

Does Female Stock Labor Promote Economic Growth? A Case of Pakistan

Kousar Ali

MPhil Scholar Economics, Shaheed Benazir Bhutto Women University Peshawar
kosarshamsher1234@gmail.com

Dr. Fariha Sami

Assistant Professor Economics, Shaheed Benazir Bhutto Women University Peshawar
farihasami@sbbwu.edu.pk

Dr. Yasir Arafat

Lecturer, Department of Economics, University of Chitral
yasir.eco@uoch.edu.pk

Abstract

This study investigates the significant contribution of the female workforce to the economic growth of Pakistan for the time 1988 - 2022. Various methodological tests are employed to determine the integration levels of the study's variables. Subsequent diagnostic tests are conducted to assess autocorrelation and heteroscedasticity, ensuring adherence to the assumptions of classical linear regression. Given the mixed order of integration of variables, the Autoregressive Distributive Lag Model (ARDL) is applied for both long-run and short-run estimations. The findings indicate a positive impact of female capital stock on Pakistan's economic growth. Furthermore, the Multivariate Granger Causality test establishes a one-way causal relationship, demonstrating the influence of the female stock of capital on the economic growth of Pakistan. In conclusion, the study advocates for creating ample opportunities for women in Pakistan to unlock the full potential of the economy.

Key words: *Economic Growth, Female Labor, ARDL, Granger Causality Crisis*

Introduction

The role of females in the economy holds great importance. It is emphasized that their participation is important for two reasons: equity and economic efficiency. The former manifests that through this participation, the females can finally enhance their economic position; the latter is achieved because the development capacity is expanded. Furthermore, female participation in the economy helps decrease gender gaps in education, improves maternal health, and, more importantly, manifests their hidden contributions in the form of unpaid labor (Mujahid and Zafar, 2012).

The term "female stock of labor" generally refers to the aggregate or total quantity of female labor available within a particular workforce, sector, or economy. It encompasses the population of women actively engaged in various forms of employment, including both formal and informal sectors. The concept of "stock" implies a cumulative or collective representation, emphasizing the overall presence and participation of women in the labor market. This measure considers factors

such as the number of employed women, their skill levels, occupations, and roles within the workforce. The term is often used in economic and sociological contexts to analyze the contribution of women to labor markets and to assess the impact of gender diversity on economic growth, productivity, and societal development. The females' contribution to the labor market is exhausted to work on their financial status (Awan, 2018). Technological advancement, declining fertility rate, reduction of gender inequality, growing household earnings, and structural changes in living standards are the main factors that increase female work in economic activities. Due to these factors, it is necessary to investigate women's participation in Pakistan's employment market and its impact on economic development. (Awan, 2018)

According to Aydin & Erdem (2014), although females have participated in all stages of production in the economy, they properly started working for wages after the Industrial Revolution. During World War I and II, the male labor force was conscripted into the army; the women's participation in the workforce increased considerably. In the mid of the twenties, the services sector dominated the economies of the emergent nations; participation of women in the workforce has witnessed unprecedented spikes since then, after 1970, with the increase in international trade and the advancement of globalization, numerous countries adopted a flexible mode of production; this transformation has made favorable grounds for female to come into the workforce. As a result of this wholesome opportunity, women's workforce participation rate is flourishing with time. It can be argued that females do play instrumental roles in different phases of economic growth.

Pakistan is experiencing segmental progress where the extent of gainful youthful people is expanding. It is in certainty the segmental profit for the future advancement of Pakistan. The state's financial growth reveals that both men and women contribute to buying and selling. It is obvious by different considerations, as within the preliminary stage of financial improvement, the female support increments uncommonly as free-willed household specialists within the agribusiness bisection. Afterward, their work increment within the fabricating and administration segments. When a female gets more education, they will have more chances in the services sector. Education assures a higher pay level and facilitates labor in their market. Hence, a strong association exists between women's workforce contribution and economic growth (Mujahid *et al.*, 2013).

The social and economic features affect women's contribution in the labor force, such as women facing more restraints than men to go into the labor market. So, there is an irregular appearance of females in the labor market, and they have less power to go to the high position institution. In a society where social rules are opposite to women's work and their role is confined to housekeeping, women do not get high education and do not want to contribute to outdoor occupations. Most of the population is financially, politically, and culturally depressed of their individual and legal rights. The research problem behind this study is to analyze the contribution of women in the workforce statistically and furthermore, the computation of the women workforce will also be done and will recommend policies to improve productivity and working conditions for women in the workforce according to Pakistan.

Literature Review

Female participation through labor force and their contribution to the economy is an emerging area of interest for researchers and international organizations. Quantitative research frequently points out that the increase of female's share in the labor force can enormously benefit economic growth, development, and welfare (Asian Development Bank, 2015). Aluzara et al (2019) and Khaliq & Khan (2017) examined U-shaped dynamic and economic growth variables such as female labor supply in Pakistan for the period 1990-2017 and found that the U-shaped dynamic link among financial development and women workforce contribution is important for Economy of Pakistan. Similarly, Obodoechine (2019) indicated that the female workforce contribution of African countries in the labor market has a positive impact on financial expansion. The result also discusses the average rate increase of the Female labor force participation and gross domestic product by 10% to 2.7%, respectively. While Mazalliu & Zogjani (2015), found negative consequences of financial development on women in the workforce. The development of financial markets, innovations, and reforms in enterprises had positive effects.

Javed et al (2022) indicated that wage inequality, labor force participation, government development spending, and human development significantly impact economic prosperity. The study concludes that gender-based disparities in the labor market pose a primary impediment to the economic welfare of the populace. Alleviating wage discrepancies is identified as a key factor in enhancing overall economic prosperity. The recommendation is for collaborative efforts by the government and private sector to address gender-based wage gaps. Furthermore, the study suggests that the government should augment development expenditure, particularly in sectors such as education, health, and social infrastructure, to foster increased economic well-being.

Wang et al (2021) revealed that a rise in the share of female labor is associated with a decrease in emissions embedded in trade. This effect becomes more pronounced when accounting for control variables, namely education level and female political participation. Specifically, in developed nations, heightened female labor force participation correlates with a reduction in embodied carbon linked to exports and imports, specifically within the service sector. In contrast, in developing countries, increased female labor force participation is linked to a decrease in the embodied carbon of imports and exports, affecting both the service and industrial sectors, respectively. The study offers policymakers novel insights, suggesting that encouraging female employment can be an effective strategy for reducing trade-related emissions embodied in trade.

Altuzarra et al (2021) empirically investigated the impact of gender inequalities in education, labor markets, and institutional representation on economic growth, using data from the World Bank Development Indicators database spanning 1990–2017. Employing cross-country and panel regressions, the findings reveal that gender equality in education positively contributes to economic growth, with this effect being more pronounced in SSA countries compared to the overall sample of developing nations. However, the female–male ratio of labor market participation does not show statistical significance. Additionally, a noteworthy positive relationship is observed between the presence of women in parliaments and economic growth in the overall sample of developing countries, but this association turns negative for SSA countries. It is suggested that, despite increased political participation by women in SSA countries, significant barriers may impede their ability to influence political priorities and impact economic growth.

Awan (2018) examined that over a period, women's contribution is reliably expanding, and unemployment and fertility rates are diminishing it is a good sign that female labor contribution is increasing, and it will ultimately enhance national income. Similarly, Forgha & Mbella (2016) found that fertility rate, male workforce, dependency ratio, and income per capita were obvious and evident determinants for females to participate in the labor force in Cameroon. The economic growth equation showed opposing significance among men and women labor supply on financial growth over the study period. According to Ehsan (2015), fertility is the main determinant of female labor force contribution. While, literacy is overvalued in determining women's workforce contribution.

Women play a crucial role in the financial growth of a nation. The significant participation of women in the labor market reduced poverty, and unemployment, and improved their living standards. The quantitative studies dispensed here are basically considerate of the effect of women's workforce participation on the economic expansion of Pakistan. The current study attempted to wrap up the primary variable i-e real gross domestic product in per capita, female literacy rate as a proxy for education level, and dependency ratio.

Theoretical Framework and Econometric Methodology

Inclusive growth, the advantages of which are correspondingly shared and appreciated by all parts of the population, is the talk of the town these days. In such circumstances, the participation of females alongside males is one of the prerequisites of inclusive growth. That is why attention towards decreasing gender inequality is on the rise. The participation of women in the labor force is deemed as critical and important as is male labor force participation. This is a type of reaction to the worldwide realization that equal or unequal attention to both genders in terms of resource allocation, rights and economic opportunities can have positive or negative consequences for the growth of the overall economy. It is now widely accepted that, along with others, females must play a significant role in a country's economic advancement.

Theoretical Framework

The most relevant concept to the research being conducted is the neoclassical growth model presented by Robert Solow. Labor, capital, and the level of technological advancement take center stage in neoclassical growth models. One such model consists of applying the Cobb-Douglas production function, which entails the idea of economic growth accounting. Initially, R. Solow and M. Abramovich developed it and later furnished it by E. Denison and A. Maddison. Economic growth accounting is meant to calculate the solid impact of the basic growth factors by differentiation of the production function. Consequently, the rate at which the output grows can be calculated as the sum of the individual expansion rates of work and capital, represented by their relative share in income and the distinction in total factor productivity. Though some of its assumptions are unrealistic, it is a handy gadget for studying the association between financial development and variations in its major supply sources (Raleva, 2014).

It is probably the best-known model of economic growth. It asserts that economies will cluster to a similar level of income provided that the savings, productivity growth, labor force growth, and depreciation rates are similar. This model is an extension of the Harrod-Domar growth model in that it introduces a second factor, labor; and a third factor, technology, to their growth model. It is

different from the other because it assumed a competitive economic environment and showed diminishing returns to labor and capital individually but constant returns to both collectively. The factor of technological progress represents long-term growth with its level being determined exogenously. The aggregate production function representing the model is as follows:

$$Y = A.K^\alpha(L.H)^{(1-\alpha)}$$

Whereas;

Y= represents real Gross Domestic Product

A=technology (including natural resources)

K=Physical stock of Capital

L= Productivity of Labor

H=human capital

α =Intercept of the model

Based on the review of literature above, the dependent variable to be used in this study is real gross domestic product per capita, RGDP. Independent variables to be used in this study are the focus variable, female stock of labor, LFPF; the control variables, female literacy rate as a proxy for the level of education of females, LRF, and age dependency ratio, AGEDP.

Model Specification:

$$RGDP_t = \beta_0 + \beta_1 LFPF_t + \beta_2 LRF_t + \beta_3 AGEDP_t + \varepsilon_t$$

Where,

RGDP is real gross domestic product per capita (in dollar), LFPF is the female stock of labor (in numbers), LRF represents female literacy rate as a proxy for the level of education of female (in percentage), AGEDP shows dependency ratio (number of employed labor force / total population x 100), β_0 is the intercept, β_1 , β_2 , β_3 are parameters of independent variables and ε_t is error term.

Moreover, the study downloaded data from the World Bank (WDI) for the years 1980 to 2022. The time duration is selected based on the availability of data.

Results and Discussions

To check the stationarity of the data, the Augmented Dicky Fuller Test and Phillips-Perron tests were used. The results of the tests are given in Table 1 and Table 2. RGDP and AGEDP are stationary at level and are I(0). On the other hand, LFPF and LRF are stationary at first difference and are I(1). As the variables show mixed order of integration, an appropriate model for its estimation would be the Autoregressive Distributive lag Model (ARDL).

Table 1: Results of ADF Test

Variables	Level		1st Difference		Level of Integration
	C	C & T	C	C & T	
RGDP	0.107	-1.586***			I(0)
LFPF	-0.910	-1.45	-2.461	-2.135***	I (1)
LRF	0.616	-2.324	-1.802	-1.830***	I (1)
AGEDP	0.120	-4.222***			I (0)

Note: The null hypothesis is the presence of unit root. Level of significance is *** $p < 0.01$, ** $p < 0.02$ and * $p < 0.1$.

Table 2: Results of Phillips-Perron Test

Variables	Level		Ist Difference	Level of Integration
	C	C & T	C	
RGDP	0.121	-1.871***		I (0)
LFPF	-1.748	-3.512	-7.805***	I (1)
LRF	1.355	-1.842	-5.113***	I (1)
AGEDP	1.292	-1.571***		I (0)

Note: The null hypothesis is the presence of unit root. Level of significance is *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Lag Selection Criterion

The results of the VAR Lag Order Selection Criteria are given in Table 3. Whichever criteria we opt for, the optimum number of lags to be used in the model is 1.

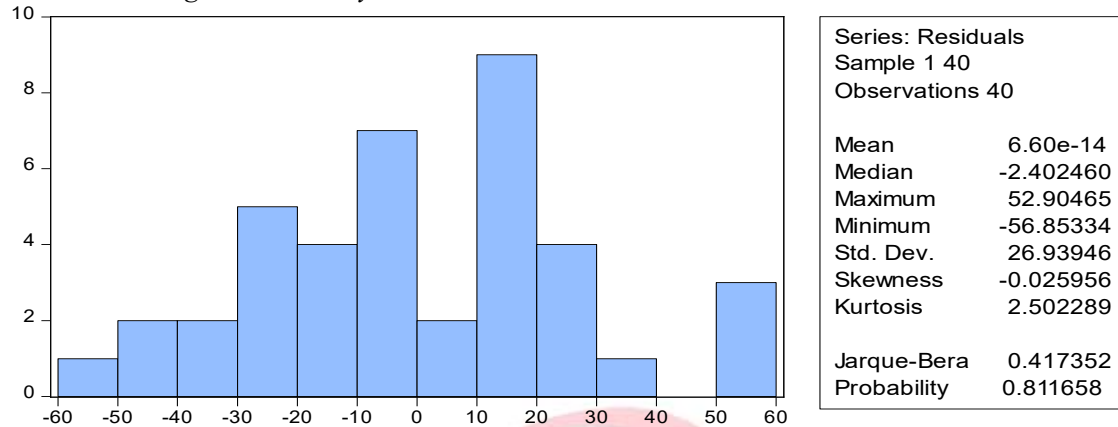
Table 3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-414.152	NA	565644.6	24.597	24.776	24.658
1	-217.312	335.785*	13.689*	13.959*	14.857*	14.265*
2	-169.231	70.707	2.165	12.072	13.688	12.623
3	-153.996	18.819	2.533	12.117	14.451	12.913
4	-133.045	20.951	2.384	11.826	14.878	12.867
5	-106.247	20.492	1.950	11.191	14.962	12.477
6	-45.8707	31.964	0.322	8.580	13.069	10.111

* Indicates lag order selected by the criterion.

Diagnostic Tests

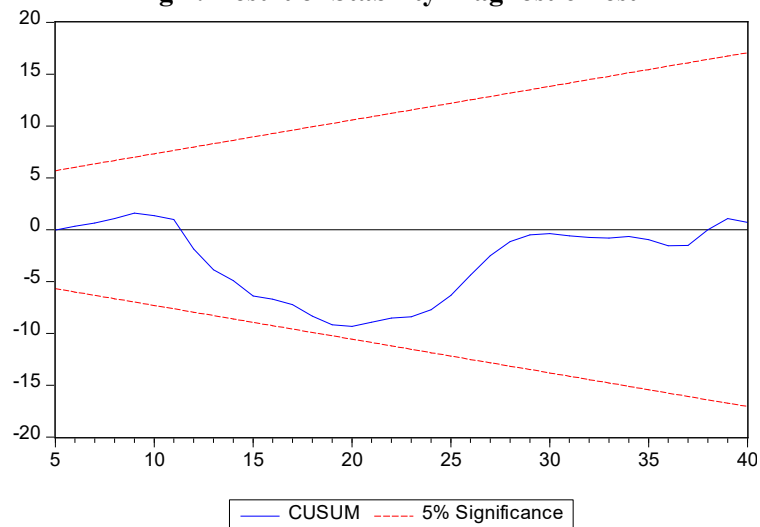
In the Histogram Normality Test (the results are shown in Table 4), as the probability is greater than 5 percent so, we cannot reject the null hypothesis, which states that the residuals follow normality. Similarly, the Serial Correlation LM Test results in Table 5 show that there is no serial correlation here because the null hypothesis of no serial correlation cannot be rejected. On the other hand, the results of the White Heteroscedasticity Test in Table 6 show the absence of this problem in the model. Finally, the stability diagnostic test shows the presence of stability in the model.

Table 4: Histogram Normality Test Results**Table 5: Serial Correlation LM Test Results**

F-stat	9.989127	Prob. F (6,30)	0.134
Obs*R-squa	26.65699	Prob. Chi-Sqr(6)	0.214

Table 6: Results of Heteroskedasticity Test: White

F-stat	2.547325	Prob. F(9,30)	0.0263
Obs*R-squa	17.32680	Prob. Chi-Squ (9)	0.0438
Scaled explained SS	10.54209	Prob. Chi-Squ (9)	0.3084

Fig 1: Result of Stability Diagnostic Test

Autoregressive Distributive Lag Technique (ARDL)

The results of the ARDL approach are given in Table 7. It is clear from the results given that the female stock of labor, represented by LFPP, is positively associated with economic growth, as shown by RGDP. The situation is true at both when the number of lags is zero and the number of lags is one. It is accurately in accordance with our theoretical framework. As the female stock of labor increases, its impact on the real GDP is positive, and, as a result, the economic growth as well as the size of the economy increases. Without any lag, the impact of a unit increase in the female stock of labor on the growth of the economy of Pakistan is 0.4 unit(s). On the other hand, at one lag, a unit increase in female stock of labor brings about a 0.8-unit(s) increase in the growth of the economy. The results can also be interpreted from the opposite side. With zero lags, a one-unit decrease in the stock of female labor pulls down the growth of the economy by 0.4 unit(s). At one lag, the impact increases to 0.8 unit(s). A very useful conclusion can be inferred from this fact: if females do not participate in the economy, the economy will suffer, and the suffering will increase with each passing year; on the other hand, if they do participate, the economy will go prosperously, and the positive impact will increase with the passage of each year. This conclusion is also directly or indirectly supported in the available literature by Begum & Yasmeen (2011), Mujahid & Zafar (2012), and Lechman & Kaur (2015).

As of the control variables, the female literacy rate, a proxy for the level of education of the female of Pakistan, represented by LRF, is also positively correlated with the growth of the economy of Pakistan. A one-unit increase in this variable leads to a 0.11-unit(s) increase in the growth of Pakistan's economy. On the other hand, the age dependency ratio, represented here by AGEDP, is negatively associated with the growth of the economy. A one-unit increase in this variable leads to a 0.7 unit(s) decrease in the growth of the economy at zero lags and to a 1.4 unit(s) decrease at lag 1.

Table 7: Results of ARDL

Variable	Coefficient	t-Statistic	Prob.*
RGDP(-1)	0.796	7.927***	0.000
LFPP	0.400	-0.604**	0.011
LFPP(-1)	0.848	0.381***	0.001
LRF	0.115	2.416**	0.039
LRF(-1)	0.478	-1.350***	0.003
AGEDP	-0.707	0.103*	0.092
AGEDP(-1)	-1.425	-0.364*	0.043
C	275.048	2.773	0.0093
R-squared	0.994	Mean dependent var	862.745
Adjusted R-squared	0.993	S.D. dependent var	169.899
S.E. of regression	14.002	Akaike info criterion	8.297

Sum squared residuals	6078.338	Schwarz criterion	8.6383
Log likelihood	-153.792	Hannan-Quinn criter.	8.419
F-statistic	794.757	Durbin-Watson stat	2.001
Prob(F-statistic)	0.000		

Level of significance is *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.1$.

Pairwise Granger Causality Test

The results of the Pairwise Granger Causality Test are given in Table 8. Here, only the causality from female stock of labor, LFPF, to economic growth, RGDP, is confirmed because the P-value is significant enough to reject the null hypothesis that LFPF does not Granger Cause RGDP. In the rest of the cases, the P-values are not low enough to reject the null hypothesis. Hence, there is only one way causality from LFPF to the growth of Pakistani economy, RGDP.

Table 8: Results of Pairwise Granger Causality Test

Null Hypothesis:	F-Statistic	Prob.
LFPF does not Granger Cause RGDP	3.15432	0.0058
RGDP does not Granger Cause LFPF	3.47940	0.1425
LRF does not Granger Cause RGDP	0.88755	0.4213
RGDP does not Granger Cause LRF	2.33277	0.1128
AGEDP does not Granger Cause RGDP	1.68093	0.2018
RGDP does not Granger Cause AGEDP	2.58841	0.1903

Conclusion and Policy Recommendations

This study investigated the impact of female stock of labor on economic growth in the case of Pakistan. The model utilized in the study was anticipated throughout Autoregressive Distributive Lags Method. The result showed that the female labor stock has a huge positive impact on economic growth. A large economic growth resulting from a small increase in the female capital stock is not surprising. We know that the female stock of labor in Pakistan has always been on the lower side, which is why a slight increase in the female stock of labor results in enormous positive changes in the economic growth of Pakistan.

Female accounts are more than a half of the population of Pakistan. However, due to numerous constraints, their participation in the labor force has always been unsatisfactory. Therefore, Pakistan has not been able to enjoy the benefits of their participation in the labor force. The economy of Pakistan is still not stable and is passing through severe economic crisis. In such a situation, it is a golden opportunity to utilize this marginalized population segment to the well-being of their own and the nation in general.

Numerous research studies have been carried out on women's empowerment worldwide (Aydin and Erdem, 2014; Tsani et al., 2013; Forgha and Mbella, 2016). Pakistani researchers have also played a handy role in this regard (Mujahid and Zafar, 2012; Begum and Yasmin, 2011). In light

of their precious contributions and the experience of conducting this very study, the following policy recommendations are vital to be made.

Women should be given every opportunity to come on equal footing with their male counterparts and play their precious role effectively in their own empowerment and contribute to the nation's welfare. Women should be given opportunities to realize that their contribution is a prerequisite if Pakistan has to stand among the world's developed and more precisely respectable nations. But it should be taken care that their participation in economic activities should not cross the limits imposed by our religion, Islam.

Women should be free to acquire as much education as possible because only an educated woman can ensure a secure future for the nation. Coeducation, however, is not a desirable solution to this problem, given the nature of our religion and society. A complete education system for women should be exclusively designed for them. Their schools, colleges, and universities should be separate from those of men. Establishing this very university is a laudable step in the right direction. Other universities and educational institutes should follow suit.

Awareness campaigns should be arranged to make women aware of the fake and deceptive women empowerment programs and procedures promulgated by some NGOs because these organizations aim to create a contradiction between their so-called women empowerment and the rules, regulations, and restrictions imposed by Islam.

Such campaigns should be designed to increase awareness of the importance of women's contribution to our societies. Because most of their hard work and labor in different sectors, especially in household activities, go unnoticed. Thus, they are marginalized by the dominant section of society, i.e., men.

Islam has approved innumerable rights of women: the right to acquire education, the right to do business, the right to do a job, the right to choose their better half, and many more. Unfortunately, it has been the characteristic of our society that most of women do not even know about the grant of these rights by Islam, let alone their usage of these rights. Awareness should be disseminated among women about their rights given to them by Islam. The male section of society should be taught that if Islam has allowed something to women, they have no right to restrict them from that.

Only by following these steps can we be certain that we are heading in the right direction, and soon, we will find Pakistan the most prosperous of all.

Contribution of study

By employing various methodological tests and models, the research seeks to provide empirical evidence on the impact of female labor on economic growth in Pakistan. This can contribute to the existing body of knowledge by offering concrete data-driven insights. The study's recommendations, such as the need for providing sufficient opportunities for females in Pakistan, can have direct policy implications. Policymakers can use these insights to develop and implement gender-inclusive policies that promote female participation in the labor force,

potentially leading to enhanced economic growth. By highlighting the role of gender disparities, particularly in the labor market, the research can contribute to raising awareness about the challenges faced by women in contributing to economic development. This awareness is crucial for fostering a more equitable and inclusive society. The research's examination of the relationship between female stock labor and economic growth in Pakistan provides a comparative perspective. This comparative analysis can be valuable for understanding how the dynamics of gender and economic growth differ across countries and regions.

References

- Altuzarra, A., Gálvez-Gálvez, C., González-Flores, A.(2021). Is Gender Inequality a Barrier to Economic Growth? A Panel Data Analysis of Developing Countries. *Sustainability*, 13(1), 367. <https://doi.org/10.3390/su13010367>
- Asian Development Bank. (2015). *Women in the workforce: an unmet potential in Asia and the Pacific*, Manila: Author.
- Aydin, F. F. &Erdem, E . (2014). The effect of women's employment on competitiveness and economic growth: a comparison of Turkey and the most competitive countries.*Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 59-71.
- Altuzarra A.& catalina G.G.(2019).Economic development and female labor force participation; the case of european union countries.
- Awan, A.G. (2018). Female participation in labor force and its impact on household and national income: evidence from Pakistan: *Global journal of Management, Social Sciences and Humanities*, 4(4), 773-784.
- Begum, R. &Yasmeen, G. (2011). Contribution of Pakistani women in agriculture: productivity and constraints, *Sarhad Journal of Agriculture*, 27(4), 637-643.
- Obodoechine, E.(2019). Impact of female labor force participation in African countries.
- Ehsan,S.(2015).Female labor force participation its determinants and effect on GDP in pakistan.
- Forgha, N. G. &Mbella, M. E. (2016). The implication of Female Labor force participation on economic growth in Cameroon. *International Journal of Development and Economic Sustainability*, 4(1), 34-47.
- Javed, M. F., Jadoon, A. K., Sarwar, A., Ahmed, M., & Liaqat, S. (2022). Gender wage disparity and economic prosperity in Pakistan. *Cogent Economics & Finance*, 10(1), DOI: 10.1080/23322039.2022.2067021
- Khaliq, A.& khan, D.(2019). Female Labor Market Participation and Economic Growth: The Case of Pakistan. *Journal of Social Science Studies*,4(2), 217-230.
- Mazalliu, M. &Zogjani, J. (2015).The effect of female labor force in economic growth and sustainability in transition economies - case study for SEE countries, *Academic Journal of Business, Administration, Law and Social Sciences*, 1(2), 179-186
- Mujahid, N. &Zafar, N. U. (2012). Economic Growth-Female Labor Force Participation Nexus: An Empirical Evidence for Pakistan, *the Pakistan Development Review*, 51(4), 565-586.
- Lechman, E. and Kaur, H. (2015). Economic growth and female labor force participation—verifying the u-feminization hypothesis. *New evidence for 162 countries over the period 1990-2012*, *Economics and Sociology*, 8(1), 246-257.
- Raleva, S. (2014).Impact of Labor on Economic Growth in Bulgaria (1991 - 2013), *Economic Alternatives*, (3), 5-14.

- Tsani, S., Paroussos, L., Fragiad, C. & Charalambidis, I. (2013). Female labor force participation and economic growth in the South Mediterranean countries, *Economic Letters*, 120, 323-328.
- Wang, S., Li, Z. & Zhang, H. (2021). Does female labor share reduce embodied carbon in trade?. *Environmental Science and Pollution Research*, 28, 8246–8257.
<https://doi.org/10.1007/s11356-020-11172-6>

