FDI, Labor Market and Welfare: How Inequality Navigates Welfare Loss?

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1 Introduction

Globalization being the prominent driver of modern economic growth significantly influences the global growth through foreign direct investment (FDI) and international trade. FDI being one of the key components of globalization made rapid growth during the previous two decades resulting in prominent changes in labor markets in the countries. Many times, FDI is seen a panacea for many economic problems like improving the standard of living. FDI is expected to generate higher income and strong positive effects in the labor markets through a monotonic decrease in unemployment. It is argued that FDI drives capital and technology, therefore, enhances the productivity to the targeted firms, industries and the country as a whole. The external effects arising from the diffusion of skill-based technology not only aim to boost productivity but also improve the employment conditions and thus the wages. However, the higher demand for skilled labor by foreign firms may create wage inequality leading to loss of welfare (Crescenzi et al. 2015).

The reason for tracing the transmission channels of FDI on labor markets is reasonably straightforward. The most prominent is outsourcing manufacturing jobs to the locations with lower labor costs. The outcome of shifting jobs generally backfires on the parent economies by altering their labor market consequences domestically. However, from the perspective of host country, inward FDI alters the labor market

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setting in the form of higher employment (Makino et al. 2004). In the long run, FDI leads to deterioration of labor market outcomes due to negative scale shift toward outsourced low-skilled and low-wage employment. On the other hand, the inward FDI improves the capacity of the labor market of the country by higher employment in low and medium skills. In most of the cases, low-wage host countries embolden FDI through the efficiency route which affects the employment structure especially in industry and services (Sethi et al. 2003; Karlsson et al. 2009; Waldkirch et al. 2009).

It may be recalled that the deterioration of the labor markets in European and other advanced countries during the 1980s and 1990s was evident probably due to shifting of labor scale and outsourcing of low-skilled labor (Gaston and Nelson 2004). This evidence contradicts to the usual convention of positive effects of FDI. Similarly, Wei (2013) rejects the notion of a positive relationship between FDI and labor market outcomes in China. Therefore, it may be argued that FDI may improve as well as dampen the condition of labor market outcomes. The positive effects may last in short run and medium run though not in long run; however, these effects may not be a regular feature (Feenstra and Hanson 1997; Bhagwati and Blinder 2009). More recently, a new phenomenon observed where the employment outcomes affect the distribution of the labor market by altering the low-skilled sectors (Acemoglu and Autor 2010). This led to a surge in many interpretations of the theoretical models and a wide array of empirical investigations. These investigations emphasize that the FDI–labor markets nexus can be of varied nature across the countries depending upon the country's macroeconomics features, development conditions and specific forms of investment (Gaston and Nelson 2004).[1] With regard to the developing economies, a major challenge is to shift the labor force from the traditional agricultural sector to reduce poverty, and FDI is expected to fairly lubricate the process (Karlsson et al. 2009). In addition, low-cost labor force drives the FDI (Dunning and Lundan 2008), thus affecting the labor market outcomes with a shift from agriculture to the services in developing economies.

With regard to the welfare aspect, a pertinent question arises regarding how FDI intrudes into the dynamics of social welfare of the host countries. This may be viewed through the prism of enhancing the various macroeconomic conditions, viz. income, wages, skill and competitiveness of the domestic market during the dynamic growth process (Klein et al. 2001; Gohou and Soumare 2012; Lehnert et al. 2013). And may arise the welfare dampening conditions by shifting the employment scale to high-skilled labors with high-end technologies, offshoring complements and sustainability (Kosack and Tobin 2006; Chintrakarn at. al. 2012). Due to this interpretation, a growing concern among the researchers is to analyze how FDI influences the distribution of incomes and labor markets of host countries. An extensive survey of studies highlights a near consensus on the complementarity between FDI and economic growth (De Mello 1997). Using a sample of more than a hundred countries, Choi (2006) found escalating inequality due to inward FDI to host countries leading to welfare loss due

[1] A comprehensive survey on the FDI–labor markets nexus through host countries perspective can be traced in Hale and Xu (2016).

to the unequal distribution of the benefits of FDI. Therefore, FDI may not always be considered as an instrument for enhancing the welfare because of the market imperfections generated that hampers welfare gains (Campos and Kinoshita 2002a, b; Blomström and Kokko 2003). Similarly, there is evidence of increased inequality as an outcome of FDI-growth nexus varies across the geographical regions in Asian economies (Tsai 1995). The differences in welfare dimensions across the economies are always a difficult task to examine, and it becomes more complicated when considered in a heterogeneous economies setup. Failing to account for this dimension poses serious challenges for the statistical inference, hypothesis testing and policy-making (Ravallion 1996). Therefore, analyzing the welfare dynamics using a comprehensive approach is vital.

Based on the above discussion, it is clear that there needs to be a comprehensive understanding of the welfare aspect of FDI in host countries. The broader question addressed here is how FDI leads to the improved social welfare of the countries. Even though the literature highlights issues of the labor market and welfare aspects of FDI, the empirical evidence remains thin on the dynamics of the interface between them. Therefore, this chapter aims at examining the relationship between inward FDI and labor market outcomes and subsequent countrywise welfare implications of FDI for a panel of 64 countries over the period 1991–92 to 2014–15. We draw special attention to the case of Asian economies in the empirical analysis given the crucial role of FDI in the Asian region. The analysis is derived to understand the conventional perspective of the positive impact of inward FDI on the labor market and to examine the welfare gains for the host countries. To estimate the models, we follow a static general equilibrium system using an instrumental variable and welfarist approaches. The novelty of the present study in contributing to the existing literature is of two-fold. *First*, the study considers a crucial aspect of the FDI and labor market relationship, where we examine the broader perspective of the nexus between the two using a comprehensive approach. The main argument analyzed is to revisit the theoretical foundations of impact inward FDI on macroeconomic conditions of the host country. *Second*, we evaluate the welfare aspect by estimating the loss exerted due to heterogeneous effects of inward FDI to the host countries. The insights gained from such an exercise would open avenues for further research.

The remaining paper is organized in the following way. Section 2 presents a detailed methodology and empirical strategy. In Sect. 3, description of the data and variables is presented. Section 4 covers the preliminary analysis of the FDI, labor market and inequality interface. In this Sect. 5, a detailed discussion on the empirical results is provided, and the final section concludes the paper.

2 Methodological Framework

2.1 The Model

A standard competitive general equilibrium approach is followed to study the labor market implications of FDI in a cross-country framework augmented through the production function approach (Helpman 1984; Ethier 1986; Jones and Kierzkowski 2001). Following the standard practice, we assume a Cobb–Douglas production function framework augmented with FDI:

$$Y_t = f(K, L, \text{FDI}) \tag{1}$$

where Y is output, K is capital, L is labor, and FDI is foreign direct investment inflows to the host country. FDI is assumed to transmit into production function and alters it through the changes in labor market outcomes assuming a profit-maximizing setting for country i at time t subject to constraint to technology. Similar to Greenaway et al. (1999) and Jude and Silaghi (2017), the augmented production function with FDI influencing the technical efficiency parameter A can be present in the following way:

$$Y_{i,t} = A^{\gamma} K_{i,t}^{\alpha} L_{i,t}^{\beta} \tag{2}$$

where α and β represent the elasticities pertaining to capital and labor, respectively. A, representing technical progress, with the coefficient γ allows the factors to change the efficiency parameter of the production function that can be traced through the influence of FDI (Greenaway et al. 1999) such that $A^{\gamma} = e^{\delta_0 T_i} \text{FDI}_{i,t}^{\delta_1}$. FDI is the stock of inward foreign direct investment in country i at the time t, T is the time trend and $\delta_0, \delta_1 > 0$. By a general rule, it is imperative that a profit-maximizing firm employs the inputs so that their marginal productivities are equal such that real returns of labor (w) are equal to the marginal productivity of labor and real returns to capital are traced through marginal product of capital (c). By eliminating capital from Eq. (2), we solve the system simultaneously.

$$Y_{i,t} = A^{\gamma} \left(\frac{\alpha}{\beta} \acute{L}_{i,t} * \frac{w_{i,t}}{C_{i,t}} \right)^{\alpha} L_{i,t}^{\beta} \tag{3}$$

$\acute{L}$ represents the employment level. Taking the logarithm of the Eq. (3) and solving for L, we obtain

$$\ln L_{i,t} = \rho + \varphi_1 \ln Y_{i,t} + \varphi_2 \ln \frac{w_{i,t}}{C_{i,t}} + \varphi_3 \ln \text{FDI}_{i,t} + \varphi_4 \ln T \tag{4}$$

where $\rho = \big(\alpha - \ln \alpha - \alpha \ln \beta\big) \big/ (\alpha + \beta)$; $\varphi_1 = 1/(\alpha + \beta)$; $\varphi_2 = -\alpha/(\alpha + \beta)$; $\varphi_3 = \theta \delta_1$; $\varphi_4 = \theta \delta_0$ and $\theta = -\gamma/(\alpha + \beta)$.

The above specification assumes the time-varying cost of capital so as to maintain the reliability of the data on capital cost (Milner and Wright 1998; Onaran 2008; Jude and Silaghi 2017). This simple theoretical simplification allows us to include time dummies into the empirical model to capture the variation over time. We expect that the level of employment has a positive correlation with output. However, FDI employment may follow either positive (Jenkins 2006) or negative relationship (Holland et al. 2000; Girma et al. 2002; Conyon et al. 2002). Therefore, it necessitates the use of a suitable empirical strategy to analyze the nexus between inward FDI and the labor markets. To test the labor market effects of FDI, we adopt econometric models with suitable instruments as explained in the subsequent section.

Further, to explore the welfare implications of FDI on the labor market, we augment the welfarist approach (Atkinson 1970; Antràs et al. 2017) in a panel set up to estimate the loss function. This approach, for evaluating the policy decisions, is estimated through the instrumented social welfare function for mapping the series of vectors to a finite number. It is usually presented as the function through the integration of the concave transformation of actual and disposable income of the agents (I) in consideration. Such that,

$$V = \int u\left(r_{\varphi}^{d}\right) d I_{\varphi} \tag{5}$$

where $u' > 0$ and $u'' \leq 0$, r_{φ}^{d} represents rate the of return. The distribution of φ in the population is measured through cumulative aggregation considering a constant elasticity function:

$$u\left(r_{\varphi}^{d}\right) = \frac{\left(r_{\varphi}^{d}\right)^{1-\rho} - 1}{1-\rho} \tag{6}$$

where $\rho \geq 0$ reflects a constant degree of aversion for inequality in a well-behaved social planner by the agents in the central position. Therefore, we consider a simple monotonic transformation of the social welfare function of the Eq. 5 to evaluate the changes in social welfare transmitted to the labor market in the following way:

$$W = [1 + (1-\rho)V]^{1/(1-\rho)} \tag{7}$$

This transformation enables us to express social welfare as an arithmetic function that is separated from aggregate real income M and a term Δ, which is assumed to be inversely related to inequality in the distribution of disposable income:

$$W = \Delta \times M, \tag{8}$$

where $\Delta = \Delta\left(F_{r}^{d}, \rho\right) = \frac{\left[E\left(\left(r_{\varphi}^{d}\right)^{1-\rho}\right)\right]^{1/(1-\rho)}}{E r_{\varphi}^{d}}$. The term Δ refers to the correction in inequality through welfarist approach is supposed to be one minus the Atkinson

(1970) index. By Jensen's inequality[2] we have $\Delta \leq 1$, and $\Delta = 1$ if and only if $\rho = 0$ (representing no inequality aversion) or if the distribution of disposable income F_r^d is fully egalitarian (has zero dispersion).[3]

2.2 *Empirical Strategy*

To unravel the empirical nexus between FDI and labor market outcomes, we derive a labor demand function from the Eq. (4) and estimate the same using a panel data approach.

$$\text{LMO}_{i,t} = \alpha + \lambda_1 \text{FDI}_{i,t} + \lambda_2 \text{INQ}_{i,t} + \lambda_3 Y_{i,t} + \gamma \sum_{i=1}^{N} X_{i,t} + \mu_{i,t} + \nu_{i,t} + \varepsilon_{i,t} \quad (9)$$

where LMO represents the Labor market outcomes consisting of total and sectoral employment across the 64 countries for the period of 1991–92 to 2014–15. $\text{FDI}_{i,t}$ represents the inward FDI as a percentage of GDP, $\text{INQ}_{i,t}$ is the income inequality, $Y_{i,t}$ is the real per capita income, $X_{i,t}$ is the various macroeconomic conditions across countries, $\mu_{i,t}$ is country fixed effects, $\nu_{i,t}$ represent the time effects, and $\varepsilon_{i,t}$ is the standard error term.

The above equation can be estimated using the ordinary least squares (OLS). However, due to the endogeneity problem, OLS estimates are not reliable due to: (i) high risk of internal conflicts, foreign investors avoid investing in those countries since there might be a high level of regional inequality which may put their investment under risk (Lucas 1990; Janeba 2002); and (ii) foreign investors may concentrate on countries with high inequality to be part of their long-run economic growth and to improve their competitiveness. To mitigate this issue, we rely on the instrumental variable (IV) panel data approach. We use educational level, the lag of FDI and regionwise income as the instruments. We undertake a standard tests to validate the suitability of the instruments employed.

3 Data Sources and Variable Description

The data for this study are obtained from various sources including Standardized World Income Inequality Database (SWIID 6.0), World Bank, Pen World Table (PWT), International Labor Organization (ILO) and Global Financial Development Database. As mentioned, we consider period from 1991–92 to 2014–15 for a sample

[2]Jensen's inequality measure relates the value of a convex function of an integral to the integral of the convex function. It is central in the derivation of the expectation–maximization algorithm and thereby proof of consistency for the maximum likelihood estimators.

[3]For further explanation, refer Antràs et al. (2017).

of 64 countries (see Appendix: Table 8 for the details). To measure the labor market outcomes, we employ three variables, viz. employment (total and sectoral with gender classification), FDI (percentage of GDP), per capita income and measure of income inequality (Table 1).

In the empirical analysis, we include a set of control variables following the existing studies. Each control variable has been standardized and used in real terms. As echoed by previous studies, a particular geographical region does affect the inward

Table 1 Variable description

Variable	Description	Source
Main variables of interest		
FDI	Foreign direct investment, net inflows (% of GDP)	World Bank, UNCTAD
Employment	Number of persons employed (in millions) to the total workforce	World Bank, ILO
Inequality	Inequality estimates based on income	SWIID 6.0 (2017)
GDP per capita	Real GDP per capita at constant 2011 national prices (in mil. 2011US$)	World Bank, PWT
Other explanatory variables		
Human capital index	Human capital index	World Bank
Welfare adjusted total factor productivity	TFP at constant national prices (2011 = 1)	PWT
Agglomeration index	Population in urban agglomerations of more than 1 million (% of total population)	World Bank, OECD database
Financial institutional index	Financial institutional index	Global financial development database, 2017
Agricultural value added	Agriculture, value added (% of GDP)	World Bank
Industrial value added	Industrial, value added (% of GDP)	World Bank
Services value added	Services, value added (% of GDP)	World Bank
Capital output ratio	Ratio of gross capital formation to total output	World Bank
Price level of household consumption	Price level of household consumption, price level of USA GDP in 2011 = 1	PWT
Price level of capital formation	Price level of capital formation, price level of USA GDP in 2011 = 1	PWT

FDI and the per capita income distribution, therefore, leading to a strong case for differential welfare implication. Sectoral decomposition does define the growth perspective of a country which in turn facilitates the penetration of FDI toward the comparative advantageous sector. Differential sectoral contribution to the overall economy plays an important role in the development perspective of an economy, and therefore, for a suitable estimation of heterogeneous economies, we need to account for such differences. Toward this end, we include a control variable, country-specific sectoral value added as a percentage of GDP. Other controls include welfare adjusted total factor productivity (TFP), human capital index, agglomeration index, financial institutional index, capital output ratio, price level of household consumption and price level of capital formation.

4 FDI, Labor Market and Inequality: A Preliminary Analysis

FDI and labor market outcomes are assumed to follow a positive relationship. However, it is argued that FDI does not necessarily affect the labor market in similar ways. One strand of literature states that FDI promotes higher employment nevertheless it has a differential impact on sectoral employment for developed and developing countries. FDI may improve the employability of the industrial sector in developing countries at the cost of the agricultural sector. It affects the employment scenario of developed countries toward high-end services and retains the employment opportunities in another sector unaffected. This situation leads to the differential interpretations where FDI on the one hand improves the employment and on the other hand shifts the employment toward more advanced sectors. In both the cases, there are possibilities of inequality and discrimination in general and toward gender-based employment in particular which is severe across countries.

Before undertaking econometric analysis, we present the trends and patterns aspect of FDI, labor market and inequality across the countries. From Figs. 1 and 2, it is observed that the kernel density function shows a skewed behavior of FDI

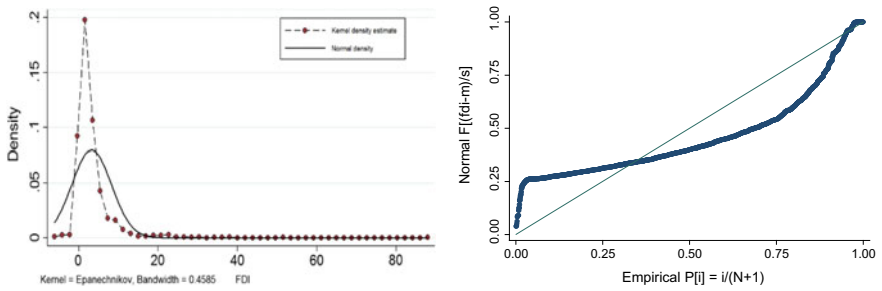

Fig. 1 Kernel density estimates and probability distribution: FDI

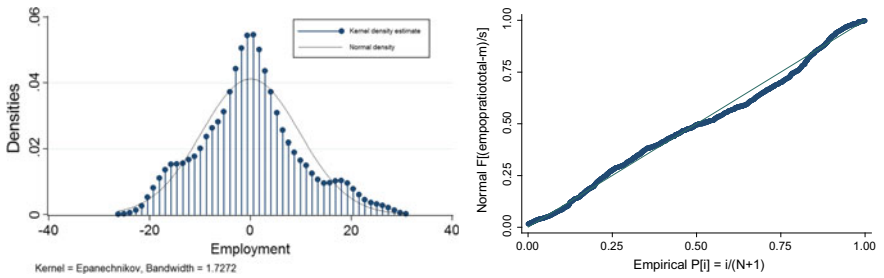

Fig. 2 Kernel density estimates and probability distribution: employment

across the countries, while employment shows a normal distributive nature among them. It may be argued that the FDI is concentrated in the countries of lower capita income. Presumably, the kernel distribution reflects that most of the FDI is hosted by lower and middle-income countries. However, the employment pattern behaves homogeneously across the sample countries. Further, to understand the true nature of a nonlinear pattern of FDI and employment, the probability densities are plotted (Fig. 3).

To trace out the distributional pattern of the relationship between FDI, labor market and inequality, we present the diagnosis graphically. Figures 4 and 5 present the linear patterns of FDI, GDP and employment. The predictions indicate that increased GDP and employment is associated with the prognostic increase in inward FDI over the study period. It may be noted that predictive graphical analysis depicts that labor market outcomes are a linear function of increase in FDI and GDP. Nevertheless, an inverted U-shaped pattern is observed in the case of inequality–FDI relationship reflecting a reduction in inequality since the 2007–08 financial crisis (Fig. 6). The graphical representation shows that the linear prediction of FDI, GDP and employment accepts the usual theoretical convention through which increasing GDP growth attracts the FDI which results to an outcome of inverted U pattern of inequality

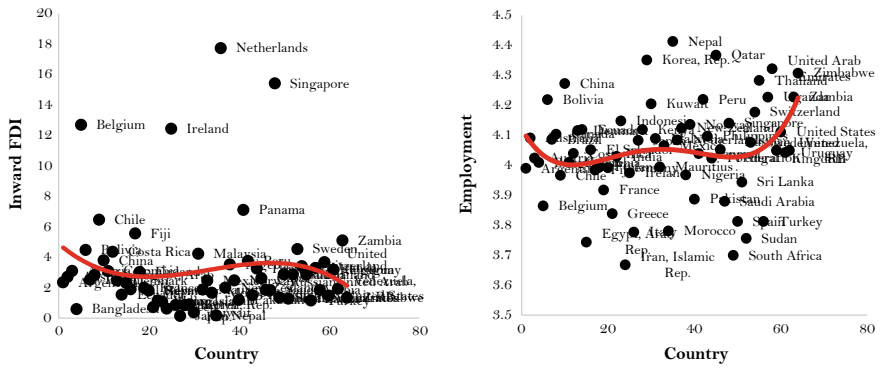

Fig. 3 Distribution according to the inward FDI and employment

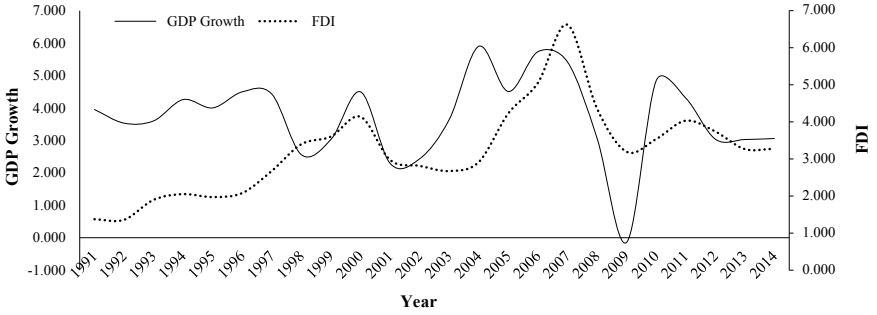

Fig. 4 Pattern of FDI and GDP per capita income

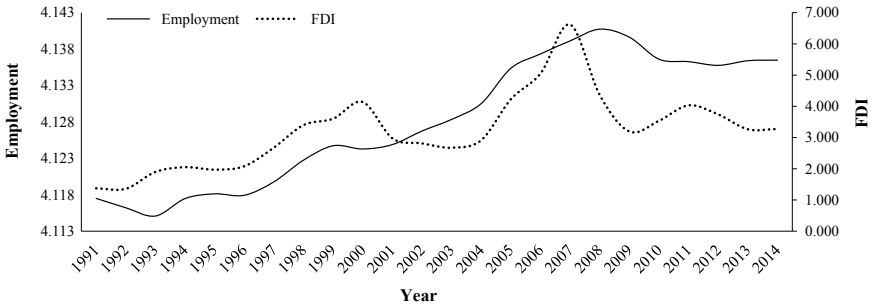

Fig. 5 Pattern of FDI and employment

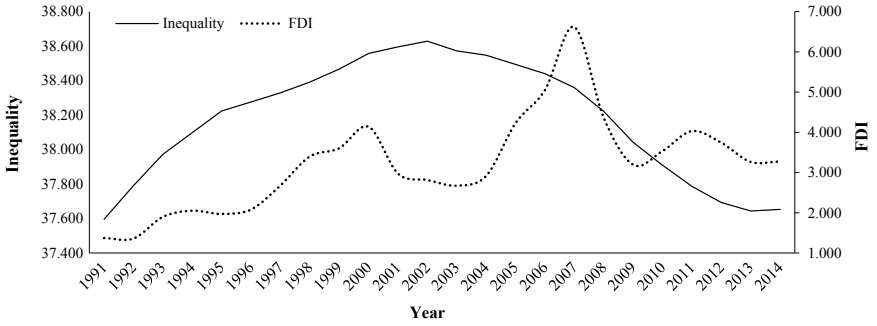

Fig. 6 Pattern of FDI and inequality

among the countries. It means that as economies grow, they attract more and more FDI for stimulating their growth process, nevertheless with a threshold where the economy attains higher per capita income growth explores the possible avenues for outward FDI for their counterparts. This transitional dynamic pattern and structural

shift of macroeconomic conditions provide an incentive to test whether the declining inequality has any impact on the welfare horizon obtained in the labor market of the host country. The graphical analysis predicts improvement in labor market outcomes albeit with mixed forces generated by inequality that might outweigh the positive effects and decline the overall welfare. It may be an important introspection concerning the relationship between FDI and labor market outcome showing a specific pattern across the countries, yet the acceptance of this prediction is subject to a rigorous empirical analysis which is taken up subsequently.

5 Empirical Results and Discussion

5.1 Global Perspective

In this section, the empirical results are presented which are obtained through regression analysis and loss function. We use IV regression analysis to estimate the labor market implications of FDI across the countries. While implementing a panel data model, it is necessary to control for fixed and other effects. To arrive at the suitable model specification, we perform diagnostic tests using the Hausman test. The test favors fixed effects specification to examine the FDI and labor market nexus.

The broader perspective of foreign investment is to ease out the process of improvement for the standard of living and the country's welfare gain. However, it is observed that FDI has a heterogeneous impact on the income, employment and other macroeconomic indicators depending upon the development scenario of the host country. In the present study, our focus is to see whether or not FDI leads to improvement in labor market outcomes and to trace out the transmitting process of the welfare gain from the FDI. To verify the degree by which labor market outcomes of the countries are being influenced by inward FDI and to facilitate the empirical analysis, we follow an empirical strategy examining the labor market effects of FDI and its welfare implications across the countries. The results reveal that labor market outcomes are positively affected by FDI for both developed and developing countries. However, there are significant differences in the long-run effects of FDI on the sectoral labor market measures leading to unequal outcomes. (Table 2, column 2, 4 and 6). Interestingly, we observe that FDI improves female labor market more than the male labor market with the significant marginal difference between the two. The results are in line with the existing literature which predicts a positive impact of FDI on employment and wages. However, the major concern is whether this improvement is strictly improving welfare or not. By welfare implication we mean, does inward FDI is harmonious and equally affecting the male–female labor markets in a country and across the markets of the countries. The main argument follows that whether the FDI equally imparts the welfare among the labor markets. The control variables are significant and are in line with the expected signs. The important one, viz. income

Table 2 FDI and labor market outcomes: IV regression

Explanatory variables	Employment—aggregate		Employment—male		Employment—female	
	Fixed effects	(2SLS) estimation	Fixed effects	(2SLS) estimation	Fixed effects	(2SLS) estimation
	(1)	(2)	(3)	(4)	(5)	(6)
FDI	0.257*** (0.034)	0.257*** (0.034)	0.072** (0.027)	0.072** (0.027)	0.437*** (0.049)	0.437*** (0.049)
Income inequality	−0.112*** (0.036)	−0.112*** (0.036)	−0.077*** (0.028)	−0.077*** (0.028)	−0.143*** (0.051)	−0.143*** (0.051)
GDP per capita growth	0.892*** (0.366)	0.892*** (0.364)	0.447* (0.216)	0.447* (0.216)	1.527*** (0.523)	1.527*** (0.523)
Human capita index	2.616*** (0.553)	2.616*** (0.551)	−1.971*** (0.432)	−1.971*** (0.432)	7.249*** (0.791)	7.249*** (0.791)
Welfare adjusted total factor productivity	−1.771*** (0.710)	−1.771*** (0.706)	0.223 (0.554)	0.223 (0.554)	−3.913*** (1.014)	−3.913*** (1.014)
Agglomeration index	−0.124*** (0.038)	−0.124*** (0.037)	−0.077*** (0.029)	−0.077*** (0.029)	−0.137*** (0.054)	−0.137*** (0.054)
Financial institutional index	2.088* (1.122)	2.088 (1.117)	−4.522*** (0.877)	−4.522*** (0.877)	8.192*** (1.603)	8.192*** (1.603)
Agricultural value added	−0.032 (0.025)	−0.032 (0.025)	−0.034 (0.019)	−0.034 (0.019)	−0.004 (0.035)	−0.004 (0.035)
Industrial value added	−0.017*** (0.008)	−0.017** (0.008)	0.011 (0.007)	0.011 (0.007)	−0.014 (0.012)	−0.014 (0.012)
Services value added	−0.138*** (0.016)	−0.138*** (0.016)	−0.154*** (0.012)	−0.154*** (0.012)	−0.099*** (0.023)	−0.099*** (0.023)
Capital output ratio	−0.003** (0.001)	−0.003*** (0.001)	−0.002*** (0.000)	−0.002*** (0.000)	−0.005*** (0.001)	−0.005*** (0.001)
Price level of household consumption	0.734* (0.352)	0.734* (0.350)	−1.183*** (0.392)	−1.183*** (0.392)	2.343*** (0.718)	2.343*** (0.718)
Price level of capital formation	1.330*** (0.365)	1.330*** (0.363)	1.382*** (0.285)	1.382*** (0.285)	1.327*** (0.522)	1.327*** (0.522)
Constant	62.761*** (3.511)	–	92.532*** (2.743)	–	27.285*** (5.040)	–
Overidentification test *(Sargan Statistic)*		87.356		84.324		99.115
Underidentification test *(Anderson Canon LM statistic)*		321.493***		321.493***		321.493***
Observations (N)	1536	1536	1536	1536	1536	1536

Note Values in parenthesis report standard errors, and [***], [**] and [*] represent the significance level at $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively

inequality, has negative sign throughout the models indicating that inequality deteriorates the labor market outcomes. This remains the major worry since it indicates that though FDI does affect positively labor market, inequality outweighs this effect in some countries resulting in loss of welfare obtained through the improved labor market situation. Other controls variables like interaction term of FDI and GDP per capita income, human capital index, welfare adjusted total factor productivity, income inequality, GDP per capita, urbanization, agricultural value added, industrial value added, services value added and capital output ratio, price level of household consumption, price level of capital formation are found to be significant.

On the sectoral analysis, it has been observed that there is a positive impact of FDI on the agriculture and service sectors (Table 3). Nevertheless, it affects industrial sector negatively. The estimates of second stage IV regression reflect a negative impact on the industrial sector that outweighs the positive effects on agriculture and service sectors. Further, it may be seen that the female labor market is affected negatively in the industrial and service sector though there is a positive implication in the agricultural sector. The main argument lies to the fact that due to improved labor market situations in industrial and service sectors, it drives the female population out of the market. That may be because of a gender-biased skill gap between the male

Table 3 FDI and sectoral labor market outcomes: IV regression—full sample

Labor market outcome (employment)	Explanatory variable—FDI	
	Fixed effects	(2SLS) estimation
Agricultural sector		
Total	0.077 (0.102)	0.010 (0.043)
Male	−0.018 (0.043)	−0.018 (0.043)
Female	0.105 (0.064)	0.105 (0.064)
Industrial sector		
Total	−0.182*** (0.039)	−0.182*** (0.039)
Male	0.147*** (0.050)	0.147*** (0.050)
Female	−0.143*** (0.041)	−0.143*** (0.041)
Service sector		
Total	0.172*** (0.050)	0.172*** (0.050)
Male	0.120*** (0.052)	0.120*** (0.052)
Female	0.038 (0.058)	0.038 (0.058)
Controls used	Yes	Yes
Observations (N)	1536	1536

Note Values in parenthesis report standard errors, and [***], [**] and [*] represents the significance level at $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively

and female labor markets. It gives rise to an important aspect of welfare loss due to unequal and gender-specific FDI effects of labor markets across the countries.

With regard to the tracing out the transmission of welfare loss, we alter the specification to find out the impact of FDI on the employment differentials estimated. The employment differential refers to the differences in the employment status of a country with respect to the other countries. It acts as an important indicator for tracing out how FDI affects the variation in employment status across countries. Following the earlier estimates, we observe that FDI has a positive impact on employment, albeit with a differential magnitude between male and female. Now, the question arises whether this positive sign does really improve welfare. To trace these effects, we estimated the augmented model with employment differential. The positive sign indicates that FDI widens the differences in employment across the nation, reflecting the fact that the benefits of foreign investment have not been materialized for the welfare gain (Table 4). The female labor market happens to be the worst affected. Even though FDI seems to be prominent to improve the female labor market outcome, nevertheless it severely deteriorates the same by increasing the variation, therefore, leading to declining overall welfare gain. These results are in line with Gaston and Nelson (2004), Makino et al. (2004) and Wei (2013) among others. These estimates refute the conventional argument where FDI is supposed to improve the labor market outcomes so as welfare. This, in turn, instigates to estimate the extent of welfare loss incurred by the inward FDI to the host country. The exercise involves estimating the welfare effect for each cross-sectional unit (country).

To explore on to the multidimensional nature of the welfare effects of FDI through the labor market, the framework augmented in the present study relaxes the linear assumption pertaining to the nexus between FDI and economic welfare. This implies that the FDI may affect the economic welfare in a random pattern. Hence, quashing

Table 4 FDI and labor market outcome: IV regression—full sample

Explanatory variable	Employment differential (aggregate)		Employment differential (male)		Employment differential (female)	
	OLS	(2SLS) estimation	OLS	(2SLS) estimation	OLS	(2SLS) Estimation
	(1)	(2)	(3)	(4)	(5)	(6)
FDI	0.104*** (0.039)	0.203*** (0.038)	0.055 (0.036)	0.119*** (0.036)	0.146*** (0.061)	0.279*** (0.049)
Overidentification test *(Sargan statistic)*		87.833		118.659		72.391
Underidentification test *(Anderson Canon LM statistic)*		329.434***		329.434***		329.434***
Controls used	Yes	Yes	Yes	Yes	Yes	Yes
N	1536	1536	1536	1536	1536	1536

the linear assumption will capture the underlying true dynamics. In order to estimate the welfare loss, we augmented the welfarist approach of Atkinson (1970) in a panel set up to estimate the loss function (see Sect. 3 for explanation). On estimating the loss function, we observe a substantial loss of welfare in income and labor market outcomes with higher magnitude in the total and agricultural sector (Table 5). With respect to the total and male labor markets, it has been observed that the highest welfare loss has been reported in high-income countries. In connection with the sectoral welfare implications, it may be noted that the highest welfare loss is observed in high-income countries and the industrial and service sector face the highest loss in low-income countries. The results show that female labor market has significant welfare loss due to skewed inward FDI to the host countries. Therefore, differential impacts of FDI on labor market trigger inequality among the nations which lead to overall welfare loss and are more severe in low-income countries. This navigation of welfare loss through inequality has stringent negative effects on industrial sector labor market outcomes. These results refute the usual convention of positive effects of FDI with welfare gain. Hence, it is imperative to consider the welfarist aspect while analyzing the effects of FDI on any macroeconomic condition, especially for host countries. As an alternative measure, we estimate different measures of inward FDI to check the robustness of our results. The results are quantitatively similar to our previous results.

It may be concluded from the above analysis that FDI does affect the labor markets but with a significant difference in the long-run outcomes and a substantial welfare loss among the male and female markets. It is noteworthy to reflect the peculiar nature FDI where literature suggests an unequal implication on labor markets of the host countries. These results highlight a very important aspect where it shows on one

Table 5 Welfare loss: employment—World Bank classification

Labor market outcome	Full sample	High income	Middle income	Low income
Total	0.933	0.989	0.911	0.623
Total (male)	0.649	0.789	0.528	0.585
Total (female)	4.176	3.746	4.883	0.789
Agricultural—total	3.253	4.988	1.969	0.170
Agricultural—(male)	2.855	4.331	1.757	0.298
Agricultural—(female)	4.832	6.820	3.473	0.112
Industrial—total	0.690	0.675	0.489	2.979
Industrial—(male)	0.562	0.425	0.487	2.689
Industrial—(female)	2.055	2.185	1.578	5.886
Service—total	0.506	0.212	0.719	1.065
Service—(male)	0.443	0.259	0.548	1.106
Service—(female)	1.044	0.127	1.830	1.520

Note Welfare loss estimated is the average of the sample period (1991–92 to 2014–15)

hand FDI improves labor market outcomes while on the other hand it deteriorates the overall welfare due to its unequal nature of the distribution of the outcomes.

5.2 A Case of Asian Economies

Asian region comprises a mix of advanced and emerging market economies. It hosts the world fastest growing economies like China, India. Over the years, the region became a magnet for the FDI. It led to improved benefits for many countries in the region with high economic growth and increasing per capita incomes. As per the Asian Economic Integration Report, there is an increasing trend of inward FDI to Asian countries. Asia accounts for 30% of global FDI in 2016 which increased from 20% in 2000–05. The main recipients include China (Hong Kong and China), Singapore and India. During the same time, more opportunities were created through the better financial sources and improved structural changes in the production process which lead major Asian firms to invest abroad particularly targeting the regional countries. This improved capacity of the country to absorb FDI has led increasing per capita incomes in this region.

However, some of the studies which analyzed FDI employment relationship in Asian countries find no clear conclusive evidence of a significant relationship. Unlike these studies, we aim at analyzing the impact of FDI on labor market outcomes in a comprehensive way and estimate the welfare loss (gain) due to inward FDI. At first, we estimate the effects of FDI on labor market outcomes followed by calculation of welfare loss function. The results reported in Table 6 show no significant sign of any labor market effects of FDI in the aggregate and industrial sector. However, the positive effect in the agricultural sector is offset by the negative effect in services sectors. An interesting fact is observed in these estimates, where female employment is affected positively in agriculture sector, whereas a significant negative impact in the tertiary sector leaves us with a positive overall impact. There was no significant impact seen with respect to male labor market outcomes. The reason could be that the inward FDI triggers increased labor demand from the home country due to skill differences. This possibility is traced out through the positive relationship between real per capita income growth and FDI. Nevertheless, these results may be interpreted with a caution.

This paradoxical situation necessitates to examine the welfare aspect of FDI to host countries. On estimating the loss function, we observe that there is a significant loss of welfare due to the inward FDI in Asian countries (Table 7). The highest loss is reported in the case of China followed by India. The estimates show the gender-biased impact of FDI on welfare. The most vulnerable female labor market is in Pakistan followed by India and Bangladesh. With respect to the sectoral labor markets, the results show a significant loss of welfare in all the sectors, agriculture being the worst affected.

Table 6 FDI and sectoral labor market outcomes: IV regression—Asian countries

Labor market outcome (employment)	Explanatory variable—FDI	
	Fixed effects	(2SLS) estimation
Aggregate		
Total	0.103 (0.080)	0.103 (0.079)
Male	−0.111 (0.069)	−0.111 (0.068)
Female	0.324*** (0.128)	0.324*** (0.125)
Agricultural sector		
Total	0.375*** (0.164)	0.375*** (0.161)
Male	0.272 (0.157)	0.272 (0.154)
Female	0.478*** (0.229)	0.478*** (0.225)
Industrial sector		
Total	−0.024 (0.141)	−0.024 (0.138)
Male	−0.137 (0.144)	−0.137 (0.141)
Female	0.244 (0.170)	0.244 (0.167)
Service sector		
Total	−0.351*** (0.169)	−0.351*** (0.166)
Male	−0.136 (0.155)	−0.136 (0.152)
Female	−0.722*** (0.237)	−0.722*** (0.233)
Controls used	Yes	Yes
Observations (N)	336	336

Note Values in parenthesis report standard errors, and [***], [**] and [*] represents the significance level at $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively

6 Conclusion

This chapter aims at exploring the welfare implications of FDI on labor market exclusively for countries hosting the FDI. For a panel of 64 countries during the period of 1991–92 to 2014–15, we estimated the FDI effects on labor market outcomes and welfare loss due to inequality in labor markets by augmenting the welfarist approach in a panel set up to estimate the loss function. The results reveal that FDI affects the labor market positively for both developed and developing countries. However, we observe a significant difference in the effects of FDI among sectoral labor markets leading to unequal outcomes during the long run. On estimating the loss function, we observe a substantial loss of welfare in income and labor market outcomes with higher magnitude in middle and high-income countries. With respect to Asian economies, no significant effects of FDI have been found. The worst affected are the female labor markets. Nevertheless, there has been a significant welfare loss across the countries. The main policy direction is to harmonize the FDI toward growth-enhancing sectors of the host countries. It will lubricate the labor market outcome by shifting the scale

Table 7 Welfare loss: employment—Asian countries

Country	Total	Total (male)	Total (female)	Agricultural total	Agricultural (male)	Agricultural (female)	Industrial total	Industrial (male)	Industrial (female)	Service total	Service (male)	Service (female)
Bangladesh	0.029	0.375	3.219	1.286	2.553	2.755	1.132	1.651	6.166	2.339	18.758	2.307
China	0.925	0.601	1.418	4.167	0.043	5.020	3.181	5.189	0.363	0.509	9.664	2.831
Fiji	0.668	0.812	0.611	0.309	0.126	0.294	0.357	0.287	0.096	0.158	0.359	0.255
India	0.779	0.157	5.101	0.504	1.442	0.446	0.315	0.547	1.525	1.333	1.637	0.246
Indonesia	0.055	0.022	0.232	0.675	0.479	0.421	0.854	0.584	0.211	0.737	0.824	0.238
Japan	0.584	0.902	0.286	1.390	0.589	0.195	2.922	0.629	2.404	0.191	0.295	0.111
Korea Rep.	0.058	0.125	0.039	4.269	0.815	0.571	5.541	3.433	2.726	0.368	0.709	0.448
Malaysia	0.127	0.064	0.606	2.035	0.219	0.389	5.021	1.298	1.399	0.146	0.935	0.164
Nepal	0.071	0.157	0.040	0.130	6.728	0.971	0.096	0.243	11.388	6.633	1.088	1.382
Pakistan	0.597	0.065	30.528	0.150	0.368	0.081	0.120	0.566	1.498	0.556	1.512	0.180
Philippines	0.011	0.057	0.181	0.722	0.064	0.561	1.095	0.568	0.637	0.077	0.327	0.783
Singapore	0.373	0.234	2.073	21.613	2.182	0.251	30.191	20.404	3.596	1.693	0.259	0.288
Sri Lanka	0.333	0.245	1.425	0.764	0.367	0.388	0.752	0.833	0.412	0.546	0.993	0.253
Thailand	0.107	0.109	0.128	1.097	0.211	1.696	1.565	0.796	0.140	0.354	2.451	1.113

Note The welfare loss reported is standardised actual numbers and can be interpreted in standard way

of labor demand function which in turn will lead to enhanced welfare across the economy.

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Appendix

See Table 8.

Table 8 List of sample countries

Argentina	Mexico
Australia	Morocco
Austria	Nepal
Bangladesh	Netherlands
Belgium	New Zealand
Bolivia	Nigeria
Brazil	Norway
Canada	Pakistan
Chile	Panama
China	Peru
Colombia	Philippines
Costa Rica	Portugal
Denmark	Qatar
Ecuador	Russian Federation
Egypt, Arab Rep.	Saudi Arabia
El Salvador	Singapore
Fiji	South Africa
Finland	Spain
France	Sri Lanka
Germany	Sudan
Greece	Sweden
India	Switzerland
Indonesia	Thailand
Iran, Islamic Rep.	Turkey

(continued)

Table 8 (continued)

Ireland	Uganda
Italy	United Arab Emirates
Japan	United Kingdom
Kenya	United States
Korea, Rep.	Uruguay
Kuwait	Venezuela, RB
Malaysia	Zambia
Mauritius	Zimbabwe

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