



DOI: 10.5281/zenodo.20678722

THE NEXUS OF HEALTH EXPENDITURE, INVESTMENT, INSTITUTIONAL QUALITY, AND ECONOMIC GROWTH IN THE EAST AFRICAN COMMUNITY (EAC)

Rugiranka Tony Gaston^{1*}, Shaun Ramroop² and Faustin Habyarimana³

¹*School of Agriculture and Sciences, University of KwaZulu-Natal, Pietermaritzburg Campus, Private Bag X01, Scottsville, 3209, South Africa. Email: rugiratony@gmail.com*

^{2,3}*School of Agriculture and Sciences, University of KwaZulu-Natal, Pietermaritzburg Campus, Private Bag X01, Scottsville, 3209, South Africa.*

Received: 04/04/2026
Accepted: 20/05/2026

Corresponding Author: Rugiranka Tony Gaston
(rugiratony@gmail.com)

ABSTRACT

The health status of a country's population plays a significant role in its development. However, if the country's economy is not doing well, it is probable that the health budget will consequently face challenges. The current study aims to examine the impact of healthcare expenditure, investments, and institutional quality on economic expansion within the country members of Easter African Community (EAC). To investigate the relationship between variables, the study applies Granger causality tests, Johansen-Fisher cointegration, random effects, and pooled ordinary least squares (OLS) models to a data sample spanning the period of 2000 to 2023. Findings of the study revealed that health expenditure and improved institutional quality positively influence economic expansion within selected countries of the East African Community. In addition, the result confirmed a significant impact of foreign direct investment flow in promoting economic activities and improving economic expansion. Nonetheless, the prevalence of joblessness or unemployment remains the bottleneck of economic growth in the region. The study suggests that governments in these countries stimulate and support health expenditure to enhance health economic activities. It is crucial to improve institutional quality and initiate job creation programmes to labour absorption and productivity as they contribute significantly to economic growth.

KEYWORDS: EAC, Economic Growth, Health Expenditure, Investment, Panel Cointegration.

1. INTRODUCTION

Health status is considered one of the key drivers of socioeconomic condition, economic development, labour productivity and human well-being (Maduka et al., 2016; Sethi et al., 2024). Additionally, economic growth also plays an important role in sustaining the good health of individuals. This implies a complementarity and interaction between health expenditure and the expansion of economic activities (Ozyilmaz et al., 2022). The complementarity between health expenditure and economic growth is justified by the fact that high-income-level countries are characterised by better health conditions, and in turn experience high per capita income (Bats, 2015; Sahnoun, 2018; Wang, 2015). Thus, this relationship is more solid within developed economies as both health and economic sectors perform well. Improved health system enhances productivity and reduces production losses through diseases that minimise or impede labour force capacity. On the other hand, despite their significant efforts, the issue of economic expansion within developing countries has been a subject of discussion for almost an entire century. Various studies were conducted to assess determinants and factors that contribute to economic growth found that one of these factors is health expenditure, which influences innovation and productivity in both developed and developing countries (Anyanwu, 2014; Boldeanu & Constantinescu, 2015; Jannat et al., 2020; Li et al., 2021).

The literature does not provide a theoretical approach that explains the linkage between health expenditure and economic expansion. However, empirical evidence corroborates a positive relationship between these two variables. That is because a deterioration of health conditions in all its forms becomes a burden to the national economy (Ozyilmaz et al., 2022; Sahnoun, 2018). Nonetheless, health expenditure is not always an indicator of economic growth. For instance, improving health conditions minimises death rates even for individuals who are not in the labour force, such as the disabled, the elderly population, and children (Sahnoun, 2018; Wang, 2015). Fundamentally, empirical evidence on the relationship between economic growth and health expenditure is varied. Some studies have found a positive relationship contrary to other studies finding an inverse relationship (Baca, 2018; Behera & Dash, 2018; Blázquez-Fernández et al., 2015; Halici-Tülüce et al., 2016; Hartwig & Sturm, 2014; De Mendonça et al., 2018; Piabuo & Tieguhong, 2017). This explains why the generalisation of findings would be erroneous,

implying that the EAC countries also need their own specific study.

Besides health expenditure, the quality of institutions is another factor that influences economic growth behaviour. The main assumption is that economic growth is subject to institutional quality, which initiates and implements economic policies and attracts investments (Abate, 2022; Hussien & Lee, 2012). The majority of EAC countries are experiencing security and governance challenges, and this may impede on economic expansion within the countries. Except for the two studies where one was conducted in Kenya (Olaniyi & Oladeji, 2022) focusing on institutional quality and the other conducted on 18 African countries (Fengju & Wubishet, 2024), no specific study was conducted to assess the link between health expenditures, institutional quality and economic expansion within the East African community (EAC) countries.

It is important to note that countries in this region also rely on foreign direct investment (FDI) in various economic activities as common with most developing countries (Minh & Trinh, 2023; Musse & Echchabi, 2024). Yet, the FDI is not always a booster of economic growth, as in some instances, FDI may crowd out the participation of domestic firms in economic expansion. Consequently, the aim of this study is to investigate the impact of these three important factors of economic growth, namely health expenditures, institutional quality and FDI, on economic growth within EAC countries. In addition to these factors, due to its potent effect on the economy, the study adds the unemployment rate to its empirical investigation. In this study, economic growth and economic expansion are used interchangeably.

2. LITERATURE REVIEW

In the early 20th century, global life expectancy at birth was estimated to be below 40 years, and during that same period, the level of economic growth was six times lower than it was in 2018 (Bloom & Kuhn, 2018). Over the years, government expenditure was a core source of impetus towards economic expansion, especially within developing countries. Government expenditure is defined as the aggregate of money that a given government, through the public section, expends on consumption (goods and services), investment, and transfer payment (Diamond, 2026). Health is one crucial component of human capital. Quality and productive labour supply come from a healthy population (Fahad et al., 2023). In other words, health is an indirect factor of production which results in economic growth

through physical capital accumulation, innovation and technological growth (Zhao & Zhou, 2021). A report from the World Health Organization (2001) states that enhanced health expenditure improves economic expenditure not only in developed countries but also in developing countries. Poor health conditions of a population minimize personal's productivity and reduce the workforce capacity, leading to sluggish economic growth (Kurt, 2015).

Health expenditures are considered one of the pertinent challenges discussed and investigated in the health economic literature (Ahmad *et al.*, 2021; Yang, 2020). A variety of empirical studies in the literature have assessed the linkage and causality between health expenditure and economic growth. Analysing the data from 560 developed countries, Hitiris and Posnett (1992) investigated the determinant of health expenditures and the results indicated that economic growth remains the utmost determinant of health expenditure. Similar results were obtained by the study of Ozturk and Topcu (2014) in G8 countries, suggesting that the key driver or causation of health expenditures' growth is economic expansion. In addition, some recent studies that investigated the relationship between economic growth and health expenditure within different regions found a positive interaction and bidirectional causality between health expenditure and economic growth (Beylik *et al.*, 2022; Ozyilmaz *et al.*, 2022; Qehaja *et al.*, 2023). Studies that support a positive relationship between economic growth and health expenditure highlight that the latter improves capital accumulation, labour productivity and other related economic multipliers.

Nonetheless, some of the empirical studies indicated that the relationship between economic growth and health expenditure is not always positive. For instance, the study by Islam *et al.* (2023) indicated that an increase in health expenditure reduces economic growth in Saudi Arabia. Similarly, an inverse relationship between economic growth and health expenditure was found by other scholars' studies, such as Mehrara and Musai (2011) in Ran, Acemoglu and Johnson (2007), Churchill *et al.* (2015), Jones and Klenow (2016), and Afawubo and Couchoro (2017). Furthermore, the study by Hu and Wang (2024) indicated that the effect of health expenditure on economic growth depends on the consumption threshold; when the consumption threshold is high, health expenditure positively influences economic growth, otherwise there is an inverse relationship. Health expenditure may negatively affect economic growth if the spending on

health exceeds optimal thresholds or if health expenditures crowd out productive investments.

Workforce health and capacity are not the only factors that influence a country's economic performance. Institutional quality is another factor that plays a significant role in creating solid ground for economic expansion. Strong and better institutions tend to attract investment and enhance economic performance (Hayat, 2019). A country dominated by corruption, lack of rule of law, poor and inefficient governance is more likely to experience poor economic performance due to high transaction costs and increased risks for investors (Hayat, 2019). Well-established institutions create a synergy between investments and economic activities. Consequently, institutional quality is the engine for national economic growth (Addi & Abubakar, 2024; Yusuf *et al.*, 2021). The core assumption is that institutional quality is associated with economic growth. However, various studies on the relationship between institutional/governance quality components and economic growth reached divergent conclusions. For instance, studies conducted by Babalola and Shittu (2020) and Shittu *et al.* (2020) concluded that an inverse relationship exists between institutional quality and economic growth. These results corroborate findings from Agostino *et al.* (2016) and Shittu *et al.* (2018) studies, confirming that corruption, as one of the institutional quality components, is positively associated with economic growth.

In contrast to those studies supporting a negative relationship between economic growth and institutional quality, studies conducted by Salman *et al.* (2019), Ngo and Nguyen (2020) and Tran *et al.* (2021) suggested a positive relationship between institutional quality and economic growth. This contradiction among empirical studies suggests that the interaction between these two variables depends on individual countries or regions' circumstances. Therefore, generalising would lead to a spurious conclusion. In this regard, it is important to assess the linkage between institutional quality and economic growth focussing on East African Community countries.

In developing countries, foreign direct investment plays a significant role in various economic activities. Theoretically, foreign direct investment is considered as a catalyst for development as it fosters technology transfer, improves capital accumulation and enhances productivity (Solow, 1999). Empirically, findings display inconsistent conclusions as some highlight the positive effect of FDI on economic growth, while others suggest a negative relationship

between the two economic variables within the host country. For instance, studies conducted by Zekarias (2016), Hayat (2018), Nguyen (2022) and Utouh (2024) suggest that FDI has a positive effect on the economic growth of the domestic country. On the other hand, studies conducted by Ayano (2023) and Obinna et al. (2025) revealed that FDI inflow causes a decrease in economic growth within the host country.

Additionally, the study by Benetrix et al. (2023) demonstrated that the effect of FDI on economic growth varies over time and depends on the host country’s human capital levels. In countries with an improved level of education, FDI improves economic growth, while in countries with low or average levels of education, FDI has no significant effect on economic growth. The variability of FDI effect on economic growth was confirmed by the Fazaalloh (2024) study suggesting that FDI positively impact economic growth in some economic sectors while halting growth in others. Furthermore, the study conducted by Arthur & Addai (2022) found no long-run relationship between economic growth and foreign direct investment. This inconsistency in the literature creates a gap which makes this current study relevant.

3. RESEARCH DATA AND METHODOLOGY

3.1. Data

To achieve the empirical objective of the study, we used a balanced panel data set covering Easter African Community countries, namely Burundi, Democratic Republic of the Congo (DRC), Kenya, Rwanda, South Sudan, Tanzania, and Uganda. Somalia was excluded from the sample because the majority of the data for the selected variables and sample period is missing. The analysis focused on a data sample between 2000 and 2023 retrieved from the World Development Indicators (WDI) (2025) and Worldwide Government Indicators (WGI) (2025). To reduce the effect of outliers, to uniformise data and facilitate interpretation, the data was transformed into natural logarithms. The study variables include constant health expenditure measure in percentage of GDP and used as a proxy of health status. This variable was selected because the use of other health proxies, such as demographic factors, mortality rate and morbidity rate are associated with complexity (Bleakley, 2010; Bloom et al., 2003). The selection of other independent variables was informed by their significance in determining a country’s economic status. The inclusion of domestic investments was considered best, however data for this variable is not available for some countries such as Burundi and Somalia hence it was excluded. Additionally, the institutional quality index (IQI) is calculated using six important factors such as control of corruption, government effectiveness, rule of law, political stability, and voice and accountability.

Table 1: Summary Of Variables Representation.

Variables	Symbol	Measurement	Expected relationship	Source
		Response variable		
Gross domestic product LGDP	lnGDP	GDP per capita (constant 2015US\$)	+ positive	WDI
		Explanatory variable		
Constant Health expenditure	lnCHE	health expenditure as a percentage of GDP)	+ positive	WDI
Institutional quality index IQI	lnIQI	control of corruption, government effectiveness, rule of law, political stability, voice and accountability.	Asymmetric (-, +)	WGI
Unemployment	lnUNE	Unemployment, total (% of total labour force)	- negative	WDI
Foreign direct investment	lnFDI	Foreign direct investment net inflow as percentage of GDP)	+	WDI

Source: Authors’ Construction

3.2. Empirical Approaches

To assess the effect of explanatory variables on economic expansion within the East African Community, the subsequent generic functional form was employed.

$$GDP = f(CHE, IQI, UNE, FDI) \tag{1}$$

Where GDP is economic growth/expansion, CHE

is the constant expenditure on health, IQI is the institutions quality, FDI is foreign direct investment, and UNE denotes unemployment rate. Considering time effect, country specification, variables transformation and omitted variables (represented by u_{it}), the subsequent Equation2 was formulated to investigate the impact of selected explanatory variables on economic expansion.

$$\ln GDP_{it} = \alpha + \varphi_1 \ln CHE_{it} + \varphi_2 \ln IQI_{it} + \varphi_3 \ln UNE_{it} + \varphi_4 \ln FDI_{it} + u_{it} \tag{2}$$

Where $t = 1, 2, 3, \dots, T$ denotes the sample time period; $i = 1, 2, 3, \dots, N$ represents the cross-section series; $\varphi_1, \varphi_2, \varphi_3,$ and φ_4 denotes the long-run coefficient explaining the extent to which economic expansion is influenced by investments, health expenditure and institutional quality. Lastly, the u_{it} represents the white noise error term.

The selection of panel data estimation, in this study, was based on the fact that the study involves multiple countries over a given timeframe. Additionally, panel data analysis has several advantages over time series and the cross-sectional estimates. These include (i) producing reliable results from a large sample variability and more degrees of freedom; (ii) ability to control effect of omitted variables; (iii) taking into account inter-individual differences; and (iv) ability to estimate data with distinct time period for distinct countries in case of unbalanced panel data (Hsiao et al., 1995). This study employed dual-panel data estimation approaches, namely random effects and the pooled ordinary least squares (POLS) estimations.

Deriving from equation 2, the subsequent two equations (3 and 4) were formulated:

$$\begin{aligned} \ln GDP_{it} &= \beta_0 + \beta_1 X_{it} \\ &+ u_{it} \end{aligned} \tag{3}$$

$$\begin{aligned} \ln GDP_{it} &= \beta_0 + \beta_1 X_{it} + \mu_i + \pi_t \\ &+ u_{it} \end{aligned} \tag{4}$$

Where the pooled OLS is expressed by equation 3 and fixed and random effect are expressed by equation 4. In both equations, X_{it} represents the vector of explanatory variables whilst u_{it} remains the determinant of the study error term. The study employed the Johansen-Fisher panel cointegration test, through trace statistics and maximum eigenvalues, to determine the presence or absence of long-run relationship among variables. Considering ρ_i as the probability value used in testing individual cointegration from cross-section i ; the following will be the hypothesis to be tested:

$$-2 \sum_{i=1}^n \log \rho_i \sim \chi^2_N \tag{5}$$

Equation 5 follows the Mac Kinnon et al. (1999) probability values in establishing maximum eigenvalue and trace tests for the Johansen cointegration. To this end, and in dealing with possible endogeneity and serial correlation, the study also employed fully modified OLS (FMOLS) and dynamic OLS (DOLS). The latter two models are mathematically expressed as follows:

$$\begin{aligned} \hat{\beta}_{IFMOLS} &= N^{-1} \sum_{i=1}^N \left[\sum_{t=1}^T (X_{it} - X_i^*)^2 \right]^{-1} \end{aligned} \tag{6}$$

$$\begin{aligned} \hat{\beta}_{IDOLS} &= \left[N^{-1} \sum_{i=1}^N \left(\sum_{t=1}^T Z_{it} Z_{it}^* \right)^{-1} \left(\sum_{t=1}^T Z_{it} \hat{Z}_{it} \right) \right] \end{aligned} \tag{7}$$

where \hat{Z}_{it} represents $2(k+1) \times 1$; \hat{Z}_{it} denotes $(X_{it} - X_i^*)$; and X_i^* represents the average of X_i .

Although the literature provides a variety of approaches to examine causation among variables, the Granger (1969) and Dumitrescu and Hurlin (2012) panel causality tests were employed in this study to estimate the causal relationships between selected variables. Equations 8 and 9 display the model used to assess causality.

$$\begin{aligned} X_{t=0} &= \alpha_{0i} + \sum_{j=1}^m \alpha_{0i} X_{it-j} + \sum_{j=1}^m \beta_{1i} Y_{it-j} \\ &+ e_{it} \end{aligned} \tag{8}$$

$$\begin{aligned} Y_{t=0} &= \alpha_{0i} + \sum_{j=1}^m \alpha_{0i} Y_{it-j} + \sum_{j=1}^m \beta_{1i} X_{it-j} \\ &+ u_{it} \end{aligned} \tag{9}$$

Where m represents the number of lags employed, t denotes the assessed period, and i represents cross-sectional series.

The panel Granger causality test assumes the cross-sectional coefficient to be homogeneous. Thus, the following assumption was tested:

$$\begin{aligned} \alpha_{0i} = \alpha_{0j}, \alpha_{1i} = \alpha_{1j}, \dots, \alpha_{mi} = \alpha_{mj}; \forall i, j \\ \beta_{1i} = \beta_{1j}, \dots, \beta_{mi} = \beta_{mj}; \forall i, j \end{aligned}$$

Contrary to the Granger causality hypothesis, Dumitrescu and Hurlin (2012) present an inverse assumption allowing differences of coefficients within cross-section.

This assumption is expressed as follows:

$$\begin{aligned} \alpha_{0i} \neq \alpha_{0j}, \alpha_{1i} \neq \alpha_{1j}, \dots, \alpha_{mi} \neq \alpha_{mj}; \forall i, j \\ \beta_{1i} \neq \beta_{1j}, \dots, \beta_{mi} \neq \beta_{mj}; \forall i, j \end{aligned}$$

This test is an extension of Granger causality, and it assists in handling the heterogeneity issues.

4. EMPIRICAL FINDINGS, INTERPRETATION AND DISCUSSION

4.1. Preliminary Assessment

Prior to the actual estimation of the relationship between dependent and independent variables, it is significant to perform a preliminary analysis. This consists of reviewing the summary statistics or descriptive statistics of the data and the correlation coefficients between selected variables. Considering the standard deviation of all variables, unemployment and foreign direct investment possess the highest values, suggesting that they experience highest volatility compared to other

variables (Table 2). The variable with lower variability is the institutions quality. This suggests that governments in this region do not change much. The presence of weak correlation coefficients between the response and explanatory variables

potentially leads to the reduction of multicollinearity in the estimation. The correlation coefficients are all statistically significant yet below 50 percent (Table 2) thus there is a weak correlation between the dependent variable and the independent variables.

Table 2: Descriptive Statistics and Correlation Coefficients Matrix.

	LGDP	LCHE	LFDI	LIQI	LUNE
Mean	2.792378	0.713914	0.508484	0.200361	0.559582
Median	2.813704	0.702793	0.547099	0.208060	0.498517
Maximum	3.257970	1.052385	1.105504	0.633443	1.197969
Minimum	2.399464	0.166118	-1.031595	0.061732	-0.038579
Std. Dev.	0.246972	0.146758	0.263507	0.055037	0.278878
Skewness	-0.094238	-0.112400	-1.322904	3.230396	0.549923
Kurtosis	1.942036	3.220133	9.543560	29.14735	3.030820
Jarque-Bera	6.928865	0.593963	298.9108	4352.556	7.263657
Probability	0.031291	0.743058	0.000000	0.000000	0.026468
LGDP	1				
LCHE	-0.2814***	1			
LFDI	0.1407*	-0.15907*	1		
LIQI	-0.2005**	0.1939**	-0.0487	1	
LUNE	0.1995**	-0.0192**	0.0906*	-0.100050	1

Note: ***, **, And * Denote Significance at the 1%, 5% And 10% Level Respectively.

4.2. Panel Unit Root Results

To ensure that the regression outcome is not spurious and establish adequate interpretation of findings, we performed stationarity tests for selected series through various panel unit root tests. These tests include Levin et al. (2002) and Im et al. (2003),

and Phillips–Perron test. Although results in Table 3 suggests that that some variables are stationary at level, all variables become stationary after the first difference. This implies that all variables are stationary at first difference, as all four tests conducted agree on the same results at first difference.

Table 3: Panel Unit Root Results.

Variable	GDP	CHE	IQI	FDI	UNE
Level					
LLC	0.1597	0.0283**	0.0259**	0.0056***	0.0600*
IPS	0.9974	0.0126**	0.0838*	0.0046***	0.0227**
PP-Fisher chi-square	0.9179	0.0042***	0.0001***	0.0002***	0.3983
PP-Choi Z-stat	1.0000	0.0044***	0.0001***	0.0001***	0.5186
First Difference					
LLC	0.0001***	-----	-----	-----	0.0000***
IPS	0.0000***	-----	-----	-----	-----
PP-Fisher chi-square	0.0000***	-----	-----	-----	0.0000***
PP-Choi Z-stat	0.0000***	-----	-----	-----	0.0000***

Note: ***, **, And * Denote Significance at the 1%, 5% And 10% Level Respectively.

4.3. Pooled OLS, Random Effects and Fixed Effect Estimations

To assess the relationship between selected variables, pooled OLS, random effects and fixed effect estimations models were estimated and their results are presented in Table 4. As indicated by the findings, the results from all these three modules are different. However, taking into account the significant level through probability values, random effect and fixed effect estimates are similar. To select the adequate model between random and fixed effect, we performed the Hausman (1978) test. The results indicate that the null hypothesis for Hausman

test is rejected suggesting that the best results are provided by the random effect.

The outcome from random effects revealed that the response variable, which is GDP, does not fit well with the selected explanatory variables and both R² and adjusted R² are very small (Table 4). However, coefficients of all independent variables are statically significant, implying that they have capacity to influence changes in economic growth. The coefficients of CHE, IQI, FDI are positive and significant. In other words, positive changes in this variable result in improved economic growth. Thus, a one percent increase in both health expenditure and institution quality index causes economic growth to

increase by 0.5530 and 0.1485 respectively. Additionally, in the long run, economic growth increases by 0.699 percent as a response to a one percent increase in foreign direct investment.

Nonetheless, as expected, unemployment has an adverse effect on economic growth as the latter declines by 0.2969 in response to a one percent increase in unemployment level.

Table 4: Pooled OLS And Random Effects Model Test Results.

variable	Polled OLS			Radom effect			Fixed effect		
	Coefficient	T-Statistic	P-value	Coefficient	T-Statistic	P-value	Coefficient	T-Statistic	P-value
C	7.1860	39.459	0.000***	5.947	18.258	0.000***	5.930	48.44	0.000***
CHE	-0.1187	-4.802	0.000***	0.553	6.0032	0.000***	0.014	1.052	0.294
IQI	0.0628	3.2623	0.001***	0.148	2.2121	0.0286**	0.148	2.202	0.029**
FDI	-0.0117	-0.544	0.587	0.699	3.978	0.000***	0.013	1.403	0.163
UNE	0.0219	1.7267	0.086*	-0.296	-1.8254	0.0701*	0.065	3.311	0.001***
R ²	0.1818			0.1455				0.897	
Adj. R ²	0.1583			0.1209				0.890	

Note: ***, **, And * Denote Significance at the 1%, 5% And 10% Level Respectively.

The study also includes the Fisher–Johansen cointegration test to assess the long run relationship among variables. As displayed in Table 5, at most 4 cointegration equations exist among the underlined

variables. Consequently, the null hypothesis on no long-run relationship (cointegration) is rejected in favour of the alternative.

Table 5: Panel Fisher–Johansen Cointegration Test Results.

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)		Prob.	Fisher Stat.* (from max-eigen test)		Prob.
None	123.6*		0.0000	91.91*		0.0000***
At most 1	49.46*		0.0000	30.95*		0.0020***
At most 2	25.60*		0.0122	14.21		0.2873
At most 3	17.93		0.1178	13.69		0.3213
At most 4	13.15		0.3583	13.15		0.3583

Note: *** Denotes Significance at the 1% Level.

To determine the extent to which explanatory variables influence long term changes in the dependent variables, while taking into consideration the endogeneity problem, small sample bias and adjusting for serial correlation, we performed a FMOLS and DOLS tests. Contrary to the parametric OLS model results in Table 4, the fully modified OLS and dynamic OLS (DOLS) tests suggest that the dependent variable (GDP) fits well with independent variables. As indicated by the value of R² of both models, more than 70 percent of changes in GDP is explained by changes in selected explanatory variables. Given that the results from FMOLS model appear to be more significant compared to those of DOLS, the former model's results were preferred over those of DOLS. All explanatory variables are statistically significant in influencing economic expansion within the selected countries (Table 6). However, while LCHE, LFDI and LIQI positively lead to positive changes in economic expansion, LUNE has an adverse impact on GDP. Consequently, a 1 percent increase in LCHE, LFDI and LIQI causes economic expansion (GDP) to increase by 0.819, 0.086 and 0.128 percent respectively. However, economic expansion declines by 0.731 in response to a one percent increase in unemployment level. This

implies that if any of the selected countries intends to improve its economy, it should invest more in human capital and increase its budget on health expenditure.

Additionally, improving institutional quality would not only have a direct implication on economic growth but also would attract foreign investments, which in return has a positive stimulation of economic expansion. Nonetheless, the results indicate that a high level of unemployment experienced within these countries impedes their economic growth. Focusing on job creation programmes, especially for youth employment, would positively influence economic levels of these countries. These results support the findings of Zekarias (2016), Hayat (2018), Hayat (2019), Yusuf et al. (2021), Beylik et al. (2022), Ozyilmaz et al. (2022), Qehaja et al., (2023), Nguyen (2022) and Utouh (2024). All these studies were conducted in different regions at various selected periods and concluded that improved health expenditure, good quality of institutions, and high level of foreign investment inflow stimulate and improve economic growth in a host country.

The study findings above suggest that economic expansion in the East African Community countries will depend on how efficiently these countries spend

on the health of their populations. Additionally, these countries necessitate institutional quality improvement, such as improvement in corruption control, government effectiveness, rule of law and regulatory quality. Not only will these institutional

quality indices directly stimulate and enhance economic growth, but they will also attract foreign investments inflow which are also an economic booster within these countries.

Table 6: Panel FMOLS And Panel DOLS Models Results.

Variable	FMOLS			DOLS		
	coefficient	t-statistic	P-value	coefficient	t-statistic	P-value
LCHE	0.818924	105.9298	0.0000***	0.449638	3.764428	0.0004***
LFDI	0.086044	24.09443	0.0000***	0.432882	5.071892	0.0000***
LIQI	0.128241	199.4254	0.0000***	0.022642	1.706914	0.0940*
LUNE	-0.731637	-82.57330	0.0000***	0.369845	1.488989	0.1428
R ²	0.820			0.703		
Adj. R ²	0.657			0.683		

Note: ***, **, And * Denote Significance at the 1%, 5% And 10% Level Respectively.

4.4. Causality Direction Assessment

The Pairwise Hurlin Panel Causality Dumitrescu-Tests were performed to investigate the causal relationship between variables (Table 7). A bidirectional causality exists between constant health expenditure and economic expansion. This implies that if more funds are allocated to support the labour force’s wellbeing, their productivity increases, leading to better economic performance. On the other hand, good economic performance brings income from which a portion is also spent to advance health affairs. Another bidirectional causality was found between institutional quality and economic expansion (Table 7). In a country where accountability, rule of law, regulatory quality, government effectiveness reign; and hence

corruption is controlled, economic activities operate at full capacity and per capita GDP contribution increases. It is also suggested that when the country’s economy is performing well, its institutional quality index improves. Alternatively, a unidirectional causality was found between foreign direct investment and economic expansion (Table 7). Meaning that, more inflow of foreign direct investment in the EAC countries leads to economic expansion, while the latter does not necessarily imply attraction of FDI. Lastly, no causal relationship was found between unemployment and economic expansion (Table 7). This implies that, due to its lagging behaviour, unemployment does not have a direct reaction towards changes in economic expansion.

Table 7: Dumitrescu Hurlin (DH) Panel Causality Tests Results.

Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.	Direction
LCHE does not homogeneously cause LGDP	4.51294	3.17935	0.0015***	Bi-directional
LGDP does not homogeneously cause LCHE	3.02514	2.73801	0.0062***	
LFDI does not homogeneously cause LGDP	3.86399	2.30248	0.0213**	Unidirectional
LGDP does not homogeneously cause LFDI	1.01639	-0.13550	0.8922	Bi-directional
LIQI does not homogeneously cause LGDP	2.51320	2.00568	0.0449**	
LGDP does not homogeneously cause LIQI	2.28456	1.67861	0.0932*	Neutrality
LUNE does not homogeneously cause LGDP	1.67997	0.81376	0.4158	
LGDP does not homogeneously cause LUNE	1.94882	1.19834	0.2308	

Note: ***, **, & * Denotes A Rejection of the H0 At 1%, 5% And 10% Significance Level

5. CONCLUSION, POLICY IMPLICATIONS AND STUDY LIMITATIONS

The current study explored the importance of health expenditure and institutional quality on economic expansion in East African Community countries. A panel data set of five countries over 33 years (1990 -2023) was employed. In addition to health expenditure and institutional quality as explanatory variables, foreign direct investment and unemployment were added as control variables. Various econometric models, including parametric

OLS model, fully modified OLS (FMOLS), dynamic OLS (DOLS) and Pairwise Dumitrescu-Hurlin Panel Causality Tests, were employed to assess the relationship between variables.

The study findings revealed that constant health expenditure and improved institutional quality significantly influence economic expansion within the selected countries of The East African Community. Additionally, a good flow of foreign direct investment was found to have a positive impact on economic expansion. Nonetheless, the expansion of the unemployment rate was found to

have a negative impact on economic growth in the region.

Grounded on these findings, the subsequent three policy implications should be drawn. Firstly, governments in these countries should stimulate and support improvement in health expenditure in order to enhance the health status of their labour force and thereafter contribute to positive economic activities. Secondly, it is indispensable to improve institutional quality as the latter is a key driver of efficiency, reduction of economic volatility, sustainable trade, accountability, transparency, and attraction of foreign direct investment. Lastly, initiating

programmes that improve job creation would reduce the rate of unemployment and increase the number of individuals from the labour force contributing to economic activities.

This study experiences some limitations, especially in terms of data collection. Some countries within the study's region had missing data while others had no data available at all. These resulted in analysing some countries instead of investigating the totality of EAC countries. Nonetheless, the findings of the study remain valid, and the majority (seven out of eight countries) of EAC countries were included in the study.

REFERENCES

- Abate, C. A. (2022). The relationship between aid and economic growth of developing countries: Does institutional quality and economic freedom matter? *Cogent Economics & Finance*, <https://doi.org/10.1080/23322039.2022.2062092>.
- Acemoglu, D., & Johnson, S. (2007). Disease and development: The effect of life expectancy on economic growth. *Journal of Political Economy*, 115, 925–985.
- Addi, H. M., & Abubakar, A. B. (2024). Investment and economic growth: do institutions and economic freedom matter? *International Journal of Emerging Markets*, 19(4), 825-845
- Afawubo, K., & Couchoro, M. K. (2017). Do remittances enhance the economic growth effect of private health expenditures in West African Economic and Monetary Union. *Economics Bulletin*, 37(2), 1247-1264.
- Agostino, G., Dunne, J. P., & Pieroni, L. (2016). Corruption and growth in Africa. *European Journal of Political Economy*, 43, 71–88.
- Ahmad, M., Akram, W., Ikram, M., Shah, A. A., Rehman, A., Chandio, A. A., & Jabeen, G. (2021). Estimating dynamic interactive linkages among urban agglomeration, economic performance, carbon emissions, and health expenditures across developmental disparities. *Sustainable Production and Consumption*, 26, 239-255.
- Anyanwu, J. C. (2014). Factors affecting economic growth in Africa: are there any lessons from China? *African Development Review*, 26(3), 468-493.
- Arthur, B., & Addai, B. (2022). The dynamic interactions of economic growth, foreign direct investment, and exchange rates in Ghana. *Cogent Economics & Finance*, 10(1); 1 – 21.
- Ayano, D. A. (2023). Impacts of foreign direct investment and other macroeconomic variables on economic growth in Nigeria. *Global Scientific Journals*, 11(1), 23-54.
- Babalola, S., & Shittu, W. (2020). Foreign aid and economic growth in West Africa: Examining the roles of Institutions. *International Economic Journal*, 34(3), 534–552.
- Bats, J.V. (2015). The Effect of Health Expenditure on Economic Growth. Ph.D. Thesis, Faculty of Economics and Business, University of Groningen, Groningen, The Netherlands.
- Behera, D. K., & Dash, U. (2018). The Impact of Macroeconomic Policies on The Growth of Public Health Expenditure: An Empirical Assessment from the Indian States. *Cogent Economics & Finance*, 6 (1): 1435443. <https://doi:10.1080/23322039.2018.1435443>.
- Benetrix, A., Pallan, H. M., & Panizza, U. (2023). The elusive link between FDI and economic growth. World Bank Policy Research Working Paper, 10422.
- Beylik, U., Cirakli, U., Cetin, M., Ecevit, E., & Senol, O. (2022). The relationship between health expenditure indicators and economic growth in OECD countries: A Driscoll-Kraay approach. *Frontiers in public health*, 10, 1050550.
- Blázquez-Fernández, C., Cantarero-Prieto, D., Perez-Gonzalez, P. & LlorcaDíaz, J. (2015). Does early-life health enhance growth? Evidence from Spain. *Applied Economics Letters*, 22 (11): 860–864.
- Bleakley, H. (2010). Malaria eradication in the Americas: A retrospective analysis of childhood exposure. *American Economic Journal: Applied Economics*, 2(2), 1-45.
- Bloom, D.E., & Kuhn, M. (2018). Health and Economic Growth. Discussion Paper Series. IZA – Institute of Labour Economics. www.iza.org.

- Boldeanu, F. T., & Constantinescu, L. (2015). The main determinants affecting economic growth. *Bulletin of the Transilvania University of Brasov. Series V: Economic Sciences*, 329-338.
- Churchill S.A., Yew S.L., Ugur M. (2015). Effects of government education and health expenditures on economic growth: a meta-analysis. Greenwich: University of Greenwich, Greenwich Political Economy Research Centre. (<http://gala.gre.ac.uk/id/eprint/14072>).
- Ciftci, C., & Durusu-Ciftci, D. (2022). Economic freedom, foreign direct investment, and economic growth: The role of sub-components of freedom. *The Journal of International Trade & Economic Development*, 31(2), 233-254. Not cited- delete.
- De Mendonça, H. F., & Baca, A. C. (2018). Relevance of Corruption on the Effect of Public Health Expenditure and Taxation on Economic Growth. *Applied Economics Letters*, 25 (12): 876-881.
- Diamond, L. (2026). *Public expenditure in practice*. Taylor & Francis.
- Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Econometrica: Journal of the Econometric Society*, 37(3), 424-438.
- Fahad, S., Nguyen-Thi-Lan, H., Nguyen-Manh, D., Tran-Duc, H., & To-The, N. (2023). Analyzing the status of multidimensional poverty of rural households by using sustainable livelihood framework: policy implications for economic growth. *Environmental Science and Pollution Research*, 30(6), 16106-16119.
- Fazaaloh, A. M. (2024). FDI and economic growth in Indonesia: A provincial and sectoral analysis. *Journal of Economic Structures*, 13(1), 1-22.
- Fengju, X., & Wubishet, A. (2024). Analysis of the impacts of financial development on economic growth in East Africa: How do the institutional qualities matter? *Economic Analysis and Policy*, 82, 1177-1189.
- Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: journal of the Econometric Society*, 424-438.
- Halici-Tülüce, N. S., Dogan, I. & Dumrul, C. (2016). Is Income Relevant for Health Expenditure and Economic Growth Nexus? *International Journal of Health Economics and Managements*, 16: 23-49. Not cited- delete.
- Hartwig, J., & Sturm, J. (2014). Robust Determinants of Health Care Expenditure Growth." *Applied Economics* 46 (36): 4455 - 4474.
- Hayat, A. (2018). FDI and economic growth: the role of natural resources? *Journal of Economic Studies*, 45(2), 283-295.
- Hayat, A. (2019). Foreign direct investments, institutional quality, and economic growth. *The Journal of International Trade & Economic Development*, 28(5), 561-579.
- Hitiris, T., & Posnett, J. (1992). The determinants and effects of health expenditure in developed countries. *Journal of Health Economics*, 11(2), 173-181. [https://doi:10.1016/0167-6296\(92\)90033-W](https://doi:10.1016/0167-6296(92)90033-W).
- Hsiao, C., Mountain, D. C., & Illman, K. H. (1995). A Bayesian integration of end-use metering and conditional-demand analysis. *Journal of Business & Economic Statistics*, 13(3), 315-326.
- Hu, Q., & Wang, L. (2024). Economic growth effects of public health expenditure in OECD countries: An empirical study using the dynamic panel threshold model. *Heliyon*, 10(4). doi: [10.1016/j.heliyon.2024.e25684](https://doi.org/10.1016/j.heliyon.2024.e25684) Why is this all italicized?
- Hussen, M. S., & Lee, K. W. (2012). The Impact of Foreign Aid on Economic Growth in Ethiopia. *Asian International Studies Review*, 13(2), 87-112. <https://doi.org/10.16934/isr.13.2.201212.87>.
- Islam, M.M.; Mondal, M.N.I.; Khoj, H. (2023). Effects of Health Factors on GDP Growth: Empirical Evidence from Saudi Arabia. *Sustainability*, 15, 8732. <https://doi.org/10.3390/su15118732>.
- Jannat, F., Miah, M. R., Faruk, M. O., & Alam, S. (2020). Empirical analysis of factors influencing economic growth rate in Bangladesh. *International Journal of Business and Economics Research*, 9(2), 78.
- Jones, C. I., & Klenow, P. (2016). Beyond GDP? Welfare across countries and time. *American Economic Review*, 106(9), 2426-2457.
- Kurt, S. (2015). Government health expenditures and economic growth: a Feder-Ram approach for the case of Turkey. *International Journal of Economics and Financial Issues*, 5(2), 441-447.
- Li, M., Sun, H., Agyeman, F. O., Heydari, M., Jameel, A., & Salah ud din Khan, H. (2021). Analysis of potential factors influencing China's regional sustainable economic growth. *Applied Sciences*, 11(22), 10832.
- MacKinnon, J. G., Haug, A. A., & Michelis, A. (1999). Numerical distribution functions of likelihood ratio tests for cointegration. *Journal of Applied Econometrics* 14 (5), 563-577.
- Mehrara, M. (2011). Health expenditure and economic growth: An ARDL approach for the case of Iran. *Journal of Economics and Behavioral Studies*, 3(4), 249-256. <https://doi:10.22610/jeps.v3i4.277>.
- Minh, V. T. H., & Trinh, P. T. T. (2023). The impact of FDI on economic growth in developing countries: the role

- of FDI inflow and trade openness. *The Economics and Finance Letters*, 10(3), 216-229.
- Musse, O. S. H., & Echchabi, A. (2024). Determinants of foreign direct investment inflows in the East African community states: The roles of political stability, economic growth and trade openness. *The Australasian Review of African Studies*, 45(2), 89-110.
- Nawaz, S. (2015). Growth effects of institutions: A disaggregated analysis. *Economic Modelling*, 45, 118-126.
- Nguyen, M. L. T. (2022). Foreign direct investment and economic growth: The role of financial development. *Cogent Business & Management*, 9(1), 2127193.
- Obinna, O. C., Chinweizu, A. J., & Emeka, E. (2025). Foreign direct investment and economic growth: Evidence from United Kingdom. *International Journal of Economics and Financial Issues*, 15(3), 351-363.
- Olaniyi, C. O., & Oladeji, S. I. (2022). Interplay between financial sector and institutional framework in the economic growth process of Kenya. *Journal of Public Affairs*, 22(3), e2562.
- Ozturk, S., & Topcu, E. (2014). Health expenditures and economic growth: evidence from G8. *International Journal of Economics and Empirical Research*, 2(6), 256-261.
- Ozyilmaz, A., Bayraktar, Y., Isik, E., Toprak, M., Er, M. B., Besel, F., ... & Collins, S. (2022). The relationship between health expenditures and economic growth in EU countries: empirical evidence using panel fourier toda-yamamoto causality test and regression models. *International journal of environmental research and public health*, 19(22), 15091.
- Piabuo, S. M., & Tieguhong, J. C. (2017). Health Expenditure and Economic Growth: A Review of the Literature and an Analysis Between the Economic Community for Central African States (CEMAC) and Selected African Countries. *Health Economics Review*, 7: 23.
- Qehaja, S. S., Qehaja, D., Arber, H. O. T. I., & Marovci, E. (2023). The relationship between government health expenditure and economic growth: Evidence from western Balkan countries. *International Journal of Applied Economics, Finance and Accounting*, 15(1), 10-20.
- Sahnoun, M. (2018). Does Health Expenditure Increase Economic Growth: Evidence from Tunisia? *Romanian Economic Journal*, 20(67); 126 - 144.
- Shittu, W. O., Hassan, S., & Nawaz, M. A. (2018). The nexus between external debt, corruption and economic growth: Evidence from five SSA countries. *African Journal of Economic and Management Studies*, 9(3), 319-334.
- Shittu, W. O., Ismail, N. A., Latiff, A. R. A., & Musibau, H. O. (2020). Modelling external debt-growth nexus: How relevant is governance? *Journal of Financial Crime*, 27(4), 1323-1340.
- Solow, R. M. (1999). Neoclassical growth theory. *Handbook of Macroeconomics*, 1, 637-667.
- Tran, O. K. T., Le, H. D., & Nguyen, A. H. V. (2021). Role of institutional quality in economic development: A case study of Asian countries. *Problems and Perspectives in Management*, 19(2), 357.
- Utouh, H. (2024). The effects of foreign direct investment on economic growth (Gross Domestic Product) in Tanzania. *Economic Insights-Trends and Challenges*. not complete! There were texts I highlighted above of misplaced ref info- probably misplaced text while typing or using a ref tool- so check for that.
- Wang, F. (2015). More health expenditure, better economic performance? Empirical evidence from OECD countries. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, 52, 1-5.
- World Health Organization. (2001). *Macroeconomics and health: Investing in Health for Economic Development*. Geneva: Commission on Macroeconomics and Health.
- Yang, X. (2020). Health expenditure, human capital, and economic growth: an empirical study of developing countries. *International Journal of Health Economics and Management*, 20(2), 163-176. <https://doi.org/10.1007/s10754-019-09275-w> 17.
- Yusuf, H. A., Afolabi, L. O., Shittu, W. O., Gold, K. L., & Muhammad, M. (2021). Institutional quality and trade flow: Empirical evidence from Malaysia and other OIC member Countries in Africa. *Insight on Africa*, 13(2), 177-191.
- Zekarias, S. M. (2016). The impact of foreign direct investment (FDI) on economic growth in Eastern Africa: Evidence from panel data analysis. *Applied Economics and Finance*, 3(1), 145-160.
- Zhao, J., & Zhou, N. (2021). Impact of human health on economic growth under the constraint of environment pollution. *Technological Forecasting and Social Change*, 169, 1-16.