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INCOME DISTRIBUTION AND HOUSEHOLD DEBT; MACROECONOMICS OF KEEPING UP WITH THE JONESES.

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the Research Project contains no material previously published or written by another person except where due reference is made in the Research Project itself.

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ABSTRACT.

The purpose of this study is to examine the factors that affect household debt. The variable of interest is income inequality and its effect on household debt. The paper uses the generalized method of moments (GMM) method to estimate the relationship between household debt and income distribution. Time series data is used for the period between 1980-2015. The study also examines other factors that affect household debt such as lending rates, growth in income rates, unemployment rates and gross domestic product per capita rates. The theoretical framework focuses on the permanent income hypothesis and consumption smoothing which explains consumer spending throughout his lifetime and we can infer consumer borrowing from this. The main hypothesis of the study is that income distribution affects household debt to a large extent because of the effect of keeping up with the Joneses on individuals. Most of the research done in this area focuses on developed countries and not much has been done on developing countries such as Kenya. The findings in this study can be used by policy makers to better understand the impact of household debt on the economy.

KEY WORDS: Household debt, income distribution, income inequality. income distribution, keeping up with the Joneses.

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CHAPTER ONE; INTRODUCTION.

1.1 Background.

Debt can be classified into three categories; mortgage debt, revolving debt and non-revolving debt (Christen and Morgan, 2005). Mortgage debt is debt created by a mortgage and secured by mortgaged property. Revolving debt is the kind of debt offered by credit cards and is usually an easy way to get credit. Non-revolving debt, also known as installment debt, is debt that one typically repays in regular monthly instalments featuring as fixed amount such as car loans.

Household debt in Kenya in 2015 was 34% of the country's Gross Domestic Product (GDP)[1] and has been on an upward trajectory creating a cause for concern. This continued increase in personal debt can be attributed to many factors, Munyoki and Okech (2012), such as interest rates and expectations of future increase in income. Ease of accessing credit through facilities such as M-shwari in Kenya has also led to an increase in debt. In many developed countries such as The United States of America, buying goods on credit is the most popular means of payment and this is a trend that is being adopted in the Kenyan market. More and more people are taking up loans to finance their daily expenditure creating a need to find out the main drivers of increased personal debt in Kenya (Munyoki and Okech, 2012).

One of the main drivers of Household debt is income inequality (Ryoo and Yun, 2013). Income inequality is the extent to which income is distributed in an uneven manner among a population. Corrado Gini (1921), invented the Gini coefficient which measures the inequality among values of a frequency distribution for example levels of income. The measure varies between '0' reflecting complete equality and '1' indicating complete inequality. Pressman and Scott (2009) define the Gini coefficient as the ratio of income received by the top 10 percent of households' relative to the bottom 10 percent. It is a great measure of income inequalities but it is relatively insensitive to changes in income at the top of the distribution and it doesn't capture changing income rising concentration at the top of the distribution. The Gini coefficient in Kenya is 0.445 reflecting a high level of inequality[2]. Figure 1 below shows the Gini coefficient and household debt data in Kenya from 1976 to 1999. The trend shows that there is probable relationship between income inequality and household debt in Kenya.

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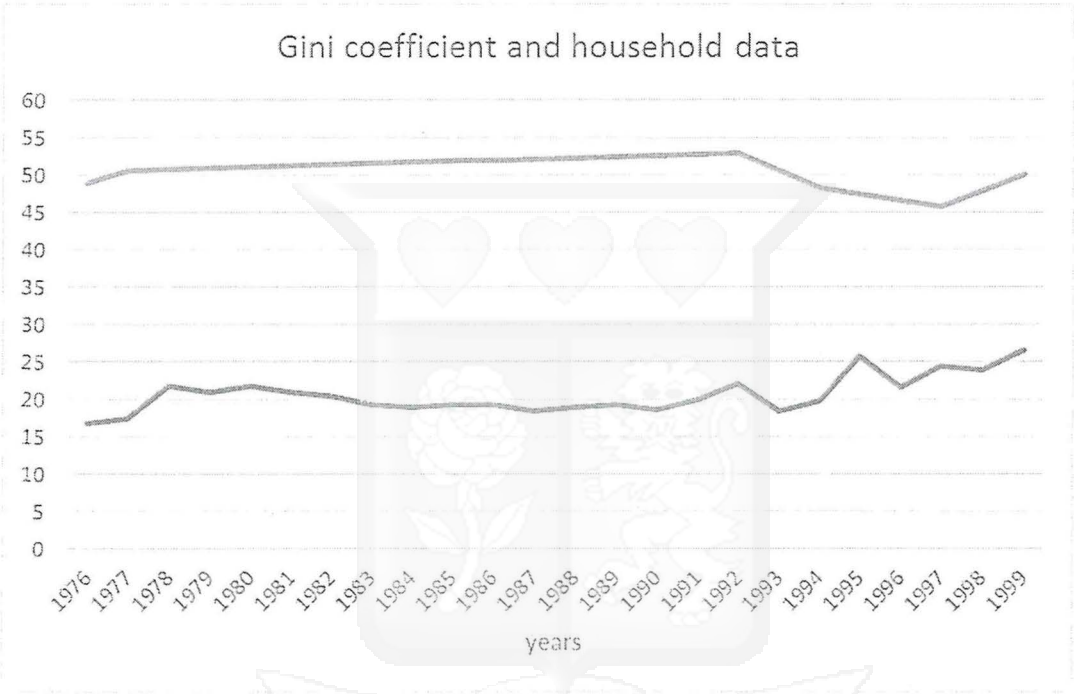
[1] Source; World bank website, 2017.

[2] http://inequalities.sidint.net/kenya/abridged/gini-coefficient/

Fast economic growth in economies widens income inequality (Yun, 2012). This is a possible explanation of the growth in income inequalities in Kenya. This increased income inequality contributes to increased consumer borrowing and this is because of conspicuous consumption (Christen and Morgan, 2005).

Figure 1 Gini coefficient and household data



Source; World bank and povcal.net data,2017

Veblen (1991) states that conspicuous consumption of valuable goods is a means of reputability to the gentlemen of leisure. Conspicuous consumption is a phenomenon that has forced consumers with smaller incomes to use debt to keep up their consumption levels relative to consumers with larger incomes (Christen and Morgan, 2005). This concept is what is referred to as 'Keeping up with the Joneses' which is to always want to own the same expensive objects and do the same things as one's friends or neighbors because one is worried about seeming less important socially than they are (Ryoo and Yun, 2013). Therefore, one strives beyond their means to keep up socially and financially with others in one's social circle or neighborhood. Tsoukis (2007) further explains the aspects of 'keeping up' and 'catching up' with the joneses to have the same meaning as explained above. Households care about their relative position in the

economy, that is, they want to catch up with the Joneses and are willing to take a loan to do so (Konig and Grobl, 2014). This is a trend that can be seen in the Kenyan economy today.

There are many drivers of personal borrowing. The main argument for the increase in personal debt stems from the permanent income hypothesis (Friedman, 1957). This explains that people smooth consumption in their early life because they expect larger incomes in their future. Therefore, they use debt for consumption expecting to earn more in future. The problem with this theory in the modern age is that people tend to borrow for luxury items and live beyond their means and are later unable to pay for their debts. A household cannot consume more than the sum of the present discounted value of its labor income and its current net worth (Christen and Morgan, 2005).

The effect of consumer borrowing on economies has been viewed by many researchers to be a blind spot (Christen and Morgan, 2005; Tsoukis, 2007; Yun, 2012). This is because of its varied effects on the economy. On one hand, increase in consumer borrowing increases the money supply in the economy which boosts consumption and increases the Gross Domestic Product (GDP). On the other hand, an increase in money supply increases inflation among other challenges such as personal distress when one is unable to repay a loan. A conclusive agreement is yet to be reached from an empirical perspective. This further creates the need to evaluate the factors that affect personal debt in Kenya and the effect on the economy.

1.2 Problem statement.

According to Christen and Morgan (2005) and Yun (2015), income inequality is the main factor that drives household debt. Household debt is important because it enables households to acquire goods and services when needed and pay for them later and this boosts consumption growth (Kapeller and Schutz, 2012).

Despite the positive impact of household debt, its continued increase driven by income inequalities can be unsustainable in future (Tsoukis, 2007). Increased household debt ultimately leads to financial fragility and a higher likelihood of a financial crisis (Coibion, Gorodnichenko, Kudlyak and Mondragon, 2014). Other consequences of increased household debt include a decline in household savings rate, Aldo and Massimo (2009), and a further increase in income inequalities (Kapeller and Schutz, 2012). This has created the need to examine the factors that drive household debt in Kenya.

This study is further informed by the fact that studies done in this field have been done mostly in developed countries such as The United States of America, (Christen and Morgan, 2005; Zezza, 2010; Pressman and Scott, 2009) creating the need to conduct the study in a developing country because the macroeconomic dynamics of the two economies differ. As a result of this, there is need to take a closer look at household debt in Kenya and its root drivers.

1.3 Research question.

- Is there a relationship between income inequalities and household debt in Kenya?

1.4 Research objective.

- To determine the relationship between income inequalities and household debt in Kenya.

1.5 Research hypotheses.

- There is a positive relationship between income inequalities and household debt.

1.6 Significance and contribution of the research.

This study investigates the impact of income inequalities on household debt and its impact on the Kenyan economy. The significance of this research is to inform policy on various aspects of household debt and income inequality. Sustainable growth path cannot be achieved unless action is taken to revert to an income distribution which allows for sustainable growth in the living standards of the median household. Focus should be directed on formulating policy which promotes economic growth with wide spread effects across all income level especially those who are at the lower quartile. There is need for policies that would help stabilize financial systems and prevent instability while dealing with income inequality. This study seeks to contribute to existing literature by focusing on a developing country, Kenya, because most of the research done in this area has been done on developed countries such as The United States of America. The results of this study will be able to be compared with results of other studies done in developed countries with different macroeconomic dynamics.

CHAPTER TWO; LITERATURE REVIEW.

2.1 Theoretical literature review.

2.1.1 Permanent income theory.

The permanent income hypothesis was advanced by Milton Friedman (1957). He explains that households spend money at a level consistent with their expected long-term average income. Households will only save if their current income is higher than the anticipated level of permanent income and borrow when their income is lower than their anticipated level of consumption. This implies that changes in consumer behavior are not predictable and depend on individual expectations. Its implications on economic policies are that even an increase in income in the economy influenced by economic policies may not result in increased consumer spending until workers adjust their expectations about future incomes. The main insight of the model is that households' smooth consumption levels during their lifespan.

This model, however, focuses on demand-side determinants of household borrowing and treats the supply of funds as perfectly elastic. Households face liquidity constraints and the structure of the lending market have a significant effect on the extent of household borrowing (Christen and Morgan, 2005).

2.1.2 Life cycle hypothesis.

This theory was advanced by Modigliani and Brumberg in 1954. The life-cycle hypothesis suggests that individuals plan their consumption and savings behavior over their life-cycle. They intend to even out their consumption in the best possible manner over their entire lifetimes, doing so by accumulating when they earn and dis-saving when they are retired. Their saving and spending behavior adjusts so that their consumption does not fluctuate across the stage of their life. It assumes that the household has unlimited ability to borrow, there is no risk of default associated with holding debt, the cost of borrowing does not vary, and households have perfect foresight about their future non-fluctuating earnings. These assumptions are not true in reality.

Tobin (1967) advanced the theory and suggested that in the early stages of a life-cycle, a household might borrow up to levels that would make its current net worth negative to afford the costs of living. According to Tobin's variant of the life-cycle model, it is optimal for younger individuals to borrow and attain a higher level of consumption than one allowed by their income. The idea is that younger households would expect their productivity and earnings to increase in

the future. As the household ages, its income exceeds its consumption requirements, resulting in an increasingly positive net worth. The increased income that comes with middle age will allow the household to pay off its early life's debts and accumulate savings for retirement as it would in the standard version of the model.

2.1.3 Consumption smoothing.

Consumption smoothing refers to the way in which people try to optimize their lifetime standard of living by ensuring a proper balance of spending and saving during the different phases of their life[3]. Some households may choose to borrow and over spend while putting off savings to enjoy a higher standard of living.

Household debt occurs mostly due to consumption smoothing. For households to achieve maximum utility, they rearrange their income flows over their whole life to smooth consumption. This helps agents to smoothen their consumption when there is unsteady and erratic income flow. Households would tend to borrow to fund current consumption in periods when income is low, relative to average income over their lifetime, with a view to then repaying the loans in periods when income will be high, relative to average lifetime income (Aldo and Massimo, 2009).

2.1.4 Theoretical approaches to income inequality.

Income inequality theories can be divided into two main traditions, quantitative and structural theories. (Guidetti and Rehbein, 2014). The quantitative tradition is linked to the development of economics and has focused on relation between inequality and growth. A free market for goods and labour leads to an increasing division of labour and thereby to economic growth. The overall product is distributed among the population so that everyone profits from this growth. However, the product is distributed not equally but proportionately and this leads to income inequalities in the economy. The main argument in this theory is that inequality exists and persists because different social groups have unequal access to socially relevant resources and power. This unequal distribution persists because each generation passes on its resources to the next, so that power and resources remain in the family remain with wealthy families. The structural approach deals with the basis of class divisions in the society. In unequal societies, only some segments of

[3] https://www.cffc.org.nz/assets/Documents/Retirement-Income-Position-Paper-6-Lifetime-Consumption-Smoothing-2012.pdf

society perform interaction with the world as labour, while others reap the profits without having to perform labour. Against this background, inequality is merely the surface of the invisible structure, which consists in the unequal distribution of capital and labour. Both theories explain the existence of income inequalities in economies.

2.2 Empirical literature review

2.2.1 Income distribution and household debt.

The most influential research done in this field, arguably, is the research done by Christen and Morgan (2005) in the US using OLS regression models in which the study shows that rising income inequality has substantially contributed to increased consumer borrowing. The study finds that income inequality affects all components of total household debt but the impact is strongest on non-revolving debt (installment loans) which is used to finance the purchase of consumer durables. The study argues and provides evidence that the income inequality effect on consumer borrowing is a result of conspicuous consumption. Rising income inequality has forced households with smaller income gains to use debt to keep up their consumption level relative to households with larger income gains. The study analyzes different types of debt separately and show the effect of income distribution on them. It also confirms the existence of a positive relationship between income inequality and household indebtedness beyond what is predicted by the standard life-cycle/permanent-income model. This is important as it involves theoretical literature in the model used.

Another study done in the US that distinguished the long run and short run effects of income inequality was done by Iacoviello (2008). The study used data in the US from 1963-2003 using a modified stochastic growth model to establish the trend and cyclical behavior of household debt and the diverging patterns in consumption and wealth inequality over time. The study finds that short run changes in household debt can be explained by business cycle fluctuations (Iacoviello, 2008). During recessions, people tend to borrow more to smooth out their consumption. At cyclical frequencies, household debt moves together with economic activity. At an aggregate level, changes in household debt can be explained by macroeconomic developments (Iacoviello, 2008). As macroeconomic developments occur within a country, financial systems allocate resources better between those who have funds and those in need of them thus those who need credit can easily access them. This has a positive relationship with a countries economic activity.

Long run changes in household debt can be explained by the concurrent increase in income inequality (Iacoviello, 2008). Credit constraints also affect cyclicality of debt behavior. In good economic times, credit agents lend more and credit constrained borrowers can borrow more (Iacoviello, 2008). This research was important in distinguishing the short term and long-term factors that affect household debt.

In the USA, the highest debt-to-income ratios are found at low and middle-income sections of the distribution (Aldo and Massimo, 2009). This debt is mostly credit card and non-bank debt which is highest among low income households. Rising household debt can be viewed as the outcome of persistent changes in income distribution and growing income inequalities (Aldo and Massimo, 2009). Households may go into debt to keep up with the consumption of their neighbors, some of whom have seen rising income levels with increases in income inequality. The state of unequal income distribution between workers and rentiers[4] , for example, leads to consumption inequality which triggers the workers' desire to emulate rentiers. This raises the workers' borrowing and stimulates aggregate demand. An increase in aggregate demand shifts income distribution in favor of rentiers which leads to the decline in the workers' income share and their consumption. Households ability to extract equity from the value of their houses exerts positive impact on consumer expenditure and consumer borrowing (Aldo and Massimo, 2009). This is because the houses serve as collateral for borrowing and this increased indebtedness as households borrow more. In the U.S., the increase in income inequality experienced over the past 25 years has not been accompanied by a corresponding increase in consumption inequality (Aldo and Massimo, 2009). Consumption rates rise even when there in income inequality because of the inelasticity of consumption with respect to reductions in households' real incomes, the availability of new goods and services, the drive for a continuous rise in the standard of living and imitation of the upper classes (Aldo and Massimo, 2009).

Pressman and Scott (2009) use data from the Survey of Consumer finances from 1983-2005 to test the relationship between consumer debt and poverty and inequality in the US on different types of credit loans. The study shows that a possible reason of increased indebtedness is slow growth in real wages and real incomes. Income inequality growth would then spur work effort and an entrepreneurship spirit leading to more innovations to increase households' income

[4] A rentier is a person living on income from property or investments.

(Pressman and Scott, 2009). The study argues that income inequality contributes to economic growth and rising living standards but to know the true impact of greater inequalities on economic growth, health and crime, the measures of inequalities should be redone to take interest payments on consumer debt into account. This serves as the main contribution to this topic.

The study done by Coibion et al (2014) suggests a hypothesis for the dramatic rise in household borrowing that preceded the financial crisis is that low-income households increased their demand for credit to finance higher consumption expenditures to "keep up" with higher income households. Using household level data on debt accumulation during 2001-2012 using OLS estimation, they show that low-income households in high-inequality regions accumulated less debt relative to income than their counterparts in lower-inequality regions, which negates the hypothesis (Coibion, et al.,2014). The study finds that banks ultimately channel more credit toward lower-income applicants in low-inequality regions than high-inequality regions. Banks are most likely to channel relatively more credit to low-income applicants when the level of local inequality is low. Lower-income mortgage applicants in high inequality regions are rejected more frequently and pay higher mortgage rates than similar applicants in low-inequality regions. The study uses data over the course of the 2000s in the US and construct local income inequality measures which are important in accurately describing the income distribution of the region.

Ryoo and Kim (2014) extend Kaldor's theory of income distribution to include workers' debt accumulation and their motive to emulate rentiers' consumption. Their results show that (i) the interaction between income distribution and emulation can produce instability and (ii) instability is more likely when the workers' emulation motive is strong and bankers' lending decisions are highly accommodating. This makes households to rely more on debt financing to maintain their lifestyles as the cost of living and expenses for essential goods and services such as housing prices, medical and education costs and inflation continue to increase over time (Ryoo and Kim, 2014). Availability of credit leads to an expansion of credit supply and an increase in household debt. Household debt might not have grown to the unprecedented level it is now if not for the profound changes in the financial sector (Ryoo and Kim, 2014). The introduction of new financial products and practices has reduced lending standards and provided easier access to consumer loans. This is true especially in Kenya with the introduction of mobile money and

services such as Mshwari. Deterioration of lending standards securitization and financial deregulation has promoted the access to credit. Financial sector therefore plays an important role.

Thompson (2016) looks at the consequence of rising concentration of income at the top of the distribution as increased borrowing. The paper uses an OLS regression for data form 1697-2013 in the US. The following are his findings; When financial institutions use income inequality information in a region to help them target credit, it affects credit accessibility of the middle and low-income earners (Thomson, 2016). Rising top incomes fuel increased housing consumption at the top, which in turn inspires debt-financed housing consumption further down the distribution. Rising disposable income at the top of the distribution could help to bid up the price of land and housing in affluent neighborhoods which further increases household debt to finance housing (Thomson, 2016). Low-income households in high-inequality areas accumulate less debt and have lower credit limits than their low-income counterparts in areas with lower inequality (Thomson, 2016). The study also finds a positive relationship between income distribution and increased borrowing. This paper contributes to literature as it divides the distribution into quartiles and analyzes them separately.

Loschiavo (2016) research question was on whether regional income inequality affect a household's likelihood of being indebted. This question is addressed by using survey data on Italian households from 2004-2012 through various regression models. The analysis shows that inequality in the regional income distribution has a negative effect on the probability of being indebted. In addition, richer households living in regions with greater income inequality have a greater likelihood of being indebted than similarly rich households residing in regions with low income inequality (and vice versa for poorer households). This is because banks may use their local income inequality and a household's position in the income distribution to make inferences about an applicant's underlying default risk. The more unequal a region, the more the indebted households are concentrated among the richer ones (Loschiavo, 2016). This study was important as it introduced the importance of financial intermediaries in determining household debt.

Wildauer (2016) investigates factors driving US household borrowing up to 2007 using a household debt accumulation function and regression. He contributes to literature by examining the impact of shifts in income distribution and asset prices on household borrowing. In the U.S the interaction of rising asset prices and the polarization of the income distribution explains a

large part of the increase in household borrowing before the crisis in 2008 (Wildauer, 2016). The findings indicate that it is the interaction between the concentration of income at the top of the distribution and rising real estate prices which explains a large fraction of the increase in household borrowing prior to 2008. The research analyzed the role of distribution and asset prices together rather than separately which is a flaw as it is important in determining the relationship of the variables to one another.

Soh, Chong and Chuah (2016) sought to find out if the different types of household credit affect income growth and income inequality differently in Malaysia using different regression models for data from 1997-2015. The study finds that different types of household credit matters. On income growth, both macro- and micro-analyses consistently find housing credit to be positively associated with future income growth, while consumption credit shows no significant evidence. On income inequality at the macro-level, housing credit in terms of total net disbursements is positively related to income inequality. However, the micro-level data, which investigate the proportion of households with housing loans, find a negative relationship with income inequality. This implies that financial inclusion that improves access to housing credit for more households would likely reduce income inequality and further accumulation of housing credit for existing borrowers may worsen income inequality given the likely concentration of housing wealth among richer households (Soh, Chong and Chuah, 2016). This is important to literature as it analyses macro and micro level data separately.

In the research by Afzanizam et al (2017) the Generalized Methods of Moments (GMM) technique is employed for 55 countries and covers the period from 2000 to 2012. The results showed that there is a significant positive relationship between income gap and household debt. In addition, the level of indebtedness is deemed to be persistent throughout our sample countries, suggesting that households will remain in debt-trap. They conclude that household debt is highly influenced by macroeconomic stability, financial sector development, and government policies (Afzanizam, et al., 2017).

2.2.2 Household debt and the economy.

A rise in inequality driven by an increase in the share of income going to those at the top of the income distribution induces the latter to save more which lowers interest rates and induces poorer households to borrow more. This ultimately leads to more financial fragility and a higher

likelihood of a financial crisis (Coibion, et al.,2014). In the USA, household debt outstanding as a share of GDP increased from about 45 per cent in 1975 to nearly 100 per cent in 2006 in the USA (Ryoo and Kim, 2014). This rapid accumulation of household debt was unsustainable which is evidenced by the Great Recession. Prior to the crisis, financial markets allowed the private sector to finance expenditure beyond real disposable income and provided a powerful channel for the globalization of the crisis (Zezza, 2010).

The rise of inequality may affect macroeconomic evolution. If consumption grows less than proportionally with wealth, that is the rich consume relatively less with respect to wealth than the poor, then increasing inequality may result in insufficient aggregate demand (Russo, Riccetti and Gallegati, 2016).

2.3 Summary of the empirical literature review.

The main finding in the empirical literature review is that income inequalities affect household borrowing (Ryoo and Kim, 2014; Afzanizam, et al., 2017; Wildauer, 2016; Christen and Morgan, 2005). The studies have been conducted in developing countries and the development of financial institutions has greatly impacted this finding (Iacoviello, 2008). Wildauer (2016) finds that a redistribution of income towards the top reduces aggregate consumption but as long as the financial sector accommodates households' demand for credit a positive relationship between income inequality and consumption is possible. Mathias and Krause find a positive correlation of consumer credit with consumption and labor, while there is a negative co-movement between consumer credit and the real wage. The study shows that if real wage growth is slower than consumption growth then income inequality and household debt will continue to increase in the economy.

2.4 Research gap.

Most of the studies conducted have been done on developed countries and little research has been done on Developing or emerging economies. Research done on Kenya will contribute to related literature in a developing country and a comparison will be able to be drawn between results obtained in a developed and developing country.

CHAPTER THREE; METHODOLOGY.

3.1 Introduction.

This chapter presents the methodology for the study. The purpose of this paper was to find out the impact of income inequalities on household debt. The methodology follows the structure by (Afzanizam, et al., 2017).

3.2 Research design.

The research employs a quantitative approach to test the research hypotheses. The study uses panel data for the period between 1980-2015. The variables used are household debt, growth in personal income rates, GDP per capita, lending rates, unemployment rates and credit ratio. Data is collected from secondary sources including the World bank, the IMF database and povcal.net database. A GMM model is used to test the impact of various variables to household debt.

3.3 Population and sample of study.

This study focuses on a developing country, Kenya. The data analyzed is for the years between 1960-2015.

3.4 Model specification and estimation.

3.4.1 Theoretical underpinning.

Generalized method of moments (GMM) is a general estimation principle. Estimators are derived from so-called moment conditions. Many estimators can be seen as special cases of GMM and a unifying framework for comparison. Maximum likelihood estimators have the smallest variance in the class of consistent and asymptotically normal estimators but there is need a full description of the distribution and correct specification. GMM is an alternative based on minimal assumptions. GMM estimation is often possible where a likelihood analysis is extremely difficult. There is need for only a partial specification of the model. Models used are for rational expectations.

3.4.2 Justification of model.

The GMM model was chosen for a variety of reasons. The GMM model when used as a combination of two differential models can reduce biases and imprecision associated with the difference estimator. Also, the GMM estimators can be applied in one and two step variants. The two-step estimator is asymptotically more efficient than the one-step estimator and this is useful

in achieving precise results. In this paper, we will use several variants of the GMM which is particularly important for the present study given the small size of the sample.

3.4.5 Variables.

Definition and measurement of variables.

Figure 2 Variable definition

VARIABLE	DEFINITION AND MEASUREMENT
HOUSEHOLD DEBT	It is the dependent variable. It is defined as the amount of money that households owe financial institutions.
GINI COEFFICIENT	It measures the extent of income gap between high and low-income level. Where the coefficient is rising, it means the income gap between the low and high-income earners are generally widening. It is expected that an increase in income inequalities will result in an increase in household debt.
CREDIT RATIO	This is data on private sector credit to GDP ratio. It is expected that the credit ratio and household debt have a positive relationship.
LENDING RATE	This represent the cost of borrowing whenever households decide to incur liabilities which need to be paid together with the principle amount. It is expected that an increase in lending rates leads to a decrease in household debt.
GDP PER CAPITA	The GDP is an indicator of a country's economic state. An increase in GDP per capita would cause an increase in household debt.
UNEMPLOYMENT RATES	This serves as a signal to development in

	labour market. Lower unemployment rate will lead to higher household debt as labour market is in good condition.
GROWTH IN PERSONAL INCOME RATES	It is expected that growth in personal income rates leads to a greater expectation of future income growth rates and this leads to an increase in household debt.

3.4.6 Empirical model.

The model to be used is the generalized method of moments (GMM).

The model to be estimated is;

$$Y_{it=}\alpha Y_{it} - 1 + \beta X'_{it} + \mu_{it}$$

Whereby,

Y_{it} = Household debt as percentage of GDP

$Y_{it}-1$ = Household debt as percentage of GDP in the previous period

and X'_{it} will include:

X_1 = Gini coefficient

X_2 = Credit ratio

X_3 = GDP per capita

X_4 = Lending rate

X_5= Unemployment rate

X_6 = growth in personal income rates

μ_{it}= the error terms.

Similarly, the equation can be written as:

$Y_{it}= \alpha Y_{i,t}-1+\beta 1 gini_{i,t} + \beta 2 x'_{it}+\varepsilon_{i,t}$

where Y is household debt as percentage of GDP, x represents a set of controlling variables which affect household debt and ε is the error term.

3.5. Data Analysis.

The data is analyzed using the Geometric method of moments (GMM) methodology. The regression equation used is highlighted in the section above. In the above equation, the lagged value of household debt is added to the regression equation so as to capture the sensitivity of current household debt to previous levels of debt.

Endogeneity in the variables is caused by the simultaneity bias. To correct the simultaneity bias and correlation in the model, lagged regressors are used as instruments. This is because the lags of the explanatory variables are exogenous although they are weakly exogeneous. The shortcoming of this method of estimation is that using weak instruments could lead to biased parameter estimates in small samples and larger variance (Afzanizam, et al., 2017).

Below are some of the moment conditions produced;

$$E\left[Y_{i,t-s}.(\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \text{ for } s \geq 2;\ t = 3,\ldots,T$$

$$E\left[gini_{i,t-s}.(\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \text{ for } s \geq 2;\ t = 3,\ldots,T$$

$$E\left[X_{i,t-s}.(\varepsilon_{i,t} - \varepsilon_{i,t-1})\right] = 0 \text{ for } s \geq 2;\ t = 3,\ldots,T$$

GMM estimators are applied in one and two step models. In this model, the two step GMM method is applied as it is asymptotically more efficient than the one step estimator. This is because in the two-step approach, the numbers of equations and parameters in the nonlinear step do not grow with the number of perfectly measured regressors which confers a computational simplicity (Erickson & Whited, 2002). Also, the two-step estimator uses optimal weight matrices where the moment conditions are weighted by a consistent estimate of their covariance matrix while the one step estimator use weighting matrices that are independent of estimated parameters (Afzanizam, et al., 2017).

Diagnostic tests such as tests for stationarity and causality tests were carried out prior to the time series regression analysis. Sargan and Hansen tests were also carried out to test for over identification in the model.

CHAPTER FOUR; RESULTS AND DISCUSSIONS.

4.1. Introduction.

This section highlights the results obtained from the data analysis. It also includes a summary of the descriptive analysis of all the variables that were used in the study.

4.2. Descriptive statistics.

Table 1 below highlights the descriptive statistics of the variables used in the study. The variables include, household debt as a percentage of GDP, the Gini coefficient, credit ratio, lending rate, GDP per capita, unemployment rates and growth in personal income rates.

Table 1; Descriptive statistics.

	Mean	Median	Standard Deviation	minimum	maximum
Household debt (%of GDP)	32.49556	34.92687	8.5554	12.02212	45.38235
Gini Coefficient	57.71	59	8.880283	38	70
Credit Ratio (%of GDP)	21.20323	20.19755	5.752758	11.80493	34.37524
Lending rate (%)	16.78479	14.90227	6.790862	9	36.24
GDP per capita	444.3384	365.9748	347.9653	94.83526	1455.36
Unemployment rates	10.68519	10.7	1.103736	8.1	12.2
Growth in personal income rates	1.268005	1.709688	2.483197	-4.73578	5.230007

From the table above, it is clear that Kenya exhibits high income inequality rates that is evidenced by the Gini coefficient with a mean of 57.71. The large difference between the minimum and maximum values of the Gini coefficient show its immense fluctuation over the years. The Gini coefficient and household debt exhibit high standard deviation which further shows high fluctuations of the variables. The lending rate in Kenya also shows large variability with its highest value being 36.24% and the lowest value as 9%. The Government of Kenya in 2016 introduced a cap value for lending in Kenya and this will eliminate that variability. This interest rate cap may lead to a decrease in the household debt in Kenya as many banks would not be willing to give loans with low interest rates. The unemployment rates in Kenya have remained

relatively stable over the past years with a mean value of 10.6%. This is a relatively large figure which can be explained by the growing labour force and lack of job opportunities.

4.3. Regression results.

The data was analyzed between 1980 and 2015 with omissions of seven years due to inadequacy of data. GMM model was used and the results are highlighted in table 2 below.

Table 2. Regression Results.

Variable	Coefficient
Household debt L1	0.4971**
Gini coefficient	0.3329**
Credit ratio	0.0972
Unemployment	-0.8973**
GDP per Capita	0.1170
Lending rate	-0.0380**
Income	-0.3491
Constant	8.6987

The significance at 1%, 5% and 10% levels are denoted respectively by *, **, ***.

The coefficient of the lagged household debt was at 0.4971 and is statistically significant at 5%. For every 1% growth in the past debt level, there is a 0.4971% increase in the present debt level. This is consistent with the findings of Deep and Domanski (2002) which explains this in the concept of U.S credit cards. People are allowed to postpone the repayments of balances on their cards and he/she uses current income. The reason households default is due to usage of too many credit cards.

The Gini index coefficient is 0.3329. This means that when the Gini index increase by 1 increases household debt by 0.3329%. This is in line with the relationship explained by Christen and Morgan (2005) and Pressman and Scott (2009). This supports the hypothesis that income inequalities are a cause of household debt. Income disparities lead to increase in household indebtedness.

Credit ratio is an insignificant variable. This contradicts the theory that financial development facilitates growth through higher spending by households. This is known as debt led growth. The

Gross domestic product and the growth in incomes are also not statistically significant in explaining household debt.

Unemployment rates are a significant variable in explaining indebtedness of households. It exhibits negative coefficient of 0.8973. This shows that a decline by 1% of unemployment rates lead to an increase in household debt by 0.8973%. Unemployment is an important factor in explaining indebtedness of households. A larger labour market results in more debt accumulated by households. The loan approval process is easier with employment hence more people take up more loans.

The lending rate is also a significant value but it is only significant in the model chosen. The coefficient is -0.038. This means that a 1% decrease in the lending rate increases household debt by 0.038. This shows that interest rate is a tool for managing debt levels of a country. This implies that monetary policy in an economy works well as a mechanism for reducing or increasing debt in an economy. This is in contrast to the findings of White (2014) who suggested that monetary policy is guided by a flawed theory which ultimately led to the crisis in 2007.

4.4 Diagnostic checks.

4.4.1 Sargan-Hansen tests.

The Sargan and Hansen tests are used to test for over- identification in a statistical model.

Ho; overidentifying restrictions are valid.

The p-value obtained was 0.0970 which shows we cannot reject the null hypothesis. Therefore, overidentifying restrictions are valid.

CHAPTER 5; CONCLUSIONS AND RECOMMENDATIONS.

5.1. Conclusion.

This paper aimed to determine the relationship between income inequalities and household debt in Kenya. The methodology used was the Generalized method of moments for data between 1980 and 2015.Earlier studies show that household debt is mainly influenced by income inequalities. The paper analyzes this and also looks at other factors that could influence household debt. The findings show a positive relationship between income inequality and level of household debt in an economy. These results are consistent with the findings of other authors and show that a more uneven distribution of incomes in an economy, the greater the likelihood of an increase in debt accumulated by households in an economy. The findings show that the more unequally distributed incomes are, the more households borrow to keep up with the joneses. We can therefore conclude that widening of the income gap incentivizes households to increase leverage to make purchases and alleviate their status in social circles (Afzanizam, et al., 2017). It was also observed that when people enter into the loan market it is difficult to exit and many stay indebted for long periods of time. It was also shown that lending rates and unemployment rates are significant in determining the level of household debt in an economy. Lower unemployment and lending rates lead to an increase in household indebtedness. This is because with employment, more people have access to credit facilities and lower lending rates incentivizes people to borrow more as the cost of repayment is lower.

5.2. Policy recommendations.

Policies for a more inclusive growth are necessary in reducing household debt significantly. This involves policies that aim at investing in human capital and physical infrastructure to help in reducing income inequalities and lowering household borrowings. There is need to tackle the problem of rising income inequalities to reduce the household debt in an economy. Policies to combat this problem that do not involve government spending or subsidies should be sought. This is because such policies work in the short run but not in the long run. Governments should channel resources towards access to equal opportunities to all its citizens in an effort to reduce income inequalities.

Policies that aim at improving the wages of working citizens are paramount in reducing household debt in Kenya. This would ensure that citizens do not have to depend on debt to

finance their daily needs and lifestyles and therefore reducing the overall debt level in the country.

5.3. Areas of further research.

Further research aimed at finding the optimal level of household indebtedness could would be useful in establishing the right amount of household debt in an economy.

This study does not incorporate household debt decomposition. An assumption about how the money is spent is made in concluding the macroeconomics of keeping up with the joneses is at play. Household debt decomposition will produce more conclusive results and findings.

5.4. Limitations.

Inconsistency in calculating Gini coefficient is a major limitation. Many sources of data provide different estimates for the Gini coefficients of countries which creates a major problem in estimation. This could also be a result of inconsistent data through time.

The unavailability of data on debt decomposition is a major limitation of the study. The decomposition of what households spend money acquired through debt would provide better insight in determining the macroeconomics of keeping up with the joneses.

References

Afzanizam, M., Rashida, A., Sarmidib, T., Hassan, A., Norc, S., & Ghani, N. (2017). Does Income Gap Matter for Household Debt Accumulation? *Institutions and Economies,* 9(1), 1-19.

Agarwal, S., Mikhed, V., & Scholnick, B. (2015). Does Inequality Cause Financial Distress? Evidence from Lottery Winners and Neighboring Bankruptcies. *Unpublished paper.*

Aldo, B., & Massimo, P. (2009). Rising household debt: its causes and macroeconomic implications—a long-period analysis. *Cambridge journal of economics, 33*(1), 113-137.

Barnett, R. C., Bhattacharya, J., & Bunzel, H. (2010). Choosing to keep up with the joneses and income inequality. *Economic theory*, 45(3), 469-496.

Christen , M., & Morgan, R. M. (2005). Keeping Up With the Joneses: Analyzing the Effect of Income Inequality on Consumer Borrowing. *Quantitative marketing and economics, 3*(1), 145-173.

Coibion , O., Gorodnichenko, Y., Kudlyak , M., & Mondragon, J. (2014). Does Greater Inequality Lead to More Household Borrowing? New Evidence from Household Data (No. w19850). *National Bureau of Economic Research.*

Erickson, T., & Whited, T. M. (2002). Two-step GMM estimation of the errors-in-variables model using high-order moments. *Econometric Theory, 18*, 776-799.

Daly, M., & May, W. (2006). Keeping up with the Joneses and staying Ahead of the Smiths; Evidence from Suicide data. *Federal reserve bank of San Francisco.* Working paper 2006-12.

Friedman, M. (1957). The permanent income hypothesis. *Princeton University Press,* 48(5), 990 991.

Gini, C. (1921). Measurement of inequality of incomes. *The Economic Journal*, 31(121), 124-126.

Guidetti, G., & Rehbein (2014). Theoretical Approaches to Inequality in Economics and Sociology;A Preliminary Assessment. *Transcience,* 5(1), 1-15.

Iacoviello, M. (2008). Household debt and income inequality. *Journal of Money, Credit and Banking*, 40(5), 929-965.

K, K. Y. (2012). Emulation and Consumer Debt: Implications of Keeping Up with the Joneses.*Trinity college, Department of economics.* Working paper 1208.

Kapeller, J., & Schutz, B. (2012). Conspicuous consumption, inequality and debt:The nature of consumption-driven profit-led regimes.*Metroeconomia,* 66(1), 51-70.

Konig, N., & Grobl, I. (2014). Catching up with the Joneses and Borrowing Constraints: An Agent-based Analysis of Household Debt (No. 4/2014) DEP (Socioeconomics) Discussion papers, *Macroeconomics and Finance Series.*

Loschiavo, D. (2016). Household debt and income inequality: evidence from Italian survey data. *Banca d'italia Eurosistema.*

Mathias, K., & Krause, C. (n.d.). (2014). Income Redistribution, Consumer Credit and Keeping up with the Riches. *Unpublished paper.*

Munyoki, I., & Okech, T. C. (2012). Empirical Analysis of Personal Debt among the Youth in Kenya; The case of Graduate students in Kenyan Universities. *International journal of academic research in economics and management science,* 1(4), 2226-3624

Pressman, S., & Scott, R. (2009). Consumer debt and the measurement of poverty and inequality in the us. *Review of social economy, 67*(2), 127-148.

Russo, A., Riccetti, L., & Gallegati, M. (n.d.) (2016). Increasing Inequality, Consumer Credit and Financial Fragility in an Agent Based Macroeconomic Model.*Journal of Evolutionary Economics,* 26(1), 25-47.

Ryoo, S., & Kim, Y. K. (2014). Income distribution, consumer debt and keeping up with the joneses. *Metroeconomia,* 65(4), 585-618.

Soh, J., Chong, A., & Chuah, K.-P. (2016). Household credit, growth and inequality in Malaysia: does the type of credit matter? *Unpublished paper.*

Thomson, J. (2016). Do Rising Top Incomes Lead to Increased Borrowing in the Rest of the distribution? *Finance and economics discussion series*.

Tsoukis, C. (2007). Keeping up with the Joneses, growth and distribution. *Scottish journal of political economy*, 54(4), 575-600.

Veblen, T. (1991). The Theory of the Leisure Class. *Oxford University Press.*

Wildauer, R. (2016). Determinants of us household debt: new evidence from the scf . *Unpublished paper.*

Yun, K. K. (2012). Emulation and Consumer Debt: Implications of Keeping Up with the Joneses. *Trinity college, Department of Economics working paper,* (1208).

Zezza, G. (2010). Income distribution and borrowing; Tracking the U.S economy with a "New Cambridge" model. *The Global Economic Crisis: New Perspectives on the Critique of Economic Theory and Policy. Routledge, London.*