The Relationship Between FDI and Income Inequality:
Does Governance Environment Matter?

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Abstract

Reducing poverty and income inequality in society is considered one of the millennium goals in developing countries. Attracting more foreign direct investment (FDI) inflows to boost economic growth and development is a good solution to achieve this goal. This paper empirically assesses the role of the governance environment in the FDI–income inequality relationship for balanced panel data of 37 developing countries from 2002 to 2018 using the two-step generalized method of moments Arellano-Bond estimator. The estimated results indicate that FDI and governance reduce income inequality while their interaction enhances it. Furthermore, economic growth, trade openness, unemployment, education, and infrastructure are significant determinants of income inequality in the developing countries studied. In particular, the Pooled Mean Group estimator is employed to guarantee the robustness of estimates. The findings suggest some policy implications for governments of developing countries in terms of reforming the governance environment to attract more FDI inflows and decrease income inequality.

Keywords: FDI, income inequality, governance, developing countries, system GMM estimator, PMG estimator

JEL Classification: C33, O10, O53

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1. Introduction

Income inequality in society is an important problem in both developed and developing countries in the context of increasing globalization. Governments in developing countries are always trying to improve the quality of life and reduce poverty and income inequality. In comparison with developed countries, developing countries lack the necessary resources and effective solutions to narrow income inequality. Foreign direct investment (FDI) is a crucial capital source to promote economic growth and development, create more jobs, and stabilize social security. The great contribution of FDI inflows in host countries is innovative capacity, capital accumulation, know-how acquisition, and technology transfer (Agosin & Machado, 2005). Therefore, attracting FDI inflows is a good solution to offset the lack of investment capital in these countries. Governments in these countries reform and improve the institutional setting to reduce income inequality and attract more FDI inflows. Acemoglu, Johnson, and Robinson (2005) emphasize that difference in the institutional environment leads to the difference in economic development outcomes between countries. Therefore, reforming and improving the institutional environment will help narrow income inequality. However, the question is how does the governance environment affect the relationship between FDI and income inequality?

Given the relevance of this topic, some theories explain the effect of FDI inflows on income inequality. First, the North-South FDI model developed by Feenstra and Hanson (1997) argues that FDI inflows could result in greater inequality in developing countries because of driven comparative advantage. In particular, in case FDI from developed countries in the North is skill-biased, the skilled–unskilled wage gap of host developing countries in the South would increase. Second, the heterogeneous firms model by Helpman, Melitz, and Yeaple (2004) is based on the traditional Heckscher–Ohlin framework that FDI inflows would benefit the relatively abundant factor of production. FDI that flows into developing countries may raise the income levels of the relatively abundant factor (less skilled labor) in these countries, and thus, decrease income inequality. Third, modernization theory modified by Rostow (1960) argues that development processes in a country that occur in different stages will have different implications on income inequality. The theory emphasizes that an increase in FDI inflows at the early stage of development will enhance income inequality, but it is expected to fall once an optimal development stage is reached. Concerning to the role of governance in the FDI – income inequality relationship, we have some arguments as follows: under the poor institutional environment in developing countries, policies and regulations

are designed, formulated, and implemented in a manner that mostly receives all FDI inflows to deal with the shortage of domestic investment capital and high unemployment. Low-quality FDI inflows that often meet these requirements will be largely welcomed. The characteristic of these FDI inflows is to employ many unqualified and unskilled workers, most of whom are low-income people. Therefore, these FDI inflows increase the income of low-income people, narrow the income gap between high-income and low-income people, and thus reduce income inequality.

Driven from the fact that hunger eradication and poverty reduction play a crucial role in development agenda of developing countries and governance significantly contributes to the relationship between FDI and income inequality, we empirically investigate the effects of FDI, governance, and their interaction on income inequality for a group of 37 developing countries from 2005 to 2018 using the two-step system GMM Arellano-Bond estimator (S-GMM). Then, the PMG estimator is used to check the robustness of estimates.

The paper is constructed in the following way. Section 2 is a literature review that focuses on the relationship between FDI and income inequality. The model specification and research data are presented in Section 3 that especially emphasizes the characteristics and appropriateness of S-GMM and the PMG estimator. Section 4 shows the empirical results and discussion. The final section concludes and suggests some important policy implications.

2. Literature review

The contribution of FDI inflows to income inequality has so far been shown in related literature. However, its real effect on income inequality is still a hotly debated theme of interest among economists. Most of the studies support either a negative impact or a positive influence from FDI inflows to income inequality. Besides, some report that the relationship between FDI inflows and income inequality is non-linear or depends on other factors. In particular, through a survey of 543 primary studies, Huang, Sim, and Zhao (2020) note that 222 investigations indicate a significantly positive effect of FDI on income inequality while the remaining 321 show a negative or insignificant effect.

Regarding the positive effect, most of the studies employ the estimation methods for the panel data. Figini and Gorg (2011) use the estimators of FEM, pooled OLS, and one-step system GMM for 103 developing and developed countries over the period 1980 – 2002. Similarly, both Chintrakarn, Herzer, and Nunnenkamp (2012) and Herzer, Hühne, and Nunnenkamp (2014) use

panel cointegration techniques for 48 U.S. States from 1977 to 2001 and for a group of Latin American countries from 1980 to 2011. More recently, Alili and Adnett (2018) use estimators of REM and FEM for 19 transition countries during the time of 1993 – 2008 while Khan and Nawaz (2019) employ the one-step system GMM Arellano-Bond estimator for 12 countries of Commonwealth of Independent States from 1990 to 2016. The findings in these studies suggest the governments should re-design the policies to mitigate the adverse impacts of FDI inflows on income inequality.

Regarding the negative effect, researchers suggest that governments should attract more FDI inflow to eradicate hunger and reduce poverty. Herzer and Nunnenkamp (2013) report that FDI inflow decreases income inequality in 8 European countries from 1980 to 2000 using the two-step GMM Arellano-Bond estimator and panel cointegration techniques. More recently, Matallah (2019) notes that FDI inflow reduces income inequality in six South Asian countries from 1996 to 2012 via estimators of pooled OLS, FEM, REM, and the one-step difference GMM Arellano-Bond. Similarly, Teixeira and Loureiro (2019) indicate the negative impact of FDI inflow on income inequality in Portugal by using the Vector Error-correction Models (VECM) for time series data between 1973 and 2016.

Noticeably, Cho and Ramirez (2016) and Kaulihowa and Adjasi (2018) find that the relationship between FDI inflow and income inequality is non-linear. Cho and Ramirez (2016) apply the group-mean fully modified ordinary least squares (FMOLS) in 7 selected Southeast Asian countries over the period 1990 – 2013 while Kaulihowa and Adjasi (2018) use the PMG and MG estimators for 16 African countries from 1980 to 2013. In particular, the finding in Cho and Ramirez (2016) shows that income inequality starts decreasing after the ratio of FDI/GDP reaches 5.6%.

Contrary to the above-mentioned studies, Wu and Hsu (2012) and Lin, Kim, and Wu (2013) confirm that the FDI–income inequality relationship depends on absorptive capacity/human capital. Wu and Hsu (2012) use the OLS estimator and the endogenous threshold regression model for 54 countries (33 developing countries and 21 developed countries) over the period 1980 – 2005 while Lin et al. (2013) employ the instrumental variable threshold regressions approach for 73 countries during the period 1960 – 2005.

From the literature perspective, in summary, this paper shows two highlight aspects which can be different from related studies. First, the study introduces governance into the FDI - income

inequality relationship. Second, the study uses the two-step system GMM Arellano-Bond estimator for estimation and the PMG estimator for robustness check.

3. Methodology and research data

3.1 Methodology

Following Figini and Gorg (2011), Herzer and Nunnenkamp (2013), and Teixeira and Loureiro (2019), the empirical equation is extended as follows:

$$GIN_{it} = \beta_0 + \beta_1 GIN_{it-1} + \beta_2 FDI_{it} + \beta_3 GOV_{it} + \beta_4 (FDI \times GOV)_{it} + X_{it}\beta' + \eta_i + \xi_{it} \quad (1)$$

where subscript *i* and *t* are the country and time index, respectively. GIN_{it} is the GINI index which is used to measure income inequality. Its value ranges from 0 to 1 where 0 indicates complete equality (all individuals have equal incomes) and 1 indicates the highest level of inequality; GIN_{it-1} is the initial level of income inequality, FDI_{it} is net FDI inflows, GOV_{it} is governance environment (six dimensions of governance, including control of corruption, government effectiveness, political stability and absence of violence, regulatory quality, rule of law, voice and accountability), and $(FDI \times GOV)_{it}$ is the interaction between FDI and governance. X_{it} is a set of control variables such as economic growth, trade openness, unemployment, education, and infrastructure; η_i is an unobserved time-invariant, country-specific effect and ζ_{it} is an observation-specific error term; β_0, β_1, β_2, β_3, β_4 and β' are estimated coefficients.

We apply Equation (1) to examine the FDI – income inequality for the balanced panel data of 37 developing countries. The study uses six dimensions of governance constructed by World Bank to proxy for governance environment in which each dimension of governance has the value from –2.5 to 2.5 (Kaufmann, Kraay, & Mastruzzi, 2011). The general method of moments (GMM) Arellano and Bond (1991) estimators first proposed by Holtz-Eakin, Newey, and Rosen (1988) is employed for estimation. To estimate Equation (1), the first difference is applied to eliminate country-fixed effects. Then, the regressors in the first difference are used as instrumented by their lags under the assumption that time-varying white noises in the original models are not serially correlated (Judson & Owen, 1999). This strategy It is known as the difference GMM estimator, which can deal with simultaneity biases in regressions.

Equation (1) can be transformed into an equation in first difference as follows:

$$GIN_{it} - GIN_{it-1}$$
$$= \beta_1(GIN_{it-1} - GIN_{it-2}) + \beta_2(FDI_{it} - FDI_{it-1})$$
$$+ \beta_3(GOV_{it} - GOV_{it-1})$$
$$+ \beta_4[(FDI \times GOV)_{it} - (FDI \times GOV)_{it-1}] + (X_{it} - X_{it-1})\beta'$$
$$+ (\xi_{it} - \xi_{it-1}) \qquad (2)$$

In case variables are persistent, their past values show little information about their future changes, making their lags become weak instruments for their differenced series. Thus, Arellano and Bover (1995) suggests combining Equation (1) and Equation (2) to form a system of two equations, one equation in difference series instrumented by lagged levels and one equation in levels instrumented by lagged differences to which GMM is employed. It is the system GMM estimator, a strategy that can promote efficiency through solving the problem of the weak instrument in the difference GMM estimator and reducing biases in its estimates. The consistency of system GMM estimator is based on the assumption that the error terms are uncorrelated, the instruments are valid, and the changes in additional instruments are not correlated with fixed country-specific effects.

Compared to the one-step GMM estimators, the two-step GMM estimators (S-GMM) are more asymptotically efficient. However, the application of the two-step GMM estimators in small samples, as in our study, has some problems (Roodman, 2009). These problems are set up by the proliferation of instruments, which quadratically increase as the time dimension increases. It can cause the number of instruments to be very large relative to the number of countries. To avoid it, the rule of thumb should be applied to maintain the number of instruments less than or equal to the number of panel units (Roodman, 2009).

The Sargan statistic, Hansen statistic, and Arellano-Bond statistic are used to assess the validity of instruments in S-GMM. The Sargan and Hansen tests with null hypothesis H0: the instrument is strictly exogenous, which means that it does not correlate with errors. The Arellano-Bond test is used to detect the autocorrelation of errors in the first difference. Thus, the test result of the first autocorrelation of errors, AR(1) is ignored while the second autocorrelation of errors, AR(2), is tested on the first difference series of errors to detect the phenomenon of the first autocorrelation of errors, AR(1).

The Pooled Mean Group (PMG) estimator developed by Pesaran, Shin, and Smith (1999) is used to check the robustness of S-GMM estimates. The PMG estimator allows the short-term parameters to be heterogeneous between groups while imposing homogeneity of the long-term

coefficients between countries. It is one advantage of the PMG estimator. Furthermore, the PMG estimator highlights the adjustment dynamic between the short-run and the long-run. The heterogeneity of short-run slope coefficients allows the dynamic specification to differ across countries. However, the drawback of the PMG estimator is that it cannot deal with the endogeneity of variables in the model.

The PMG estimator – based error correction model as follows:

$$\Delta Y_{it} = \emptyset S_{it-1} + \sum_{j=1}^{p} \delta_{ij}\Delta X_{it-j} + \eta_{it} + \xi_{it} \text{ where } S_{it-1} = Y_{it-1} - \theta X_{it-1} \quad (3)$$

where *Y* is the GINI index; S_{it-1} is the deviation from long-run equilibrium at any period for group *i*, and ϕ is the error-correction coefficient (speed of adjustment). The vector θ captures the long-run coefficients which do not vary across groups; these coefficients represent the long-run elasticity of income inequality with respect to each variable in X_{it-1}. The short-run responses of the *X* variables are captured by the vector δ. η_i is an unobserved time-invariant, country-specific effect and ζ_{it} is an observation-specific error term. The validity of the PMG estimates is based on the level and significance of the error-correction coefficient ϕ (negative, smaller than 1).

3.2 Research data

The variables are the GINI index, FDI, six dimensions of governance, real GDP per capita, trade openness, unemployment, education, and infrastructure. Data are taken from the World Bank World Development Indicators (WDI) and Worldwide Governance Indicators (WGI) database. The research sample consists of 37 developing countries from 2002 to 2018 (see Appendix1).

The definition and descriptive statistics of data are given in the Appendix (Table 1A and Table 2A). The results in Table 2A indicate that most developing countries have a poor governance environment. In particular, it is completely consistent with that in the approach of Li (2003) and Li and Filer (2007) that most developing countries are those with a poor governance environment (relation-based governance).

4. Estimated results and discussion

4.1 S-GMM estimates

S-GMM estimates are shown in Table 1. Each column is the model in correspondence with each dimension of governance. In all estimation procedures, we detect that FDI is endogenous, thus we use FDI as instrumented in the GMM-style and the remaining variables (income inequality,

governance, economic growth, trade openness, unemployment, education, and infrastructure) as instruments in the IV-style. A battery of diagnostic tests shown at the bottom (Sargan tests, Hansen tests, and Arellano-Bond AR(2) tests) suggest that S-GMM estimates are relatively reliable.

The estimated results show that FDI and governance environment positively affect income inequality while their interaction negatively. All these results are highly consistent for all six dimensions of governance. FDI inflows reduce the income inequality in developing countries, supporting the view in Helpman et al. (2004) that FDI inflows improve the income levels of the less skilled labor in these countries, and thus, narrow income inequality. This finding can be found in Herzer and Nunnenkamp (2013), Matallah (2019), and Teixeira and Loureiro (2019). Similarly, the governance environment also decreases income inequality. "Actually, good governance has a crucial impact on inequality; as a matter of fact, poor governance hampers the effective delivery of public goods and services, depriving low- and middle-income households of their basic right to a dignified life" (Matallah, 2019, page 12). Reforming the governance environment aims to increase the effectiveness of government in the design, formulation, and implementation of policies related to economic growth and development to achieve United Nations Millennium Development Goals (hunger eradication and poverty reduction), to reasonably allocate benefits of economic growth in society, and thus reduce income inequality. However, why does the interaction between FDI and governance enhance income inequality? Developing countries are those that lack investment capital and need investment capital to promote economic growth and development. Therefore, governments in these countries are always reforming the governance environment and implementing related policies to attract more FDI inflows. Part of the FDI has resulted in economic growth and development by creating more jobs and narrowing income inequality in host countries. Besides, reforming governance environment also creates favorable conditions for FDI inflows to enter markets and access skilled workers, especially FDI inflows from developed countries in the North is skill-biased as argued by Feenstra and Hanson (1997), and thus the skilled–unskilled income gap in developing countries increases.

Furthermore, economic growth, trade openness, and unemployment stimulate income inequality while education and infrastructure reduce it. The positive impact of economic growth on income inequality may stem from the fact that the process of economic development in developing countries only benefits a part of the rich, who are considered to have many resources to receive the outcomes of economic growth. This finding is indicated in Wu and Hsu (2012), Herzer and

Nunnenkamp (2013), Kaulihowa and Adjasi (2018), and Teixeira and Loureiro (2019). It also presents a challenge for governments in developing countries to appropriately allocate the outcomes of economic growth to all people in the country. Similarly, trade openness widens income inequality, which is mentioned in Herzer and Nunnenkamp (2013), Alili and Adnett (2018), and Khan and Nawaz (2019). The openness of the economy helps to promote economic growth and thus benefits only a portion of the rich in developing countries. In particular, the poor in developing countries do not have access to the benefits of economic openness. Meanwhile, the high unemployment rate often falls into the poor groups, those who lack the skills and necessary knowledge to have a good job and thus widening the income inequality in society. The results also suggest that governments in developing countries should pay more attention and create conditions for the poor to access education for better employment opportunities. In contrast, education narrows income inequality, as pointed out in Herzer and Nunnenkamp (2013), Cho and Ramirez (2016), Khan and Nawaz (2019), and Matallah (2019). Improving the quality of education is necessary to enhance the ability to find jobs and income, especially for the poor. Besides, infrastructure development through public investment projects is also a good way to create favorable conditions to access employment opportunities for the poor and thus also reduce income inequality.

Table 1: FDI and inequality: S-GMM estimates, 2002 – 2018

Dependent variable: GINI index (income inequality)

Variables	GOV1	GOV2	GOV3	GOV4	GOV5	GOV6
Gini index (-1)	1.020***	0.987***	0.950***	0.978***	1.005***	0.990***
	(0.013)	(0.008)	(0.003)	(0.007)	(0.009)	(0.009)
FDI	-0.025***	-0.014***	-0.013***	-0.008***	-0.013***	-0.011***
	(0.003)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
Governance	-1.160***	-0.192**	-0.176***	-0.563***	-0.669**	-0.320***
	(0.197)	(0.090)	(0.061)	(0.115)	(0.107)	(0.109)
FDI x Governance	0.064****	-0.062	0.26**	0.290**	0.121**	0.461**
	(0.021)	(0.074)	(0.115)	(0.130)	(0.057)	(0.208)
Economic growth	0.005***	0.002***	0.002***	0.005***	0.004***	0.004***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Trade openness	0.004***	0.003***	-0.000	0.002	0.003**	0.002**
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)

Unemployment	0.149***	0.142***	0.001	0.180***	0.126***	0.147***
	(0.025)	(0.019)	(0.011)	(0.021)	(0.020)	(0.022)
Education	-0.077***	-0.025***	-0.005	-0.043***	-0.057***	-0.038***
	(0.013)	(0.009)	(0.005)	(0.008)	(0.012)	(0.010)
Infrastructure	0.001	-0.003**	-0.001**	-0.005***	0.000	-0.005***
	(0.002)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)
Instrument	36	35	37	35	37	36
Country/Observation	37/592	37/555	37/555	37/592	37/592	37/555
AR(2) test	0.557	0.532	0.477	0.513	0.518	0.542
Sargan test	0.270	0.104	0.117	0.127	0.163	0.104
Hansen test	0.544	0.555	0.789	0.411	0.505	0.485

Note: ***, ** and * denote significance at 1 percent, 5 percent and 10 percent respectively. GOV1, GOV2, GOV3, GOV4, GOV5, and GOV6 are six dimensions of governance in corresponding with Regulatory Quality, Rule of Law, Voice and Accountability, Control of Corruption, Government Effectiveness, and Political Stability.

4.2 Robustness check

To check the robustness of estimates, we re-estimate Equation (1) using the PMG estimator. In this estimation, we use only the main variables such as FDI, governance, and interaction. The PMG estimator – based error correction model requires the existence of co-integration between the dependent variable and explanatory variables. So, the paper first tests the co-integration developed by Westerlund (2007). The Westerlund panel co-integration tests in Table 2 indicate that all four tests reject the null of no co-integration, a covariate is considered co-integrated with the dependent variable. So, FDI and governance are co-integrated with income inequality.

The corresponding results across all models are reported in Table 3. In line with S-GMM, we find that FDI and governance narrow income inequality while their interaction enhances it. In particular, the level and significance of the error-correction coefficients shown at the bottom of tables suggest that PMG estimates are highly reliable.

Table 2: Westerlund panel co-integration tests, 2002 – 2018

Normalized variable: GINI index (income inequality)

Covariates	G_t	G_α	P_t	P_α
FDI	-3.610***	-16.812***	-21.344***	-16.641***
Governance 1	-3.743***	-16.074***	-20.149***	-15.153***

Governance 2	-3.614***	-15.852***	-18.723***	-13.296***
Governance 3	-3.228***	-17.356***	-18.333***	-16.555***
Governance 4	-3.677***	-19.077***	-19.550***	-16.879***
Governance 5	-3.618***	-17.149***	-19.880***	-14.673***
Governance 6	-3.512***	-15.436***	-19.514***	-15.929***

Note: ***, ** and * denote significance at 1 percent, 5 percent and 10 percent respectively. G_t, G_α, P_t, and P_α are test statistics for an individual unit of the panel and all the cross-sectional units of the panel.

Table 3: FDI and inequality: PMG estimates, 2002 – 2018

Long run co-integrating vectors

Dependent variable: GINI index (income inequality)

Variables	GOV1	GOV2	GOV3	GOV4	GOV5	GOV6
FDI	-0.263***	-0.072**	-0.009	-0.028***	-0.074***	-0.111***
	(0.077)	(0.033)	(0.018)	(0.019)	(0.027)	(0.048)
Governance	-4.868***	-2.836***	-1.464***	-0.097***	-2.183***	-5.741**
	(0.849)	(0.633)	(0.367)	(0.805)	(0.857)	(0.844)
FDI x Governance	0.769***	1.877***	0.488**	2.520***	4.783***	0.679***
	(0.302)	(0.707)	(0.219)	(0.737)	(0.718)	(0.562)
Error correction	-0.300***	-0.289***	-0.427***	-0.402***	-0.515***	-0.264***
Observation	592	592	592	592	592	592
Log likelihood	-713.264	-702.619	-640.471	-564.002	-587.949	-725.445

Note: ***, ** and * denote significance at 1 percent, 5 percent and 10 percent respectively. GOV1, GOV2, GOV3, GOV4, GOV5, and GOV6 are six dimensions of governance in corresponding with Regulatory Quality, Rule of Law, Voice and Accountability, Control of Corruption, Government Effectiveness, and Political Stability.

5. Conclusion and policy implications

Motivated by the fact that the governance environment plays an important role in the FDI – income inequality relationship, the paper uses S-GMM to empirically investigate the effects of FDI, governance, and their interaction on income inequality for a panel data of 37 developing countries over the period of 2002 – 2018. The estimated results show that FDI and the governance environment decreases income inequality while their interaction stimulates it. The robustness of these estimates is checked by the PMG estimator. Besides, economic growth, trade openness, unemployment, education, and infrastructure are determinants of income inequality in these countries.

The findings in this study support some important implications in the design, formulation, and implementation of policies relating to the relationship between FDI and income inequality. The implication is that the governance environment not only narrows income inequality but plays a significant role in the FDI – income inequality as well. In particular, severe income inequality can cause social instability. Therefore, governments in developing countries should be careful in reforming the governance environment to attract more income inequality-reducing FDI inflows and limit income inequality-increasing FDI inflows.

Acknowledgements

Reference

Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. *Handbook of Economic Growth*, *1*, 385-472.

Agosin, M. R., & Machado, R. (2005). Foreign investment in developing countries: Does it crowd in domestic investment? *Oxford Development Studies*, *33*(2), 149-162.

Alili, M. Z., & Adnett, N. (2018). Did FDI increase wage inequality in transition economies? *International Journal of Social Economics*, *45*(9), 1283-1304.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2), 277-297.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, *68*(1), 29-51.

Chintrakarn, P., Herzer, D., & Nunnenkamp, P. (2012). FDI and income inequality: Evidence from a panel of US states. *Economic Inquiry*, *50*(3), 788-801.

Cho, H. C., & Ramirez, M. D. (2016). Foreign direct investment and income inequality in southeast Asia: A panel unit root and panel cointegration analysis, 1990–2013. *Atlantic Economic Journal*, *44*(4), 411-424.

Feenstra, R. C., & Hanson, G. H. (1997). Foreign direct investment and relative wages: Evidence from Mexico's maquiladoras. *Journal of International Economics*, *42*(3-4), 371-393.

Figini, P., & Gorg, H. (2011). Does foreign direct investment affect wage inequality? An empirical

investigation. *The World Economy*, *34*(9), 1455-1475.

Helpman, E., Melitz, M. J., & Yeaple, S. R. (2004). Export versus FDI with heterogeneous firms. *American Economic Review*, *94*(1), 300-316.

Herzer, D., & Nunnenkamp, P. (2013). Inward and outward FDI and income inequality: Evidence from Europe. *Review of World Economics*, *149*(2), 395-422.

Herzer, D., Hühne, P., & Nunnenkamp, P. (2014). FDI and income inequality—Evidence from Latin American Economies. *Review of Development Economics*, *18*(4), 778-793.

Holtz-Eakin, D., Newey, W., & Rosen, H. S. (1988). Estimating vector autoregressions with panel data. *Econometrica: Journal of the Econometric Society*, *56*(6),1371-1395.

Huang, K., Sim, N., & Zhao, H. (2020). Does FDI actually affect income inequality? Insights from 25 years of research. *Journal of Economic Surveys*, *34*(3), 630-659.

Judson, R. A., & Owen, A. L. (1999). Estimating dynamic panel data models: A guide for macroeconomists. *Economics Letters*, *65*(1), 9-15.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: Methodology and analytical issues. *Hague Journal on the Rule of Law*, *3*(2), 220-246.

Kaulihowa, T., & Adjasi, C. (2018). FDI and income inequality in Africa. *Oxford Development Studies*, *46*(2), 250-265.

Khan, I., & Nawaz, Z. (2019). Trade, FDI and income inequality: Empirical evidence from CIS. *International Journal of Development Issues*, *18*(1), 88-108.

Li, J. S. (2003). Relation‑based versus rule‑based governance: An explanation of the East Asian miracle and Asian crisis. *Review of International Economics*, *11*(4), 651-673.

Li, S., & Filer, L. (2007). The effects of the governance environment on the choice of investment mode and the strategic implications. *Journal of World Business*, *42*(1), 80-98.

Lin, S. C., Kim, D. H., & Wu, Y. C. (2013). Foreign direct investment and income inequality: Human capital matters. *Journal of Regional Science*, *53*(5), 874-896.

Matallah, S. (2019). The triptych migration-inward FDI-inequality in South Asian countries: How much do governance and institutions matter? *Migration and Development*, *8*(1), 93-118.

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, *94*(446), 621-634.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in

Stata. *The Stata Journal*, *9*(1), 86-136.

Rostow, W.W. (1960). *The stages of economic growth – A non-communist manifesto.* Cambridge: Cambridge University Press.

Teixeira, A. A., & Loureiro, A. S. (2019). FDI, income inequality and poverty: A time series analysis of Portugal, 1973–2016. *Portuguese Economic Journal*, *18*(3), 203-249.

Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and Statistics*, *69*(6), 709-748.

Wu, J. Y., & Hsu, C. C. (2012). Foreign direct investment and income inequality: Does the relationship vary with absorptive capacity? *Economic Modelling*, *29*(6), 2183-2189.

Appendix

Appendix 1. List of 37 developing countries: Argentina, Armenia, Belarus, Bolivia, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, El Salvador, Georgia, Honduras, Hungary, Indonesia, Kazakhstan, Kyrgyz Republic, Latvia, Malaysia, Mexico, Moldova, Pakistan, Panama, Paraguay, Peru, Poland, Romania, Russian Federation, Slovenia, Thailand, Turkey, Ukraine, Vietnam, and West Bank and Gaza.

Table 1A. Data description

Variable	Definition	Type	Source
Income inequality	GINI index	value	World Bank
FDI	Foreign direct investment, net inflows (% of GDP)	%	World Bank
Economic growth	GDP per capita (constant 2010 US$)	log	World Bank
Trade openness	Trade is the sum of exports and imports of goods and services (% of GDP)	%	World Bank
Unemployment	Unemployment, total (% of total labor force) (modeled ILO estimate)	%	World Bank
Education	School enrollment, primary (% gross)	%	World Bank
Infrastructure	Fixed telephone subscriptions (per 100 people)	log	World Bank
Regulatory Quality	Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	level	World Bank

Rule of Law	Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts.
Voice and Accountability	Voice and Accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government.
Control of Corruption	Control of Corruption captures perceptions of the extent to which public power is exercised for private gain.
Government Effectiveness	Government Effectiveness captures perceptions of the quality of public services, and the quality of the civil service.
Political Stability	Political Stability measures perceptions of the likelihood of political instability and/or politically-motivated violence.

Table 2A. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Income inequality (GINI index)	629	40.031	8.883	23.7	59.5
FDI	629	4.092	5.121	-41.508	54.648
Economic growth (GDP per capita)	629	7029.794	4900.304	676.269	26684.21
Trade openness	629	84.687	38.793	22.105	210.374
Unemployment	629	7.424	4.682	0.398	27.465
Education (School enrollment, primary)	629	103.731	8.861	70.894	146.827
Infrastructure (telephone subscriptions)	629	19.085	10.346	1.318	51.390
Regulatory quality	629	-0.303	0.583	-1.394	1.592
Rule of Law	629	-0.066	0.576	-1.269	1.275
Voice and Accountability	629	-0.272	0.791	-2.810	1.302
Control of Corruption	629	0.047	0.625	-1.622	1.538
Government Effectiveness	629	-0.269	0.621	-1.371	1.433
Political Stability	629	-0.083	0.734	-1.766	1.292