A Panel Study on the Impact of Labor Market Freedom on the Female Labor Force Participation Rate Across the World

Nazmul Islam

Department of Humanities, Bangladesh University of Engineering and Technology (BUET), Dhaka-1000, Bangladesh. Email: nazmul786humbuet@gmail.com. ORCiD: 0000-0002-8602-6740

Abstract

This paper explores whether a greater degree of labor market freedom leads to an increase in the female labor force participation rate (FLFPR) by examining the country-level panel dataset across the world. In the study, we employ the labor market regulation (LMR) index to present labor market freedom. We find a positive association between LMR index and FLFPR using the countrywide panel data without fixed effects. This result implies that, other things remaining the same, a 1% increase in the LMR index would lead to a 0.116% increase in the FLFPR in the world. However, there exists a negative association between the LMR index and FLFPR for the fixed effects models. Economic policy reforms can substantially enhance the FLFPR in the job markets in countries with heavily regulated labor markets.

Keywords: female labor force participation rate; labor market freedom; economic freedom; country-level datasets; panel study

1. Introduction

Prosperity and opportunity are greatly increased when the labor market functions freely and effectively. Freer labor markets are also more competitive, less constrained, and more dynamic. They are also associated with more jobs and greater employee compensation. However, some employees would feel under pressure to accept lesser pay and fewer benefits, which might lead to a widening wealth gap and more job instability. Some economies, like the US, have relatively low tax rates, relatively free labor markets, and a high degree of economic freedom.

Following trade liberalization, Gaddis and Pieters (2012) discovered a positive correlation between FLFPR and economic freedom in Brazil. Furthermore, Cebula and Alexander (2014), using US state-level data, and Wong and Stansel (2016), using US metropolitan-level data, discover a positive correlation between FLFPR and the extent of labor market openness. Furthermore, as demonstrated by the tax treatment of second earners, tax incentives for shared market work, and childcare subsidies, Jaumotte (2003) demonstrated that labor market freedom had a beneficial effect on the degree of FLFPR. Nevertheless, no research has been done to date to determine if labor market openness and FLFPR are related globally.

The specific objective of this study is to estimate the impact of labor market freedom on the FLFPR across the globe using the country-level panel data.

Existing literature used several control variables that affected female labor force participation, such as legal, cultural, and social considerations. The importance of age, marital status, and education in affecting a woman's engagement in the labor force was also emphasized by Lari et al. (2022). Economic growth also has an impact on this; higher levels of development lead to higher rates of female engagement (Pampel & Tanaka, 1986). The growth of the service industry, opportunities for part-time work, and the availability of childcare facilities have all shown to have a significant influence on increasing the participation rate of women in the labor force in the Organization for Economic Cooperation and Development (OECD) nations (Thévenon, 2013). Furthermore, employment flexibility significantly affects the salary distribution, especially for women who have completed college (Flabbi & Moro, 2012). Gonzales et al. (2015) draw attention to the important influence that legal constraints have on women's involvement in the labor force, especially with regard to inheritance and property rights. This emphasizes how

important it is that everyone has equitable access to the job market. According to Moghadam et al. (2015), marriage and traditional norms are the main obstacles to female engagement, underscoring the impact of cultural and religious issues. But education can be beneficial, especially in the secondary and tertiary levels. Building on this, Jayachandran (2021) examines the function of social norms in developing nations and makes the case for the viability of measures meant to remove these obstacles.

Considering the availability of worldwide data, the control variables used in this study are age, education, average female wage, average male wage, percentage of female population, percentage of unemployed female population, and births per woman.

The remainder of this paper is structured as follows. Section 2 contains the descriptive statistics. Section 3 illustrates the empirical models and estimation methods. Section 4 explains the results and analysis. And finally, Section 5 concludes and provides potential future research directions.

2. Descriptive Statistics

For the variable of interest, we use the LMR index.[1] A detailed methodology of measuring the index is provided in the Economic Freedom of the World 2021 Annual Report.[2] The dataset for our dependent variable, FLFPR, can be found in the World Development Indicators published by World Bank.

We include the data of 2011-2019 for our dependent variable, FLFPR, and those of 2010-2018 for the independent variables in our panel data. The datasets of female average wage and male average wage are both derived from the REST API developed by United Nations Development Program (UNDP).[3] The datasets of female unemployment rate[4], the percentage of female population ages 15-64[5], and fertility rate[6] can be retrieved from the World Bank website. The percentage of female population ages 25 and older with at least some secondary education can be found in UNESCO Institute for Statistics (2020) and Barro and Lee (2018).[7]

Data description for the panel dataset is represented in Table 1. We use 1161 observations for the variables of FLFPR, female wage, male wage, female age, unemployment rate, and fertility rate. We also use 1133 observations for labor market regulation and 1159 observations for female education. We collect data from the Economic Freedom of the World index. In this case, the mean FLFPR equals 52.135, and the mean of the LMR index equals 6.517. The mean, the lower limit, and the upper limit of female wages are lower than those of male wages, respectively, in the panel dataset. We also find that the mean female age, female education rate, and the female unemployment rate are 63.23, 68.28, and 8.721, respectively.

Table 1. Descriptive Statistics for the Panel Dataset

Variable	Observation	Mean	Std. Dev.	Min	Max
Female labor force participation rate (FLFPR)	1161	52.135	14.469	11.28	84.08
Labor market regulation (LMR)	1133	6.517	1.306	2.451	9.293
Female wage (Fwage)	1161	15276.862	14928.943	443.136	72244.462

---

[1] The Labor Market Regulations index ranges from 0-1. Counterintuitively, a value of 0 signifies the most regulations and thus the least degree of labor market freedom; a value of 1 signifies the least regulations and thus the largest degree of labor market freedom.

[2] https://www.fraserinstitute.org/sites/default/files/economic-freedom-of-the-world-2021.pdf

[3] http://hdr.undp.org/en/content/human-development-report-office-statistical-data-api

[4] https://data.worldbank.org/indicator/SL.UEM.TOTL.FE.ZS?most_recent_year_desc=false

[5] https://data.worldbank.org/indicator/SP.POP.1564.FE.ZS?most_recent_year_desc=false

[6] https://data.worldbank.org/indicator/SP.DYN.TFRT.IN

[7] http://hdr.undp.org/en/indicators/23906 and http://www.barrolee.com/

Male wage (Mwage)	1161	26513.309	24575.809	648.533	133227.75
Female Age (Fage)	1161	63.231	5.708	47.782	77.249
Female Education (Fedu) rate	1159	68.28	63.243	14.45	100
Unemployment rate	1161	8.721	6.898	.16	31.59
Fertility	1161	2.643	1.305	1.14	7.429

3. Empirical Models and Estimation Methods

We employ models using panel data for the estimation. The following model using panel data is to be estimated:

$$\log(FLFPR_{i,t}) = \beta_0 + \beta_1 \log(LMR_{i,t-1}) + \beta_2 \log(Fwage_{i,t-1}) + \beta_3 \log(Fage_{i,t-1}) +$$

$$\beta_4 \log(Fedu_{i,t-1}) + \beta_5 \log(Funemployment_{i,t-1}) + \beta_6 \log(Fertility_{i,t-1}) +$$

$$\beta_7 \log(Mwage_{i,t-1}) + \tau_i + \tau_t + u_{it}$$

In this model, $FLFPR_{i,t}$ refers to the female labor force participation rate of country i in year t; $LMR_{i,t-1}$ refers to the labor market freedom index of country i in year t-1; $Fwage_{i,t-1}$ refers to the average female wage of country i in year t-1; $Fage_{i,t-1}$ refers to the percentage of female population ages 15-64; $Fedu_{i,t-1}$ refers to the percentage of female population ages 25 and older with at least some secondary education of country i in year t-1; $Funemployment_{i,t-1}$ refers to the percentage of unemployed female population of country i in year t-1; $Fertility_{i,t-1}$ refers to births per woman of country i in year t-1; $Mwage_{i,t-1}$ refers to average male wage of country i in year t-1; τ_i represents the country fixed effect; τ_t represents the time fixed effect; and u_{it} represents the residual term.

4. Results and Analysis

The regression results are given in Table 2 using the LMR index. The LMR index ranges from 0-1. Counterintuitively, a value of 0 signifies the most regulations and thus the least degree of labor market freedom; a value of 1 signifies the least regulations and thus the largest degree of labor market freedom.

The findings in Table 2 demonstrate that the LMR index has a positive relationship with FLFPR in the case of the model 'panel without fixed effect'. The findings show that a 1% rise in the LMR index would cause a 0.116% increase in the FLFPR, which is aligned with the findings of the studies conducted in the USA by Cebula and Alexander (2014) and Wong and Stansel (2016). It implies that FLFPR and economic freedom are positively connected because greater freedom fosters a competitive economy where women's human capital is recognized and increases work prospects. Higher levels of education for women are also typically found in nations with more economic independence, which motivates them to pursue careers. Even though economic expansion on its own might lead to increased opportunities, economic freedom is essential because it establishes a framework that makes it easier for women to seek gainful employment and become financially independent.

However, the results show that the LMR index has negative associations with FLFPR for the models 'panel with country fixed effects', 'panel with year fixed effects', and 'panel with two-way fixed effects'. The coefficients of the LMR index are statistically significant for these models. Table 2 shows that using country-level panel data, a 1% rise in the LMR index would cause a 1.80 %, 0.067 %, and 1.36 % decrease in the FLFPR for the models 'panel with country fixed effects, panel with year fixed effects, and panel with two-way fixed effects, respectively. These results are contrasted with the existing studies that were not conducted using countrywide

panel data.

In the early phases of a nation's economic development, there may be a negative correlation between economic freedom and FLFPR. According to the "U-shaped" hypothesis, which is frequently used to explain this, FLFPR is high in low-income, agrarian cultures, decreases with early industrialization, and then rises once again with additional economic development. During the transitional phase, the following factors contribute to the negative relationship:

- The transition from agriculture to industry can have a detrimental effect on women because traditional agricultural civilizations frequently use women as unpaid domestic help. The physical demands of modern industrial jobs frequently favor men, but social standards prevent married women from working in factories.

- Household income rises as economic freedom and growth expand, primarily as a result of increased male pay. Because of this economic effect, women may leave the paid workforce to concentrate on taking care of their families and their homes. Until higher levels of economic development are attained, this balances out the substitution impact, which occurs when higher salaries make market labor more appealing.

- Social and cultural conventions: Particularly in some sectors, women's employment in the paid sector may be restricted by social conventions and traditional gender roles. Gender-based occupational segregation and a lack of "appropriate" professions for women might result in high unemployment or women simply leaving the workforce, even as more women educate themselves.

Table 2. Regression Results Using the LMR Index

VARIABLES	(1) panel without fixed effect	(2) panel with country fixed effect	(3) panel with year fixed effect	(4) panel with two-way fixed effects
log_LMR	0.00116***	-0.0180***	-0.00067***	-0.0136***
	(0.000237)	(0.0169)	(0.0238)	(0.0168)
log_Female_wage	0.705***	0.209***	0.704***	0.186***
	(0.0159)	(0.0165)	(0.0159)	(0.0168)
log_Age	0.0443*	-0.109*	0.0265*	0.107*
	(0.104)	(0.0942)	(0.105)	(0.101)
log_Education	0.0389***	0.0119***	0.0406***	-0.0352**
	(0.0121)	(0.0146)	(0.0122)	(0.0168)
log_Unemployment	-0.0987***	-0.00540***	-0.0998***	-0.00098***
	(0.00647)	(0.00504)	(0.00652)	(0.00507)
log_Fertility	0.126**	-0.0519**	0.124**	0.0393**
	(0.0274)	(0.0293)	(0.0275)	(0.0332)
log_Male_wage	-0.707***	-0.177***	-0.706***	-0.185***
	(0.0153)	(0.0191)	(0.0153)	(0.0189)
Constant	4.076	4.629	4.161	3.993
	(0.448)	(0.411)	(0.452)	(0.423)

Observations	1,124	1,124	1,124	1,124
R-squared	0.756	0.992	0.756	0.992

P values are within parentheses *** p<0.01, ** p<0.05, * p<0.1

- Barriers to women's employment: As economies grow, several obstacles may keep women from fully engaging, including, (i) employing women comes with higher expenditures, which may be related to cultural conventions around women's mobility and traditional gender roles; (ii) women continue to shoulder a disproportionate amount of domestic duties and family care obligations, which results in unpaid care labor.

- Wage and Opportunity Gaps: a lack of access to important social networks (such as "old boys' clubs") and systemic discrimination can result in women's labor being paid less than men.

Eventually, as an economy develops, the "U-shaped" curve is completed by rising FLFP due to falling fertility rates, increased education for women, and the growth of the service sector.

The coefficients of female wage, age of female, and education variables show positive associations with the FLFPR. Lari et al. (2022) shows the same directions in the case of age and education. On the other hand, in Table 2, we find that the estimates of the unemployment rate and male wage coefficients have a negative relationship with FLFPR. The negative male wage coefficient implies that if the male partner's wage increases, it discourages the FLFPR. It works like a negative substitution effect.

5. Conclusions

The findings of the research demonstrate that a greater degree of labor market freedom causes an increase in the FLFPR throughout the globe, while using the panel data without fixed effects. For the fixed effects models, there is a negative correlation between the LMR index and FLFPR.

In this study, we did not include the "daycare expenditures" and the "opportunity cost of childcare by the mothers" as regressors. Future studies by the researchers may take these two variables into account. The statistical study may reveal a relationship between the expense of childcare and FLFPR. Childcare expenses might have gone up along with global economic norms.

Our study ignores cross-country comparisons and historical trends that are unique to a certain region. If the model of this study had included the regional time trends, even just for the purpose of finding statistically significant global relationships that are purely descriptive, it would be incredibly interesting.

Future studies could find greater success concentrating on a single country or territory and trying to pinpoint the specific pattern of FLFPR over time, as well as any significant contributing factors that may be unique to that nation or location. It is advised that future researchers focus on individual regions such as China, Europe, North America, and so on, rather than combining them all.

References

1. Cebula, R. J., & Alexander, G. (2014). An exploratory empirical note on the impact of labor market freedom on the female labor force participation rate in the US. *Applied Economics Letters*, *22*(8), 632–636. https://doi.org/10.1080/13504851.2014.962221.

2. Flabbi, L., & Moro, A. (2012). The effect of job flexibility on female labor market outcomes: Estimates from a search and bargaining model. *Journal of Econometrics*, *168*(1), 81–95. https://doi.org/10.1016/j.jeconom.2011.09.003.

3. Gaddis, I., & Pieters, J. (2012). *Trade Liberalization and Female Labor Force Participation: Evidence from Brazil* (SSRN Scholarly Paper 2157951). https://doi.org/10.2139/ssrn.2157951.

4. Gonzales, C., Jain-Chandra, S., SJain-Chandra, Kochhar, K., KKochhar, Newiak, M., & (2015). Fair Play: More Equal Laws Boost Female Labor Force Participation. *Staff Discussion Notes*, *15*(2), 1. https://doi.org/10.5089/9781498354424.006.

5. Jaumotte, F. (2003). Female Labour Force Participation: Past Trends and Main Determinants in OECD Countries (December 12, 2003). *OECD Working Paper* No. 376, Available at SSRN: http://dx.doi.org/10.2139/ssrn.2344556.

6. Jayachandran, S. (2021). Social Norms as a Barrier to Women's Employment in Developing Countries. *IMF Economic Review*, *69*(3), 576–595. https://doi.org/10.1057/s41308-021-00140-w.

7. Lari, N., Awadalla, A., Al-Ansari, M., & Elmaghraby, E. (2022). Determinants of female labor force participation: Implications for policy in Qatar. *Cogent Social Sciences*, *8*(1), 2130223. https://doi.org/10.1080/23311886.2022.2130223.

8. Moghadam, F. E., Guiahi, F., & Naguib, R. (2015). Women and Work in Dubai City: Institutional Barriers and Potentials. In *Women, Work and Welfare in the Middle East and North Africa* (pp. 351–381). IMPERIAL COLLEGE PRESS. https://doi.org/10.1142/9781783267347_0013.

9. OECD. (2020). Can Collective Bargaining Help Close the Gender Wage Gap for Women in Non-Standard Jobs? (2020). *OECD*. Published. https://www.oecd.org/gender/collective-bargaining-and-gender-wage-gap-2020.pdf.

10. Pampel, F. C., & Tanaka, K. (1986). Economic Development and Female Labor Force Participation: A Reconsideration*. *Social Forces*, *64*(3), 599–619. https://doi.org/10.1093/sf/64.3.599.

11. Thévenon, O. (2013). *Drivers of Female Labour Force Participation in the OECD*. OECD. https://doi.org/10.1787/5k46cvrgnms6-en.

12. Wong, C., & Stansel, D. (2016). An Exploratory Empirical Note on the Relationship between Local Labor Market Freedom and the Female Labor Force Participation Rate in US Metropolitan Areas. *The Empirical Economics Letters*, *15*(11), 1095–1100.