Effects of Foreign Direct Investment on Wage Inequality in Developing Countries: Do recipient sectors matter?

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Scientific Journal for Financial and Commercial Studies and Research (SJFCSR)

Faculty of Commerce – Damietta University

Vol.4, No.1, Part 1., January 2023

APA Citation:

Ahmed, A. M. E. (2023). Effects of Foreign Direct Investment on Wage Inequality in Developing Countries: Do recipient sectors matter? ***Scientific Journal for Financial and Commercial Studies and Research***, Faculty of Commerce, Damietta University, 4(1)1, 587-618.

Website: https://cfdj.journalsekb.eg

Effects of Foreign Direct Investment on Wage Inequality in Developing Countries: Do recipient sectors matter?

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Abstract

Foreign direct investment (FDI) is one of the main pillars of globalization. Reducing household income inequality (henceforth income inequality) is one of the goals of the new millennium. Limited empirical studies are applied to test the impact of attracting inward FDI on income inequality. Fewer studies focused attention on the impact on labor return (henceforth wages) inequality within countries despite wages is the main source of household income for the majority of people and directly influence poverty. Neither these empirical studies nor the theoretical framework agreed on the direction of the impact of inward FDI on whether income or wage inequalities, particularly in developing countries. Very few of these empirical studies investigated the disparity in this impact depending on the recipient economic sectors, although being proven theoretically. This study tests the main hypothesis that the impact of inward FDI on wage inequality is sensitive to the recipient sector. The study is applied using the deductive approach in a group of developing countries using panel macroeconomic data. Eight models are estimated for the period 2004-2019. Results of system generalized method of moments (henceforth S-GMM) confirmed that inward FDI is one of the main determinants of wage inequality. Moreover, the impact differs depending on the recipient economic sectors and the measurement of inward FDI. Estimation results confirmed the dynamic nature of wage inequality. Supportive policies are proposed to effectively improve the role of sectoral FDI inflows in reducing wage inequality.

Key Words: Income inequality, Sector-disaggregated FDI, S-GMM, Wage inequality

JEL Classifications: D63, F21, F41 and G11

1. Introduction

FDI is considered one of the main sources of enhancing economic growth all over the world. Many channels combine to convey the positive impact of FDI on supporting economic growth in the host country. These channels include the impact of FDI on covering the domestic resources gap, increasing local labor capabilities, increasing purchasing power, and transferring technology. This has led to the tendency of all countries to compete to attract inward FDI. The trend towards attracting inward FDI is accelerated in developing countries in light of the need to provide resources of foreign countries and transfer technology.

Despite reducing income inequality is not being a new issue; it has gained additional importance, with increased focus on sustainable development. Although many studies dealt with the impact of inward FDI as one of the dimensions of globalization on socio-economic variables, the impact on income inequality was relatively received less attention, particularly in developing countries (Couto, 2018; Le *et al.*, 2021). Suanes (2016) justified this relative scarcity of attention to the lack of data or the lack of clarity of the theoretical relationship. Misztal (2020) justified this relative scarcity by the optimal income inequality hypothesis that is determined in isolation from FDI trends. This hypothesis assumes the existence of a favorable level of income inequality that should be accepted as a minimum to motivate skilled labor. At the same time it should not be exceeded to avoid increasing unskilled labor injustice feeling. Studies that investigated the impact of sector-disaggregated inward FDI or those focused on wage inequality have suffered from even greater scarcity.

The lack of clarity of the theoretical basis of the distributional effect of inward FDI was reflected on the empirical relationship between them, particularly in developing countries (Le *et al.*, 2021). Some studies failed to find the relationship between the two variables. Others proved the linear relationship, but differed on its direction. A third group showed that the relationship is non-linear as it differs with time.

The lack of clarity of the empirical relationship between the two variables can be attributed to several factors (Couto, 2018). First there are no unified measures of income or wages inequalities (henceforth inequalities) from one side and inward FDI from the other. Second,

different groups of countries are used while ignoring the recipient economic sectors (henceforth sectors) for FDI despite the impact differs depending on recipient sectors. Third, several methods of estimation are applied.

Based on the foregoing, the main contribution of this study is to assess the impacts of inward FDI on wage inequality depending on the recipient sector in a group of developing countries. This group of countries has different levels of wealth, economic development, geographical locations and dependency on wages in generating income. In this study, the concern focuses on changes in inequalities over time within countries without giving attention to inequalities across countries. Through estimating the models and comparing between their results, the sector-disaggregated inward FDI impacts on wage inequality can be clear. To the best of our knowledge, studying the sector-disaggregated inward FDI impact on income inequality was relatively neglected in empirical studies, particularly in developing countries. Relatively few of them have investigated this impact on wage inequality.

The limitations of the study involve the selection of developing countries those satisfy three conditions. The first is the availability of sector-disaggregated inward FDI data. The second is having data for inequalities. The third is the diversity of countries included regarding levels of wealth, economic development, relative abundance of labor, dependency on wage in generating income and geographical locations.

The structure of the study includes five sections. Section 1 includes an introduction. Section 2 reviews the impact of inward FDI on inequalities theoretically and empirically with a focus on the changing impact depending on the recipient sectors. Section 3 describes the specification of the model, estimation techniques and data sources. Section 4 provides empirical results and discussion. Section 5 involves conclusions and policy implications.

2. Literature Review

This section studies, theoretically and empirically, the distributional effect of inward FDI. Additionally, whether this impact differs depending on recipient sectors is reviewed.

2.1 The distributional effect of inward FDI theoretically

Several theories have been used to study the distributional effect of attracting inward FDI. Each theory used one or more of the channels of transforming the effect. This can explain partially the ambiguity of the distributional effect of inward FDI theoretically (Couto, 2018; Le *et al.*, 2021). In general, most of theories focused attention to the changing pattern of relative demand for unskilled to skilled labor resulted from attracting inward FDI to the host country. Accordingly, although not declared, most of these theories implicitly state that the impact is greater in the manufacturing sector that is relatively labor-intensive (Suanes, 2016).

Through a review of literature, six theoretical basics have linked inward FDI to the effect on income distribution. These theories are **the traditional trade theory, the Modernization theory**, **the North-South model**, the dependency theory, the heterogeneous firms model and the endogenous-growth model (Couto, 2018; Huang *et al.*, 2020; Le *et al.*, 2021; Mihaylova, 2015).

In the **traditional trade theory** according to "Heckscher-Olin model" (henceforth H-O model), countries export goods that use intensively their relatively abundant factors and import goods that use intensively their relatively scarce factors. Under the assumptions of H-O, Stolper and Samuelson predicted that international trade reduces inequalities in developing countries for two reasons. First, inward FDI to labor abundant countries reduces total return on capital relative to total wages of labor (Bogliaccini and Egan, 2017; Li and Su, 2021). Second, the increasing demand for low-skilled labor increases its relative income (Figini and Gorg, 2011; Jensen and Rosas, 2007; Suanes, 2016). The same processes raises inequalities in developed countries as being abundant in high-skilled labor. This seems to be applied more in labor-intensive sectors such as manufacturing in least developed countries (LDCs) (Couto, 2018).

The Modernization theory has reached the same results as H-O model when stating that developing and LDCs can converge with developed countries if they integrated in the global economy (Rezk *et al.*, 2022). According to the theory, several channels of connections coupled with the spillover effects lead to this convergence. These channels include the transfer of technology, job creation, accompanying managerial skills and enhancing productivity, competition and growth (Jaumotte *et al.*, 2008; Mihaylova, 2015). Accordingly, Modernization theorists implicitly confirm the positive impact of inward FDI on reducing wage inequality in low-skilled labor developing countries (Mihaylova, 2015). According to the theory, even if inward FDI leads to an increase in wage inequality in the short run, it will help reducing it in all sectors in the long run, even if some sectors precede others (Huang *et al.*, 2020). This supports the non-linear hypothesis of the inward FDI in affecting income inequality (Nguyen, 2021).

With time, results of H-O model and Modernization theories proved to be not realistic. The explanation is found in **North-South model** (henceforth N-S model) and dependency theory. The **N-S model** differentiates between vertical and horizontal FDI. It provides that there is a growing trend of multinationals (henceforth MNCs) to relocate low-skilled labor processes of production to low-skilled labor abundant developing countries. However, this pattern of inward vertical FDI cannot guarantee lowering wage inequality in developing countries even in countries that are relatively dependent on labor intensive sectors (Herzer *et al.*, 2014; Nguyen, 2021). The reason is that despite these processes of production are low-skilled labor intensive from the perspective of MNCs, it is still high-skilled labor intensive from the perspective of developing host countries (Gossel, 2022; Huang *et al.*, 2020). Hence, relying on attracting inward vertical FDI in developing countries will raise wage inequality (Couto, 2018; Le *et al.*, 2021; Li and Su, 2021).

The dependency theory differentiates between two types of countries when mentioning the integration in world economy. The first is the centre countries represented in the developed countries with abundant skilled labor. The second is the margin countries represented in developing countries and LDCs with abundant unskilled labor (Rezk *et al.*, 2022). As a result of the integration of both in the global economy, the latter follows

the former. The global economic system is shaped so that this dependency is increasing. According to this theory, labor in the FDI-recipient sectors isolates themselves from the rest of labor in the traditional sectors in the receiving country (Gossel, 2022). This leads to increase the wage inequality between both (Hemmer *et al.,* 2005). According to the theory, the spillover effect of benefiting traditional sectors is limited to relatively capital-intensive sectors which results in increasing unemployment and accordingly increasing inequalities (Mihaylova, 2015).

With the beginning of providing micro-data on productive firms since the eighties of the twentieth century, the shortcomings of traditional international trade theory began to appear. The most important shortcomings are represented in the heterogeneity of the size, production abilities and competitive capabilities of firms. This was reflected in differences in the ability to engage in foreign markets. As a theoretical response, the heterogeneous firms' model has been formulated. This model states that opening markets, having heterogeneous firms, results in reallocating resources within industries (Herzer *et al.*, 2014; Nguyen, 2021). Following the model, the presence of firms internationally is divided into three categories: least-productive-firms exit totally from foreign markets, relatively more-productive-firms choose to export and most-productive-firms prefer FDI (Helpman *et al.*, 2004). Considering search frictions result from labor market imperfections, inward FDI redistributes income leading to increase wage inequality at first stages of development then decrease it later with deepening development (Gossel, 2022; Redding, 2011). According to the model, this does not differ from one sector to another. Hence, the heterogeneous firms model supports the "Kuznets curve non-linear inverted-U hypothesis" of the inward FDI in affecting inequalities.

Another explanation for the non-linear distributional effect of inward FDI is represented by the "endogenous-growth model". According to this model, domestic firms go through two different stages during absorbing the technology associated with inward FDI. In the first stages of development, although domestic firms use skilled labor in an attempt to absorb advanced technology, the reliance of these firms on the old technology increases the demand for unskilled labor. This leads to a convergence of wage levels between skilled and unskilled labor during this

stage. The second stage begins when deepening development, with the use of domestic firms of new technology in production. Here the demand for skilled labor increases and the demand for unskilled labor decreases. Consequently, the wage inequality between the two categories of labor increases (Le *et al.*, 2021). Although this is not stated, the interpretation of the model shows an increase in this effect in labor-intensive sectors, especially in manufacturing sectors those depend more on unskilled labor.

In conclusion, the theoretical framework for the distributional effect of inward FDI does not decisively determine the relationship either to aggregate inward FDI or by recipient sectors. It became clear that related theoretical framework used different channels for the distributional effect of inward FDI including the accompanying changes in skilled to unskilled labor wages, capital returns relative to wages and profits of firms relative to wages. The discrepancy in the results between the theories has led to the tendency to resolve the relationship through empirical studies (Chintrakarn *et al.*, 2010).

2.2 Empirical studies of the impact of inward **FDI on income inequality**

The lack of clarity of the theoretical background of the distributional effect of inward FDI and its sectoral differences was reflected in the empirical relationship. By reviewing the related empirical studies, very few studies investigated the sectoral differences in this relationship. Four main groups of relations between the two variables are found (Le *et al.*, 2021). The first includes studies those concluded that attracting FDI increases inequalities. The second involves studies those have considered inward FDI as a supporter to reduce inequalities. The third group of studies failed to prove a significant distributional effect of inward FDI. The fourth one found the relationship between the two variables to be non-linear. Some recent studies belonging to each group are presented below.

Within each group, there is diversity in several aspects, some of which are related to the application to a group of countries or to one country, the use of aggregate or sector-disaggregated inward FDI, the indicators used to refer to inequalities and the estimation methods. Despite Gini index (henceforth Gini) is not the best or latest measure of income inequality, it is commonly used in the majority of studies because of data availability (Cho and Ramirez, 2016). Few studies used other indicators such as

percentage of income share of different groups such as fifth (quintile) or tenth (decile) and some inequality measures generated by national authorities in case of country level studies. Very few studies used wage distribution when studying the effects on wage inequality.

2.2.1 Attracting FDI increases inequalities

A large number of studies have proven that the inward FDI, to developing countries in particular, leads to an increase in inequalities (Bogliaccini and Egan, 2017). Below a number of recent studies belongs to this group are presented.

Li and Su (2021) explored the distributional effect of inward FDI in 153 countries for 1970–2015 using generalized method of moments (GMM). Both of Gini and income share by top quintile were used to measure income inequality and FDI-inflows was used referring to inward FDI. According to the study, despite the importance to study the impact on wage inequality, the lack of data for different skill-levels restricted studying it. Findings stated that opening markets for FDI-inflows increases income share of the richest and decreases it for the poorest. This impact increases in the long run.

Couto (2018) assessed the impact of aggregate inward FDI on income inequality in 96 countries during 1990-2013. Gini was used referring to income inequality and the ratio of inward FDI stock to GDP was used referring to inward FDI. Using both of ordinary least squares (OLS) and instrumental variables (IV) techniques, results illustrated that inward FDI to lower-middle-income countries was associated with spurring income inequality.

Herzer *et al.* (2014) investigated the contribution of FDI-stock in affecting inequalities in 5 Latin American countries during the period 1980-2000. Gini was used referring to income inequality and the ratio of FDI stock to GDP was used referring to inward FDI. Dynamic ordinary least squares (DOLS) technique was used in estimation. Results stated that income inequality was stimulated with attracting inward FDI to Latin America. The reason was that inward FDI increases the relative wages of skilled-labor.

Wu and Hsu (2012) analyzed the distributional effect of inward FDI in 54 countries during the period 1980-2005. Gini was used referring to income inequality and the ratio of aggregate FDI-inflow to GDP was used referring to inward FDI. Using the endogenous threshold regression technique, findings proved that FDI-inflow is harmful for income distribution, particularly in countries where levels of absorptive capacity are low.

Jaumotte *et al.* (2008) investigated the determinants of income inequality variations in a group of 51 countries including 20 developed countries and 31 developing countries and LDCs during the period 1981-2003. Gini was used referring to income inequality and the ratio of FDI-inflow to GDP was used referring to inward FDI. The model was estimated using OLS with heteroskedasticity-consistent standard errors and IV technique. Findings confirmed the rising income inequality impact of FDI-inflow. When studying the sectoral distribution of inward FDI, results confirmed that rising income inequality was resulted from the effects of FDI-inflow on increasing relative wages of more-skilled labor. This was supported with the results of sectoral implications of FDI as inward FDI to agriculture is found to increase income inequality while those directed to manufacturing reduces income inequality.

Choi (2006) used pooled-OLS technique to investigate the impact of aggregate FDI stock to GDP ratio on income inequality in 119 countries from 1993 to 2003. Gini was used referring to income inequality and the stock of FDI was used referring to inward FDI. Results found evidence that aggregate FDI attraction increases income inequality.

Le *et al.* (2021) inspected the effect of aggregate FDI-inflow to GDP ratio on wage inequality in 63 provinces in Vietnam during 2012-2018 using GMM. Labor income generated from "Vietnam Household Living Standards Survey" was used in measuring wage inequality. Findings indicated that attracting FDI-inflow is associated with spurring wage inequality despite this impact decreases over time. The explanation for this finding was that on average wages in foreign firms were higher than those of domestic firms in Vietnam during the period of the study.

Chintrakarn *et al.* (2010) found similar results when investigating the long run impact of inward FDI on wage inequality in US 48 states. The ratio of income hold by top decile to total was used referring to wage inequality. Panel cointegration techniques were used for estimation during the period 1977-2001. The negative impact of inward FDI on income distribution in US was explained by the tendency of MNCs to relatively increase the demand for the most skilled labor.

Ucal *et al*. (2014) investigated the contribution of inward FDI on affecting income inequality in Turkey covering the period 1970-2008 using Autoregressive Distributed Lag technique (henceforth ARDL). Gini was used referring to income inequality and the ratio of FDI-inflow to gross fixed capital formation was used referring to inward FDI. Despite the impact was insignificant in the long- run, FDI-inflow was found to affect income distribution negatively in the short-run because of the reliance of MNCs on skilled-labor those can deal with the new technology in the short run.

Jin (2009) explored the distributional impact of inward FDI in 25 provinces located in China from 1990 to 2006. Both of urban Gini and the urban-rural income gap calculated depending on China Statistical Yearbooks were used as measurements of income inequality. The percentage of FDI stocks to provincial GDP was used to measure inward FDI. Fixed effects, random effects, and S-GMM techniques are used to estimate this impact. Results stressed on the significance of attracting inward FDI on increasing income inequality in urban areas of China using all techniques. The study interpreted the impact of inward FDI on increasing income inequality by the skill-biased technology in MNCs investment in China.

Bogliaccini and Egan (2017) investigated sector-disaggregated inward FDI impact on income inequality using data for 41 middle-income countries for the period 1989-2010. Standardized Gini generated by World Income Inequality Database was used referring to income inequality and the ratio of sector-disaggregated inward FDI-stock to GDP was used referring to inward FDI. Using error correction model technique, results confirmed that the impact differs depending on the recipient sector as it was proven that the concentration of inward FDI in the service (tertiary)

sector increases income inequality to a greater extent, whereas inward FDI to manufacturing was not closely related to increased inequality. Accordingly, findings confirmed that the magnitude of the impact depends on the ability of host countries to redistribute inward FDI towards manufacturing and away from services.

Suanes (2016) analyzed the sector-disaggregated inward FDI impact on income inequality in 13 countries in Latin America during 1980-2009. Gini was used referring to income inequality and the ratio of net FDI-inflow to GDP was used referring to inward FDI. Using fixed effects, two-stage least squares and GMM techniques, results proved that FDI-inflow increases inequalities differently from one sector to another in sample countries. This impact increases in highly skilled labor-intensive sectors.

Keane and Prasad (2006) inspected the structure of labor earnings during the transition period (1985-1996) in Poland using OLS technique estimates. Household Budget Survey data generated by Polish Central Statistical Office was used referring to wage inequality. Findings highlighted the increase in wage inequality during the transition in Poland. Additionally, findings proved that the main source of wage inequality was the transfer of labor between sectors in light of the differential wages between them and between skilled and unskilled labor within sectors rather than being the move of labor from public to private sector during the transition.

2.2.2 Attracting FDI supports reducing income inequality

Fewer studies have proven that inward FDI rewards the host country by reducing inequalities. The following is a number of recent studies those differ in terms of countries used in application, measures of inequalities, and technique used in estimation.

Gossel (2022) investigated the distributional effect of inward FDI in 38 Sub-Saharan African countries from 1990 to 2018 using both of FE and S-GMM techniques. Human Development Index was used instead of Gini referring to inequalities and the stock of inward FDI as a ratio of GDP was used referring to inward FDI. Results support that inward FDI reduces inequalities only after a moderate level of democracy.

Nguyen (2021) analyzed the contribution of inward FDI in affecting income inequality in 37 developing countries covering the period 2002-2018. Gini is used referring to income inequality and net FDI-inflow was used in measuring inward FDI. Using S-GMM technique, findings confirmed the role of attracting FDI to developing countries coupled with good governance in reducing income inequality. This was interpreted by the spillover effects explained in modernization theory despite FDI-inflows affect directly only skilled-labor.

Ravinthirakumaran and Ravinthirakumaran (2018) investigated the distributional effect of inward FDI in 13 of "Asia-Pacific Economic Cooperation" countries from 1990 to 2015. Gini was used to measure income inequality and FDI-inflow was used referring to inward FDI. Using panel-ARDL technique, findings suggest that FDI-inflow contributed to decrease income inequality in these countries in the long run. Couto (2018) obtained the same results in a previously cited study for countries at lowest levels of economic development such as Bangladesh, Ethiopia and Malawi.

Figini and Gorg (2011) assessed the impact of inward FDI on wage inequality. The application involved more than 100 countries divided between OECD and non-OECD countries from 1980 to 2002. A wage inequality database in manufacturing was constructed using UNIDO Industrial Statistics database. The percentage of inward FDI stock to GDP was used referring to inward FDI. Using S-GMM technique, findings illustrated that the increase in inward FDI stock decreases wage inequality in OECD countries.

Rezk *et al.* (2022) inspected the impact of foreign investment on income inequality in Egypt. The study covers the period 1975-2017 using Gini referring to income inequality and FDI-inflow relative to gross fixed capital formation referring to inward FDI. Using "the limited information maximum likelihood technique", results illustrated that the increase of FDI-inflow to Egypt reduces income inequality.

Jensen and Rosas (2007) assessed the relationship between inward FDI and income inequality in 32 states in Mexico during the period 1990-2000. A subnational index of income inequality was constructed using Mexico national census data and both of FDI-inflow and its ratio of GDP were used referring to inward FDI. IV technique was used in estimation. Findings

concluded that FDI-inflow was a supporter in reducing income inequality in Mexico states.

2.2.3 Attracting FDI has no impact on income inequality

Some studies failed to prove the impact of inward FDI on inequalities. The following is a number of recent studies those differ in terms of countries used in application, measures of income inequality, and techniques of estimation.

Misztal (2020) explored the impact of inward FDI on income inequality in four countries of Central and Eastern Europe (CEE): Hungary, Poland, Slovakia and the Czech Republic during the period 1990-2016. World Income Inequality Database is used to measure income inequality. Both of Greenfield and Brownfield FDI-inflow as percentages of GDP were used referring to inward FDI. Using vector autoregression (VAR) technique, findings failed to prove the statistically significant impact of both of Greenfield and Brownfield FDI on income inequality.

Mihaylova (2015) assessed the impact of FDI-inflow on income inequality in ten CEE countries from 1990 to 2012. These countries are Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia and the Czech Republic. Gini was used as a measurement of income inequality and FDI stock as a percentage of GDP was used referring to inward FDI. Using FE technique, having no relationship between the two variables was confirmed. This is despite the increase in the relative share of the service sector, which is characterized by higher income inequality compared to rest of sectors, from generating GDP in the sample countries during the transition period.

Bhandari (2007) investigated inward FDI as a determinant of wage inequality in transition economies in Central Asia and Eastern Europe covering the period 1990-2002. Gini for gross earnings of employed people was used as a measurement of wage inequality and the share of inward FDI stock to GDP was used referring to inward FDI. Using FE technique, results found no evidence for the effect of inward FDI on wage inequality. Findings emphasized that the main source of wage inequality in sample countries was labor movements from public to private sector

during the transition. Hemmer *et al.* (2005) found the same results while assessing the impact of FDI-inflow on income inequality measured as Gini for Latin America, East and South East Asia counties.

Fazaalloh (2019) inspected the distributional effect of inward FDI in 33 provinces in Indonesia covering the period 2012-2016. Gini generated from World Income Inequality Database is used in measuring income inequality. The ratio of provincial FDI-inflow to provincial GDP was used in measuring inward FDI. "Panel-corrected standard errors" (PCSE) technique is used in estimation. Results found no direct significant effect of FDI-inflow on income inequality.

Chintrakarn *et al.* (2010) used income share of the top decile relative to total income earned in measuring wage inequality using state-level panel data in USA to investigate the distributional effect of inward FDI. Inward FDI was measured as the ratio of state FDI stock to gross state product. Using Panel cointegration estimation technique, results failed to prove the significant distributional effect of FDI-inflow during the short and long term.

2.2.4 Attracting FDI has a non-linear impact on income inequality

Few studies tested the hypothesis that the behavior of the impact of FDI-inflow on inequalities changes over time. These studies were not agreed about the behavior of non-linearity of the relationship. Some of them found the relationship follows the “heterogeneous firms' model” supporting that inequality increases at first stages with FDI-inflows then decreases with time. Others confirm the findings of “endogenous-growth model” that inequalities decrease at first stages with FDI-inflows then increases with time as mentioned before. Most of the studies those investigated the non-linearity of the effect have confirmed that FDI-inflow increases inequalities first then decreases it with time. This supports “heterogeneous firms' model” at the expense of “endogenous-growth model”.

In a previously reviewed study, Le *et al.* (2021) indicated that attracting FDI-inflow to Vietnam increases income inequality in 63 provinces in the short run but this effect decreases gradually over time.

Huang *et al.* (2020) analyzed the distributional effect of inward FDI through surveying this effect in 543 empirical studies that were prepared between 1995 and 2019. Finings supported that inward FDI may raise inequalities at first stages of development and then it reduces inequalities with deepening development.

Cho and Ramirez (2016) investigated the distributional effect of inward FDI in 7 countries in Southeast Asia from 1990 to 2013. Gini was used referring to income inequality. Both of FDI-inflow and FDI stock as percentages of GDP were used referring to inward FDI. Using fully modified OLS (FMOLS) technique, findings supported that FDI-inflow increases income inequality in the short run then decreases it with time.

In a previously reviewed study, Figini and Gorg (2011) confirmed the non-linearity of FDI-inflow in affecting inequality in the developing countries. Findings proved that attracting FDI-inflow to developing countries increases inequality first then inequality decreases with deepening FDI-inflow.

Herzer and Nunnenkamp (2011) inspected the impact of inward FDI on income inequality in ten European countries from 1980 to 2000. Gini was used referring to income inequality. The ratio of FDI stock to GDP was used in measuring inward FDI. Techniques of panel DOLS and panel cointegration are used in estimation. Results supported that income inequality increases with FDI-inflow in the short run then it decreases in the long run. Although it was not tested, the study stated that it is necessary to investigate the impact of some evolutions regarding inward FDI. First, despite the theoretical focus on the impact of inward FDI in the manufacturing sector, the increase in FDI to the service sector highlights the need to test its impact on the host developing countries. Second, with the increasing role of South-South FDI at the expense of North-South FDI, the impact of this should be studied as the effect differs in the former from the latter.

Chen *et al.*, (2017) explored the contribution of inward FDI on the wage gap in 12,892 manufacturing domestic and foreign firms in China. The study covered the period 1999-2007. Wage differences percentage between foreign and domestic firms was used referring to wage gap. A dummy variable was used to distinguish foreign capital firms. Findings

highlighted the increasing wage gap between both groups of firms in the short run but this effect decreases with time. These findings were explained by the effects of technology spillover and labor movements as a result of attracting FDI, as both effects increase first and then decrease over time.

Although all of these studies confirmed the "heterogeneous firms model" hypothesis, very few studies supported the "endogenous-growth model" hypothesis. Kaulihowa and Adjasi (2018) investigated the non-linearity of the impact of inward FDI on income inequality in 14 African countries during the period 1980-2013. Using Pooled Mean Group technique, findings illustrate that FDI-inflow enhances equality of income first, and then this effect diminishes with time.

To summarize, the empirical studies did not agree on neither the existence of a statistically significant relationship between inward FDI and inequalities, nor their direction, if exists. Several factors participated in the disparity in the effects of inward FDI on inequalities. First, both directions of the effect have their theoretical basics. Second, several measures are used referring to inward FDI and inequalities. Third, the focus on sector-disaggregated impact was limited to manufacturing sector only. Fourth, the nature of the relationship between the two variables that probably leads to a two-way causality. Fifth, the sensitivity of the relationship to estimation techniques and the sample countries used.

Hence the contribution of this study to the literature lies in investigating the impact of inward FDI on wage inequality depending on the recipient sector in a group of developing countries.

3. Model Specification, data sources, and estimation technique

In this section, model specifications, sources and description of data are discussed and the estimation strategy used is clarified. The dependent variable used in all models is wage inequality measure. Models differ in the sector-disaggregated inward FDI "FDI_{ist}" measures used as an independent variable. Wage inequality "*Wineq*" is measured using the Palma inequality ratio as labor income generated by the top decile to labor income generated for the lowest 40 percent of the population. The proposed empirical specification of the model will be as follows:

$$Wineq_{it} = \propto + \rho Wineq_{i(t-1)} + \sum_{n=1}^{4} \beta_n FDI_{ist} + \sum_k \delta_k X_{it} + \lambda_i + \varepsilon_{it} \quad \text{.... (1)}$$

where i, s and t denote country, sector and time period, respectively. The time lag of "$Wineq_{i(t-1)}$" is used to test the possible persistence in wage inequality. "FDI_{ist}" is considered the main independent variable in this model. This variable is used once as inflows as a percentage of GDP "$FDIf_{ist}$" due to the availability of more data and once as stocks as a percentage of GDP "$FDIs_{ist}$" that captures long-run impacts more effectively (Herzer *et al.*, 2014; Mihaylova, 2015). The Sectors included in measuring "FDI_{ist}" includes petroleum and mining "*min*", primary (Agriculture, forestry and fishing) "*pr*", manufacturing (henceforth secondary) "*sec*" and services "*ser*" sectors. "X_{it}" refers to vectors of control variables; "λ_i" is a set of individual and time-invariant country's FE and ε_{it} stands for the error term.

The macroeconomic control variables used "X_{it}" includes only those have a stable long-run relationship in the literature as determinants of wage inequality. These control variables are GDP per-capita "*GDPPC*", Inflation calculated using GDP deflator "*Infl*", Trade openness "*Open*" measured as the summation of exports and imports as a percentage of GDP, Government expenditure as a percentage of GDP "*Gexp*", domestic investment spending as a percentage of GDP "*DomInv*", human capital measured using Human Development Index that is a composite index includes knowledge, long-healthy life and a decent standard of living to measure human development "*HDI*", unemployment rate "*Unem*", age dependency ratio "*ADR*" and political stability and absence of violence "*PolS*". Using these control variables in equation (1), the specification of the model can be shown as follows:

$$\begin{aligned} Wineq_{i,t} = \propto + \rho Winq_{i,(t-1)} + \beta_1 FDI_{pr,i,t} + \beta_2 FDI_{min,i,t} + \\ \beta_3 FDI_{sec,i,t} + \beta_4 FDI_{ser,i,t} + \delta_1 GDPPC_{it} + \delta_2 GDPPC_{it}^2 + \\ \delta_3 Infl_{it} + \delta_4 Open_{it} + \delta_5 Gexp_{it} + \delta_6 DomInv_{it} + \delta_7 HDI_{it} + \\ \delta_8 Unem_{it} + \delta_9 ADR_{it} + \delta_{10} PolS_{it} + \lambda_i + \varepsilon_{it} \end{aligned} \quad \text{.. (2)}$$

The expected effect and significance of indicators of sector-disaggregated inward FDI and control variables in "*Wineq*" models are as follows:

a) "$Wineq_{i(t-1)}$" tests the hypothesis of the possible persistence in wage inequality (Li and Su, 2021; Nguyen, 2021). To accept this hypothesis, the variable "$Winq_{i,(t-1)}$" need to be statistically significant and positive in the model.
b) "$FDIf_{pr,i,t}$", "$FDIf_{min,i,,t}$" , "$FDIf_{sec,i,t}$", "$FDIf_{ser,i,t}$", "$FDIs_{pr,i,t}$", "$FDIs_{min,i,,t}$", "$FDIs_{sec,i,t}$" and "$FDIs_{ser,i,t}$" have ambiguous effects on wage inequality as mentioned before. Some studies stated that the effect differ depending on the recipient sector while others failed to prove this heterogeneous impact. The effects of these variables in the model test the main hypothesis of this study.
c) "*GDPPC*" refers to the level of development in the host country (Alshamsi *et al.*, 2015). It is hypothesized that more development and the increase in per-capita income increases wages and helps reducing inequality through affecting the economic structure of the country (Rezk *et al.,* 2022). To accept this impact, the variable "*GDPPC*" need to be statistically significant and negative in the model.
d) "$GDPPC^2$" studies the hypothesis of the non-linearity of the effect of "*GDPPC*" and "*Wineq*". As mentioned before, both of heterogeneous firms' model and endogenous-growth model gave different explanations for the non-linearity of the effect. If heterogeneous firms model holds, the expected sign of "$GDPPC^2$" will be negative confirming Kuznets curve inverted-U hypothesis. If endogenous-growth model holds, the expected sign of "$GDPPC^2$" will be positive.
e) "*Infl*" measures the macroeconomic stability of the host country. Mihaylova (2015) and Rezk *et al.* (2022) stated that having high inflation can accelerate wage inequality in two ways. First, low-income earners those who have nonadjustable income pay a larger bill as a result of inflation. Hence, wage inequality increases with inflation. Second, inflation erodes the savings of the middle class resulting in increasing the number of the poor and increasing inequalities. On the other hand, stagflation, which results from cost-push inflation, lowers real and nominal wages and may lead to reduce inequalities. Additionally, with inflation, unskilled labor tend to work more while skilled labor may not have the same tendency to work more because they receive skills grants. Balcilar *et al.* (2018) stated

that the net effect of inflation on wage inequality depends on the initial level of inflation. Hence, the variable "*Infl*" need to be statistically significant and both signs are accepted in the model.

f) "*Open*" has an unknown effect on wage inequality as liberalizing trade enforces countries towards producing commodities those having a comparative advantage in. Therefore, the net effect depends on the relative weight of skilled to unskilled-labor intensity in the sectors in which the countries enjoy a comparative advantage compared to comparative disadvantage sectors (Le *et al.*, 2021).

g) "*Gexp*" measures the efforts of governments to reduce inequality. It is hypothesized that the more the government expenditure on redistributing income, the less the inequality (Li and Su, 2021). To accept this impact, the variable "*Gexp*" need to be statistically significant and negative in the model (Bhandari, 2007).

h) "*DomInv*" increases can be reflected on more employment and less dependency which press on wage inequality (Bhandari, 2007). To accept this impact, the variable "*DomInv*" need to be statistically significant and negative in the model.

i) "*HDI*" increases lead to raising skilled-labor supply. The latter reduces wage inequality (Figini and Gorg, 2011; Rezk *et al.,* 2022). To accept this impact, the variable "*HDI*" need to be statistically significant and negative in the model.

j) "*Unem*" increases more for unskilled labor those have relatively lower wages leading to reduce wage inequality. On the other hand assuming flexible wage system, unemployment affects wage inequality by affecting the bargaining power of the prevailing wage rate for unskilled labor in the market, especially in the private sector. Increasing unemployment puts pressure on prevailing wage rate for unskilled labor and accordingly increases wage inequality (Le *et al.*, 2021; Li and Su, 2021). Hence, both directions of effect are accepted in the model.

k) "*ADR*" increases result in lowering per-capita income and investment on human capital. The latter is reflected on increasing the relative percentage of unskilled labor and accordingly increases wage inequality (Li and Su, 2021). To accept this impact, the variable "*ADR*" needs to be statistically significant and positive in the model (Bhandari, 2007).

l) "*PolS*" measured using political stability and absence of violence which is one of Worldwide Governance Indicators after adjusting data to give countries scores between 0 for the lowest degree of freedom and 6 for the highest. Political stability improvements put pressure on wage inequality (Bhandari, 2007**;** Nguyen, 2021). To accept this impact, the variable "*PolS*" need to be statistically significant and negative in the model.

3.2 Sample countries and data

Following the limitations on the availability of sector-disaggregated inward FDI on wage inequality, 57 developing countries are included in estimating the model for the period 2004-2019. Some of these countries have data for both of inflows and stocks of sector-disaggregated inward FDI; others have data for only one of both measurements of sector-disaggregated inward FDI. Diversification was taken into account in the selection of countries, whether according to geographical distribution or between income groups (as shown in appendix 1).

Data sources include World Bank - World Development Indicators database for "*ADR*", "*DomInv*", "*GDPPC*", "*Gexp*", "*Infl*", "*Open*", "*PolS*", and "*Unem*". "*Wineq*" has been obtained from ILO modeled estimates of labor income distribution. "$FDIf_{pr,i,t}$", "$FDIf_{min,i,,t}$", "$FDIf_{sec,i,t}$", "$FDIf_{ser,i,t}$", "$FDIs_{pr,i,t}$", "$FDIs_{min,i,,t}$", "$FDIs_{sec,i,t}$" and "$FDIs_{ser,i,t}$" have been collected from International Trade Centre (ITC) database and unpublished domestic sources in case of unavailability of data in ITC. "*HDI*" has been compiled from Human Development Reports of UN development Programme.

Variables included in the model are transformed to a natural logarithm form except inflows and stocks of sector-disaggregated inward FDI data and "*Infl*" those can have negative or zero values. The reason for the transformation of variables is to reduce the heterogeneity of measurements of variables (Ravinthirakumaran and Ravinthirakumaran, 2018). Hereafter, the letter "*L*" at the beginning of the variable's name indicates the transformation of its values to the natural logarithm.

Descriptive statistics of variables used in estimation show that the average wage inequality in selected countries is approximately 8.04 percent. This is close to average wage inequality in lower-middle-income countries and much higher than that of upper-middle-income countries. Hence, it is clear that selected countries had significantly higher wage inequality during the sample period.

Correlation coefficients between variables used confirm that "*LADR*" is highly negatively correlated to "*LGDPPC*", "$FDIs_{ser}$" and "*LHDI*". This has a clear theoretical justification. Accordingly, "*LADR*" is omitted from the model estimation. "$FDIs_{ser}$" is highly positively correlated to "$FDIs_{sec}$". These correlations have also clear theoretical justifications. Hence, despite Suanes (2016) merged all sector-disaggregated inward FDI together in one model, the correlation between them leads to estimate eight models, one for each sector in separate. This is consistent with the study of Bogliaccini and Egan (2017).

3.3 Estimation Technique

Models are specified using a non-balanced yearly dynamic panel data technique based upon S-GMM modified by Arellano and Bond (1991). S-GMM technique is used to deal with the possibility of the two-way causal effects and to avoid the potential endogeneity problem between "*Wineq*" and some of control variables. Following Arellano and Bond (1991), the first-differences of variables are used in estimating dynamic-GMM model instead of levels to exclude the individual effects. Simultaneously the lagged levels of predetermined independent variables are used in estimation and the differenced endogenous are used as instruments.

The model in equation 2 is estimated using S-GMM technique for each sector. Several studies used S-GMM technique in estimating the impact of inward FDI on inequalities to avoid estimation problems resulted from heteroscedasticity, autocorrelation, omitted variable bias and endogeneity (Figini and Gorg, 2011; Nguyen, 2021).

4. Empirical Results and Discussions

Results of Wald test confirmed that variables of "$FDIf_{pr}$", "$FDIs_{min}$", "$FDIs_{sec}$", "$FDIs_{ser}$", "*Infl*", "*LGDPPC*", "*LGexp*", "*LOpen*" and "*LPolS*" are endogenous variables in "*Wineq*" model. The proof of the endogeneity problem and the need to add the lag dependent variable highlighted the importance of using S-GMM technique in estimation. The values of the Sargan test of over-identifying restrictions rejected the null of over-identifying restrictions in all models. The tests of Arellano-Bond test for AR(2) imply that problems of second order autocorrelation in differences can be rejected in all models. The results of estimating the Dynamic S-GMM models are reported in appendix 2.

As shown in appendix 2, the results of Dynamic S-GMM models confirmed the theoretical basis regarding the impact of sector-disaggregated inward FDI on wage inequality in developing countries as sector-disaggregated inward FDI stocks are statistically significant in their models. More specifically, the estimated coefficients of "$FDIs_{min}$" and "$FDIs_{ser}$" are statistically significant and positive while the estimated coefficients of "$FDIs_{pr}$" and "$FDIs_{sec}$" are statistically significant and negative in their models. This indicates that attracting inward FDI to mining and services sectors increases the wage inequality while attracting inward FDI to primary and secondary decreases the wage inequality in sample countries. Accordingly, the main hypothesis of the study cannot be rejected as the impact of inward FDI on wage inequality is proved to be sensitive to the recipient sector. These results are consistent with theoretical background that attracting inward FDI to relatively labor-intensive sectors help reducing inequality (Suanes, 2016). Results are consistent with empirical studies of Bogliaccini and Egan (2017), Figini and Gorg (2011), Jaumotte *et al.* (2008) and Mihaylova (2015).

Sector-disaggregated FDI inflows are statistically insignificant in their models. This is consistent with empirical studies of Herzer *et al.* (2014) and Mihaylova (2015) those stated that FDI stocks captures long-run impacts on inequalities more effectively relative to FDI inflows.

The rest of the statistically significant independent variables included in the models have the expected signs. The statistically significance of the time lag of the "*Wineq*" confirmed the dynamic nature of sector-

disaggregated inward FDI in sample countries. This is consistent the results of Li and Su (2021) and Nguyen (2021). The negative statistically significant parameters of "*GDPPC*" confirmed that the increase in per-capita income helps reducing wage inequality through affecting the economic structure of the country.

The negative statistically significant parameters of "*DomInv*" confirmed that domestic investment increases employment and decreases dependency which presses on wage inequality. This is consistent with the study of Bhandari (2007). The negative statistically significant parameters of "*Infl*" confirmed two facts mentioned above about the impact of stagflation on wage inequality. The statistically significant parameters of "$GDPPC^2$" confirmed the non-linearity of the effect of "*GDPPC*" on wage inequality. The positive sing of parameters indicates that endogenous-growth model dominants the effect at the expense of heterogeneous firms model. This confirms that wage inequality decreases in the early stages of absorbing technology associated with foreign investment, then with time wage inequality increases.

The variable "*Gexp*" is found to be statistically significant and negatively affects wage inequality in case of mining and primary sectors inward FDI while it is statistically significant and positively affects wage inequality in case of secondary and services sectors. This indicates that government expenditure needs to be restructured to effectively help reducing wage inequality in all sectors. The variable "*Open*" is found to be statistically significant and negative in sector-disaggregated FDI inflows models and positive in sector-disaggregated FDI stocks. Since stocks of FDI show the effect over the long term more than inflows, this means that trade liberalization in sample developing countries increases inequality in the long run in light of the existing pattern of specialization and division of labor internationally. The variable "*Unem*" is found to be statistically significant and negative in only secondary and mining sectors. This indicates the tendency of these sectors to be skilled labor intensive when attracting FDI. As unemployment increases for unskilled labor, consequently wage inequality declines.

5. Conclusions and policy implications

This study used both of the theoretical and empirical evidence to test the heterogeneous impact of inward FDI on wage inequality depending on the recipient sector. Despite the focus theoretically was on manufacturing sector, this impact can be generalized to be relied on the intensity of dependence on skilled labor to unskilled labor in each sector. Moreover, theoretically, both direction of this sectoral impact over time are accepted as both directions of the impact have supportive theories. The empirical studies did not result in a greater specification of the nature of this sectoral inward FDI impact on wage inequality.

The contribution of this study is to investigate the impact of inward FDI on wage inequality depending on the recipient sector in a group of developing countries. S-GMM technique is used in order to deal with the possibility of the endogeneity problem in the model and to add lag dependent variable to the model. The impact of inward FDI on wage inequality is estimated for primary, petroleum and mining, manufacturing and services sectors. For each sector inward FDI is measured first using FDI inflows and then using FDI stock. Accordingly, eight models are estimated. The estimation gave several implications regarding the sector-disaggregated FDI inflows impact on wage inequality in sample developing countries. First, inward FDI stock is one of the main determinants of wage inequality. Second, FDI stocks are more accurate than FDI inflows in measuring the impact on wage inequality. Third, the estimation results confirmed that the impact of inward FDI on wage inequality is sensitive to the sector receiving FDI. While the concentration of inward FDI in mining and services sectors increases the wage inequality, attracting inward FDI to primary and secondary decreases the wage inequality. Fourth, wage inequality has a dynamic nature and follows a historical pattern.

Results of the study can lead to a number of recommendations to support the effectiveness of attracting inward FDI to reduce wage inequality in developing countries. Among these recommendations:

1. Giving more attention to the stock of sectoral distribution of FDI instead of focusing only on the volume of inward FDI as a total figure or its inflow and give a special care to relatively labor-intensive sectors.

2. Targeting incentives given to foreign investors to be directed more to primary and manufacturing sectors in order to help reducing wage inequality.
3. Giving incentives to domestic investors to be directed to labor intensive sectors those are complementary with FDI. These incentives can be tied to a certain level of labor employed.
4. Giving a special focus when investing in human capital on increasing the capabilities of unskilled labor to be ready for the changes in the skills required in labor while absorbing newer technologies in domestic firms in the long run.

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Appendix 1: Selected countries diversification, geographically and between income groups

Geographical diversification of selected countries				
Continent	Africa	Latin America	Asia	Europe
No. of countries	15	11	23	8
Diversification of selected countries between income groups				
Income groups	Low-income	Lower-Middle	Upper-Middle	High-income
No. of countries	3	21	25	8

Source: Prepared by the researcher depending on sample countries.

APPENDIX 2: S-GMM estimates of "*Wineq*" model (2004-2019)

Variable	$FDIf_{min,}$	$FDIf_{pr}$	$FDIf_{sec}$	$FDIf_{ser}$	$FDIs_{min}$	$FDIs_{pr}$	$FDIs_{sec}$	$FDIs_{ser}$
$LWineq_{i(t-1)}$	0.897*** (10.95)	1.00*** (28.44)	0.993*** (42.52)	0.979*** (35.54)	0.964*** (84.21)	0.987*** (120.56)	1.001*** (53.54)	1.006*** (62.54)
$FDIF_{min}$	1.701 (1.41)							
$FDIF_{pr}$		5.125 (1.39)						
$FDIF_{sec}$			-1.398 (-0.99)					
$FDIF_{ser}$				0.018 (0.08)				
$FDIS_{min,}$					0.101* (1.65)			
$FDIS_{pr}$						-1.901* (1.75)		
$FDIS_{sec}$							-0.057* (-1.79)	
$FDIS_{ser}$								0.072** (2.47)
Infl	-0.016* (-1.71)	-0.001** (1.82)	-0.001* (-1.78)	-0.001** (-2.05)	-0.001** (-2.36)	-0.001** (-2.14)	-0.001* (-1.74)	-0.001** (-2.14)
LDomInv	-0.236** (-2.01)	-0.005 (-0.16)	0.014 (0.59)	0.005 (0.24)	-0.109* (-1.84)	-0.087* (-1.92)	-0.066** (-2.39)	-0.044* (-1.94)
LGDPPC	-1.765* (-1.72)	-0.929* (-1.83)	-0.488* (-1.82)	-0.613* (-1.9)	-0.713*** (-2.82)	-0.618** (-2.38)	-0.33* (-1.65)	-0.174* (-1.87)
$LGDPPC^2$	0.093* (1.76)	0.044* (1.65)	0.021* (1.67)	0.029* (1.95)	0.038*** (2.88)	0.029** (2.37)	0.019* (1.73)	0.012** (2.46)
LGexp	-0.103* (-1.68)	-.042* (-1.77)	-0.009 (-0.46)	-0.014* (-0.67)	-0.018 (-0.63)	0.029 (1.41)	0.077* (1.72)	0.031 (0.94)
LOpen	-0.102* (-1.65)	-0.042* (-1.77)	-0.065** (-2.37)	-0.069* (-1.73)	0.041** (2.48)	0.045*** (2.77)	0.059*** (3.01)	0.019** (2.37)
LPolS	-0.114 (1.54)	-0.009 (-0.14)	0.037* (1.68)	-0.001 (-0.03)	-0.048* (-1.8)	0.001 (0.08)	0.03 (1.4)	-0.001 (-0.72)
LUnem	-0.01 (-0.26)	-0.006 (-0.37)	-0.022* (-1.87)	-0.018* (-1.89)	-0.006 (0.648)	0.009 (0.83)	-0.003 (-0.28)	-0.001 (-0.2)
LHDI(-1)	0.159 (0.29)	0.859** (2.1)	0.699** (2.38)	0.506* (1.84)	0.005* (0.03)	0.343 (1.64)	-0.041 (-0.2)	-0.207* (-1.65)
System GMM data used								
Countries/Obs.	45/396	41/373	47/417	50/469	29/232	31/272	29/222	29/222
System GMM Related Tests								
AR(2) p-value[1]	0.251	0.244	0.283	0.309	0.144	0.111	0.124	0.130
Sargan Test[2]	0.969	0.993	0.992	0.952	0.640	0.598	0.801	0.885

The symbols *, ** and *** reflects significance at 10%, 5% and 1% levels.

Values in () refers to z- statistics.

[1] Arellano-Bond test for Second-order autocorrelation AR(2) in first differences.

[2] Sargan test of over-identifying restrictions

Source: Prepared by the researcher depending on estimation results.

أثر الاستثمار الأجنبي المباشر على تفاوت الأجور في الدول النامية: هل يختلف الاثر حسب القطاعات المتلقية؟

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أستاذ الاقتصاد المساعد – كلية النقل الدولي واللوجستيات- الأكاديمية العربية للعلوم والتكنولوجيا والنقل البحري.

المستخلص

يعد الاستثمار الأجنبي المباشر من الركائز الأساسية للعولمة. ويعتبر الحد من تفاوت الدخول أحد أهداف الألفية الجديدة. ومع ذلك لم تتعرض الكثير من الدراسات التطبيقية لاختبار تأثير الاستثمار الأجنبي المباشر الوارد على عدم المساواة في الدخل. وقد ركز عدد قليل من هذه الدراسات على التأثير على تفاوت الأجور داخل الدولة. هذا بالرغم من أن الأجور هي المصدر الرئيسي لدخل غالبية السكان وتؤثر بشكل مباشر على الفقر. ولم تتفق كل من الدراسات التطبيقية والنظرية الاقتصادية على اتجاه تأثير الاستثمار الأجنبي المباشر الوارد على عدم المساواة في الدخل أو الأجور، لا سيما في الدول النامية. وتعاني الدراسات التطبيقية التي تعرضت لدراسة التباين في هذا التأثير اعتمادًا على القطاعات الاقتصادية المضيفة من ندرة شديدة، على الرغم من إثباتها نظريًا. لذا، تتمثل الفرضية الرئيسية للدراسة في أن تأثير الاستثمار الأجنبي المباشر الوارد على عدم المساواة في الأجور يختلف باختلاف القطاع المتلقي للاستثمار. تم استخدام المنهج الاستنباطي بالتطبيق على مجموعة من الدول النامية باستخدام بيانات اقتصادية كلية مقطعية-زمنية، كما تم تقدير ثمانية نماذج قياسية للفترة ٢٠٠٤-٢٠١٩. أكدت نتائج وطريقة نظام العزوم المعممة (S-GMM) أن الاستثمار الأجنبي المباشر الداخل هو أحد المحددات الرئيسية لتفاوت الأجور. ويختلف التأثير باختلاف كل من القطاعات المتلقية للاستثمار والمقاييس المستخدمة لقياس الاستثمار الأجنبي المباشر الوارد. كما أكدت نتائج التقدير الطبيعة الديناميكية لعدم المساواة في الأجور. وتم اقتراح سياسات داعمة لزيادة كفاءة استخدام الاستثمار الأجنبي المباشر الوارد للحد من تفاوت الأجور.