Determinants of Unemployment in East African Community Countries

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ABSTRACT: The purpose of this research study is assessing the relationship between unemployment and its determinants for five east Africa community countries i.e., Kenya, Uganda, Tanzania, Rwanda & Burundi. Particularly, discussed are some economic variables and their significant effects especially in the long run. The study variables include; inflation, GDP growth, population growth and foreign direct investments in relation to unemployment. In order to achieve the research objectives, a methodology framework of panel autoregressive distributed-lag (PARDL) is undertaken. The study finds that a long-run relationship exists among all the variables. Moreover, GDP, POPL, and FDI are found significant to interpret the unemployment in the long-run whereas INF is found insignificant to interpret unemployment in the long-run. The findings also reveal that the tradeoff between inflation and unemployment in EACCs is in the short run and not in the long run. This study concludes that foreign direct investment and gross domestic product have negative and significant relationship with unemployment. Population growth has positive and significant relationship with unemployment and it contributes to unemployment while inflation rate has a positive and insignificant relationship with unemployment. According to the findings of this study population growth is the key determinant of unemployment in EACCs.

KEYWORDS: Unemployment, Inflation, PARDL, GDP, FDI, EACC

I. INTRODUCTION

Unemployment is an important economic indicator since it reflects a country's economic health. Unemployment, on the other hand, has been and continues to be a pain in the flesh of many economies around the world. It is a problem that affects both developing and industrialized countries. The high influx of job seekers into Africa's low-absorbing economies has been and continues to be a continual and chronic headache for these countries' leaders and policymakers (ILO, 2019). Despite significant efforts and resources being mobilized and channelled toward resolving this coming boom through policies, programs, and initiatives, little or nothing appears to have changed in terms of human resource usage. The unemployed are defined by the International Labour Organization (ILO) as a percentage of the economically active population who are unemployed but looking for work, including persons who have lost their jobs and those who have voluntarily quit their jobs (ILO, 2019).

Other macroeconomic factors, such as interest rate, inflation, currency rate, and Gross Domestic Product (GDP), have a significant impact in a country's economic success and are essential issues in global economies. Unemployment is never a good indicator of a country's social and economic health because it leads to poverty, crime, and political and discontent This issue necessitates a deeper examination and examination of existing policies, initiatives, and educational curricula in particular African countries in order to enhance or devise new strategies to handle the problem more fully

(ILO, 2019). Unemployment, according to Neoclassical economics, originates when external rigidities are placed on the labor market, but Keynesian economics claims that unemployment is caused by market inefficiency and inefficient demand for commodities (IMF,2016).

The Great Depression (Chandler, 1970), which became a global event in the history of unemployment, was the starting point for empirical research on unemployment. Africa, Asia, Australia, Europe, and the United States, both north and south, were all affected by the monetary collapse. As countries fought to safeguard their native sectors by raising tariffs on imported goods, global trade fell sharply, by 30%. The consequences were severe and felt all across the world, with an estimated 30 million people losing their jobs by 1932.

In East Africa, unemployment is still largely concentrated in rural regions. Poor rural infrastructure, a failure to modernize rural livelihoods, and a lack of job diversity have all contributed to inclusive growth's issues. This highlights the importance of considering the spatial dimensions of structural transformation, particularly in East Africa, and pursuing spatial targeting, strategically directing, and prioritizing investments and interventions to capitalize on the advantages of spatial areas such as urban centers for industrial development. In brief, while considering a structural transformation program, it is critical to consider the geographical aspects of what to create and where it should be produced. Strategies should be customized to the specific spatial needs of targeted industries and businesses, which

may have a regional component. As a result, policies aimed at attracting spatial investments should take into account both national and regional economic geography.

In 2018, an estimated 172 million individuals were unemployed worldwide to 5% unemployment rate (WESO; ILO 2019 It's that, while the worldwide unemployment rate jumped from 5% in 2008 to 5.6 percent in 2009 in just one year, it took nine years to go back to the levels that were before the global financial crisis The current forecast remained unknown assuming economic conditions, however unemployment rates were expected to fall further in many countries. However macroeconomic risks continued to rise, putting downward pressure on the labor market in a number of countries. Overall, during 2019 and 2020, the global unemployment rate should have remained nearly the same (WESO; ILO 2019). As a result of the rising work force, the number of unemployed is expected to rise by 1 million each year to 174 million by 2020. (WESO; ILO 2019).

Kenya ranks first among East African countries in terms of the number of unemployed people (UNDP, 2019). According to statistics, one out of every five Kenyans is unemployed, compared to one out of every twenty in Tanzania. Kenya's unemployment rate was 39.1% at the end of 2016, with youngsters accounting for the majority of the unemployed, compared to Tanzania's 24 percent, Ethiopia's 21.6 percent, Uganda's 18.1 percent, and Rwanda's 17.1 percent (UNDP, 2019). The UNDP cautions that rising unemployment in the region, particularly in Kenya, poses a risk of fostering rampant crime and violence. Academic institutions have been criticized in large part for producing half-baked individuals who cannot compete in today's evolving work market.

Despite robust growth, East Africa's lack of structural transformation has resulted in high unemployment. The failure of African economies to structurally shift from low-productivity agriculture higher-productivity nonagricultural industries has exacerbated the continent's unemployment problem. Due to a lack of formal wage jobs, younger people are being forced to seek revolutionary work in agriculture, which is propelling them into agri-businesses. The informal economy will continue to play an important role in employing young people; governments should boost its productivity, help it, and eventually legitimize it. Regulations will differ from nation to country, but Ethiopia has shown that providing financing through microfinance organizations, providing working space, relaxing some rules, and granting tax incentives can all help.

Slow progress in reducing unemployment has ramifications for poverty and inequality, and East African governments must take bold steps and initiatives to address the problem. This research identifies the factors that have a significant impact on EACC's employment rate. Annual time series data collected from 1995 to 2019 is analysed for the purpose of the research. GDP growth, FDI inflows, inflation rates, population growth, and unemployment rates are among the variables studied.

II. MAIN OBJECTIVE
The main objective of this study was to examine the determinants of unemployment in East African Community Countries.

A. Specific objectives
i) To determine the effect of inflation on unemployment rate.
ii) To determine the effect of GDP growth on unemployment rate.
iii) To determine the effect of FDI on unemployment rate.
iv) To determine the effect of population on unemployment rate.

III. THEORETICAL REVIEW
There are several theories and frameworks, which support the need for promoting human dignity, and this can only be achieved through sustained employment. The impacts of unemployment are enormous; economic, health and psychological, and is therefore imperative for authorities to put in measures to curtail the challenge before a whole generation is doomed. Some of the theories related to this study include;

A. Keynesian Theory of Unemployment
Keynesian economics is thought to have developed as a result of the worldwide slump of the 1930s. Throughout the world's capitalist economies, massive unemployment rates have been observed. The achievement of full employment in an economy is a fantasy, according to Keynes, especially in capitalist economies. The accomplishment of full employment, according to Keynes, would be an astronomical coincidence. As a result, Keynes' underemployment equilibrium hypothesis is informed by the worldwide reality of full employment's impossibility. Involuntary unemployment, as defined by Keynes, occurs when people in an economy are unable to find work at the current wage rate. By contrasting his theory of involuntary unemployment with the conventional assumption of wage-price flexibility, Keynes objected to the classical assumption of wage-price flexibility. Workers' wages are fixed or rigid in their downward trend. They are, however, adaptable to an increasing trend. The main causes of market wage rigidity are money illusion and institutional factors. Workers' unions are a significant impediment to wage rate reductions. As a result, any pay reduction will be faced with opposition by trade unions. While salaries cannot fall below a particular level, nothing precludes them from increasing. Wages may increase if full employment is achieved. This argument by Keynes implies that, unlike the classical system, the labor supply function is a factor of money wages rather than real wages; - SL = f (W).

Wage rigidity, according to Keynes, leads to involuntary unemployment. This means that in the existence of wage rigidity, full employment in a free enterprise capitalist

economy will remain a phantom. Keynes proposed two more causes for a capitalist economy's failure to achieve full employment: liquidity trap and interest inelas-ticity of investment.

B. Philip's curve theory

In economic theory, Philip's curve theory is a well-known word. Okun's law is connected to this curve. Philip proposed an inverse relationship between economic growth and unemployment in his hypothesis, which is known as the Philip curve in economic theory (Phillips, 1958). According to Philip's idea, unemployment and inflation have a positive relationship. Inflation and unemployment, on their own, have severe consequences for a country's inhabitants. Phillips curves are often computed using either exogenous measurements of the unemployment gap or directly observed cyclical activity (Revoredo-Giha et al., 2012). When demand for a commodity or service exceeds supply, Phillip suggested, the price would likely rise, with the rate of growth growing as the excess demand rises. When demand is relatively low compared to supply, however, prices are projected to decline, with the rate of reduction increasing as the demand deficit grows. This idea, according to (Akerlof, 2000), is one of the elements that determines the rate of change of money pay rates, such as the price of labour services. When there is a strong demand for labour, for example, the number of people employed is low. Employers are likely to bid wage rates up quickly, with enterprises and industries giving a little more than the going rate to attract the best workers from their competitors. Workers are unwilling to sell their services for less than the going rate when labour demand is low and unemployment is high, Phillip continued. This causes wage rates to fall rapidly (Pissarides & McMaster, 1990). This, according to the theory, means that the relationship between unemployment and wage rate changes is likely to be extremely non-linear, depending on other factors like the pace of change in labour demand. According to Pierce (1977), when unemployment is high, monetary authorities frequently choose to keep interest rates low in the hopes that businesses will find the availability of low-interest loans an incentive to invest in their businesses, thereby increasing the number of available jobs and lowering unemployment. However, as Furuoks et al. (200) point out, more research on the relationships between unemployment, wage rates, prices, and productivity are needed.

C. Classical theory of unemployment

The classical approach to unemployment is based on the theory of 'free' competition, which is regarded as a process of rivalry between enterprises in their never-ending quest for survival. Individual capitals are forced to increase productivity and reduce unit cost of production due to competition, according to (Fiaschel and Semmler, 1990; Shaikh, 1980), primarily through the mechanization of the labor process, which occurs through the introduction of fixed capital into the production process. Optimal capacity utilization is connected with the full employment of all wasted chances for earning more profits in this theory of competition. In fact, the classical subsistence wage proposition does not require full employment of labor, and Marx's argument of the reserve army of unemployed indicates that the economy's dynamics affect not the existence of unemployment, which is always present, but the level of unemployment, which fluctuates in response to the economy's 'fat and lean years.' As a result, unemployment rises during economic downturns and declines during moments of prosperity, but it is always present. The three variables responsible for an economy's unemployment level are dynamic interactions of the rate of capital accumulation, mechanization of the labor process as expressed in the movement of the capital-labor ratio, and labor force mobility of the potential working population (Botwinick, 1993: 110-11). In this theory, the pace of capital accumulation, rather than wage rate flexibility, is the most important component in determining labor demand, as it is in mainstream and Keynesian models.

D. The Malthusian Theory of Population

Thomas Robert Malthus expressed his thoughts on population in his renowned 1798 article, Essay on the Principle of Population as it Affects the Future Improvement of Society. Malthusian, asserts that population growth is a geometrical progression phenomenon and food supply assumes arithmetical progression. As a result, population tends to outrun food supply, resulting in an imbalance that leads to overpopulation. In the absence of a comprehensive plan and population control to contain it, Malthusian ideology predicted that it will unquestionably overwhelm available resources. In a nutshell, a large population means a high rate of unemployment in the economy. Human reproduction rates are controlled using preventive interventions such as birth control. Prophylactic methods such as foresight, late marriage, celibacy, moral constraint, and others are also accessible. If people fail to utilize preventative checks to control population increase, natural positive checks such as vice, misery, starvation, war, disease, pestilence, floods, and other natural calamities tend to reduce population and so maintain a state of equilibrium between population and food supply. Preventative checks are always in effect in a civilized society, according to Malthus, because positive checks are crude. Malthus urged his compatriots to use preventive checks to avoid the sin or sorrow that positive checks could bring. Indeed, Malthus enlightened the Europeans by forewarning them of the dangers of overpopulation, and they began to take precautions to avoid it. The fact that people utilize preventive measures such as late marriage and various contraception and birth control measures on a large scale demonstrates the Malthusian law's viability. When great economists like Marshall and Pigou, as well as sociologists like Darwin, adopted this notion into their theories, they were inspired by it. Keynes later wrote about "Some Economic

Consequences of Declining Population," after being overawed by Malthusian fears of overpopulation.

Although the Malthusian philosophy is no longer applicable in its original location, its influence has extended across two-thirds of the universe. With the exception of Japan, it covers all of Asia, Africa, and South America. India was one of the first countries to implement population control measures at the state level. Floods, wars, droughts, plagues, and other natural disasters act as positive checks. The rates of birth and death are both high. The population is growing at a pace of roughly 2% per year. The true goal of population policy, however, is not to prevent starving but to reduce poverty in order to increase output per capita at a faster rate. As a result, the Malthusian theory applies equally well to developing countries such as India. "The Malthusian principle is applicable to all communities without any consideration of colour or place," Walker stated. Despite all the dispute that has raged around it, Malthusianism has remained unblemished and impenetrable.".

IV. EMPIRICAL LITERATURE REVIEW
A. Unemployment rate

A study of the Nigerian economy Obi (2007) investigated the relationship between fiscal policy and unemployment and discovered that there is a link. Experiential findings were figured out with the use of the equilibrium model, and it was concluded that fiscal policy has an impact on inflation and unemployment. Meanwhile, inflation has a negative impact on unemployment. Obi (2007) proposed at the end of the study that policymakers should consider income distribution when implementing future policies.

Furthermore, both the unemployment rate and inflation oscillate throughout time, both continuously and discretely. Inflation oscillates around the increase in nominal money supply, with monetary policy as a mirror, but the unemployment rate orbits around its natural rate. In the study of the hypothesis, inflation is negatively affected not only by its rate of change, but also by the unemployment rate of a country, which dynamically causes an economy's instability (Todorova, 2012)

Asif studied the macroeconomic factors affecting unemployment in India, Pakistan, and China (2013). He used granger causality, regression analysis, and co-integration tests during his research. Unemployment is influenced by GDP, population, and exchange rate growth in all three countries. For all three countries, there was no granger causality among those factors. In Pakistan, China, and India, however, long-term relationships had an impact on all variables.

According to certain research, an increase in a country's growth, exports, and inflation can reduce unemployment, but a fall in the exchange rate, money supply, and interbank interest rate might result in an increase in unemployment. investigate Taking into account the consequences of financial crises (Dogan, 2012). Based on low-income countries,

Bartolucci, Choudhry, Marelli, and Signorelli (2015) explored the effects of GDP on unemployment in high-income countries. Financial crises, such as banking and exchange rate crises, may have an additional effect on the unemployment rate, according to empirical evidence.

Al Amarat (2016) examined the significant association between foreign direct investments and unemployment rates in Jordan, focusing on variables that limit foreign direct investments. Jordan's low levels of FDI are due to legislation that restricts international investment. At the conclusion of their research study, they recommended mobilizing and channeling additional funds to the department of services and infrastructure in order to increase investment prospects in Jordan.

B. GDP Growth

The GDP growth rate is one of the most important metrics for determining whether a country's economic situation has improved or deteriorated by comparing one quarter of the country's financial yield (GDP) to the previous quarter. Some academics argue that the link between growth and unemployment stems from Okun's Law, which explains the inverse relationship between output and unemployment rate. Arthur Okun proposed Okun's Law in 1962, and it is a well-known concept in macroeconomics theory. The relationship between the change in the unemployment rate and the change in real gross domestic product is described by this theory (GDP). Using US GNP data, Okun quantified this relationship into a statistical relationship that shows how the proportion of unemployment is inversely connected to the actual rise in the economy's output (GDP).

The effect of unemployment on growth rate in South Africa a study by Mosikari, (2013). He used annual time series data for the period 1980 to 2011. He employed an Augmented Dickey Fuller Stationary test, and the variables proved to be integrated of order one. He also applied Granger causality test and found that there is no causality found between unemployment and economic growth. He concluded by encouraging all policies of economic growth with the idea that growth will reduce unemployment in South African economy.

Ordinary Least Square (OLS) methodologies were employed in another study by Fallahai et al., (2012) to investigate the association between unemployment and economic growth in Peru and Lima from 1992 to 2012. In all situations, her findings revealed a negative link between unemployment and economic growth. Iqbal and Sattar (2010) similarly found a negative correlation between unemployment and Pakistan's economic growth. These findings were corroborated by Okun's law. According to Okun's law, if unemployment rises by 1% from its typical level, GDP growth will fall by 2%, and vice versa. The relationship between real GDP and unemployment is thought to be direct. It is estimated that real GDP and unemployment has a direct relationship. The period of the study spans from

1980 to 2008. To ascertain the relationship between unemployment and economic growth selected Econometric models were employed.

Kreishan used annual time series data from 1970 to 2008 to determine the relationship between unemployment and economic growth in Jordan (2011), Okun's law has not been confirmed for Jordan, according to the empirical findings of this study. He predicted that economic strategies aimed at demand management would have little impact on the unemployment rate.

In their analysis, Olayiwola and Okodua (2013) discovered a favorable association between unemployment and Nigerian economic growth. Their research spanned the years 1980 to 2008. The Engel Granger and Co integration test, as well as the Ordinary Least Square (OLS) methodologies, were their methods of choice. In both industrialized and emerging economies, there appears to be greater empirical evidence of a negative association between unemployment and GDP, according to the studies analysed.

Huseyin Bilgin and Karabulut investigated the long-term relationship between unemployment and GDP growth in MENA nations such as Egypt, Israel, Turkey, and Jordan between 1975 and 2005. (2009). In their research, they discovered that GDP growth has an inverse relationship with unemployment. In Egypt and Turkey, however, the inverse link was significantly stronger than in Israel and Jordan.

In Arab countries, economic growth has an inverse and considerable impact on unemployment rates. According to Abdul-Khaliq, Soufan, and Shihab (2014). Ball, Leigh, and Loungani (2012) claim that Okun's Law strongly explained variations in the unemployment rate in the short run. Okun's Law is believed to have proven a strong and steady relationship in most countries, even during the Great Recession, according to the research.

On the other hand, other academics believe that Okun's Law is inapplicable to the majority of the world's countries. For example, Lal, Muhammad, Jalil, and Hussain (2010) investigated and discovered that Okun's Law does not apply in various developing Asian countries due to asymmetry difficulties.

According to Neely (2010), unemployment rates in most industrialized countries tend to vary less for a given change in GDP. This can be explained by the fact that some countries' labour markets are less tightly controlled, allowing firms to quickly lay off people during economic downturns. He also claimed that the Okun's coefficient is affected by changes in other elements such as technology, regulations, and preferences over time.

Raurich and Sorolla also looked at the long-run link between GDP growth and employment based on real wage inertia (2014). By taking into consideration wage inertia, a decrease in GDP growth rate can permanently reduce employment rates, according to their findings.

C. Inflation rate

In the recent past, the relationship between inflation and unemployment has been a point of interest for many economists and researchers. However, it all began with William Phillips (1958), with his study of the relationship between unemployment and the rate of change of money wage rates in the United Kingdom for the period 1861 to 1957. The doctrine of 'Phillips Curve' is the basis upon which this empirical study was built upon. In the long-run there exist no trade-off between inflation and unemployment (Phillips, 2006) explaining the vertical nature of Phillips curve.

Dritsaki and Dritsaki (2012) states that increase in inflation will lead to increase in employment rate hence improve the economic growth in Greece. Reasons that cause These circumstances in Greece are due to hike in taxes, stagnated investment activities, monetary strategy uncertainties and state corruption. It is further established, in the long term the lack of occur theory of unemployment & inflation in Greece. However, Granger causality test results established the existence of long-term relationship between unemployment and inflation. A 10-years data trend forecast showed that on inflation shocks established that the shocks would trigger a decrease in unemployment rate for the first years before subsequent steady but slow rise in the years that follows.

Reichel, (2014) found trade-off between inflation and unemployment only for USA and Japan when he tested Phillips's hypothesis applicability on industrialized economies. In addition to that, Furuoka, (2013) reported that the long-run and causal relationship between unemployment rate and inflation rate in Malaysia during the period of 1975–2004.

Lui (2015) studied the relationship between inflation and unemployment in Italy. The data used in this analysis was from Italian Survey of household income and Wealth 2004, only labor force was included. General equilibrium model and linear regression method was used. The inflation-unemployment relationship is either negative or positive depending on goods & labor market institutions research results indicates. While higher inflation rates increase workers' incentives to work on the flip side it generates negative effect on unemployment since inflation negatively affects firm's return which in turn hinders firms employing more people, thereby raising unemployment

D. 2.4.4 Foreign Direct Investments

Foreign Direct Investment (FDI) is an investment by a company or individual from the home country to another country. In recent times FDI have been hailed by the developing countries as one of the best alternatives to spur economic growth in their nations. In their study attempting to explain this relationship, Strat et al., (2015) report, in their study of the interdependencies between the inflow of FDI and the unemployment, that such studies are of high importance for each country which shows increased in attracting foreign direct investments. They conducted their analysis for the

period 1991 – 2012, on yearly data downloaded from the web page of the World Bank. Their econometrical methodology was based on the T-Y procedure which was used with the purpose of analyzing the short-term causal relationship between the two variables. For the six countries their findings observed lack of Granger causality relation between the variables but observed one direction causal relation for the remaining ones.

The view that FDI and trade are expected to have positive effect on the levels of employment is supported by Lee & Vivarelli, (2004). New jobs recreation cannot automatically be assured, and this is idea is amplified by the fact that employment effect is diverse in different parts of the world. In additional, previous studies in the past have yielded varies results and sometimes contradictory ones depending on the econometric methods and the time period under study.

The examination of the dynamic interactions between FDI, economic growth, exports and unemployment for Taiwan and Turkey using time series data over the period 1981-2003 and 2000 – 2007 respectively by Chang, (2007) and Aktaar & Ozturk, (2009) found that FDI contributed to unemployment. Vector auto regression (VAR) model was their methodology of choice.

E. Population Growth

Growth in population is a key driving factor of unemployment rates in most economies, Arslan and Zaman (2014). Growth in population has a positive impact towards unemployment rate thus a key driver of the rise in unemployment. Research on the causes of unemployment in Pakistan for a period covering 1976 to 2012 conducted by Maqbool et al. (2013) established a positive relationship between population and unemployment in Pakistan. Both in the short-run and long-run the relationship between unemployment and population was found to be positive and significant.

A research study on changes in population and rates of unemployment for baby boomers was conducted in 1990 by Flaim. His study focused on changes in demography and unemployment for the period 1960 to 1990. The results explored that unemployment rate had an upward trend in 60's and 70's and the reason were the growing rate of population and this rate had a downfall in the decade of 1980's. The findings in their study affirmed that changes in age and demographic structure changes have huge effects on unemployment rate.

The determinants affecting unemployment in Peshawar Division of Pakistan in the education sector was a study by Mahmood, Akhtar, Amin, and Idrees (2011). 442 residents of Peshawar Division, with a graduation degree (first degree) or qualified with any professional or technical job regardless of their employment status were sampled. Their findings established population growth among the educated segment to have a positive impact on their unemployment status.

Based on a research study by Bakare (2011), where he researched on the causes of urban unemployment in Nigeria for a span thirty years from 1978 to 2008. Unemployment rate and population, the findings established them to be positively related. The mismatch between job seekers influx in Nigeria economy and the low uptake of job seekers into the economy is the key driver of the high unemployment rates experienced in Nigeria.

However, the findings by Aqil et al. (2014) contradict many other findings out there. In his research on population growth and unemployment in Pakistan he argues that population growth has a significant inverse impact on unemployment rate. The research findings concludes that there exists an inverse relationship between population growth ang unemployment.

V. METHODOLOGY

This section entails a blue print for this research study data collection, measurements and analysis as well as the methodology employed. This study adopts panel autoregressive-distributed lag model (Panel ARDL) in examining the relationship between unemployment and a selected economic variable under consideration in this study.

A. Research Design

The research's design is descriptive in nature. According to Pride and Ferrell (2007), descriptive research design addresses the following questions: where, who, when, what, and how they connect to a specific study topic. However, descriptive studies cannot definitively establish solutions to why a scenario is what it is. Descriptive studies gather data on a phenomenon's current state and describe what exists in terms of variables in a scenario. Descriptive statistics are used because they are the most appropriate in this situation for highlighting the link and impact of the economic variables under examination on unemployment.

B. Target population

The target population for this study is the entire economic performance data for the variables under study. The study will capture the annual economic variable data for FDI influx values, annual GDP growth, annual unemployment rates, inflation rates and annual population growth.

C. Research Data

Secondary data is used in this study to gain a better knowledge of the local unemployment situation and its evolution, as well as to uncover data gaps. Documents and historical data; websites of different countries' bureaus of statistics; KNBS, UBS, and TNBS are all used to compile secondary data. Websites for trading economics, world development indicators, ILO databases, and the World Bank. Between the years 1995 and 2016, a total of 21 years passed. All of the information gathered is on an annual basis.

D. Data Collection Methods

Data collection is the process of obtaining empirical evidence in order to gain insights into a phenomenon and answer the questions that prompted the investigation. Secondary data is collected in this study in order to analyze and meet the criteria of the specific research objectives. The desk study is the most common form of data collection. To collect data, three checklists are employed; each checklist collects variables for a specified period of time in a single country. The number of years, the variables, and their related data for each year are all detailed in the checklist structure.

E. Model Specification

Based on the theoretical work and empirical literature, the model below was used to assess the effect of a selected macroeconomic variables on unemployment in East African Community countries;

$$Yit = α + βX_{it} + ε_{it} \dots \dots \dots \dots \dots \dots \dots \dots (1.1)$$

Where: Y_{it} was the dependent variable denoting unemployment rates at time t; i denoted the observation (country), i = 1…, 5 while t was the time period, t = 1995, ……, 2019; X_{it} denoted a vector of independent variables, β were coefficients to be estimated, α was a constant term, and $εit$ was a composite error term.

Equation 1.1 was expanded to obtain equation 1.2 which was used for estimation.

$$UE_{it} = ∝_0 + β_1 GDP_{it} + β_2 INFL_{it} + β_3 FDI_{it} + β_4 POPL_{it} + ε_{it} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (1.2)$$

VI. DATA ANALYSIS

Redundant fixed effect test and Hausman test have to be done prior to conducting diagnostic test on the study model. This is to enable the researcher to identify whether either pooled OLS model, fixed effect model or random effect model are better for the study.

A. Redundant fixed effect test

H_0: Pooled OLS is better than fixed effect model
H_1: Fixed effect model is better than pooled OLS model
Decision Rule: Reject H_0 if p-value is less than significance level. Otherwise, do not reject H0.
Decision: Reject H_0 since the p-value is less than the significance level of 0.01 (1%).
Conclusion: There is sufficient evidence to conclude that fixed effect model is better than pooled OLS model.

B. Hausman test

H_0: Random effect model is better than fixed effect model
H_1: Fixed effect model is better than random effect model
Decision Rule: Reject H_0 if p-value is less than significance level. Otherwise, do not reject H_0.
Decision: Reject H_0 since the p-value is less than the significance level of 0.01 (1%).
Conclusion: There is sufficient evidence to conclude that fixed effect model is better than random effect model.

C. Diagnostic checks

The assumptions of Classical Linear Regression Model (CLRM) should be tested for violation before running a regression model on time series data, since they may pose serious threats on the regression results. The following diagnostic tests were used in the study: tests for multicollinearity, auto correlation and normality test.

VII. RESULTS AND DISCUSSIONS

This section presents the results of the study based on the analysis performed. The presentation is made in terms of descriptive results and multivariate results.

A. Descriptive statistics

Table I: Statistics summary

Variables	UE	GDP	POPL	INFL	FDI
Mean	3.829	5.549	2.899	10.499	1.965
Median	2.125	5.385	2.834	8.311	2.042
Std. Dev.	3.614	4.561	0.957	10.498	1.744
Minimum	0.511	-8.01	1.018	-6.350	0.002
Maximum	12.20	35.22	8.117	67.199	6.479
Skewness	1.345	2.001	2.827	2.525	0.537
Kurtosis	3.169	18.811	16.095	12.036	2.285

Table I presents the descriptive statistics of the variables of interest. It can be observed that the mean and median of virtually all the variables are close in values, which implies that their distributions are nearly symmetrical. This is an indication of low variability. The skewness statistics shows that all the variables are positively skewed.

B. Stationarity test

Table II: ADF

ADF - Fisher Chi-square						
Variables	Level (Trend & intercept)			1st Difference(intercept)		
	Stats	Prob	Status	Stats	Prob	Status
UE	11.621	0.681	non-stationary	18.871	0.041	Stationary
GDP	34.990	0.000	Stationary			
POPL	140.27	0.000	Stationary			
INFL	49.670	0.000	Stationary			
FDI	21.668	0.016	Stationary			

The results in Table II show that apart from unemployment all the other variables are stationary at level at 5% significance level. However, unemployment is stationary in first difference at 5% significance level. In conclusion, the stationarity of the variables is found in ADF tests, besides

there is no I (2) variables in the test. Therefore, can proceed to the model estimation by using ARDL co-integration technique.

C. Random effect model vs Fixed effect model

Table III: Correlated Random Effects - Hausman Test

Equation: REM

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1932.847689	4	0

Hypotheses;
H_0: Random effect model is appropriate
H_1: Fixed effect model is appropriate
Significance Level: α = 5% or 0.05
Decision Rule: Reject H_0 if p-value is less than α. Otherwise, do not reject H_0.

In this case the p-value is 0 thus the null hypothesis is rejected and it is concluded the fixed effect model is the appropriate model.

D. Fixed effect model vs Pooled Regression model

UE= c(1) + c(2)*gdp + c(3)*popl + c(4)*inf + c(5)*fdi + c(6)*d1 + c(7)*d2 + c(8)*d3 + c(9)*d4

H_0: c(6) = c(7) = c(8) = c(9) = 0 pool regression model is appropriate.
H_1: Fixed effect model is appropriate

Table IV: Wald Test

Test Statistic	Value	Df	Prob
F-statistic	483.212	(4, 101)	0.000
Chi-square	1932.85	4	0.000

Significance Level: α = 5% or 0.05
Decision Rule: Reject H_0 if p-value is less than α. Otherwise, do not reject H_0.

In this case the p-value is 0 thus the null hypothesis is rejected and concluded the fixed effect model is the appropriate model.

E. ARDL Bound Co-integration Test Model

Table V: ARDL Long Run Form and Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	4.7516	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual Sample Size	95	Finite Sample: n=35		
		10%	2.46	3.46
		5%	2.947	4.088
		1%	4.093	5.532
		Finite Sample: n=30		
		10%	2.525	3.56
		5%	3.058	4.223
		1%	4.28	5.84

In order to find out the long-run relationship among the variables, the Wald F-statistics bounds testing approach on the ARDL equation is carried out. The lag lengths selected to estimate ARDL model are based on what had been purposed by SIC. We assumed the variables with a constant and no linear trend.

Decision Rule: Reject H_0 if test statistic is greater than upper critical value, otherwise do not reject H_0.

According to the result in Table V, the calculated F-statistic (4.7516) is higher than the upper bound test critical value at 5% significance level (4.088). This shows that the null hypothesis of no co integration is rejected at 5% significance level, thus we concluded that there is a long-run relationship among the variables. Based on this result, we can evaluate the long-run effect of each variable on changes of unemployment rate.

F. The Long-Run Relation of Unemployment Rate and Its Determinants

Table VI: Long-run relationship

Dependent Variable: UE

Independent Variables	Coefficient	Std. Error	t-Statistic	P-Value
GDP	-0.0124	0.0072	-1.7025	0.0030
POPL	0.0931	0.0314	2.9565	0.0042
INFL	0.0031	0.0018	1.6778	0.0978
FDI	-0.1427	0.0275	-5.1814	0.0001

Long run equation;
$$UE_{it} = 0.658 - 0.012GDP_{it} + 0.0031INFL_{it} - 0.142FDI_{it} + 0.093POPL_{it} + \varepsilon_{it}$$

The constant value which is known as the Y intercept, is 0.658. The altitude of the regression line when it touches the Y axis is explained by the value of constant in a model. If all the regressors are assumed to be zero, it's the projected value of unemployment. The results show that all the variables in the long run have significant impact on the rate of unemployment except for inflation. GDP and FDI showed significant negative impact on unemployment rate, while population growth showed a significant positive impact on unemployment rate.

The value of -0.012 implies that when the gross domestic product increase by 1 percentage point, on average, the estimated unemployment rate will decrease by 0.012 percentage point in the long-run, holding other variables constant. This discovery is in line with Okun's Law, which states that the rate of GDP growth is inversely proportional to

the rate of unemployment. Economic growth has an inverse and considerable impact on the unemployment rate in Arab countries, according to Abdul-Khaliq, Soufan, and Shihab (2014).

Furthermore, the value of 0.093 shows that holding other factors constant, when the population growth rate increase by 1 percentage point, on average, the estimated unemployment rate will be increasing by 0.093 percentage point. This finding confirms Malthusian theory, population increases in geometrical progression and resource supply in arithmetical progression, population tends to outrun resource supply. It explains that when population grows unemployment rate is increased too. Logically and logically, the results are supported by the fact that, while the components of production continue to increase with increased population, this increase is not proportional to the production and usage of resources. As a result of the limited market, a saturation state develops, raising the unemployment rate. Their empirical data show that the population is negative and significant towards unemployment, according to Loku and Deda (2013) and Aqil et al. (2014). The results of INF though positive are insignificant to the unemployment rate in the long-run. Based on Philips Curve, there is no effect on unemployment in the long run as it assumes natural unemployment rate in the `long term. However, the short-run coefficient of INF showed a negative impact on unemployment of -0.0094 (Aped 4); this finding supports Philip curve short-run assertion, implying that, when wages of labor force increases, unemployment rate is decreased. Lui (2009) studied the relationship between inflation and unemployment in Italy and found a trade-off between the two in the short-run.

Based on this study FDI has a statistically significant effect on the reduction of unemployment in east Africa community countries. Even if FDI and trade are supposed to have a good influence on employment levels, the creation of new jobs cannot be guaranteed, according to Lee and Vivarelli (2004), because the employment effect can be extremely different in different parts of the world. In recent years, studies on the relationship between foreign direct investments, exports, unemployment, and economic growth, using either time series or panel data, have produced a variety of results that vary depending on the econometric methodology used and the time period studied.

The value of error-correction term which is -0.6208 (Aped 3) implies that the long-run relation model is a valid error-correction mechanism for any disequilibrium occurs in the short-run.

G. Diagnostic checks

Diagnostic test	Null H_o	Prob	Accept H_0 if $P>\alpha=5\%$ otherwise Reject
J-B test	εt normally distributed	0.111	Accept H_0
Autocorrelation test	no autocorrelation	0.838	Accept H_0
Heteroscedasticity	Homoscedasticity	0.401	Accept H_0
ECT	Co-integration	0.352	Accept H_0
Ramsey RESET Test	model correctly specified	0.076	Accept H_0

VIII. CONCLUSIONS

A. Inflation on unemployment

As to whether inflation is insignificant and has no effect on unemployment in the long run is still questionable, but one thing that is clear is that there exists a trade-off between the two variables in the short run and that the two variables relationship may be significant or insignificant subject to the country being studied, the operational policies of an individual nation, the used methodology and even the period of study. For this study in respective EACCs, there is a trade-off between inflation and unemployment in the short run with a negative correlation and an insignificant relationship between the two variables in the long run.

B. GDP on unemployment

As to whether GDP has a significant effect on unemployment it is clear that there existed an inverse relationship between the two variables. It is also not doubtful that the relationship between the two variables could be significant or insignificant subject to the country of study, the type of investments and industry, and the operational policies of the host country, the used methodology and even the period of study. The findings in this study indicate there is an inverse and significant relationship between GDP and unemployment.

C. FDI on unemployment

The question whether FDI has effect on unemployment or not and whether significant or not is subject to the country of study, the type of investments and industry, and the operational policies of the host country, the used methodology and even the period of study. The findings in this study show that foreign direct investment has negative and significant relationship with unemployment in respective EACCs.

D. Population growth on unemployment

As to whether population growth contributes to unemployment it is no doubt a major contributor. The findings in this study indicate that Population growth has

positive and significant relationship with unemployment and it contributes to unemployment. According to the findings population growth is the key determinant of unemployment.

VIII. RECOMMENDATIONS

A. GDP on unemployment

Since there is an inverse relationship between GDP and unemployment in EACCs, to effectively manage unemployment policy makers in these countries ought to formulate better policies and measures geared towards enhancing the distribution of income in their individual countries in order to shift the impact of growth towards bridging the income gap between the rich and the poor. This will ensure equitable distribution of income, resources, wealth and economic opportunities thus improving living standards in these individual countries consequently reducing unemployment

B. FDI on unemployment

To effectively manage unemployment as there is found to be a negative and significant relationship between FDI and unemployment in EACCs, respective governments should put more emphasis on attracting foreign direct investments. This can be realized through incentives and policies favourable to foreign investors. This coupled with proper utilization of foreign investment will contribute to growth and unemployment reduction.

C. Inflation on unemployment

There is found to be a trade-off between inflation and unemployment in the short run with a negative correlation and an insignificant relationship between the two variables in the long run. EACCs should therefore constantly adopt proper and effective measures both monetary and fiscal measures to regulate the inflation rates for regulating the unemployment rate.

D. Population growth and unemployment

Population growth is found to have a positive and significant relationship with unemployment and thus the need for respective EACCs governments to adopt policies that control population growth rate by constantly sensitizing people the importance of family planning and the methods of achieving the same and even giving incentives to people in order to encourage them have small manageable families.

E. Suggestion for further studies

Due to limited time, data and resources further research can be done by using age, gender, qualification, sector, and wages etc. as variables to have a broad view towards unemployment and the reasons of unemployment in EACCs. For the sake of future research, a large number of sample sizes should be employed in order to increase the accuracy of the result obtained. According to Gujarati and Porter (2009), they stated that when number of sample size increases, error terms tend to be normally distributed, hence, the estimated result will be closer to the actual result. In addition, the larger samples primarily cause a more accurate estimate of population means (Hertwig, Zangerl, Biedert, & Margraf, 2008). Based on the Noordzij et al. (2010), when the sample size is too small, an important existing effect may not be able to detect. Hence, future researchers to use monthly or quarterly data in order to increase the sample sizes since there are limited data with annual basis provided in World Development Indicators. Besides, future researchers can focus on studying the unemployment of the other nations other than ECCs. For example, they can divide the nations into less developed countries, developing countries as well as developed countries to observe the respective unemployment based on this segmentation. In other words, future researchers can employ panel data to carry out the analysis. They can study the impacts of inequality in the economy which lead to the difference in the income per capita, and finally affect the unemployment rate in the country. On the other hand, Other macroeconomic indicators, such as interest rate, money supply, income, exchange rate, and export, can also be included (Asif, 2013; Bennett, 2011; Dogan, 2012). Future researchers can try to study the relationship between these variables and unemployment rate for them to carry out a more in-depth study into why these relationships exist.

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