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**Review Article**

# Globalization-Female Labour Participation Nexus in Pakistan: A Dynamic Analysis.

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## Abstract

**Background:** The process of globalization is defined as a process of integration with the globe through trade, foreign investment, and the transfer of technology and migration from one region to another. There is a need to investigate whether increasing dependency and interconnectedness among various regions can bring any advantage for female labor while opening a new venue or creating hurdles. The main objective of this study is to empirically investigate the impact of globalization on female labor participation using time series data. This study also considers the impact of the economic situation, education, and health on the female labour supply in Pakistan.

**Methodology:** Female labour force participation rate is a dependent variable, whereas; Globalization Index, Economic Misery Index, school enrolment ratio, fertility rate, and GDP growth are independent variables. The ARDL bound testing approach has been used for data analysis to estimate the model. The time series data was collected from secondary data from 1973 to 2019.

**Results:** The study's finding proves globalization's negative and significant impact on female labour participation in Pakistan. The increasing trend of globalization is not supporting domestic employment opportunities for females. Rather, it pushed females back from the labor market due to the demand for more skilled labor and the replacing human labor with technology. Moreover, the lack of education and health facilities and the worse economic situation have overturned globalization's positive effects on females.

**Conclusion:** Based on the study's findings, it is suggested to improve female skills through investment in different education, training, and skills development programs to cope with the imminent challenges of globalization on females in Pakistan. Even though researchers have highlighted the impact of globalization on female labour, however; it has not been investigated comprehensively in the context of Pakistan. This study aims to fill this gap by investigating the impact of globalization on females, considering the Economic Misery Index, school enrolment ratio, fertility rate, and GDP growth.

## Keywords

Globalization, Female Labour Participation, Fertility Rate, Economic Growth, Economic Misery Index.

## Introduction

The involvement of females in economic activity has increased in the 21st century. Most females participate in the labor market to improve their well-being and living standards in developing countries. Nowadays, the contribution of females in economic activity is visible; however, in some sectors such as agriculture, livestock, textile, and household as unpaid facility helpers; it has not been praised economically. Most of the females work as casual and temporary labor, which is unrecorded[1]. In developing countries, female is considered unskilled labor due to a lack of proper knowledge and required skills of the labor market. Hence, they are exploited as compared to their male counterparts. The main feature of the globalization process is to create new job opportunities for males and females because it brings foreign investment in domestic industries and export processing zones and creates market linkage with the globe.

However, females are not being equally paid as their male counterparts because; females are considered uncertain and unconfident in the labor market, particularly in developing countries. Moreover, it adversely impacted the employment rate of females, which led to the feminization of poverty as another unfavorable feature of globalization[2]. In developing countries, female is the most vulnerable group in the labor market. It has been highlighted that female laborers are generally working in informal sectors, small-scale industries, and farming activities[3]. As the economy opens its border, it brings many alterations in a different segment of the economy while changing prices of goods and services, wags, the composition of inputs, and income distribution. These changes also affect the demand and supply of goods and inputs in markets.

Moreover, trade also affects employment and wages, which are based on the skills and abilities of laborers. For instance, females are exploited and segregated into low-skill jobs. Therefore, they preferred to hire with low wages and few benefits and perks compared to male labour[4]. Besides, more trading activities can encourage more female employment opportunities, which may increase their income level[5]. Hence, it is very challenging to realize the impact of trading activities on female employment opportunities. Besides, relatives' wages and employment patterns are also restructured due to foreign investment[6]. However, FDI may expand or contract the employment opportunities for unskilled labor; hence, it depends on whether FDI receiving sector is female-oriented or male-dominated. It has also been studied that trade and FDI negatively impacted the female labour supply due to the high demand for skilled labour[2]. Moreover, globalization policies have brought new opportunities for the private sector due to liberalization, stabilization, and privatization. Labor-intensive industries have been established, which brought new employment opportunities for unskilled labor, including females.

Although it benefited females with increasing job opportunities, however; they are considered informal or unskilled labor with no proper labor rights due to a lack of education and awareness regarding labor market policies[6]. Moreover, skill-based technology transfer is the main cause of reducing demand for unskilled labor. Moreover, technology transfer through FDI, imports of machinery, and migration from advanced countries can also provide various opportunities for employment for skilled labor that can suppress demand for female labour[7]. Moreover, imports of more labor-saving technology also negatively impact the female labour supply in developing countries. Hence, globalization has impacted the economic phenomenon through various sources; however, the linkage between globalization and female labour is still inconclusive. The positive and negative impact of globalization has been found on females. Employment creation of females in the exporting sector and free trade zones has increased through global integration. This may enable females to increase their earnings, empowering them to change patriarchal structures, including traditional household relations[8,9]. However, most female laborers are paid low wages or are demeaning or insecure, whereas; the female unemployment rate is higher than males in developing countries. The feminization of poverty is also another negative impact of globalization on females. On the other hand, globalization ensures that the employment of

females in the labor market should be guaranteed by law which shows a positive side of globalization. However, the concepts of harassment and discrimination have also been widely discussed in the literature despite the positive influence of globalization in the labor market[10,11].

In this recent era, skills and knowledge significantly impact the productivity and competitiveness of resources. Developing countries with a low level of education have failed to acquire the favorable benefits of globalization. Therefore, developing countries are encouraged to invest in promoting technical knowledge and skill development of the labor force through implementing various education and training programs. It will not only bring more employment opportunities but also enhance the well-being of individuals, especially females[12]. Despite knowing that Pakistan is not paying attention to investing in human capital that may prepare the labor force, particularly females, for the upcoming globalization and economic integration challenges. It has been proved that traditional female characteristics and skills strongly connect with the demand for labor in small industries, stimulating trading activity in developing countries[13]. Some other economic and non-economic factors, such as fertility rate, economic growth, increasing inflation, and high unemployment, have also been discussed by many neo-classical and feminist economists[14]. Numerous studies are available regarding the distributional impact of trade and economic integration on income and skills after reducing the trading barrier[15].

However, limited evidence has been found on the effect of globalization in developing countries, including Pakistan. In Pakistan, most females are employed in the exporting sector, such as textile and garments. However, fast-growing industries, like transportation construction industries, are male-oriented, where male labor is hired. Also, cultural and social restrictions limit female participation in the labor market. To sum up the discussion, the main focus of this study is to empirically investigate the nexus between globalization and female labour participation in Pakistan. This study also emphasizes other factors such as education, fertility rate, and economic situation that also determine female labour force participation[16,17].

Based on the objective of the study; the following questions have been set:

**Question 1:** Is there any relationship exist between globalization and FLFP in Pakistan?
**Question 2:** How can a worse economic situation affect females entering the labour force?
**Question 3:** To what extent can FLFP be explained by education, health, and economic growth in Pakistan?

## Theoretical Framework and Literature Review

Neo-Classical Trade Theory (NTT) has played a significant role in reshaping trade policies. NTT also incorporates those policies and strategies that encourage gender equality. However, these many feminist economists have criticized this theory for certain reasons. Based on Heckler-Ohlin-Samuelson (H-O), NTT has explained factor endowments and allocation. The H-O models explain that free trade impacts the real income of various resources that are used in production and equalizes wage income among trading countries[18]. It emphasized producing those goods that required extensive use of profuse factors of production. Hence, developing countries prefer to import capital goods, whereas they export primary goods, which are labor-intensive[19]. Export-led Industrialization policies have been stressed by Çagatay. It has been proved that free trade brings economic growth due to more integration with global markets and resources. It also equalizes the prices of goods by bringing competition in the local market due to the availability of imported goods. It also equalizes the difference between incomes of the factor of production, which brings more benefits for low-skilled laborers in terms of higher wages in developing countries[19].

Moreover, NTT envisages the influence of trading policies on reducing the gender wage and employment gap. Moreover, a lack of technical education and vocational skills; females are

considered unskilled labor. Hence, bringing production specialization into labor-intensive industries could increase female employment opportunities. The feminist economist has introduced feminists Trade Theory (FTT) in response to NTT, which completely opposes all arguments of NTT. Heterodox approaches have developed FTT to trade based on Marxian and Post-Keynesian views[20]. FTT has argued that goods are traded due to absolute advantage in factor prices and level of technology. Therefore, all countries cannot enjoy the real fruits of trade. Moreover, FTT has also rejected the idea of comparative advantage due to its unrealistic assumption such as perfect competition, price adjustment, and full employment of all available resources[19,20]. FTT has highlighted and discussed four aspects that NTT has ignored.

First, social aspects should be considered a major factor of the economic process because social spares cannot be separated from economic aspects[19-21]. Feminist economists have raised the conflict regarding the perception of considering labor as input by NTT. However, in reality, the capacity and productivity of an individual can be improved or depleted over time. Second, FTT always believes that other reproductive tasks like home chores and nurturing children are also productive spares, highlighting the importance of females as unpaid laborers. Third; the wages of inputs are set through social and historical processes, however; they should be fixed based on an initial endowment of technological differences that determines the position of the female in the economy. Lastly, FTT also rejected the idea that free trade has brought benefits for all individuals irrespective of the society of gender. It has been highlighted that trade has not benefited females due to higher unemployment, low wages, and lack of access to resources. The NTT favors liberalization and internationalization in terms of improving gender equality in developing countries which relays on female labor supply.

On the other hand, FTT argues that Neo-Classical Trade Theory does not consider gender as a unit of analysis. Labors are considered input rather than individuals; hence, NTT has failed to explain the social outcomes[22]. Moreover, it has been pointed out that inequalities between South and North regions have increased due to Neo-liberal policies. Particular groups, particularly females, have faced unequal and overly burdensome consequences. Trade liberalization has led to a large-scale movement from highly paid industrial jobs into low wages-free trade in the global north. It brought pressure on industries to contract their production and employment and shift their production activities where cheap labor was available with less government interference in the labor market in the north globe. Therefore, many laborers were affected who were working in well-paid industries before.

Moreover, these jobs are extensively replaced by part-time work in the service industry. Adverse impact on females has also been documented due to parallel deterioration in real wages, particularly for females working in the service sector. Furthermore, industrial growth through foreign investment and technology has also brought more male employment opportunities. Even, trade expansion has allowed the exporting of waned agricultural products in developed countries. It has damaged small-scale businesses and substance farming where; most females are employed[11,22]. Hence; there is needed to analyze the impact of neo-liberal policies on females.

In the study of Psacharopoulos & Tzannatos, it has been observed that married female participation in the labor force has increased globally, particularly in industrialized countries, by 10 percent. Elson explores the role of female participation in Kenya's economic growth. It has been highlighted that female productivity can also provide the same level of agricultural output as male counterparts. Even, females have given 20 percent extra yields compared to male farmers.

Moghadam describes globalization as a complex phenomenon of recent times. Female participation in the labor market has increased after trade openness. Due to imported goods, the price of domestic goods has become competitive, pressuring local producers to reduce the cost of production. Therefore, female labor has been employed as cheap labor, increasing the demand

for females and bringing more employment opportunities for low-skill laborers. Fontana et al., also explored the benefits of trade expansion and liberalization policies for males and females. The study shows that females do not have the same level of access to resources and are considered low-skilled; therefore, females could not avail themselves of the benefit of globalization. Many research studies have also been carried out to explore the role of globalization in female employment[23,24]. It has been proved that trade and export expansion activities lead to the feminization of the labor force.

Moreover, Goldin, (1994) also explained that the female labour supply has increased due to economic development because it created more job opportunities for females[25]. Moreover, some research have also proved the impact of structural adjustment policies on employment opportunities for a female since the mid-1980s[26-28].

The study of Hafeez, and Ahmed also explores different socio-economic and demographic factors that also affect the female labour supply. While employing Logit and Probit techniques, the model has been estimated. The finding shows that demographic factors of the family, such as family size, income, age, experience, and education, significantly impact the decision of female labour supply. The authors highlight that the joint family system in developing countries has an opportunity for females because it supports them in sharing domestic burdens and provides assistance in handling young children at home[29].

Moreover, it has been evident from the study of Adebayo that increasing education can support self-employment opportunities for females rather than wage employment probability. The study has also found an adverse impact on female employment in the manufacturing sector in Japan. However, the finding is the opposite in the case of Germany[30].

Siegmann has examined the impact of foreign investment on the gendered labor market in Indonesia[31]. The finding provides evidence of the positive association between foreign investment and high female employment. The study of Menon et al, highlighted that trade liberalization has increased competitiveness which changed the status of females in India[32]. The finding proves the increasing gender wage gap in the manufacturing sector. It has also been explained by author that explains that economic development significantly impacts female participation. The study highlighted that household and husband earnings, education, and low demand of highly educated females are major supply-side factors of low participation of females in the labour market. On the other hand, those sectors which require highly educated females are not flourishing, which pushes females back from the labor force. Moreover, a mismatch of skills and sectoral economic changes has also affected female employment[32]. The study of Oksak & Koyuncu explored the impact of the various dimension of globalization on female labour using panel data from 101 countries from 1990 to 2015. The outcome of the study proved the positive and significant impact of economic and social globalization whereas; a negative but significant on female labour force participation[33]. The study of Gaddis & Pieters revealed that trade liberalization policies have significantly reduced the gender gap in the labor market[34]. Hence; it adversely squeezed male labor because; gender differences are concentrated in tradable sectors, which pushed male labor from tradable to non-tradable sectors, increasing male unemployment but supporting females to enter the labor market with more job opportunities in low-skill sectors[35].

## Methodology

### Data Source

Secondary data during 1973 to 2019 have been gathered from the World Bank Indicator, various publications of the Economic Survey of Pakistan, and the Global Economy.

### Description of Variables

In this study, FLFP has been taken as a dependent variable. In 2019, 24 percent of female laborers took part in economic activity, which is low compared to India and Sri Lanka. Moreover, the KOF Index of Globalization has been taken as an independent

variable that measures three dimensions of globalization Economic, social and Political. KOF Index has been developed by Dreher and was further updated by Dreher et al., the Index range varies between 1 to 100, where closer to 1 shows less integration while closer to 100 reflects more integration[21,22]. Other variables, such as female-to-male enrolment ratio and fertility rate, have been used to investigate the relationship between female health and education and female involvement in the labour market. The low fertility rate positively affects FLFP, whereas; higher education can ensure more employment opportunities for females. GDP growth has been taken to observe how economic prosperity affects the female labour supply. Economic growth also affects the composition of sectors which increase demand for female in the primary sector as male laborers move from the primary sector to the industrial or service sector[35,36]. We have also incorporated Economic Misery Index for measuring the impact of a worse economic position on female labour. Author Okun calculated the Economic Misery Index in the 1970s, simply the sum of unemployment and inflation rate. The increasing value of the Index shows worse economic conditions, which also pressurizes females to enter the labor market to increase their earnings and livelihoods. Table 1 provides details of the variables.

**Table 1: Reference of Selected Variables from Previous Quantitative Studies.**

| Variables | Symbol | Measurement of Variables | Reference Studies |
|---|---|---|---|
| **Female Labour Force Participation Rate** | LnFLFP | Rate | 2, 8, 20, 36, 46, 47 |
| **Globalization Index** | LG | Index | 8, 9, 58 |
| **Real Gross Domestic Product** | LnRGDP | Rate | 59 |
| **Fertility Rate** | LnFR | Rate | 8, 9, 46 |
| **Female to Male Enrolment Ratio** | LnENRL | Ratio | 8, 9, 46, 61 |
| **Economic Misery Index (Inflation Rate plus Unemployment Rate)** | LEM | Index | 2, 46, 47 |

Source: Compiled by Author

**Estimated Model Framework**

This study examines the nexus between overall globalization and FLFP, including other control variables. The model has been estimated through equation (1).

$$\mathbf{FLFP = f(GI, RGDP,ENRL,FR, EM)..... (1)}$$

Where,

FLFP = Female Labour Force Participation
GI = Globalization Index
RGDP = Real Gross Domestic Product
ENRL = School Enrollment Ratio
FR = Fertility Rate
EM = Economic Misery Index (Arthur Okun)

Equation (2) represents an econometric form of the model for estimation purposes while adding an error term.

$$\mathbf{LnFLFPt = \alpha1 + \alpha2\ LnGI + \alpha3\ LnFR + \alpha4\ LnENRL + \alpha5\ LnRGDP + \alpha6 Ln\ EM + \epsilon t..... (2)}$$

**Unit Root Tests and ARDL**

For quantitative analysis, this study applies the ARDL bound testing approach. However, it is necessary to check the stationarity of time series data. This study applied the most widely used test, such as Augmented Dickey-Fuller (ADF) and Philips-Perron (PP). For time-series data, different estimation techniques are available such as Ordinary Least Square (OLS) and Co-integration analysis. However, these methods have various methodological issues that make them difficult to apply. For instance, the assumptions of OLS consider the residual term to be normally distributed with zero mean and finite constant. Whereas in the presence of stationarity in the data, OLS provides vague and unclear outcomes.

On the other hand, co-integration analysis requires that all data should be integrated at level (I). If time series data are a combination of level (0) and first difference (1), then applying OLS and Co-integration makes the situation more complicated. The main advantage of ARDL is to incorporate all these methodological issues. It does not require pre-testing of unit root and can be an application with a different level of the order of integration of variables. ARDL encounters all these procedural issues in one model and provides efficient outcomes, which is its preeminent advantage[37].

**The ARDL model is modeled as follows:**

$$\Delta LnFLFP_t = \vartheta_1 + \vartheta_2 T + \vartheta_3 LnGI_{t-1} + \vartheta_4 LnFR_{t-1} + \vartheta_5 LnENRL_{t-1} + \vartheta_6 LnRGDP_{t-1} + \vartheta_7 LnEM_{t-1} + \sum_{l=1}^{a} \vartheta_1 \Delta LnFLFP_{t-l} + \sum_{m=0}^{b} \vartheta_{2_1} \Delta LnGI_{t-m} + \sum_{n=0}^{C} \vartheta_{2_1} \Delta LnFR_{t-n} + \sum_{o=0}^{d} \vartheta_{2_1} \Delta LnENRL_{t-o} + \sum_{p=0}^{e} \vartheta_3 \Delta LnRGDP_{t-p} + \sum_{q=0}^{f} \vartheta_4 \Delta LnEM_{t-q} + e_i \quad \text{.....(3)}$$

Where Δ indicates the difference operator, whereas; T explains the trend variable, and e is the error term. The study's null and alternative hypotheses have been set and tested to prove the nexus between FLFP, independent, and control variables.

**Null hypothesis**

$$H_0 : \vartheta FLFP = \vartheta GI = \vartheta FR = \vartheta ENRL = \vartheta RGDP = \vartheta EM = 0$$

**Alternative hypothesis**

$$H_1 : \vartheta FLFP \neq \vartheta GI \neq \vartheta FR \neq \vartheta ENRL \neq \vartheta RGDP \neq \vartheta EM \neq 0$$

(51), have generated upper critical bound (UCB) and lower critical bound (LCB). For accepting the hypothesis of co-integration, the computed F-value should be more than UCB. After the determination of co-integration, long-run coefficients are estimated through equation (4).

$$LnFLFP_t = \delta_{\circ 1} + \sum_{i=1}^{a} \delta_{GI} LnGI_{t-i} + \sum_{j=0}^{b} \delta_{FR} LnFR_{t-j} + \sum_{l=0}^{d} \delta_{ENRL} LnENRL_{t-l} + \sum_{m=0}^{e} \delta_{RGDP} LnRGDP_{t-m} + \sum_{s=0}^{j} \delta_{EM} LnEM_{t-s} \quad \text{.....(4)}$$

The next step is to establish the short-run impact of the variables, which determines the convergence of variables in the long run. Equation (5) represents the Error Correction Model (ECM), estimated for short-run analysis.

$$\Delta LnFLFP_t = \delta_{\circ 1} + \sum_{i=1}^{a} \delta_{GI} \Delta LnGI_{t-i} + \sum_{j=0}^{b} \delta_{FR} \Delta LnFR_{t-j} + \sum_{l=0}^{d} \delta_{ENRL} \Delta LnENRL_{t-l} + \sum_{m=0}^{e} \delta_{RGDP} \Delta LnRGDP_{t-m} + \sum_{s=0}^{j} \delta_{EM} \Delta LnEM_{t-s} + \vartheta ECM_{t-1} + \varepsilon_i \ldots\ldots\ldots (5)$$

Here, ECM $_{(t-1)}$ represents a lagged error term that measures convergence speed from short-run to long-run equilibrium. It is said that the difference in FLFP is explained by the difference of the linear (non-linear) term of overall globalization plus lagged term of control variables, lagged term of the error term, and the stochastic term. In this study, various diagnostic tests have also been used to check the problem of normality, serial correlation, model specification, and Heteroskedasticity.

**Results and Discussion**

Descriptive statistics are used to summarize the data. It presents some statistics related to variables of an estimated model in terms of minimum and maximum values, measures of central tendency (mean and median), the measure of variability (standard deviation), and normality.

**Table 2: Descriptive Statistics.**

| | LOG(FLFP) | LOG(FR) | LOG(ENRL) | LOG(EM) | LOG(GI) | LOG(RGDP) |
|---|---|---|---|---|---|---|
| **Mean** | 2.630565 | 1.567737 | 4.061026 | 2.61107 | 3.629368 | 1.443039 |
| **Median** | 2.646175 | 1.65058 | 4.07276 | 2.630294 | 3.627536 | 1.495149 |
| **Maximum** | 3.301303 | 1.888584 | 4.519627 | 3.389799 | 4.059431 | 2.324347 |
| **Minimum** | 1.882514 | 1.041217 | 3.555348 | 1.960095 | 3.323596 | 0.00995 |
| **Std. Dev.** | 0.441441 | 0.294235 | 0.278871 | 0.302016 | 0.255173 | 0.495411 |
| **Skewness** | -0.077395 | -0.3286 | -0.106072 | 0.406732 | 0.229616 | -0.633658 |
| **Kurtosis** | 1.757952 | 1.52332 | 1.78841 | 3.251199 | 1.472624 | 3.194725 |
| **Jarque-Bera** | 3.068009 | 5.116134 | 2.962872 | 1.419447 | 4.981553 | 3.219512 |
| **Probability** | 0.21567 | 0.077454 | 0.227311 | 0.49178 | 0.082846 | 0.199936 |
| **Sum** | 123.6365 | 73.68364 | 190.8682 | 122.7203 | 170.5803 | 67.82281 |
| **Sum Sq. Dev.** | 8.964046 | 3.98241 | 3.577379 | 4.195839 | 2.995209 | 11.28987 |
| **Observations** | 47 | 47 | 47 | 47 | 47 | 47 |

Table 2 shows that all median values of FLFP, FR, ENRL, EM, and RGDP are more than mean values which shows a tendency toward negative skew, whereas; the mean value of GI is more than the median value, which shows a tendency toward positive skew. Correlation is used to investigate the direction and strength of the association between two variables. The correlation matrix presents the coefficients of correlation that show which pair has the highest correlation.

**Table 3: Correlation Matrix.**

| | LOG(FLFP) | LOG(FR) | LOG(ENRL) | LOG(GI) | LOG(EM) | LOG(RGDP) |
|---|---|---|---|---|---|---|
| **LOG(FLFP)** | 1 | -0.9551 | 0.9388 | 0.8992 | 0.1196 | -0.4622 |
| **LOG(FR)** | | 1 | -0.9103 | -0.9271 | -0.1844 | 0.4377 |
| **LOG(ENRL)** | | | 1 | 0.9289 | 0.1378 | -0.4533 |
| **LOG(GI)** | | | | 1 | 0.1986 | -0.4307 |
| **LOG(EM)** | | | | | 1 | -0.2896 |
| **LOG(RGDP)** | | | | | | 1 |

FLFP has a negative and strong correlation with fertility rate, whereas a positive and high correlation with school enrolment ratio and globalization. Furthermore, FLFP has a positive but weak correlation with economic misery and a negative but moderate correlation with GDP growth.

**Unit Root Test**

As mentioned above, the unit root is a necessary condition before applying time-series data. Time series data is usually de-trended before analysis to obtain significant results. Because it is required to ensure that all variables are integrated at level (0) or first difference (1), and none of any variable is integrated at the second difference (II).

**Table 4: Unit Root Test.**

| **ADF Test with Trend and Intercepts** | | | | |
|---|---|---|---|---|
| | **Level** | | **1st difference** | |
| | **T-Statistics** | **Probe- values** | **T-Statistics** | **Probe-values** |
| **FLFP** | -4.102133 | 0.012 | ---------- | ---------- |
| **FR** | -2.510913 | 0.3217 | -5.303647 | 0.0004 |
| **ENRL** | -2.398727 | 0.3754 | -4.716484 | 0.0023 |
| **EM** | -3.634964 | 0.0377 | ---------- | ---------- |
| **GI** | -0.74501 | 0.9633 | -6.588226 | 0 |
| **RGDP** | -5.21718 | 0.0005 | ---------- | ---------- |
| **Philips-Perron Test with Trend and Intercepts** | | | | |
| | **Level** | | **1st difference** | |
| | **T-Statistics** | **Probe- values** | **T-Statistics** | **Probe-values** |
| **FLFP** | -4.105671 | 0.0118 | ---------- | ---------- |
| **FR** | -2.363949 | 0.3928 | -5.468253 | 0.0003 |
| **ENRL** | -2.565899 | 0.297 | -4.047743 | 0.0139 |
| **EM** | -3.634964 | 0.0377 | ---------- | ---------- |
| **GI** | -0.854882 | 0.9524 | -6.588226 | 0 |
| **RGDP** | -5.245784 | 0.0005 | ---------- | ---------- |

The finding of the unit toot test has been presented in Table 4. The ADF test has proved that FLFP, EM, and RGDP are stationary at the level I(0) with trend and interest, whereas; FR, ENRL, and GI are integrated at the first difference I(1) with 1%, 5%, and 10% level of significance. The same findings have been confirmed by the outcomes of the PP unit root test.

**Estimation of ARDL Bound Testing Approach**

Although; ARDL does not require pre-testing for unit root tests, however; to avoid any uncertainty due to the presence of an integrated stochastic trend of I(2), we have applied two different tests. The outcomes of unit root tests provide a valid justification for applying the ARDL bound testing approach for dynamic analysis.

**Table 5: ARDL Co-integration Analysis.**

| | | |
|---|---|---|
| **Dependent Variable** | Ln(FLFP) | |
| **Model Selection Criteria** | Akaike info criterion (AIC) | |
| **Estimated Model** | Ln(FLFP) =f Ln(GI), Ln(RGDP), Ln(FR), Ln(ENRL), Ln(RGDP), Ln(EM) | |
| **Selected lag Structure** | ARDL (6, 3, 2, 4, 4, 1) | |
| **Null Hypothesis** | No Long-run Relationship Exist | |
| **F-statistic** | 9.477259 K= 5 | |
| **Significance** | **Lower bound I(0)** | **Lower bound I(1)** |
| **10%** | 2.38 | 3.45 |
| **5%** | 2.69 | 3.83 |
| **2.5%** | 2.98 | 4.16 |
| **1%** | 3.31 | 4.63 |
| **R-Square** | 0.997763 | |
| **Adjusted R-square** | 0.993609 | |
| **F-statistic** | 138.7398 | |
| **Prob(F-statistic)** | 0.00000 | |
| **Durbin-Watson stat** | 2.251302 | |

Table 5 illustrates the estimated model of the study through the ARDL method as it has been found that the F-statistics is 9.4772, which is higher than UCB at a 1 percent level of significance. It is proving long-run co-integration among variables. Moreover, for the appropriate selection of lag order for dependent and independent variables, Akaike Information Criterion (AIC) has been used based on automatic selection, however; researchers have selected maximum lags.

**Table 4: ARDL Long Run Analysis.**

| | | | | |
|---|---|---|---|---|
| **Dependent Variable** | LnFLFP | | | |
| **Optimal Lags** | ARDL (6, 3, 2, 4, 4, 1) | | | |
| **Estimated Model** | Ln(FLFP) =f Ln(GI), Ln(RGDP), Ln(FR), Ln(ENRL), Ln(RGDP), Ln(EM) | | | |
| **Model Selection Criteria** | Akaike Info Criterion (AIC) | | | |
| **Variables** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.** |
| **LOG(FR)** | -0.47052 | 0.193205 | -2.43535 | 0.0288 |
| **LOG(ENRL)** | 0.107388 | 0.11376 | 0.943986 | 0.3612 |
| **LOG(EM)** | 0.188754 | 0.015755 | 11.9806 | 0 |
| **LOG(GI)** | -0.77156 | 0.18041 | -4.27672 | 0.0008 |
| **LOG(RGDP)** | 0.018031 | 0.008339 | 2.162318 | 0.0484 |
| **C** | 4.362533 | 0.734346 | 5.940706 | 0 |
| **@TREND** | 0.033866 | 0.002618 | 12.93555 | 0 |

The long-run model of the corresponding ARDL (6, 3, 2, 4, 4, 1) for the FLFP can be written as follow:

**LnFLFP= -0.4705*LnFR + 0.1074*LnENRL + 0.1888*LnEM -0.7716*LnGI + 0.0180*LnRGDP**

Long-run coefficients have been presented in table 5. A one percent increase in globalization has been shown to decrease female participation in the labor force by 0.77 percent. The finding of the study is in line with the other studies[26,38-42]. Although gradual integration with the world has brought more employment opportunities in many sectors, however; it is not clear yet whether these sectors are female or male-oriented in Pakistan. Trade liberalization reduces the bargaining power of female labor and employment in tradable sectors; import penetration also increases foreign competition and discriminatory behaviors that are unfavorable to female labor[43,44]. Regarding fertility rate, we have found an inverse and significant relationship with FLFP. A similar finding has also been proved by others[34,45]. Female has less opportunity to participate in the labor market with more children, therefore; it is expected that reducing the fertility rate may increase female contribution in the labor market. Education is another factor that encourages females to take part in economic activity. We have found a positive, however insignificant, relation between the school enrolment ratio and FLFP[46]. Moreover, the reason for low female participation is a gender gap in education in Pakistan, which also influences cultural impacts[47]. Hence increasing enrolment ratio shows declining gender inequality which further increases female employment opportunities. A positive and significant association has been proved between FLFP and economic growth. Increasing GDP growth encourages more economic activity in various sectors of the economy; hence, it increases the demand for female labour in various sectors[28]. Higher economic growth ensures the opportunity for work and salaries, which propels a female to participate in economic activity[2]. The finding shows a significant positive association between Economic Misery Index and female labour supply. It has been studied that increasing unemployment discourages workers and affects male labour; however, during the worse economic situation, females always choose to participate in the labour market[48]. On the other hand, increasing the price of goods create financial pressures and cost of living, which increases household expenditure. Therefore, the female has to participate in economic activity to earn extra income[2,49].

**Table 6: ARDL Error Correction Model for Short Run Analysis.**

| **Dependent Variable** | LnFLFP | | | |
|---|---|---|---|---|
| **Optimal Lags** | ARDL(6, 3, 2, 4, 4, 1) | | | |
| **Estimated Model** | Ln(FLFP) =f Ln(GI), Ln(RGDP), Ln(FR), Ln(ENRL), Ln(RGDP), Ln(EM) | | | |
| **Model Selection Criteria** | Akaike info criterion (AIC) | | | |
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.** |
| **C** | 16.53006 | 1.87444 | 8.818666 | 0 |
| **@TREND** | 0.12832 | 0.0147 | 8.729491 | 0 |
| **DLOG(FLFP(-1))** | 2.417122 | 0.325936 | 7.415951 | 0 |
| **DLOG(FLFP(-2))** | 1.555307 | 0.271059 | 5.737893 | 0.0001 |
| **DLOG(FLFP(-3))** | 1.598894 | 0.204031 | 7.836526 | 0 |
| **DLOG(FLFP(-4))** | 1.026858 | 0.169882 | 6.044533 | 0 |
| **DLOG(FLFP(-5))** | 0.629969 | 0.144809 | 4.350352 | 0.0007 |
| **DLOG(FR)** | -0.15869 | 0.42846 | -0.37037 | 0.7167 |
| **DLOG(FR(-1))** | 1.573885 | 0.469487 | 3.352351 | 0.0047 |
| **DLOG(FR(-2))** | 0.96269 | 0.366228 | 2.628661 | 0.0198 |
| **DLOG(ENRL)** | 0.215916 | 0.119935 | 1.800279 | 0.0934 |
| **DLOG(ENRL(-1))** | -0.45864 | 0.126008 | -3.63971 | 0.0027 |
| **DLOG(EM)** | 0.076608 | 0.035133 | 2.180479 | 0.0468 |

| | | | | |
|---|---|---|---|---|
| **DLOG(EM(-1))** | -0.52326 | 0.06873 | -7.61327 | 0 |
| **DLOG(EM(-2))** | -0.38948 | 0.059947 | -6.49696 | 0 |
| **DLOG(EM(-3))** | -0.1654 | 0.034856 | -4.74515 | 0.0003 |
| **DLOG(GI)** | 0.098194 | 0.085955 | 1.142391 | 0.2725 |
| **DLOG(GI(-1))** | 2.8891 | 0.3628 | 7.963338 | 0 |
| **DLOG(GI(-2))** | 1.731644 | 0.332671 | 5.205271 | 0.0001 |
| **DLOG(GI(-3))** | 0.816559 | 0.309971 | 2.634304 | 0.0196 |
| **DLOG(RGDP)** | 0.019801 | 0.017614 | 1.124121 | 0.2799 |
| **ECM(-1)** | -3.7891 | 0.431326 | -8.78476 | 0 |
| **R-squared** | 0.893156 | **F-statistic** | | 7.563313 |
| **Adjusted R-squared** | 0.775066 | **Prob(F-statistic)** | | 0.000021 |
| **Durbin-Watson stat** | | 2.251302 | | |
| **Null Hypothesis: No levels of relationship** | | | | |
| **Bound Test** | **Value** | **Sign in.** | **I(0)** | **I(1)** |
| **F-statistic** | 9.477259 | 10% | 2.75 | 3.79 |
| **K** | 5 | 5% | 3.12 | 4.25 |
| | | 2.5% | 3.49 | 4.67 |
| | | 1% | 3.93 | 5.23 |

Table 6 represents the short-run coefficients of the model. For long-run convergence, the coefficient value of ECM should be negative and significant, which are the two most important criteria. We have found the estimated value of ECM (-1) is -3.78 (0.0000) proving both criteria that if any shock occurs in the short run, it will be temporary and corrected in the long run.

**Diagnostic and Stability Tests**

**Table 7: Diagnostic tests.**

| | **F-statistics (Prob. value)** |
|---|---|
| **$\chi$2 Norm** | 2.277120[0.3202] |
| **$\chi$2 Serial** | 0.340025[0.7184] |
| **$\chi$2 Hetero** | 0.589890[0.8814] |
| **$\chi$2 Reset** | 0.071851[0.7929] |

The values of f-ratios are in parentheses. 2. The values in brackets are probabilities. 3. X2 Serial is the Breusch–Godfrey LM test for Serial correlation. 4. X2 Norm is the Jarque–Bera normality test. 5. X2 Hetero is the Breuseh-Godfrey for heteroscedasticity. 6. X2 RESET is the Ramsey test for omitted variables/functional.
Source: Estimated and Tabulated by Author

For the significance of the model, we have applied several post-estimation diagnostic tests, which have been presented in table 7. Our estimated model has passed all diagnostic tests for functional form, normality, heteroscedasticity, and serial correlation. Moreover, the stability of the parameters has been checked through CUSUM and CUSUMsq tests developed by Brown et al.[50], which proves the constancy of the coefficients in a model.

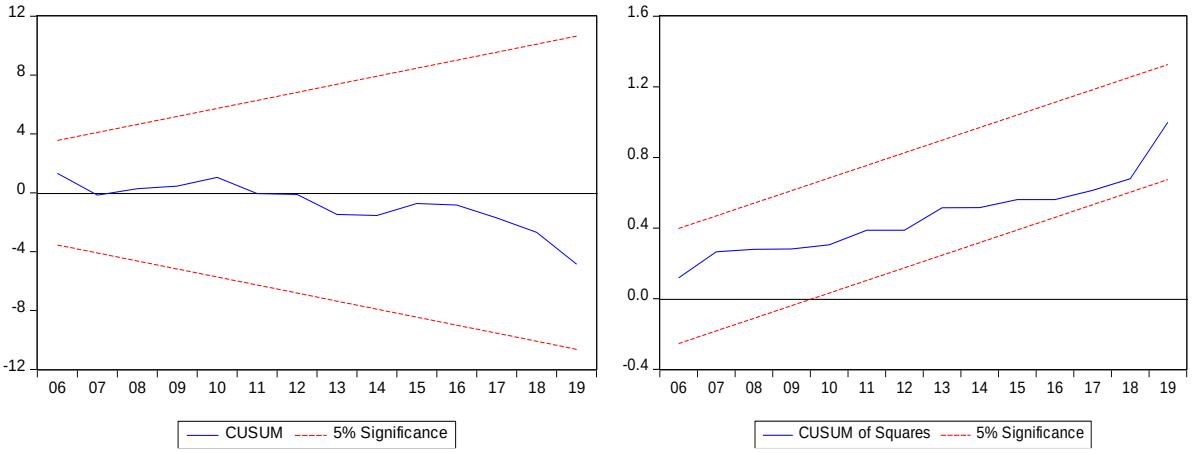


**Figure 1: Representation of CUSUM and CUSUMSQ Plot.**

Figure 1 shows plots of the CUSUM and CUSUMsq tests. The blue line between critical boundaries proves that our estimated model coefficients are correctly specified and reliable.

## Discussion

The main objective of this study is to examine how globalization impacts female labour force participation in Pakistan. The process of globalization has increased global integration, which has stimulated human networks to become more interconnected. Besides this, unprecedented developments in several dimensions, such as communication, transport and infrastructure, trade, and information technology, have also pushed the process of globalization. However, it is considered "marginalizing the less-educated and low-skilled workers," particularly female labor in developing countries. Expansion of new business will no longer increase employment; however, it may cause high remuneration of capital due to its higher mobility compared to the labor force. There is a need to increase the skills and capabilities of female labor to make them more competitive in the global labor market[51-53]. Globalization brings employment opportunities for laborers with significant education and skills; hence, female laborers were forced to work with less pay and under unfavorable conditions[54,55]. Moreover, there are many other reasons behind the contrary influences of globalization on the female labor market in Pakistan, such as low demand for unskilled labor, technology transfer, poor labor standards, discrimination against females, wage inequality, reproductive workload, etc[56].

Demographic and social characteristics of female laborers have undergone great modifications. For instance, multinational companies also hired older, unmarried, educated females in their quest for increasing flexibility and taking advantage of their needs. Fertility and education are important determinants of female labour force participation in Pakistan. A fundamental realization is that childbearing impacts female decision to sit at home, which reduces their participation in the labor market at least in advance. Huber and Stephens have also highlighted that globalization has a "gender-discriminating effect" due to "gender-differentiated initial conditions" which allows discriminating females[57]. There is a discriminator gender ideology that resulted in separate roles of females and males in the productive spheres. The gender division of labor also disadvantages females due to their inferior condition in the labor market and their role in the care economy. It has also been explained by Bloom et al. that special preferences are given to young, edited females, particularly in the industrialization phase, where employment is considered paid work outside the home. Manufacturing and industrial services do not allow females to care for children and perform their duties

simultaneously. On the other hand, increasing female enrolment also increases their productivity in terms of editions[58]. Furthermore, Mujahid et al., explained that increasing GDP also increases female participation while providing more education and dynamics of economic activity. It also provides more opportunities for better access to employment through a wide range of economic activities due to economic expansion[59]. Inflation and unemployment have also risen in Pakistan due to several factors that have pushed females to participate in the labor market to support their male counterparts. Thus, it has also become an important determinant of increasing female labour participation in Pakistan[60].

economic advantages of unskilled labor, particularly females. The objective of this study is to find nexus between overall globalization and FLFP in Pakistan using time series data from 1973 to 2019. This study also analyzes the impact of other economic and non-economic factors that affect the female labour supply, such as GDP growth, inflation, unemployment rate, fertility, and education level. The adverse effects of globalization without considering females have been evident in this study. The globalization flow has failed to incorporate the socio-economic and political risks; therefore, there is a need to increase the education and skills of females. Pakistan should tightly monitor the development and growth of female labor. Hence, education and skills development programs should be implemented to ensure the long-term employability of females.

## Conclusion

Based on international strategies, globalization aims to expand domestic markets globally by facilitating global communication, technological advancement, and socio-economic development. It gradually changes the economy while affecting different groups such as households, businesses, and the government. The opponents of globalization are concerned that increasing trade and FDI worsen the economic advantages of unskilled labor, particularly females. The objective of this study is to find nexus between overall globalization and FLFP in Pakistan using time series data from 1973 to 2019. This study also analyzes the impact of other economic and non-economic factors that affect the female labour supply, such as GDP growth, inflation, unemployment rate, fertility, and education level. The adverse effects of globalization without considering females have been evident in this study. The globalization flow has failed to incorporate the socio-economic and political risks; therefore, there is a need to increase the education and skills of females. Pakistan should tightly monitor the development and growth of female labor. Hence, education and skills development programs should be implemented to ensure the long-term employability of females.

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