Does Gender Inclusivity Matter for Economic Growth in South Africa? An ARDL approach

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A R T I C L E I N F O

A B S T R A C T

With inequality at the forefront of economic development, this paper examined the impact of gender inequality on economic growth in South Africa. Different gender dimensions were considered, including female education, female labor force participation, fertility, and the representation of women in the political arena (democracy). The research applied a quantitative approach (Autoregressive Distributive lag) (ARDL) with secondary data on the proportion of all variables spanning from 1989 to 2019. The results revealed that high fertility negatively affects economic growth. Moreover, the effects are positive when women have greater access to secondary education and the labor market. However, an unorthodox finding from the study reveals that the effects are negative when women have access to political seats in parliament. The paper recommends that policymakers should focus on guaranteeing obligatory secondary education for females in the country. Additionally, policymakers should introduce measures that favor appointing and absorbing women in qualified jobs.

A B S T R A K

Dengan ketidaksetaraan di garis depan pembangunan ekonomi, penelitian ini mengkaji dampak ketidaksetaraan gender terhadap pertumbuhan ekonomi di Afrika Selatan. Dimensi gender yang berbeda dipertimbangkan, termasuk pendidikan perempuan, partisipasi angkatan kerja perempuan, kesuburan, dan keterwakilan perempuan di arena politik (demokrasi). Penelitian ini menggunakan pendekatan kuantitatif (Autoregressive Distributive lag) (ARDL) dengan data sekunder pada proporsi seluruh variabel mulai tahun 1989 hingga 2019. Hasilnya mengungkapkan bahwa fertilitas yang tinggi berpengaruh negatif terhadap pertumbuhan ekonomi. Selain itu, efeknya positif ketika perempuan memiliki akses yang lebih besar ke pendidikan menengah dan pasar tenaga kerja. Namun, temuan yang tidak lazim dari studi tersebut mengungkapkan bahwa efeknya negatif ketika perempuan memiliki akses ke kursi politik di parlemen. Penelitian ini merekomendasikan pembuat kebijakan harus fokus pada jaminan pendidikan menengah wajib bagi perempuan di negara ini. Selain itu, pembuat kebijakan harus memperkenalkan langkah-langkah yang mendukung penunjukan dan penyerapan perempuan dalam pekerjaan yang berkualitas.

1. INTRODUCTION

Gender roles refer to the social expectations of how men and women should behave and act. In many societies, gender roles are clearly defined and enforced. In other societies, they are much less defined and enforced. For instance, women are expected to be good at home and raise children, while men are expected to work and provide for the family. However, in some communities, men and women are free to do whatever they want. South Africa is one country that motivates gender equality, whereby it inspires to provide equal opportunities for both men and women. Gender inequality is evident in many aspects of society, such as the education system, the job market, and the government. In South Africa, women comprise 47 percent of the population yet account for only 26 percent of those holding management positions (Statistics South Africa, 2021).

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Protecting and investing in girls, women, and people of all gender identities is necessary for building more green, productive, and inclusive societies. No society can develop sustainably without transforming and amplifying the distribution of opportunities, resources, and choices for men and women so that they have equal power to shape their own lives and contribute to their families, communities, and countries (World Bank, 2022). Progress in South Africa has been slow in many essential domains. The female labor force participation rate is 42 percent, while men occupy about 60 percent. It shows that women are not absorbed as much as their male counterparts in the labor market (Statistics South Africa, 2021). However, successful efforts have been made to increase the number of females in tertiary education enrolment from 2010 to 2020. Despite the efforts made, women continue to be responsible for the bulk of child and elder care in the home. Women also remain underrepresented as leaders in their communities and at the highest levels in the government and private sector. Gender inequality is said to have an imperative effect on the economy.

Several researchers, such as Klasen (2018), Cabeza-García et al. (2018), and Ram et al. (2022), have found interest in examining the relationship between gender inequality and economic growth. The results emphasized that gender inequality leads to low economic growth, and high economic growth, on the other hand, leads to a reduction in gender inequality. It means that growth in a country is beneficial for women since women are now being exposed to different opportunities that will empower and enable them to earn income, contributing to the economy's growth. This paper's key question is whether gender inequality affects economic growth. Therefore, the core objective is to analyze the impact of gender variables on economic growth by giving attention to different gender dimensions, including female education, female labor force, fertility, and the representation of women in the political arena. A plethora of literature analyzed some of these dimensions; however, to the best of our knowledge, there are limited studies conducted in the South African context (Ruiters & Charteris, 2020). The study on gender inclusivity and economic growth vary from the former. It aims to fill the lacuna in the literature by focusing on various gender aspects – increasing the reliability and validity of results, and avoiding biases.

On the other hand, the study by Ruiters & Charteris (2020) did not consider the aspect of education in expressing the effect of gender inequalities towards growth – especially with the prevailing educational gender disparities in the country. Therefore, in examining the effect of gender inequality on economic growth, the study conducted an empirical analysis of gender in South Africa for the period 1989-2019 using the Autoregressive Distributive lag (ARDL) model. Using this approach, the study wanted to offer robust, current, and timely results on the relationship between women's inclusivity and economic growth in South Africa.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

Economic growth and gender inequality

The literature discussed various ways through which gender inequality impacts economic growth. Micro and macro theories view gender inequality as an obstacle to economic growth, particularly in the long run. From the micro theory lens, gender disparities impact the supply of labor, education, and health (Santos Silva & Klasen, 2021). Moreover, a study on the theoretical view of gender roles in economic development has found that little conversation between neoclassical and feminism confirming and accepting literature. Most studies found a negative relationship between economic growth and gender parity (Onogwu, 2021). Kleven & Landais (2017) concurred that inequality in gender has an inverse relationship to economic growth. Onogwu (2021) has found that gross fixed capital formation, trade openness, and population growth rate are the key drivers of economic growth in Sub-Saharan African countries. The study, therefore, recommended that policies be put in place to promote the drivers of economic growth, as mentioned above. On the contrary, a study by Kabeer & Natali (2013) found that it is not gender inequality that has a positive effect on economic growth but education that leads to increased women's employment. It then contributes positively to economic growth; the strength of the relationship between gender inequality and economic growth is weak.

Economic growth and female education

Gender has recently become essential to the mainstream economic growth and development discourse. Arora (2012) examined whether gender inequality differs across the Indian states and whether it is lower in more open and globalized states. Using the state-level openness indices, the results revealed that education and better health facilities are required in the states as these will

improve women's status and empowerment. However, the improved status should be increased participation in the paid workforce as this would lead to higher economic growth and reduced poverty. The study also acknowledges that female education and better health are linked to many other positive developments, such as lower fertility rates, lower child mortality, and better children's education. It is also supported by the findings of Ahang (2015), which investigates the impact of gender inequality on economic growth in developed countries. The author argued that gender equality in female education and health could increase human capital, leading to increased economic growth due to high productivity. Besides, women's education can boost their ability to innovate, which can help improve knowledge and modern technology. Studies by Altuzarra et al. (2021), Kleven & Landais (2017), and Baten et al. (2021) found an indirect causal relationship between gender inequality in education and economic growth. It suggests that although women's access to education does not affect the economy directly, it does so indirectly through other channels, as access to education is linked to other positive developments. Waseem (2015) suggested that increasing women's access to education leads to greater economic growth if the education attained will increase qualified labor. Given the literature presented above, the following hypothesis is expected:

H1: With a higher educational level for women, greater economic growth is expected.

Economic growth and female labor force participation
Bertay et al. (2020) studied whether gender inequality facilitates economic growth by enabling better allocation of a valuable resource: female labor. By allocating female labor to its more productive use, they hypothesize that reducing gender inequality should disproportionately benefit industries with a typically higher female share in their employment relative to other industries. The results revealed that gender inequality affects real economic outcomes at the industry level and that high female share in industries grows relatively faster in countries that are more gender equal. More literature reveals a significant and positive impact on economic growth when more women participate in the labor market (Kim et al., 2016; Kurniawan & A'yun, 2022; Ali & Decker, 2015; Mukherjee & Mukhopadhyay, 2013). These studies show that if gender equality policies could lower discrimination

in the labor market or increase the time a father spends on child rearing, women could contribute positively to female labor market participation and per capita income growth. A study by Al-Shammari & Rakhis (2017) empirically examined the influence of gender inequality on economic growth across the Arab region. The findings revealed no evidence that gender inequality in education and gender inequality in the labor force hinder economic growth across the Arab region. The findings of this study showed that the main factors driving economic growth across the Arab region are capital accumulation and population growth. Based on the arguments presented above, the following hypothesis is posed:

H2: With the higher participation of women in the labor market, greater economic growth is expected.

Economic growth and fertility
Prior evidence points to a negative relationship between economic growth and high fertility in that decrease in fertility provide a demographic dividend and a window of opportunity for economic growth (Jean et al., 2013). Jayachandran (2015) discussed several mechanisms through which gender gaps narrow as countries grow. Among those mechanisms, there is high fertility. The authors argue that low fertility is likely a cause of economic growth and that fertility is lower in rich countries. Jayachandran (2015) noted that high fertility results partly from desired fertility and limited access to contraceptive methods to control fertility. Cabeza-García et al. (2018) investigated gender factors that trigger economic growth in both high and low-income countries. To address these gender factors, four characteristic dimensions of gender inclusion were considered: education, access to the labor market, fertility, and democracy. The relationship between economic growth and gender factors was analyzed in a sample of 127 countries. The study concluded that high fertility in women negatively affects economic growth.

Silva & Klasen (2021) investigated the role of gender inequality in economic development. The study revealed that when female empowerment increases (exogenously), a woman's relative preference for child quality has a higher impact on household decisions. Therefore, fertility falls, human capital accumulates, and the economy grows. An improvement in women's education reduces fertility and, in turn, reduces population growth; such opportunities for women not only

affect them. On the other hand, it also increases human income in their families, which leads to better education for the new generation (Kleven & Landais, 2017; Ruiters & Charteris, 2020; Altuzarra et al., 2021; Baten et al., 2021) Considering the above arguments, the following hypothesis is expected:

H₃: With high fertility, lower economic growth is expected.

Economic growth and democracy
Little literature is available on the relationship between the presence of women in parliament and economic growth. Our hypothesis expects a positive relationship between the two variables. Women have long played a role in politics, but more recently, there has been a growing movement to increase the number of women in politics. The goal of this movement is to improve economic growth by increasing the number of diverse perspectives that are represented in government. Cabeza-García et al. (2018) revealed that women's access to active political participation significantly affects economic growth. Women's underrepresentation in leadership positions, either in politics or business, may also affect economic performance via its effect on corruption (Santos Silva & Klasen, 2021). There is suggestive evidence that women engage in less corruption than men (Brollo & Troiano, 2016; Ahang, 2015). Women may avoid corruption because they are more risk-averse than men, or because they are more honest— since honesty is a trait they want to pass on to their children (for whose rearing they are mainly responsible)— or because they put a greater preference on obeying the law. However, Ahang (2015) stated that women lack experience in economic participation and political empowerment. Therefore with a lack of experience and practical information, females cannot trust environmental factors, all of which force women to make illogical decisions, which to some extent, might be radical.

Ahang (2015) considers social capital an effective factor because political and economic participants with high education and low experience in critical situations cannot make a decision effectively. Therefore, the social capital of females would be increased by a rise in the number of women in political and economic participation; hence, in the long run, the human capital of females as a distinguishing factor would positively affect economic growth. Kuk & Hajnal (2021) suggested that having more women presentations in parliament can help with policy change, which may

result in declining gender gaps. The study proposed that increasing the number of females in parliament will decrease gender inequality. Onogwu (2021) has proven that Sub-Sahara region that females are few in top management positions, either politically or economically. Maguire (2018) studied the barriers to women entering parliament. The study shows that women are more likely to resign before even finishing one term due to politics.

Furthermore, women continue to play a critical role in their household responsibilities, which will be a significant barrier, especially for women raising children. Additionally, women face challenges in balancing work, long working hours, and maternity in between, which negatively impacts women's decision-making in the political space. Given the arguments above, the following hypothesis is expected:

H₄: With the greater participation of women in the democratic system, greater economic growth is expected.

Economic growth, trade openness, and labor force participation
Trade openness opens opportunities for female employment in developing countries, leading to positive economic growth (Ghosh, 2022; Juhn et al., 2012; Verick, 2014). Trade is the engine of economic growth. The argument is that when the trade opens, it generates opportunities that can impact gender equality. Contrary, women can be vulnerable to new opportunities; therefore, trade can negatively impact gender inequality. Export intensification alone will not lead to inequality in gender opportunities.

An increase in education allows women to have opportunities, which will increase the human capital investment from the increase in female labor forces, thereby contributing positively to economic growth. The studies have shown that trade and increased female labor participation are significant drivers of economic growth. There is a nonlinear relationship between trade diversification and economic growth. An increase in export diversification, especially in the manufacturing industries in developing countries, has a positive impact on the decline in fertility and female labor participation increases. Sajid & Ullah (2014) conducted a study to investigate if trade openness boosts gender equality. The study found that trade openness is an important contributor to growth. In addition, it further allows for the free exchange of knowledge and information and free transaction among the states. One challenge

that affects a country's growth is international trade restrictions. On the downside, trade openness includes costs and decreases government revenue due to tariff reduction, which moves the burden of increasing domestic taxes. The study highlights that in developing countries, trade openness has benefited females in labor. Openness influences the price of goods and services when it enforces the factors of production (labor) that will increase the

demand for labor in developing states. The results show that openness has a positive relationship with employees and can cause a reduction in the wage gap through labor market reforms.

3. RESEARCH METHOD

The study used annual time series data for the period 1989-2019. The data collected is specified in Table 1, along with the data source.

Table 1. Variable description and data sources

Variable	Description	Source
Gross Domestic Product (L_GDP)	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.	World Bank national accounts data and OECD national accounts data files
Female Labor Force Participation Rate (L_FLabor)	The labor force participation rate is the proportion of the population ages 15-64 that is economically active: females who supply labor to produce goods and services during a specified period.	International Labor Organization, ILOSTAT database
Female Secondary School Enrolment rate (L_Edu)	The Female Secondary School Enrolment rate is the ratio of total female enrolment, regardless of age, to the population of the age group that officially corresponds to the secondary level of education.	UNESCO Institute for Statistics
Fertility Rate (L_Fertility)	The total fertility rate represents the number of children born to a woman if she were to live to the end of her childbearing years and bear children by age-specific fertility rates of the specified year.	United Nations Population Division; World Population Prospects: 2019 Revision
Democracy (L_Demo)	Women represent democracy in parliaments as the percentage of parliamentary seats in a single or lower chamber held by women.	Inter-Parliamentary Union (IPU)
Total Labor Force Participation Rate (L_Labor)	The labor force participation rate is the proportion of the population ages 15 and older that is economically active: all people who supply labor to produce goods and services during a specified period.	International Labor Organization, ILOSTAT database
Trade Openness (L_Open)	Calculated as the ratio of exports minus imports over GDP	World Bank database, World Development Indicators

The model and variable selection are informed by the works of Cabeza-Garcia et al. (2017). In empirical form, our model is written as follows:

$$GDP = \mu + \emptyset_1 + L\_Labor_t + \emptyset_2 L\_Edu_t + \emptyset_3 L\_fertility_t + \emptyset_4 L\_Demo_t + \emptyset_5 L\_Open_t + \emptyset_6 L\_labor_t + \varepsilon_t \quad (1)$$

where μ is the intercept, $\emptyset_{1-6}$ are the slope coefficients of our independent variables, GDP represents Gross Domestic Product used as a proxy for economic growth, L_Flabor is the female labor participation rate, L_Edu is the female secondary

school enrollment, l_Fertility is the fertility rate, L_demo is a democracy, proxied by the proportion of seats held by women in national parliament, and L_labor is the total labor force participation rate, and e_t is an error term. Log transformation was applied to the data to normalize it.

All variables except the fertility rate are expected to have positive signs, as a plethora of empirical literature suggests. Fertility is expected to have a negative sign. However, this does not suggest that the model is somewhat invalid if variables do not corroborate the prior expectation as economic outputs differ across selected populations or geographical areas. This study performed non-stationarity tests using the Augmented Dickey-Fuller (ADF). Testing for stationarity is important when dealing with time-series data, as non-stationary variables may lead to spurious results.

The ADF was chosen because there is no uniformly better test. After our variables had passed the unit root test and the order of integration was established, the Autoregressive Distributed Lag (ARDL) cointegration test was conducted. This test was selected as the unit root test showed that the variables are not integrated of the same order, i.e., some variables are stationary at a level, while others are stationary after 1st difference. The ARDL approach has the added advantage of yielding reliable estimates of the long-run coefficients that are asymptotically normal irrespective of whether the underlying regressors are I (0) and/or I (1). Furthermore, the ARDL provides more robust estimates when dealing with small sample data.

In the ARDL estimation, equation (1) can be written as:

$$lgdp_t = m + f_1 lgdp_{t-1} + \emptyset_2 LFlabor_{t-1} + \emptyset_3 LEdu_{t-1} + \emptyset_4 LFertility_{t-1} + \emptyset_5 LDemo_{t-1} + \\ \emptyset_6 LLabor_{t-1} \sum_{i=1}^{p} y_1 \Delta LGDP_{t-i} + \sum_{i=1}^{p} y_2 \Delta LFlabor_{t-i} + \sum_{i=1}^{p} y_3 \Delta Ledu_{t-i} + \sum_{i=1}^{p} y_4 \Delta Lfertility_{t-i} + \\ \sum_{i=1}^{p} y_5 \Delta LDemo_{t-i} + \sum_{i=1}^{p} y_6 \Delta L\_Open_{t-i} + \sum_{i=1}^{p} y_7 \sum_{i=1}^{p} y_7 \Delta Llabor_{t-i}\ \varepsilon_t \qquad (2)$$

where $y_{1-7}D$ are short-run coefficients to be estimated. Furthermore, this study estimates the ARDL Error Correction Model (ECM) to derive the rate at which any disequilibria in the short run will be corrected in the next year (speed of adjustment). The ECM can be expressed as follows:

$$D\ lgdp_t = \mu + \sum_{i=1}^{p} y_1 \Delta LGDP_{t-i} + \sum_{i=1}^{p} y_2 \Delta LFlabor_{t-i} + \sum_{i=1}^{p} y_3 \Delta Ledu_{t-i} + \sum_{i=1}^{p} y_4 \Delta Lfertility_{t-i} + \\ \sum_{i=1}^{p} y_5 \Delta LDemo_{t-i} + \sum_{i=1}^{p} y_6 \Delta L\_Open_{t-i} + \sum_{i=1}^{p} y_7 \Delta Llabor_{t-i} + ECT_{-1} + \varepsilon_t \qquad (3)$$

where ECT$_{-1}$ is the error correction term. Lastly, because correlation does not imply causality, this study tests the variables for causality using the Granger causality test, which will allow us to determine the direction of causality between our variables.

4. DATA ANALYSIS AND DISCUSSION
Summary of Statistics
The analysis begins by providing descriptive statistics of the variables. It includes the mean, median, maximum, and minimum values and the standard deviation. Table 2 shows that Gross Domestic Product (L_Gdp) averaged 12.17 during the period in consideration – mainly because of the two-tier growth structure indicated by periods 1989 – 2009 and 2010 – 2019. The first tier has experienced numerous exponential GDP growth periods, such as 1996 (4.3 percent) and 2006 (5.6 percent). The second tier predominantly became a recovery era since the prevalence of the 2007/08 global financial crisis, which led to a major decline in GDP growth (-1.5

percent) after one was experienced in 1992 (-2.14 percent). The female labor force participation rate averaged 1.66, while gross female secondary school enrollment (L_Edu) averaged 1.96. With references to one of the millennium development goals of "Promoting gender equality and empowering women," these average ratios are not encouraging towards materializing the goal in question. Moreover, the results show that the fertility rate (L_Fertility) averaged 0.44 while Democracy (L_Demo), trade openness (L_open), and total labor force participation rate (L_Labor) averaged 1.48, -1.09, and 1.68, respectively. The average ratio of democracy has improved in recent years, receiving greater attention in subduing process to address gender inequality and women empowerment. Lastly, all variables have a low standard deviation, which suggests that the data points are close to the mean; on that note, as variables have been linearized, normality does not seem to be an issue since the kurtosis values are approaching 3.7, with L_Labor at 4.28.

Table 2. Descriptive statistics

	L_GDP	L_FLABOR	L_EDU	L_FERTILITY	L_DEMO	L_OPEN	L_LABOR
Mean	12.18	1.66	1.96	0.45	1.48	-1.09	1.68
Median	12.22	1.69	1.96	0.42	1.52	-1.11	1.69
Maximum	12.74	1.73	2.05	0.62	1.66	-0.69	1.75
Minimum	11.41	1.45	1.85	0.37	1.18	-1.37	1.48
Std. Dev.	0.41	0.08	0.05	0.07	0.15	0.17	0.07
Skewness	-0.29	-1.85	-0.17	1.26	-0.68	0.35	-1.42
Kurtosis	1.86	5.01	2.76	3.41	2.49	2.68	4.28
Jarque-Bera	2.12	22.88	0.22	8.42	2.76	0.77	12.47
Probability	0.34	0.00	0.89	0.01	0.25	0.67	0.00
Sum	377.54	51.59	60.95	13.89	46.04	-33.80	52.12
Sum Sq. Dev.	5.05	0.19	0.07	0.13	0.63	0.91	0.13

Sources: Processed data, 2022

Unit root test

The Unit Root test is applied to ensure that variables are integrated in the same order. It is an important phenomenon for a series to be tested for stationarity since this can influence its behavior Ruiters & Charteris (2020). For this discipline, variables are tested for unit root to avoid spurious results and to ensure that no 2nd difference variables exist in our model, as this would violate the ARDL estimator. Table 3 below presents the Unit Root test results.

Table 3. Unit root tests

	Augmented Dickey-Fuller			Philips Perron		
Variable	Intercept	Trend & intercept	Order of integration	Intercept	Trend & intercept	Order of integration
LGDP	-5.92*	-0.14	I (0)	-6.23*	-0.05	I (0)
L_FLABOR	-3.18*	-3.18	I (0)	-5.67*	-3.05	I (0)
L_EDU	-2.54	-2.99		-2.29	-2.64	
D(L_EDU)	-3.80*	-3.77**	I (1)	-3.77*	-3.75**	I (1)
L_FERTILITY	-2.55	-2.28		-5.71*	-2.97	I (0)
D(L_FERTILITY)	-5.95*	-4.75*	I (1)			
L_DEMO	-1.55	-2.67		-1.53	-2.67	
D(L_DEMO)	-4.79*	-4.58*	I (1)	-5.22*	-4.90*	I (1)
L_LABOR	-2.23	-3.79*	I (0)	-2.19	-3.78**	I (0)
L_OPEN	-1.714	-2.158		-1.707	-2.248	
D(L_Open)	-4.395*	-4.353*	I (1)	-4.395*	-4.353*	I (1)

Sources: Processed data, 2022.
Notes: Asterisks (*,**, ***) denote significance at the 1%, 5% and 10% level, respectively

The findings reported above reveal that L_GDP, L_Flabor, L_Fertility, and L_Labor are all stationary at a level, while L_Edu and L_Demo only become stationary after 1st difference. It is to say the former variables are integrated of I (0) and the latter I (1). The results also indicate that no I (2) variables exist, as this would violate the ARDL estimator.

Order selection criterion
Identifying the long-run structure and formulating a long-run analysis requires a lag order selection with the ARDL method. Table 4 presents the requisite lag order selection criterion conforming to the selected method applicable to this discipline.

According to the results presented in Table 4, by considering the lowest value with an asterisk (*), it is evident that the Akaike Information Criterion value of -6.140447* is less than -6.046150* of the Schwarz Information Criterion and -6.110914* of Hannan-Quinn Criterion. Therefore, this value indicates the best optimal lag for the model as lag 1. A chosen criterion should minimize the asterisk figure to determine the best optimal lag.

Table 4. Lag order selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-12.05	NA	0.14	0.90	0.94	0.91
1	91.03	191.95*	0.00*	-6.14*	-6.05*	-6.11*
2	91.10	0.11	0.00	-6.07	-5.93	-6.03

Sources: Processed data, 2022

Note: *Asterisks (*,**, ***) denote significance at the 1%, 5% and 10% level, respectively*

ARDL bounds test

Having confirmed that our employed series is not integrated of an order greater than the order I (1), the ARDL regression is modeled. The ARDL Bound test for cointegration is employed to ascertain whether a long-run relationship exists amongst the variables. This technique offers several advantages, including the strong ability to handle small sample data and accommodate series integrated of different orders. ARDL Bound test results are presented in Table 5.

Table 5. Bounds test

F-STATISTIC		32.63*
SIGNIFICANCE	LOWER BOUND	UPPER BOUND
10%	1.99	2.94
5%	2.27	3.28
2.5%	2.55	3.61
1%	2.88	3.99

Sources: Processed data, 2022

Note: *Asterisks (*,**, ***) denote significance at the 1%, 5% and 10% level, respectively*

As observed, the F-statistic of 32.63 is higher than the upper and lower bounds at the 1 percent significance level. It confirms that a long-run association exists among the variables. Hence, it rejects the null hypothesis of no cointegration against the alternative hypothesis of cointegration. It is to say L_GDP, L_Flabor, L_Edu, L_Fertility, L_Demo, L_Open, and L_Labor has equilibrium condition that keeps them in proportion with each other in the long run.

Error correction model

Following establishing a long-run relationship amongst the variables, the next step was to estimate the speed of adjustment to equilibrium and long-run coefficients. The results are summarized in Table 6.

Table 6: Long-run coefficients

Variable	Coefficient	S.E.	t-statistic	Prob.
L_GDP	-0.73	0.08	-9.19	0.00
L_FLABOR	0.45	0.03	16.14	0.00
L_EDU	0.00	0.05	0.09	0.93
L_FERTILITY	-19.41	1.19	-16.30	0.01
L_DEMO	-0.29	0.02	-14.24	0.00
L_LABOR	0.02	0.02	0.92	0.00
ECT	-0.14	0.01	-20.67	0.00

Sources: Processed data, 2022

Note: *Asterisks (*,**, ***) denote significance at the 1%, 5% and 10% level, respectively*

Table 6 summarizes the Error Correction Model results to study the proposed long-run relationships. These results were obtained using the E-views 12 program. In support of hypothesis 1, the results reveal that, though insignificant, female secondary school enrolment and attainment (L_EDU) contributes positively to economic growth in South Africa. This finding is consistent with Carbeza-Garcia (2018), which suggested that increasing female education levels increase economic growth. Hypothesis 2 is also confirmed because if more women are more active in the labor market (L_Flabor), economic growth increases (β=0.45; *p=0.000)*. The study, therefore, is verbatim and

corroborates results presented in previous literature (Elborgh-Woytek et al., 2013).

Our results further confirmed hypothesis 3 as the higher the female fertility (L_Fertility), the lower the GDP and *vice-versa* (β=-19.41; *p=0.00)*. It is because the rapid growth of the population produces exhaustion of resources and dilution of capital due to rapid growth of the labor force, urbanization, and the reduction of savings caused by a largely dependent population (Komura & Ogawa, 2015).

An unorthodox finding of the study, however, rejects hypothesis 4 as the results reveal that a percentage increase in the proportion of seats held by women in the democratic process (parliament) reduces economic growth (β=-0.29; *p=0.000)*. However, this is relevant in the South African context that women's leadership qualities are questioned because of their nature, in that they are

more risk averse and more altruistic for the public interest than men (Ngwakwe, 2018). On that note, more parliamentary seats are occupied by men to dominate and rule without interference – and mostly women are inefficient in parliamentary duties, as they operate under male dominance and their unruly conduct.

Finally, the total labor force participation rate is found to have a positive and statistically significant impact on GDP. It shows that when working-age women and men participate in the labor market, the economy will reap positive results. As can be seen from Table 6, the error correction term is 14 percent, implying that 14 percent of any deviations from equilibrium will be corrected today. Furthermore, the results reveal that the value of the ECT is negative and statistically significant. The estimated long-run equation can be written as follows:

$$L_{GDP} = 1.56 + 0.455 * L_{Flabor} + 0.004 * L_{Edu} - 19,413 * L_{Fertility} - 0.295 * L_{Demo} + 0.018 * L\_Labor \quad (4)$$

Equation 4 implies that in the long run, a one percent increase in the female labor participation rate will increase GDP by 45 percent. These results substantiate the women and development (WAD) emphasis on the involvement of women in planning for economic growth – noting that women are good at decision-making for long-term developments (Ngwakwe, 2018). In the relevant South African context, the extensive impact of the female labor force participation rate on economic growth is associated with measures to rectify existing gender

gaps in employment by substantially providing equal employment opportunities for all.

Causality test

The purpose of the causality test is to check how the variables react to each other and the direction of causality between them (Waseem, 2015). Table 7 provides a Causality test between the dependent variable and independent variables.

Table 7. Granger Causality test

Null Hypothesis:	F-statistic	Prob
L_FLABOR does not Granger Cause L_GDP	0.19	0.83
L_GDP does not Granger Cause L_FLABOR	0.76	0.48
L_EDU does not Granger Cause L_GDP	0.92	0.41
L_GDP does not Granger Cause L_EDU	1.89	0.17
L_FERTILITY does not Granger Cause L_GDP	1.38	0.27
L_GDP does not Granger Cause L_FERTILITY	145.23	4.E-12
L_DEMO does not Granger Cause L_GDP	0.06	0.95
L_GDP does not Granger Cause L_DEMO	3.12	0.06*
L_OPEN does not Granger Cause L_GDP	0.19	0.83
L_GDP does not Granger Cause L_OPEN	1.99	0.16
L_LABOR does not Granger Cause L_GDP	0.09	0.92
L_GDP does not Granger Cause L_LABOR	7.63	0.00***

Sources: Processed data, 2022
Note: *Asterisks (*,**, ***) denote significance at the 1%, 5% and 10% level, respectively*

The Granger Causality results reveal that there is no causal relationship between real gross domestic product (L_GDP) and female labor force participation rate (L_FLABOR), female secondary school enrolment rate (L_EDU), the female fertility rate (L_FERTILITY) and trade openness (L_OPEN).

However, there is causality between real gross domestic product and democracy (L_DEMO) and labor force participation rate (L_LABOR). The causality runs from real gross domestic product to democracy and labor force participation rate, at 5 and 10 percent significance levels, respectively. Therefore, this study concludes that there is a unidirectional causal relationship among all presented variables between real gross domestic product and democracy and labor force participation rate.

Diagnostics tests

The reliability and stability of the model were ensured by conducting diagnostic tests on the estimated parameters. Table 8 shows diagnostic test results for serial correlation and heteroscedasticity.

Table 8. Heteroskedasticity and Serial Correlation test

Null Hypothesis (F-statistic)	F- statistic [p-value]
Breusch-Godfrey test: No serial correlation	3.30 [0.08]
White test: Homoskedasticity	0.69 [0.76]
Breusch-Pagan Godfrey: Homoskedasticity	0.55 [0.86]

Sources: Processed data, 2022

As illustrated in Table 8, the diagnostic test statistics reveal that the model passed all diagnostic tests. Residuals in the model are not serially correlated. The heteroscedasticity test also shows the absence of heteroscedasticity in the error variance.

Stability tests

The cumulative sum of the recursive residuals (CUSUM) and the cumulative sum of squares of the recursive residual (CUSUMSQ) was used to test the stability of the growth model. The CUSUM and CUSUMSQ plots to check the stability of the long-run parameters, together with the short-run movements for the ARDL-Error Correction Model, are given in Figure 1. Suppose the CUSUM and CUSUMSQ statistics plots stay within the critical bounds of a five percent significance level. In that case, the null hypothesis of all coefficients in the given regression is stable and cannot be rejected. Examining plots in Figure 1 shows that CUSUM and CUSUMSQ statistics are well within the 5% critical bounds implying that short-run and long-run coefficients in the ARDL-Error Correction Model are stable. Figure 1 show that the CUSUM and CUSUMSQ statistics are within the critical bounds, suggesting that the model is stable over time.
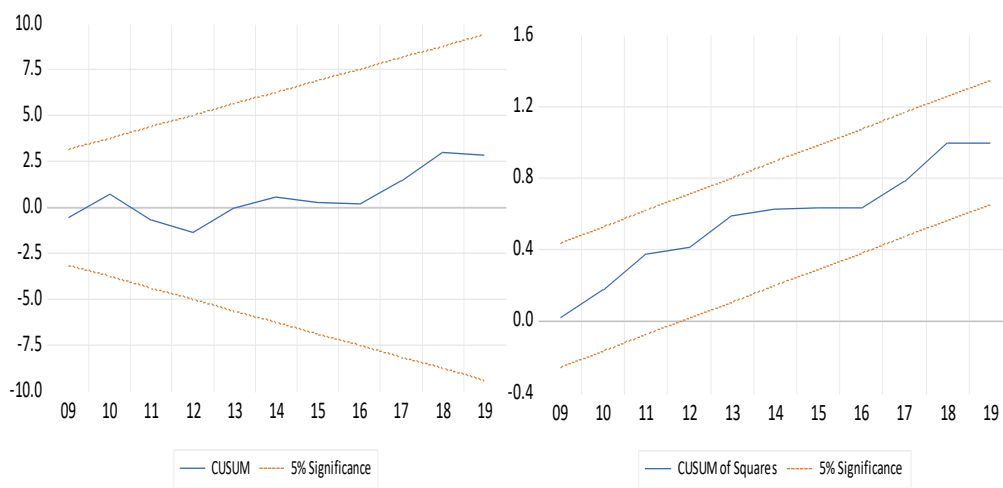
Sources: Processed data, 2022
Figure 1. The plot of the CUSUM test

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

There has been growing interest in studying the effects of several gender variables on economic growth. Owing to how gender inclusivity affects economic growth, the study of female inclusion should not be reduced only to women's employment at the top management level,

salary/pay gaps, or the availability of women on the board of directors of companies, which are variables that many studies have found interest in exploring, in developed and developing countries alike. Based on this argument, the basic questions that affect all countries should be analyzed, such as the impact of gender on the country's economic growth, regardless of its GDP. If the welfare of citizens is to

be improved, both males and females must actively participate in finding solutions to the problem of women's exclusion in the economy.

The study's results mostly support the hypotheses and prior evidence in the literature. As such, this corroborates the need for policymakers to strongly influence policies of sex education and the prevention of pregnancy in South Africa. The findings indicate that correlation exists amongst the variables in question. In an attempt to determine the impact of gender inequality on economic growth, the overall finding of this study is that the intractable issue of gender inequality is at the forefront and has an imperative effect on the economy. In particular, the study's findings reveal that high fertility negatively affects economic growth. Moreover, when women have greater access to secondary education and the labor market, the effects become positive on economic growth.

Furthermore, the representation of women in the democratic process was an important variable in this study. Although the relationship was negative, this study notes that this presents a very tacit narrative – in that the marginalization of women as far as the economy is concerned prohibits any significant growth. As a result, it is a call for the government to increase the representation of women in the political arena and remove bureaucracies that suppress women from having their voices heard. It is also observed that the persistent gender inequality that restricts economic growth stems from several reasons not limited to repercussions of the apartheid era and presiding policies from the past that side-lined women in most economic activities. It has probably facilitated a significant increase in gender inequality amid initiatives in place to promote, protect, monitor, and evaluate gender equality, such as the Commission for Gender Equality (CGE). Therefore, addressing the retarded economic growth is concurrent with gender equality.

Lastly, this study recommends that policymakers should focus on guaranteeing obligatory secondary education for females in the country. However, the study stresses that the attainment of secondary education or any level of education by females is futile if women are not absorbed by the labor market like their male counterparts. Therefore, the study suggests that public policy should prioritize appointing and absorbing women into qualified jobs. Given the results above, the study concludes that the existence of gender gaps presents an obstacle for South Africa to reaching its full economic potential. As such,

economic growth will continue to be impeded.

One of the study's limitations includes the unavailability of quarterly gender-disaggregated data. Hence, this research employed annual time-series data for our analysis. Quarterly data would offer a more robust analysis as econometric modeling always favor a large sample size. Other questions remain, which could be explored in future research, i.e., what is the impact of gender inclusivity on economic growth and development at the provincial level in South Africa? Answering these questions at a micro level will provide a better understanding and help inform a bottom-up approach policy stance to solving the problem at hand. Meanwhile, this study is concluded by calling upon public office bearers to empower women and enable inclusive economic growth.

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