FDI and Wage Nexus: Evidence from the Manufacturing Sector of Pakistan

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Abstract: *Foreign capital inflows resulted in overall economic growth in many countries, but there are many concerns about its distributive effects, especially on fluctuating wages, which are still being investigated. The aim of this research is to investigate the impact of foreign direct investment on domestic industry wages using micro-level data from Pakistan from 1996-97 to 2007-08. Foreign firms are expected to pay higher wages than that domestic firms in order to attract more labor; thus, if foreign and domestic firms compete in the same labor market, domestic firms would pay higher wages to recruit jobs, resulting in rising average domestic industry wages. The empirical analysis also shows that in Pakistan, FDI inflows raise industry wage premiums. The findings of the study are robust by the inclusion of various globalization and sector-related variables. To reap higher wages, Pakistan's government should promote FDI at the industry level.*

Introduction

The last decade's third wave of globalization has assisted the economic linkage between countries through the rush inflows of the foreign direct investment (FDI) world widely. Multinational firms have chosen the way of internationalization and have outpaced the expansion of trade and increased their investment in developing countries (Büthe & Milner, 2008). Inward foreign direct investment as a percentage of world GDP grew up from less than 5% in 1980 to around 30% in 2010 (Pittiglio et al., 2015). This urges policymakers to frequently emphasize inquiring about the potential benefits of FDI to host economies. In this regard, several researchers have inquired about the impact of FDI on productivity spillovers (Hussain, 2017; Li & Tanna, 2019; Mahmood & Chaudhary, 2012; Smarzynska Javorcik, 2004). While other impacts of FDI on the host country, such as wage spillovers,

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have rarely been studied. It often seems to be a fundamental condition that firms with foreign ownership pay higher wages than firms that are home owned in host countries, promoting wage spillover (Lipsey & Sjöholm, 2004; Tomohara & Takii, 2011). On average, foreign companies paid 30% more than their domestic counterparts (Brian Aitken, 1996).

In the way of globalization of an economy, foreign direct investment plays a crucial role (Aluko et al., 2021). FDI can have both direct and indirect effects on average domestic wages. Direct effects arise when foreign firms offer higher wages than domestic firms to attract more labor in the same field. In return, domestic firms would pay higher wages to recruit jobs, thereby increasing average wages, while an indirect impact arises from the positive effect that foreign firms' entry can have on the productivity of foreign affiliate domestic firms (Pomfret, 2010). It's unclear which way the impact on wages at domestic firms will swing. Firms may, for example, boost labor demand or increase labor market competition, forcing domestic firms to raise wages in relatively stable labor markets, and FDI's technological externalities, or spillovers, may increase wages and productivity in domestic firms while foreign firms, on the other hand, may seek out the best, probably higher-paid workers in domestic firms or acquire high paid local firms thus, inflows of foreign firms can also result in domestic firms having a smaller scale of output and lower productivity which leads to lower wages (Lipsey & Sjöholm, 2004).

Empirical results of FDI impact on wage spillovers are inconclusive (Brian Aitken 1996, Lipsey and Sjöholm 2004, Pomfret 2010, (Barry et al. 2005, Vijaya and Linda 2007, Muñoz-Bullón and Sánchez-Bueno 2013, Brian Aitken 1996). In this stream of literature, some studies focus on cross-country analysis (Azam & Lukman, 2010; Büthe & Milner, 2008; Gopinath & Chen, 2003). These studies, face major obstacles: cross-country data may not be equivalent, sample sizes may even be small, and changes in liberalization may also be closely associated with other factors specific to income processes (Atkinson, 1970; Topalova, 2007). According to some country-specific studies, the presence of FDI improves wages in domestic countries (Elliott & Zhou, 2015; Lipsey & Sjöholm, 2004; Pomfret, 2010; Rosanna Pittiglio, 2014). While other researchers found that the inflows of foreign investment have a negative impact on domestic wage levels (Barry et al., 2005; Muñoz-Bullón & Sánchez-Bueno, 2013). At long last, some studies show that FDI does not affect wages in domestic firms (Brian Aitken, 1996). Thus concluding that the effect of the FDI on domestic wages varies depending on country characteristics.

In the case of Pakistan, the findings of this study show that Foreign Direct Investment (FDI) has a highly significant positive impact on wage premiums. The magnitude of this positive impact is that a 1% rise in FDI corresponds to a 1.85% increase in wage premium and vice versa. Moreover, this positive effect is robust by the inclusion and exclusion of different control variables. From the empirical literature on developed and developing countries, our findings are in line with (Brian Aitken, 1996; Chidambaran Iyer, 2012; Elliott & Zhou, 2015; Lipsey & Sjöholm, 2004; Pomfret, 2010; Rosanna Pittiglio, 2014; Tomohara & Takii, 2011) while contrast with (Barry et al., 2005; Muñoz-Bullón & Sánchez-Bueno, 2013; Vijaya & Linda, 2007). These empirical results argue that FDI is a key factor that can increase wages in Pakistan.

The existing literature on FDI in Pakistan focuses on determining the factors responsible for low FDI in Pakistan (Akhtar & Radice, 2001; Aqeel et al., 2004; Sharif, 1997). In recent decades, the focus has shifted to identifying the factors that cause FDI to expand (Ahmed & Jhandir, 2012; Azam & Lukman, 2010; Khan & Nawaz, 2010). Various researchers have classified the determinants of FDI in different ways. In this study, we add to the literature by exploring the impact of FDI inflow on the domestic wages of Pakistan, which is an effect rather than a cause of FDI inflows. To address the problem of cross-country analysis, this study uses a promising alternative: micro evidence from household surveys at sector-level data on two-digit manufacturing industries during 1996-97 to 2007-08. This sector-level data allows us to get a more disaggregated perspective than we would get from

country-level data. Rules regarding the labor market play a significant role in wage determination. Pakistan is an exclusive case study for examining the effect of FDI on wages since no new labor market regulations were enforced during this period or even previously (Chen et al., 2019; Wu et al., 2019). Since there are ambiguous results in the current literature on this relationship, it is believe that the minimal role of regulation that can influence the labor market during the study period will give us the core effect of foreign investment on wages.

The next section proceeds with data and methodology. Results and discussions are presented in section 3. The final chapter wraps up the research and offers some policy recommendations.

Pakistan's FDI Reforms

Pakistan's attempts to attract FDI became fruitful when following the implementation of deregulation, privatization, and liberalization policies as part of the Structural Adjustment Program (SAP) criteria in a collaboration with the World Bank (WB) and the International Monetary Fund (IMF) after 1988. As a result, Pakistan began to follow a more liberal foreign investment policy, and investment inflows increased by 93.3 percent in 1995/1996, owing primarily to increased investment in the power sector (Khan & Kim, 1999).

In 1997 FDI inflows dropped unexpectedly to 0.2 percent of global FDI reasoning because of the Asian currency crisis started in Thailand in July 1997 and has since spread to other countries, including Pakistan. After that, FDI inflows gradually increased until 2007.

After that, the global financial crisis in 2008, triggered by a liquidity deficit in the US financial system results in a major decrease in foreign capital inflows. Pakistan's economy had been indicating signs of insecurity for some time, with power outages and law and order issues, but the country was thrown into a full-fledged economic and financial crisis in 2008. In addition to a very critical domestic political situation, and the collapse of international financial markets has caused investors in Pakistan to fear and expect the Karachi stock exchange to crash in early 2008 (Haque, 2010). Before the global financial crisis, exports accounted for roughly 15% of GDP and were a major source of foreign capital; however, both exports and imports fell significantly in 2009, the year following the crisis.

Data and Methodology

Data

For empirical estimation, we used data on wage premium and worker characteristics from the labor force survey (LFS). FDI data has been taken from the State Bank of Pakistan (SBP) and aggregated at 2-digit industry-level data using International Standard Industrial Classifications (ISIC-Rev3). We need to aggregate this because we have only 2-digit sectoral data in LFS. This is one of our limitations of data. Due to the lack of data before 1996-97 and the clear delineation after 2007-08, we use data with no fluctuations from 1996-97 to 2007-08.

LFS offers data on labor status, employment characteristics, underemployment, labor status, workforce, and income, in addition to respondents' demographic context (age, gender, and head of family, literacy, level of education, occupation, and population movement). The workforce data includes information on the workforce by sector, occupation, employment status, number of working hours and educational qualification, informal and formal industries, workplace safety, and health-related measures, and unemployed workers by work experience and education. The industry employs a total of 2-digits, including nine manufacturing industries in one survey year. Descriptive statistics of worker's attributes are shown in Table 1 only for several years used in the analysis.

The information gathered on worker characteristics has some flaws, including the fact that it does not include the worker's union status, which is an important factor in deciding workers' earnings. The data does not provide details about whether or not an individual is a member of a labor union. In some sectors, the union lobby is very powerful, while in others, the union lobby is ineffective and does not play a role in determining

workers' wages. Second, we have not taken into account the number of years that employees have worked in a given sector. Also in the same sector, two workers in the same job may have a pay difference. The reason behind this is the number of years to join the industry and serve in the post. Therefore, in our data, we have not provided such information.

Table 1. Descriptive Statistics of the Worker's Characteristics (Selected Years)

Variables	1999	2001	2003	2005
Log weekly wage	6.69	6.74	6.83	5.99
Weekly wage (current PKR)	1018.43	1074.68	1243.82	1105.23
Monthly wage (current PKR)	4073.7	4298.73	4975.26	4420.91
Male	0.895	0.897	0.889	0.878
Age	34.05	33.69	33.85	32.68
Married	0.715	0.699	0.679	0.646
Head of Household	0.756	0.749	0.704	0.705
Literate	0.756	0.752	0.768	0.645
Below Primary	0.273	0.288	0.273	0.389
Primary but below Middle	0.111	0.122	0.116	0.147
Middle but below Metric	0.107	0.108	0.117	0.116
Metric but below Inter	0.19	0.194	0.187	0.15
Inter but below Graduation	0.109	0.105	0.11	0.073
Graduate	0.144	0.121	0.13	0.082
Post Graduate	0.064	0.062	0.067	0.042
Managers	0.01	0.009	0.01	0.005
Professionals	0.157	0.113	0.119	0.076
Technicians	0.173	0.195	0.176	0.122
Clerks	0.158	0.162	0.163	0.11
Services	0.056	0.068	0.075	0.048
Skilled	0.014	0.008	0.01	0.016
Crafts	0.309	0.306	0.305	0.394
Plant	0.123	0.139	0.143	0.229
Formal	0.651	0.635	0.587	0.394
Punjab	0.456	0.449	0.427	0.494
Sindh	0.255	0.272	0.283	0.259
KPK	0.157	0.147	0.155	0.156
Baluchistan	0.132	0.133	0.135	0.09
Observations	6672	7808	7803	23389

Source: Calculations by the author based on LFS data

Furthermore, labor market regulations play a crucial role in determining wages. Luckily, during our study period, the labor market regulations remained unchanged. Between 1996 and 2007, no new rules were enacted (Chen et al., 2019; Wu et al., 2019). The most recent law is the Children's Work Act of 1991, which prohibits children from working in some occupations and establishes minimum working standards anywhere they are permitted to work. As a result, we expect that labor market reform would have little to no effect on our research. As a consequence, the most accurate estimates are obtained.

Empirical Methodology

The research employs the wage premium framework established by Krueger and Summers (1988); Dickens and Katz (1987); Gaston and Trefler (1994); Pavcnik et al. (2004) and Goldberg

and Pavcnik (2005) to investigate the impact of FDI on the domestic wages. The analysis employed a two–step estimation process used in labor economics (Aleman-Castilla, 2006; Goldberg & Pavcnik, 2003; Matthew, 2011; Wu et al., 2019). It proceeds methodology by two steps. In a first step, we regress the log of the worker i wages ($ln\ (w_{ijt})$) on a vector of individual characteristics I_{ijt} such as

gender, age, qualification, geographic location, and a collection of industry indicators followed as:

$$ln\ (w_{ijt}) = H_{ijt}\beta_H + I_{ijt} + \varepsilon_{ijt} \qquad (1)$$

Here $ln\ (w_{ijt})$ is the log wage of worker i in sector j at time t, β_H is the coefficient of worker i's characteristics in sector j at time t, H_{ijt} is the vector of worker i's characteristics in sector j at time t, I_{ijt} is the set of industrial indicators, which exhibits the worker i's association with industry and ε_{ijt} is the error component of worker i with all its assumptions of normality and heteroscedasticity. Workers' characteristics capture wage variation caused by a worker's skill, age, gender, and other factors. The coefficient of industry indicator, on the other hand, captures certain aspects of heterogeneity that are not captured by worker characteristics. As a result, the coefficient of industry predictor captures the differences that can be explained by the worker's industry affiliation.

Following Krueger and Summers (1988) we estimate wage premium as deviation from the employment-weighted average wage premium, assuming that the omitted industries variable has no effect on wage premium. This normalized wage premium can be conceived of as the proportional difference in wages between an average worker in all industries with the same specific attributes and a worker in a given industry. Using Haisken-DeNew and Schmidt (1997) two–step restricted least squares method, we measure the normalized wage differentials and their corresponding standard errors. The restricted least squares method of two-stage least squares (2SLS) is used to estimate the wage differential in the first equation as well as the standard errors (SE). The regression equation is computed separately for each year in the analysis at the first stage then industry wage premium, on the

other hand, is pooled over time and regressed on industry characteristics in the second stage.

$$wp_{jt} = FDI_{jt}\beta_F + D_{jt}\beta_D + \mu_{jt} \qquad (2)$$

The reduced form relationship is represented by the above equation, which is in line with the alternative theoretical interpretations (for example, Specific factors-, the Ricardo-Viner model, or a model of imperfect competition causing industry wages to rose). Where D_{jt} is the vector of set of industry and time indicators, while FDI_{jt} is the vector of the industry including FDI. The above equation is also regressed in the first difference, which is the industry fixed effects alternative. We can get the following result by taking the first difference of the above equation: By taking the first difference of the above equation, we obtain:

$$\Delta wp_{jt} = \eta^* \Delta t_{jt} + \Delta FDI'_{jt}\beta'_F + D'_{jt}\beta'_D + \mu'_{jt} \qquad (3)$$

The shift in the industry wage premium for the j industry between time t and time $t-1$ is represented by wp_{jt}. Between t and $t-1$, t_{jt} is the transition in tariff in industry j. D_{jt} is the set of other control variables, and FDI_{jt} is the one-period change in foreign direct investment into the industry. Ideally, both equations 2 and 3 are reduced form equations, and we can add several more control variables that can affect the wage premium, such as other sectors tariff changes, and put some restrictions on the model in order to get the deep analysis, but data constraints prevent us from doing so.

The endogenous variable for the second stage is calculated with error. Measurement error does not affect the second stage coefficients until and unless it is uncorrelated with the exogenous variable, but it adds noise to it becoming the reason of larger variance. This noise varies by industry and is determined by the coefficient on the industry indicator in the first stage. As a result, we opt for weighted least squares (WLS), with weights equal to the inverse of the variance of the first-step wage premium estimates. This weights sectors with less fluctuation in industry premiums. By computing robust (Huber-White) standard errors grouped by industry, we compensate for general forms of heteroscedasticity and serial correlation.

Result and Discussion

First Stage Regression Results

Before discussing the relationship between foreign direct investment and domestic wages, we present some explanation on the results of the first stage regression. Table 2 shows first stage regression estimates for each year of the sample period. At a first glance, we observe the gender component, which is positive and significant in all equations. We have one for males and zero for females in the gender dummy. The coefficient of gender's significance suggests that it plays a significant role in assessing the wage premium. Wage determination is often influenced by age. The age coefficient is positive and important in all equations, but it has a small magnitude, indicating that becoming older has a minor effect on the pay premium. The age-square variable is used in our models to monitor the impact of previous employment on the wage premium. When we control the previous employment effect, age square has a negative and significant effect on the wage premium, indicating that it has a negative impact on the current wage premium. Moving on to education, primary education has mixed effects on wage inclusion in all equations, implying that it is vulnerable to control variable inclusion and exclusion.

Except one equation, the impact of primary education on the wage premium is negligible. Middle income has a noticeable effect on the wage premium in all equations and is thus unaffected by the control variables' inclusion or exclusion. Across all equations, the effect of middle education is greater than that of primary education. The positive effect of middle education on the wage premium indicates that higher education ensures higher earnings. Inter, graduation, and post-graduation all have a substantial influence on the wage premium in all equations as we move into higher education. If we analyze their coefficients, we will find that as the level of education increases it raises the wage premium of the workforce.

The effect of marital status is also positive and significant except the equation six in which the effect of marital status on the wage premium is negative and insignificant. If we analyze the coefficient of marital status, we can see that it is low, indicating that changing one's marital status has a positive but smaller impact on the wage premium than changing one's educational level. Head of a household has also shown us mixed results; in some equations, this variable has a positive impact on the wage premium, whereas, in others, it has a negative impact.

Table 2. *First Stage Regression Results (Selected Years)*

Variables	1999	2003	2005	2007
Sex	0.264***	0.373***	0.405***	0.337***
	(0.0306)	(0.0202)	(0.0221)	(0.0130)
Age	0.0626***	0.0599***	0.0580***	0.0444***
	(0.00398)	(0.00302)	(0.00328)	(0.00203)
age2	−0.000648***	−0.000635***	−0.000581***	−0.000453***
	(4.95e−05)	(3.77e−05)	(4.07e−05)	(2.52e−05)
Primary	−0.0278	−0.000835	−0.00602	0.0142
	(0.0503)	(0.0313)	(0.0347)	(0.0238)
Middle	0.0530	0.0690**	0.0746**	0.0897***
	(0.0506)	(0.0319)	(0.0348)	(0.0242)
Matric	0.183***	0.175***	0.180***	0.167***
	(0.0489)	(0.0303)	(0.0338)	(0.0234)
Inter	0.308***	0.295***	0.266***	0.263***
	(0.0520)	(0.0333)	(0.0367)	(0.0250)

Variables	1999	2003	2005	2007
Prof	0.589***	0.511***	0.517***	0.477***
	(0.0531)	(0.0336)	(0.0370)	(0.0254)
Pgrad	0.779***	0.699***	0.705***	0.678***
	(0.0610)	(0.0378)	(0.0414)	(0.0277)
Hhh	–0.0304	–0.0216	–0.0340**	–0.00493
	(0.0212)	(0.0142)	(0.0153)	(0.00913)
Married	0.103***	0.0822***	0.0698***	0.0276**
	(0.0229)	(0.0170)	(0.0187)	(0.0113)
Literate	0.137***	0.0927***	0.113***	0.0656***
	(0.0474)	(0.0294)	(0.0324)	(0.0230)
Industry indicator	Yes	Yes	Yes	Yes
Time Indicator	Yes	Yes	Yes	Yes
Observations	6,623	8,009	8,029	15,239

Note. Wage premium is an endogenous variable in all forms of the model. Standard errors are clustered in parentheses. Level of significance at 1%, 5% and 10% is depicted by *** $p<0.01$, ** $p<0.05$, * $p<0.1$ respectively. Other variables that are included in other models are insensitive to affect the robustness of the results. All the models are estimated by using industry-fixed effect dummies.

Second Stage Regression Results

The industry wage premium obtained from the first stage regression is pooled across time and modeled on industry variables in the second stage. Table 3 shows the coefficients and p-values for each explanatory variable. The regression model's estimates of industry wage differentials on foreign investment, sector dummies, and time dummies are reported in the first column. FDI has a positive and statistically significant coefficient. This suggests that domestic wages and foreign direct investment have a statistical association. A one percentage point increase in foreign investment, for instance, is associated with a 1.85 percent increase in domestic wages. Our results are consistent with (Brian Aitken, 1996; Chidambaran Iyer, 2012; Elliott & Zhou, 2015; Lipsey & Sjöholm, 2004; Pomfret, 2010; Rosanna Pittiglio, 2014; Tomohara & Takii, 2011) while contrast with (Barry et al., 2005; Muñoz-Bullón & Sánchez-Bueno, 2013; Vijaya & Linda, 2007).

Table 3. FDI and Wage premiums in the manufacturing sector of Pakistan

	(1)	(2)
LFDI	1.85e–09***	3.05e–09***
	(0)	(0)
1st difference	No	Yes
Sector indicator	Yes	No
Time indicator	Yes	Yes

Note. Wage premium is a dependent variable in all the models. Standard errors are clustered in parentheses. Level of significance at 1%, 5% and 10% is depicted by *** $p<0.1$, ** $p<0.05$, * $p<0.1$ respectively. N is 49 in the first column, and 40 in the second column.

Further, we have estimated the eight different models by inclusion and exclusion of different control variables including lag of FDI, imports, exports, nominal effective exchange rate, gross fixed capital formation, for the sensitivity analysis. Sector indicators and time indicators have been considered, while estimation most of the above models. Table 4

columns 1-4 are calculated using industry fixed effects, whereas columns 5-8 are examined using the variables' first difference. The magnitude and significance of our main results remain the same even after including these variables.

Table 4. FDI and Wage premiums in the manufacturing sector of Pakistan (sensitivity analysis)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LFDI	1.85e–09***	1.23e–10***	1.24e–10***	1.86e–09***	3.05e–09***	4.52e–09***	4.52e–09***	8.43e–09***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Lagged X		–0***				0***		
		(0)				(0)		
Lagged M		–0***				0***		
		(0)				(0)		
Lagged XNEER			–0***				0***	
			(0)				(0)	
Lagged MNEER			–0***				0***	
			(0)				(0)	
Log GDP				0.0108***				–0.144***
				(0.00168)				(0.000393)
Log GFCF				0.0845***				0.159***
				(0.00207)				(0.000277)
1st difference	No	No	No	No	Yes	Yes	Yes	Yes
Sector indicator	Yes	Yes	Yes	Yes	No	No	No	No
Time indicator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

Note. Wage premium is an endogenous variable in all the models. Standard errors are clustered in parentheses. Level of significance at 1%, 5% and 10% is depicted by *** $p<0.1$, ** $p<0.05$, * $p<0.1$ respectively. N is 49 in the first column, it is 44 in 2 and 3 columns, 49 in the 4th column, and 40 in the remaining columns. Columns 1-4 are estimated using industry-fixed indicators, while columns 5-8 are estimated using the first difference, our findings are robust and are not affected by the inclusion of these variables.

In conclusion, we find that the impact of FDI on the wage premium is stable and not affected by the inclusion and exclusion of control variables and that the FDI has a significant positive impact on the wage premium, based on sensitivity analysis, inclusion, and exclusion of control variables, and consideration of sector and time characteristics.

Conclusion

The study aims to analyze the effect of FDI on the wages of the manufacturing industries of Pakistan by using panel data from 1996 to 2007. We found that FDI has a positive and statistically significant effect on the wages of the manufacturing sector. Furthermore, this positive effect is robust to a number of different control variables, worker characteristics, and firm characteristics. As rigidity and flexibility of labor market regulations play a critical role in wage determination, there is no new regulation in Pakistan, and there hasn't been in a long before. As a result, it is expected that the results could accurately capture the impact of foreign investment.

The findings of the study argue that FDI is a key factor that can increase incomes in the host country's manufacturing sector. This effect can be

strong, but FDI inflows are low in Pakistan. The low inflow of FDI is due to a number of factors, the most important of which is the political risk factor. Thus, the study's results have significant policy consequences for Pakistani policymakers. Foreign direct investment (FDI) is used to replace domestic investment and to meet domestic investment requirements. The government should take measures to ensure that foreign investors' investments are safe and stable, as well as provide incentives to attract foreign investment. To attract foreign investment and allow FDI to play its role in promoting the domestic economy, appropriate FDI policies and regulations are required. The government should be careful when choosing the sectoral FDI and policies should be made to promote the industry in which FDI gives more benefits to the domestic economy. Pakistan's government should encourage industry-level FDI, which can be beneficial to our economy.

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