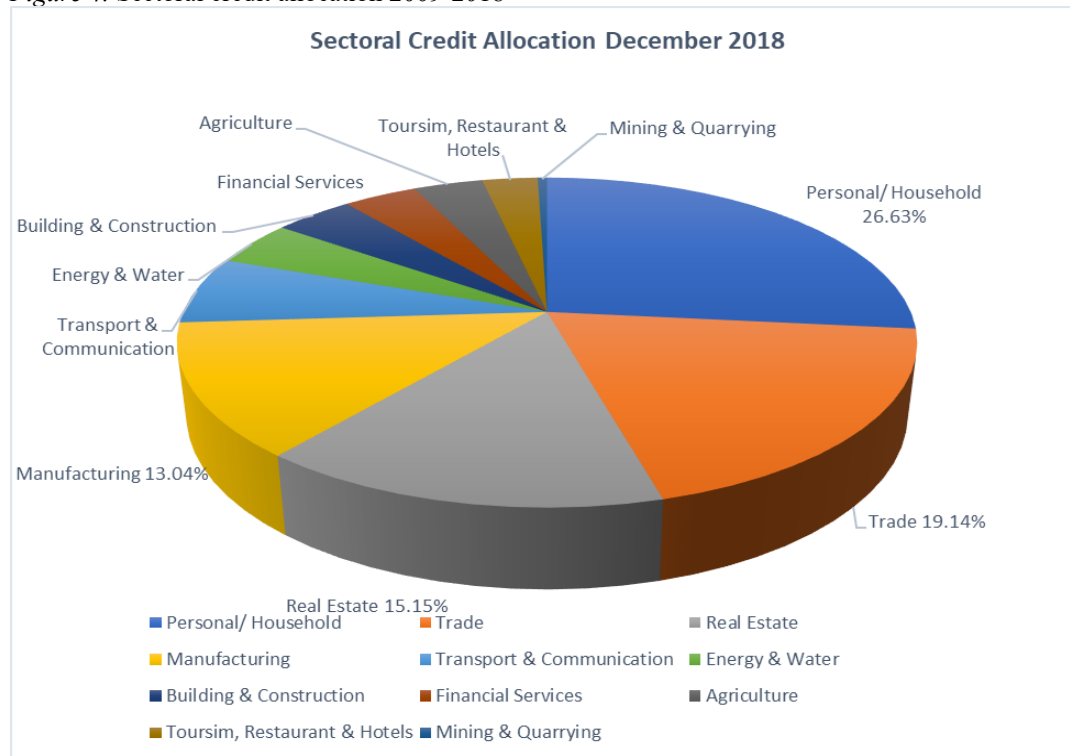
$$y = X\beta + D\alpha + \varepsilon \dots \dots \dots (9)$$

The study used equation (7) to estimate the parameters.



#### 4.0 Results and discussion

Figure 4. Sectoral credit allocation 2009-2018

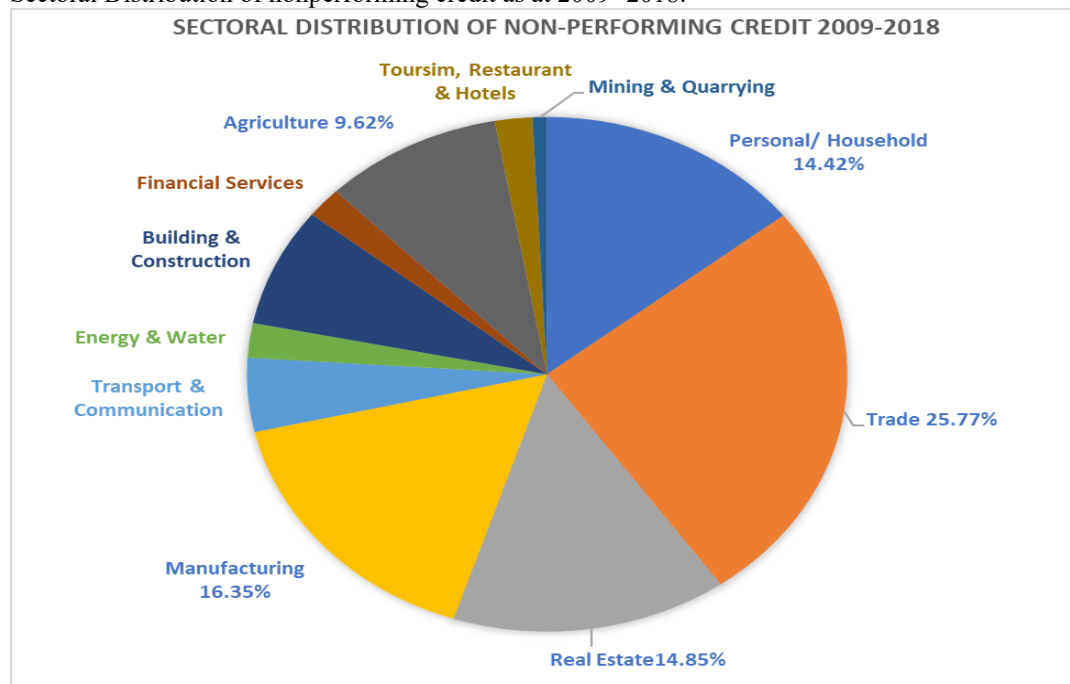


Source: Authors computations from research data.

Figure 4, shows that personal/ household loans consume the largest amount of total gross allocation to the sectors in the Kenyan economy at 26.63 percent, followed by trade 19.14 percent and real estate third at 15.15 percent. However, if proper consumer loan classification were to be reviewed, then real estate/mortgage is part of household loans, and the total credit allocation would be a staggering 41.78 percent of gross loans to the economy transmitted through the banking sector.

Figure 5

Sectoral Distribution of nonperforming credit as at 2009- 2018.



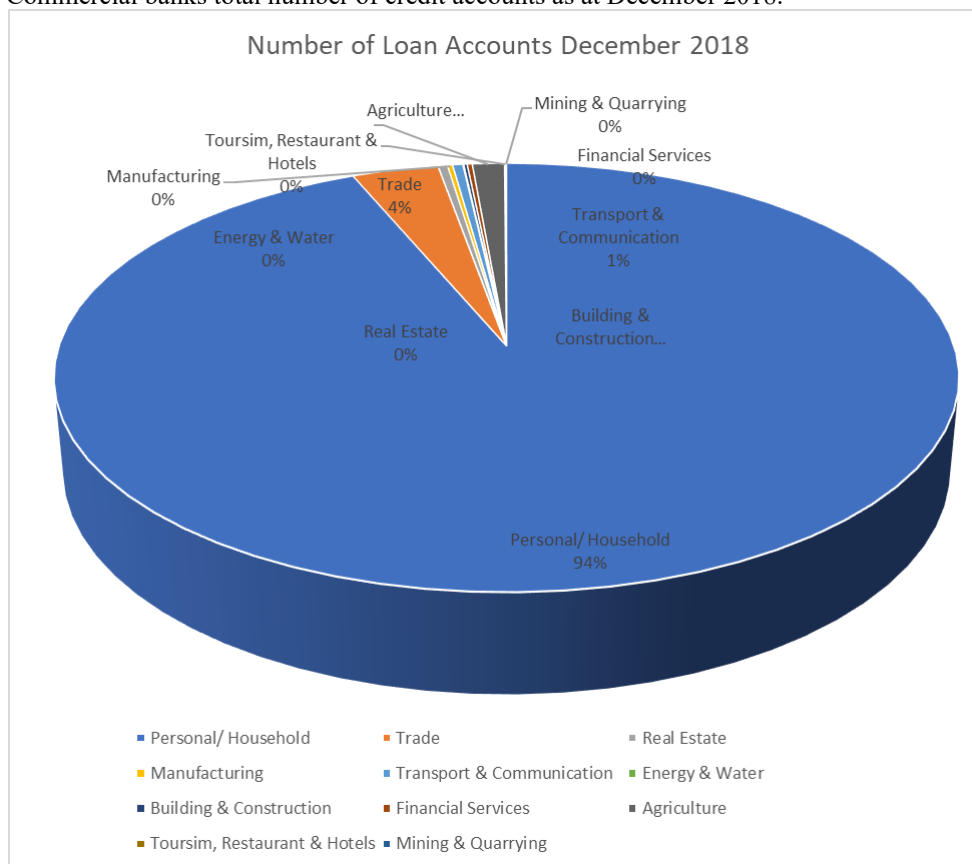
Source: Authors Computations from research data

Figure 5 shows that the total consumer household nonperforming credit (personal plus real estate) is 29.27

percent of the gross totals. Trade and manufacturing contributed to nonperforming credit by 25.8 percent and 16.35 percent, respectively.

**Figure 6**

Commercial banks total number of credit accounts as at December 2018.



**Source:** Authors Computations from research data

The total number of loan accounts as at December 2018 stood at 94 percent for household / personal loans in the Kenyan banking sector., while real estates among others had few transactional accounts. This signifies that the bulk of commercial banks credit transactions is concentrated in processing and maintenance of unproductive personal consumer credit.

**Table 2**

Descriptive Statistics

	Mean	Std. Deviation	N
InBad_Debts	9.47	0.86	30
Dummy_RealEstate	0.33	0.479	30
Dummy Household	0.33	0.479	30
Interest Rate	16.0510	2.14005	30
G.D.P. Growth	5.090	1.0155	30

The low standard deviations in *Table 5* indicate that the numbers are close to the averages or group means. Basically, a small standard deviation implies that the values in the statistical data set are close to the mean of the data set and that there is normal distribution in the dataset. However, there is a slight dispersion in interest rates and G.D.P. growth rate. This normality is corroborated by the histogram in appendix 1.

**Table 3**

Least Squares Dummy Variable (LSDV) Regression

Model	R	R Square	Adjusted R Square	Std Error of the estimate	F Change	df1	Sig F Change	Durbin-Watson
1	0.796 <sup>a</sup>	0.633	0.575	0.559	10.802	4	0.000	1.794

<sup>a</sup> Predictors: constant, G.D.P. Growth, Dummy Household, Interest Rate, Dummy Real Estate,

<sup>b</sup> Dependent Variable: In Bad Debts.

The F statistic is significant implying that the model is fit in predicting and forecasting and that there is no autocorrelation as indicated by the Durbin-Watson Statistics.

**Table 4**

<i>ANOVA (Analysis of Variance)</i>						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.513	4	3.378	10.802	.000 <sup>b</sup>
	Residual	7.819	25	0.13		
	Total	21.332	29			

<sup>a</sup> Dependent Variable: InBad Debts, <sup>b</sup> Predictors: (Constant), G.D.P. Growth, Dummy Household, Interest Rate, Dummy\_ Real Estate.

**Table 5**

<i>Least Squares Dummy Variable Parameter Estimates</i>							
<i>Dependent Variable: InBad Debts</i>							
Parameter	B	Std. Error	T	Sig	95% confidence Interval.	Observed Power <sup>b</sup>	
					Lower Bound	Upper Bound	
Intercept	9.211	1.023	9.002	0.000	7.104	11.318	1.000
Dummy-Real Estate	0.754	0.250	3.016	0.006	0.239	1.270	0.826
Dummy Household	1.418	0.250	5.671	0.000	0.903	1.932	1.00
Interest Rate	0.103	0.049	-2.094	0.047	-0.204	0.202	0.521
GDP Growth	0.232	0.103	2.244	0.034	0.019	0.445	0.578
<b>[Sector = 1]</b>	0 <sup>a</sup>						
<b>[Sector = 2]</b>	0 <sup>a</sup>						
<b>[Sector = 3]</b>	0 <sup>a</sup>						

Note. <sup>a</sup> This parameter is to zero because it is redundant, <sup>b</sup> Computed using alpha = 0.05

The results indicated that a one -percent increase in lending interest rate will lead to a 10.3 percent increase in the level of nonperforming household loans, and that the relationship is significant and direct. This is true because an increase in interest rates will increase the cost of credit and thus lead to an expansion of credit default. Espinoza and Prasad (2010) similarly found a positive relationship between nonperforming loans and lending interest rate. Athirah & Mansur (2018), concluded that in the short-run asymmetric relationship, increase or decrease in lending rates, will lead to one way increase in nonperforming consumer loans, especially during economic recession. In the long run there is symmetric relationship between nonperforming credit and interest rate. It can also be noticed that G.D.P. growth rate has a positive significant correlation with the level of bad debts. It implies that a one- unit change in G.D.P. growth rate will lead to a 23.2 percent change in bad debts. European Central Bank (2013) and Ogbebor & Ighodar (2019) however found an inverse relationship between bad debts and G.D.P. growth rate.

#### 4.1 Conclusion

This study examined the effect of financial literacy on nonperforming household credit in Kenya using a fixed effects least squares dummy variables panel data approach. Nonperforming household credit was used as a proxy for financial literacy. The positive correlation between household nonperforming credit and lending interest rate in Kenya, demonstrates, that households will procure more commercial bank credit when the rates are low and default rate will rise with high lending rates. The higher the proportion of gross sectoral credit, the higher the nonperforming loans. The Kenyan financial system seems to be operating in the short run asymmetry, where only the households have full information regarding their ability to successfully repay the loan, while the lender does not have all the necessary client information for complete analysis of the client current personal and financial situation. This asymmetry condition implies that while the lending rates increase or decrease the volume and value of nonperforming household credit continues to escalate. Just like any underdeveloped financial system, where monetary policy alone is not enough for economic growth. The above results could indicate that commercial banks prefer investing in money market and capital market assets, such as the treasury bills and bonds when interest rates are high, thereby stifling access to credit to the household's consumers.

On economic growth rate and the positive association with the nonperforming household credit, it means that household credit is not productive, and funds are not invested in profitable investment businesses that yields higher returns, but households utilize the funds in nonproductive personal consumption. When the economy is growing, more individuals will secure employment, and with increased family disposable incomes, will prefer bank loans to meet immediate personal financial goals.

#### 4.2 Recommendation.

The findings of the study on the relationship between financial literacy and nonperforming household credit in Kenya have significant policy implications. The following are some policy recommendations based on the study:

- Integration of Financial Literacy in Educational Curriculum: Consider revising the national educational curriculum to include comprehensive financial literacy education at various levels, especially in tertiary institutions and universities. Collaborate with educational institutions to introduce courses or modules focused on personal financial planning, drawing inspiration from established international certifications like the American Certified Financial Planning (C.F.P.).
- Enhanced Regulatory Framework: Strengthen regulatory oversight of financial institutions to ensure adherence to fiduciary responsibilities and ethical lending practices. Introduce measures that encourage responsible lending and discourage the issuance of loans without proper assessment of borrowers' financial capabilities. Currently 94 percent of total commercial banking loan transactions and maintenance relates to personal loans segment.
- Macroprudential Policies: Align monetary and fiscal policies with macroeconomic indicators such as unemployment, interest rates, and nonperforming credit. Regularly review and adjust policies to ensure that economic growth is sustainable and does not contribute to an increase in nonperforming loans.
- Sectoral Credit Allocation: Monitor and regulate the distribution of credit across different sectors, especially in areas prone to high nonperforming loans. Assess the impact of credit allocation on sectors such as agriculture, real estate, and households, with a focus on maintaining a balanced and sustainable credit market.
- Public Awareness Campaigns: Launch targeted public awareness campaigns to educate households about the importance of financial literacy and responsible borrowing. Encourage financial institutions to actively engage in financial education programs for their clients.
- Research and Data Collection: Invest in ongoing research to continually assess the impact of financial literacy programs on reducing nonperforming loans. Improve data collection mechanisms to enhance the accuracy of nonperforming loan statistics and other relevant financial indicators.
- Government Support for Financial Planning Initiatives: Provide incentives for financial institutions that actively contribute to financial literacy initiatives. Support public-private partnerships aimed at promoting financial education and planning.
- Professional Standards: Collaborate with professional bodies like the Kenya Accountants and Secretaries National Examinations Board (KASNEB) to ensure that financial planning standards are incorporated into professional qualifications. By implementing these policy recommendations, Kenya can create an environment that promotes responsible financial behavior, reduces nonperforming loans, and fosters the overall financial well-being of households.

#### 4.3 Future Research

This study focused on personal loans non-performing credit in Kenya. Households also manage businesses, procure mortgage loans and operate credit cards. Future research should be undertaken to holistically review nonperforming credits emanating from personal loans, business loans, mortgage loans and credit card loans provided by commercial banks, savings and credit cooperative societies (Saccos), and FinTech Loans. Similarly, a comparative study should be considered between developing countries and developed countries on the state of household financial literacy and non-performing consumer credit.

#### References

- Angela C. Lyons., John E. Grable and Ting Zeng. (2019). *Impacts of financial literacy on the loan decisions of financially excluded households in the Peoples' Republic of China*. ADBI Working paper Series No 923.
- Bahrudin, Wan Athirah & Masih, Mansur. (2018). *"Is the relationship between lending interest rate and nonperforming loans symmetric or asymmetric? evidence from ARDL and NARDL."* MPRA Paper 91565, University Library of Munich, Germany. Retrieved from [https://mpra.ub.uni-muenchen.de/91565/MPRA Paper No 91565](https://mpra.ub.uni-muenchen.de/91565/MPRA_Paper_No_91565)
- Brown, M., A.Haughwout, D. Lee, J. Scally, and W. van der Klaauw. ( February 2013a). *Just released. Press briefing on household debt and credit. Federal Reserve Bank of New York. Liberty Street Economics Blo.*
- Bucher-Koenen T, Lusardi. (2011). Financial Literacy and retirement planning in Germany. . *Journal of Pension Economic and Finance* 10(4):, 565-584.
- Central Bank of Kenya (2009-2019) Annual Bank Supervision Repots
- CFPB (2013)*Financial Literacy Annual Report*. Consumer Financial Protection Bureau.
- Congressional Research Service. (2019). *An overview of Consumer Finance and Policy Issues*. Congressional Research Service R 45813.

- Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Pub. L. No. 111-203, 124 Stat. 1376. (2010).
- Espinoza, R.A and Prasad, A. (2010). "Nonperforming Loans in the G.C.C. Banking System and their Macroeconomic Effects" I.M.F. Working papers 10/221/2010.
- Fernandes, D., J.G Lynch, and R.G Netermeyer. (2014). Financial literacy and downstream financial behaviors. *Management science* 60: , 1861-83.
- Gholipour, H. F., & Arjomandi, A. (2022). Economic policy responses to the COVID-19 pandemic and growth of nonperforming loans. *International Review of Finance*, 22(3), 551-566.
- Herispon, H. (2018). *FINANCIAL LITERACY, DEBT AND ITS BENEFITS IN HOUSEHOLD LIFE*. Herispon Academy of Finance and Banking Riau.
- Hunh A.A., Parker A.M., and Yoong J.K. (2009). Defining and measuring financial literacy. RAND Working Paper Series No 708.
- Huston. (2010). Measuring Financial Literacy. *Journal of Consumer Affairs*, 296-316.
- Lusard, A. (2008). Increasing the effectiveness of financial education in workplace. *International Conference on Financial Education, U.S. Department of the Treasury and OECD*.
- Lusardi, A.M., and Mitchell, O. (2007). Financial literacy and retirement planning: Evidence and implications for financial education. *Journal of Business Economics*, 35-44.
- Lusardi, Annamaria., Mitchell, Olivia S. (2014, March). The Economic Importance of Financial Literacy: Theory and Evidence. *Journal of Economic Literature*, LII(52(1)), 5-44.
- Lusardi, A. (2019). Financial literacy and the need for financial education: evidence and implications. *Swiss Journal of Economics and Statistics*, 155(1), 1-8.
- Meta Brown., John Grigsby.,Wilbeert van der Klaauw., Jaya Wen and Basit Zafar. (2016). Financial Education and Debt Behavior of the Young. *The Society for Financial Studies*.
- Organization for Economic Cooperation and Development. (2017). *G20/OECD INFE report on a dult financial literacy in G20 Countries*.
- Angela C. Lyons., John E. Grable and Ting Zeng. (2019). *Impacts of financial literacy on the loan decisions of financially excluded households in the Peoples' Republic of China*. ADBI Working paper Series No 923.
- Bahrudin, Wan Athirah & Masih, Mansur. (2018). "Is the relationship between lending interest rate and nonperforming laons symmetric or asymmetric? evidence from ARDL and NARDL." *MPRA Paper 91565, University Library of Munich, Germany*. Retrieved from [https://mpra.ub.uni-muncen.de/91565/MPRA Paper No 91565](https://mpra.ub.uni-muncen.de/91565/MPRA_Paper_No_91565)
- Brown, M., A.Haughwout, D. Lee, J. Scally, and W. van der Klaauw. ( February 2013a). *Just released. Press briefing on household debt and credit. Federal Reserve Bank of New York. Liberty Street Economies Blo*.
- Bucher-Koenen T, Lusardi. (2011). Financial Literacy and retirement planning in Germany. . *Journal of Pension Economic and Finance* 10(4):, 565-584.
- Central Bank of Kenya (2009-2019) Annual Bank Supervision Repots  
*CFPB (2013)Financial Literacy Annual Report*. Consumer Financial Protection Bureau.
- Congressional Research Service. (2019). *An overview of Consumer Finance and Policy Issues*. Congressional Research Service R 45813.
- Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Pub. L. No. 111-203, 124 Stat. 1376. (2010).
- Espinoza, R.A and Prasad, A. (2010). "Nonperforming Loans in the G.C.C. Banking System and their Macroeconomic Effects" I.M.F. Working papers 10/221/2010.
- Fernandes, D., J.G Lynch, and R.G Netermeyer. (2014). Financial literacy and downstream financial behaviors. *Management science* 60: , 1861-83.
- Gholipour, H. F., & Arjomandi, A. (2022). Economic policy responses to the COVID-19 pandemic and growth of nonperforming loans. *International Review of Finance*, 22(3), 551-566.
- Herispon, H. (2018). *FINANCIAL LITERACY, DEBT AND ITS BENEFITS IN HOUSEHOLD LIFE*. Herispon Academy of Finance and Banking Riau.
- Hunh A.A., Parker A.M., and Yoong J.K. (2009). Defining and measuring financial literacy. RAND Working Paper Series No 708.
- Huston. (2010). Measuring Financial Literacy. *Journal of Consumer Affairs*, 296-316.
- Lusard, A. (2008). Increasing the effectiveness of financial education in workplace. *International Conference on Financial Education, U.S. Department of the Treasury and OECD*.
- Lusardi, A.M., and Mitchell, O. (2007). Financial literacy and retirement planning: Evidence and implications for financial education. *Journal of Business Economics*, 35-44.
- Lusardi, Annamaria., Mitchell, Olivia S. (2014, March). The Economic Importance of Financial Literacy: Theory and Evidence. *Journal of Economic Literature*, LII(52(1)), 5-44.
- Lusardi, A. (2019). Financial literacy and the need for financial education: evidence and implications. *Swiss*

- Journal of Economics and Statistics, 155(1), 1-8.
- Meta Brown., John Grigsby., Wilbeert van der Klaauw., Jaya Wen and Basit Zafar. (2016). Financial Education and Debt Behavior of the Young. *The Society for Financial Studies*.
- Organization for Economic Cooperation and Development. (2017). *G20/OECD INFE report on adult financial literacy in G20 Countries*.
- Ogbebor, O., & Ighodaro, C. A. (2017). Macroeconomic Determinants of Non-Performing Loans of Deposit Money Banks in Selected African Countries. *Nigerian Journal of Social Sciences*, 13(2).
- Xu, S., Yang, Z., Ali, S. T., Li, Y., & Cui, J. (2022). Does financial literacy affect household financial behavior? The role of limited attention. *Frontiers in Psychology*, 13, 906153.