Comparative Economic Research. Central and Eastern Europe
Volume 28, Number 2, 2025
https://doi.org/10.18778/1508-2008.28.16

The Impact of Foreign Aid on Foreign Direct Investment in Emerging Markets

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Abstract

This study explores the influence of foreign aid on foreign direct investment (FDI) in emerging markets using panel data analysis methods (fixed effects, fully modified ordinary least squares (FMOLS), and ordinary least squares (OLS)) with data from 2004 to 2019. It also examines whether financial development is a channel through which FDI is influenced by foreign aid in emerging markets using the same econometric estimation methods. Fixed effects and FMOLS indicate that foreign aid significantly improves FDI. However, contrary to the available literature, FMOLS and pooled OLS indicate that financial development significantly reduces FDI. The interaction between foreign aid and financial development did not show a significant impact on FDI across all three panel methods. Pooled OLS analysis shows that human capital development significantly enhances FDI. Furthermore, all the panel methods indicate that employment and infrastructure development positively influence FDI. Emerging markets also need to implement employment, human capital, and infrastructure development-enhancing policies and strategies to attract more and significant FDI inflows. They also need to implement policies that encourage the inflow of foreign aid to boost FDI. Future research should focus on estimating the optimal level of foreign aid needed to attract significant FDI into emerging markets.

Keywords: foreign direct investment, foreign aid, emerging markets, panel data

JEL: C23, F21, F35, P2

Received: 18.06.2024. Verified: 28.01.2025. Accepted: 7.04.2025

Introduction

Despite conclusive evidence regarding foreign aid-led growth, the influence of foreign aid on foreign direct investment (FDI) remains a contentious subject in finance and economics. Kimura and Todo (2010) noted that foreign aid attracts FDI through its ability to improve the investment climate of the host country. By contrast, Arellano et al. (2009) argued that foreign aid crowds out FDI by increasing the supply of tradable goods while reducing the price of non-tradable goods. Hence, the influence of foreign aid on FDI is mixed, inconclusive and far from exhaustive.

Empirical research on the foreign aid-led FDI discourse has yielded diverse results, which are grouped into five broad categories: (1) Foreign aid positively influences FDI. (2) Foreign aid negatively influences FDI. (3) Foreign aid and FDI affect each other. (4) Foreign aid indirectly influences FDI through various channels. (5) The relationship between foreign aid and FDI is insignificant and negligible. Several research questions arise from the literature review: Does foreign aid influence FDI? Is the influence direct or indirect? If the influence is indirect, does financial development affect the impact of foreign aid on FDI, especially in emerging markets? These questions are addressed in this paper. These mixed, divergent and inconclusive in the existing empirical literature highlight the need for continued research in this area.

Previous empirical studies are also characterized by methodological weaknesses. Many studies do not address endogeneity in the FDI function (e.g., Beladi and Oladi 2006; Annageldy 2011; Dastidar 2013; Garriga and Phillips 2014; Pham 2015; Dash, Gupta, and Khandelwal 2024). Additionally, the possibility that the relationship between foreign aid and FDI operates through indirect channels was overlooked (e.g., Karakaplan, Neyapti, and Sayek 2005; Beladi and Oladi 2006; Kapfer, Nielsen, and Nielson 2007; Selaya and Sunesen 2008; Asiedu, Jin, and Nandwa 2009; Annageldy 2011; Garriga and Phillips 2014; Quazi et al. 2014; Pham 2015; Amusa, Monkam, and Viegi 2016; Ulrika 2016; Michael 2018). A significant portion of the data used is often outdated (e.g., Karakaplan, Neyapti, and Sayek 2005; Beladi and Oladi 2006; Kapfer, Nielsen, and Nielson 2007; Selaya and Sunesen 2008; Asiedu, Jin, and Nandwa 2009; Annageldy 2011; Garriga and Phillips 2014; Quazi et al. 2014; Pham 2015; Amusa, Monkam, and Viegi 2016; Ulrika 2016; Michael 2018). Finally, the dynamic characteristics of the dependent data were frequently ignored (e.g., Beladi and Oladi 2006; Annageldy 2011; Dastidar 2013; Garriga and Phillips 2014; Pham 2015; Dash, Gupta, and Khandelwal 2024). This study seeks to fill these gaps.

This is the first study to exclusively focus on the effect of foreign aid on FDI in emerging markets, a region often overlooked in previous research. Unlike prior research with outdated, this analysis uses the most recent available data. This study is unique because it uses panel data, whilst the majority of previous research employed time series data. Finally, this study investigates the channels through which foreign aid influences FDI, in contrast to existing studies.

The remainder of this paper is organized as follows: Section 2 provides a review of the relevant literature. Section 3 details the research methodology and discusses the results. Section 4 presents the conclusion of the study.

Literature review

The influence of foreign aid on FDI can be understood through three theoretical rationales. First, foreign aid attracts foreign direct investors by enhancing the investment climate in the host country (Kimura and Todo 2010). By reducing the perceived investment risk associated with the recipient country, foreign aid makes it more appealing to companies from donor countries (Kimura and Todo 2010). Additionally, foreign aid often introduces business practices, norms, rules, and institutions that facilitate the transmission of information regarding the recipient country's business environment to companies based in the donor country (Kimura and Todo 2010, p. 482). Second, Arellano et al. (2009) argued that foreign aid pushes up the supply of tradable products and decreases the price of non-tradable products, crowding out FDI.

Third, there are specific channels through which foreign aid influences FDI (Kimura and Todo 2010). One such channel is the positive infrastructure effect, where improvements in social and economic developmental infrastructure in the host country enhance the positive influence of foreign aid on FDI. A positive financing effect is when the financial sector of the foreign aid-receiving country easily allows profit repatriation by the foreign direct investors (Arellano et al. 2009). Conversely, a rent-seeking effect can occur when foreign aid in the host country negatively influences FDI and economic growth by promoting unproductive rent-seeking behaviour (Harms and Lutz 2006). Lastly, a Dutch disease effect may occur when foreign aid distorts the allocation of resources between non-tradable and tradable economic sectors, thereby hindering FDI (Arellano et al. 2009).

The following table summarizes the empirical literature on the role that foreign aid plays in FDI.

Table 1. Foreign aid led FDI hypothesis (Empirical literature)

Author(s)	Unit of analysis	Methodology	Results
Karakaplan, Neyapti, and Sayek (2005)	Developing nations	Panel data analysis	The foreign aid-led FDI inflows hypothesis was confirmed.
Beladi and Oladi (2006)	Developing countries	Multiple regression analysis	Foreign aid crowded FDI in both the short and long runs.
Kapfer, Nielsen, and Nielson (2007)	Developing nations	Fixed effects	Aggregate foreign aid had no significant influence on FDI in developing countries. However, foreign aid aimed at infrastructure development had a significant causal effect on FDI in developing countries.
Selaya and Sunesen (2008)	Developing nations	Generalized methods of moments	Foreign aid into complementary inputs attracts FDI, whilst foreign aid into physical capital had a crowding out effect on FDI.
Asiedu, Jin, and Nandwa (2009)	Sub-Saharan Africa and low-income countries	Generalized methods of moments	Overall, foreign aid had a deleterious influence on FDI.
Kimura and Todo (2010)	Developing nations	Gravity-equation method	An insignificant influence of foreign aid on FDI was observed in developing countries.

Author(s)	Unit of analysis	Methodology	Results
Ndambendia and Njoupouognigni (2010)	Sub-Saharan African countries	Dynamic fixed effects and pooled mean group estimator	In the context of Sub-Saharan African countries, economic growth was significantly enhanced by the complementarity between foreign aid and FDI.
Annageldy (2011)	Central Asia	Seemingly unrelated regressions (SUR)	Regional results observed that (1) FDI was enhanced by foreign aid and (2) FDI and foreign aid complemented each other. Country-level analysis indicates that foreign aid enhanced FDI only in Tajikistan and Kyrgyzstan. The overall conclusion is that countries characterized by low levels of economic growth experience higher levels of foreign aid-induced FDI.
Wang and Balasubramanyam (2011)	Vietnam	Multiple regression analysis	Foreign aid and FDI complemented each other in the economic growth process. In other words, foreign aid enhanced FDI's efficacy in enhancing development and growth in Vietnam. The Vietnam data showed that foreign aid significantly attracted FDI during the period under study.
Dastidar (2013)	Developing nations	Panel data analysis	Foreign aid was observed as an exogenous factor that positively affected FDI in developing countries.
Garriga and Phillips (2014)	Post-conflict countries	Panel data analysis	Foreign aid that is geographically motivated attracted FDI into post-conflict countries.
Quazi et al. (2014)	South Asia and East	Feasible generalized least squares (panel estimation method)	The positive influence of foreign aid on FDI was found to be significantly positive across all countries.
Pham (2015)	Vietnam	Ordinary least squares	In Vietnam, in the short term, the influence of foreign aid on FDI was negligible. However, in the medium-term to long-term, the influence was more pronounced and significant.
Amusa, Monkam, and Viegi (2016)	Sub-Saharan Africa	Panel data estimation	The study noted that foreign aid aimed at boosting productive infrastructure enhanced FDI in sub-Saharan Africa. Foreign aid channeled toward socio-economic infrastructure had a positive but non-significant influence on FDI in Sub-Saharan Africa.
Ulrika (2016)	Middle-income developing countries	Multiple regression analysis	A positive influence of foreign aid on FDI was confirmed in both the short and long runs. This is possible through foreign aid's ability to mitigate market failures that trigger investment shortages in developing markets.
Michael (2018)	Africa	System generalized methods of moments	The positive influence of foreign aid on FDI in Africa was confirmed.

Author(s)	Unit of analysis	Methodology	Results
Quazi et al. (2019)	African countries	Feasible generalized least squares (Panel estimation method)	Foreign aid significantly attracted FDI in Africa. Using disaggregated data, bilateral aid had a negligible impact on FDI, whilst multilateral aid's positive influence on FDI was significant and more pronounced.
Addison and Baliamoune-Lutz (2020)	Latin America, Caribbean nations and Sub-Saharan Africa	Generalized methods of moments	Foreign aid was found to have crowded out FDI in countries with higher levels of human capital development. In most Sub-Saharan countries, the complementarity between foreign aid and social cohesion reduced FDI inflows. Foreign aid had a significant, positive influence on FDI inflows in the Caribbean region but a negative impact in Sub-Saharan Africa and Latin America.
Aluko (2020)	African countries	Panel data analysis	African countries characterized by developed institutional quality and financial sectors experienced significant levels of foreign aid-led FDI inflows.
Younsi, Bechtini, and Khemili (2021)	African countries	Fixed effects and system generalized methods of moments	The study found that foreign aid and FDI significantly complemented each other in promoting economic growth in African countries. The same study observed that domestic investment, foreign aid, and FDI all had a complementarity influence on economic growth.
Ono and Sekiyama (2023)	63 major donor-receiving countries from France, Japan, the United States, Germany and the United Kingdom	Generalized methods of moments	Foreign aid from Germany, the United Kingdom and Japan into major recipient countries promoted FDI when energy, transport, finance, and telecommunications infrastructure is developed.
Slesman (2023)	Cambodia	Autoregressive Distributive Lag (ARDL)	In the long run, donor-specific aid and aggregate development aid from the United Nations Development Programme (UNDP) and Australia attracted FDI into Cambodia. European aid into Cambodia crowded out FDI in the short run. Donor aid from the United States, France, and Japan had an insignificant positive or no influence on FDI in Cambodia.
Dash, Gupta, and Khandelwal (2024)	South Asian countries	Panel data analysis	In the long run, foreign aid reduced domestic investment but promoted both FDI and financial development.
Tian (2024)	Developing countries	Panel data analysis	A decline in foreign aid led to a significant drop in the inflow of FDI. The results imply that foreign aid-led FDI inflow is confirmed in this study.

Author(s)	Unit of analysis	Methodology	Results
Wang and Fillat-Castejon (2024)	African countries	Panel data analysis	The significant positive influence of institutions and foreign aid on FDI was confirmed in African countries. On the other hand, foreign aid that was influenced mainly by political considerations was confirmed to have had a deleterious influence on FDI.

Source: author's elaboration.

The empirical research summarized in Table 1 reveals a wide range of varied, divergent, conflicting, and mixed findings regarding the relationship between foreign aid and FDI. The literature supports several perspectives, including the foreign aid-led positive FDI, foreign aid-led negative FDI, feedback effect, channel perspective, and the neutral view.

Furthermore, the studies presented in Table 1 are characterized by differing methodological weaknesses. Some failed to address endogeneity issues, others relied on outdated datasets, and some research completely disregarded the dynamic nature of the FDI data. Additionally, other studies focused solely on individual countries or economic groupings but not those from emerging markets. These inconsistencies highlight significant gaps in the foreign aid-led FDI literature that need to be addressed, prompting our research on the subject matter.

Based on the literature review, the null and alternative hypotheses are formulated as follows:

- Null Hypothesis 1: Foreign aid significantly enhances FDI in selected emerging markets.
- Alternative Hypothesis 1: Foreign aid does not significantly enhance FDI in selected emerging markets.
- Null Hypothesis 2: Financial development is a channel through which FDI is influenced by foreign aid in selected emerging markets.
- Alternative Hypothesis 2: Financial development is not a channel through which FDI is influenced by foreign aid in selected emerging markets.

Research methodology

Sample data and variables

The study used panel data ranging from 2004 to 2019 to investigate the foreign aid-FDI nexus in selected emerging markets (Brazil, Colombia, Indonesia, Poland, Thailand, Turkey, and Greece). The time was carefully chosen because it is within this timeframe that most emerging markets experienced rapid economic growth and development. These seven emerging markets were selected because of data availability considerations for all the critical variables employed. The variables used for this study include foreign direct investment, foreign aid, financial development, human capital development, income inequality, infrastructure development, unemployment and trade openness. The data for these variables was obtained from publicly viewable databases (World Bank development indicators, the International Monetary Fund and International Financial Statistics), which are also reputable, consistent and reliable.

Empirical models

The general model specification of this study is captured by Equation 1 below, which designates foreign direct investment (FDI) as the dependent variable and foreign aid (FAID) as the independent variable. The model also includes several control variables: financial development (FIN), income inequality (INEQ), unemployment (UNEMP), human capital development (HCD), infrastructure development (INFR) and trade openness (OPEN). The selection of these control variables is informed by various empirical studies, including but not limited to Beladi and Oladi (2006), Selaya and Sunesen (2008), Quazi et al. (2014), Amusa, Monkam, and Viegi (2016), Ulrika (2016), Quazi et al. (2019), Addison and Baliamoune-Lutz (2020), Younsi, Bechtini, and Khemili (2021), Slesman (2023), and Tian (2024).

$$FDI = f(FAID, FIN, HCD, INEQ, INFR, UNEMP, OPEN). \quad (1)$$

Table 2. Theory discussion of control variables

Variable	Rationale	Expected sign
Financial development	According to Ezeoha and Cattaneo (2012), the productivity of foreign capital is enhanced by the development of financial markets. Domestic and foreign financial markets alleviate entry and exit constraints for foreign investors, thereby promoting FDI in both the short and long run (Kaur, Yadav, and Gautam 2013).	+
Human capital development	High levels of human capital development indicate a highly skilled, healthy, and educated workforce, which attracts direct foreign investors as a locally available potential workforce can easily and quickly adapt to new technology (Craigwell 2012). Dunning (1980) argues that developed human capital reduces labor costs, making host countries more attractive to foreign firms.	+
Income inequality	Consistent with Brozen (1958), high levels of unemployment, income inequality and poverty may signal high levels of macroeconomic instability in the host country, thereby dissuading potential foreign direct investors.	-
Infrastructure development	Richaud, Sekkat, and Varoudakis (1999) noted that increased infrastructure development not only attracts FDI but allows countries to enjoy the benefits of FDI inflows, often referred to as spillover effects. Estache and Fay (2010) argued that developed infrastructure reduces investment costs, lowers sunk costs, and enhances private capital durability.	+
Unemployment	Blanchard (2011) argued that higher levels of unemployment can attract foreign direct investors due to lower labour costs and a readily available workforce. Conversely, Brozen (1958) argued that high unemployment may signal macroeconomic instability, which could deter potential foreign direct investors.	+/-
Trade openness	Denisia (2010) argued that a government policy of trade openness is a locational advantage for FDI. In addition, Denisia (2010:108) suggests that the eclectic paradigm hypothesis identifies trade openness as an economic locational advantage of FDI. However, high levels of trade openness may reduce the need for international firms to establish operations in foreign countries as they can easily access these international markets more cheaply through exporting. Thus, trade openness may have mixed effects on FDI.	+/-

Source: author's elaboration.

The proxy for foreign aid in this study is net official development assistance and official aid received as a percentage of GDP. Income inequality is represented by the GINI coefficient, whilst

FDI is measured by net FDI inflows as a ratio of GDP. The Human Capital Development Index is the proxy for human capital development. Financial development is measured by domestic credit to the private sector as a ratio of GDP, and trade openness is represented by the total of exports and imports as a ratio of GDP. Infrastructural development is proxied by the percentage of individuals using the Internet, whilst unemployment was measured as the total unemployment rate as a percentage of the total labour force. The selection of these proxies is consistent with prior empirical research (Garriga and Phillips 2014; Michael 2018; Dash, Gupta, and Khandelwal 2024; Wang and Fillat-Castejon 2024) on a similar subject matter.

The econometric representation of the FDI function is summarized in Equation 2.

$$\begin{aligned} \text{FDIit} = \beta_0 + \beta_1 \text{AIDit} + \beta_2 \text{FINit} + \beta_3 \left(\text{FAIDit} \cdot \text{FINit}\right) + \beta_4 \text{HCDit} + \\ + \beta_5 \text{INEQit} + \beta_6 \text{INFRit} + \beta_7 \text{UNEMPit} + \beta_8 \text{OPENit} + \mu + \varepsilon. \end{aligned} \tag{2}$$

Consistent with the findings of Harms and Lutz (2006), Arellano et al. (2009), and Kimura and Todo (2010), who argued that foreign aid influences FDI through various channels available in the host country, Equation 2 included the complementarity variable (FAID x FIN). The latter was included in Equation 2 to investigate if financial development, as argued by Arellano et al. (2009), is a channel through which foreign aid influences FDI in emerging markets.

To estimate Equation 2, three panel data analysis methods were employed: Fully Modified Ordinary Least Squares (FMOLS), fixed effects and pooled ordinary least squares (OLS). These panel estimation approaches are suitable because they (1) control for individual country-specific effects, (2) are ideal for analysing panel data, and (3) facilitate the isolation of the impact of time-varying variables.

Discussion of the results

As shown in Figure 1, net FDI inflows for Brazil decreased from 2.71% of GDP in 2004 to 1.89% in 2009. They then rose to 3.57% in 2014 and further increased to 3.68% in 2019. Colombia's net FDI inflow increased from 2.66% of GDP in 2004 to 3.46% in 2009. They rose further to 4.24% in 2014 and slightly increased again to 4.32% in 2019.

Greece's net FDI inflows declined from 0.89% of GDP in 2004 to 0.83% in 2009 and increased to 1.15% in 2014. They rose further to reach a peak of 2.44% in 2019. Indonesia's net FDI inflows grew from 0.74% of GDP in 2004 to 0.90% in 2009 and then rose significantly to 2.82% in 2014. They then declined to 2.23% in 2019. Poland's net FDI inflows fell from 5.44% of GDP in 2004 to 3.19% in 2009. They increased slightly to 3.65% in 2014, and then declined again to 2.82% in 2019. Thailand's net FDI inflows dropped from 3.39% of GDP in 2004 to 2.28% in 2009, decreased further to 1.22% in 2014, and continued their decline to reach 0.88% in 2019.

As illustrated in Figure 2 below, foreign aid for Brazil decreased from 0.027% of GDP in 2004 to 0.022% in 2009. It then experienced a slight increase to 0.037% in 2014, before declining again to 0.015% in 2019. Colombia's foreign aid remained stable at 0.022% of GDP from 2004 to 2009, followed by a marginal drop to 0.020% in 2014, and then increased to 0.024% in 2019. Foreign aid for Greece rose from 0.006% of GDP in 2004 to 0.014% in 2009, further increasing to 0.017% in 2014, before experiencing a decline to 0.007% by 2019.

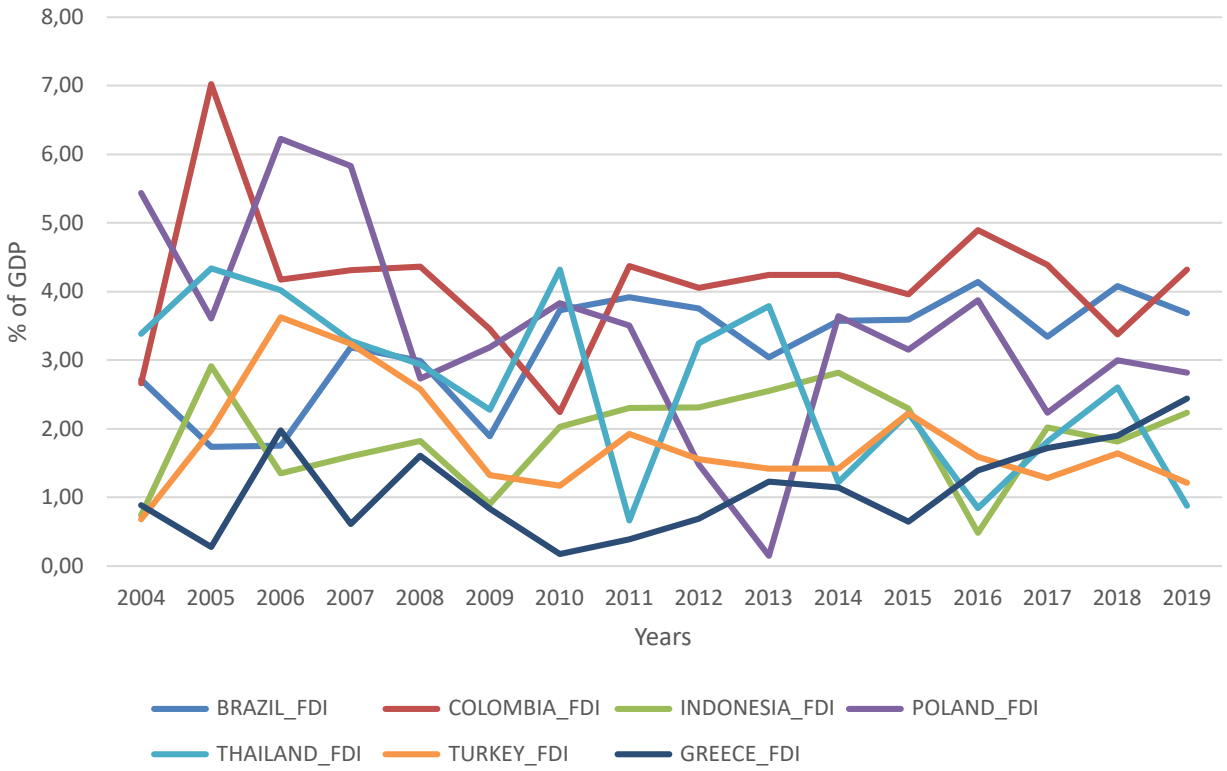

Figure 1. Net foreign direct investment trends for selected emerging markets

Source: author's own analysis based on data from World Development Indicators

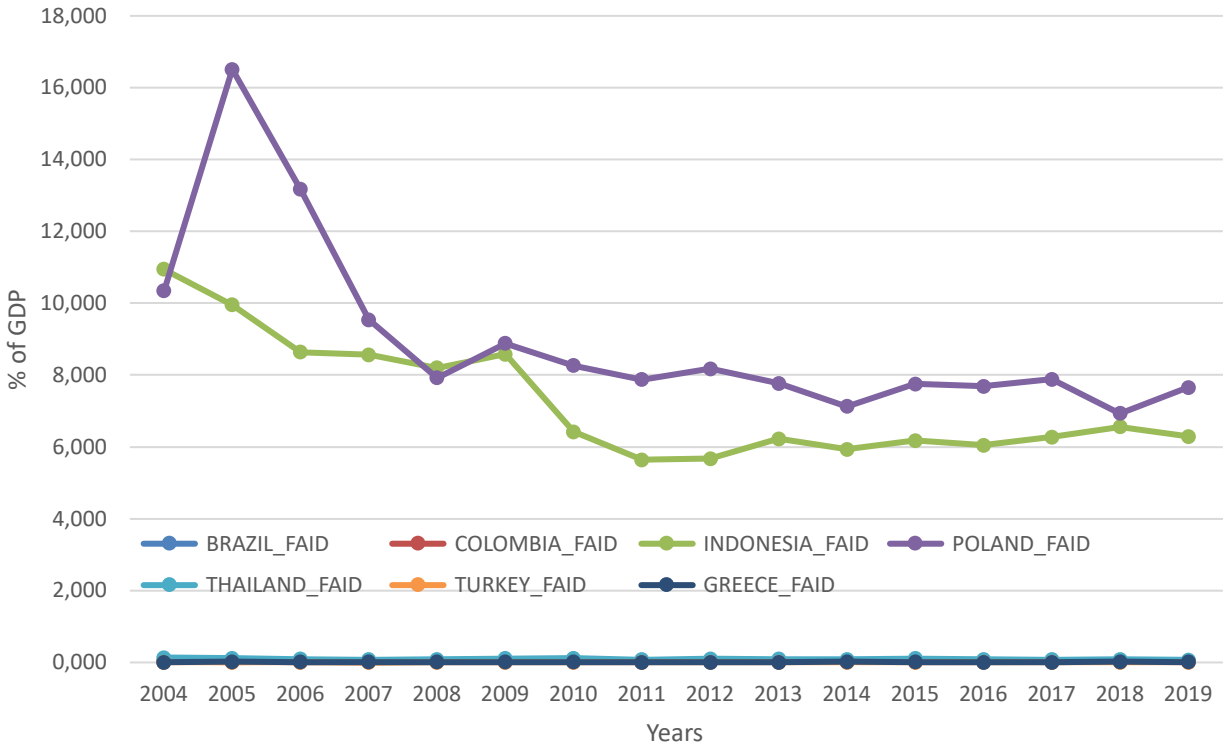

Figure 2. Foreign aid trends in selected emerging markets

Source: author's own analysis based on data from World Development Indicators

Foreign aid for Indonesia declined from 10.947% of GDP in 2004 to 8.58% in 2009. It further decreased to 5.93% in 2014 before experiencing a slight recovery, rising to 6.29% in 2019. Poland's foreign aid fell from 10.34% of GDP in 2004 to 8.88% in 2009, continued to decline to 7.13% in 2014, and then increased slightly to reach 7.65% by 2019. Thailand's foreign aid decreased from 0.132% of GDP in 2004 to 0.106% in 2009, followed by a further decline to 0.088% in 2014, and ultimately dropped to 0.067% by 2019. Turkey's foreign aid inflow remained constant at 0.002% of GDP between 2004 and 2009, increased slightly to reach 0.003% in 2014, and maintained that level through the subsequent five-year period until 2019.

As Table 3 below shows, there is a non-significant positive relationship between FDI and foreign aid, whilst financial development is significantly related to FDI. Additionally, a non-significant negative relationship was observed between: (1) human capital development and FDI, (2) unemployment and FDI, and (3) trade openness and FDI. Infrastructure development is positively related to FDI, but this relationship is non-significant. Lastly, a significant negative relationship exists between FDI and income inequality. There are no issues with multi-collinearity, in line with Stead (2007), as no correlation values exceed 0.70.

Table 3. Correlation study

	FDI	FAID	FIN	HCD	INEQ	INFR	UNEMP	OPEN
FDI	1.00							
FAID	0.09	1.00						
FIN	0.29***	−0.42***	1.00					
HCD	−0.06	0.18*	0.16	1.00				
INEQ	−0.44***	−0.50***	−0.30***	−0.43***	1.00			
INFR	0.02	−0.08	0.24**	0.55***	−0.10	1.00		
UNEMP	−0.11	−0.07	−0.11	0.43***	0.01	0.35***	1.00	
OPEN	−0.05	0.13	0.66***	0.19**	−0.58***	0.03	−0.40***	1.00

Note: *, ** and *** denote 10%, 5% and 1% levels of significance, respectively.

Source: author

According to Table 4, there are outliers present in the dataset. For example, the data for financial development and trade openness are characterized by a range exceeding 100. Additionally, the infrastructure development dataset is the only one which is negatively skewed, indicating that the data are not normally distributed. Except for the FDI data, the Jarque-Bera test results for all other variables have a probability of zero, further confirming that the data are not normally distributed. To address econometric problems such as outliers, multi-collinearity, and abnormal distribution, the study adopted Aye and Edoja's (2017) strategy of natural logarithm transformation of all data sets before conducting panel stationarity tests.

Table 4. Descriptive study

	FDI	FAID	FIN	HCD	INEQ	INFR	UNEMP	OPEN
Mean	2.60	2.34	63.37	0.78	41.52	41.49	8.85	63.09
Median	2.49	0.03	51.47	0.76	39.35	41.53	8.73	51.87
Maximum	7.03	16.51	149.37	0.94	56.50	80.44	27.47	140.44
Minimum	0.15	0.002	22.20	0.64	29.70	2.60	0.25	22.11
Standard. deviation	1.39	3.86	35.33	0.08	8.08	21.02	5.64	33.28
Skewness	0.42	1.36	1.01	0.30	0.60	– 0.06	1.03	0.95
Kurtosis	2.93	3.74	2.86	2.08	1.87	1.86	4.77	2.78
Jarque-Bera	3.32	36.94	18.99	5.56	12.74	6.18	34.61	16.95
Probability	0.19	0.00	0.00	0.06	0.00	0.05	0.00	0.00
Observations	112	112	112	112	112	112	112	112

Source: author

The hypothesis that the dataset is integrated of order 1 is supported by the results in Table 5, facilitating panel co-integration.

Table 5. Panel stationarity tests (Individual intercept)

Level stage	Levin, Lin, and Chu (2002)	Im, Pesaran, and Shin (2003)	ADF (Augmented Dick Fuller)	PP (Phillip Perron)
LFDI	– 2.9852***	– 2.3160**	26.3181**	52.5660***
LFAID	– 6.0487***	– 3.5669***	38.8603***	32.5113***
LFIN	– 4.2295***	– 1.4617*	22.0507*	21.3922*
LHCD	– 2.7008***	– 1.9740**	23.7276**	42.2435***
LINEQ	– 1.9419**	– 0.3406	13.0924	13.1353
LINFR	– 7.1360***	– 3.3920***	46.2103***	101.8460***
LUNEMP	– 1.7288**	– 0.1957	12.4244	9.2482
LOPEN	– 1.3098*	0.2852	12.2551	14.8320
First difference stage				
LFDI	– 7.8499***	– 7.3190***	72.2204***	161.349***
LFAID	– 7.1797***	– 7.3805***	71.8231***	109.493***
LFIN	– 7.2172***	– 4.1937***	126.2173***	107.2638***
LHCD	– 12.4664***	– 10.6153***	102.295***	162.187***
LINEQ	– 2.0799**	– 2.6980***	30.4301***	61.0979***
LINFR	– 4.9298***	– 3.4005***	36.7302***	52.6493***
LUNEMP	– 2.8804***	– 2.1466**	25.985**	39.6495***
LOPEN	– 7.5527***	– 5.7434***	57.7916***	120.276***

Note: *, ** and *** denote 10%, 5% and 1% levels of significance, respectively.

Source: author

The alternative hypothesis that there is no long-run relationship in the FDI model was rejected (see Table 6).

Table 6 is the Kao's (1999) approach to panel co-integration.

Table 6. Panel co-integration tests

Series	ADF t-statistic
FDI FAID FIN HCD INEQ INFR UNEMP OPEN	–1.3797**

Note: ** denotes a 5% significance level

Source: author

The relationship between foreign aid and FDI yielded mixed results. Both fixed effects and FMOLS estimations indicate that foreign aid significantly contributed to FDI inflows. However, the pooled OLS results showed an insignificant effect. These results generally support the Kimura and Todo (2010)'s argument that foreign aid enhances the investment climate of the host country, thereby attracting FDI.

Conversely, the pooled OLS and FMOLS models indicate that financial development significantly reduced FDI. These results contradict Kaur, Yadav, and Gautam (2013) hypothesis that domestic and foreign financial markets ease entry and exit constraints for foreign investors, thereby promoting FDI. Meanwhile, the fixed effects model revealed a non-significant negative effect of foreign aid on FDI.

The negative impact of the complementarity variable (FAID x FIN) on FDI was insignificant across all three econometric methods. This suggests that the negative influence of financial development on FDI was more pronounced than the positive influence of foreign aid on FDI. This is in line with Arellano et al. (2009), who attribute such outcomes to the Dutch disease effect, i.e., when foreign aid negatively affects FDI by distorting the allocation of resources between non-tradable and tradable economic sectors.

Human capital development yielded mixed results. FMOLS found an insignificant positive effect on FDI, whilst pooled OLS indicates a significant positive effect. This supports Craigwell's (2012) assertion that developed highly skilled, healthy, and educated workforces attract direct foreign investors because they can easily and quickly adapt to new technology. Conversely, fixed effects show that FDI was significantly reduced, potentially indicating that foreign investors do not like to engage in markets with higher salaries associated with developed human capital.

Income inequality significantly improved FDI across all three econometric approaches, supporting the hypothesis that workforces in a country associated with high income inequality and unemployment readily accept lower salaries, thereby attracting foreign investors. This contradicts Brozen's (1958) argument that income inequality and unemployment signal macroeconomic instability, deterring foreign investors.

Infrastructure development had a significant positive influence on FDI under the pooled OLS and the FMOLS models, aligning with Estache and Fay (2010), who argue that infrastructure

reduces investment costs, lowers sunk costs, and enhances private capital durability. By contrast, fixed effects indicate that it non-significantly attracted FDI in emerging markets.

Unemployment had a significant negative impact on FDI across all three models, reinforcing Brozen's (1958) view that unemployment reflects economic instability. Trade openness showed an insignificant positive influence in all three panel approaches, confirming Denisia's (2010) hypothesis that the location advantage of direct foreign investment includes trade openness.

Table 7. Impact of foreign aid on income inequality – Main data analysis

	FMOLS		Fixed effects		Pooled OLS	
	Co-efficicent	t-statistic	Co-efficicent	t-statistic	Co-efficicent	t-statistic
FAID	0.37*	1.8100	0.65*	1.8267	0.47	1.6206
FIN	–0.14***	–3.3014	–0.71	–1.3012	–0.84***	–4.0215
FAIDFIN	–0.15	–1.5555	–0.12	–1.3895	–0.13	–1.6441
HCD	0.41	1.6204	–0.28*	–1.8073	0.62**	2.0118
INEQ	0.39***	3.3275	0.61*	1.8673	0.47***	4.8346
INFR	0.14**	2.5621	0.36	0.8196	0.41***	3.3858
UNEMP	–0.03***	–3.6004	–0.35*	–1.9669	–0.53***	–4.9722
OPEN	0.05	1.2284	0.54	1.6321	0.22	1.2888
Adjusted R-squared 0.5503 F-statistic 117.09 Prob (F/-statistic) 0.0000			Adjusted R-squared 0.5382 F-statistic 27.19 Prob (F-statistic) 0.0000		Adjusted R-squared 0.5716	

Note: *, ** and *** denote 10%, 5% and 1% levels of significance, respectively.

Source: E-Views

Conclusion

This study explored the influence of foreign aid on FDI in emerging markets using panel data analysis methods. It also investigated whether financial development is a channel through which foreign aid influences FDI.

The analysis reveals that foreign aid significantly enhances FDI under the fixed effects and FMOLS estimations. However, contrary to the available literature, financial development significantly reduces FDI according to FMOLS and pooled OLS results. The complementarity variable showed no significant effect on FDI in emerging markets across all three panel methods. Human capital development significantly enhanced FDI, according to the pooled OLS. Furthermore, employment and infrastructure development were also found to increase FDI across all the panel methods.

These findings offer valuable insights for emerging markets, enabling them to implement policies that will encourage the inflow of foreign aid to attract significant FDI inflows. Additionally, the results underscore the importance of implementing strategies that foster employment,

human capital, and infrastructure development to further attract significant FDI inflow into their economies.

Future research should focus on determining the threshold level of foreign aid necessary to attract significant FDI inflows in emerging markets.

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Wpływ pomocy zagranicznej na bezpośrednie inwestycje zagraniczne na rynkach wschodzących

W artykule zaprezentowano wynik badania wpływu pomocy zagranicznej na bezpośrednie inwestycje zagraniczne (BIZ) na rynkach wschodzących przy użyciu metod analizy danych panelowych – metody efektów stałych, w pełni zmodyfikowanej metody najmniejszych kwadratów (FMOLS) i zwykłej metody najmniejszych kwadratów (OLS) – na podstawie danych z lat 2004–2019. Zbadano również, przy użyciu tych samych metod szacowania ekonometrycznego, czy rozwój finansowy jest kanałem, za pośrednictwem którego pomoc zagraniczna na rynkach wschodzących wpływa na BIZ. Metoda efektów stałych i FMOLS wskazują, że pomoc zagraniczna ma znaczący pozytywny wpływ na BIZ. Jednak inaczej niż wynikałoby z dostępnej literatury, FMOLS i pooled OLS wskazują, że rozwój finansowy znacznie ogranicza BIZ. Interakcja między pomocą zagraniczną a rozwojem finansowym nie wykazała znaczącego wpływu na BIZ we wszystkich trzech metodach panelowych. Analiza pooled OLS pokazuje, że rozwój kapitału ludzkiego znacznie zwiększa BIZ. Co więcej, wszystkie metody panelowe wskazują, iż zatrudnienie i rozwój infrastruktury pozytywnie wpływają na BIZ. Rynki wschodzące muszą również wdrażać polityki i strategie sprzyjające zatrudnieniu, kapitałowi ludzkiemu i rozwojowi infrastruktury, aby spowodować większy i znaczący napływ bezpośrednich inwestycji zagranicznych. Muszą również wdrożyć politykę, która będzie zachęcać do napływu pomocy zagranicznej w celu zwiększenia bezpośrednich inwestycji zagranicznych. Przyszłe badania powinny koncentrować się na oszacowaniu optymalnego poziomu pomocy zagranicznej niezbędnej do przyciągnięcia znacznych BIZ na rynki wschodzące.

Słowa kluczowe: bezpośrednie inwestycje zagraniczne, pomoc zagraniczna, rynki wschodzące, dane panelowe