

**EFFECTS OF MACROECONOMIC FACTORS ON INCOME INEQUALITY IN
EAST AFRICA**

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MASTERS OF SCIENCE (FINANCE AND ECONOMICS)

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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ABSTRACT

Stable macroeconomic environment enables achievement of the macro-economic objectives and targets. Therefore, governments should continually focus on stabilizing macroeconomic factors such as interest rates, inflation rates, trade openness and unemployment levels while implementing policies that spur fair distributive economic growth. Generally, inequality in the world with the East African region included has got the attention of development organisations, policy makers and governments as well as citizens. The objective of the study was to establish the impact of macroeconomic factors on income inequality levels in East Africa. The specific objectives of the study were to establish the influence of unemployment, interest rates, international trade openness and inflation on income inequality in East Africa. The study applied a descriptive research design. The study focused on Kenya, Uganda and Tanzania. Data that was utilized in the study was data for forty one years (1975-2015). Secondary data was used in this study. This data was sourced from World Trade Organization, World Bank, Kenya National Bureau of Statistics (KNBS), Uganda Bureau of Statistics, Tanzania National Bureau of Statistics and Institute of Economic Affairs (IEA). Vector Error Correction Model (VECM) was applied for analysis using stata statistical software. The results indicated that in Kenya, inflation had a negative and significant effect on income inequality ($B = -7.31$; $p < 0.05$). Interest rates on the other hand had a significant positive effect on income inequality ($B = 2.8$; $p < 0.05$). Unemployment ($B = 4.13$; $p > 0.05$) and international trade openness ($B = 0.69$; $p > 0.05$) had long term insignificant effect on income inequality. In Uganda, inflation ($B = -.043$; $p < 0.05$), unemployment ($B = -4.13$; $p < 0.05$) and international trade openness ($B = -.498$; $p < 0.05$) had negative and significant effects on income inequality. Interest rates on the other hand had a significant positive effect on income inequality ($B = 0.29$; $p < 0.05$). In Tanzania, inflation ($B = 2.33$; $p < 0.05$) and international trade openness ($B = 1.16$; $p < 0.05$) had significant positive effects on income inequality while unemployment ($B = -13.86$; $p < 0.05$) and interest rates ($B = -1.71$; $p < 0.05$) had significant negative effect on income inequality. The following were the recommendations. First, the three east African governments should institute policies to reduce income inequality. Some of the policies that could be considered include reducing interest rates to enhance aggregate demand, developing the human capital to reduce long term structural unemployment and also lowering the minimum wage so as to deal with real wage unemployment. Secondly, the countries should moderately engage in trade openness by balancing exports and imports ensuring that the balance of trade deficit does not grow. Lastly, the monetary policy organs of the country should carefully analyse the inflation, interest rates and macroeconomic factors to ensure that the expansionary or contractionary policies they adopt lead to the desired outcomes of improving income distribution.

Key words: Income inequality, unemployment, inflation, international trade, interest rates

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TABLE OF CONTENTS

DECLARATION.....	ii
ABSTRACT.....	iii
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENTS	v
DEDICATION.....	vii
LIST OF TABLES	viii
LIST OF FIGURES	ix
ACRONYMS AND ABBREVIATIONS.....	x
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background of the Study	1
1.2 Problem Statement.....	8
1.3 Objectives of the Study	10
1.4 Research Questions	10
1.5 Significance of the Study.....	10
1.6 Limitations of the Study	11
1.7 Basic Assumptions.....	11
CHAPTER TWO	12
LITERATURE REVIEW	12
2.1 Introduction	12
2.2 Theoretical Review.....	12
2.3 Empirical Review	15
2.4 Research Gap.....	23
2.5 Conceptual Framework	24
2.6 Measurement of variables	25
CHAPTER THREE	27
RESEARCH METHODOLOGY	27
3.1 Introduction	27
3.2 Research Design.....	27
3.3 Target Population.....	28
3.4 Data Collection	28
3.5 Model Specification and Data Analysis.....	28
CHAPTER FOUR.....	31
DATA ANALYSIS, FINDINGS AND DISCUSSION	31
4.1 Introduction	31
4.2 Trend of Gini coefficient.....	31
4.3 Pre-Analysis Tests	32
4.4 Vector Error Correction Models	35
CHAPTER FIVE	46
SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	46
5.1 Introduction	46
5.2 Summary of Findings.....	46
5.3 Conclusion.....	48

5.4 Recommendations	49
REFERENCES.....	50
APPENDIX Raw Data.....	55

DEDICATION

I dedicate this thesis to my family and my employer Makueni County Assembly. In addition, I thank the School of Business KCA University for the Support accorded throughout my course. I have been able to acquire wealth of knowledge during my studies at the University.

LIST OF TABLES

TABLE 1 Operationalization of Variables	26
TABLE 2 Correlation Matrix.....	33
TABLE 3 Lag Order Selection Criteria	33
TABLE 4 Dickey Fuller Test for Unit Root	34
TABLE 5 Johansen Cointegration Test	35
TABLE 6 Vector Error Correction Model (Kenya).....	36
TABLE 7 Cointegration Equation (Kenya)	37
TABLE 8 Vector Error Correction Model (Uganda).....	40
TABLE 9 Cointegration Equation (Uganda)	42
TABLE 10 Vector Error Correction Model (Tanzania)	43
TABLE 11 Cointegration Equation (Tanzania).....	44

LIST OF FIGURES

FIGURE 1 Conceptual Framework	25
FIGURE 2 Trend of Gini Coefficient for the Three Countries.....	32

ACRONYMS AND ABBREVIATIONS

CPI	Consumer Price Index
CRA	Commission on Revenue Allocation
FDI	Foreign Direct Investment
FE	Fixed Effects
GDP	Gross Domestic Product
GMM	Generalized of Method Moment
HDR	Human Development Report
IEA	Institute of Economic Affairs
KNBS	Kenya National Bureau of Statistics
NDP	National Development Plan
OECD	Organisation for Economic Cooperation and Development
RE	Random Effects
SID	Society for International Development
UK	United Kingdom
UN	United Nations
US	United states of America

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Income inequality is a global problem. According to Oxfam (2016), the richest one percent in the world has wealth that exceeds what the rest of the world owns. As the world's richest continue to amass more wealth, the bottom of the pyramid continues to get poorer. For instance, Credit Suisse (2015) observed that the wealth possessed by the lowest half of humanity had dropped by a trillion dollars (38%) in the preceding five years. This evidence indicates that the world is experiencing levels of inequality that may not have been experienced in over a century (World Bank, 2015). Oxfam (2016) observed that dealing with inequality is a key factor in the fight against poverty; until inequality is managed, war on poverty is futile.

The most equal countries globally according to the Gini coefficients of 2013 include Denmark, (24.3), Ukraine (24.6), Kazakhstan (26.4) and Moldova (28.5). Notable economic powers like the US have Gini coefficient of 41.1, UK has 32.6, Germany, 39.6 and Italy has 34.0 and China has 47.1. This indicates that income inequality is high in US as compared to most European countries. In Africa, the most unequal countries are Comoros (64.3), South Africa (63.4), Namibia (61.3) and Botswana (60.5). These are also the most unequal countries globally. Regionally, income inequality in Uganda is 39.5, 37.6 in Tanzania, 46.8 in Rwanda 46.0 in South Sudan and 42.4 in Burundi. Kenya's inequality stands at 44.5 (World Bank, 2015).

Inequalities in the developed countries are moderate contrary to the high inequalities experienced in the developing countries (HDR, 2015). Approximately 80% of the world's population had an income less than the average (HDR, 2014). According to Grimm, Harttgen, Klasen, and Misselhorn (2016) inequality measure as a ratio (80/20) of the upper rich quartile

and lower poor quartile is high in Africa. Sub-Saharan Africa's contributes highly to the share of the poorest 20% and in the last 35 years has increased to 36% from 15% (HDR, 2015). These statistics point to a persistent problem those governments all over the world need to address.

The negative effects of income inequality were documented as early as 1930s by Pigou (1932) who posited that income inequality makes people unable to afford essential as well as luxury goods and services. This causes reduction in aggregate demand which lowers overall employment and production down. Hunt and Lautzenheiser (2014) observed that income inequality is a social problem which is destructive to the society. Through decreasing desire for risk taking and incentives for productivity, income inequality hinders long term growth. Moreover, Wilkinson & Pickett (2009) noted that equal societies almost always do better than unequal societies. Furthermore, inequality brings political polarization creating political crisis and weakening the community's social cohesion (Vandemoortele, 2010).

Contributing to the debate on income inequality, Lo (2012) argued that the worsening income inequalities globally have resulted to global economic systems to have 'fault lines' that have greatly increased the likelihood of global crises compared to the past years. The increasing income inequality has made governments to design unsustainable monetary policies to increase financial inclusion and lower reemployment rates. These policies make the global financial system to be more susceptible to financial crises (Moyes, 2012).

Moreover, Pickett and Wilkinson (2011) had earlier postulated that income inequality causes higher rates of health and social problems and lower quality of social goods. Other negative effects of income inequality include low life expectancy, higher rates of social and health problems (for example crime, drug use, obesity, teenage births and mental illness), psychosocial stress, parenting problems and diseases that are related to stress (Attanasi, Hurst &

Pistaferri, 2012). Similarly, Piketty (2014) indicated that income inequality leads to lower level of economic utility and low economic growth in society because resources are diverted to less productive high-end consumption. Considering these negative effects of income inequality, there is need to understand the factors contributing to income inequality so as to design policies that would management income distribution.

This study will focus on income inequality and the macroeconomic factors that play a role in influencing income distribution. Macroeconomic factors are variables that affect the aggregate behaviour and performance of the whole economy. Income inequality (also referred to as wealth gap) relates to the difference in measures of economic well-being amongst individuals in a group, amongst groups in a population, or among countries (Hunt & Lautzenheiser, 2014). Income inequality (mostly measured through Gini coefficient) focus on the disparity in incomes of the population in relation to income, consumption and wealth. A Gini coefficient of 0 depicts percent equality while a Gini coefficient of 100 depicts perfect inequality (World Bank, 2015). For every country that is seeking to provide justice and equity to its people, income inequality and the factors influencing it, is a relevant policy issue (Oxfam, 2016).

According to Keynes (1936), the government has a role to play in order to bring the economy to full employment and stabilize the economy after shocks. Through fiscal policy, monetary policy and supply side policy, the government interventions are indicated as policy goals with targets, key performance indicators, outcome and output. Inequalities depicts disparities in the capabilities enjoyed by individuals that enables them to indulge in what they value (HDR, 2007). Inequality is the disproportionate redistribution of prosperity to the segments of the population and unsustainable progress from generation to generation (World Bank, 2013).

King (2014) posits that unemployment and income inequality have a very high positive relationship. This is because those mostly affected by unemployment are usually on the lower or middle-income bands, rising unemployment hence relates to increasing income inequality. Rising unemployment hence indicates that there will be reduced share of the total income going to the lower and middle bands of the population thereby increasing income inequality (Garcia, Prieto-Alaiz & Simon, 2013).

Jantti and Jenkins (2010) intimate that the relationship that exists between interest rates and income inequality is complex, owing to the varied effects that interest rates can have on the economy. While Jantti and Jenkins found that rising interest rates have no effect on income inequality. Garcia et al. (2013) argue that increase in interest rates result to mechanisms that intensify inequality in developing countries. This is because rising interest rates raise the cost of credit which mostly affects the lower income bands than the upper income bands.

Ohlin (1967) posited that increased trade openness perpetuates income inequality in developing countries but reduces income inequality in developed countries. This is because international trade is skewed against less industrialized countries. Developed countries are better endowed with capital resources to better utilize their human as well as land resources. This makes them better placed to export high net worth products to developing countries while importing cheap agricultural products from developing countries. However, this hypothesis is not supported by some empirical studies (Jackson, 2006).

Inflation is another macroeconomic factor whose relationship with economic inequality has been variously tested. Garcia et al. (2013) intimates that inflation could have a negative effect in income inequality. This is due to the expectation that during times of high inflation, investors mostly prefer investing in financial instruments with high profitability above the

inflation level. Since low income earners have low capacity to invest, they are highly affected by rising interest rates more than those with high incomes. However, inflation can have a positive effect on income inequality. This emanates from the reduction in real debt owed as low-income earners are the mostly indebted. When the real debt is reduced, the real incomes are increased thus reducing the income inequality.

The role played by macroeconomic factors in income equality has been a subject of various discussions, studies and reviews in different countries. In US, Marrero and Rodríguez (2012) established that inflation was found to have a significant and positive effect on inequality of effort. Expenditures of the government on welfare had negative and significant effect on inequality of opportunity. In China, Wang, Wan, and Yang (2014) noted that the driving forces behind rising inequality include bias in policy formulation, geographic factors, effects of globalization and inequity in access to education.

On a multi country study, Dabla-Norris et al. (2015) established that international trade, globalization and technological advancement has fuelled growth but has contributed to increased inequality in various countries. Dabla-Norris and colleagues argued that since macroeconomic factors affects income distribution in different countries in different ways; policies to deal with inequality should be specific to a country and suited to the country's geopolitical, economic and social factors.

Rose (2011) established that there were economic, demographic, macroeconomic and environmental and political factors that play a role in influencing income inequality in transition economies in Central and Eastern Europe. Countries considered in the analysis included Belarus, Estonia, Hungary, Bulgaria, Czech Republic, Latvia, Poland, Lithuania and Moldova. Inflation

was another factor that had a positive relationship with Gini coefficient indicating that increases in inflation can result to increased income inequality.

In assessing the effect of macroeconomic factors on income inequality in 103 developing countries, Garcia, Prieto-Alaizb and Simónc established that GDP growth, real interest rate and employment rate were the macroeconomic elements with great influence in determining personal income spread in developing countries. Another study by Batuo and Asongu (2015) assessed the effect of liberalisation strategies on income inequality in African countries. The authors observed that financial liberalisation had alleviated income inequality in the 26 African countries that were studied. The study also established that trade, exports and international trade openness have lessened income inequalities in those countries. Also noted was that political and institutional liberalisation and economic freedom perpetuates income inequality.

Gakuru and Mathenge (2012) assessed the role of poverty and growth on income distribution in Kenya. Gakuru and Mathenge noted that due to high inequality in Kenya, incentives for growth in manufacturing and agricultural segments largely benefited the richest urban household deciles because they are the owners of most factors of production. The recommendation was that Kenya needed to emphasize not only on economic progress but also on decreasing inequality in order to successfully address the country's poverty.

1.1.1 Income Inequality in East Africa

Statistics show that Kenya's Gini-coefficient is 0.445 reflecting high level of inequality (SID and KNBS, 2013). The rural and the urban Gini coefficients are 0.361 and 0.368 respectively. The difference between rural and urban areas Gini coefficients is small considering that rural areas have proportionally high populations. The top 10% of the population consumption is 20 and 12

times that of the lower 10% of the population in urban and rural areas respectively (World Bank, 2015). This indicates that consumption inequality in urban areas in Kenya is higher than that in rural areas. The top decile of the household controls 42% of the total income while the lowest decile controls less than 1% (SID, 2014). Fifty percent of the 47 counties in Kenya have monthly consumption expenditures less than the Ksh1,440.00. Moreover, income inequality in Kenya is increasing by the day (Omondi, 2014).

Uganda's Gini coefficient stood at 0.443 in 2014. Uganda has improved its income inequality over the years from a high of 0.496 in 1975, to 0.457 in 2002 to the current level of 0.443. Tackling inequality in Uganda entails a comprehensive development framework that puts people's participation in the economic growth process at the centre. People must be viewed as agents of economic growth and transformation and not passive recipients of social services and/or handouts from either development partners or their own government.

During the past two decades Uganda witnessed remarkable increases in income inequality. The Gini coefficient increased from about 0.32 in 1990 to 0.48 in 2012 (World Bank 2015). Bategeka (2013) observed that macroeconomic stability together with market based economics and liberalization were encouraged as the correct policies that enabled Uganda to accomplish the desired optimum levels of income inequality. The state reduced its role in the economy whilst Uganda's spending in the public sector targeted the social sectors. However, after 2002, Uganda's income inequality increased. This was because economic growth in the country was uneven and biased against the agricultural sectors which provides most income to the poor households. The economic growth in Uganda from 2002 to 2014 was buoyed by construction sector and services such as banking, wholesale trade, transport and telecommunications. These sectors grew at an average of 8.8 percent between 2002 and 2014.

These sectors employ less than 15 percent of the population. On the other hand, agriculture grew by 1.5 percent in the same period whilst it employs 70 percent of the population (World Bank 2015).

Despite the focus on the social sector by the government, the inequality in economic growth has not helped alleviate the problem of economic inequality. Bategeka (2013) argues that Uganda has to improve growth in the agriculture sector that supports a majority of the population if it seeks to deal with income inequality. This is more because income inequality between the urban and rural areas is also increasing since the agriculture sectors support more in rural areas than it does in urban areas. The 2010 National Development Plan (NDP) in Uganda seeks to support the poor households to participate in the productive sectors of the economy apart from agriculture (World Bank 2015). However, this seems not to have borne fruit as income inequality continues to rise.

Tanzania has the lowest income inequality in East Africa with a Gini coefficient of 37.8 in 2014. However, this is an increase from 34.6 in 2000 and 33.5 in 1980 (World Bank 2015). Belghith and Zeufack (2015) noted that income inequality in Tanzania has been low due to the government following socialist economic policies. However, as Tanzania seeks to follow market based economic policies, the income inequality is increasing since growth in sectors and distribution of the growth effects to the population is uneven.

1.2 Problem Statement

Stable macroeconomic environment enables achievement of the macro-economic objectives and targets. Therefore, governments should continually focus on stabilizing macroeconomic factors such as interest rates, inflation rates, trade openness and unemployment levels while

implementing policies that spur fair distributive economic growth. This is expected to reduce income inequality, to motivate productivity, increase social cohesion and stimulate long term growth and development (Hunt & Lautzenheiser, 2014).

Generally, inequality in the world with the East African region included has got the attention of development organisations, policy makers and governments as well as citizens. This is because in Kenya, Tanzania and Uganda, despite impressive economic growth, the state of inequality has been worsening (Oxfam, 2016). As Kenya, Tanzania and Uganda seek to reduce poverty through stabilizing macroeconomic factors, this has not proportionately trickled down to the population in an equitable pattern (SID, 2014). Inequality in the region has evolved and currently cross-country regional, gender and ethnic inequalities are widespread and evident (Omondi, 2014).

Various studies conducted have indicated various factors as contribution to income inequality. In US, Marrero and Rodríguez (2012) established that inflation had a significant and positive effect on inequality. In a study on 103 developing countries, Garcia et al. (2013) established that GDP growth, real interest rate and employment rate significantly influenced income inequality in developing countries. These studies were however in contexts that are different from the East African region. Much of research done previously in Kenya on inequality has not focused on the effects of macroeconomic factors influencing inequality (Gakuru and Mathenge, 2012). Many researchers have dwelt on poverty and its relation with inequality (Garcia et al., 2013). Moreover, most studies on causes of inequality are multicountry studies (Dabla-Norris et al., 2015; Rose, 2011) that focus on countries with many differences including geographical, economic and political. As such, the factors related to income inequality in the region need to be analysed to have a basis for effective strategies to deal with the challenge.

1.3 Objectives of the Study

The objective of the study was to establish the impact of macroeconomic factors on income inequality levels in East Africa.

Specific objectives of the study were:

- i. To establish the influence of unemployment on income inequality in East Africa.
- ii. To determine the effect of interest rates on income inequality in East Africa.
- iii. To determine influence of international trade openness on income inequality in East Africa.
- iv. To determine the effect of inflation on income inequality in East Africa.

1.4 Research Questions

- i. What is the effect of unemployment on the level of income inequality in East Africa?
- ii. What is the influence of interest rate on income inequality in East Africa?
- iii. How does international trade openness impact on the level of income inequality in East Africa?
- iv. What is the effect of inflation on the level of income inequality in East Africa?

1.5 Significance of the Study

There were limited empirical studies on role of macroeconomic variables on income inequality. Most of the researchers have concentrated on poverty, growth and inequality. Despite East African region's potential of growth and numerous interventions to achieve an equal society, inequality remains a key challenge and on an upward trend. The global attention has focused on the sustainable development goals adopted by the 67th Assembly of the United Nations.

This study advanced and provided valuable knowledge on goal eight that seeks to promote inclusive and sustainable economic growth, employment and decent work for all. This study seeks to find out the impact of macroeconomic factors on income inequality through reliable and efficient modelling. The findings from the study may be a source of useful information to policy makers on what needs to be focussed on in any policy that seeks to address income inequality.

The findings from the study might also be of importance to students, scholars and researchers. Future researchers may make use of the limitations that will be encountered in this study to make their studies in future more reliable and better designed. For scholars, the study will be an addition to the few studies on macroeconomic factors and their role in income inequality. Lastly, the study provided suggestions for further research that researchers can act upon in future research in the area.

1.6 Limitations of the Study

This study focused on the macroeconomic factors that impacted on the level of income inequality in East Africa. The study's limitation was that there were other factors affecting inequality and the types of inequality differed in East Africa. The findings that were from this study might not explain how macroeconomic factors affected all types of inequality.

1.7 Basic Assumptions

The study made the following assumptions;

- i) Secondary data for the variables was available and reliable.
- ii) The measures applied for the study variables over the time considered in the study were comparable.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Presented in this chapter is the review of literature comprising of theoretical review, empirical literature, research gaps, conceptual framework and measurement of variables. The theoretical review focuses on the theories that were used to provide a strong basis for the study. Empirical review provides a discussion of the various studies that had been conducted relating macroeconomic variables and income inequality. The research gaps that had been realized after a review of empirical studies were also provided. Moreover, the chapter presents the conceptual framework which indicated the relationship that was hypothesized between the independent and dependent variables. Lastly, the chapter presents the indicators that were used in measuring the variables.

2.2 Theoretical Review

This study was based on the Heckscher-Ohlin Theory (Ohlin, 1967), Keynesian economic theory and Marxian economic theory (Wood, 1996). These two theories and how they relate to the study are presented in the following sections.

2.2.1 Heckscher-Ohlin Theory

The Heckscher-Ohlin Theory is a universal stability scientific model of international trade (Ohlin, 1967). The theory posits that countries that are endowed with factors of production are better poised to be more competitive than those countries that are not well endowed with factors of production. The theory hence implies that countries with factors of production such as capital,

natural resources and human capital will be more productive than countries with fewer resources. This will lead the factor endowed countries to be more engaged in export trade.

When countries become open to trade, the countries that benefit more are the ones who are comparatively better in terms of resources. Since developed countries are more industrialized and have better capital resources, they benefit more from trade openness than their developing counterparts. This hence leads to trade openness having a positive effect on income inequality in developing countries while having a negative effect on income inequality in developed countries. This is because there is negative balance of trade in developing countries and a positive balance of trade in developed countries. This theory was used in this study to establish how international trade openness could affect income inequality.

2.2.2 Marxian Economic Theory

Marxian economic theory can be traced back to Karl Marx who was a German philosopher, sociologist, economist, revolutionary and journalist (Wood, 1996). Inequality according to the Marxian theory is brought about by imperfections in the market that are brought about by government and capitalism. Capitalism can cause inefficiencies in allocation of factors of production which the government must correct through fiscal and monetary policies. Distortion in the allocation of resources by capitalistic systems can cause reduced productivity, scarcity of some essential products and hence influence the entire economic system. This can lead to undesirable factors such as inflation, unemployment and high interest rates (Kořakowski, 2005).

Moreover, as capitalistic firms substitute capital equipment for labour, this leads to unemployment thus creating huge disparities between the rich and the poor. This is because capitalistic firms are motivated by profits but not by the welfare of the masses (O'Laughlin,

1975). Most of the actions of capitalistic firms lead to income disparity which the government must intervene to correct (Anderson, 1976). High interest rates on the other hand perpetuate income inequalities by making financial access to the masses expensive. The high-income classes are the only one who can have access to credit when interest rates rise that making returns to be skewed against lower income earners. High inflation makes the money spent on essentials by low income earners to be relatively higher compared to that used by high income earners. This makes the low-income earners to save and invest less thus making fewer returns compared to the rich. In this study therefore, this theory explains the relationship between unemployment, inflation interest rates and income inequality.

2.2.3 Keynesian Economic Theory

Known as the general theory of employment, interest and money, this theory is attributed to John Keynes (Cohn, 2006). According to Arthur (1954), Keynes contributed immensely in creating the basis for macroeconomics. Opposed to the classical economic theory on the ways to stabilise the economy which had failed, Keynesian theory proposition is that market deviates from full employment and the government has to stabilise the economy back to full employment. The economic cycle cannot be left to the markets to stabilise. At times of recession and depression the government reduction in interest rates is justifiable to spur consumer expenditure and investment (Clower, 1965). At boom when the economy is at full employment money supply decrease is necessary to curb inflation. The government is supposed to formulate and implement policies that stimulate the economy towards full employment (Leijonhufvud, 1968). Governments should spend (in public works) to replace the decline in the private sector

expenditure to maintain the economy at full employment. This theory was used in the study to explain how unemployment, inflation and interest rates can influence income inequality.

2.3 Empirical Review

This study provides empirical studies that had been conducted globally, regionally and locally on the effect of macroeconomic variables on income inequality. The gaps that were left by these studies that the study sought to fill are provided. Studies that had been the focus of the empirical review included studies on unemployment, interest rates, inflation and international trade openness.

2.3.1 Unemployment and Income Inequality

Unemployment present unutilised labour factors and deny citizens the right to earn income to support their basic wants. Unemployment can be classified as seasonal, structural, and cyclical and frictional. Governments measure the level of economic activity and health of an economy in terms of the unemployment rate. Bakker and Creedy (2000) conducted a study in New Zealand that sought to establish the macroeconomic variables influencing income distribution and established that the rate of unemployment was significantly influencing modal income and hence increasing income inequality. These findings disagree with findings by Garcia et al. (2013) that levels of employment were associated with increase in income inequality. The study by Garcia and colleagues established that rising employment levels led to increase in income disparity since rising employment led to higher increase in income for higher income bands than for lower income bands.

The proportion of the population facing unemployment experience reduced return to labour reward and invest in education in their life span compared to their peers in employment. In Argentina, González and Menendez (2000) examined the role played by unemployment on labour earnings inequality. The study was focused on the period between 1991 and 1998. The study results indicated that unemployment played a significant role in increase in earnings inequality in Argentina in the nineties. As an economy expands towards full employment, inequality tends to reduce. Another study in US by Saunders (2002) had similar findings as that by González and Menendez (2000). Saunders (2002) established strong evidence that indicated a strong and positive association between unemployment and income inequality.

Countries within the same economic and trade classifications experience different types of inequality. In Australia, Harding and Richardson (2009) investigated the effect of unemployment on income distribution. The study used the 1994/95 survey data on income and housing costs from the Australian Bureau of Statistics. These records contained data for 14 000 adults aged 15 and above from 8 675 households. Study results established that the rise in income disparity in Australia was associated with increasing levels of unemployment. The lower and middle-income groups are the most affected by changes in the labour market due to their high marginal propensity to consume and over-reliance on employment income as oppose to wealth income. Martinez, Ayala and Ruiz-Huerta (2011) studied the effects of unemployment on income inequality in OECD Countries. The study utilized Luxembourg Income Study micro-data. Findings revealed substantial differences across OECD countries. Unemployment increased income disparities with most of the middle and lower income groups being the mostly affected by unemployment.

Income inequality and poverty overlap. Apergis, Dincer and Payne (2011) investigated the dynamics of poverty and income inequality in US states. The study examined the causality between unemployment, poverty and income inequality using a multivariate framework. Panel data set for 50 US states between 1980 and 2004 was used. The results revealed that there was a bidirectional relationship that existed between unemployment and income inequality both in the short and long run.

2.3.2 Interest Rates and Income Inequality

Interest rate levels affect both the level of investment and consumption as well as their distribution patterns across the demographics. Through the monetary policy transmission channel, decrease or low interest rates spur investment and consumption. A study by Garcia et al. (2013) examined the influence of macroeconomic factors on personal income distribution in developing countries. The study applied data for 44 developing countries for 2005. Generalized least squares regression was used to establish the effect of the selected macroeconomic factors on income inequality. The study results revealed that real interest rates had significant positive effect on income inequality. This implied that when real interest rates escalate, income inequality also escalates. This can be explained by the increased diminishing effect that high interest rates have on incomes to lower quartiles than it has for upper quartile incomes. High interest rates affects the poorest more adversely than its affects the rich thus perpetuating income disparity.

Interest rates influence the accessibility and cost of credit which affect the cost of capital and profitability. Decrease in interest rates makes credit affordable for investment by the poor and unemployed entrepreneurial youths, raising their incomes hence reducing income inequality. However the characteristics, level of development and inclusivity of the banking sector also

affect credit accessibility creating mixed results on the relationship between interest rates and income inequality. The study by Battisti, Fioroni and Lavezzi (2014) investigated how the world Interest rates associated with income inequality. The study focused on the period 1985-2005 which witnessed falling interest rates globally. The study used panel regression models and established that reduction of the world interest rates increased income inequality in rich countries and decreased income inequality in poor countries.

In advanced economies, interest rate cuts have a small effect on income inequality. Study results by Miles (2015) indicated that except in US, a raise in interest rates caused income inequality to increase. The reasons why rising interest rates caused decrease in Gini coefficient was that when interest rates are low, cost of investments go down which translates to companies investing more on capital equipment rather than on labour. This causes wages to go down and hence increasing income disparity. Increasing interest rates had the negative effect in US where investors preferred to use labour rather than capital and hence leading to increased labour demand and high wages. In UK, higher interest rates worsen income inequality (Miles, 2015).

With the modern economic demographic changes characterised by urban population growth, housing and automobile have become a necessity to the majority of urban working class. The financed two commodities are purchased through credit. According to Reeves (2015) in a study in US following the raising of interest rates indicated that raising interest rates resulted to increased income disparity. The reason for this is that most of the lower income consumers used most of their income to repay mortgages or car loans. This meant that increased interest rates resulted to a huge proportion of their income going towards payment of loans and thus increasing the gap between the poor and the rich.

Governments through central banks use monetary policy to regulate the level of money supply which consequently determines the level of interest rates. O'Farrell, Rawdanowicz and Inaba (2016) assessed the effect of monetary policy on income inequality in the OECD countries. The authors noted that the effect of monetary policy on income inequality is ambiguous in theory and more so in practice. O'Farrell et al. (2016) noted that falling interest rates reduced debt servicing which led to increased returns on assets. This led to increased, reduced or unchanged income inequality depending on the countries and years being focused on. The ambiguity in the mixed effect of interest rates on income inequality is dependent on the comparative size of variable-rate liabilities, ease at which rates can be re-negotiated the availability of interest-paying assets. Moreover, how income, assets and liabilities are distributed also dictates how changes in interest rates will affect income inequality.

2.3.3 International Trade Openness and Income Inequality

International trade favors and disadvantage countries depending on the trade policies and competitive advantage. Improved ease of doing business ranking influenced majorly by trade openness has made East Africa the destination of investment and trade deals. This is expected to raise FDI and consequently create employment hence reduce inequality. The corporate taxes from FDI businesses will boost the governments' income and enable social expenditure to trim down inequality. Sarel and Robinson (1997) established that improvement in terms of trade and increased international trade openness resulted to a reduced Gini coefficient. These results implied that when countries become more open to international trade, income inequality is reduced. The level of development determines the nature and value of exports and imports. In another study by Jackson (2006), data for various developed and developing countries for 1980s

and 1990s was used. The study established that trade openness increased income inequalities in poor countries but decreased income inequality in developed and rich countries. The study also established that countries with high capital resources had their income inequality reduced by trade openness while countries that had abundant land and labour resources had income inequality increased due to trade openness. This is because countries that have abundant natural resources export high volume, low value products compared to their capital rich partners.

The concern by development economists is the distribution of the benefits of open trade. Meschi and Vivarelli (2007) investigated the distributive consequences of trade flows in developing countries. The study applied a dynamic specification to estimate the effect of international trade openness on income inequality within countries. The study focused on a sample of 70 developing countries for the period 1980-1999. The results revealed that international trade openness had a weak relationship with income inequality. However, disaggregating total trade flows according to their areas of origin or destination indicated that trading with higher income countries made income inequality to worsen.

Mahesh (2011) studied the effect of international trade openness on income inequality focusing on developing countries. This study was conducted using panel data for 10 years (2001-2010) from 72 developing countries. The study established that international trade openness and income inequality significantly and positively. Oloufade's (2012) study on trade openness, conflict risk and income inequality investigated the effect of trade openness on income inequality, and revealed how this influence was molded by the incidence of conflicts. The study established that trade openness led to greater income inequality in countries where the risk of conflicts was high.

Tabassum (2013) examined the empirical relationship between economic growth and income inequality in 69 developing countries Sub-Saharan Africa, Latin America, South and East Asia, Central and Eastern Europe, Middle East and North Africa. The study used data for 1965-2003. Findings from the study established that openness to international trade had statistically significant role in reducing income inequality. However, a study by Wahiba (2013) in Tunisia revealed that trade openness had a significant and positive influence on wage inequality. This indicted that intensive integration into the global economy made Tunisia to experience increased levels of income inequality.

Trade liberalization and growth of private sector yield efficiency and economic growth. Salimi, Akhoondzadeh and Arsalanbod (2014) in their study on 30 developing and developed countries investigated the interactions between trade liberalization, income inequality and economic growth. Data used was for the period 2000–2011 where GMM model was used for the study established that trade openness among the higher income countries reduced income inequality while trade openness among low income countries increased income inequality.

2.3.4 Inflation and Income Inequality

Government macroeconomic objective is to maintain low levels (2%) and predictable inflation. During high levels of inflation, the poor who have the highest marginal propensity to consumer are the most hit. The study by Sarel and Robinson (1997) revealed that inflation levels, rate of change of inflation and variability did not have a significant effect on income inequality. This was however contrary to a study in US where Marrero and Rodríguez (2012) established that inflation had a significant positive effect on income inequality. Marrero and Rodríguez noted that as inflation levels increased the lower income bands are expected to spend relatively more than

the upper income bans on essentials thus reducing their real income relatively more and adversely affecting income distribution. This contrasts with a study by Garcia et al. (2013) which determined that inflation was not a significant variable influencing level of income inequality.

Inflation distorts the market pricing mechanism hence causing price instability. Yue (2011) in a study in Korea assessed the co-integration between income inequality, economic growth and inflation. The study was aimed at filling the knowledge gap of limited research on the developed market of Asia. Error-Correction model was applied to examine the co-integration movement for data in 1980-2002. The findings from the study determined that income inequality did not have any long-term co-integration relationship with inflation.

There are different types of inflation determined by their causes either supply or demand side. A study by Walsh and Yu (2012) in India and China investigated the effect of food inflation and income inequality. This study was informed by the availability of extensive literature indicating that high inflation rates contribute to income inequality. The study divided inflation into food and nonfood inflation and tested what influence each of these kinds of inflation had on income inequality. In China, the study established that nonfood inflation worsens income inequality while the role of food inflation is mixed. This was due to non-food inequality being in relation to productive factors. In India, the study categorized areas as either rural or urban. The study results revealed that nonfood inflation added to income inequality in both areas, while food inflation had a neutral to positive effect on income inequality in rural areas.

Deflation can also be harmful to an economy as witnessed in Japan. Monnin's (2014) study on developed countries tested the effect of inflation on income inequality. The study included 10 OECD countries for the period 1971 to 2010. Apart from inflation, the study included other six control variables (business cycles, openness to international trade, economic

development level, unemployment, skill changes due to technological change and unionization). The study established that the relationship was U-shaped where low inflation rates were associated with higher income inequality. However, as rates rose, inequality reduced and reached a minimum when inflation rate was about 13%. After inflation rate rose above 13% income inequality started to rise.

Many central banks and treasuries pay a lot of attention to the levels of inflation in order to institute measures to counter its negative impacts. Bagus (2014) on a study in UK assessed the relationship that exists between inflation and income inequality and probed the mechanisms through which the relationship existed. Bagus noted that in a monetary system that experiences high inflation, the redistribution leads to a tendency for wealth to flow to the rich and the upper middle class. This is because most of the wealth of the poor and the lower middle class goes to consumables and hence when prices for consumables increase, most of their wealth goes to producers who are the rich.

2.4 Research Gap

The rising income inequalities levels are a concern to global economies and it has adversely affected social cohesion and long-term economic development. The extent of income inequality levels, their drivers, and measures to be taken to address the rising income inequality are hot topics and debates for scholars, researchers and policymakers. Addressing income inequality is an important subject as it has substantial consequences for development and macroeconomic stability. Income inequality leads to inefficiency in resource usage, concentration of political power in the hands of a few and increased risk of social, political and economic crisis.

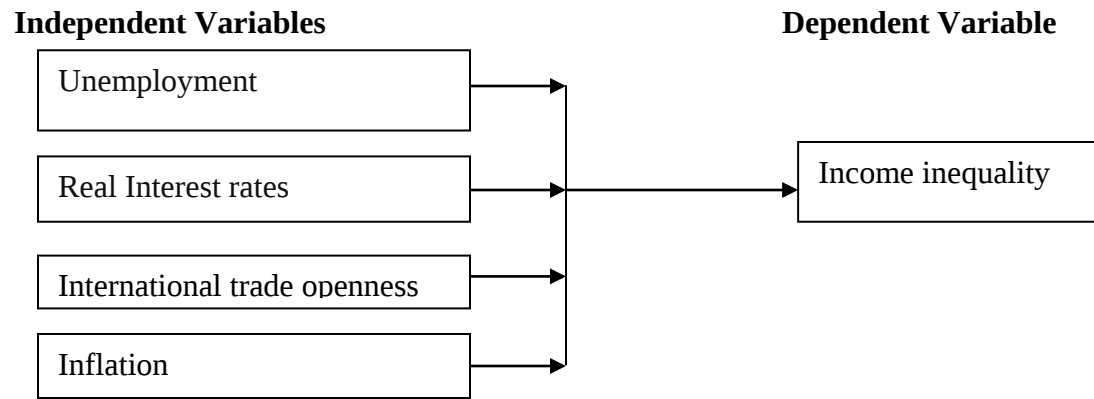
Despite the role played by macroeconomic factors in influencing income inequality, there are few studies on the subject locally (Gakurun & Mathenge, 2012) while most studies are multi country though there are significant differences among various countries. Most of the studies on macroeconomic factors and income distribution have been carried out in countries with different conditions than Kenya such as New Zealand (Bakker & Creedy, 2000), US (Marrero & Rodríguez, 2012) or a combination of different countries (Garcia et al., 2013). Most of these studies may not be generalizable to the Kenyan case due to the material differences between Kenya and those other countries studied. This hence justified the current study.

Moreover, most studies on the role played by macroeconomic factors on economic growth had ambiguous results. For instance, in relation to the effect of unemployment on income inequality, Bakker and Creedy (2000) in their New Zealand study established that rate of unemployment was significantly increasing income inequality. These findings were contrary to findings by Garcia et al. (2013) that levels of unemployment were associated with decreased income inequality. The differences in these studies could be due to differences in the countries studied, years used or the models applied. The current study hence sought to find how macroeconomic factors influenced income inequality in East Africa.

2.5 Conceptual Framework

The study was based on the conceptual framework presented in Figure 2. The study depicted that international trade had a role in human capital development, technological advancement, customs duty, FDI and international trade openness. These in return have an effect on the economic growth of the country.

FIGURE 1
Conceptual Framework



Source: Author (2017)

2.6 Measurement of variables

Table 1 indicates the variables that were considered in the study and the measures that were applied.

TABLE 1
Operationalization of Variables

Variable	Type of Variable	Indicator
Unemployment	Independent Variable	Unemployment to population ratio, 15+, total (%) (National estimate)- (Martinez, Ayala, & Ruiz-Huerta, 2011).
Interest rates	Independent Variable	Real lending interest rates (%) - (Reeves, 2015).
International trade openness	Independent Variable	Ratio of exports & imports to GDP-(Wahiba, 2013).
Inflation	Independent Variable	Inflation rate per annum-(Walsh, 2012).
Income inequality	Dependent Variable	Gini coefficient (World Bank estimate)

Source: Author (2017)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research design, sample size, sampling technique and the data collection techniques. The chapter also includes the model specification, data analysis methods and the presentation of results. Moreover, the diagnostic tests that were conducted before the model was run are also presented in this chapter.

3.2 Research Design

The study applied a descriptive research design. Creswell (2013) argues that descriptive research encompasses collecting data that describe events and then arranges, depicts, tabulates and then gets meaning from the data collected. Descriptive design also entails usage of visual aids such as tables, charts and graphs to assist the reader in understanding the distribution of the data. Descriptive studies are applicable in historical studies with a large mass of raw data and provides meaning by summarizing and analysing such data. Most importantly, descriptive studies are also capable of providing relationship between the various variables that are under consideration in a study.

Descriptive design in this study was most appropriate as it sought to establish the factors influencing income inequality and hence provided the avenue to relate the variables. The current study sought to establish the factors influencing income inequality and hypothesized that, inflation, international trade openness, interest rates and unemployment influenced income inequality. The study, first sought to understand the variables that cause income inequality and then determine the nature of the relationship between the four independent variables and income

inequality. This made the descriptive research design suited for this study to achieve those objectives of the research.

3.3 Target Population

The study focused on Kenya, Uganda and Tanzania. Data that was utilized in the study was data for forty one years (1975-2015). There was no sampling that was necessary in the study.

3.4 Data Collection

Secondary data was used in this study. This data was sourced from World Trade Organization, World Bank, Kenya National Bureau of Statistics (KNBS), Uganda Bureau of Statistics, Tanzania National Bureau of Statistics and, respective Central Banks and Institute of Economic Affairs (IEA). Data was sourced from the electronic databases and libraries of these institutions. Data on international trade openness and interest rates was sought from Kenya National Bureau of Statistics (KNBS), Uganda Bureau of Statistics and Tanzania National Bureau of Statistics. Data on unemployment, inflation and income inequality was sourced from World Bank.

The data collected was entered into Microsoft excel. To check the validity of data, data from several sources was compared for authenticity. Data was only collected from the institutions that are credible. Data was then cleaned and entered into standard statistical software ready for analysis.

3.5 Model Specification and Data Analysis

The data collected in the study was panel with three entities (Kenya, Uganda and Tanzania) over 41 years (1975-2015). However, since the data related to three independent and differing states,

data was analyzed individually for each country and then a comparative analysis was conducted. The data collected in the study was time series for each country and hence a time series model was applied in analysis. The Vector autoregressive (VAR) or the vector error correction model (VECM) model was applied for each country to assess the relationship between the time series of the independent variables and the time series of income inequality (Hacker & Hatemi, 2008). The model was as indicated below;

$$IE = \beta_0 + \beta_1 ITO_{1t} + \beta_2 INF_{2t} + \beta_3 IR_{3t} + \beta_4 UR_{4t} + \varepsilon_t \dots \dots \dots (1)$$

Where:

β_0 = Constant

β_i = Coefficients of the independent variables

t = time (1....40)

IE = Income inequality

ITO = International trade openness

INF = Inflation rate

IR = Interest rates

UR = Unemployment rate

ε = error term

Three different models were run for each country. Before the model was run using the Stata statistical software, time series diagnostics tests such as correlation analysis, lag length, unit root test and test of cointegration were conducted. Granger and Newbold (1974) noted that it is crucial to conduct Granger causality tests to ascertain whether there are long as well as short term relationships between the various time series. Co-integration in this study was conducted using the augmented Dickey–Fuller test (Creswell, 2013). Other tests that were conducted in the

study include test of serial correlation and normality of residuals (Greene, 2008). When any of the tests indicated that one of the regression assumptions were violated, transformation of the data was performed.

After the diagnostic tests, the time series model was run and results presented both in graphical form as well as tabular form. Descriptive statistics were also used to inform on the distribution and dispersion of the data.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

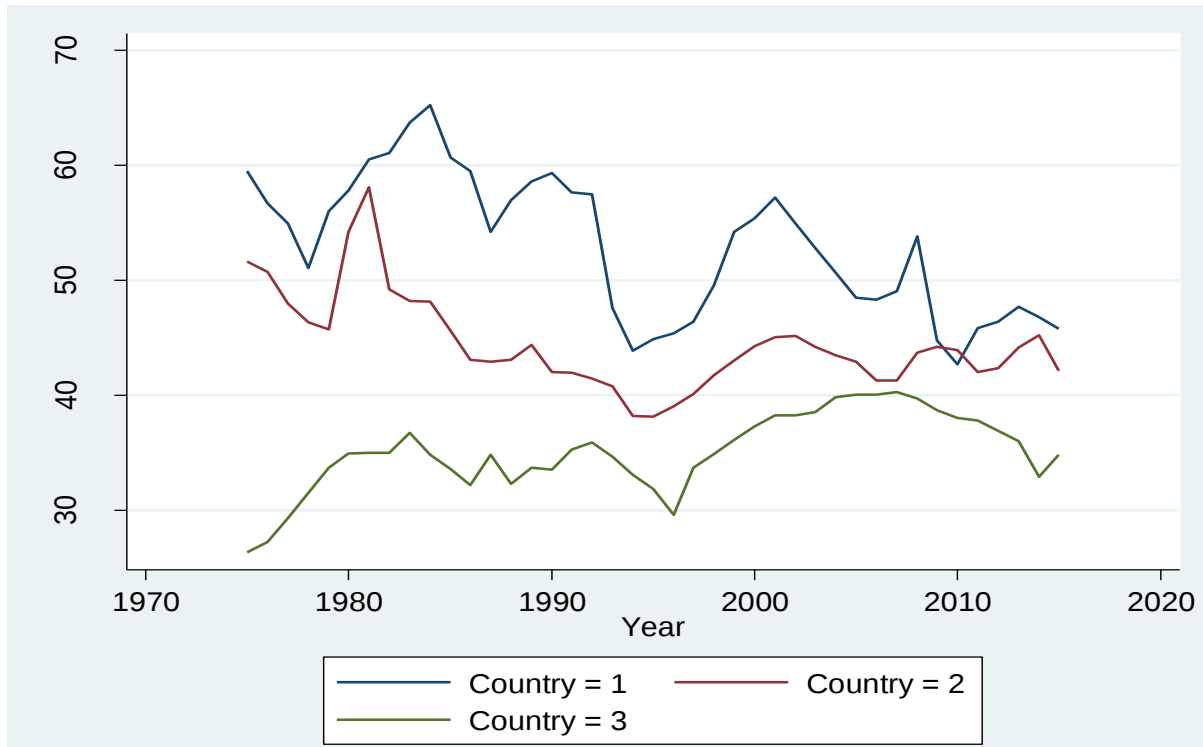
4.1 Introduction

This chapter presents the study results on the study of the effects of macroeconomic factors on income inequality in East Africa. The analysis involved the data collected for the three countries for 41 years from 1975 – 2015. Analysis was conducted separately for each country and the results compared. This chapter presents the descriptive statistics, the trends of Gini coefficient and the results from the models that were selected.

4.2 Trend of Gini coefficient

The study analysed the trend plot for Gini coefficient for the three countries. This was to indicate the trend and also the comparison of the trend of the three countries over time. Results are presented in Figure 2. The results indicate that Kenya (1) had the highest economic inequality of the three countries followed by Uganda (2) while Tanzania (3) reported the lowest income inequality over the period. The results also indicated that there were erratic movements of income inequality for the three countries in early 1980s, mid 1990s and around 2010.

FIGURE 2
Trend of Gini Coefficient for the Three Countries



Source: Author (2017)

4.3 Pre-Analysis Tests

The study conducted pre-analysis tests to establish which of the models were suited for analysis of the data. The pre-analysis tests included tests of multicollinearity, test for the suitable time lags, unit root tests and cointegration tests.

Multicollinearity was tested using a correlation matrix. The correlation of all the variables was tested and results are presented in Table 2. The results indicated that the correlation of the variables ranged from -0.3999 to 0.7219. This indicates that there was no collinearity among the variables as no two variables had high correlation with each other.

TABLE 2
Correlation Matrix

. corr CPI Inf Int U ITO Gini (obs=123)							
	CPI	Inf	Int	U	ITO	Gini	
CPI	1.0000						
Inf	-0.2606	1.0000					
Int	0.0065	0.3168	1.0000				
U	-0.3999	-0.0699	-0.2579	1.0000			
ITO	0.0508	-0.3500	-0.1162	0.4555	1.0000		
Gini	-0.2413	-0.0198	-0.2516	0.7219	0.1905	1.0000	

Source: Author (2017)

Another test that was conducted was a test to establish the appropriate time lags for the time series model. This was tested using the various tests including Akaike's Information Criterion (AIC), Lag length (LL), the Likelihood Ratio (LR), Hannan and Quinn information criterion (HQIC), Schwarz's Bayesian information criterion (SBIC) and the Final Prediction Error (FPE). The results are presented in Table 3. The results indicated that one lag was appropriate for the data as FPE, HQIC and SBIC showed that one lag was preferred.

TABLE 3
Lag Order Selection Criteria

Selection-order criteria								
Sample: 1979 - 2015					Number of obs = 37			
lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-586.081				5.2e+07	31.9503	32.0271	32.168
1	-427.968	316.23	25	0.000	39342.9*	24.755	25.2155*	26.0612*
2	-403.746	48.443	25	0.003	44367.2	24.7971	25.6413	27.1917
3	-376.821	53.851	25	0.001	49422.5	24.693	25.921	28.1761
4	-347.435	58.771*	25	0.000	61708.3	24.456*	26.0676	29.0275

Source: Author (2017)

Further, analysis of time series data through regression models has the assumption that the data does not have unit root or that the data is stationary. The study tested this assumption using the Augmented Dickey Fuller (ADF) test. The results are presented in Table 4. The results indicated that only CPI, international trade openness and unemployment were stationary. Interest rates, and Gini coefficients were not stationary. This was corrected using the first differencing.

TABLE 4
Dickey Fuller Test for Unit Root

		Number of obs = 40
Variable	Test Statistic	5% Critical Value
CPI	5.994	-2.598
Interest rates	-1.657	-2.598
Unemployment	-3.253	-2.598
International trade openness	-2.840	-2.598
Gini coefficient	-1.695	-2.598

Source: Author (2017)

Another test that was conducted was the Johansen Cointegration test which enabled the study to select the appropriate model between the VAR and VECM. The results of the cointegration test are presented in Table 5. The results indicated that there were at least 2 cointegrating equations. Interest rates, CPI and unemployment were significant in the first cointegrating equation while unemployment and international trade openness were significant in the second. As noted in Table 5, the null hypothesis of no or one cointegrating equations was rejected as the trace statistics were higher than the 5% critical value. This hence indicated that VECM was the appropriate model in the study.

TABLE 5**Johansen Cointegration Test**

Johansen tests for cointegration					
Trend: constant			Number of obs =		40
Sample: 1976 - 2015			Lags =		1
maximum				5%	
rank	parms	LL	eigenvalue	trace statistic	critical value
0	5	-513.26605	.	99.0983	68.52
1	14	-492.32592	0.64901	57.2180	47.21
2	21	-477.03905	0.53436	26.6443*	29.68
3	26	-468.44633	0.34925	9.4589	15.41
4	29	-464.71721	0.17010	2.0006	3.76
5	30	-463.7169	0.04879		

Source: Author (2017)

4.4 Vector Error Correction Models

The VECM model was then developed using one lag and this was done for each of the three countries. The model for Kenya was developed first and the results of the long run are as presented in Table 6. The results indicated that the error term did not have a significant effect on income inequality – Gini ($B = 0.017$; $p > 0.05$), unemployment - U ($B = -0.003$; $p > 0.05$) or international trade openness- ITO ($B = -0.024$; $p > 0.05$) had insignificant relationship with the error term. This indicates that the error term does not affect income inequality, international trade openness or unemployment whether it is positive or negative. On the other hand, the error term had a significant positive effect on Inflation – Inf ($B = 0.052$; $p < 0.05$) but had a significant negative effect on Interest rates – Int ($B = -0.023$; $p < 0.05$). This indicates that if the error term is positive, inflation increases while interest rates decreases.

TABLE 6
Vector Error Correction Model (Kenya)

Sample: 1976 - 2015	No. of obs	=	40
	AIC	=	26.17354
Log likelihood = -509.4707	HQIC	=	26.38726
Det(Sigma_ml) = 79550.86	SBIC	=	26.76465

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_Gini	2	3.19566	0.0936	3.924205	0.1406
D_Inf	2	7.13434	0.1432	6.351154	0.0418
D_Int	2	2.73075	0.1829	8.507452	0.0142
D_U	2	1.47469	0.0199	.7696275	0.6806
D_ITO	2	5.85681	0.0562	2.26483	0.3223

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
D_Gini						
_cel						
L1.	.017249	.0092704	1.86	0.063	-.0009206	.0354186
_cons	-.3182916	.5054599	-0.63	0.529	-1.308975	.6723916
D_Inf						
_cel						
L1.	.052082	.0206962	2.52	0.012	.0115182	.0926459
_cons	-.0768352	1.128443	-0.07	0.946	-2.288543	2.134873
D_Int						
_cel						
L1.	-.0229364	.0079217	-2.90	0.004	-.0384626	-.0074101
_cons	.1186452	.4319241	0.27	0.784	-.7279104	.9652009
D_U						
_cel						
L1.	-.0032496	.004278	-0.76	0.447	-.0116343	.0051351
_cons	.0975825	.2332529	0.42	0.676	-.3595849	.5547499
D_ITO						
_cel						
L1.	-.0239489	.0169902	-1.41	0.159	-.0572491	.0093513
_cons	-.5232121	.9263763	-0.56	0.572	-2.338876	1.292452

Source: Author (2017)

The results of the cointegration equation are presented in Table 7. The results indicate that inflation had a negative and significant effect on income inequality ($B = -7.31$; $p < 0.05$). This indicates that increasing inflation in Kenya had the long-term effect of decreasing income inequality. These results are against the Marxian economic theory (Wood, 1996) which indicated

that market imperfections such as inflation increase income inequality. The findings also contradict the findings by Sarel and Robinson (1997) which revealed that inflation levels, rate of change of inflation and variability did not have a significant effect on income inequality. The study findings were also contrary to a study in US where Marrero and Rodríguez (2012) established that inflation had a significant positive effect on income inequality. These study findings also are contrary to the findings by Garcia et al. (2013) that inflation was not a significant variable influencing level of income inequality. Moreover, the study findings also contradicted the findings by Yue (2011) income inequality did not have any long-term co-integration relationship with inflation. The study findings on the negative effect of inflation on income inequality supports the findings by Monnin's (2014) which established that as inflation rose, inequality reduced and reached a minimum when inflation rate was about 13%.

TABLE 7
Cointegration Equation (Kenya)

Equation	Parms	chi2	P>chi2
_cel	4	80.68796	0.0000

Identification: beta is exactly identified

Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
_cel						
Gini	1	.	.	.	.	.
Inf	-7.305824	.8934714	-8.18	0.000	-9.056996	-5.554652
Int	2.800242	.9741057	2.87	0.004	.8910297	4.709454
U	4.12568	3.279878	1.26	0.208	-2.302763	10.55412
ITO	.6872381	1.084976	0.63	0.526	-1.439276	2.813752
_cons	-100.6886	.	.	.	.	.

Source: Author (2017)

Results in Table 7 indicate that interest rates on the other hand had a significant positive effect on income inequality ($B = 2.8$; $p < 0.05$). This indicates that increasing lending interest rates have the effect of increasing income inequality in Kenya in the long term. These findings support the Marxian economic theory (Wood, 1996) that when interest rates rise, the high-income classes are the only ones who can have access to credit when interest rates rise. This makes returns to be skewed against lower income earners. The study results also agree with findings by Garcia et al. (2013) that real interest rates had significant positive effect on income inequality.

Unemployment ($B = 4.13$; $p > 0.05$) had long term insignificant effect on income inequality. These findings do not support the Marxian economic theory (Wood, 1996) which posits that market imperfections such as unemployment lead to increase in income inequality. The results also disagree with findings by Bakker and Creedy (2000) that the rate of unemployment was significantly influencing modal income and hence increasing income inequality. The study findings also contradict the results by González and Menendez (2000) which established that unemployment played a significant role in increasing inequality in Argentina in the nineties.

International trade openness ($B = 0.69$; $p > 0.05$) had long term insignificant effect on income inequality. These results do not support the Heckscher-Ohlin Theory (Ohlin, 1967) that international trade openness has a positive effect on income inequality in developing countries. The study results also contradict the results by Sarel and Robinson (1997) which established that increased international trade openness resulted to significant reduction in Gini coefficient. The study results however, agree with findings by Meschi and Vivarelli (2007) that international trade openness had a weak and insignificant relationship with income inequality.

A VECM model was also developed for Uganda with results being presented in Table 8. The results indicated that the error had significant negative effect on income inequality – Gini ($B = -0.21$; $p < 0.05$) and interest rates – Int ($B = -0.21$; $p < 0.05$). This indicates that when the error is positive, income inequality and interest rates decrease. Results also indicate that the error term had a significant positive effect on unemployment - U ($B = 0.058$; $p < 0.05$). This indicates that if the error term is positive, unemployment increases in Uganda. Results also indicated that the error term had an insignificant effect on international trade openness – ITO ($B = 0.14$; $p > 0.05$).

The results of the cointegration equation for the data on Uganda are presented in Table 9. The results indicate that all the factors in Uganda had significant effect on income inequality. Inflation ($B = -.043$; $p < 0.05$) had a negative and significant effect on income inequality. This was however contrary to the study in US where Marrero and Rodríguez (2012) established that inflation had a significant positive effect on income inequality. The study results also contradicted the findings by Sarel and Robinson (1997) that inflation levels, rate of change of inflation and variability did not have a significant effect on income inequality. These results also contradicted the results by Garcia et al. (2013) that inflation was not a significant variable influencing level of income inequality. These results however, concurred with the Marxian economic theory (Wood, 1996) which indicated that market imperfections such as inflation increase income inequality.

TABLE 8
Vector Error Correction Model (Uganda)

Sample: 1976 - 2015	No. of obs	=	40
	AIC	=	28.1299
Log likelihood = -548.5981	HQIC	=	28.34363
Det(Sigma_ml) = 562709.1	SBIC	=	28.72101

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_Gini	2	2.27796	0.1903	8.932159	0.0115
D_Inf	2	38.9778	0.0001	.0047063	0.9976
D_Int	2	2.69326	0.1467	6.531882	0.0382
D_U	2	.821466	0.1229	5.324676	0.0698
D_ITO	2	5.11252	0.0379	1.49643	0.4732

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
D_Gini						
_cel						
L1.	-.2056508	.07056	-2.91	0.004	-.3439459	-.0673557
_cons	-.1131277	.3627271	-0.31	0.755	-.8240598	.5978044
D_Inf						
_cel						
L1.	.0498173	1.207338	0.04	0.967	-2.316522	2.416156
_cons	-.3680755	6.206547	-0.06	0.953	-12.53268	11.79653
D_Int						
_cel						
L1.	-.2056287	.0834238	-2.46	0.014	-.3691363	-.042121
_cons	.4127672	.4288557	0.96	0.336	-.4277746	1.253309
D_U						
_cel						
L1.	.0584317	.025445	2.30	0.022	.0085605	.1083029
_cons	-.0649511	.1308046	-0.50	0.620	-.3213234	.1914211
D_ITO						
_cel						
L1.	.140072	.1583606	0.88	0.376	-.170309	.4504531
_cons	.5978617	.8140823	0.73	0.463	-.9977103	2.193434

Source: Author (2017)

Unemployment ($B = -4.13$; $p < 0.05$) had significant negative effect on income inequality. These results indicate that increasing unemployment can lead to reduced income inequality. These findings contradict the Marxian economic theory (Wood, 1996) which posits that market imperfections such as unemployment mean that income move from the poor to the

rich thus perpetuating inequality. The results also disagree with findings by Bakker and Creedy (2000) that the rate of unemployment was significantly influencing modal income and hence increasing income inequality. The study findings however agree with findings by Garcia et al. (2013) which established that levels of unemployment were associated with reduction in income inequality.

International trade openness ($B = -.498$; $p < 0.05$) had negative and significant effects on income inequality. These results contradict the Heckscher-Ohlin Theory (Ohlin, 1967) that international trade openness has a positive effect on income inequality in developing countries. These results also contradict findings by Jackson (2006) which established that trade openness increased income inequalities in poor countries.

Interest rates on the other hand had a significant positive effect on income inequality ($B = 0.29$; $p < 0.05$). This indicates that increasing lending interest rates have the effect of increasing income inequality in Uganda in the long term. These findings support the Marxian economic theory (Wood, 1996) that when interest rates rise, the high income classes are the only ones who can have access to credit when interest rates rise. This makes returns to be skewed against lower income earners. These results from the study concur with findings by Garcia et al. (2013) that real interest rates had significant positive effect on income inequality.

TABLE 9
Cointegration Equation (Uganda)

Equation	Parms	chi2	P>chi2
_cel	4	57.19719	0.0000

Identification: beta is exactly identified

Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
_cel						
Gini	1	.	.	.	.	.
Inf	-.0430402	.0207079	-2.08	0.038	-.0836269	-.0024535
Int	.2898051	.140394	2.06	0.039	.014638	.5649723
U	-4.138208	.8823591	-4.69	0.000	-5.8676	-2.408816
ITO	-.4976947	.1127962	-4.41	0.000	-.7187712	-.2766183
_cons	-12.28643	.	.	.	.	.

Source: Author (2017)

Lastly, the VECM model for Tanzania was developed and results are presented in Table 10. The results (Table 10) indicated that the error term had significant negative effect on income inequality - Gini ($B = -0.025$; $p < 0.05$). This indicates that when the error term is positive, income inequality in Tanzania is expected to decrease. The error term had significant positive effect on interest rates - Int ($B = 0.058$; $p < 0.05$). This indicates that when the error is positive, interest rates increase. Results also indicate that the error term insignificant inflation – Inf ($B = -0.039$; $p > 0.05$) and unemployment - U ($B = 0.007$; $p > 0.05$). This indicates that the error term does not increase or decrease inflation or unemployment.

Lastly, the results of the cointegration equation for the data on Tanzania are presented in Table 11. The results indicate that all the factors in the model on that data for Tanzania had significant effect on income inequality.

TABLE 10

Vector Error Correction Model (Tanzania)

Sample: 1976 - 2015	No. of obs	=	40
	AIC	=	24.1759
Log likelihood = -469.5179	HQIC	=	24.38962
Det(Sigma_ml) = 10791.46	SBIC	=	24.767

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_Gini	2	1.43055	0.1911	8.979305	0.0112
D_Inf	2	6.62389	0.0301	1.180414	0.5542
D_Int	2	3.14478	0.1947	9.189187	0.0101
D_U	2	.812271	0.0648	2.633939	0.2679
D_ITO	2	6.33321	0.0354	1.393749	0.4981

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
D_Gini						
_cel						
L1.	-.0251719	.0088486	-2.84	0.004	-.0425148	-.007829
_cons	.2974756	.2281311	1.30	0.192	-.1496532	.7446044
D_Inf						
_cel						
L1.	-.0397646	.0409716	-0.97	0.332	-.1200675	.0405383
_cons	-.3779961	1.056316	-0.36	0.720	-2.448338	1.692346
D_Int						
_cel						
L1.	.0583621	.0194518	3.00	0.003	.0202372	.0964869
_cons	.0192482	.5015001	0.04	0.969	-.9636739	1.00217
D_U						
_cel						
L1.	.0075132	.0050242	1.50	0.135	-.0023342	.0173605
_cons	-.1062138	.1295333	-0.82	0.412	-.3600945	.1476669
D_ITO						
_cel						
L1.	-.0462436	.0391737	-1.18	0.238	-.1230226	.0305354
_cons	.1701465	1.009962	0.17	0.866	-1.809342	2.149635

Source: Author (2017)

Inflation ($B = 2.33$; $p < 0.05$) had a positive and significant effect on income inequality. This indicates that increasing inflation in Tanzania had the long-term effect of increasing income inequality. These study findings on Tanzania agreed with the findings by Marrero and Rodríguez (2012) that inflation had a significant positive effect on income inequality. The study results however contradict the findings by Sarel and Robinson (1997) that inflation levels, rate of change of inflation and variability did not have a significant effect on income inequality.

TABLE 11
Cointegration Equation (Tanzania)

Equation	Parms	chi2	P>chi2
_ce1	4	42.33669	0.0000

Identification: beta is exactly identified

Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
_ce1					
Gini	1	.	.	.	.
Inf	2.332299	.4916373	4.74	0.000	1.368708 3.295891
Int	-1.710406	.5243718	-3.26	0.001	-2.738156 -.6826563
U	-13.86051	3.380321	-4.10	0.000	-20.48582 -7.235202
ITO	1.159637	.5755115	2.01	0.044	.0316552 2.287619
_cons	-33.06836	.	.	.	.

Source: Author (2017)

Results in Table 11 also indicate that international trade openness ($B = 1.16$; $p < 0.05$) had significant positive effect on income inequality. This indicates that increasing international trade openness in Tanzania had the long-term effect of increasing income inequality. These findings support the Heckscher-Ohlin Theory (Ohlin, 1967) that international trade openness has a positive effect on income inequality in developing countries. The results also agree with results

from a study by Mahesh (2011) that international trade openness influenced income inequality significantly and positively.

The results further indicated that unemployment ($B = -13.86$; $p < 0.05$) had significant negative effect on income inequality. This indicates that increasing unemployment had the effect of reducing income inequality in Tanzania the long run. These findings contradict the Marxian economic theory (Wood, 1996) which posited that market imperfections such as unemployment makes income to flow to the rich more than to the poor thus increasing inequality. The results also disagree with findings by Bakker and Creedy (2000) that the rate of unemployment was significantly influencing modal income and hence increasing income inequality.

The results further indicated that interest rates ($B = -1.71$; $p < 0.05$) had significant negative effect on income inequality. This indicates that increasing lending interest rates have the effect of reducing income inequality in Tanzania in the long run. These findings contradict the Marxian economic theory (Wood, 1996) that when interest rates rise income inequality increases. These results contradict with the findings by Garcia et al. (2013) which established that real interest rates had significant positive effect on income inequality. The study results also contradict the findings by Battisti et al. (2014) which established that reduction of the world interest rates decreased income inequality in poor countries.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of major findings, deduction and recommendations. The summary of the results is presented and discussed in relation to theory and previous studies that had been conducted. The conclusions are then provided based on the findings in the study while recommendations are provided in relation to the gaps that were noted in the findings. The study provides the summary results, conclusion and recommendations on the study of the macroeconomic factors that contribute to income inequality.

5.2 Summary of Findings

The results from the VECM model for the data on Kenya indicated that error term did not have a significant effect on income inequality - Gini ($B = 0.017$; $p > 0.05$), unemployment - U ($B = -0.003$; $p > 0.05$) or international trade openness- ITO ($B = -0.024$; $p > 0.05$) had insignificant relationship with the error term. This indicates that the error term does not affect income inequality, international trade openness or unemployment whether it is positive or negative. On the other hand, the error term had a significant positive effect on Inflation – Inf ($B = 0.052$; $p < 0.05$) but had a significant negative effect on Interest rates – Int ($B = -0.023$; $p < 0.05$). This indicates that if the error term is positive, inflation increases while interest rates decreases.

The results of the cointegration equation indicated that Inflation had a negative and significant effect on income inequality ($B = -7.31$; $p < 0.05$). This indicates that increasing inflation in Kenya had the long-term effect of decreasing income inequality.

Interest rates on the other hand had a significant positive effect on income inequality ($B = 2.8$; $p < 0.05$). This indicates that increasing lending interest rates have the effect of increasing income inequality in Kenya in the long term. However, unemployment ($B = 4.13$; $p > 0.05$) had long term insignificant effect on income inequality. International trade openness ($B = 0.69$; $p > 0.05$) had long term insignificant effect on income inequality.

The results on the VECM model developed for Uganda indicated that the error had significant negative effect on income inequality - Gini ($B = -0.21$; $p < 0.05$) and interest rates - Int ($B = -0.21$; $p < 0.05$). This indicates that when the error is positive, income inequality and interest rates decrease. Results also indicate that the error term had a significant positive effect on unemployment - U ($B = 0.058$; $p < 0.05$). This indicates that if the error term is positive, unemployment increase in Uganda. Results also indicated that the error term had an insignificant effect on international trade openness – ITO ($B = 0.14$; $p > 0.05$).

The results of the cointegration equation for the data on Uganda indicated that all the factors in Uganda had significant effect on income inequality. Inflation ($B = -.043$; $p < 0.05$), unemployment ($B = -4.13$; $p < 0.05$) and international trade openness ($B = -.498$; $p < 0.05$) had negative and significant effects on income inequality. This indicates that increasing inflation, unemployment and international trade openness in Uganda had the long term effect of decreasing income inequality.

Interest rates on the other hand had a significant positive effect on income inequality ($B = 0.29$; $p < 0.05$). This indicates that increasing lending interest rates have the effect of increasing income inequality in Uganda in the long term.

The results for the VECM model for Tanzania indicated that the error term had significant negative effect on income inequality - Gini ($B = -0.025$; $p < 0.05$). This indicates that when the error term is positive, income inequality in Tanzania is expected to decrease. The error term had significant positive effect on interest rates - Int ($B = 0.058$; $p < 0.05$). This indicates that when the error is positive, interest rates increase. Results also indicate that the error term insignificant inflation – Inf ($B = -0.039$; $p > 0.05$) and unemployment - U ($B = 0.007$; $p > 0.05$). This indicates that the error term does not increase or decrease inflation or unemployment.

Lastly, the results of the cointegration equation for the data on Tanzania indicated that all the factors in the model on that data for Tanzania had significant effect on income inequality. Inflation ($B = 2.33$; $p < 0.05$) and international trade openness ($B = 1.16$; $p < 0.05$) had significant positive effects on income inequality. This indicates that increasing inflation and international trade openness in Tanzania had the long-term effect of increasing income inequality. The results further indicated that unemployment ($B = -13.86$; $p < 0.05$) and interest rates ($B = -1.71$; $p < 0.05$) had significant negative effect on income inequality. This indicates that increasing lending interest rates and unemployment have the effect of increasing reducing income inequality in Tanzania the long run.

5.3 Conclusion

The study concludes that that Inflation had a negative and significant effect on income inequality in Kenya and Uganda but had a significant positive effect on income inequality in Uganda. Interest rates on the other hand, had a significant positive effect on income inequality in Kenya and Uganda but had a significant negative effect on income inequality in Tanzania.

Unemployment had an insignificant effect on income inequality in Kenya but had significant negative effects on income inequality in Uganda and Tanzania. Lastly international trade openness had insignificant effect on income inequality in Kenya but the effect was significantly negative in Uganda and Tanzania. The study hence concluded that the three east African countries were dynamic and different on how the different macroeconomic factors related to income distribution.

5.4 Recommendations

The following recommendations are made. First, the three east African governments should institute policies to reduce income inequality. Some of the policies that could be considered include reducing interest rates to enhance aggregate demand, developing the human capital to reduce long term structural unemployment and also lowering the minimum wage so as to deal with real wage unemployment.

Secondly, the countries should adopt international trade policies that are backed by research and data. They should ensure that they moderately engage in trade openness by balancing exports and imports ensuring that the balance of trade deficit does not grow. This would ensure that locals do not lose jobs to foreign workers which can increase income inequality.

Lastly, the monetary policy organs of the country should carefully analyze the inflation, interest rates and macroeconomic factors to ensure that the expansionary or contractionary policies they adopt lead to the desired outcomes of improving income distribution.

REFERENCES

- Agyemang, E. (2010). *Economic growth, income inequality and poverty reduction: A regional comparative analysis*. Master of Arts thesis, University of Lethbridge, Lethbridge.
- Anderson, P. (1976). *Considerations on Western Marxism*. London: NLB.
- Apergis, N., Dincer, O., & Payne, J. E. (2011). On the dynamics of poverty and income inequality in US states. *Journal of Economic Studies*, 38(2), 132 – 143.
- Aron, R. (1965). *Main currents in sociological thought*. Garden City: Anchor Books.
- Attanasio, O., Hurst, E., & Pistaferri, L. (2012). *The Evolution of Income, Consumption, and Leisure Inequality in the US, 1980–2010*. NBER Working Papers No. 17982.
- Bagus, P. (2014). *How monetary inflation increases inequality*. London: Institute of Economic Affairs.
- Bakker, A., & Creedy, J. (2000). Macroeconomic variables and income distribution: Conditional modelling with the generalised exponential. *Journal of Income Distribution*, 9(2), 183–197.
- Bategeka, L. (2013). *Tackling Inequality in Uganda*. Retrieved from:
<http://www.thebrokeronline.eu/Blogs/Inequality-debate/Tackling-Inequality-in-Uganda>.
- Battisti, M., Fioroni, T., & Lavezzi, A. M. (2014). *World Interest Rates, Inequality and Growth: an Empirical Analysis of the Galor – Zeira Model*. Discussion Paper no. 184.
- Batuo, M. E., & Asongu, S. A. (2015). The impact of liberalisation policies on income inequality in African countries. *Journal of Economic Studies*, 42(1), 68 – 100.
- Belghith, N. B. H., & Zeufack, A. G. (2015). *Inequality of outcomes and inequality of opportunity in Tanzania*. World bank Policy Research Working Paper No. WPS7260.
- Burns, A. F. (1954). *Economic Research and the Keynesian Thinking of Our Times*. Princeton: Princeton University
- Clower, R. (1965). The Keynesian Counter-revolution: A Theoretical Appraisal' in F. Hahn and F. Brechling (eds.). *The Theory of Interest Rates*. London: Macmillan.
- Cohn, Steven Mark (2006). *Reintroducing Macroeconomics: A Critical Approach*. New York: M.E. Sharpe.
- Credit Suisse. (2015). *Global Wealth Databook 2015: Total net wealth at constant exchange rate (USD billion)*. Retrieved from: <http://publications.credit-suisse.com/tasks/render/file/index.cfm?fileid=C26E3824-E868-56E0-CCA04D4BB9B9ADD5>.

- Creswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches* (7th ed.). Thousand Oaks: Sage Publications.
- Dabla-Norris, E., Kochhar, K., Suphaphiphat, N., Ricka, F., & Tsounta, E. (2015). *Causes and Consequences of Income Inequality: A Global Perspective*. IMF staff discussion note No. SDN/15/13.
- Gakuru, R., & Mathenge, N. (2012). *Poverty, Growth, and Income Distribution in Kenya: A SAM Perspective*. AGRODEP Working Paper 0001.
- García, C., Prieto-Alaiz, M., & Simón, H. (2013). The influence of macroeconomic factors on personal income distribution in developing countries: A parametric modelling approach. *Applied Economics*, 45(30), 4323-4334.
- González, M., & Menendez, A. (2000). *The Effect of Unemployment on Labor Earnings Inequality: Argentina in the Nineties*. Princeton: Princeton University.
- Granger, C. W. J. (2004). Time series analysis, cointegration, and applications. *American Economic Review*, 94(3), 421-425.
- Granger, C.W.J., & Newbold, P. (1974). Spurious regressions in econometrics. *Journal of Econometrics*, 2, 111-120.
- Gray, D. E. (2012). *Doing research in the real world*. London: Sage Publications.
- Greene, W. H. (2008). *Econometric analysis* (6th ed.). Upper Saddle River: Prentice Hall.
- Hacker, R. S., & Hatemi, A. (2008). Optimal lag-length choice in stable and unstable VAR models under situations of homoscedasticity and ARCH. *Journal of Applied Statistics*, 35(6), 601-615.
- Harding, A., & Richardson, S. (2009). Unemployment and Income Distribution. *Australian Economic Review*, 47(4), 139-164.
- Hobsbawm, E. J. (2011). *How to Change the World: Marx and Marxism, 1840-2011*. London: Little Brown.
- Hsiao, C., Lahiri, K., & Lee, L. (2009). *Analysis of Panels and Limited Dependent Variable Models* (4th ed). Cambridge: Cambridge University Press.
- Hunt, E. K., & Lautzenheiser, M. (2014). *History of Economic Thought: A Critical Perspective*. New Delhi: PHI Learning.
- Jäntti, M., & Jenkins, S. P. (2010). The impact of macroeconomic conditions on income inequality. *The Journal of Economic Inequality*, 8(2), 221-240.

- King, M. (2014). *Krugman: Income inequality and unemployment are linked*. Retrieved from: <http://www.newsmax.com/Finance/Economy/Krugman-inequality-unemployment-income/2014/01/24/id/548876/>.
- Kořakowski, L. (2005). *Main Currents of Marxism: The Founders, the Golden Age, the Breakdown*. New York: W.W. Norton & Company.
- Leijonhufvud, A. (1968). *On Keynesian Economics and the Economics of Keynes: A Study in Monetary Theory*. New York: Oxford University Press.
- Lo, A. W. (2012). Reading about the financial crisis: A 21-book review. *Journal of Economic Literature*, 24(3), 129 – 144.
- Maddala, G. S. (2001). *Introduction to Econometrics* (3rd ed.). New York: Wiley.
- Mahesh, M. (2011). *The Effect of Trade Openness on Income Inequality: Evidence from Developing Countries*. Available at: <http://ssrn.com/abstract=2736721> or <http://dx.doi.org/10.2139/ssrn.2736721>.
- Majumdar, S., & Partridge, M. D. (2015). Impact of Economic Growth on Income Inequality: A Regional Perspective. *Ideas*, 15, 34-50.
- Marrero, G. A., & Rodríguez, J. G. (2012). *Macroeconomic determinants of inequality of opportunity and effort in the US: 1970-2009*. Society for the Study of Income Inequality Working Paper Series No. 249.
- Martinez, R., Ayala, L., & Ruiz-Huerta, J. (2011). The Impact of Unemployment on Inequality and Poverty in OECD Countries. *Economics of Transition*, 9(2), 98-109.
- Meschi, E., & Vivarelli, M. (2007). *Trade openness and income inequality in developing countries*. Working Paper No. 232. Coventry: University of Warwick, Centre for the Study of Globalisation and Regionalisation.
- Miles, M. (2015). *Low interest rates actually hurt the middle class*. Boston: Boston Globe.
- Monnin, P. (2014). *Inflation and Income Inequality in Developed Economies*. Council on Economic Policies Working Paper 2014/1.
- Moyes, P. (2012). A note on minimally progressive taxation and absolute income inequality. *Social Choice and Welfare*, 5(2-3), 227–234.
- Neuman, W. L. (2006). *Social research methods: Qualitative and quantitative approaches* (10th ed.). Boston: Allyn& Bacon.
- O'Farrell, R., Rawdanowicz, L., & Inaba, K. (2016). *Does monetary policy increase income and wealth inequality?* Macroeconomic Policy Division, OECD Economics Department.

- Ohlin, B. (1967). *Interregional and International Trade: Harvard Economic Studies*. Cambridge: Harvard University Press.
- O'Laughlin, B. (1975). Marxist Approaches in Anthropology. *Annual Review of Anthropology*, 4, 341–70.
- Oloufade, D. K. (2012). Trade Openness, Conflict Risk and Income Inequality. *Journal of Economic Growth*, 17, 5-32.
- Omondi, G. (2014). Wide wealth gap leads to calls for pro-poor policies. *Business Daily*, August 25.
- Oxfam. (2016). *An economy for the 1%*. Oxfam Briefing Paper No. 210.
- Pickett, K., & Wilkinson, R. (2011). *The spirit level: Why greater equality makes societies stronger*. New York: Bloomsbury Press.
- Pigou, A. C. (1932). *The economics of welfare* (4th ed.). London: Macmillan and Co.
- Piketty, T. (2014). *Capital in the twenty-first century*. Boston: Harvard University Press.
- Reeves, J. (2015). *What higher interest rates mean for consumers*. New York: USA Today.
- Rose, S. (2011). *Income inequality and its contributing factors in transition economies*. An Honours essay submitted to Carleton University, Ottawa.
- Rubin, A., & Segal, D. (2015). The effects of economic growth on income inequality in the US. *Journal of Macroeconomics*, 45, 258–273.
- Salimi, F., Akhoondzadeh, T., & Arsalanbod, M. R. (2014). The Triangle of Trade Liberalization, Economic growth and Income Inequality. *Communications on Advanced Computational Science with Applications*, 4, 1-15.
- Sarel, M., & Robinson, D. J. (1997). *How macroeconomic factors affect income distribution: The cross-country evidence*. IMF Working Paper No.WP/97/152.
- Saunders, P. (2002). *The Direct and Indirect Effects of Unemployment on Poverty and Inequality*. The Social Policy Research Centre Discussion Paper No. 118.
- Shukla, R. (2016). *Impact of GDP growth on income inequality*. Mumbai: People Research on India's Consumer Economy.
- Society for International Development. (2014). *Pulling apart: Facts and figures on inequality in Kenya*. Nairobi: Society for International Development.
- Tabassum, A. (2013). *Economic Growth and Income Inequality Relationship: Role of Credit Market Imperfection*. Master of Philosophy thesis, Quaid-i-Azam University, Islamabad.

- Vandemoortele, M. (2010). *Equity: A key to macroeconomic stability*. London: Overseas Development Institute.
- Wahiba, N. F. (2013). Trade Openness and Inequality. *Journal of Knowledge Management, Economics and Information Technology*, 3(6), 1-12.
- Walsh, J. P., & Y, J. (2012). *Inflation and Income Inequality: Is Food Inflation Different?* International Monetary Fund No.WP/12/147.
- Wang, C., Wan, G., & Yang, D. (2014). Income inequality in the people's republic of china: Trends, determinants, and proposed remedies. *Journal of Economic Surveys*, 28(4), 686–708.
- Wilkinson, R., & Pickett, K. (2009). *The spirit level: Why more equal societies almost always do better*. London: Allen Lane.
- Wood, J. C. (1996). *Karl Marx's Economics: Critical Assessments I and II*. New York: Routledge.
- World Bank (2015). *Global monitoring report 2014/2015: Ending poverty and sharing prosperity*. Washington: World Bank.
- Yue, H. (2011). Income inequality, economic growth and inflation: A study on Korea. *International Journal of Economic Research*, 2(5), 14-21.

APPENDIX Raw Data

Country	Year	Inflation CPI 2009 = 100	Inflation rate pa	Interest rates	Unemployment	Exports (% of GDP)	Imports (% of GDP)	Gini
Kenya	1975	2.04	12.7	10	6.0067342	29.82368597	34.51158185	59.51
	1976	2.19	15.2	10	9.09267652	32.45047124	31.75563773	56.72
	1977	2.5	14.6	10	12.9726185	34.95886876	31.5930964	54.93
	1978	2.82	14.8	10	11.04273	28.93551834	38.68802232	51.05
	1979	3.12	14.1	10	14.7602	25.75315424	31.61102051	56.02
	1980	3.51	13.858	10.58333333	12.10000038	29.51696422	35.89983172	57.81
	1981	4	11.603	12.41666667	12.26699981	30.45988132	33.82030444	60.51
	1982	4.94	20.667	14.5	12.55999962	26.657466	31.55827115	61.06
	1983	5.72	11.398	15.83333333	14.9029001	25.94993241	28.21277299	63.72
	1984	6.72497045	10.284	14.41666667	13.0910991	26.74989265	32.05400493	65.23
	1985	6.72497045	13.007	14	15.90298	25.29893296	30.14650159	60.66
	1986	7.380827942	2.534	14	13.092871	25.84835527	29.89303032	59.51
	1987	8.097122928	8.638	14	12.95208145	21.30522135	26.39754666	54.2
	1988	9.211269662	12.265	15	11.8719115	22.37121356	27.60376853	56.95
	1989	10.38592579	13.789	17.25	12.5619866	23.03302943	30.1233478	58.63
	1990	12.48022663	17.782	18.75	12.879016	25.69260596	31.32830772	59.33
	1991	14.47960369	20.084	18.9975	10.10000038	27.04163232	28.5560669	57.65
	1992	19.00129814	27.332	21.0675	10.19999981	26.26037419	26.67049591	57.46
	1993	29.68531446	45.979	29.98916667	10.10000038	38.90363017	33.95485119	47.56
	1994	32.37854678	28.814	36.24	10	37.04028084	34.22584439	43.86
	1995	34.07284993	1.554	28.79583333	9.899999619	32.59170122	39.15404042	44.91
	1996	37.76880174	8.864	33.78666667	9.899999619	25.20060195	32.11150875	45.37
	1997	40.94966345	11.358	30.245	9.899999619	22.68638735	31.37072951	46.38

	1998	42.46246958	6.312	29.49	9.800000191	20.16926083	28.72798111	49.55
	1999	46.7950965	4.984	22.38	9.800000191	20.8327352	27.35953979	54.21
	2000	52.20621721	7.77	22.33916667	9.800000191	21.58757114	31.72147324	55.38
	2001	53.4163978	5.824	19.66583333	9.699999809	22.93157636	33.01525966	57.21
	2002	54.9664997	2.156	18.45333333	9.699999809	24.89797261	30.27469965	54.94
	2003	59.80280624	5.983	16.57333333	9.600000381	24.08681531	30.04545059	52.84
	2004	70.32161172	8.381	12.53166667	9.600000381	26.61025858	32.86674477	50.65
	2005	73.43350214	7.823	12.8825	9.5	28.50903021	35.96983595	48.51
	2006	78.27041765	6.041	13.63553391	9.5	22.98493964	32.25154548	48.32
	2007	82.67841908	4.265	13.34034368	9.399999619	21.91899129	31.97579751	49.03
	2008	96.38094986	15.101	14.01693938	9.399999619	22.67405755	34.90454109	53.83
	2009	100	10.552	14.80454124	9.399999619	20.03262925	30.83101232	44.76
	2010	108.0708434	4.309	14.3715	9.300000191	20.65720485	33.57024151	42.71
	2011	128.8064363	14.022	15.04675999	9.199999809	21.62597244	38.82270088	45.82
	2012	133.3478054	9.378	19.72340665	9.199999809	19.81682883	35.40526961	46.41
	2013	143.245408	5.717	17.31345769	9.100000381	18.14904796	33.13118133	47.71
	2014	152.0929203	6.878	16.51393071	9.199999809	16.92444637	34.2004661	46.82
	2015	163.2735904	6.582	16.08661379	10.10000038	15.76902012	29.03775467	45.77
Country	Year	Inflation CPI 2009 = 100	Inflation rate pa	Interest rates	Unemployment	Exports (% of GDP)	Imports (% of GDP)	Gini
Uganda	1975	8.041434832	18.73604882	11.095008	5.475999905	8.650404973	10.91542663	51.65
	1976	8.122661446	31.81959296	10.761855	5.376	11.38806031	9.606505128	50.71
	1977	8.550169944	58.51967185	14.760164	5.576000048	9.152644231	7.798477564	48
	1978	9.827781544	55.86645207	11.985477	5.675999952	13.65285812	18.86250135	46.33
	1979	11.04245117	76.70726541	12.86	6.575999809	19.40136277	17.5313519	45.71
	1980	14.72326823	10.05999676	10.8	6.876	19.44384185	26.03225107	54.23

1981	26.29155041	108.739648	12.5	6.475999905	16.07717042	22.05937336	58.11
1982	26.55712163	49.27408656	14.5	6.676000191	8.381171068	17.52009185	49.2
1983	28.55604476	24.05315615	16.16666667	6.475999905	8.659425681	13.64380301	48.21
1984	29.74587996	42.72562935	21.91666667	6.975999905	12.69242264	14.32515682	48.12
1985	30.35293874	157.6552931	24	6.975999905	13.73852487	15.00833153	45.6
1986	31.03572468	160.9847199	33.33333333	5.475999905	12.81011212	15.23828003	43.11
1987	33.82271652	200.0260213	34.66666667	5.376	8.247098751	18.04329189	42.9
1988	33.89049751	196.1188205	35	4.876	7.572671313	17.77736699	43.11
1989	34.47659971	61.44101926	40	4.376	7.954400699	18.09322782	44.36
1990	38.26481655	33.11865022	38.66666667	6.176000191	7.240720859	19.3688229	42
1991	38.72957141	28.0681431	34.41666667	3.599999905	7.464430308	21.93777155	41.96
1992	41.9605324	52.44226881	29.65201	3.5	8.761088805	24.29105525	41.43
1993	42.47017449	1.163982625	26.87042	3.700000048	7.062522977	21.17731156	40.76
1994	43.78368505	10.03675988	23.76093	3.799999952	8.740531831	19.09882803	38.19
1995	48.11393961	6.55014019	20.1625	4.699999809	11.79199233	20.83115353	38.11
1996	49.04581	7.191646604	20.29416667	5	11.96111327	23.42437361	39.04
1997	49.27377	8.169021441	21.37083333	4.599999905	13.35951368	20.79905329	40.11
1998	52.11048	0.068804172	20.86166667	4.800000191	9.639047588	20.40487434	41.71
1999	53.86899	5.777368987	21.54916667	4.599999905	12.2515739	23.77313626	43
2000	54.91204	3.392021585	22.9197575	5.099999905	10.65140929	22.09762405	44.29
2001	54.74601	1.865125241	22.655	5.099999905	11.51808264	23.81189414	45.05
2002	59.52071	0.287508512	19.09717823	3.599999905	11.21327917	25.06451499	45.17
2003	61.70702	8.680476516	18.94214089	3.5	11.38672483	25.19900163	44.23
2004	67.016	3.72128744	20.60317574	3	12.69688075	22.7632055	43.48
2005	71.85213	8.448726423	19.6453884	2.5	14.17969998	24.8145855	42.94
2006	76.22589	7.310676136	18.6973348	4.300000191	15.27541338	28.35787241	41.28
2007	85.39732	6.138510833	19.10574548	2	16.72506853	30.05234812	41.28

	2008	96.50606	12.05085555	20.4500661	2.5	24.28014234	31.97812586	43.71
	2009	100.361	13.01725619	20.95516578	2.5	17.54877966	29.95610226	44.2
	2010	119.0849	3.976552885	20.17463013	3	17.13578649	28.59468209	43.9
	2011	135.7959	18.69290448	21.83318937	3.5	18.93673075	33.77467734	42
	2012	143.2185	14.01605656	26.31136912	3.200000048	20.12558622	32.97246081	42.37
	2013	149.3697	5.464401872	23.25140199	2.900000095	20.24584555	30.51984101	44.17
	2014	155.4014	4.288209263	21.52754211	3.099999905	18.36995928	28.45561664	45.23
	2015	161.6112	5.22542724	22.60133971	4.3	17.48795856	29.4012559	42.12
Country	Year	Inflation CPI 2009 = 100	Inflation rate pa	Interest rates	Unemployment	Exports (% of GDP)	Imports (% of GDP)	Gini
Tanzania	1975	17.73843763	26.05775688	7.5	6.140000191	10.71072187	38.2135839	26.31
	1976	17.91761377	6.859350027	8	5.939999905	11.07979715	29.18689861	27.21
	1977	18.47176677	11.6041381	10.5	6.439999905	10.48479905	41.95835231	29.28
	1978	18.65835028	6.575	6.539999999	6.439999905	10.26828081	47.43301239	31.49
	1979	19.43578154	12.94862773	11.5	6.800000191	10.66464335	45.09747544	33.71
	1980	20.67636334	30.2	11.5	6.599999905	9.666070536	47.16241059	34.91
	1981	20.88521549	25.7	12	7.099999905	9.13238644	37.16457405	35
	1982	23.00133865	28.9	12	7.099999905	9.037519102	34.0299337	35
	1983	23.08444264	27.1	13	5.599999905	9.625368067	34.99547234	36.71
	1984	23.15158223	36.1	13	5.5	9.996398275	37.72928252	34.81
	1985	23.46364876	33.3	12.29166667	5	10.65479167	34.05510509	33.6
	1986	25.50396604	32.4	18.5	4.5	11.49790694	45.2770865	32.17
	1987	26.56663129	29.9	27.5	6.300000191	12.51439847	36.03191295	34.8
	1988	27.09498347	31.2	29.625	4	11.01165643	38.83128988	32.27
	1989	28.58120619	25.8	31	4.5	12.37830094	37.48948344	33.71
	1990	29.16449612	36.4	33	4.5	12.62114885	37.45463125	33.54

1991	32.04889683	25.2	31	3.599999905	10.26206119	33.63914964	35.29
1992	33.66269803	20.7	35	3.5	12.44183789	39.35357747	35.88
1993	34.34969187	26.1	31	3.700000048	17.98310786	47.70761085	34.62
1994	36.15757039	37.9	39	3.799999952	20.61398071	43.6249683	33.06
1995	38.46484	26.8	42.83333333	4.699999809	24.07472273	41.5076974	31.82
1996	40.91934	21	33.965	5	19.93716494	31.94350737	29.61
1997	42.82626	16.1	26.27	4.599999905	16.21810672	25.68951914	33.71
1998	45.2667	12.8	22.8925	4.800000191	12.39772917	25.01989802	34.9
1999	49.70668	7.9	21.89416667	4.599999905	12.52965707	22.8543342	36.1
2000	54.6038	6	21.5775	5.099999905	13.36490944	20.12594462	37.3
2001	59.76899	5.1	20.05726141	5.099999905	17.00656486	21.28368882	38.25
2002	63.58534	4.6	16.39824076	3.599999905	17.58075321	19.8403333	38.25
2003	69.38627	4.4	14.51696089	3.5	18.56259595	22.81101724	38.51
2004	74.00596	4.1	14.14031947	3	19.65127524	26.06580553	39.81
2005	78.69545	4.4	15.24894872	2.5	16.91431367	22.16804675	40.04
2006	87.86319	7.3	15.65209779	4.300000191	17.10083396	25.00539113	40.04
2007	96.07164	7	16.07036615	2	18.91911613	31.68440893	40.28
2008	103.0583	10.3	14.98213468	2.5	18.64867074	30.7891127	39.69
2009	112.1316	12.1	15.03048182	2.5	17.37384595	26.27800112	38.71
2010	122.1581	7.2	14.5459147	3	18.74641327	29.12998381	38
2011	130.2059	12.7	14.96187317	3.5	20.75641834	36.03873747	37.78
2012	138.6299	16	15.46046414	3.200000048	21.28530986	33.11176971	36.9
2013	148.1499	7.9	15.83487943	2.900000095	17.65122642	31.06942949	35.98
2014	159.6327	6.1	16.26413585	3.099999905	19.48160925	29.89179687	32.91
2015	167.6709	5.6	16.10432422	2.900000001	20.78287623	28.73964544	34.83