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# The Investigation of the Drivers of Gender Inequality in Developed and Developing Countries

**Oluwabusola Ikeoluwa OLAOSEBIKAN\***

<https://orcid.org/0009-0008-8822-3087>

Department of Economics, Federal University Oye-Ekiti, Nigeria

**Corresponding email:** olaosebikanoluwabusola@gmail.com

**Phone:** 07033070303

**Bosede Olanike AWOYEMI†**

<https://orcid.org/0000-0001-6391-2443>

Department of Economics, Afe Babalola University, Ado-Ekiti, Nigeria

**Email:** nikeawoyemi@abuad.edu.ng

**Phone:** 08030776250

**Samuel Aderemi IGBATAYO‡**

<https://orcid.org/0000-0003-0803-7900>

Department of Economics, Afe Babalola University, Ado-Ekiti, Nigeria

**Email:** remisamuel2002@yahoo.com

**Phone:** 08033800373

## Abstract

Gender inequality continues to pose significant challenges to inclusive development, undermining social, economic, and health progress across countries. This paper examines the drivers of gender inequality across 15 developed and 54 developing countries over the period 2000–2024, with the primary aim of analysing how socioeconomic, demographic, and health-related factors influence the Gender Inequality Index (GII). Using annual panel data, the study employs dynamic panel methods,

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\* Olaosebikan Oluwabusola is a Lecturer in the Economics Department, Federal University, Oye Ekiti. Her area of Research Interest is Development Economics with a specialization in gender studies. She earned a B.Sc. and M.Sc. in Economics from Adekunle Ajasin University, Ikare Akoko, in Ondo State, South West Nigeria. She is currently a PhD student at Afe Babalola University, Ado-Ekiti (ABUAD).

† Bosede Olanike Awoyemi is a Professor of Economics at Afe Babalola University, Ado-Ekiti, and a former Research Consultant at UNECA, Addis Ababa. She holds a Ph.D. from the University of Ibadan and has authored over 40 publications. Her expertise covers international trade, macroeconomics, and development. She chairs the Nigerian Economic Society, Ekiti State Chapter.

‡ Professor Samuel Aderemi Igbatayo, PhD, is an agricultural economist specializing in renewable energy, sustainable agriculture, and climate-smart practices for food security and rural development. He has served at Igbinedion and Afe Babalola Universities, he is a PASRC member, Green Growth Africa advisor, and Fellow of the Institute of Economists of Nigeria.

including Feasible Generalized Least Squares (FGLS), Panel-Corrected Standard Errors (PCSEs), and Driscoll–Kraay corrections, to account for cross-sectional dependence, slope heterogeneity, and non-stationarity. The model specifies GII as a function of education gaps, labour-force participation and employment disparities, wage and salaried-worker gaps, public health spending, infant mortality, immunization coverage, GDP per capita, and urbanization. The results reveal that in developed countries, gender inequality is significantly aggravated by wider education and employment gaps, larger labour-force participation and wage disparities, higher infant mortality, and rapid urban growth, whereas higher GDP per capita and broader immunization coverage mitigate inequality. In developing countries, the education gap, labour-force gap, wage gap, and infant mortality emerge as strong positive drivers of inequality, while GDP per capita, increased public health expenditure, and urbanization contribute to reducing it; the impact of immunization is weak and mixed, and the employment gap shows estimator-dependent significance. The findings underscore that although certain determinants are common across countries, their effects vary in intensity depending on the level of development. The study concludes that targeted interventions such as closing educational and employment disparities, formalizing labour markets, improving job quality, and strengthening health systems through sustainable financing are essential to narrowing gender gaps. The contribution of this paper lies in providing comparative empirical evidence that deepens the understanding of the context-specific dynamics of gender inequality and in proposing multi-dimensional policy frameworks relevant to both developed and developing economies.

**Keywords:** *Gender Inequality, Drivers, Developed, Developing Countries, Education Gap, Labour-Force Participation, Wage Gap, Public Health Expenditures.*

## **Introduction**

Over the past five decades, gender inequality has emerged as a critical barrier to sustainable development, inclusive economic growth, and public health improvement. While earlier economic theories often overlooked women's contributions, modern perspectives highlight that no society can achieve its full potential when half of its population

is systematically excluded (Sen, 1999; World Bank, 2023). Persistent disparities in education, health, political participation, and employment hinder women's empowerment and slow overall development. In developed countries, significant progress has been recorded, with women attaining near parity in education and increased workforce participation. However, challenges remain in wage disparities, occupational segregation, and underrepresentation in senior leadership. OECD (2023) reports show women earn 13% less than men for comparable roles and hold fewer than 20% of top corporate positions. Structural barriers such as limited parental leave and entrenched social norms further reinforce these inequalities (ILO, 2022).

In contrast, gender inequality in many developing regions remains deeply embedded in cultural practices, weak institutions, and limited access to resources. In Sub-Saharan Africa, issues such as child marriage, inheritance restrictions, and inadequate maternal healthcare contribute to high maternal mortality rates, with Nigeria recording 512 deaths per 100,000 live births in 2023 (UNICEF, 2023). Similarly, barriers to girls' education and exclusion from formal employment perpetuate cycles of dependency and poor health outcomes (UNDP, 2022; UNESCO, 2023). Institutional capacity plays a decisive role in narrowing gender gaps. Scandinavian countries, particularly Sweden, demonstrate how coherent and enforced policies such as extended parental leave, subsidized childcare, and corporate board quotas can raise female labour participation and reduce pay gaps (Mateos et al., 2022). Conversely, in many low- and middle-income countries, weak enforcement undermines progressive legal reforms, resulting in limited practical impact (World Bank, 2022).

Tackling gender inequality requires multidimensional, context-specific interventions. Evidence shows that countries combining policies such as education incentives, gender quotas, and healthcare financing achieve greater progress than those relying on piecemeal approaches (Duflo, 2012; Chattopadhyay & Duflo, 2004). Moreover, productivity growth, fueled by technology and human capital investment, creates the fiscal space for inclusive social policies (ILO, 2023). This study builds on these insights by analysing the drivers of gender inequality in developed and developing countries. The countries selected are based on the United Nations Department of Economic and Social Affairs [UN DESA] classification of developed and developing nations

(UN DESA, 2025). Examining the interplay between education, productivity, institutions, and cultural norms provides evidence-based strategies to guide governments and development partners in advancing gender equality and fostering inclusive, sustainable growth.

Literature Review

## **Conceptual Literature**

Gender inequality is a complex, multidimensional phenomenon that impedes economic, social, and political development in both developed and developing countries. Broadly, it refers to the unequal distribution of opportunities, resources, and power between men and women, reinforced by institutional, cultural, and structural barriers (World Economic Forum [WEF], 2023). While gender inequality manifests in diverse forms, three principal drivers- labour force participation, access to education, and leadership representation stand out in shaping outcomes. Labour force participation is a critical determinant of gender inequality, reflecting the degree to which women are integrated into economic life. According to the International Labour Organisation (ILO, 2021), women's global labour force participation rate is 47%, compared with 74% for men. This disparity is sustained by structural obstacles such as unpaid caregiving responsibilities, low wages, limited childcare provision, and enduring stereotypes that confine women to domestic roles. Such barriers not only restrict women's economic engagement but also perpetuate broader inequalities across society.

Unequal access to education represents another key driver of gender inequality, limiting women's empowerment and long-term economic mobility. UNESCO (2022) reports that 129 million girls remain out of school due to poverty, cultural norms, and practices such as child marriage. Education is a transformative tool; each additional year of schooling for girls increases their potential earnings by nearly 20% and contributes to overall poverty reduction (World Bank, 2018). Yet, challenges, including inadequate infrastructure, social exclusion, and entrenched gender norms, continue to hinder educational attainment for many girls worldwide. Leadership representation is equally crucial, as decision-making arenas remain overwhelmingly male-dominated. Globally, women occupy only 26% of parliamentary seats (Inter-Parliamentary Union [IPU], 2023), limiting the development of policies that address women's specific needs. Structural barriers,

gender stereotypes, and societal expectations often prevent women from attaining leadership positions, further entrenching systemic inequities (Begeny et al., 2021; Hariri, 2022).

In sum, the literature underscores that gender inequality is sustained by interrelated economic, educational, and political factors. Effective mitigation requires policies that dismantle structural barriers, expand equitable access to education, and promote inclusive leadership opportunities. Such strategies not only advance social justice but also enhance economic growth and sustainable development across both developed and developing contexts.

## **Theoretical Literature**

Intersectionality Theory, originally advanced by Kimberlé Crenshaw in 1989, provides an important lens for analysing the drivers of gender inequality in both developed and developing countries. The theory posits that individuals experience multiple, overlapping identities such as gender, race, class, and socioeconomic status that intersect to create unique forms of privilege or disadvantage (Crenshaw, 1989, 1991). This approach moves beyond the single-axis analysis of inequality, emphasising instead that structural discrimination is multidimensional and context-specific. In the study of gender inequality, this framework is particularly useful in explaining why women from marginalised racial, ethnic, or economic groups often experience deeper disadvantages than women from more privileged backgrounds.

Building on Crenshaw's work, scholars such as Collins (2000) and hooks (2000) expanded the discourse by stressing how systems of power and domination, including patriarchy, capitalism, and racism, interconnect to reproduce inequality. Intersectionality thus challenges researchers and policymakers to consider how gender cannot be isolated from other social categories when investigating disparities in education, labour force participation, or leadership representation. More recent studies reaffirm this view, showing that women in developing countries often face a compounded burden of inequality due to poverty, limited institutional support, and cultural restrictions (Hankivsky & Kapilashrami, 2020; Cho, Crenshaw, & McCall, 2013). The theory further underscores that policy interventions designed to address gender inequality must be inclusive of intersecting identities to be effective. For instance, programs that enhance women's labour force

participation must also address barriers tied to class and ethnicity, such as childcare access or discriminatory workplace cultures (Hankivsky, 2012). Similarly, education policies targeting gender parity should incorporate strategies that respond to the compounded vulnerabilities of rural or minority girls (UNESCO, 2022). By adopting this multidimensional perspective, Intersectionality Theory reveals how global efforts toward gender equality can be strengthened through context-sensitive approaches.

Despite its usefulness, the theory is not without challenges. Critics argue that its complexity can make policy design and implementation more difficult, as it requires simultaneously addressing multiple forms of discrimination (Yuval-Davis, 2006). Others caution that excessive fragmentation of identities might obscure broader structural struggles for women's empowerment (McCall, 2005). Nevertheless, Intersectionality Theory remains a powerful conceptual tool for this study, as it illuminates how overlapping barriers, economic, cultural, and institutional, shape gender inequality differently across developed and developing contexts.

## **Empirical Literature**

Empirical research on the drivers of gender inequality has expanded across contexts, highlighting both commonalities and regional differences in its determinants. Auró and Arpino (2024), for instance, used multilevel regression on SHARE survey data from 19 European countries to examine gender gaps in social participation. They found that national institutional and cultural contexts strongly shape gendered engagement, with egalitarian nations recording higher female participation. Similarly, Hua (2024) synthesised evidence across employment, education, and health systems, showing how systemic workplace discrimination, enrollment gaps, and healthcare disparities reinforce gender inequality, particularly in low-income countries. These findings underscore that addressing inequality requires multidimensional interventions.

At the macroeconomic level, Karma (2023) employed fixed-effects panel data covering Southeastern Europe over two decades to link socioeconomic and environmental factors to life expectancy, revealing that education, urbanisation, and GDP per capita significantly

improve longevity, while fertility rates and CO<sub>2</sub> emissions worsen outcomes. Although not explicitly framed around gender, these determinants intersect with gendered vulnerabilities in health and productivity. Mateos et al. (2022) regressed the Gender Inequality Index (GII) against longevity and leadership outcomes across WHO regions, finding that gender equality narrows life-expectancy and leadership gaps in Europe and the Americas but paradoxically widens them in Africa, suggesting institutional weaknesses may mediate the benefits of parity. In the African context, Adeosun and Owolabi (2021) applied OLS and Theil's entropy index on Nigeria's LSMS data to explore income disparities. Their results revealed significant regional and sectoral variations in gender wage gaps, with education partially mitigating inequality, though married women faced greater deprivation. Similarly, Qing (2020), using the Chinese General Social Survey and Oaxaca-Blinder decompositions, found that traditional gender-role beliefs exert a direct negative effect on women's wages through occupational segregation and reduced labour participation. These results demonstrate how cultural and structural barriers intersect to depress women's economic outcomes despite rising educational attainment.

Broader cross-country studies also enrich the empirical evidence. Fedotenkov and Derkachev (2020) showed that gendered longevity gaps in OECD and EU countries are shaped by GDP, urbanisation, and women's unemployment, while Kheder (2020) highlighted the role of education, fertility, and political participation in driving female empowerment in Gulf Cooperation Council states. Furthermore, Fisher and Ryan (2020) documented how the COVID-19 pandemic exacerbated gender disparities globally, amplifying occupational precarity and reinforcing stereotypes. Earlier, Abdalali and Abolfazl (2015), using panel data from 136 countries, found that macroeconomic instability (inflation and unemployment) reduces life expectancy, whereas income and investment enhance it, reinforcing the link between economic structures and social inequalities.

Overall, these studies reveal that the drivers of gender inequality are multifaceted, spanning education, labour markets, health, politics, and macroeconomic conditions. Importantly, they highlight that while some determinants (education gaps, labour-force participation, health inequities) are globally consistent, their effects vary across developed

and developing contexts, shaped by cultural norms, institutional capacity, and policy frameworks.

## Methodology

This study investigates the drivers of gender inequality in developed and developing countries using a panel data approach. The empirical model incorporates key determinants such as the education gender gap, public health spending, employer gender gap, labour force participation, wage and salaried workers' gender gap, infant mortality rate, and immunisation rate. These indicators have been widely employed in recent empirical literature to explain disparities in gender outcomes across socio-economic contexts (Auró & Arpino, 2024; Hua, 2024).

The model for developed countries is specified as:

$$GII_{itd} = \alpha_0 + \alpha_1 Edg_{itd} + \alpha_2 Phe_{Gdp_{itd}} + \alpha_3 Emp_{itd} + \alpha_4 Lfp_{itd} + \alpha_5 Wsw_{itd} + \alpha_6 Imr_{itd} + \alpha_7 Imz_{itd} + \mu_{itd} + \epsilon_{itd}$$

For developing countries, the model is formulated as:

$$GII_{itdev} = \alpha_0 + \alpha_1 Edg_{itdev} + \alpha_2 Phe_{Gdp_{itdev}} + \alpha_3 Emp_{itdev} + \alpha_4 Lfp_{itdev} + \alpha_5 Wsw_{itdev} + \alpha_6 Imr_{itdev} + \alpha_7 Imz_{itdev} + \mu_{itdev} + \epsilon_{itdev}$$

Where  $GII$  represents the gender inequality index,  $Edg$  is the education gender gap,  $Phe\_Gdp$  is public health spending as a percentage of GDP,  $Emp\_G$  is the employer gender gap,  $Lfp\_G$  denotes the labor force participation gender gap,  $Wsw\_G$  represents the wage and salaried workers' gender gap,  $Imr$  is the infant mortality rate,  $Imz$  is the immunization rate,  $\mu$  captures country-specific fixed effects, and  $\epsilon$  is the error term. To capture dynamic interactions and ensure robust estimates, two econometric strategies are employed. First, the Feasible Generalized Least Squares (FGLS) method addresses potential heteroskedasticity and serial correlation in panel datasets (Baltagi, 2021).

Second, the Panel-Corrected Standard Errors (PCSEs) technique provides unbiased standard errors by adjusting for contemporaneous correlation and cross-sectional dependence without altering coefficient



estimates (Beck & Katz, 1995; Reed & Ye, 2011).

Before estimation, descriptive statistics including mean, median, standard deviation, skewness, and kurtosis are computed, while panel unit root tests assess variable stationarity. Post-estimation diagnostics involve the Arellano–Bond test for serial correlation, Wald tests for heteroskedasticity, and variance inflation factors to detect multicollinearity (Wooldridge, 2016). The dataset consists of annual World Bank indicators covering the period 2000–2024, with a sample of 15 developed and 54 developing countries. The sample size was determined using Yamane’s adjusted formula (Yamane, 1967; Adam, 2020), ensuring a balanced representation of high- and low-life-expectancy nations. Developed countries were stratified at an 80-year life expectancy threshold, while developing countries were stratified at 72 years.

This dual-model design enhances comparability and allows for a nuanced understanding of the drivers of gender inequality across diverse economic contexts. For developing countries with life spans exceeding 72 years, the selected countries are Afghanistan, Angola, United Arab Emirates, Argentina, Burundi, Benin, Burkina Faso, Bangladesh, Bahrain, Bahamas, Belize, Bolivia, Brazil, Barbados, Brunei Darussalam, Bhutan, Botswana, Central African Republic, Chile, China, Cote d’Ivoire, Cameroon, Congo (Democratic Republic), Congo (Republic), Algeria, Ethiopia, and Egypt while those with life spans below 72 years, the study selected India, Iran, Iraq, Israel, Jamaica, Jordan, Kenya, Cambodia, Kiribati, Kuwait, Lao PDR, Lebanon, Liberia, Libya, Sri Lanka, Lesotho, Niger, Madagascar, Nigeria, Mexico, Mali, Myanmar, Mongolia, Mozambique, Pakistan, Peru, and Korea, Dem. People’s Rep. The selection of these countries is based on their life expectancy at birth.

## **Data Analysis and Interpretation of Results**

### **Descriptive Statistics for Drivers of Gender Inequality in Developed Countries**

The descriptive statistics in Table 1a highlight substantial variation in gender inequality drivers across developed countries. The Gender Inequality Index (GII) averages 0.16, with a wide range (0.01–0.68)

and significant skewness, showing that while most countries perform well, a few face much higher inequality. The education gender gap (EDG) also shows large disparities, ranging from -11.26 to 83.15, with evidence of outliers where gender imbalances in education are extreme. Public health expenditure (PHE\_GDP) averages 5.59% of GDP but remains uneven, with a few countries investing considerably more than others. The employer gender gap (EMP\_G), averaging -2.96, confirms women's persistent underrepresentation in entrepreneurial roles. Infant mortality (IMR) remains relatively low overall (mean = 4.57), yet some countries experience notably higher rates, underlining uneven health outcomes. GDP per capita (GDPPC) shows a very large variation, from \$1,659 to over \$137,000, reflecting the income disparities even among developed economies.

Labour force participation gender gap (LFP\_G) is consistently negative (-12.57 on average), indicating systematic barriers to women's inclusion in the workforce. Immunisation coverage (IMZ) is high (95.5%) with little variation, though a few countries lag. Urban population growth (UPR) averages 0.54%, with a relatively balanced distribution across countries. Finally, the wage and salaried workers gender gap (WSW\_G) averages 6.37, highlighting ongoing inequality in formal employment access. Overall, the distributions of many variables deviate from normality, suggesting skewed or heavy-tailed patterns. These results reveal persistent though varied gender disparities in health, education, labour, and income across developed countries, underscoring the need for robust econometric methods in subsequent analysis.

**Table 1a: Summary Statistics for Drivers of Gender Inequality in Developed Countries**

	GII	EDG	PHE_GDP	EMP_G	IMR	GDPC	LFP_G	IMZ	UPR	WSW_G
Mean	0.16	12.13	5.59	-2.96	4.57	38072.78	-12.57	95.50	0.54	6.37
Median	0.15	1.28	5.09	-3.04	3.80	32062.72	-11.87	96.00	0.54	6.13
Maximum	0.68	83.15	10.73	-0.68	18.10	137516.60	-1.64	99.00	3.22	16.78
Minimum	0.01	-11.26	2.61	-6.54	1.80	1659.93	-27.78	78.00	-2.28	-5.04
Std. Dev.	0.09	22.01	1.73	1.19	2.56	29630.25	5.94	3.35	1.06	3.83
Skewness	1.22	1.85	0.72	-0.21	2.40	1.16	-0.42	-1.51	0.00	0.22
Kurtosis	6.78	5.39	2.79	3.18	10.93	3.87	2.51	6.65	2.52	3.42
Jarque-Bera	316.79	303.25	32.92	3.22	1339.68	96.17	14.69	349.89	3.55	5.72
P-Value	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.17	0.06
Obs.	375	375	375	375	375	375	375	375	375	375

*Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.*

**Descriptive Statistics for Drivers of Gender Inequality in Developing Countries**

The descriptive statistics in Table 1b highlight the dynamics of gender inequality across developing countries by examining economic, social, and demographic indicators. The Gender Inequality Index (GII) averages 0.48, reflecting moderate disparities, though with wide variation across countries. Education Gender Gap (EDG) shows that women are generally disadvantaged in schooling, with large cross-country disparities, while Public Health Expenditure (PHE\_GDP) averages just 2.28% of GDP, indicating low health investment. Labour-related indicators reveal systemic barriers: the Employer Gender Gap (EMP\_G) and Wage and Salaried Workers Gender Gap (WSW\_G) show persistent underrepresentation of women in leadership and formal employment, while the Labour Force Participation Gender Gap (LFP\_G) underscores women’s limited access to labour markets.

Health outcomes also vary widely: Infant Mortality Rate (IMR) remains high on average (37.61 per 1,000 live births), and although immunisation coverage (IMZ) is relatively high (82.9%), gaps remain in some countries. GDP per capita (GDPPC) displays strong inequality, with a few wealthier economies skewing results, while Urban Population Growth (UPR) is highly uneven, with some

countries facing rapid urbanisation pressures. Overall, most variables exhibit skewness, kurtosis, and significant deviations from normality, underscoring the heterogeneity and persistence of gender inequality in education, labour markets, health access, and economic outcomes across developing countries.

**Table 1b: Summary Statistics for Drivers of Gender Inequality in Developing Countries**

	GII	EDG	PHE_GDP	EMP_G	IMR	GDPG	LFP_G	IMZ	UPR	WSW_G
Mean	0.48	-3.53	2.28	-2.71	37.61	7129.88	-24.79	82.91	3.36	-5.29
Median	0.50	-0.78	2.07	-1.90	30.85	2667.86	-19.63	89.00	2.73	-4.52
Maximum	0.82	81.14	6.82	1.97	234.90	55585.19	5.85	99.00	38.68	46.01
Minimum	0.03	-84.56	0.06	-16.73	2.30	109.59	-68.20	23.00	-3.03	-78.36
Std. Dev.	0.16	34.34	1.44	3.20	27.78	10766.43	18.77	16.67	3.76	13.02
Skewness	-0.58	0.08	0.71	-2.64	0.94	2.28	-0.63	-1.22	5.58	-1.21
Kurtosis	2.85	2.89	2.89	10.61	4.66	7.78	2.21	3.82	42.97	8.31
Jarque-Bera	77.70	1.96	112.88	4831.88	353.83	2457.51	123.50	373.59	96894.66	1913.04
P-Value	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Obs.	1350	1349	1350	1350	1350	1350	1350	1350	1350	1350

*Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.*

### Comparative Analysis of Developed and Developing Countries on Drivers of Gender Inequality

The Gender Inequality Index (GII) reveals stark contrasts between developed and developing countries, with averages of 0.16 and 0.48, respectively. This wide gap underscores greater inequality in education, employment, health, and political participation across developing nations. Developed countries have expanded women’s access to education, resulting in better labour force participation and leadership representation, supported by stronger health systems and higher public health spending. In contrast, developing countries struggle with limited access to quality education, high levels of informal employment, weak maternal and reproductive health services, and inadequate policy frameworks for gender equity. While developed nations have advanced through targeted reforms and institutional

support, developing countries continue to face entrenched structural barriers, highlighting the need for sustained investments and policies to close the gender gap.

## **Test for Multicollinearity**

### **Correlation Analysis for Drivers of Gender Inequality in Developed Countries**

Table 2a presents the correlation matrix for macroeconomic and social variables shaping gender inequality in developed countries. The Gender Inequality Index (GII) is strongly linked to health and income outcomes: it correlates positively with infant mortality (0.767) and negatively with GDP per capita (−0.682), showing that higher mortality worsens inequality while higher income reduces it. Public health expenditure (PHE\_GDP) is negatively associated with both GII (−0.289) and IMR (−0.422), suggesting that greater investment in health helps reduce gender disparities and child deaths.

Urban population growth (UPR) shows a moderate negative correlation with GII (−0.386) and a strong positive one with income (0.767), indicating urbanisation may promote growth and lower inequality. Employment measures such as labour force participation (LFP\_G) and female employment-to-population ratio (EMP\_G) have weak positive correlations with GII (0.242 and 0.192), suggesting limited independent impact on reducing inequality. Similarly, education gender parity (EDG) shows only a minimal effect (0.054), likely reflecting already high education access in developed countries. Importantly, all correlation coefficients remain below the 0.8 multicollinearity threshold, confirming suitability for further regression analysis.

Table 2a: Correlation Matrix for Drivers for Developed Countries

	GII	EDG	PHE_GDP	EMP_G	IMR	LGDP	LFP_G	UPR	IMZ	WSW_G
GII	1.000									
EDG	0.054	1.000								
PHE_GDP	-0.289	-0.225	1.000							
EMP_G	0.192	0.165	-0.178	1.000						
IMR	0.767	-0.089	-0.422	0.219	1.000					
LGDP	-0.682	0.133	0.465	-0.181	-0.708	1.000				
LFP_G	0.242	0.240	-0.017	0.134	-0.116	0.026	1.000			
UPR	-0.386	0.135	0.328	-0.192	-0.455	0.767	-0.186	1.000		
IMZ	0.045	0.263	0.049	-0.012	-0.045	-0.052	0.179	-0.024	1.000	
WSW_G	0.217	-0.230	0.139	-0.642	-0.255	0.044	-0.024	0.104	-0.184	1.000

Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.

Note: GII – Gender Inequality Index; EDG – Education Gender Gap; PHE\_GDP – Public Health Spending as a Percentage of GDP; EMP\_G – Employer Gender Gap; IMR – Infant Mortality Rate; LGDP – Log of GDP per Capita; LFP\_G – Labor Force Participation Gender Gap; UPR – Unemployment Rate; IMZ – Immunization Rate; WSW\_G – Wage and Salaried Workers’ Gender Gap

Correlation Analysis for Drivers of Gender Inequality in Developing Countries

Table 2b explores the correlations between socioeconomic variables and gender inequality in developing countries. The Gender Inequality Index (GII) shows a strong positive correlation with infant mortality (0.639) and a strong negative correlation with GDP per capita (−0.707), highlighting that poor child health and low-income levels are closely tied to higher inequality. Public health expenditure (PHE\_GDP) is negatively associated with both GII (−0.555) and IMR (−0.527), underscoring the role of healthcare investment in reducing disparities. Immunisation coverage (IMZ) is moderately positively correlated with GII (0.477), suggesting that broader systemic health gaps persist despite improving vaccine access.

Education gender gap (EDG) and wage and salaried workers gap (WSW\_G) also show moderate positive correlations with GII (0.303 and 0.323), emphasising the influence of educational and employment

inequalities. By contrast, urbanisation (UPR) and labour market measures (LFP\_G and EMP\_G) have very weak correlations with GII, indicating limited direct impact on inequality. Importantly, all coefficients remain below the 0.8 multicollinearity threshold, confirming that these variables can be reliably included in regression analysis.

**Table 2b: Correlation Matrix for Drivers for Developing Countries**

	GI	EDG	PHE_GDP	EMP_G	IMR	LGDP	LFP_G	UPR	IMZ	WSW_G
GI	1.000									
EDG	0.303	1.000								
PHE_GDP	-0.555	0.320	1.000							
EMP_G	0.033	-0.236	0.017	1.000						
IMR	0.639	-0.319	-0.527	0.082	1.000					
LGDP	-0.707	0.373	0.543	-0.038	-0.658	1.000				
LFP_G	0.034	-0.268	0.017	0.201	0.161	-0.169	1.000			
UPR	0.008	-0.137	-0.165	0.167	0.313	0.065	-0.061	1.000		
IMZ	0.477	0.344	0.439	-0.022	-0.655	0.575	-0.210	-0.006	1.000	
WSW_G	0.323	0.314	0.496	-0.191	-0.499	0.242	-0.126	-0.610	0.207	1.000

Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.

### Variance Inflation Factor and Tolerance Tests for Drivers of Gender Inequality in Developed and Developing Countries

The assessment of multicollinearity using the Variance Inflation Factor (VIF) and tolerance values shows no serious multicollinearity issues in either developed or developing country models. Conventional thresholds (VIF < 10 and tolerance > 0.1) are satisfied across all variables. The mean VIF is slightly higher in developed countries (2.28) than in developing ones (1.98), but both are well within acceptable limits. GDP per capita (GDPPC) records the highest VIF 5.21 in developed and 3.17 in developing countries, yet remains below the critical threshold. Similarly, tolerance values, though lowest for LGDP, are consistently above 0.1. These results confirm that the explanatory variables are statistically independent, ensuring reliable regression estimates without bias from multicollinearity.

**Table 2b: Correlation Matrix for Drivers for Developing Countries**

Variable	Developed VIF	Developed 1/ VIF	Developing VIF	Developing 1/ VIF
LGDP	5.21	0.191949	3.17	0.315587
UPR	3.03	0.330253	2.45	0.407362
IMR	2.55	0.391859	2.44	0.409471
WSW_G	2.26	0.442045	2.09	0.479599
EMP_G	1.97	0.508829	1.97	0.506457
PHE_GDP	1.51	0.661951	1.97	0.508010
EDG	1.39	0.720468	1.39	0.719741
LFP_G	1.29	0.777682	1.22	0.822211
IMZ	1.28	0.778894	1.13	0.881106
Mean VIF	2.28		1.98	

Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.

**Slope Heterogeneity Test for Drivers of Gender Inequality in Developed and Developing Countries**

Table 4 reports the Pesaran and Yamagata (2008) slope heterogeneity test results, showing that slope coefficients are not homogeneous across countries. For developed countries, both the Delta (6.942,  $p = 0.000$ ) and adjusted Delta (9.2777,  $p = 0.000$ ) confirm significant heterogeneity. Similarly, in developing countries, the Delta (15.301) and adjusted Delta (20.447) are highly significant at the 1% level. These findings reject the null of slope homogeneity in both panels, indicating that the effects of education, employment, health expenditure, and economic growth on gender inequality differ across countries. Thus, country-specific factors play a crucial role, making it necessary to use models that account for heterogeneous slope coefficients.

**Table 4: Pesaran and Yamagata Slope Heterogeneity Test for Drivers of Gender Inequality in Developed and Developing Countries**

Pesaran and Yamagata Test	Developed	Developing
Delta	6.942	15.301
P-Value	0.000	0.000
Delta Adj	9.2777	20.447
P-Value	0.000	0.000

Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.



## Cross-Sectional Dependency Test for Drivers of Gender Inequality in Developed and Developing Countries

Testing for cross-sectional dependence (CSD) is crucial in panel analysis to capture common shocks or regional linkages that may bias results if ignored. Table 5 presents Pesaran CD test results, which show highly significant CSD ( $p = 0.000$ ) across all variables for both developed and developing countries. Indicators such as GII, EDG, PHE\_GDP, EMP\_G, IMR, LGDPC, LFP\_G, UPR, IMZ, and WSW\_G all display strong interdependencies, confirming that gender inequality and its drivers are shaped by regional and global dynamics rather than being country-specific alone. The rejection of cross-sectional independence highlights the importance of applying second-generation panel methods, such as the CIPS test, to properly account for these dependencies in further analysis.

**Table 5: Pesaran CD Cross-Sectional Dependency Test for Drivers of Gender Inequality in Developed and Developing Countries**

Variable	Developed CD-test	p-value	Developing CD-test	p-value
GI	39.02	0.000	86.05	0.000
EDG	4.15	0.000	44.18	0.000
PHE_GDP	20.78	0.000	28.61	0.000
EMP_G	14.62	0.000	8.25	0.000
IMR	49.97	0.000	135.67	0.000
LGDPC	41.8	0.000	151.18	0.000
LFP_G	14.16	0.000	6.43	0.000
UPR	5.26	0.000	29.77	0.000
IMZ	20.04	0.000	21.01	0.000
WSW_G	2.43	0.000	6.26	0.000

*Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.*

## Unit Root Test for Drivers of Gender Inequality in Developed and Developing Countries

Given the presence of cross-sectional dependence confirmed earlier, the Cross-Sectionally Augmented IPS (CIPS) unit root test by Pesaran (2007) was applied to assess the stationarity of the panel data spanning

1995 to 2023. As shown in Table 6, the null hypothesis of a unit root could not be rejected at the level for any of the variables in both developed and developing countries. However, when the variables were first-differenced, the null hypothesis was consistently rejected across all cases. This implies that each of the variables is integrated of order one,  $I(1)$ , indicating non-stationarity at the level but stationarity after first differencing.

**Table 6: CIPS root test for Drivers of Gender Inequality in Developed and Developing Countries**

Variables	Developed Level Stat (critical level @5%)	Developed First Difference Stat (critical level @5%)	Remark	Developing Level Stat (critical level @5%)	Developing First Difference Stat (critical level @5%)	Remark
GII	-2.181 (-2.25)	-5.048 (-2.25)	I(1)	-2.045 (-2.08)	-4.970 (-2.08)	I(1)
EDG	-1.581 (-2.25)	-4.475 (-2.25)	I(1)	-2.033 (-2.08)	-5.059 (-2.08)	I(1)
PHE_GDP	-2.153 (-2.25)	-4.434 (-2.25)	I(1)	-2.044 (-2.08)	-5.236 (-2.08)	I(1)
EMP_G	-2.199 (-2.25)	-4.637 (-2.25)	I(1)	-1.727 (-2.08)	-3.993 (-2.08)	I(1)
IMR	-2.060 (-2.25)	-3.544 (-2.25)	I(1)	-1.819 (-2.08)	-1.084 (-2.08)	I(1)
LGDPC	-1.461 (-2.25)	-3.704 (-2.25)	I(1)	-2.013 (-2.08)	-4.013 (-2.08)	I(1)
LFP_G	-1.163 (-2.25)	-4.605 (-2.25)	I(1)	-1.602 (-2.08)	-3.717 (-2.08)	I(1)
UPR	-1.672 (-2.25)	-3.990 (-2.25)	I(1)	-2.002 (-2.08)	-3.608 (-2.08)	I(1)
IMZ	-2.239 (-2.25)	-4.703 (-2.25)	I(1)	-2.184 (-2.08)	-5.319 (-2.08)	I(1)
WSW_G	-1.624 (-2.25)	-4.835 (-2.25)	I(1)	-1.585 (-2.08)	-3.707 (-2.08)	I(1)

Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.

### Heteroskedasticity Test for Drivers of Gender Inequality in Developed and Developing Countries

To determine whether heteroskedasticity is present in the models for developed and developing countries, the Modified Wald test for groupwise heteroskedasticity was conducted. This test evaluates the null hypothesis that there is constant variance (homoskedasticity) across groups. As shown in Table 7, the test results indicate that the null hypothesis is rejected for both developed and developing countries, as the p-values are less than 0.05. This provides evidence of heteroskedasticity in both panels, suggesting that variance in the residuals is not constant across groups. Hence, robust estimation techniques that correct for heteroskedasticity are necessary for reliable inference.

**Table 7: Modified Wald test for groupwise heteroskedasticity result for Drivers of Gender Inequality in Developed and Developing Countries**

Region	Chi2 Statistic	Degrees of Freedom	Prob > Chi2
Developed Countries	3,747.16	15	0.000
Developing Countries	64,294.56	54	0.000

*Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.*

**Serial Correlation Test for Drivers of Gender Inequality in Developed and Developing Countries**

Table 8 presents the results of the Breusch-Pagan LM test for serial correlation in the panel data models. The null hypothesis assumes no serial correlation in the residuals. This hypothesis is rejected if the p-value is less than 0.05. From the table, the p-values for both developed and developing countries are 0.000, indicating a rejection of the null hypothesis. Thus, the residuals exhibit serial correlation in both models. Consequently, the presence of serial correlation implies that the Feasible Generalised Least Squares (FGLS) and panel corrected standard error (PCSEs), and Driscoll-Kraay standard error methods are more appropriate for model estimation.

**Table 8: Breusch-Pagan LM test of independence for Drivers of Gender Inequality in Developed and Developing Countries**

Region	Chi2 Statistic	Degrees of Freedom	Prob > Chi2
Developed Countries	639.665	105	0.000
Developing Countries	7,124.917	1431	0.000

*Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.*

**The Drivers of Gender Inequality in Developed and Developing Countries**

**The Drivers of Gender Inequality in Developed Countries**

The regression estimates from the Feasible Generalised Least Squares (FGLS) and Driscoll-Kraay methods provide strong evidence on the drivers of gender inequality in developed countries. Both models are statistically significant, confirming that the explanatory variables account for much of the variation in the Gender Inequality Index

(GII). Key findings show that the education gender gap, employment gender gap, labour force participation gap, and the wage and salaried workers gap all have positive and highly significant effects on GII, meaning that disparities in schooling, access to jobs, labour market participation, and secure formal employment strongly worsen gender inequality. Infant mortality rate and urban population growth are also positive and significant, suggesting that poor child health outcomes and unevenly distributed urbanisation exacerbate inequality.

In contrast, GDP per capita has a negative and highly significant effect, confirming that higher income levels reduce gender disparities, while immunisation coverage also reduces inequality, though its effect is weaker under Driscoll-Kraay estimation. Public health expenditure, however, is insignificant, implying its impact may depend more on efficiency and targeting than spending levels alone. Overall, the results emphasise that reducing gender inequality in developed countries requires closing education and labour market gaps, alongside leveraging economic growth and public health programs to support women’s opportunities and wellbeing.

**Table 9a: Results on the Drivers of Gender Inequality in Developed Countries**

Dependent: GII	FGLS coeff (P-Value)	Driscoll-Kraay Coeff (P-Value)
EDG	0.0005 (0.001)***	0.0005 (0.012)**
EMP_G	0.0082 (0.000)***	0.0082 (0.000)***
PHE_GDP	0.0026 (0.393)	0.0026 (0.104)
IMR	0.0168 (0.000)***	0.0169 (0.000)***
LGDP	-0.0594 (0.000)***	-0.0594 (0.000)***
LFP_G	0.0023 (0.000)***	0.0023 (0.000)***
UPR	0.0157 (0.000)***	0.0157 (0.003)***
IMZ	-0.0023 (0.010)**	-0.0023 (0.064)*
WSW_G	0.0031 (0.003)***	0.0031 (0.000)***
Constant	0.8271 (0.000)***	0.8271 (0.000)***

Statistic	Value
F(9, 24)	286.90
Prob > F	0.0000
Wald chi2(9)	846.39
Prob > chi2	0.0000
No. of Obs.	375

*Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.*

Note: P-value < 1%, < 5%, < 10% indicates significance at 1%, 5%, and 10%, respectively.

**The Drivers of Gender Inequality in Developing Countries.**

The regression results from the Panel Corrected Standard Errors (PCSEs) and Driscoll-Kraay estimations highlight key socioeconomic determinants of gender inequality in developing countries. Both models are statistically significant, confirming that the included variables jointly explain a large share of the variation in the Gender Inequality Index (GII). The findings show that the education gender gap, labour force participation gap, wage and salaried workers gap, and infant mortality rate all have positive and highly significant effects, meaning that disparities in education, employment opportunities, and child health strongly worsen inequality.

In contrast, GDP per capita and public health expenditure are negative and highly significant, suggesting that higher income levels and greater investment in healthcare contribute to reducing inequality. Urban population growth also has a negative and significant effect, implying that urbanisation may help narrow gender gaps by improving access to jobs and services. However, immunisation coverage has a weakly positive effect, and the employment gender gap shows mixed significance, depending on the estimation method. Overall, the results emphasise that reducing inequality in developing countries requires addressing structural barriers in education, labour force participation, and secure wage employment, while also leveraging economic growth, healthcare investment, and equitable urban development to promote greater gender equality.

**Table 9b: Results on the Drivers of Gender Inequality in Developing Countries**

Dependent: GII	PSCEs Coeff (P-Value)	Driscoll-Kraay Coeff (P-Value)
EDG	0.00029 (0.000)***	0.001 (0.002)***
PHE_GDP	-0.0123 (0.000)***	-0.016 (0.000)***
EMP_G	0.0024 (0.015)**	-0.0024 (0.135)
IMR	0.002 (0.000)***	0.002 (0.000)***
LGDP	-0.0455 (0.000)***	-0.0543 (0.000)***
LFP_G	0.0016 (0.000)***	0.0053 (0.000)***
UPR	-0.0078 (0.000)***	-0.0078 (0.000)***
IMZ	0.0004 (0.083)*	0.0009 (0.058)*
WSW_G	0.0016 (0.000)***	0.0016 (0.000)***
Constant	0.7287 (0.000)***	0.6847 (0.000)***

Statistic	Value
Wald chi2(9)	715.60
Prob > chi2	0.0000
F(9, 24)	197.24
Prob > F	0.0000
No of Obs.	1350

*Source: Compiled by the author based on the World Bank WDI (2025), UNDP (2024), UIS (2024) data.*

Note: P-value < 1%, < 5%, < 10% indicates significance at 1%, 5%, and 10%, respectively.

**Comparative Analysis of Drivers of Gender Inequality in Developed and Developing Countries**

The analysis shows that the drivers of gender inequality differ across developed and developing countries, both in strength and direction. Education, wage, and labour force participation gaps significantly worsen inequality everywhere, but the effects are much larger in developing economies due to deeper structural barriers. In developed countries, employer and wage gaps tied to formal labour markets are

more influential, while in developing countries, economic growth, public health spending, and immunisation coverage play stronger equalising roles.

Infant mortality raises inequality in both groups, but more sharply in developing contexts with weaker health systems. Urbanisation reduces inequality in developed economies but exacerbates it in developing ones, where infrastructure is strained. Overall, gender inequality is driven by universal factors, but their impacts are context-specific: structural labour market dynamics matter more in developed countries, while health, income growth, and education access are critical in developing economies. This underscores the need for tailored policy approaches aligned with each country group's socio-economic realities.

## **Discussion of Findings**

The results demonstrate that gender inequality is consistently shaped by education, health, and labour market factors, though their relative influence varies between developed and developing countries. In developing economies, the education gender gap, infant mortality, and limited health investments emerged as dominant drivers, confirming that foundational access to schooling and healthcare remains critical. By contrast, in developed countries, inequality is driven less by access and more by structural barriers such as wage gaps, occupational segregation, and underrepresentation in leadership. Labour force participation disparities were significant across both contexts, underscoring the global persistence of unequal economic opportunities.

These findings suggest that while some determinants of inequality are universal, others are highly context-specific. Developing countries require greater investments in health, education, and employment creation, whereas developed countries must prioritise institutional reforms to address pay equity, career progression, and leadership inclusion. Overall, the study reinforces that gender inequality is a multidimensional challenge shaped by socioeconomic and institutional dynamics, demanding context-sensitive and globally coordinated strategies.

## **Conclusion**

This study provides a comparative analysis of the drivers of gender inequality in developed and developing countries using panel data from 2000–2024. The findings confirm that gender inequality is shaped by both structural economic factors and the quality of public services. Education and labour-market disparities, including education gaps, employment gaps, labour-force participation gaps, and wage/salaried-worker gaps, consistently exacerbate inequality across all countries. However, the magnitude differs: developing countries are more affected by foundational gaps in schooling and health, while developed countries face entrenched structural barriers in wage systems, leadership representation, and career progression.

Health and macroeconomic capacity also matter. High infant mortality and weak immunisation coverage worsen gender inequality, whereas higher GDP per capita and, in developing countries, increased public health expenditure and inclusive urbanisation mitigate it. These results highlight that investments in human capital and social infrastructure are most effective when complemented by policies ensuring equitable access and labour-market integration. Reducing gender inequality thus requires integrated, context-specific strategies: expanding educational opportunities, improving formal employment quality, enforcing pay equity, and strengthening health and social services. Progress depends not only on national policy action but also on coordinated global efforts to dismantle systemic barriers, ultimately fostering inclusive social and economic development across all income levels.

## **Recommendations**

Based on the study's findings, reducing gender inequality requires integrated and context-sensitive strategies. First, at the education and labour-market level, governments should prioritise closing persistent schooling gaps through retention, re-entry, and skills development programs for girls. Policies promoting formal employment for women, coupled with social protection measures, affordable childcare, and enforcement of pay transparency and anti-discrimination laws, are critical to translating education into equitable economic opportunities. Second, at the public-service and macroeconomic level, scaling up investments in maternal and child health, expanding immunisation



coverage, and directing urban development toward inclusive infrastructure can help mitigate structural barriers.

In developing countries, prioritising GDP growth that supports equitable access to services enhances women's participation and agency. Third, interventions should be packaged and sequenced, combining legal reforms, targeted cash transfers, gender quotas, corporate incentives, and community-level campaigns to change social norms, as isolated policies are unlikely to achieve sustained progress. Finally, policymakers should adopt evidence-based monitoring and evaluation systems to track gender-disaggregated outcomes, allowing iterative improvement of interventions. By linking education, decent work, health, and institutional reform in a coordinated manner, countries can create conditions that move gender equality from aspiration to measurable social and economic progress.

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