



Does government size matter for quality of life in ECOWAS? Evidence from Method of Moment Quantile Regression

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ABSTRACT

Quality of life across the ECOWAS sub region remains persistently low despite decades of government spending intended to improve health, education, and social welfare. This study investigated whether government size, measured as general government final consumption expenditure as a share of Gross Domestic Product, matters for quality of life, proxied by life expectancy at birth, in twelve ECOWAS countries over the period 2000 to 2025. After confirming cross sectional dependence, slope heterogeneity, and a mixed order of integration among the series, the study employed the Dumitrescu and Hurlin panel causality test and the Method of Moments Quantile Regression, complemented by the Augmented Mean Group estimator. The results revealed bidirectional Granger causality between government size and life expectancy. Government size showed a positive average association with life expectancy; this association was statistically insignificant among countries at the lowest quantiles of life expectancy, became significant at the 5 percent level from the 40th quantile, and was strongest at the top of the distribution. The Augmented Mean Group results revealed considerable heterogeneity, with government size significantly and positively associated with life expectancy in Senegal and Sierra Leone but negatively associated with it in Benin, Cape Verde, Guinea, and Togo, and only marginally so in Ghana. Because the estimates capture conditional associations rather than definitive causal effects, the findings are interpreted with caution. The study concludes that government size does not relate to quality of life uniformly across ECOWAS and recommends that countries with comparatively low life expectancy prioritise targeted and efficiency driven public spending, that fiscal and health authorities coordinate policy given the feedback relationship identified, and that regional bodies such as ECOWAS avoid prescribing a uniform government expenditure target across member states.

Keywords: Government size, Government consumption expenditure, Quality of life, Life expectancy, Method of Moments Quantile Regression, ECOWAS.

INTRODUCTION

The size of government, which refers broadly to the scale of the public sector's command over a nation's resources, remains one of the most contested questions in development economics. Governments are expected to provide essential public goods such as healthcare, education, and infrastructure, correct market failures, and redistribute income in ways that improve the welfare of citizens, yet the appropriate scale of this intervention is far from settled. Some scholars argue that a larger public sector, through sustained investment in health and social protection, is indispensable to improving population wellbeing, particularly in developing regions where markets alone have failed to deliver adequate healthcare and education (Christopher et al., 2025; Islam, 2025). Others contend that excessive government size crowds out private investment, breeds fiscal inefficiency, and, in weak institutional settings, does little to translate public spending into tangible welfare gains (Bonanno et al., 2025; Mokoena and Tweneboah, 2025). Because the scale of government can be gauged through several fiscal indicators, including total public expenditure, government consumption, tax revenue, and public employment, conclusions about whether government size is beneficial often depend on how it is measured, a point taken up in the conceptual section of this paper. This unresolved debate carries particular weight for a region such as ECOWAS, where government expenditure patterns vary widely and population wellbeing remains persistently fragile.



Measured by general government final consumption expenditure, the indicator of government size adopted in this study, the public sector across the twelve ECOWAS countries examined averaged 13.002 percent of Gross Domestic Product between 2000 and 2025 (World Bank, 2026). That average conceals wide differences in fiscal scale, from a peak of 37.123 percent recorded in Liberia and Senegal in certain years to a low of 2.463 percent in Cote d'Ivoire. Whatever the fiscal scale, however, quality of life across the sub region remains among the weakest in the world. In the Human Development Report 2025, which ranks 193 countries and territories on the basis of 2023 data, Sierra Leone appeared among the ten lowest ranked countries globally, alongside Mali, Niger, and Burkina Faso, three Sahelian states that belonged to ECOWAS until their formal withdrawal in January 2025 (United Nations Development Programme [UNDP], 2025). Life expectancy at birth, the quality of life indicator used in this study, averaged only 59.609 years across the panel, ranging from 44.834 years in Sierra Leone to 76.363 years in Cape Verde (World Bank, 2026). This combination of highly variable government spending and persistently weak wellbeing outcomes raises the question of whether, and under what conditions, the size of government genuinely matters for the quality of life that citizens experience in ECOWAS (Ali-Nakyee & Adimola, 2024; Kolawole et al., 2024).

Over the years, ECOWAS governments have introduced several policy commitments aimed explicitly at using public expenditure to improve population wellbeing, yet many of these commitments have fallen conspicuously short of their targets. The clearest example is the Abuja Declaration of April 2001, in which African heads of state, meeting under the Organisation of African Unity that later became the African Union, pledged to allocate at least 15 percent of their annual government budgets to improving the health sector (World Health Organization [WHO], 2011). This benchmark is expressed as a share of total government expenditure rather than of Gross Domestic Product, so it is not directly comparable with either the government size measure or the current health expenditure variable used later in this study. Ten years after the pledge, the World Health Organization found that very few African countries had reached the target, identifying Tanzania as the clearest case of compliance (WHO, 2011), and assessments more than two decades on show that most African health systems remain underfunded relative to the commitment (Dereje et al., 2025). Nigeria, the sub region's largest economy, has never met the benchmark, with allocations to health in successive federal budgets generally ranging between about three and six percent of total federal spending (AllAfrica, 2026). Similar patterns of ambitious commitment followed by weak implementation are evident in national poverty eradication and universal basic education programmes across the sub region, where allocated resources have often failed to translate into commensurate improvements in living standards.

Beyond the practical failure of policy commitments, the academic literature itself has been far from settled on whether government size actually improves quality of life. A number of studies report a distinctly positive relationship. Dibor-Alfred et al. (2025), for instance, found that government spending significantly improved quality of life in Nigeria, while Aazami and Farani (2022) reported that sustained government investment translated into meaningfully higher quality of rural life in Iran over the long run. In sharp contrast, a comparable body of evidence suggests that government size has not really improved, and may even have undermined, wellbeing outcomes. Andres et al. (2024) found that the welfare effect of government size across thirty six OECD countries turned negative once government spending exceeded roughly thirty five to forty percent of Gross Domestic Product, Kunawotor et al. (2025), using data on 52 African economies, found that government size reduced economic welfare, although strong institutions offset much of this adverse effect, and Alimi (2020), working with ECOWAS data directly, found that government size exerted a significant negative effect on economic welfare, an effect that was most pronounced precisely among the sub region's least developed countries. Part of this disagreement is arguably definitional, since these studies measure government size in different ways, from total public expenditure to government consumption, and capture wellbeing through indicators ranging from composite welfare indices to subjective life satisfaction (Bjornskov et al., 2007). This body of conflicting evidence has left policymakers in ECOWAS at a genuine crossroads, unsure whether continuing to expand government size represents a reliable path to improved population wellbeing or a costly policy misdirection, and it is this unresolved tension that this study sets out to address.

Compounding this uncertainty, existing evidence on the government size and wellbeing relationship in ECOWAS specifically remains thin and methodologically limited in ways that obscure rather than clarify this question. Much of the available literature relies on estimators that recover only a single, average effect of government size on wellbeing, implicitly assuming that this effect is identical for a country with very low life



expectancy and one with comparatively high life expectancy, an assumption that is unlikely to hold given the sub region's wide disparities in institutional capacity and administrative efficiency. Many panel studies of the sub region also treat member states as cross sectionally independent and impose identical slope coefficients on all countries, even though shared trade links, a common monetary arrangement among several members, and regional shocks such as the 2014 to 2016 Ebola epidemic make such assumptions difficult to sustain. Where government size and life expectancy are jointly examined, the direction of causality between them is rarely established, leaving open whether government spending drives wellbeing outcomes, whether wellbeing outcomes instead shape the fiscal capacity and political demand for public spending, or whether both operate simultaneously. Without evidence that speaks to these gaps, policy prescriptions on government spending risk being applied uniformly across a sub region whose member states are, in reality, far from uniform.

Motivated by this problem, the objective of this study is to determine whether government size matters for quality of life in ECOWAS, and specifically to establish the direction of Granger causality between government size and life expectancy, to determine how the association between government size and life expectancy varies across the conditional distribution of life expectancy rather than at the average alone, and to establish the country specific relationship between government size and life expectancy across individual ECOWAS member states.

Apart from this introduction, the rest of the paper is structured as follows. The next section clarifies the key concepts and sets out a conceptual framework linking government expenditure to health and welfare outcomes. The methodology section then describes the panel structure, data, preliminary tests, and model specifications, and explains how each estimator responds to the properties of the data. The results and discussion follow, and the final section concludes, presents the study's recommendations, and notes its limitations.

CONCEPTUAL CLARIFICATION AND FRAMEWORK

Government Size and Government Consumption Expenditure

Government size refers to the overall scale of the public sector in an economy, that is, the extent to which resources are allocated, produced, or redistributed through the state rather than through markets and households. Because the public sector acts through several fiscal instruments, government size has no single measure. The literature has proxied it with total general government expenditure as a share of Gross Domestic Product, government final consumption expenditure, tax or total revenue as a share of output, transfers and subsidies, public employment, and composite indices such as the size of government component of economic freedom indices (Christopher et al., 2025; Islam, 2025). Each captures a different facet of the state. Total expenditure reflects the full fiscal footprint of government, including capital spending, transfers, and interest payments; revenue measures reflect the burden of financing the state; and consumption expenditure reflects the resources the state absorbs in delivering goods and services directly to citizens.

This study measures government size as general government final consumption expenditure as a percentage of Gross Domestic Product. In the national accounts, this aggregate covers all current government spending on purchases of goods and services, including the compensation of public employees such as doctors, nurses, and teachers, together with most spending on national defence and security, but it excludes government capital formation, transfers to households, subsidies, and interest payments (World Bank, 2026). Three considerations motivate the choice. First, government consumption corresponds most closely to the channel through which the state directly provides health care, education, sanitation oversight, and public order, which are the services that theory links most directly to longevity. Second, the series is available on a consistent and comparable basis for all twelve countries over 2000 to 2025, whereas total expenditure and revenue series for several ECOWAS members contain long gaps and definitional breaks. Third, consumption expenditure is a widely used proxy in cross country studies of government size and wellbeing, including Bjornskov et al. (2007), which

eases comparison with earlier findings. The study nonetheless recognises that this proxy captures only one component of public expenditure. Its results should therefore be read as evidence on the consumption dimension of government size rather than on the full fiscal footprint of the state, and they may differ from

results based on total expenditure, especially in countries where public investment or transfers make up a large share of the budget.

Life Expectancy as a Proxy for Quality of Life

Quality of life is a multidimensional concept that spans health, knowledge, material living standards, security, social relationships, and the freedom to lead a life one has reason to value (Sen, 1999). No single indicator captures all of these dimensions, and this study uses life expectancy at birth as its principal proxy for four reasons. Longevity is, first of all, a precondition for enjoying every other dimension of wellbeing, and within the capability approach a long and healthy life is regarded as a basic functioning in its own right (Sen, 1999). Second, life expectancy is one of the three pillars of the Human Development Index and serves as a summary measure of population health, reflecting the cumulative influence of nutrition, disease burden, sanitation, access to care, and living conditions (UNDP, 2025). Third, gains in longevity account for a very large share of the total welfare improvement experienced by developing countries, so that ignoring them understates changes in living standards (Becker et al., 2005). Fourth, and of particular importance in the ECOWAS context, life expectancy is reported consistently and annually for all twelve countries over the full study period, whereas broader alternatives such as the Human Development Index series, subjective wellbeing surveys, or multidimensional poverty indices are available only intermittently or with methodological revisions that impair comparability across the panel. In a sub region where mortality from infectious disease, maternal causes, and childhood illness remains high, life expectancy is also a particularly sensitive gauge of the welfare conditions that public spending is meant to improve.

Life expectancy nevertheless leaves important dimensions of quality of life unmeasured. It records the length of life but not its quality, so it is silent on morbidity, disability, and years lived in poor health, which health adjusted life expectancy would capture. It says nothing directly about education, income and its distribution, personal security, or political freedoms, nor about subjective life satisfaction, which Bjornskov et al. (2007) show may respond to government size quite differently from objective indicators. As a national average, it also conceals inequalities between regions, genders, and income groups. The findings of this study are therefore interpreted as evidence on the health and longevity dimension of quality of life, and the conclusions are framed accordingly.

Conceptual Framework Linking Government Expenditure to Health and Welfare Outcomes

The link between government expenditure and quality of life can be traced through public finance theory and the theory of health capital. In the framework of Grossman (1972), health is a durable stock that individuals produce using medical care, their own time, and environmental inputs, and the state enters this production process by supplying or financing many of those inputs. Public consumption spending pays for health workers, medicines, immunisation and disease control programmes, the teachers who raise households' health knowledge, and the regulatory and security services that make safe water, sanitation, and orderly urban living possible, in line with the allocative function of the public sector described by Musgrave (1959). Through these channels, summarised in Figure 1, a larger government can raise the stock of population health and thereby lengthen life expectancy.

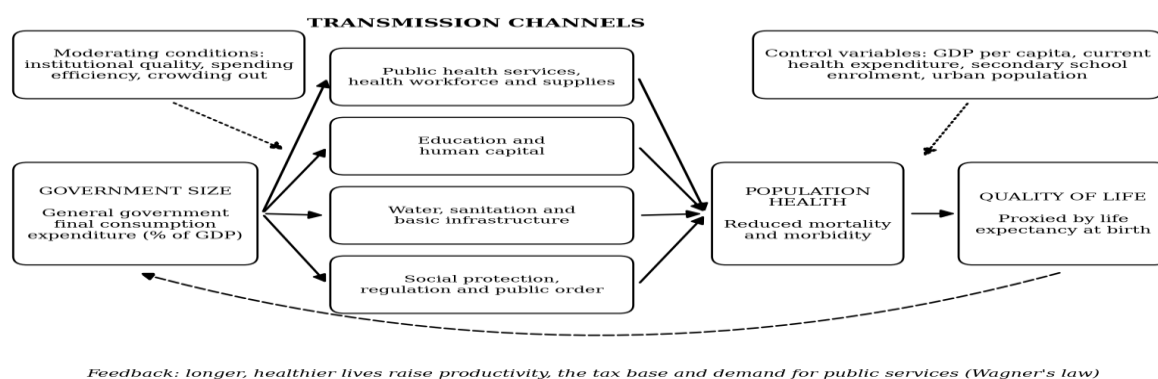


Figure 1: Conceptual Framework Linking Government Size to Quality of Life

Source: Authors' conceptualisation, 2026.

Theory also explains why this relationship need not be uniform. The Armey curve (Armey, 1995) and the endogenous growth model of Barro (1990) imply that the benefits of public spending diminish, and may eventually turn negative, as government expands, because additional spending must be financed through distortionary taxation or borrowing and may crowd out private activity. Empirical work further shows that the health returns to public spending depend heavily on governance and spending efficiency; where institutions are weak, leakages, absenteeism, and misallocation dilute the link between money spent and outcomes achieved (Filmer & Pritchett, 1999; Rajkumar & Swaroop, 2008). Institutional quality and spending efficiency therefore act as moderating conditions, implying that the same increase in government size can be associated with very different outcomes across countries and across points of the life expectancy distribution. The relationship may also run in both directions. Wagner's law holds that demand for public services rises as societies develop (Wagner, 1958), and a healthier, longer living population is more productive, broadens the tax base, and demands more public services, so improvements in life expectancy may themselves enlarge government. This feedback, shown by the dashed arrow in Figure 1, motivates the causality analysis and cautions against reading the estimated coefficients as purely one directional effects. Income, current health expenditure, secondary education, and urbanisation enter the analysis as control variables because each influences life expectancy independently of government size.

METHODOLOGY

Materials and Methods

This study adopted an ex post facto research design, appropriate because government size and life expectancy are outcomes that had already unfolded over time and could not be manipulated by the researchers. The analysis is based on a country year panel of twelve ECOWAS member countries, namely Benin, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Nigeria, Senegal, Sierra Leone, and Togo. These twelve countries make up the entire current membership of ECOWAS following the formal withdrawal of Burkina Faso, Mali, and Niger in January 2025, and each has usable data on the variables of interest over the study window. The period covered was 2000 to 2025, a twenty six year span considered adequate for capturing important institutional, economic, and health related developments in the sub region, including major economic reforms, the implementation of the Millennium Development Goals and the Sustainable Development Goals, and significant public health events, such as the Ebola outbreak, that have shaped both government spending patterns and quality of life outcomes over the period.

With twelve cross sectional units ($N = 12$) and twenty six years ($T = 26$), the panel has a maximum of 312 country year observations. It is unbalanced because some series, notably secondary school enrolment and, to a lesser degree, current health expenditure, are missing for certain country years, and because the most recent release of the World Development Indicators does not yet report every indicator up to 2025 for all countries. The number of usable observations is therefore below this maximum. The quantile and mean group estimations were carried out on all available observations, while the Dumitrescu and Hurlin test, which requires a balanced panel, was conducted on balanced series of government size and life expectancy. Because the time dimension is relatively long compared with the number of countries, the panel is well suited to heterogeneous panel methods that exploit the time series variation within each country.

Quality of life was proxied by life expectancy at birth (LEX), measured in years. Government size (GOS) was measured as general government final consumption expenditure as a percentage of Gross Domestic Product, for the reasons set out in the conceptual section. Gross Domestic Product per capita in current United States dollars (GDPPK), current health expenditure as a percentage of Gross Domestic Product (HEX), gross secondary school enrolment (SSE), and urban population as a percentage of total population (URB) were included as control variables, given their established theoretical and empirical relevance to life expectancy outcomes. Current health expenditure measures total spending on health from both public and private sources, and so it differs from the Abuja benchmark, which concerns the share of government budgets allocated to health. Since government consumption expenditure also contains the public share of health consumption, the coefficient of government size should be read as its association with life expectancy when the overall level of



health spending is held constant, which shifts attention towards the non health components of government consumption and the efficiency with which public resources are used. All data were obtained from the World Bank's World Development Indicators database (World Bank, 2026), chosen for its consistency, reliability, and comparability across the countries and years covered. All variables were transformed into natural logarithms before estimation, so that the estimated coefficients can be interpreted as elasticities, while descriptive statistics are reported in levels. Table 1 summarises the definition, measurement, source code, and expected sign of each variable.

Table 1: Variable Definition and Measurement

Variable	Symbol	Measurement	WDI Code	Expected Sign
Quality of Life	LEX	Life expectancy at birth, total (years)	SP.DYN.LE00.IN	Dependent
Government Size	GOS	General government final consumption expenditure (% of GDP)	NE.CON.GOV.T.ZS	+
GDP Per Capita	GDPPK	GDP per capita (current US\$)	NY.GDP.PCAP.CD	+
Health Expenditure	HEX	Current health expenditure (% of GDP)	SH.XPD.CHEX.GD.ZS	+
School Enrolment	SSE	School enrolment, secondary (% gross)	SE.SEC.ENRR	+
Urban Population	URB	Urban population (% of total population)	SP.URB.TOTL.IN.ZS	+

Source: Authors' compilation, 2026. All variables are drawn from the World Bank World Development Indicators (WDI).

Prior to estimation, the study examined four properties of the data that determine the appropriate estimators. Cross sectional dependence was tested using the Breusch and Pagan (1980) LM, Pesaran scaled LM, bias corrected scaled LM, and Pesaran (2004) CD statistics, since close trade, monetary, and institutional ties among ECOWAS member states, together with common shocks such as commodity price cycles and the Ebola epidemic, make cross sectional independence an unrealistic assumption. The slope homogeneity test of Pesaran and Yamagata (2008) was applied to determine whether the coefficients linking government size to life expectancy could be assumed identical across countries. The Im, Pesaran, and Shin (2003) panel unit root test was used to establish the order of integration of each series, and the Wooldridge test was used to check for first order serial correlation in the panel errors (Wooldridge, 2010).

Model Specification

The choice of estimators follows directly from these data properties. When cross sectional dependence is present, conventional panel estimators that treat countries as independent yield biased standard errors and, if unobserved common factors are correlated with the regressors, inconsistent coefficients. When slopes are heterogeneous, pooled estimators that impose a common coefficient on all countries average away economically important differences. And when series are integrated of different orders, techniques that require every variable to be stationary, or every variable to be integrated of order one, become inappropriate. Each of the three techniques employed addresses one or more of these issues, and together they offer complementary perspectives on the same relationship.

To determine the direction of causality between government size and life expectancy, the Dumitrescu and Hurlin (2012) panel causality test was applied. The test allows the autoregressive and causal coefficients to differ across countries, which is consistent with the slope heterogeneity detected, and it accommodates cross sectional dependence among panel members. It tests the null hypothesis that one series does not homogeneously Granger cause the other against the alternative that it does so for at least some countries, in

both directions of the relationship. Granger causality, it should be stressed, concerns predictive precedence, meaning that past values of one variable help to forecast the other; it is not proof of a structural causal effect.

To determine how the relationship between government size and life expectancy varies across the conditional distribution of life expectancy, the Method of Moments Quantile Regression (MMQR) developed by Machado and Silva (2019), building on Koenker and Bassett (1978) and Chernozhukov and Hansen (2006), was employed. The technique suits the data for three reasons. By modelling both the location and the scale of the conditional distribution with country fixed effects, it allows the coefficient of government size to differ for countries positioned at different points of the life expectancy distribution, extending the concern with slope heterogeneity from differences between countries to differences across outcome levels. It requires neither the dependent variable nor the errors to be normally distributed and is robust to outliers, which matters given the wide gap between Sierra Leone and Cape Verde in the sample. It also does not presuppose that all regressors share the same order of integration. The MMQR does not, however, explicitly model unobserved common factors, and this is one reason why the Augmented Mean Group estimator, which does, is used as a complement. Following Machado and Silva (2019), the location scale model is written as:

$$LEX_{it} = \alpha_i + X'_{it}\beta + (\delta_i + Z'_{it}\gamma)U_{it} \quad (1)$$

where X is the vector of regressors, Z is a vector of known transformations of X (here $Z = X$), α and δ are country fixed effects capturing location and scale respectively, and U is an unobserved random variable, independent of X , normalised to satisfy the moment conditions of Machado and Silva (2019). The conditional quantile function of life expectancy at quantile τ is then:

$$Q_{LEX}(\tau | X_{it}) = (\alpha_i + \delta_i q(\tau)) + X'_{it}\beta + Z'_{it}\gamma q(\tau) \quad (2)$$

where $q(\tau)$ is the τ th quantile of U , $\alpha(\tau) = \alpha + \delta q(\tau)$ is the quantile specific country fixed effect, β is the vector of location coefficients, and γ is the vector of scale coefficients, so that the coefficient of each regressor at quantile τ equals $\beta + \gamma q(\tau)$. Applied to the variables of this study, the estimated model is:

$$Q_{LEX,it}(\tau) = \alpha_i(\tau) + \beta_1(\tau)GOS_{it} + \beta_2(\tau)GDPPK_{it} + \beta_3(\tau)HEX_{it} + \beta_4(\tau)SSE_{it} + \beta_5(\tau)URB_{it} \quad (3)$$

where $0 < \tau < 1$, $Q(\tau)$ is the τ th conditional quantile of life expectancy for country i at time t , and $\beta_1(\tau)$ to $\beta_5(\tau)$ are the quantile specific coefficients of the regressors. The model was estimated at the tenth through the ninetieth quantiles in steps of ten, alongside the location and scale coefficients that summarise the average and dispersion effects respectively. The specification is static, with all variables entering contemporaneously and without lags, consistent with the annual frequency of the data and the slow moving, structural character of the variables. The serial correlation detected by the Wooldridge test was taken into account in the choice of standard errors used for inference.

To determine the country specific relationship between government size and life expectancy, the Augmented Mean Group (AMG) estimator developed by Eberhardt and Bond (2009) and Eberhardt and Teal (2010) was employed. The estimator responds to all three data properties at once: it estimates a separate slope for every country, which addresses slope heterogeneity; it accounts for cross sectional dependence by including an estimated common dynamic process that captures unobserved shocks shared by all countries; and it remains valid when variables are nonstationary, so a mixture of $I(0)$ and $I(1)$ series does not invalidate it. Estimation proceeds in two stages. In the first stage, a pooled regression in first differences with year dummies is estimated, and the coefficients on the differenced year dummies are collected as the common dynamic process. In the second stage, the following regression is estimated separately for each country:

$$LEX_{it} = \alpha_i + \beta_{1i}GOS_{it} + d_i\hat{\mu}_t + \varepsilon_{it} \quad (4)$$

where α is the country specific intercept, β_{1i} is the country specific coefficient of government size, $\hat{\mu}$ is the common dynamic process capturing cross sectional dependence arising from shared policy or regional economic shocks, d is its country specific loading, and ε is the error term. The panel wide AMG estimate is the simple average of the twelve country specific coefficients.

Government size, Gross Domestic Product per capita, current health expenditure, secondary school enrolment, and urban population were all expected to be positively associated with life expectancy. All hypotheses were tested at the 5 percent level of significance, and coefficients significant only at the 10 percent level are described as marginally significant.

RESULTS AND DISCUSSION

Table 2 presents the descriptive statistics of the variables used in the study. Life expectancy recorded a panel mean of 59.609 years, ranging from a minimum of 44.834 years in Sierra Leone to a maximum of 76.363 years in Cape Verde. Government size, measured as general government final consumption expenditure as a percentage of Gross Domestic Product, recorded a mean of 13.002 percent, with a standard deviation of 6.182 percent, ranging from 2.463 percent in Cote d'Ivoire to 37.123 percent in Liberia and Senegal. This points to a fairly wide disparity in government spending behaviour among ECOWAS countries, with the unusually high spending ratio observed in Liberia plausibly linked to post conflict reconstruction needs that compel heavy public outlay on rebuilding infrastructure and restoring basic services.

Table 2: Descriptive Statistics

Statistics	LEX	GOS	GDPPK	HEX	SSE	URB
Mean	59.609	13.002	1254.79	4.761	30.359	47.612
Std. Dev.	6.219	6.182	956.814	2.167	21.807	9.393
Minimum	44.834	2.463	29.557	1.663	1.858	30.923
Maximum	76.363	37.123	5639.4	15.119	103.156	77.216

Source: Authors' computation, 2026. Note: Statistics are reported in levels, before logarithmic transformation.

Tables 3 and 4 report the preliminary tests. All four cross sectional dependence statistics rejected the null hypothesis of cross sectional independence for every variable examined, confirming that ECOWAS countries are cross sectionally dependent and that estimators ignoring common shocks would be unreliable. The slope homogeneity test returned a Delta statistic of 16.164 and an adjusted Delta statistic of 17.572, both significant at the 1 percent level, so the null hypothesis of slope homogeneity was rejected. The coefficients linking government size to life expectancy therefore differ meaningfully across countries, a result that supports the country specific AMG estimator and the heterogeneous Dumitrescu and Hurlin test, while the quantile approach extends the same logic to differences across the life expectancy distribution. The Im, Pesaran, and Shin test revealed a mixed order of integration: life expectancy, Gross Domestic Product per capita, and secondary school enrolment were integrated of order one, whereas government size, current health expenditure, and urban population were stationary at level. This mixture rules out estimators that require a uniform order of integration and favours the MMQR and AMG approaches adopted. Finally, the Wooldridge test returned an F statistic of 26.956, significant at the 1 percent level, confirming first order serial correlation, which was addressed through the choice of standard errors described in the methodology.

Table 3: Cross Sectional Dependence and Panel Unit Root Tests

Variable	Breusch Pagan LM	Pesaran Scaled LM	Bias Corrected Scaled LM	Pesaran CD	IPS Order
LEX	Reject	Reject	Reject	Reject	I(1)
GOS	Reject	Reject	Reject	Reject	I(0)
GDPPK	Reject	Reject	Reject	Reject	I(1)
HEX	Reject	Reject	Reject	Reject	I(0)
SSE	Reject	Reject	Reject	Reject	I(1)
URB	Reject	Reject	Reject	Reject	I(0)

Source: Authors' computation, 2026. Note: Reject indicates rejection of the null hypothesis of cross sectional independence. $I(0)$ denotes stationarity at level and $I(1)$ stationarity after first differencing.

Table 4: Slope Homogeneity and Serial Correlation Tests

Test	Statistic	Value	Prob.	Decision
Pesaran and Yamagata slope homogeneity	Delta	16.164***	< 0.01	Reject homogeneity
	Adjusted Delta	17.572***	< 0.01	Reject homogeneity
Wooldridge serial correlation	F statistic	26.956***	< 0.01	Reject no serial correlation

Source: Authors' computation, 2026. Note: *** denotes significance at 1%.

Table 5 presents the Dumitrescu and Hurlin panel causality test between government size and life expectancy. Both null hypotheses were rejected at the 1 percent level. The statistic for the null that government size does not Granger cause life expectancy was 7.759, with a probability value of 0.000, while that for the reverse null was 6.251, with a probability value of 0.001. The joint rejection points to a bidirectional, or feedback, Granger causal relationship: past movements in government size help to predict subsequent life expectancy, and past movements in life expectancy help to predict subsequent government size. This is consistent with the conceptual framework, in which public spending supports population health while healthier populations, through greater productivity and a stronger demand for public services, in turn shape fiscal outcomes in the manner suggested by Wagner's law. Two cautions apply, however. Granger causality establishes predictive precedence rather than structural causation, and the feedback it reveals signals that government size and life expectancy are jointly determined. The coefficients from the quantile and mean group estimations that follow should therefore be read as conditional associations rather than as clean causal effects of government size.

Table 5: Dumitrescu and Hurlin Panel Causality Test

Null Hypothesis	W-Stat.	Prob.	Decision
GOS does not Granger cause LEX	7.759***	0	Reject
LEX does not Granger cause GOS	6.251***	0.001	Reject

Source: Authors' computation, 2026. Note: *** denotes significance at 1%. Conclusion: bidirectional (feedback) Granger causality between GOS and LEX.

Table 6 presents the MMQR estimates of the association between government size and life expectancy across the conditional distribution of life expectancy, reporting for the location, the scale, and each quantile the coefficient, its probability value, and its level of significance. Government size returned a positive and statistically significant location coefficient of 0.026 ($p = 0.011$), indicating a positive average association across the sub region; given the logarithmic specification, a one percent higher government consumption ratio is associated, on average, with approximately 0.026 percent higher life expectancy, other things being equal. The scale coefficient of 0.021 ($p = 0.014$) was also positive and significant, showing that the association widens as one moves up the distribution. At the tenth and twentieth quantiles, which represent the lowest levels of life expectancy in the sub region, the coefficients of negative 0.024 and 0.006 were statistically insignificant, and their confidence intervals include zero. At the thirtieth quantile, the coefficient of 0.021 was only marginally significant at the 10 percent level, so its 95 percent confidence interval also spans zero. From the fortieth quantile upward, every coefficient was positive and significant at the 1 percent level, rising from 0.027 at the fortieth quantile to 0.035 at the median and 0.052 at the ninetieth quantile. The positive association between government size and life expectancy is therefore negligible where life expectancy is lowest but grows steadily stronger where life expectancy is already comparatively high. One interpretation, consistent with the conceptual framework, is that countries with firmer health foundations and stronger institutions are better placed to translate public consumption into gains in longevity. This remains an interpretation of an association,



since the quantile estimates condition on the observed controls but do not isolate the causal effect of government size.

Table 6: Association of Government Size with Life Expectancy Across Quantiles (MMQR)

Quantile	GOS Coeff.	Prob.	Significance
Location	0.026	0.011	5%
Scale	0.021	0.014	5%
10th	-0.024	0.408	Not significant
20th	0.006	0.742	Not significant
30th	0.021	0.09	10%
40th	0.027	0.005	1%
50th	0.035	0	1%
60th	0.039	0	1%
70th	0.041	0	1%
80th	0.046	0	1%
90th	0.052	0	1%

Source: Authors' computation, 2026. Note: The dependent variable is life expectancy (in logarithms). Control variables (GDPPK, HEX, SSE, and URB) and country fixed effects are included but not reported in this table.

Among the control variables, Gross Domestic Product per capita displayed a broadly similar pattern to government size, insignificant at the tenth and twentieth quantiles before turning positive and highly significant from the thirtieth quantile onward, rising to 0.066 at the ninetieth quantile. Current health expenditure exhibited the opposite pattern, showing a positive and significant association at the tenth, twentieth, and thirtieth quantiles, where basic healthcare needs remained largely unmet, before losing significance from the fortieth quantile onward and turning mildly, though insignificantly, negative at the upper quantiles. Secondary school enrolment was insignificant across the lower and middle quantiles but turned negative and increasingly significant from the sixtieth quantile upward, reaching negative 0.014 at the ninetieth quantile, a finding that does not support the a priori expectation that greater educational access should uniformly improve health outcomes. Urban population was positively and significantly associated with life expectancy across every quantile examined, though the magnitude of this association declined steadily from 0.286 at the tenth quantile to 0.194 at the ninetieth quantile, indicating that urbanisation was consistently linked to longer life but most strongly among countries with the lowest starting life expectancy.

The pattern reported in Table 6 is presented graphically in Figure 2, which traces the coefficient of each explanatory variable across the full range of quantiles alongside the corresponding confidence band. The coefficient lines for government size and Gross Domestic Product per capita both trace a clear upward path, beginning from negative or near zero values at the lower quantiles and rising steadily to their highest positive values at the upper quantiles, confirming that the positive association of these two variables with life expectancy strengthens as one moves toward countries with already higher life expectancy. In sharp contrast, the plot for current health expenditure traces a steep downward path, starting from a relatively high positive value at the lower quantiles and declining continuously until it dips below zero at the uppermost quantiles. Secondary school enrolment follows a broadly similar downward path, while urban population also declines steadily across the distribution but remains positive throughout its entire range. The width of the confidence bands, visibly wider at the lower and upper extremes for most variables, further indicates greater estimation uncertainty at the tails of the distribution than at the middle quantiles.

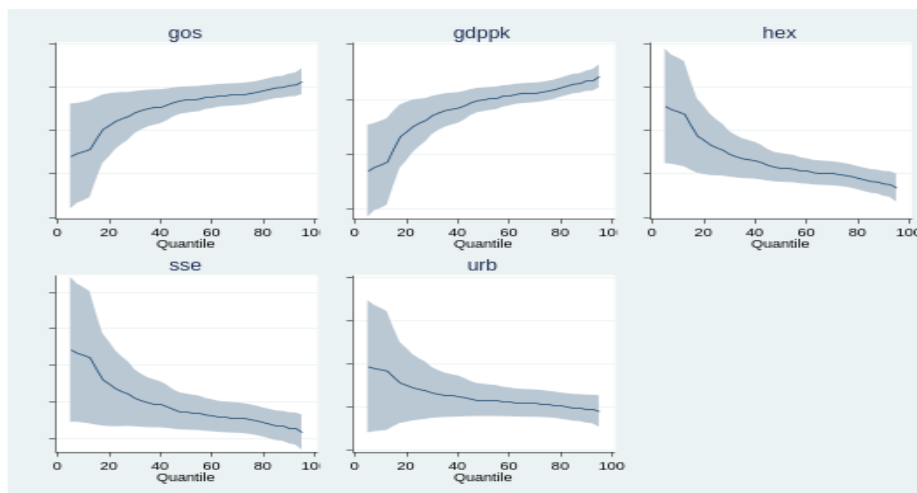


Figure 2: Graphical Representation of MMQR Coefficients Across Quantiles of Life Expectancy in ECOWAS

Source: Authors' computation, 2026.

Table 7 presents the AMG estimates of the country specific association between government size and life expectancy. Government size was positively associated with life expectancy in Gambia, Guinea Bissau, Liberia, Nigeria, Senegal, and Sierra Leone, with elasticities of 0.006, 0.0004, 0.013, 0.002, 0.021, and 0.033 respectively, so that a one percent higher government consumption ratio is associated with life expectancy that is higher by between 0.0004 and 0.033 percent. Only the associations in Senegal (at the 5 percent level) and Sierra Leone (at the 1 percent level) were statistically significant. Conversely, the association was negative in Benin, Cape Verde, Cote d'Ivoire, Ghana, Guinea, and Togo, with elasticities of 0.029, 0.028, 0.011, 0.005, 0.003, and 0.038 in absolute value respectively. At the 5 percent level adopted for hypothesis testing, the negative association was significant in Benin, Cape Verde, Guinea, and Togo, while in Ghana it was only marginally significant at the 10 percent level and in Cote d'Ivoire it was insignificant. This heterogeneity, taken together with the quantile pattern in Table 6, indicates that government size is not associated with life expectancy uniformly across ECOWAS, and that an expansion of government consumption alone cannot be relied upon as a universal remedy for improving population health across the sub region.

Table 7: Country Specific Association of GOS with LEX (AMG)

Country	GOS Coefficient	Significance
Benin	-0.029	1%
Cape Verde	-0.028	5%
Cote d'Ivoire	-0.011	Not significant
Gambia	0.006	Not significant
Ghana	-0.005	10%
Guinea	-0.003	5%
Guinea Bissau	0.0004	Not significant
Liberia	0.013	Not significant
Nigeria	0.002	Not significant
Senegal	0.021	5%
Sierra Leone	0.033	1%
Togo	-0.038	5%

Source: Authors' computation, 2026.



These findings carry an important policy message, although it must be stated with appropriate caution. Government size in ECOWAS appears to behave less like a universal welfare enhancing instrument and more like a capability whose returns depend on the institutional and developmental foundation a country already possesses. In Senegal and Sierra Leone, larger government consumption is associated with higher life expectancy, suggesting that public expenditure there has been channelled, at least in part, into services that support longevity. In Benin, Cape Verde, Guinea, and Togo, where the association is significantly negative, the pattern is consistent with fiscal inefficiency, weak public expenditure management, a composition of consumption spending weighted away from health related services, or a crowding out of private welfare enhancing activity, although the present estimates cannot discriminate among these explanations. The result is broadly consistent with Cho and Lee (2025) and Mokoena and Tweneboah (2025), both of whom found that the consequences of government size vary with a country's institutional and developmental starting conditions, with Rajkumar and Swaroop (2008), who showed that the health returns to public spending depend on the quality of governance, and with Dibor-Alfred et al. (2025) and Aazami and Farani (2022), who reported a positive relationship between government spending and quality of life where institutional conditions are supportive.

It is important to distinguish these statistical associations from causal effects when drawing policy implications. The MMQR and AMG coefficients measure how life expectancy moves together with government size after conditioning on the included controls, country fixed effects, and, in the AMG case, common shocks. They do not by themselves establish that raising government consumption would cause life expectancy to rise or fall by the estimated amounts. The bidirectional Granger causality reported in Table 5 indicates that the two variables are jointly determined, so part of the estimated association may reflect life expectancy shaping government size rather than the reverse, and omitted factors such as institutional quality, conflict, donor financing, and disease outbreaks may also influence both. The policy implications discussed below are therefore offered as implications consistent with the evidence rather than as precise forecasts of the consequences of fiscal expansion; establishing causal effects would require identification strategies, such as instrumental variable quantile methods, which are left for future research.

CONCLUSION

This study examined whether government size, measured as general government final consumption expenditure, matters for quality of life, proxied by life expectancy at birth, in twelve ECOWAS countries between 2000 and 2025. It paid attention to the direction of causality between the two variables, the way their association varies across the conditional distribution of life expectancy, and its country specific pattern. The evidence shows that government size and life expectancy are linked by a feedback relationship in the Granger sense, each helping to predict the other over time. Government size is positively associated with life expectancy on average, but the association is concentrated among countries that have already attained relatively high life expectancy and is statistically indistinguishable from zero where life expectancy is lowest, a pattern reinforced by the considerable heterogeneity found across individual countries. The answer to the question posed in this paper is therefore a qualified one: government size does matter for quality of life in ECOWAS, but its association with longevity is neither automatic nor evenly shared across the sub region, and an expansion in government consumption alone cannot be relied upon as a universal remedy for improving population health.

On this basis, governments in ECOWAS countries with comparatively low life expectancy should prioritise targeted and efficiency driven public spending, particularly on primary healthcare and maternal and child health programmes, rather than simply expanding the overall size of government, since the quantile results show no statistically significant association between government size and life expectancy at the lower end of the distribution. Given the bidirectional causality identified between government size and life expectancy, fiscal authorities and health ministries should coordinate their planning, because improvements in population health can themselves expand the fiscal space and institutional capacity available for further public investment, and current health expenditure should similarly be directed toward countries at the lower end of the distribution, where its association with life expectancy was strongest. Given the considerable heterogeneity found across countries, regional bodies such as ECOWAS should avoid prescribing a uniform government expenditure target as a share of Gross Domestic Product, and should instead support member states in

designing fiscal strategies suited to each country's institutional capacity and current position in the region's life expectancy distribution. Continued investment in urban infrastructure and social services is also recommended to sustain the health gains associated with urbanisation, which was significantly and positively associated with life expectancy across every quantile examined.

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