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Economic Growth and Female Participation in the Labour Market: Gender Disaggregated Data

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Abstract

The study aims to examine the impact of economic growth on female labour market participation in Kenya with data spanning between 1991 and 2022. Labour-force data disaggregated by gender are important to monitor the dynamic of gender inequalities in the labour market. The secondary data used to construct the time series was obtained from the World Bank and the International Labour Organization sources. The research was informed by the Feminisation U hypothesis, which describes the tendency of female labour force participation to first decline and then rise in the process of economic growth. The study used a fully modified ordinary least square (FMOLS) and Granger causality test to analyse the long-run effect of economic growth on women's participation in the labour market. The study results indicate that economic growth positively and significantly contributes to women's participation in the labour market in the long run. Furthermore, the results of the control variables suggest that education has a beneficial effect on women's workforce, while women's access to the workforce is hampered by male labour market participation, fertility rate, female self-employment and rate of urbanization. The study suggests to policymakers that the strategy to success is to facilitate education, vocational training, and social change that enable women to play the same role as men in the labour market. Finally, women must be in productive sectors and government should remove barriers to ownership of factors of production to encourage them to participate in economic activities and the labour market.

Keywords: Economic growth, Gender inequality, Labour market

1. Introduction

Despite the increase in female participation in the labour market over the last four decades, women still do not have the same opportunities as men to participate in economic activities and labour markets in most developing nations (Fabrizio et al., 2020; Litti et al., 2024). According to the International Monetary Fund (IMF) discussion report on average female

participation in the labour market is 20 per cent lower than the male rate, and still gender gap in wages and education attainment continues to persist (Fabrizio et al., 2020). Theoretical and empirical literature has suggested that gender equality leads to economic growth and development and improves social outcomes (Jayachandran, 2021; Nica et al., 2023). Economic growth and gender equality are some of the 17 United Nations Sustainable Development Goals that all countries across the globe are committed to achieving by the year 2030 (UNCTAD, 2022). Low workforce participation rates, a persisting gender gap in employment, and a greater chance of unpaid work are all signs that women are being excluded from the labour market and main sectors of economic activities (Heath & Mobarak, 2015; Nica et al., 2023). Economic development has positive spillover effects such as creating employment opportunities, improving human capital, increasing exports, increasing wage rate, increasing political participation, better social outcomes and generally promoting gender equality in employment and access to productive roles and ownership of factors of production (Horton, 1996; Heath & Mobarak, 2015). For developing countries to grow, women must be in productive sectors and barriers to joining the labour market removed (Vesna et al., 2023).

According to the World Bank report, Kenya has recorded broad-based economic growth averaging 4.8 per cent per year between 2015 to 2019, thus reducing the poverty rate from 36.5 per cent in 2005 to about 27.2 in 2019 (World Bank, 2023). The poverty rate decline trend and economic growth trend have resumed their trend after the financial crisis and COVID-19 pandemic crisis that brought disruptions in major sectors and negatively affected health, education and employment outcomes for women (UNCTAD, 2022). In Kenya, there are about 27.85 million males and 28.36 million females, women's population makes up the majority at 50.45 % compared to the 49.55 male population. Since women make up half of Kenya's population (Statista 2023), their non-participation in the labour market can hurt economic development and social outcomes (Vesna et al., 2023). The available statistics show that as of 2022 in Kenya, women represented 49.7 per cent of the total workforce. The labour force share has slowly increased in the last few years. In the year 2010, female workers accounted for only 48.8 per cent of the economically active population (World Bank, 2022; Statista, 2023). Despite Kenya's economic progress, women are still underrepresented in leadership, education, parliament, politics, private organizations and public life, women currently account for 23.3 per cent of parliament in Kenya (World Bank, 2022). This implies women are excluded from decision and policy making thus hindering their progress towards gender equality in labour engagement. A higher share of women in education and parliament is crucial for the country's economic progress (Vesna et al., 2023). There are several barriers preventing women from fully participating in the workforce, including, low levels of education, gender-based violence, exclusion from ownership of factors of production, social norms and exclusion, lack of access to safe transport and barriers to women's mobility, household roles, increasing gender inequality, poverty, lack of maternity leave among others (Jayachandran, 2021; Nica et al., 2023). Furthermore, according to the United Nations Conference on Trade and Development (UNCTAD) analysis, more women than men left the labour market entirely in the year 2020, a trend that will hurt efforts to bring back women to the labour market (UNCTAD, 2022).

Most empirical studies have generated mixed or inconclusive findings on the role of economic growth in women's participation in the labour market. Nica et al. (2023) carried out a study in eight SAARC countries, the authors observed that economic growth, high wage rate, political participation, trade openness and foreign direct investment were beneficial to female labour participation, while urbanization rate and social norms hampered the ability of women to access workforce (Jayachandran, 2021). An increase in economic growth and income from enlarging output sector and exports could fund higher levels of investment in areas such as public education, healthcare and infrastructure. An increase in health and education will increase labour productivity and thus increase women's participation in the labour market. Infrastructure development will also imply complementing private sector growth and increasing employment opportunities for women through self-employment. Fabrizio et al. (2020) explored the role of fiscal policy tools on female labour participation in several developed and developing countries. The result identified that for developed economies removing tax will boost women's participation in the paid workforce while for developing economies it was observed investing in education and infrastructure will have higher returns on women. In contrast, Luci (2009) studied 184 countries and concluded that economic growth does not influence female labour market participation. Majorly most studies suggest that the impact of economic growth on women's participation in the labour market is positive but still some studies argue that the impact is not clear (Luci, 2009). For instance, some studies argue that economic growth and women's participation in the market relationship is feminisation "U", economic growth first lowers women's labour participation and increases in the long run, however, the U-shaped curve does not give an exact estimation result (Uberti & Douarin, 2023). The study intends to investigate how gender-responsive economic growth affects women's participation in the paid workforce (female participation in the labour market).

2. Review of Literature

According to the U-shaped female participation curve hypotheses, agriculture is the dominant sector for both male and female employment in least-developed countries and women are productively active due to a large number of employment opportunities in the agricultural sector, and women's participation in the work workforce is high (Luci, 2009; Uberti & Douarin, 2023). Feminisation U hypothesis can be summarized in three stages: Stage one in the early development stage, economies are characterized by a large agricultural sector and subsistence farming with low income, most women work in agricultural farms or family farms and women's labour market participation is high; the second stage with growth in urbanization, technological and industrialization gender difference in employment begins (Goldin, 1995). Women face mobility to urban areas problems, cultural barriers and social norms thus becoming obstacles to women's participation in wage employment (Jayachandran, 2021). Technological change also lowers demand for female workers because of low skills and low education attainment; third stage of economic development women receive education and training, and employment opportunity increases as the fertility rate declines and female labour market participation rises (Luci, 2009; Uberti & Douarin, 2023). Figure 1 shows a U-shaped female labour participation and economic growth graph adopted from

Goldin (1995) and Uberti and Douarin (2023) empirical studies.

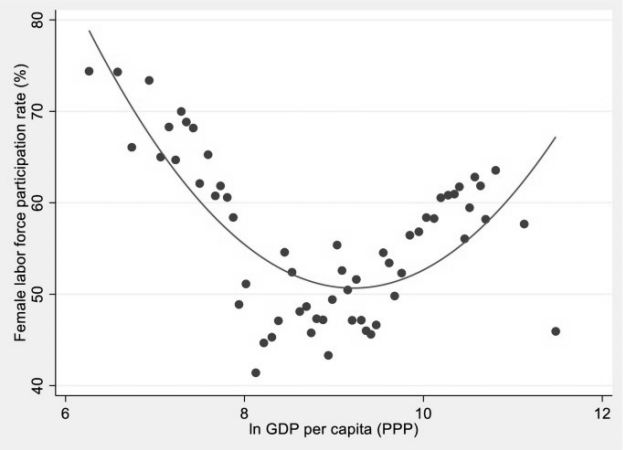

Figure 1. U-shaped female labour participation with economic growth

Source: Goldin (1995) and Uberti and Douarin (2023).

The U-shaped theory also introduces the role of education, female education can contribute a downward portion of the U-shaped curve. It is argued that least developed countries have high levels of women participation rates in the economy because agriculture activities play an important role, and most women are employed as family workers thus female labour participation is very high in these countries in comparison to developed economies (Onur, 2008; Uberti & Douarin, 2023). However for women to be able to work in urban areas, education and vocational training is necessary.

In summary, several theories indicate that political, social change and cultural factors may influence women's participation in the labour market as well as economic factors (Lincove, 2008; Jayachandran, 2021). These hypotheses focus on non-economic barriers to women's participation in the labour market, which vary between countries and regions depending on cultures, social norms and political institutions (Horton, 1996). Some religious factors also play a role in the allocation of employment opportunities between different groups of gender, for instance, Islam and Catholicism (Nassar, 2003). Some theories argue that women's participation in the labour market is associated with political freedom, human rights, political rights, participation of women in politics, economic rights and the ability to freely participate in the labour market (Sen, 1996).

The Cobb-douglas production model has been extended beyond the original factors (capital and labour) to include the influence of gender inputs on output (Kibona et al. 2022; Nica et al., 2023) on the labour market. In this study, female labour force participation will be used as an output or production factor that depends on many factors such as foreign direct investment, urbanization, male employment, self-employment, economic growth, fertility rate, population, education attainment, trade openness and other economic factors (Kibona et al. 2022; Nica et al., 2023).

Several empirical studies have been carried out on the effect of economic growth on female labour participation using different estimation methods and study periods. For instance, Luci (2009) carried out a study in 184 countries using GMM and indicated that generally, growth in the economy does not increase female labour participation. Furthermore, Onur (2008) indicate that economic growth hampers female participation in the labour market because of the introduction of technology which favours a skilled male workforce. In contrast, Baslevent and Onaran (2004), Uberti and Douarin (2023) and Nica et al. (2023) have suggested that economic growth is beneficial to women's participation in the labour market. Generally, the empirical work findings have been mixed or inconclusive. Table 1 shows the empirical studies on the effect of economic growth on female labour force participation.

Table 1. Literature Review

Author (s)	Sample (Period)	Methods	Result
Tansel (2001)	Turkey 67 provinces (1985-1990)	OLS	Economic growth dampens female labour force participation
Baslevent & Onaran (2004)	Turkey (1988-2024)	ARDL	Economic growth promotes female labour force participation
Lincove (2008)	141 countries (1970-2000)	OLS	Economic growth dampens female labour force participation
Onur (2008)	Turkey (1980-2002)	OLS	Economic growth dampens female labour force participation
Luci (2009)	184 countries (1965-2005)	GMM	Economic growth is not significant
Benabdallah & Namri (2023)	Morocco (1991-2019)	ARDL	Economic growth dampens female labour force participation
Nica et al. (2023)	8 SAARC countries (1991-2021)	GMM	Economic growth promotes female labour force participation
Uberti & Douarin (2023)	169 countries (1991- 2013)	OLS	Economic growth promotes female labour force participation
Litti et al. (2024)	Indonesia (2015- 2020)	OLS	Economic growth dampens female labour force participation

Notes: ARDL: Autoregressive Distributed Lag; GMM: Generalized Method of Moment; OLS: Ordinary Least Squares Regression
Source: Author compilation.

3. Methodology

3.1 Data and Model Establishment

The study will adopt an explanatory research design to examine the long-run causal relationship between economic growth and women's participation in the labour market during the period between 1991 and 2022 for Kenya. The secondary data used to construct the time series is obtained from the World Bank (World Development Indicators) and the International Labour Organization sources. The period was chosen since it has experienced a financial crisis (2008-2009) and the Covid-19 pandemic crisis (2019-2021) that have affected women more than men in employment and unemployment in Kenya. During analysis, the study adopted a fully-modified OLS (FMOLS) estimation technique to examine the link between economic growth and female labour force participation. Labour-force data disaggregated by

gender are important to monitor the dynamic of gender inequalities in the labour market. The dependent variable is female participation in the labour market while the explanatory variable is economic growth. As reviewed in the literature several control variables were deployed, including fertility rate, male labour force participation, education attainment, urbanization rate and self-employment by females (Nica et al., 2023; Uberti & Douarin, 2023; Litti et al., 2024). The variables and their measures are shown in Table 2.

Table 2. Variable Definition

Variables	**Abbreviations**	**Definition**	**Measure**	**Source**	**Expected signs**
Dependent variable					
Female Labor force participation	FLFP	Labour force participation rate, female	% of the female population ages 15+	International Labour Organization (modelled ILO estimate)	Not predicted (Nica et al., 2023)
Independent variables					
Economic growth	GDP	Real Gross domestic product	Per capita GDP (Constant 2015 US$)	World Bank-World development indicators	Positive (Uberti & Douarin, 2023)
Male Labor force participation rate	MLFP	Labour force participation rate, male	% of the male population ages 15+	International Labour Organization (modelled ILO estimate)	Negative (Nica et al., 2023)
Female Self-employed	SELF	Self-employed, female	% of female employment	International Labour Organization (modelled ILO estimate)	Positive (Thaddeus et al., 2022)
Fertility Rate	TFR	Fertility rate, total	births per woman	World Bank-World development indicators	Negative (Benabdallah & Namri, 2023)
Education	EDU	Labour force (total)	Number	World Bank-World development indicators	Positive (Onur, 2008)
Urbanization	URB	Urban population	% of the total population	World Bank-World development indicators	Negative (Nica et al., 2023)

Source: Author compilation.

The study used a simple theoretical baseline estimation model adopted from Luci (2009) and Nica et al. (2023) empirical works.

$$FLFP = f(GDP, MLFP, SELF, TFR, EDU, URB) \quad (1)$$

The baseline model measuring the effect of selected variables on economic growth is

presented as follows

$$FLFP_t = \beta_0 + \beta_1 MLFP_t + \beta_2 SELF_t + \beta_3 TFR_t + \beta_4 EDU_t + \beta_5 URB_t + \beta_6 GDP_t + \varepsilon_t \quad (2)$$

Whereβ - are regression coefficient ε_t -is the error term and the subscript t represents the period dimension.

To remove the skewness of data and control for heteroscedasticity, the econometric equation 2 was transformed into logarithm form (ln) (Thomi et al., 2024). The econometric equation takes a new form as shown below. Following the empirical works of Gisore (2017), the FOLMS estimation model was selected as the preferred model of long-run analysis as presented in Equation 3.

$$\ln FLFP_t = \beta_0 + \beta_1 \ln MLFP_t + \beta_2 \ln SELF_t + \beta_3 \ln TFR_t + \beta_4 \ln EDU_t + \beta_5 \ln URB_t + \beta_6 \ln GDP_t + \varepsilon_t \quad (3)$$

To analyze the long-run effect between economic growth and female labour force participation equation 3 was adopted.

3.2 Time series Data Analysis

The study adopted several modern econometric techniques during time series data analysis.

3.2.1 Pre-Estimation Procedure

The estimation analysis started with pre-estimation procedures such as lag selection criteria, stationarity test and cointegration test. Vector autoregression (VAR) lag selection criteria were conducted to estimate the best lag length and identify the best estimation criterion. The commonly used criteria are the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC), both perform well for small sample data. The study applied the Philips Perron test to check for unit root or confirm stationarity of dependent and independent variables. Stationarity test is important to confirm the result is free of misleading inferences. Once non-stationarity is confirmed the study will proceed to check the long-run relationship using the Johansen cointegration approach (Granger, 1988; Pedroni, 2004; Alam et al., 2021) because it controls for homogeneity. The presence of cointegration indicates the variables can be combined as they share the same stochastic trend. Once co-integration is confirmed, vector error correction analysis will be conducted to check for long-run causality or convergence based on error correction term value. The error correction term is expected to be significant and range between 0 and 1, suggesting convergence (Narayan & Smyth, 2006). Then the study will move to estimating long-run coefficients using the FMOLS estimator.

3.2.2 Estimation Approach

In long-run analysis, many estimation possibilities are available when using time series data such as ordinary least squares (OLS), fully-modified OLS (FMOLS) and dynamic OLS (DOLS) econometric tests (Pedroni, 2001). FMOLS and DOLS generate consistent estimates of standard errors and can check for long-run relationships (Stock & Watson, 1993; Al-Mulali et al., 2015) while OLS can generate misleading inferences. FMOLS technique is based on a non-parametric method that takes into account the effect of serial correlation while solving

the endogeneity problem of the regresses (Al-Mulali et al., 2015). In addition, this approach produces reliable estimates on small samples and provides robust findings (Phillips, 1995; Gisore, 2017; Khan et al., 2023). As propagated by Al-Mulali et al. (2015), FMOLS was performed to generate the long-run coefficient effects between the independent and dependent variables. Finally to verify the direction of causality between the variables of this study Granger causality test is conducted.

3.2.3 Post-Diagnostic Procedures

Post-diagnostic estimations were conducted after regression analysis to avoid misleading inferences. The study diagnostic tests included normality analysis using the Jarque-Berra test, heteroskedasticity examination using the Breusch-Pagan-Godfrey test and serial correlation analysis using the Breusch-Pagan Lagrange Multiplier test. All the regression tests were conducted and controlled for.

4. Research Results and Discussion

The next chapter presents the time series regression estimation findings.

4.1 Pre-Estimation Result

Vector autoregression (VAR) lag selection criteria were applied to confirm the lag length and best model estimator. The result of the VAR selection criteria is presented in Table 3.

Table 3. Lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	818.7633	NA	7.41e-33	-54.11755	-53.79061	-54.01296
1	1266.140	656.1531	2.38e-44	-80.67603	-78.06046	-79.83929
2	1381.460	115.3195*	5.19e-46*	-85.09733*	-80.19314*	-83.52844*

*Note: * = lag order selected by the criterion; SIC= Schwarz information criterion; AIC= Akaike information criterion; HQ: Hannan-Quinn information criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error*
Source: Author computation

Table 3 results indicate that the lag of 2 is the most optimal lag length as indicated by the minimum value (-85.09733) of all criteria. In addition, the study result suggests that AIC is selected as the best estimation criterion. Once lag length was established the study proceeded to check for stationarity. The study applied the Phillips Perron unit root test to check for unit root or stationarity on selected variables. Table 4 presents the stationarity test result for both the level and first difference.

Table 4. Result of Phillips Perron test statistic

Variables	Level		Order	First difference		Order
	Adjusted t	Prob.		Adjusted t	Prob.	
FLFP	-0.216237	0.9262	I(1)	-23.74812***	0.0001	I(0)
GDP	1.911872	0.9997	I(1)	-4.435750***	0.0015	I(0)
MLFP	-1.778416	0.3837	I(1)	-5.567732***	0.0001	I(0)
SELF	2.674943	1.0000	I(1)	-13.67663***	0.0000	I(0)
TFR	0.454053	0.9821	I(1)	-4.905545***	0.0005	I(0)
EDU	-2.510832	0.1227	I(1)	-9.158504***	0.0000	I(0)
URB	0.707818	0.9904	I(1)	-4.084968***	0.0037	I(0)

Note *** Denotes significance at a 1% level of significance
Null Hypothesis: The variable has a unit root
Source: Author computation

As indicated by the Phillips-Perron test result, Table 4, all variables were integrated of order one I(1), non-stationarity. The null hypothesis is accepted that the study variables have a unit root at 1 per cent. This means that unit root is present, however, it was removed by differencing. This confirms that there is a high possibility that variables are cointegrated. Johansen cointegration test which uses unrestricted cointegration rank (Maximum Eigenvalue) and has high power was used during cointegration analysis. Unrestricted cointegration rank (Maximum Eigenvalue) which is similar to the Johansen trace was used to identify the number of cointegration relations in our model using rank value. The result of the Johansen cointegration test is represented in Table 5.

Table 5. Johansen cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.929422	79.53098	46.23142	0.0000
At most 1 *	0.893592	67.21412	40.07757	0.0000
At most 2 *	0.796091	47.70239	33.87687	0.0006
At most 3	0.583780	26.29621	27.58434	0.0724
At most 4 *	0.559298	24.58157	21.13162	0.0157
At most 5 *	0.426719	16.69138	14.26460	0.0203
At most 6 *	0.317805	11.47319	3.841465	0.0007

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Author computation

The maximum eigenvalue statistic suggests three cointegration vectors and trace statistics indicate four cointegration vectors at the 5 per cent significance level, meaning the error correction model can be estimated. Given the evidence in favour of at least one cointegrating vector, the study proceeded to check for long-run causality using the vector error correction model (VECM) and long-term coefficient effect using the FMOLS estimation method. Table 6 shows the coefficient of vector error correction estimates.

Table 6. Vector Error Correction Estimates

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.866529	0.248589	-3.485787	0.0020
C(2)	0.069331	0.019985	3.469086	0.0021
C(3)	0.002048	0.300330	0.006820	0.9946
C(4)	-0.011980	0.027202	-0.440402	0.6638
C(5)	0.768307	0.268981	2.856356	0.0089
C(6)	0.000731	0.000282	2.587720	0.0165

Source: Author computation.

As presented by the error correction term (ECT), the empirical result shows unidirectional causality running from economic growth to female participation in the labour market. This indicates a long-run association between economic growth and female participation in the labour market, economic growth granger causes women's participation in the labour market. This is confirmed by negative and significant at 1 per cent, ECT also confirms the presence of convergence (-0.866529). The negative and significant ECT suggest the existence of a long-run relationship. It implies that about 86 per cent of disequilibrium or shocks are collected annually in the current year. Finally, the study proceeded to estimate the long-run coefficient effects using the FMOLS estimation test.

4.2 Coefficients Regression Result

The study employed a fully modified ordinary least squares (FMOLS) estimation model to examine the long-run effect of economic growth on female labour force participation and control variables. Table 7 shows the long-run result of study coefficients.

Table 7. FMOLS Regression Results

Variable	**Coefficient**	**Standard error**	**t-Statistics**	**p-Value**
GDP	0.052279	0.009121	5.731506***	0.0000
EDU	0.316346	0.058617	5.396847***	0.0000
MLFP	-0.346476	0.057907	-5.983344***	0.0000
SELF	-0.132535	0.035182	-3.767115***	0.0009
URB	-0.638463	0.129157	-4.943325***	0.0000
TFR	-0.005115	0.012390	-0.412853	0.6834
CONS	1.179906	0.139777	8.441361***	0.0000
Goodness of Fit	R^2 = 0. 969330		Adjusted R^2 = 0.961663	
	F = 9.384548		P-value(F) = 0.004691	
Breusch-Pagan	$\chi2$ = 2.526328		Prob > $\chi2$ = 0.0543	
Breusch-Godfrey	$\chi2$ = 7.139132		Prob> $\chi2$ = 0.0037	
Jarque-Bera	$\chi2$ = 1.713504		P-value($\chi2$) = 0.424539	
Durbin-Watson	DW = 2.046975		P-value = 0.000000	

Note: * p < 0.1, ** p < 0.05, *** p < 0.01 are significance levels, in which the null hypothesis is rejected.
Dependent variable: FLFP
Source: Author computation.

According to the FMOLS estimation result, economic growth has a positive and significant effect on female participation in the labour market at a 1 per cent level of significance.

Specifically, it suggests that on average increase in economic growth by 1 per cent will cause female labour participation to increase by 0.05 in the long run in Kenya. This implies that economic growth is an enabler of women's participation in the labour market. This has been attributed to an increase in female education attainment and health outcomes as a result of an increase in gross domestic product (GDP) or income and thus growing women's participation in the labour market (Fabrizio et al., 2020; Thaddeus et al., 2022). Economic growth has positive spillover effects such as creating employment opportunities, improving human capital, increasing exports, increasing wage rate, increasing political participation, better social outcomes and generally promoting gender equality in employment and access to productive roles and factors of production (Horton, 1996; Heath & Mobarak, 2015). The findings support the feminisation "U" relationship that economic growth first lowers women's participation in the labour market and then increases in the long run as a result of an increase in education attainment due increase in government investment in the education, health and infrastructure sectors (Luci, 2009; Fabrizio et al., 2020; Uberti & Douarin, 2023). This is possible now that Kenya is a middle-income country and has invested heavily in education, health and infrastructure thus promoting women's participation in the labour market. The U-shaped theory also introduces the role of education, female education can contribute downward portion of the U-shaped curve. According to the U-shaped female participation curve hypotheses, agriculture is the dominant sector for both male and female employment in least-developed countries and women are productively active due to a large number of employment opportunities in the agricultural sector, and women's participation in the work workforce is high (Goldin, 1995; Uberti & Douarin, 2023). Our result agrees with a similar study by Baslevent and Onaran (2004) and Nica et al. (2023), the coefficient for economic growth is positive and statically significant to female labour participation in Turkey and SAARC countries, respectively. In contrast, Luci (2009) suggested economic growth is insignificant to women's participation in the labour market in 184 countries including Kenya. Even other studies argue that economic growth hampers women's workforce participation, for instance, Onur (2008), Lincove (2008) and Benabdallah and Namri (2023) reported a negative relationship between economic growth and women's workforce in Turkey, developing countries and Morroco, respectively, due to their early stage of development where most production is in agriculture and subsistence sector.

The result in Table 7 indicates that education attainment has a positive and significant effect on female labour participation in Kenya at a 1 per cent level of significance. Particularly, an increase in education by 1 per cent will translate on average to an increase in female labour participation by 0.3 per cent. As the level of female education or vocational training increases the females attain higher education and skills, and their participation in the labour market increases. An increase in education will increase labour productivity and thus increase women's participation in the labour market. The study finding is similar to the study by Onur (2008) in Turkey who suggested an increase in education level will mean more opportunities for employment and an increase in qualification and thus growth in the female workforce. The findings contrast Benabdallah and Namri (2023) study in Morocco which suggested education hampers women's participation in the labour market and this was attributed to the high graduate unemployment rate in Morocco.

Based on regression analysis, male labour participation is negative and significant to female labour participation. This implies that as male labour market participation increases female labour participation declines. This indicates that an increase in male participation in the labour market competes with the female workforce for the same employment opportunities (the male labour force is likely to be more skilled than the female), thus reducing the probability of women being employed in the formal sector. In contrast, other studies argue that male participation encourages females to take up jobs (Nica et al., 2023) and thus increase women in the workforce. The empirical findings, in Table 7, agree with Nica et al. (2023) study in SAARC countries. Nica et al. (2023) indicated that an increase in male labour force participation reduces the participation of the female labour force in SAARC nations.

As shown in the result Table 7, an increase in female self-employment hampers female participation in formal employment. The self-employment rate has a negative and significant effect on female labour force participation rate. Self-employment will discourage women from increasing their education or skills and also looking for formal employment, thus remaining stuck in the informal sector. In contrast, some studies report a positive relationship attributed to access to microfinance loans via formal institutions or mobile money to self-employment businesses that has led to an increase in female labour participation (Thaddeus, 2022; Thomi et al., 2024).

The regression result indicates that urbanization is negative and significant at 1 per cent on female labour participation. Specifically, an increase in urbanization rate by 1 per cent will cause female labour participation to reduce by 0.6 per cent. This implies women's access to formal employment is hampered by the urbanization rate. The findings support similar results of Onur (2008) in Turkey and Nica et al. (2023) in SAARC countries. Onur (2008) and Nica et al. (2023) indicate that urbanization slows women's participation of women in the labour market because, in urban areas, the female workforce is reluctant to work, and is more solvent when compared to rural women. Furthermore, their labour force is migrating to traditional sectors ignoring modern sectors (Nica et al., 2023). In contrast, several studies argue that urbanization increases women's labour participation because women feel secure working in urban areas and also as per capita income increases family expenses increase. The rising household expenses push women to access the employment market and take formal employment (Onur, 2008; Nica et al., 2023).

The effect of the fertility rate on female labour participation is found to be negative and insignificant. This implies that fertility does not influence female labour participation in Kenya. The negative result mirrors the same result reported by Onur (2008) in Turkey and Benabdallah and Namri (2023) in Morrocco. Onur (2008) and Benabdallah and Namri (2023) argued that an increase in fertility rate will slow women's workforce. This is attributed to growth in urbanization, life is expensive in urban areas and thus most families have few children and some are practising delayed marriage or using family planning methods, hence population decline (Benabdallah & Namri, 2023). Education has also affected the fertility rate due to delayed marriage and an increase in knowledge of family planning methods, thus slowing workforce growth.

The adjusted R^2 is 0.96 which implies that 96 per cent of the variations of the dependent variable are explained by the independent variables in the regression model. The F statistic test result reveals that the null hypothesis is rejected and a conclusion made that the estimators are non-zero and therefore are simultaneously significant at a 1 per cent level of significance. Table 7 results present a post-estimation diagnostic test for time series data. The model passed some diagnostic tests, heteroscedasticity (Breusch-Pagan-Godfrey test) was not a problem while serial correlation (Breusch-Pagan Lagrange Multiplier test) was detected and the study used FMOLS estimation and robust standard errors to control for serial correlation. The null is no serial correlation (0.0037). Furthermore, Durbin Watson results established that serial correlation may not be a problem. In addition, the Jarque-Bera test was also tested and the result indicates that the model variables are normally distributed

4.3 Granger Causality

The objective of this test is to verify the direction of short-run causality between the variables of the study. The null hypothesis of this test states that there is no Granger causality between the variables while the alternative states that there is causality and it equally indicates if the causality is unidirectional or bidirectional (Litti et al., 2024). Table 8 presents the pairwise Granger causality test result.

Table 8. Causality test results

Null hypothesis	Observations	F-statistics	Probability
Economic growth does not Granger cause female labour participation	31	2.11918	0.1566
Female labour participation does not Granger cause economic growth		6.28643	0.0182

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ are significance levels, in which the null hypothesis is rejected.
Null hypothesis: no causality
Source: Author computation.

Our results show that for Kenya there is a unidirectional causality running from female labour participation to economic growth, economic growth does not granger cause female labour participation. This implies countries promoting and supporting women's participation in the labour market will enjoy faster economic growth because the quality of human capital will improve with an increase in female labour participation. This result supports the result by Thaddeus et al. (2022) in sub-Saharan Africa that suggested that economic growth is an enabler of growth in the women workforce in Sub-Saharan African countries including Kenya

5. Conclusion

The study intended to investigate how gender-responsive economic growth affects women's participation in the paid workforce. Labour-force data disaggregated by gender are important to monitor the dynamic of gender inequalities in the labour market. In this study, we have explored the long-run relationship between economic growth and female participation in the labour market in Kenya using time series data of Kenya during the period 1991-2022. The study adopted several control variables to make sure the result is robust, this included male

labour force participation, fertility rate, female self-employment, education and urbanization. The study applied the Feminisation U hypothesis to describe the tendency of female labour force participation to first decline and then rise in the process of economic development. To achieve the study objective, the study employed several econometric strategies. First Philips Perron stationarity test was conducted to check for unit root and the Johansen cointegration test to confirm the long-run relationship between the selected variables. Secondly, once cointegration is confirmed, a vector error correction model was performed to check for long-run causality between target variables through the error correction term. The error correction term has confirmed that long-run causality or convergence exists between the selected variables. Finally, fully modified ordinary least squares (FMOLS) estimation was performed to check for the long-run coefficient effect between study variables. FMOLS model performs well for small sample size data and solves endogeneity problems. The estimation results show that economic growth positively affects female participation in the labour market, and education attainment plays a significant role in enhancing such effect. The control variables have presented mixed results. Specifically, male participation in the labour market, female self-employment, total fertility rate and urbanization do not add positive value to female participation in the labour market. In contrast, educational attainment adds positive value to women's participation in the labour market. The study recommends an increase in economic activities in the manufacturing, service and agricultural sectors to encourage and empower female labour market participation in Kenya. The government can create wealth through an increase in government expenditure, the use of fiscal policy tools like cash transfer, high wage rates and tax waivers on women businesses, and also investing in infrastructure and education sectors. The government and stakeholders need to facilitate female students to pursue education to generate skilled workers and help reduce the fertility rate. Social change and education will increase the participation of females in highly skilled and well-paying jobs. Moreover, policies in Kenya should remove barriers to women's labour force participation and at the same time, encourage women's active engagement in the labour market for the achievement of economic benefits. Finally, women must be in productive sectors and the government should remove barriers to women's access to key productive assets such as land ownership, access to finance and factors of production and encourage social change to encourage them to participate in economic activities and labour markets. Future studies can consider examining the factors that determine the participation of females in the labour market in three major sectors (service, manufacturing and agriculture) in Kenya.

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