

Labor Force Participation Rate and Economic Growth: Observations for Bangladesh

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Abstract

The study investigates the relationship between the labor force participation rate for both male and female, gross fixed capital formation, and economic growth in Bangladesh using the annual time series data from 1991 to 2017. The results find two bidirectional nexus that one is between total labor force participation and economic growth and second is between gross fixed capital formations and economic growth whereas the findings also show a unidirectional causal association from female labor force participation to economic progress for Bangladesh. The study also finds that both total labor force participation and female labor force participation have short-run positive significant effects on the economic development for Bangladesh but adverse effects in the long run. On the contrary gross fixed capital formation contains short term significant negative indication on the economic growth but has an explicit positive considerable impact on the economic development of Bangladesh. The government of Bangladesh needs to give more importance in technical education format that will produce more skilled labor.

Keywords: Economic growth; Labor force participation rate; Granger Causality test; and ARDL test.



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1. Introduction

Economic growth propagates an order of changes in the economic environment of a country (Clark *et al.*, 1999). Developed and developing countries show their high interest to speed up economic development (Shahid, 2014). Bangladesh is a developing country with more than 161.3 million people, of which 80.3 million are female (BBS, 2016-17). According to the findings, 67.6% of the population in 2016-17 and 64% of the people in 2011 are in the age range 15 or above. Past four Labor force survey (2010, 2013, 2015-16, 2016-17) shows, LFPR is 59.3, 57.1, 58.5, and 58.2 percent, respectively.

The labor force participation rate (LFPR) is a measure of the proportion of a countries' working-age population that engages actively in the labor market, either by working or by looking for work. According to the definition of Bangladesh Bureau of Statistics (BBS) persons either employed or not age 15 or above will be included in the labor force. It is a talked-about topic that many developed countries of the world now facing the problem of a low level of labor force participation rate.

This labor force participation could play a vital role to keep our GDP growth trend upward. The average annual GDP growth rate of Bangladesh for the last five fiscal year is 6.86%, which is 7.4% for the year 2017-18 and projected 8.13% for the 2018-19 fiscal year. It is also observed that among the 58.2% labor force, 80.5% is male, and 36.3% is female (BBS, 2016-17). Evidence suggests a U-shaped relationship between female labor force participation rate and economic growth (Lechman, 2014). But for Bangladesh, the trend is upward for the variables.

Female labor force of Bangladesh has a strong influence in our readymade garments sector, which is very important in our growth paradigm. Along with showing the relationship between the concerned variables, we should also consider the unemployment rate. However, different practices disclose a robust association between economic development and labor for participation rate. A complete, efficient labor force promotes economic development (Duval *et al.*, 2010). Clark *et al.* (1999), disclose a negative association between labor force participation rates and income per capita.

Kargi (2014), thinks about the labor force participation rate as a paradox, which is united with the low female participation in the labor force as well as low employment in the overall agriculture sector. The author points out that a quantity cannot generate quality. Denton and Spencer (1997), study the population, labor force and economic growth using the trend analysis technical know-how and find a low fertility rates problem in Canada which make the population old considerably a low population growth. Moreover, in the last decades, numerous studies have

examined on labor force participation (Bheemeshwar, 2016; Bratti, 2003; Madsen *et al.*, 2008; Queneau and Sen, 2013; Tiwari and Mutascu, 2015).

The economic statistics of female labor force participation get attention explicitly since the most pioneering studies of Mincer (1962) and Cain (1966). In recent years, female labor force participation improves considerably for the developed countries (Tansel, 2001).

Female labor force participation can enhance their well-being and socioeconomic condition in the substantive world (Kaushik and Kanbur, 2009; Stiglitz *et al.*, 2010). There are some literature studies on labor force participation of women (Boserup, 1970; Durand, 1975; Goldin, 1990;1995; Lincove, 2008; Luci, 2009; Mammen and Paxson, 2000; Pampel and Tanaka, 1986; Sinha, 1967; Tamh, 2011; Tsani *et al.*, 2013).

The main objective of this paper is to ascertain the short and long-run relationship between labor force participation and economic growth of Bangladesh.

2. Methodology

Data: The basic objective of the study is to look into the short and long-run relationship between labor force participation and economic development of Bangladesh. The data is collected from the world development indicators (WDI). The study uses the annual time series data over the period of 1991 to 2017.

Model:

Therefore, the study employs the Cobb-Douglas production function as follows:

$$Y = A.K^\alpha.L^\beta \dots\dots\dots (1)$$

Where Y represents the GDP growth exercised as a proxy of economic development, A is for technological progress, K exhibits capital stock and L for the labor force. Therefore, the equation mentioned above is used as an econometric model to point out the relationship between economic development and labor force participation.

Now, considering natural log to generate a linear equation:

$$\ln Y = \ln A + \alpha \ln K + \beta \ln L \dots\dots\dots (2)$$

This study rearranges this equation is as below:

$$\ln Y = \beta_0 + \beta_1 \ln TLFPR + \beta_2 \ln FLFPR + \beta_3 \ln GFCF + \mu \dots\dots\dots (3)$$

Where,

Y = GDP growth (annual %)

TLFPR = Total Labor Force Participation Rate

FLFPR = Female Labor Force Participation (% of the total labor force)

GFCF = Gross Fixed Capital Formation (% of GDP)

Here, we include female labor force participation as a variable to see whatever it's significantly different from the total labor force participation or not and coefficients β_1 , β_2 , and β_3 are expected to be a positive sign in both short run and long run respectively.

3. Result and Discussion

3.1. Unit Root Test

Table-1. Unit root test (Augmented Dickey-Fuller test)

Variables		At level	At first difference
GDPG	Without trend	-1.223 (1)	-3.108*** (4)
	With trend	-2.330 (4)	-4.569*** (3)
TLFPR	Without trend	-3.212*** (2)	-1.596*** (2)
	With trend	-3.086 (2)	-3.308* (2)
FLFPR	Without trend	-0.972 (2)	-1.873*** (1)
	With trend	-2.398 (2)	-3.569* (1)
GFCF	Without trend	-2.794*** (3)	-1.766* (3)
	With trend	-4.314** (4)	-3.853* (1)

Source: Authors calculation from STATA 12 software.

Notes: (1) figures within parentheses show lag lengths selected by the Akaike Information Criterion (AIC) (2) ***, **, * denote the rejection of the null hypothesis of unit root at 1%, 5%, and 10% significance level respectively.

The results in table 1 exhibits that some variables are non-stationary, that means that there present unit root problems at levels. But after using the first difference, all the considered variables are entirely stationary and therefore, these conclusions complete the cointegration conditions for all variables.

3.2. Cointegration Test

Table-2. Johansen Cointegration Test

Null H_0	λ_{trace}	5% Critical value	λ_{max}	5% Critical value
$r = 0$	63.7055*	47.21	27.072*	27.07
$r \leq 1$	36.6334*	29.68	20.3248	20.97
$r \leq 2$	16.309	15.41	13.6434	14.07
$r \leq 3$	2.666	3.76	2.6657	3.76

Source: Authors calculation from STATA 12 software.

Note: (1) r shows the cointegrating equation number. (2) AIC selects the lag order for each VAR. (3) "*" indicates the rejection of the null hypothesis of a unit root at 5% level of significance.

Table 2 reveals the cointegration test results. There are at least two cointegrating vectors in trace statistics and one cointegration vector in max statistics which concludes that there is a long run association between all the variable.

3.3. Granger Causality Test

Table-3. Granger Causality Wald Test

Null hypothesis	χ^2 -value	$P > \chi^2$	Direction of causality
TLFPR does not Granger cause GDPG	67.198	0.000	TLFPR \longleftrightarrow GDPG
GDPG does not Granger cause TLFPR	10.872	0.028	
FLFPR does not Granger cause GDPG	44.467	0.000	FLFPR \longrightarrow GDPG
GDPG does not Granger cause FLFPR	0.1611	0.997	
GFCF does not Granger cause GDPG	60.489	0.000	GFCF \longrightarrow GDPG
GDPG does not Granger cause GFCF	43.938	0.000	

Source: Authors calculation from STATA 12 software

Conducting the Granger causality test, the results disclose that there are two bidirectional causal relationships. One is between total labor force participation and economic growth, and another is between gross fixed capital formations and economic growth whereas the results also show a unidirectional causal association from female labor force participation to economic development for Bangladesh.

The next step is to conduct an error-correction specification test for estimating the short-run and long-run movements. Therefore, the study uses the ARDL bounds testing approach of Pesaran *et al.* (2001).

$$\Delta GDPG_t = \alpha + \sum_{i=1}^{n_1} \beta_i \Delta GDPG_{t-i} + \sum_{i=0}^{n_2} \delta_i \Delta TLFPR_{t-i} + \sum_{i=0}^{n_3} \varphi_i \Delta FLFPR_{t-i} + \sum_{i=0}^{n_4} \varphi_i \Delta GFCF_{t-i} + \rho_0 GDPG_{t-1} + \rho_1 TLFPR_{t-1} + \rho_2 FLFPR_{t-1} + \rho_3 GFCF_{t-1} + \varepsilon_t$$

Table-4. Full information estimates of linear ARDL model (Bangladesh)

Lag order	0	1	2	3
Panel A: short-run coefficient estimates				
GDPG	-	2.0237*** (3.96)	1.2975*** (3.34)	1.1305*** (5.04)
TLFPR	768.8546** (2.55)	-429.9257 (-1.22)		
FLFPR	344.8281*** (4.13)	-26.23495 (-0.26)	198.0388 (1.58)	
GFCF	-27.8661 (-1.74)	-49.3886*** (3.40)	-30.5807** (-3.10)	-19.3973* (-2.12)
Panel B: long-run coefficient estimates				
Constant	TLFPR	FLPR	GFCF	
326.2775 (2.97)	-219.4379*** (-4.09)	-74.69451*** (-3.64)	17.8893*** (4.43)	
Panel C: diagnostics				
F	\bar{R}^2	\bar{R}^2	CUSUM(CUSUMQ)	
10.788*	0.9325	0.7526	S(S)	

Source: Authors calculation from STATA 12 software.

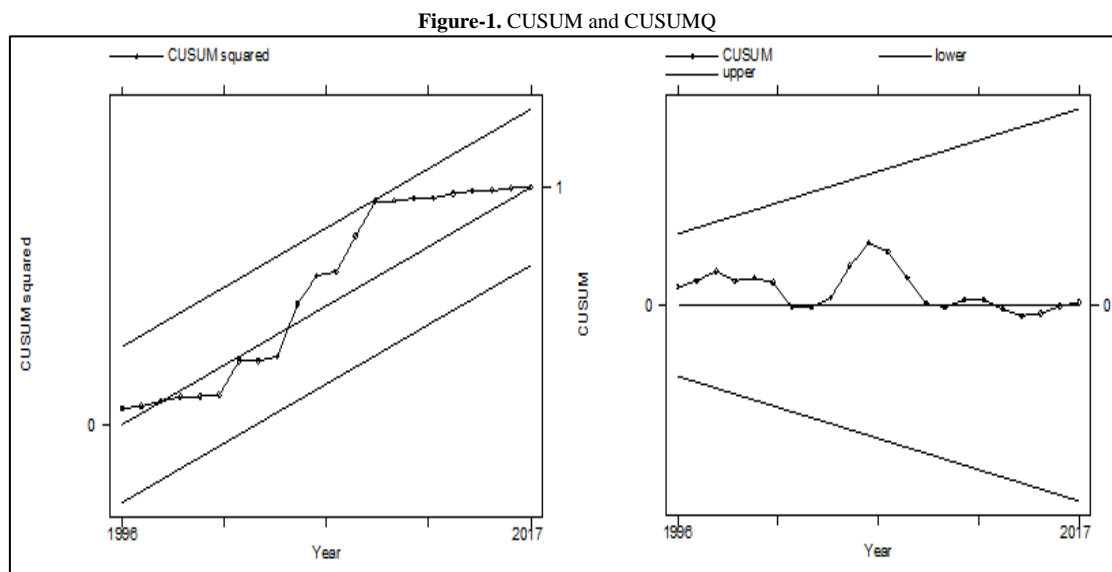
Note: Numbers under the parentheses are t-ratios and *, **, *** denote the rejection of the null hypothesis of a unit root at 10%, 5%, and 1% level of significance.

Table 4 contains three panels where panel A, B, and C show short-run coefficient estimates, long-run coefficient estimates, and at last diagnostic analysis, respectively.

From panel A, each variable holds at least one significant coefficient where both total labor force participation and female labor force participation have short-run positive significant effects on the economic development for Bangladesh whereas gross fixed capital formation contains a significant negative indication on the economic

development. Panel B reveals the long run estimations where both total labor force participation and female labor force participation have significant negative long-run effect promoting the economic development whereas gross fixed capital formation has an explicit positive significant impact on the economic development of Bangladesh.

Finally, to test the stability of the estimate results for both short run and long run, the study employs the popular CUSUM and CUSUMQ tests, and the estimations are entirely stable.



4. Conclusion and Policy Recommendation

The study has studied the relationship between the labor force participation rate for both male and female, gross fixed capital formation, and economic growth in Bangladesh. The results find two bidirectional nexus that one is between total labor force participation and economic growth and second is between gross fixed capital formations and economic growth whereas the findings also show a unidirectional causal association from female labor force participation to economic progress for Bangladesh. The study finds that both total labor force participation and female labor force participation have short-run positive significant effects on the economic development for Bangladesh but negative effects in the long run. Whereas gross fixed capital formation contains short term significant negative indication on the economic development but has an explicit positive significant impact on the economic development of Bangladesh.

The government of Bangladesh needs to give more importance in technical education format that will produce more skilled labor. Moreover, there is a need for mutual collaboration of public and private institution to train the labor force about technological knowledge. The government should also manage a flexible one digit interest rate for the small entrepreneur that will promote the gross fixed capital formation strongly. More importantly, the public and private authority should set up polytechnic institution for girl students to enhance female's skill. Finally, there is a need to ensure proper health care services for the labor force because healthy workers can strongly show their productivity.

Reference

- Bheemeshwar, R. A. (2016). Labour force participation of elderly in India: patterns and determinants. *International Journal of Social Economics*, 43(5): 502-16.
- Boserup, E. (1970). *Woman's role in economic development*. St. Martin: New York.
- Bratti, M. (2003). Labour force participation and marital fertility of Italian women: The role of education. *Journal of Population Economics*, 16(3): 525-54.
- Cain, G. G. (1966). *Labor force participation of married women*. University of Chicago Press: Chicago.
- Clark, R. L., York, E. A. and Anker, R. (1999). Economic development and labor force participation of older persons. *Population Research and Policy Review*, 8(5): 411-33.
- Denton, F. T. and Spencer, B. G. (1997). *Population, labor force, and long-term economic growth*. Research Institute for Quantitative Studies in Economics and Population, McMaster University: Hamilton, Ont.
- Durand, J. D. (1975). *The labor force in economic development: a comparison of international census data 1946–1966*. Princeton University Press: Princeton.
- Duval, R., Eris, M. and Furceri, D. (2010). Labour force participation hysteresis in industrial countries: Evidence and causes. Available: <https://www.oecd.org/eco/growth/46578691.pdf>
- Goldin, C. (1990). *Understanding the gender gap: an economic history of American women*. Oxford University Press: New York.
- Goldin, C. (1995). *The U-shaped female labor force function in economic development and economic history*. In: Schultz P(ed) *Investment in women's human capital*. University of Chicago Press: Chicago. 61–90.
- Kargi, B. (2014). Labor force participation rate and economic growth: observations for Turkey. *Universal Journal of Management and Social Sciences*, 4(4): 46-54.

- Kaushik, B. and Kanbur, R. (2009). *Arguments for a better world: Essays in honor of Amartya Sen: Ethics, welfare, and measurement*. Oxford University Press: Oxford.
- Lechman, E. (2014). Female labor force participation and economic growth. Re-examination of u-shaped curve. Re-examination of u-shaped curve. *Lett*, 110(2): 140-42.
- Lincove, J. A. (2008). Growth, girls' education, and female labor: a longitudinal analysis. *J. Dev. Areas*, 41(2): 45–68.
- Luci, A. (2009). Female labor market participation and economic growth. *Int. J. Innovat Sustain Dev.*, 4(2/3): 97-108.
- Madsen, J. B., Mishra, V. and Smyth, R. (2008). Are labour force participation rates nonstationary? Evidence from 130 years for G7 countries. *Australian Economic Papers*, 47(2): 166-89.
- Mammen, K. and Paxson, C. (2000). Women's work and economic development. *J. EconPerspect*, 14(4): 141–64.
- Mincer, J. (1962). *Labor force participation of married women: A study of labor supply, in aspects of labor economics*. National Bureau of Economic Research, Princeton University Press: Princeton, N.J.
- Pampel, F. C. and Tanaka, K. (1986). Economic development and female labor force participation: a reconsideration. *Soc. Forces*, 64(3): 599–619.
- Pesaran, M. H., Shin, Y. and Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3): 289-326.
- Queneau, H. and Sen, A. (2013). On the persistence of labor force participation rates by gender: Evidence from OECD countries, preliminary version.
- Shahid, M. (2014). Impact of labour force participation on economic growth in Pakistan. *Journal of Economics and Sustainable Development*, 5(11): 89-93.
- Sinha, J. N., 1967. "Dynamics of female participation in economic activity in a developing economy. In: United Nations department of economic and social affairs." In *Proceedings of the World Population Conference, Belgrade 1965 UN Publications*. pp. 336–37.
- Stiglitz, J., Sen, A. and Fitoussi, J. (2010). *Mismeasuring our lives: Why GDP doesn't add up*. New Press: NY.
- Tamh (2011). U-shaped female labor participation with economic development: some panel data evidence. *Econ. Lett.*, 110(2): 140–42.
- Tansel, A., 2001. "Economic development and female labor force participation in Turkey: time-series evidence and cross-province estimates. ERF." In *Economic Research Forum Working Papers (No. 0124)*.
- Tiwari, A. K. and Mutascu, M. (2015). Is the labour force participation rate non-stationary in Romania? *Review of Economic Perspectives*, 14(4): 411-26.
- Tsani, S., Paroussos, L., Fragiadakis, C., Charalambidis, I. and Capros, P. (2013). Female labour force participation and economic growth in the South Mediterranean countries. *Economics Letters*, 120(2): 323-28.