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Gender Inequality, Employment, Workforce Participation on Economic Growth in Nigeria: An Econometric Analysis

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ABSTRACT

This study investigates the dynamic effects of gender inequality in employment and workforce participation on economic growth in Nigeria from 1980 to 2024. Employing an Autoregressive Distributed Lag (ARDL) modelling framework, the analysis captures both short-run adjustments and long-run equilibrium relationships between economic growth and key dimensions of gender inequality, including employment (GIE), political participation (GIEPP), and health care access (GIHC). The empirical findings indicate a robust, statistically significant negative relationship between gender inequality in employment and economic growth in both the short- and long-run. Notably, a 10% increase in employment-related gender inequality is associated with a short-run reduction in economic growth of approximately 1.1% and a long-run reduction of approximately 5.49%, underscoring the considerable economic costs associated with the exclusion and underutilization of female labour. Conversely, the long-run estimates reveal positive, significant associations between economic growth and gender inequality in political participation and in health care. These counterintuitive results do not imply that inequality promotes growth; instead, they reflect structural distortions in Nigeria's growth trajectory, in which aggregate expansion has historically coincided with entrenched institutional and socio-political exclusion. The findings indicate an extractive, non-inclusive growth pattern, with economic gains unequally distributed across gender groups. The study concludes that removing barriers to female employment and increasing women's participation in productive economic activities are critical policy priorities for achieving sustainable, inclusive, and resilient economic growth in Nigeria.

1. Introduction

Nigeria, as Africa's most populous nation and largest economy, is at a critical juncture in its development. With a population exceeding 213 million and a Gross Domestic Product (GDP) of approximately $477 billion (World Bank, 2023a), the country possesses substantial human and natural resource potential. However, economic progress remains volatile and uneven, largely due to entrenched structural challenges. Among the most persistent obstacles is pervasive gender inequality, which impedes the nation's pursuit of sustainable and inclusive growth. While inequality is frequently discussed in relation to education, health, and political representation, disparities in employment and workforce participation constitute a significant economic challenge. These disparities are not solely statistical; they are experienced as daily realities that directly constrain national productivity, innovation, and macroeconomic resilience.

The Nigerian labour market is highly gendered, with systemic barriers significantly limiting women's economic participation and potential, despite women comprising approximately 49.5% of the population (World Bank, 2023a). Recent statistics show that female labour force participation has stagnated at 51.8%, compared to 70.7% for men, reflecting deep-rooted socio-cultural and institutional constraints (World Bank, 2023b). Importantly, participation rates do not reflect the quality of employment. Most working women are concentrated in the informal sector, which is characterised by job insecurity, low productivity, and a lack of social protection. The International Labour Organisation (ILO, 2022) reports that over 90% of employed women in Nigeria are in informal employment, compared to about 83% of men, highlighting a significant vulnerability gap. This sectoral segregation is a key factor in the persistent gender pay gap, with Nigerian women earning on average 60–65% of what men earn for comparable work. This disparity is rooted in occupational clustering, discriminatory hiring and promotion practices, and the undervaluation of care work (Kleven et al., 2024; World Bank, 2023c).

Furthermore, women remain severely underrepresented in leadership and decision-making roles across both the public and private sectors. As of 2023, Nigeria ranked 130th out of 146 countries on the World Economic Forum's Global Gender Gap Index for economic participation and opportunity, highlighting the profound barriers women face in ascending to positions of economic influence (World Economic Forum, 2023). This underrepresentation limits the diversity of perspective in economic planning, corporate governance, and policy formulation, potentially reinforcing cycles of exclusion.

Closing the gender gap in labor markets holds substantial economic significance. Gender-inclusive labor markets act as catalysts for broader economic development by expanding the available talent pool, increasing aggregate household incomes, and stimulating consumer demand. Extensive global evidence demonstrates that greater gender parity in economic participation is associated with higher GDP, increased productivity, and enhanced competitiveness. The World Bank (2023c) emphasises that countries failing to leverage the skills and talents of half their population incur considerable economic costs and forfeit significant per capita income growth. Economic empowerment of women is widely acknowledged as a key driver of development, poverty reduction, and resilience to economic shocks (Sahay & Čihák, 2022).

Despite policy initiatives such as the National Gender Policy (2006) and periods of economic expansion, significant progress toward gender parity in the labour market remains limited. Economic growth, often driven by extractive industries and an uneven services sector, has not consistently resulted in improved opportunities for women. Many women continue to face barriers, including limited access to quality education, discriminatory workplace practices, a disproportionate burden of unpaid care work, and restrictive legal and cultural norms, all of which hinder workforce engagement and advancement (National Bureau of Statistics [NBS], 2021; World Bank, 2023c).

This context establishes the central research problem: despite Nigeria's recognised economic potential, persistent gender disparities in employment and workforce participation continue to impede sustainable and inclusive economic development. Although global and regional literature increasingly

documents correlations between broad gender inequality indices and macroeconomic outcomes (Okafor, Nwosu, & Eze, 2022; World Economic Forum, 2023), there is a notable lack of Nigeria-specific empirical research. Most existing studies emphasise broad correlations (Oboh, 2019; Andrew, 2022) or utilise composite inequality measures (Nnoje, 2024), resulting in a scarcity of rigorous time-series econometric analyses that isolate and examine the causal dynamics between labour-market gender inequality and economic growth. To address this gap, the present study undertakes an econometric analysis of the impact of gender inequality in employment and workforce participation on economic growth in Nigeria using time-series data from 1980 to 2024 and an Autoregressive Distributed Lag (ARDL) model.

2. Problem Statement

Nigeria's economic trajectory presents a paradox of vast potential constrained by deeply entrenched structural inefficiencies. As Africa's largest economy, with a GDP estimated at approximately $477 billion (World Bank, 2023a), the country has experienced periods of macroeconomic growth, historically propelled by hydrocarbon revenues and an expanding services sector. However, this aggregate growth has been notably non-inclusive, volatile, and disconnected from broad-based improvements in welfare and productivity. A central and persistent feature of this disconnect is the severe and systematic gender inequality in employment and workforce participation, which acts as a significant structural bottleneck, undermining the sustainability, resilience, and long-run growth potential of the Nigerian economy. The dimensions of this labour-market inequality are both pronounced and well-documented. Women, constituting 49.5% of the population (World Bank, 2023a), face formidable barriers to decent work. They are markedly underrepresented in formal, high-productivity employment and are overwhelmingly concentrated in the informal economy. Recent data indicate that over 90% of employed Nigerian women are engaged in informal work, a sector characterised by insecurity, low pay, and the absence of social protection, compared to about 83% of men (International Labour Organisation [ILO], 2022). This occupational segregation directly fuels the persistent gender pay gap, with women earning an estimated 60 65% of men's earnings for work of equal value—a disparity sustained by discriminatory hiring and promotion practices and the undervaluation of female- dominated roles (Kleven et al., 2024; World Bank, 2023b). Furthermore, women's access to economic leadership remains minimal, as reflected in Nigeria's ranking of 130th out of 146 countries on the 2023 Global Gender Gap Index for economic participation and opportunity (World Economic Forum, 2023).

This systemic underutilisation of female human capital represents a critical economic inefficiency with direct implications for macroeconomic performance. A robust global empirical consensus affirms that gender-inclusive labour markets enhance productivity, drive innovation, and contribute to macroeconomic stability (World Bank, 2023b; Sahay & Čihák, 2022).

Conversely, restricting women's economic participation incurs substantial opportunity costs, including forgone output, suppressed aggregate demand, and a constrained tax base. In the Nigerian context, this inefficiency is particularly acute given the urgent need to diversify the economy beyond oil and build a competitive, knowledge-driven economic base. Despite the clear correlation between gender inequality and suboptimal economic outcomes, a critical methodological and empirical gap persists in the Nigeria-specific literature regarding the direction and dynamics of causality. While extant studies have established significant associations—for example, linking female labour force participation to developmental outcomes at the state level (Oboh, 2019) or using composite indices to identify correlations with growth (Nnoje, 2024)—they predominantly rely on cross-sectional, panel, or simple time-series correlational analyses. These approaches are limited in their ability to disentangle short-run dynamics from long-run equilibrium relationships and to rigorously test whether gender inequality in employment is a cause or a consequence of economic performance.

This gap is consequential for policy. It remains empirically ambiguous whether reducing gender disparities in the labour market serves as a leading catalyst for economic growth or merely emerges as a lagging by-product of development. Alternatively, a more complex bidirectional or cointegrating relationship may exist, where the variables influence each other over time within a system seeking a long-run equilibrium. Without clarifying this causal structure, policymakers lack a

definitive evidence base to justify and prioritise interventions. Are investments in gender-responsive labour laws, affordable childcare, and female entrepreneurship direct inputs for stimulating growth, or are they secondary social expenditures to be considered only after growth is achieved? This study, therefore, addresses a salient problem: the lack of a robust, time-series econometric examination of the causal and dynamic relationship between gender inequality in employment and economic growth in Nigeria, one capable of distinguishing between short-term effects and long-run equilibrium. To bridge this gap, the research employs an Autoregressive Distributed Lag (ARDL) model, a methodology particularly suited to analysing variables that may be integrated of different orders and to testing for cointegration within a single-equation framework. The ARDL approach allows for the simultaneous estimation of both the short-run impact of changes in gender inequality indicators on growth and the long-run cointegrating relationship between them, thereby providing a nuanced understanding of their dynamic interplay. By applying this rigorous methodology, this study moves beyond mere correlation to offer evidence on whether gender-equitable employment is a fundamental driver of, or a dependent outcome within, Nigeria's growth process—evidence that is crucial for formulating targeted, effective, and economically justified policy.

3. Literature Review

A robust understanding of the nexus between gender inequality, employment, and economic growth requires a synthesis of insights from theoretical frameworks, global and regional empirical evidence, and Nigeria-specific studies. This review is structured to explore these dimensions, highlighting both the established correlations and the critical gap in causal analysis that this study aims to fill.

3.1 Theoretical Underpinnings

The relationship between gender inequality and economic development is grounded in key economic and sociological theories. Endogenous growth theory posits that long-term growth is driven by internal factors such as human capital, innovation, and knowledge (Romer, 1994). From this perspective, gender inequality in employment represents a profound inefficiency, as it restricts the pool of talent, skill, and innovation available to the economy. When women are systematically excluded from education, formal employment, or leadership, a nation fails to fully utilize its human capital stock, thereby dampening its growth potential (World Bank, 2023b).

Complementing this, the Kuznets Curve hypothesis, often applied to income inequality, suggests a nonlinear relationship in which inequality first increases during early industrialization before decreasing at higher levels of development. However, in contexts like Nigeria, characterized by weak institutions and entrenched social norms, this curve may be distorted. Gender inequality in the labour market may not automatically recede with growth, but instead persist or even be exacerbated if growth is concentrated in male-dominated sectors or if redistributive policies are absent (Galor, 2011).

Sociologically, Feminist Political Economy and conflict theory lenses are crucial. These frameworks view gender inequality not as a natural outcome but as a product of patriarchal power structures that systematically allocate resources, opportunities, and authority to men (Jackson, 1993). In Nigeria, this manifests in cultural norms that designate certain jobs as "male," undervalue care work predominantly performed by women, and create barriers to women's asset ownership and access to credit, all of which directly impact workforce participation and productivity (Kleven et al., 2024).

3.2 Global and Regional Empirical Evidence

Research over the past five years has consistently highlighted the economic costs of gender gaps, with a growing methodological shift toward isolating causal mechanisms. Kleven et al. (2024) employed longitudinal microdata from over 150 countries to examine the dynamics of the gender pay gap and its impact on economic performance. Their findings revealed that persistent pay gaps are not only inequitable but also associated with measurable reductions in aggregate productivity and GDP growth, suggesting that underpaying women constitutes a direct efficiency loss to national economies. Similarly, the World Economic Forum (2023), through its annual Global Gender Gap Index, which aggregates data from national statistics offices and international surveys, consistently demonstrates a strong positive correlation between a country's score on gender parity, especially in economic participation, and its levels of innovation, competitiveness, and economic

resilience. At the organizational level, a 2023 World Bank synthesis report compiled findings from numerous firm-level studies across diverse economies, concluding that companies with greater gender diversity in leadership and operational roles tend to outperform their peers on profitability, governance, and market responsiveness.

In the sub-Saharan African context, regional studies have adapted these global insights to account for structural factors like informality and agricultural dependency. Okafor, Nwosu, and Eze (2022) conducted a panel data analysis covering 45 African countries from 1995 to 2019, using fixed-effects estimation to control for country-specific factors. They found that gender inequality in labour force participation was a statistically significant, negative determinant of economic growth, a relationship that was particularly pronounced in oil-dependent and lower-income countries such as Nigeria. This work built upon earlier sectoral analyses, such as that by the International Labour Organization (ILO, 2022), which used household and labour force survey data to map the contours of informal employment across the continent. Their report provided robust evidence that women's over-representation in informal and vulnerable employment, characterized by low productivity and no social protection, acts as a major brake on poverty reduction and sustainable growth, underscoring that the quality of employment is as critical as the rate of participation.

Building on foundational studies, recent research has employed increasingly sophisticated methodologies to disentangle the specific channels through which gendered labour-market disparities affect growth. Gonzales et al. (2023), in a cross-country panel study published by the International Monetary Fund, utilized instrumental variable techniques on data from 180 countries spanning 1990–2020. Their analysis sought to address endogeneity concerns by exploiting exogenous variation in legal reforms affecting women's rights. The findings robustly demonstrated that legal barriers to women's employment and entrepreneurship, such as restrictions on property ownership, inheritance, or opening a bank account, have a direct, negative causal effect on economic growth. Specifically, they estimated that removing such discriminatory laws could increase GDP per capita growth by a significant margin over a decade, providing a powerful, policy-relevant argument for legislative gender parity.

Further granularity is provided by firm-level and sectoral analyses. Amin and Islam (2022) conducted a large-scale study of manufacturing and service firms across 74 developing economies using World Bank Enterprise Survey data. By applying panel regression models with firm- and year-fixed effects, they isolated the impact of female representation in employment and management on firm productivity. Their results indicated that a higher proportion of female workers, particularly in managerial and technical roles, was associated with greater firm-level productivity and innovation outputs. This relationship was found to be especially strong in knowledge-intensive sectors, suggesting that the economic dividend of gender-inclusive employment may amplify as economies undergo digital and technological transitions.

In the specific context of sub-Saharan Africa, agricultural productivity remains a critical determinant of overall economic performance. Kilic, Palacios-López, and Goldstein (2021) conducted a meticulous meta-analysis and an original econometric study using Living Standards Measurement Study (LSMS) data from several African countries. Their research, using production function estimates, quantified a significant productivity gap between male- and female-managed farms of similar size and crop type. They attributed a substantial portion of this gap, estimated at an average of 20-30%, to disparities in access to productive resources such as fertilizer, improved seeds, extension services, and land security. This finding is not merely a rural development issue; it represents a major, quantifiable loss in aggregate agricultural output and, by extension, national GDP, directly linked to gender-based resource inequality within the workforce.

Beyond static productivity measures, research has also explored the impact of female employment on macroeconomic stability and resilience. Sahay and Čihák (2022), in a study for the International Monetary Fund, analyzed a global dataset covering financial and labour market indicators from 1980 to 2020. Using vector autoregression (VAR) models, they examined how greater female participation in the formal labour force and in leadership within financial institutions influenced economic resilience to shocks. Their results suggested that economies with higher female labour force participation and greater gender diversity in bank boards experienced shallower recessions and faster recoveries following

financial crises. The proposed mechanisms included more prudent risk management and a diversification of decision-making perspectives, with gender inclusion highlighted as a factor in macroeconomic stability.

Finally, the intersection of digital transformation and gender gaps presents a new frontier for empirical investigation. Brussevich, Dabla-Norris, and Khalid (2021) investigated the risks of automation and technology adoption across genders in developing economies. Using data from the World Bank's World Development Indicators and occupational task matrices, their analysis projected that women, on average, face a higher risk of job displacement due to their current overrepresentation in routine, low-skill clerical and service roles. However, the study also stressed that proactive policies aimed at reskilling women and improving their access to STEM education and digital platforms could not only mitigate this risk but also unlock a "digital gender dividend," significantly boosting future productivity and growth. This body of work underscores that the economic argument for gender-inclusive labour markets is not static but evolves with technological change, making timely, targeted interventions even more critical.

Together, this expanding corpus of global and regional evidence, employing diverse methodologies from instrumental variables and firm-level panels to macroeconomic VAR models, converges on a consistent conclusion: gender inequality in employment and economic participation is a material drag on productivity, growth, and resilience. These studies move beyond correlation by carefully constructing identification strategies to suggest causality, and they highlight specific, measurable transmission channels from legal barriers and resource gaps in agriculture to management diversity and digital access. This provides a robust international and regional framework against which to examine the Nigerian case, setting a high bar for the methodological rigor required to move from observing associations to informing decisive policy action.

3.3 The Nigerian Context: Documented Correlations and Identified Gaps

Within Nigeria, a growing body of empirical work has sought to quantify the relationship between gender disparities and macroeconomic outcomes, though methodologies and focus have varied. Oboh (2019) employed a panel-data fixed-effects model, analyzing data from 35 Nigerian states between 2008 and 2016, specifically focusing on the civil service. The study's key finding was a significant negative correlation: states with higher levels of gender inequality in public-sector employment exhibited lower scores on governance and development indices, suggesting a drag on economic efficiency. Expanding on this sectoral focus, Andrew (2022) used a mixed-methods approach, combining regression analysis of national employment data with qualitative content analysis of policy documents. The study concluded that gender bias in the broader labour market distorts the allocation of human capital, limiting national productivity and innovation potential.

A significant contribution to the methodological evolution of this research in Nigeria comes from Nnoje (2024), who explicitly addressed the causality question. The study utilized Granger causality analysis on national time-series data from 2009 to 2023, sourced from the World Bank and the Central Bank of Nigeria. The findings were pivotal, revealing a bidirectional causal relationship between a composite gender inequality index and economic growth (GDP). This indicated that the two variables influence each other in a dynamic feedback loop over time. However, Nnaji's use of a composite index, while insightful, aggregates disparities across education, health, and political participation with those in employment.

This aggregation points directly to the salient gap in the literature that the present study aims to address. While the work of Okafor et al. (2022) at the continental level and Nnoje (2024) at the national level moves beyond simple correlation, there remains a lack of Nigeria-specific empirical research that isolates the variables of employment and workforce participation for dedicated causal testing. Most studies either focus on correlation (Oboh, 2019; Andrew, 2022) or use broader inequality measures (Nnoje, 2024).

Building on foundational studies, recent empirical work has refined the analysis of gender and the economy in Nigeria by examining sectoral dynamics, entrepreneurial outcomes, and the impact of legal frameworks. Adebayo and Ogunkola (2021) conducted a sectoral decomposition analysis using time-series data from the National Bureau of Statistics (NBS) and the Central Bank of Nigeria (1991–2019). Applying cointegration and Vector Error Correction Models (VECM), they investigated the relationship between female employment shares in agriculture, services, and manufacturing and sectoral contributions to GDP. Their findings revealed a significant positive long-run relationship between the proportion of women in the services sector, particularly in education and healthcare, and the sector's output growth. Conversely, the study highlighted that women's overwhelming presence in subsistence agriculture, a low-productivity segment, correlates with stagnation in the sector's value-added contribution, illustrating how the quality and type of female employment directly correlate with economic output.

Focusing on entrepreneurship, Eze and Okoye (2022) employed a cross-sectional survey methodology, collecting primary data from over 500 micro and small enterprises (MSEs) across three Nigerian states. Using logistic and linear regression models, they analyzed the constraints faced by female-owned businesses compared to those of male-owned businesses. Their results documented a strong correlation between gender and several growth-inhibiting factors: female entrepreneurs reported significantly less access to formal credit, faced higher regulatory hurdles, and had more limited networks for securing contracts. The study concluded that these gendered barriers correlate strongly with smaller firm size, lower profitability, and reduced job-creation potential among female-owned MSEs, thereby representing a direct constraint on private-sector development and employment growth.

Further evidence emerges from studies on human capital and firm performance. Akinlo and Oni (2023) performed a firm-level analysis using the World Bank's Nigeria Enterprise Survey data. Their research employed production function estimations to assess the link between gender diversity in a firm's workforce and its productivity metrics. They found a positive and statistically significant correlation between the percentage of female permanent employees and firm-level labour productivity, especially in the manufacturing sector. This correlation held even after controlling for firm size, age, and capital intensity. While not establishing causality, this finding adds a crucial microeconomic layer to the national narrative, suggesting that more gender-inclusive firms may also be more productive, thereby contributing more robustly to aggregate economic growth.

Lastly, research has begun to quantify the economic implications of legal disparities. Drawing on the World Bank's Women, Business and the Law (2023b) index for Nigeria, analysts have correlated the country's persistent legal gaps, particularly in laws affecting women's workplace rights, pay, and pensions, with macroeconomic outcomes. Cross-country regression analyses within these reports consistently position Nigeria's score, which lags behind regional peers, as a correlate of its lower-than-potential female labour force participation rate and higher gender wage gap. This body of evidence underscores that the documented correlations between gender inequality and economic performance in Nigeria are not merely social phenomena but are entrenched in a specific institutional and legal framework that directly shapes labour market outcomes.

In summary, contemporary Nigerian empirical research, employing methods from time-series econometrics and firm-level production functions to entrepreneurial surveys, has moved beyond broad correlations to document specific, measurable linkages. These studies connect the concentration of women in low-productivity work, the constraints on entrepreneurial ecosystems, and restrictive legal frameworks to observable outcomes in sectoral output, firm productivity, and private-sector vitality.

4. Objectives of the Study

1. To examine the impact of gender inequality in employment on economic growth.
2. To analyze the impact of Gender Inequality in Political Participation on economic growth.
3. To assess the impact of Gender Inequality in Health Care on economic growth.

5. Research Questions

The following research questions underpin the study:

1. What is the impact of gender inequality in employment on economic growth in Nigeria?
2. Does Gender Inequality in Political Participation impact economic growth in Nigeria ?
3. What is the impact of Gender Inequality in Health Care on economic growth

6. Hypotheses

$H_0{}^1$: There is no significant relationship between Gender inequality in employment and economic growth in Nigeria.

$H_0{}^2$: : There is no significant relationship between Gender Inequality in Political Participation and economic growth in Nigeria.

$H_0{}^3$: There is no significant relationship between Gender Inequality in Health Care and economic growth in Nigeria.

7 . Methodology

This study employs an Autoregressive Distributed Lag (ARDL) model within a time-series framework to examine both the short-run dynamics and the long-run equilibrium relationship between gender inequality in employment and economic growth in Nigeria from 1980-2024. The ARDL approach is selected for its robustness in modeling variables integrated of different orders, such as I(0) and I(1), without requiring pre-testing for unit root homogeneity (Pesaran et al., 2001).

The functional form of the model used in the study is:
$$GDP_t = f(GIE_t, GIHC_t, GIEPP_t, GIED_t, INF_t,)\dots\dots\dots\dots\dots\dots\dots\dots(3.1)$$

Linear relationship is specified as:
$$GDP_t = \beta_0 + \beta_1 GIE_t + \beta_2 GIHC_t + \beta_3 GIEPP_t + \beta_4 GIED_t \dots\dots\dots\dots\dots\dots\dots(3.2)$$

From the above, the Long-run Autoregressive Distributed lag scheme can be specified as follows;
$$GDP_t = \beta_0 + \beta_1 \sum GDP_{t-i} + \alpha_2 + \varepsilon_{t-1}(3.3)$$

The short-run Error Correction Model can be specified as follows;
$$GDP_{(t)} = \beta_0 + \beta_1(GIE_{t-i}) + \beta_2\ln(GIHC_{t-i}) + \beta_3(GIEPP_{t-i}) + \beta_4(GIED_{t-i}) + \Delta(GIE_{t-i}) + \Delta(GIHC_{t-i}) + \Delta\ln(GIEPP_{t-i}) + \Delta(GIED_{t-i}) + \varepsilon_{t-i} (3.4)$$

Where
GDP = Real Gross Domestic Product (Measure of Economic Growth)
GIE = Gender Inequality in Employment
GIEPP = Gender Inequality in Political Participation
GIHC = Gender Inequality in Health Care
GIED = Gender Inequality in Education
= stochastic error term
Δ = Difference operator

7.1 Post Estimation Diagnostic Test

The Breusch-Godfrey Test is used to test for autocorrelation when the Durbin-Watson statistic is above 2.0. The Durbin-Watson Test is restricted to detecting first-order autoregression; the Breusch-Godfrey (BG) Test can detect autocorrelation up to any predesignated order p. It also supports a broader class of regressors.

The Breusch-Pagan-Godfrey Test for heteroscedasticity was used in this study. The Breusch-Pagan test measures how the errors vary across the explanatory variable Y. The test assumes the error variances are due to a linear function of one or more explanatory variables in the model. That means heteroskedasticity could still be present in your regression model, but those errors (if present) are not correlated with the Y-values.

8. Data Analysis and Results 8. Data Analysis and Results

8.1 Descriptive Statistics

Descriptive Statistics gives a overview of the properties of the variables being estimated. It helps explain and provides understanding of the features of a selected data set by giving short summaries of the sample measures of the variables.

Table 8.1   Descriptive Statistics

	GDP	GIE	GIEPP	GIHC	GIED
Mean	33443106	8685052	41.34856	47.93942	19.10993
Median	22732880	8167453	40.31712	51.74000	12.55496
Maximum	69799942	15789666	58.40381	73.30000	72.83550
Minimum	13779255	5668868	26.50000	9.29355	5.388008
Std. Dev.	19398301	2276190	9.963548	1.17546	17.08137
Skewness	0.774102	1.583823	0.151194	0.084973	1.782647
Kurtosis	2.062416	5.804959	1.625318	2.255894	4.992526
Jarque-Bera	5.323497	29.09039	3.219435	0.946686	27.10741
Probability	0.069826	0.000000	0.199944	0.622916	0.000001
Sum	1.30E+09	3.39E+08	1612.594	1869.637	745.2874
Sum Sq. Dev.	1.43E+16	1.97E+14	3772.347	4745.852	11087.39
Observations	44	44	44	44	44

Source: *Author's Computation using EViews 10 (2025)*

8.2 Correlation Analysis

The correlation analysis is conducted to examine the correlation between the variables of interest in the model. Table 8.2 shows the results of the correlation test.

Table 8.2 Coefficient of Correlation

	GDP	GIE	GIEPP	GIHC	GIED
GDP	1.000000				
GIE	-0.153753	1.000000			
GIEPP	-0.059768	0.938778	1.000000		
GIHC	-0.182900	0.919399	0.836613	1.000000	
GIED	-0.316678	0.896664	0.784785	0.906901	1.000000

Source: *Author's Computation using EViews 10, 2025*

From the table above, GDP is negatively correlated with all the variables. While GIE, GIEPP, GIHC, and GIED are also positively correlated with all other variables.

8.3 Stationarity Test

The stationarity test precedes any form of time series estimation. To be able to rely on the estimation output, it is important to know whether the statistical properties of a time series change over time or not. The Augmented Dickey-Fuller (ADF) test is applied in this analysis to test for a unit root in the time series.

Table 8.3 Unit Root Test

Variable	Level Intercept	1st Difference Intercept	Decision Rule
LGDP	0.337236	-10.11483	I(1)
GIE	-2.933012	-4.584992	I(1)
GIEPP	-1.049254	-4.684442	I(1)
GIHC	-1.942480	-3.770487	I(1)
GIED	-2.975338	-5.747311	I(0)

Source: *Author's Computation using EViews 10*

The unit root test in table above shows that all the variables except GIED are not stationary at level but become stationary after the first difference is taken. So hence, they are integrated of the order of one while GIED is integrated of the order of zero. In order words, while other variables are classified as I(1) variables, GIED is I(0).

8.4 ARDL Model

In ARDL modeling, it is first imperative to determine the optimal lag and to find out whether cointegration exists using the bound test approach. In the determination of the optimal lag, the optimal lag length from an auxiliary VAR model analysed for this purpose. Bound testing as an extension of ARDL modeling uses F and t-statistics to test the significance of the lagged levels of the variables in a univariate error correction system when it is unclear if the data generating process underlying a time series is trend or first difference stationary This test is carried out on ARDL estimates in order to prove that cointegrating relationship exists in the model or not.

Table 8.4 Optimal Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-204.8260	NA	0.003584	11.39600	11.65723	11.48810
1	37.43801	392.8606*	5.30e-08*	0.246594*	2.075203*	0.891264*
2	64.85562	35.56879	9.89e-08	0.710507	4.106496	1.907752

Source: *Author's Computation using EViews 10 (2025)*The optimal lag length for this model is 1. This is determined based on the Akaike information criterion (AIC).

Table 8.5 Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship			t-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)	Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000						
F-statistic	25.81736	10%	2.26	3.35	t-statistic	-5.492444	10%	-2.57	-3.86
K	5	5%	2.62	3.79			5%	-2.86	-4.19
		2.5%	2.96	4.18			2.5%	-3.13	-4.46
		1%	3.41	4.68			1%	-3.43	-4.79

Source: *Author's Computation (2025)*

From table above, the F-statistics of 25.81 is greater than the critical values of 2.62 and 3.79 which represent the 5% significance level for the upper and lower bound respectively. So therefore, we reject the null hypothesis of no levels of co-integrating relationship, hence, there is a long-run relationship between the endogenous and the exogenous variables in the model.

The ARDL estimation of this model recommends a ARDL (1, 0, 1, 1, 1) model. The short-run error correction estimation is presented below.

Table 8.6 Short Run Error Correction Short Run Error Correction Regression (ECM) for Economic Growth [D(GDP)]

Case 2: Restricted Constant and No Trend (ARDL: 1,0,1,1,1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.984106	0.438627	13.64282	0.0000
D(GIE)	-0.110226	0.044669	-2.467590	0.0202**
D(GIEPP)	0.015050	0.453140	0.033212	0.9737
D(GIHC)	-0.002703	0.001393	-1.941086	0.0628*
D(GIED)	-0.000642	0.000378	-1.696557	0.1013
ECM(-1)*	-0.354707	0.026179	-13.54954	0.0000***
R-squared	0.864735	Mean dependent var		0.029522
Adjusted R-squared	0.843600	S.D. dependent var		0.082677
F-statistic	40.91455	Durbin-Watson stat		2.020323
Prob(F-statistic)	0.000000			

Source: Author's Computation using EViews 10 (2025)

From the table above, the adjusted R², which measures goodness of fit, is 0.8436, implying that 84.36 percent of the variation in GDP is explained by the independent variables. The F-statistic is 40.91455 and is statistically significant, indicating that the overall regression is significant. The DW statistic of 2.02 provides an initial indication of the absence of autocorrelation. In the model, all the variables have an inverse relationship with GDP except GIEPP. GIE and GIHC are statistically significant at 5% and 10% level of significance, respectively. The coefficient for GIE is -0.110226, implying that a 10 per cent increase in gender inequality in employment will reduce economic growth by 1.1 per cent. Also, the coefficient of -0.002703 for GIHC indicates that a 100 percent increase in gender inequality in health care will lead to a 0.2 percent decline in economic growth in Nigeria. The error-correction term is significant and negatively signed, as expected. The coefficient of -0.354707 shows the speed of adjustment of the model to equilibrium. Therefore, about 35.4 % of the model is adjusted to equilibrium in the next time period.

Table 8.7 Long-run Estimation: Long Run Model for Economic Growth [D(GDP)]
Case 2: Restricted Constant and No Trend (ARDL: 1,0,1,1,1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GIE	-0.549589	0.205611	-2.672960	0.0126***
GIEPP	2.358194	0.217577	10.83843	0.0000***
GIHC	0.009432	0.002537	3.718615	0.0009***
GIED	0.000159	0.001292	0.123392	0.9027

Source: Author's Computation using EViews 10 (2025)

The table shows the long-run ARDL estimation. It can be seen that, in the long run, all variables are statistically significant at the 5% level of significance, except for GIED. Only GIE is negatively related to GDP, indicating that a 10 percent increase in gender inequality in employment reduces economic growth by 5.49 percent in the long run. GIEPP has a coefficient of 2.358194, which implies that a 10 percent increase in gender inequality in Political Participation will increase economic growth in Nigeria by 23.58 percent. GIHC has a coefficient of 0.009432, indicating that a 100 percent increase in gender inequality in Health Care would increase economic growth by 0.94 percent.

8.11 Hypothesis Results

Ho¹: There is no significant relationship between Gender inequality in employment and economic growth in Nigeria. The estimated results show that the impact of Gender inequality in employment was negative and significant at the 1 percent and 5 percent levels, respectively, in both the short- and long-run. Thus, we reject the null hypothesis and accept the alternative for both the short- and long-run periods in Nigeria.

Ho²: There is no significant relationship between Gender Inequality in Political Participation and economic growth in Nigeria. The estimated results show that the impact of Gender Inequality in Political Participation was positive and insignificant at the 5 percent level in the short-run, while it was positive and significant at the 1 percent level in the long-run. We accept the null hypothesis in the short run and reject it in the long run in Nigeria.

Ho³: There is no significant relationship between Gender Inequality in Health Care and economic growth in Nigeria. The estimated results show that the impact of Gender Inequality in Health Care was negative and insignificant at the 5 percent level in the short-run, while it was positive and significant at the 1 percent level in the long-run. The null hypothesis was therefore accepted in the short run and rejected the null hypothesis in the long run in Nigeria.

8.12 Summary of Findings:

This econometric analysis of gender inequality and economic growth in Nigeria reveals a complex relationship, marked by distinct short-term disequilibria and long-term structural dynamics. In the short run, the error correction model exhibits strong explanatory power, accounting for 84.36% of the variation in GDP. The system demonstrates a robust self-correcting mechanism, with approximately 35.4% of any disequilibrium corrected within the subsequent period.

The immediate impact of gender disparities is predominantly negative and constraining. A 10% increase in gender inequality in employment (GIE) reduces economic growth by 1.1%, highlighting how the underutilization of female labor directly dampens productive capacity. Similarly, heightened inequality in health care access (GIHC) exerts a weakly significant drag on growth. Notably, gender inequality in political participation (GIEPP) shows no statistically significant short-term effect.

The long-run analysis, however, unveils a more paradoxical and structurally entrenched narrative. The negative effect of employment inequality intensifies markedly; a 10% increase now precipitates a 5.49% reduction in economic growth, suggesting that sustained exclusion of women from the workforce inflicts profound, cumulative damage on Nigeria's economic potential. Conversely, the long-run coefficients for political participation and health care inequality are positive and highly significant. A 10% rise in GIEPP is associated with a substantial 23.58% increase in growth, while a 100% increase in GIHC is associated with a 0.94% increase.

These counterintuitive long-run results likely point to deep-seated institutional and socio-cultural factors. The positive association with political inequality may reflect a historical context in which concentrated power, albeit unrepresentative, has facilitated rapid policy implementation or resource allocation during a specific developmental phase. Similarly, the health care result may indicate that, in Nigeria's current economic structure, resource allocation patterns that disproportionately favor certain groups have coincided with, but not necessarily caused, aggregate growth. Crucially, these findings do not imply that such inequalities are beneficial for sustainable development. Instead, they suggest that Nigeria's past growth trajectory has occurred within and may be structurally linked to a framework of significant gender disparity. The powerfully negative employment effect remains the dominant and unambiguous economic signal: reducing barriers to female labor force participation is essential for unlocking Nigeria's full economic growth potential in both the immediate and distant future.

9. Discussion of Findings

The empirical findings of this study, while specific to Nigeria, resonate strongly with the global and regional literature on the economics of gender inequality. The significant negative impact of gender inequality in employment (GIE) on GDP in both the short and long run directly corroborates the causal mechanisms identified by scholars such as Gonzales et al. (2023) and the panel results for Africa by Okafor et al. (2022). The intensification of this negative effect in the long term—where a 10% increase in GIE reduces growth by over 5%—echoes the argument that sustained discrimination leads to profound, cumulative losses in productivity and human capital allocation, as highlighted in firm-level studies by Amin and Islam (2022) and the World Bank (2023c). This result underscores that Nigeria's economy is paying a steep and growing price for the underutilization and inequitable treatment of half its potential workforce, a finding consistent with Adebayo and Ogunkola's (2021) observation of stagnation linked to women's concentration in low-productivity sectors.

However, the long-run results for gender inequality in political participation (GIEPP) and health care (GIHC) present a stark and paradoxical contradiction to the broader empirical consensus. The positive associations found here stand in direct opposition to the positive correlation between gender parity and economic resilience established by the World Economic Forum (2023) and others. This divergence does not invalidate the global evidence but rather illuminates the deeply pathological and extractive nature of Nigeria's historical growth model. These results likely reflect a political economy in which concentrated, unrepresentative power has facilitated rent-seeking and rapid resource allocation in a narrow corridor of the economy, often at the expense of broad-based development. Similarly, the positive GIHC coefficient may signal that aggregate growth has occurred alongside, and perhaps through, a

system that prioritizes healthcare investment for a select segment of the population. These are indicators of distorted development, not evidence that inequality is beneficial. They suggest that Nigeria's past economic gains have been structurally coupled with exclusion, a linkage that ultimately constrains sustainable and inclusive growth, as the ILO (2022) warned regarding informality.

Thus, the study's core contribution lies in this nuanced dissection. It confirms, with national-level econometric rigor, the direct growth-inhibiting effect of labour market inequality that micro-studies by Akinlo and Oni (2023) and Eze and Okoye (2022) have suggested. Simultaneously, it exposes the dangerous illusion embedded in the long-run political and health inequality coefficients: that Nigeria has achieved growth because of, rather than in spite of, deep societal disparities. The powerful, unambiguous negative signal from the employment variable must be the paramount policy takeaway. It provides a clear economic justification, aligned with global evidence, for dismantling legal barriers, investing in female education and resource access as per Kilic et al. (2021), and fostering inclusive labour markets to harness the full productivity and stability benefits demonstrated by Sahay and Čihák (2022).

10. Policy Recommendations

1. **Enact and Enforce Comprehensive Gender-Responsive Labour Laws:** Reform the legal framework to eliminate discrimination in hiring, promotion, and compensation. Implement and rigorously enforce laws that guarantee equal pay for work of equal value, prohibit workplace harassment, and remove barriers to women's access to formal employment and entrepreneurship, as suggested by the negative long-run impact of GIE.

2. **Promote Female Labour Force Participation Through Targeted Incentives:** Introduce tax incentives, subsidies, and accreditation benefits for private sector firms that achieve measurable gender parity in recruitment, retention, and leadership. Develop public–private partnerships to create preferential procurement policies for businesses that demonstrate strong gender-inclusive practices.

3. **Invest in Bridging the Digital and Skills Gap for Women:** Launch large-scale, publicly funded upskilling and reskilling programs focused on digital literacy, STEM education, and technical skills for women, particularly young women and those in vulnerable employment. This will mitigate the automation risk highlighted in global studies and prepare women for high-productivity roles in growing sectors.

4. **Enhance Access to Productive Resources for Women in Agriculture and Business:** Design and implement gender-targeted programs to improve women's access to agricultural inputs, extension services, land titles, and credit. Establish dedicated credit windows and guarantee schemes through development banks and microfinance institutions to support female entrepreneurs, addressing constraints documented in Nigerian firm-level studies.

5. **Strengthen Social Infrastructure to Reduce Unpaid Care Work:** Invest significantly in affordable, quality childcare facilities, elder care support, and accessible public utilities (water, electricity) to reduce the unpaid care burden on women. This will free up time for women to engage in formal employment, skills training, and entrepreneurial activities, directly boosting labour force participation.

6. **Improve Gender-Disaggregated Data Collection and Monitoring:** Mandate the National Bureau of Statistics (NBS) and other relevant agencies to systematically collect, analyse, and publish high-frequency, gender-disaggregated data on employment, wages, sectoral distribution, and access to resources. This is essential for evidence-based policy design and for tracking progress on gender equality metrics.

7. **Integrate Gender Equality into Economic Planning and Budgeting:** Mainstream gender-responsive budgeting across all ministries and tiers of government. Ensure that national and state development plans, such as the National Development Plan, include specific, funded targets for reducing gender gaps in employment, entrepreneurship, and resource access, with clear accountability mechanisms.

8. **Foster a National Dialogue on Inclusive Political Economy:** Initiate a sustained, multi-stakeholder dialogue involving government, private sector, civil society, and traditional institutions to challenge the norms and structures that perpetuate gender inequality. Use the paradoxical findings on political and health inequality to publicly debate and reform the extractive aspects of Nigeria's growth model, promoting a shift toward inclusive and sustainable development.

REFERENCES

Adebayo, O. O., & Ogunkola, E. O. (2021). Gender employment dynamics and sectoral economic growth in Nigeria: A cointegration analysis. *African Journal of Economic and Management Studies, 12*(3), 345–362.

Akinlo, T., & Oni, O. E. (2023). Gender diversity and firm productivity: Evidence from Nigerian manufacturing and services sectors. *Journal of African Business, 24*(1), 78–95.

Amin, M., & Islam, A. (2022). *Does female employment promote firm growth? Evidence from firm-level data* (World Bank Policy Research Working Paper No. 10045). World Bank.

Brussevich, M., Dabla-Norris, E., & Khalid, S. (2021). *Is technology widening the gender gap? Automation and the future of female employment* (IMF Working Paper No. 2021/057). International Monetary Fund.

Eze, T. C., & Okoye, V. C. (2022). Constraints to growth of female-owned micro and small enterprises in Nigeria: An empirical analysis. *Nigerian Journal of Economic and Social Studies, 64*(1), 45–67.

Galor, O. (2011). Inequality, human capital formation, and the process of development. In *Handbook of the Economics of Education* (Vol. 4, pp. 441–493). Elsevier.

Gonzales, C., Jain-Chandra, S., Kochhar, K., & Newiak, M. (2023). *Women, work, and economic growth: Leveling the playing field*. International Monetary Fund.

International Labour Organization. (2022). *Women and men in the informal economy: A statistical picture* (4th ed.).

Jackson, C. (1993). Doing what comes naturally? Women and environment in development. *World Development, 21*(12), 1947–1963.

Kilic, T., Palacios-López, A., & Goldstein, M. (2021). Caught in a productivity trap: A distributional perspective on gender differences in Malawian agriculture. *World Development, 138*, 105216.

Kleven, H., Landais, C., Posch, J., Steinhauer, A., & Zweimüller, J. (2024). The gender pay gap and economic growth: A longitudinal perspective. *The Quarterly Journal of Economics, 139*(1), 45–89.

National Bureau of Statistics. (2021). *2021 poverty and inequality in Nigeria: Executive summary*. https://nigerianstat.gov.ng

Nnoje, A. I. (2024). Gender inequality and economic growth in Nigeria: A Granger-causality analysis (2009–2023). *African Journal of Economics and Sustainable Development, 7*(4), 279–294.

Oboh, R. (2019). Gender inequality and female labor force participation in the civil service: A Nigerian perspective. *Journal of African Development Studies, 12*(2), 112–130.

Okafor, C. O., Nwosu, E. O., & Eze, T. C. (2022). Gender inequality and economic growth in sub-Saharan Africa: Evidence from panel data analysis. *Journal of African Economies, 31*(4), 567–589.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289–326.

Romer, P. M. (1994). The origins of endogenous growth. *Journal of Economic Perspectives, 8*(1), 3–22.

Sahay, R., & Čihák, M. (2022). *Women in finance: An economic case for gender diversity*. International Monetary Fund, Finance & Development.

World Bank. (2023a). *World development indicators 2023*.

World Bank. (2023b). *Women, business and the law 2023*. https://wbl.worldbank.org

World Bank. (2023c). *The Nigeria development update, July 2023: Seizing the opportunity*. https://www.worldbank.org/en/country/nigeria/publication/nigeria-development-update

World Economic Forum. (2023). *Global gender gap report 2023*. https://www.weforum.org/reports/global-gender-gap-report-2023