

Unleashing the potential: Exploring the relationship between trade liberalization and female labor force participation in Pakistan

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ABSTRACT

Purpose: This study examines the impact of trade liberalization (TL) on female labor force participation (FLFP) during the trade regime period in Pakistan, using sectoral panel data of the manufacturing sector for the period of 1990-2005.

Design/Methodology/Approach: We employed panel fixed effects (FEM) and Instrumental-variable (IV) regression models for empirical analysis.

Findings: Our study reveals that trade liberalization and FLFP are associated. Trade liberalization increases FLFP in the manufacturing sector. The results of both measures of FLFP (i.e., the share of female employment, and female-to-male ratio) verify each other findings. Our findings are robust to the inclusion of various control variables. Furthermore, our IV analysis also confirms that liberalization has given rise to female employment in the manufacturing sector. Our policy implication is that the government should liberalize trade sectors that can help to enhance FLFP.

Originality/Value: This study adds to the existing literature by exploring the association between TL and FLFP in the manufacturing sector of Pakistan by utilizing a better proxy of reductions in import tariffs for TL. The reduction of import tariffs is a policy-based measure that captures the pure impacts of trade policy as compared to outcome-based measures (i.e., trade ratios). We also consider the whole trade regime as a sample period (i.e., from 1990-2005) to examine the core impacts of the trade regime, as import tariffs drastically reduced during this period. Furthermore, we use two measures of FLFP for the analysis, i.e., the share of female employment, and the female-to-male ratio. Lastly, our use of sectoral panel data strengthens the empirical analysis.

Keywords: Labor force participation, Manufacturing sector, Pakistan trade liberalization.

1. INTRODUCTION

Pakistan underwent drastic trade reforms as part of the conditions of the structural adjustment program (henceforth SAPs) of the IMF and World Bank in the 1990s, which include the progressive reduction of tariffs (Ul-Haq, Khanum, & Raza Cheema, 2020; Wu, Ul-Haq, Zafar, Sun, & Jiang, 2019). It is recognized that trade policy extensively affects the labor market, reduces poverty, enhances exports, wages, and economic growth (Hoque & Yusop, 2012; Rahman, 2011), and has expanded Pakistan's economic size as well as labor force participation. However, in existing research, the impact of trade liberalization (TL) on FLFP is inconclusive (Gaddis & Janneke, 2012; Li, Su, Tao, & Hao, 2019).

Women's participation in economic activities improves the country's development level because their participation ensures some social and economic benefits (Cooray, Dutta, & Mallick, 2017). Over the last three decades, female labor has been affected more by the expansion of developing nations' manufactured exports to developed nations. A large proportion of female labor of developing countries is conspicuously engaged in export-oriented manufacturing. Moreover, in developed nations, female labor is over-represented in sectors where manufactured

imports are concentrated in developing countries and under-represented in sectors of manufacturing that export to the developing nations (Schumacher, 1984).

The effect of TL on the labor force participation of females has recently attracted researchers' attention. The study of Sauré and Zoabi (2014) shows that the liberalization of trade and diffusion of technology have created more jobs and are strongly linked to female labor markets, thereby enhancing their access to economic opportunities and contributing to economic empowerment. This is consistent with the observations of Becker (1971), who argued that liberalization of an economy enhances competition among firms and reduces discrimination which fosters the participation of the female labor force.

Previous empirical studies have highlighted the diverse effects of trade liberalization (TL) on the female participation in the labor market (Gaddis & Janneke, 2012; Jonsson & Subramanian, 2001). The openness of an economy can lead to an expansion of traded sector as TL may generate more employment opportunities (Cooray et al., 2017), especially for female workers, and increases their participation in the labor markets because the skill level across the gender is different. However, globalization can increase the demand for female labor due lower wages and skill level (Anderson, 2005; Çağatay & Berik, 1990). While liberalization of trade may enhance competition, it may reduce the competitiveness of female workers, particularly if they have lower levels of education, and it may also weaken their bargaining power if they work in sectors with lower wages (Oostendorp, 2009). Generally, globalization reallocates resources and creates both winners and losers in the process of openness to trade (Li et al., 2019). Therefore, our study explores the openness effect on FLFP in the manufacturing sector, considering the crucial role of TL.

Our study finds that TL and FLFP are associated in Pakistan, as TL increases FLFP in the manufacturing sector. The results of both measures of FLFP validate each other's findings. Our results are robust and remain insensitive to the inclusion of various sector-related covariates. Moreover, the IV analysis also confirms that TL has led to an increase in female employment in the manufacturing sector. The findings of our study are in line with the studies of Gaddis and Janneke (2017); Li et al. (2019) and contrast with the studies of AlAzzawi (2014); Sauré and Zoabi (2014).

This study contributes to the existing literature by examining the association between TL and FLFP in the manufacturing sector of Pakistan, using a proxy of reduction of import tariffs deemed a better measure of TL. Unlike outcome-based measure such as trade ratios, this policy-based measure captures the pure impacts of trade policy. The reduction of import tariffs as a proxy for TL has not been utilized to find the effect of TL on FLFP in the case of Pakistan.

In addition, this study covers the whole trade regime from 1990-2005, a period during which import tariffs drastically reduced. This allows for an examination of the core impacts of the trade regime on FLFP. Moreover, as there were no crucial amendments made to the labor market during this sample period, the study captures the true impact of the trade regime on FLFP. This study therefore contributes to the existing literature by providing a more comprehensive analysis of the of the impact of TL on FLFP in the manufacturing sector of Pakistan (Chen, Ul-Haq, Visas, & Cheema, 2019; Wu et al., 2019).

2. THEORETICAL FRAMEWORK

Theoretically research on the effect of TL on the labor market, especially the Heckscher-Ohlin model (henceforth HOM), highlight how TL can affect labor force participation through relative factor prices between developed and developing countries (Li et al., 2019). TL can affect the labor force participation in different ways and one of such ways is the incentives given to the export-oriented industries, which lead to the enhancement of labor force participation (Kabeer & Mahmud, 2004; Ozler, 2000). Moreover, the increase in liquidity constraints faced by households due to the removal of subsidies through SAP persuades individuals to join the labor force. On the other hand, the labor force participation rate is positively related to openness if TL increases the wage rates as suggested by the study of Thurlow (2006). However, TL can adversely affect labor force participation if it favors more imports than exports (Bell & Nicolette, 1997). The existing studies have also found a negative association between labor force participation and TL, arguing that the influx of imports decreases employment (Edwards, 1999).

Further, it is worth noting that TL affects the labor force across gender differently because the male and female labor forces have different skills. By increasing wage differential, globalization enhances more female labor demand than male as it is cheaper (Anderson, 2005; Çağatay & Berik, 1990). In contrast, TL is more beneficial for males as compared to female labor if it is accompanied by technological upgrading. So, for the better utilization of technology, TL increases the demand for male laborers as they are more skilled than female laborers (Wood,

1998). In this way, TL adversely affects FLFP and their income level due to the utilization of labor-saving technology (substitution of male for female labor) (Oostendorp, 2009; Seguino, 2000). In their study Bhorat and Hodge (1999) also found the same evidence that trade benefits the skilled workers as compared to the less-skilled labor force. These views are supported by Anker, Helinä, and Ailsa (2003); Berik (1995).

I. TL → increases female job opportunities → increases in FLFP

In developing economies, TL generates more job opportunities for the female labor force as the international organizations are working in a competitive environment and want to decrease the total cost. To reduce its total cost, industries employ cheaper labor, which are often female workers. Females of the developing economies prefer these job opportunities due to the gender differences, which enhances their participation in the labor market (Gaddis & Janneke, 2012).

II. TL → technology upgrading → increases the demand for skilled labor (i.e., male)

Many experts believe that male labor is typically more skilled than female labor, and therefore increasing the demand for male is necessary for the better utilization of technology. On the other hand, as TL increases, developing nations face a more competitive environment. So, to be more competitive, the females of developing nations may need to enhance their educational status and decrease their participation in the labor market (Gaddis & Janneke, 2012). However, it remains uncertain whether these theoretical predictions hold true in practice and thus require empirical investigation (AlAzzawi, 2014).

3. DATA

3.1 Pakistan Trade Policy

Pakistan's trade policy experienced significant transformations between 1988 and 2005. During the reign of Zia Ul-Haq, Pakistan's economy was opened to international trade, and in 1988, significant changes were planned and implemented as part of the SAP. The reduction in tariff rates was unexpected and gradual across all sectors, and the protection levels varied significantly between sectors. In manufacturing sectors that promoted imports from protected industries, furniture, wood products, and wood, handicrafts, textiles and related goods were subjected to average tariffs of 106%, 94%, and 96%, respectively. Pakistan safeguarded relatively less skilled labor-intensive industries, as was observed by Pavcnik, Andreas, Pinelopi, and Norbert (2003) for Brazil and Colombia.

The tariff reduction during the sample period 1990-2005 (i.e., trade regime) of all sectors as well the manufacturing industry is shown in Figure 1. The average tariff declined by 13% in all sectors as well as 14% in the manufacturing industry out of the 64% protection rate during the trade regime of Pakistan.

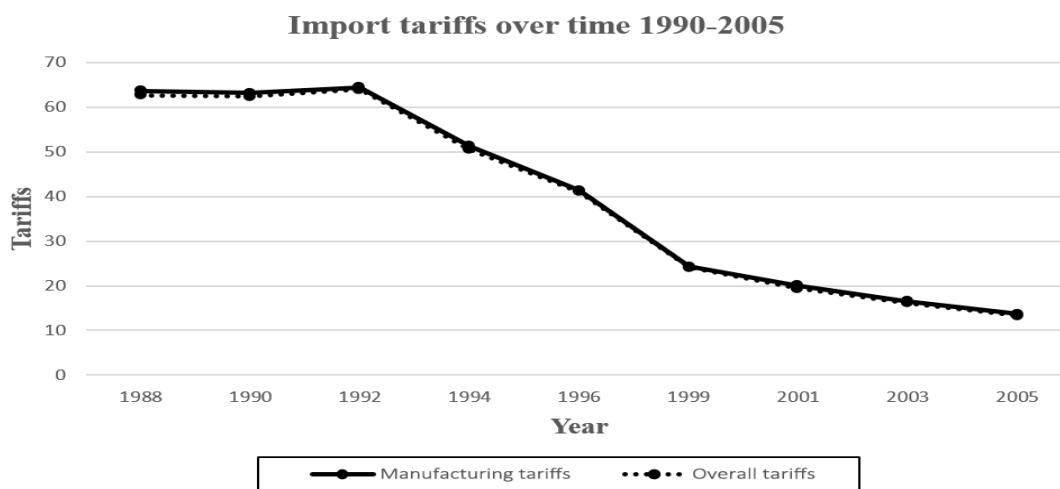


Figure 1. Time trend of reduction in tariffs.

Source: Wu et al. (2019).

3.2. Labor Market in Pakistan

There is high regulation in the labor market of Pakistan, and formal sector organizations face significant dismissal costs. Besides high rigidity, there exist enormous firing costs in Pakistan's labor market. The labor regulation in Pakistan is much more stringent as compared to the world standards. This is proved by the data of indicators of

market flexibility (Akhtlaque, Rasmus, & Taye, 2006). In Pakistan there exists very high employment laws restrictiveness as compared to other Asian Countries. Pakistan placed merely a 9 months ceiling for fixed-term contracts, whereas no limits have been placed by China, Singapore, and Malaysia for term contracts.

According to a survey of investment climates, Pakistan ranks 91st place in the World for ease of hiring and firing and 126th for worker's firing cost. The sample period of this study consists of data from 1990-2005, and there has been no change in the situations of the labor market (i.e., no new law was executed) during the study period (Chen et al., 2019; Wu et al., 2019).

3.3. Pakistan Labor Force Survey

It is organized by the Bureau of Statistics of Pakistan. LFS is cross-sectional data collected at the national level. The survey is conducted quarterly, which helps to deal with seasonal functions. Different characteristics of the labor force are covered by the survey. The main characteristics covered by the Pakistan Labor Force Survey (LFS) are the literacy rate, level of education, and affiliation with the industry. The main information about the labor force comprises the division of labor force based on informal and formal industry, sector, occupation, and working hours. The other features of the labor force are the workplace data on the health conditions of the labor employed. Besides this, there is information about the unemployed labor, educational qualification, and previous experience. The industries are taken at 2-digits ISIC codes. A total of 33 industries, including 9 manufacturing industries are covered every year. Labor is also separated into formal and informal industries.

We employed household data of manufacturing industries for FLFP for the years 1990, 1992, 1994, 1996, 1999, 2001, 2003, and 2005 of the labor force survey of Pakistan. The descriptive statistics of other variables are given in Table 1. Sectoral protection rates and other control variables are obtained from the study of Wu et al. (2019).

Table 1. Descriptive statistics (Selected year).

Variables	1990	1996	2001	2005
Log weekly wage	5.78	6.55	6.74	5.99
Weekly wage (Current PKR)	398.24	881.26	1074.68	1105.23
Monthly wage (Current PKR)	1594.86	3525.03	4298.73	4420.91
Male	0.915	0.91	0.897	0.878
Age	32.76	34.18	33.69	32.68
Married	0.687	0.727	0.699	0.646
Head of household	0.758	0.795	0.749	0.705
Literate	0.562	0.737	0.752	0.645
Below-Primary	0.469	0.292	0.288	0.389
Primary-but-below-middle	0.12	0.107	0.122	0.147
Middle-but-below-matric	0.093	0.099	0.108	0.116
Matric-but-below-inter	0.149	0.199	0.194	0.15
Inter-but-below-graduation	0.067	0.12	0.105	0.073
Bachelors	0.076	0.142	0.121	0.082
Masters	0.025	0.041	0.062	0.042
Managers	0.027	0.013	0.009	0.005
Professionals	0.131	0.191	0.113	0.076
Technicians	0.05	0.248	0.195	0.122
Clerks	0.135	0.096	0.162	0.11
Services	0.143	0.042	0.068	0.048
Skilled	0.073	0.02	0.008	0.016
Crafts	0.15	0.303	0.306	0.394
Plant	0.05	0.088	0.139	0.229
Punjab	0.449	0.427	0.449	0.494
Sindh	0.278	0.296	0.272	0.259
KPK	0.182	0.163	0.147	0.156
Baluchistan	0.09	0.113	0.133	0.09
Observations	12055	7833	7808	23389

4. MODEL SPECIFICATION

To investigate the relationship between TL and FLFP in the manufacturing sector of Pakistan, our study constructs a sector level panel data to investigate the following baseline specification:

$$FLFP_{kt} = \alpha + \beta Tarrif_{kt} + \gamma_{kt} + \mu_k + \delta_t + \varepsilon_{kt} \quad (1)$$

Where $FLFP_{kt}$ is FLFP rate in sector k in year t. The dependent variable of our study is the share of female employees of age 15-60 years in the manufacturing sector. To measure FLFP, we used two proxies namely: share of female workers (i.e., total female workers to total workers in that particular sector) and female to male ratio (i.e., total female workers/total male workers in that particular sector). $Tarrif$ is the proxy for TL defined as the sectoral tariffs in sector k at time t and β is the parameter estimate of interest which shows how the reduction in import tariff may affect the FLFP. γ_{kt} is a vector of the individual-level control variables. μ_k is a sector fixed effect and δ_t is a time-fixed effect. ε is the error term.

To ensure the robustness of our main findings, we followed the methodology proposed by [Goldberg and Pavcnik \(2005\)](#); [Ul-Haq \(2016\)](#) and include several control variables, such as gross domestic product (GDP), gross fixed capital formation (GFCF), interactive variable (nominal tariffs*net importer) (NMTAR), lagged exports (LX), lagged imports (LM), lagged XNEER (export nominal effective exchange rate), lagged MNEER (manufacturing nominal effective exchange rate), import penetration ratio (IPR), and export consumption ratio (XCR). Additionally, we employ instrumental variable (IV) analysis, as suggested by [Attanasio, Pinelopi, and Nina \(2004\)](#); [Goldberg and Pavcnik \(2005\)](#); [Ul-Haq \(2016\)](#), to examine the association between TL and FLFP in the manufacturing sector.

5. RESULTS AND DISCUSSION

[Table 2](#) presents the impact of TL on FLFP in the manufacturing sector of Pakistan. To explore the relationship between TL and FLFP, we used the two measures of FLFP (i.e., total female workers to total workers in that particular sector and total female workers to total male workers in that particular sector). In [Table 2](#), columns 1-2 indicate the relationship between TL and total female workers to total workers and total female workers to total male workers respectively.

Table 2. Trade policy and female employment.

Variables	1	2
Import tariff	-0.001** (0.001)	-0.002** (0.001)
Time indicator	Yes	Yes
Observations	72	72

Note: Total female workers to total workers in that particular sector are the dependent variable in column 1 and total female workers to total male workers in that particular sector in column 2. The Standard errors are presented in brackets. The Number of asterisks represents significance-level at five percent is shown by **.

Column (1) of [Table 2](#) indicates a negative and statistically significant association between TL and FLFP in the manufacturing sector of Pakistan. A one percentage decrease in protection rate leads to a 0.0016 percentage increase in FLFP. TL enhances FLFP in the manufacturing sector of Pakistan. Hence, we can say that TL plays a significant role in FLFP. TL is therefore a powerful tool used to improve female employment. Similarly, Column 2 also reveal a negative and statistically significant relationship between TL and FLFP. A reduction in protection rate leads to an increase in FLFP, where a one percentage decrease in protection rate results in a 0.0024 percentage increase in FLFP.

5.1. Robustness Checks

Our study's primary measure of TL is the reduction in import tariffs, which is a key strength of our study. However, trade may affect FLFP through other channels as well. For instance, industries may have encountered distinct variations in the communication and transportation costs, informal trade barriers, and exchange rates over time. Therefore, we investigate the robustness of our findings by controlling for some of these factors.

In our empirical model, we include tariffs along other trade-related variables as controls to examine the robustness of our core tariff coefficients. These controls are not based on any particular theory, and we do not describe the estimated coefficients of the control variables in the light of any theory. Rather, we treat these trade-related controls as conditioning variables to test the robustness of our core tariff coefficients. To further check the

robustness of our core findings, we include various control variables in the regression model, and the findings are presented in Table 3. NMTAR is an interactive dummy that considers nominal tariff and net import tariff. The robustness check results are given in columns 1-6.

Table 3. Trade policy and female employment (Robustness checks-I).

Variables	1	2	3	4	5	6
Import tariff	-0.002** (0.000)	-0.002* (0.000)	-0.003* (0.001)	-0.001** (0.000)	-0.002* (0.000)	-0.003* (0.001)
Log GDP		0.003 (0.038)			0.021 (0.027)	0.0278 (0.023)
Log GFCF		0.008 (0.016)			0.004 (0.016)	0.007 (0.015)
NMTAR	0.001** (0.000)				0.001** (0.000)	0.0002 (0.0004)
Lagged export			4.3E-10 (5.0E-10)			5.6e-10 (6.2e-10)
Lagged import			7.9E-11 (7.3E-10)			0 (6.9e-10)
Lagged XNEER			-0 (0)			-0 (0)
Lagged MNEER			0 (0)			0 (0)
Import Penetration				-0.005 (0.063)	0.0006 (0.0611)	-0.021 (0.074)
Export Consumption ratio				-0.028 (0.037)	-0.022 (0.035)	-0.020 (0.048)
Time indicators	Yes	Yes	Yes	Yes	Yes	Yes
Observations	72	72	63	72	72	63

Note: Total female workers to total workers in that particular sector are the dependent variable in all models. NEER stands for the nominal effective exchange rate. The Standard errors are presented in brackets. The Number of asterisks represents significance-level at five and ten percent are shown by **, and * respectively. NMTAR is an interactive dummy that takes into account nominal tariff and net import tariff. Our results are robust and are not sensitive to the inclusion of other variables.

Table 3 shows that the coefficient of the measure of tariffs does not change its sign after the inclusion of various control variables. It remains robust as well as negatively associated with female employment.

Table 4 indicates the robustness check of our core findings using the measure of the female to male ratio. The results show that our findings on the core variable of import tariff remain unchanged after the inclusion of various trade-related variables as shown in columns 1-6 of Table 4.

5.2. Results from Instrumenting for Trade Policy Changes

Table 5 outlines the determinants of trade policy change based on the first-stage regression results of 2SLS. To further examine our instruments, we rigorously analyze the determinants of annual tariffs from 1990-2005. Our study investigates the relationship between annual tariffs and the variables listed in Table 5. In column 1 of the table, the coefficient of the protection rate is shown to be negative. In the same column, tariff changes are regressed against the tariff levels in 1988, a time indicator, and a constant. The coefficient of the 1988 tariffs level is -0.097, and R-square is 0.67. Column 2 displays the results of regressing tariff changes on the interaction between 1988 tariff levels and FOREX reserves. These interactions yield potential industry-specific time-varying instruments in column 3, which remain consistent even when we include the industry's 1990 share of unskilled workers as a regressor (unreported) because the correlation between the share of unskilled workers and preliminary tariff level is so strong. As a result, we concentrate on 1988 tariff levels (rather than the proportion of unskilled workers) as the primary determinants of tariff declines. The joint explanatory power of these regressors continues to be high across all specifications.

Table 4. Trade policy and female employment (Robustness checks-II).

Variables	1	2	3	4	5	6
Import tariff	-0.003** (0.001)	-0.002* (0.001)	-0.004* (0.002)	-0.002* (0.001)	-0.003** (0.001)	-0.004* (0.002)
Log GDP		-0.016 (0.056)			0.011 (0.036)	0.026 (0.029)
Log GFCF		0.014 (0.023)			0.009 (0.022)	0.007 (0.019)
NMTAR	0.001** (0.0004)				0.001*** (0.0003)	0.0002 (0.0006)
Lagged exports			1.1e-09 (6.9e-10)			1.3e-09 (8.2e-10)
Lagged imports			-1.3e-10 (1.0e-09)			-1.8e-10 (9.8e-10)
Lagged XNEER			-0 (0)			-0 (0)
Lagged MNEER			0 (0)			0 (0)
Import penetration				0.013 (0.082)	0.0007 (0.085)	-0.031 (0.096)
Export consumption ratio				-0.053 (0.053)	-0.025 (0.0498)	-0.023 (0.063)
Time indicators	Yes	Yes	Yes	Yes	Yes	Yes
Observations	72	72	63	72	72	63

Note: Female to male ratio is the dependent variable in all models. NEER stands for the nominal effective exchange rate. The Standard errors are presented in brackets. The Number of asterisks represents significance-level at one, five and ten percent are shown by ***, **, and * respectively. NMTAR is an interactive dummy that takes into account nominal tariff and net import tariff. Our results are robust and are not sensitive to the inclusion of other variables.

Table 5. Determinants of trade policy changes (First stage regression results of 2SLS).

Variables	1	2	3
Tariffs 88	-0.097*** (0.012)		
FOREX reserves × Tariffs 88		-7.2e-09*** (1.1E-09)	
Share of unskilled workers in 1990			-0.114** (0.046)
R-squared	0.674	0.624	0.645
Time indicator	Yes	Yes	Yes

Note: Dependent variable is a change in tariffs. The Standard errors are presented in brackets. The Number of asterisks represents significance-level at one, and five percent are shown by ***, and ** respectively. The number of observations is 63.

Table 6 displays the results of the second stage of 2SLS estimates for [Equation 1](#). Column 1 describes the findings of the first difference when we do not instrument for changes in the tariff. The coefficient of the tariff is negative and statistically significant. Using alternative sets of instruments, the 2SLS results are reported in columns 2 through 4. The coefficient estimates are robust even after using the interaction between pre-reform tariff levels and FOREX reserves, and the share of unskilled workers as instruments. The negative (statistically significant) association between tariff declines and increase in FLFP is robust, despite the fact that the magnitude of tariff coefficient changes compared to the baseline specification. However, the estimated adverse influence of TL on FLFP increases from 0.001 in column 1 to 0.008 in columns 2 and 4, and to 0.023 in column 3.

Table 6. Trade policy and FLFP (2SLS).

Variables	1	2	3	4
Nominal tariffs	-0.001** (0.0006)	-0.008* (0.004)	-0.023*** (0.007)	-0.008** (0.004)
Instrument	No	Tariffs 88	FOREX reserves × Tariffs 88	Share of unskilled workers in 1990
Time indicator	Yes	Yes	Yes	Yes

Note: Dependent variable is a female share in the manufacturing sector. The Standard errors are presented in brackets. The Number of asterisks represents significance-level at one, five, and ten percent are shown by ***, **, and * respectively. The number of observations is 63.

To sum up, our results reveal a significant effect of TL on FLFP in the manufacturing sector of Pakistan. Whether this effect stems from female shares or female to male ratio, FLFP increases in sectors with larger tariff cut. Our findings are consistent with the studies of [Gaddis and Janneke \(2017\)](#); [Li et al. \(2019\)](#), but contrast with the studies of [AlAzzawi \(2014\)](#) and [Sauré and Zoabi \(2014\)](#).

6. CONCLUSION

Pakistan experienced drastic trade reforms as part of the conditions of the structural adjustment program (SAPs) of IMF and World Bank in 1988. This study aims to examine the association between TL and FLFP by using the micro-level data from the manufacturing sector between 1990 to 2005. Our study finds that TL enhances FLFP, as the decrease in protection rates leads to an increase in FLFP in the manufacturing sector. The results of both measures of FLFP are consistent with each other. We also add several control variables for robustness checks, and our results are robust and are insensitive to various trade and sector-related variables. The IV analysis also confirms that liberalization has contributed to female employment in the manufacturing sector. The policy implication is that the government and higher authorities should formulate TL policies that can help to enhance FLFP.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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AUTHORS' CONTRIBUTIONS

All authors contributed equally to the conception and design of the study.

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