



Impact of Foreign Aid on Income Inequality in Emerging Markets

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Abstract: This paper investigated the influence of foreign aid on income inequality in selected emerging markets using panel data (2004-2019) analysis methods such as fully modified ordinary least squares (FMOLS), fixed effects and pooled ordinary least squares (OLS). The study also examined whether human capital development is a channel through which foreign aid influenced income inequality or whether human capital development is one of the conditions which must be fulfilled in the recipient country before foreign aid can have a significant reduction effect on income inequality in selected emerging markets. Foreign aid was found to have non-significantly reduced income inequality across all the three estimation methods. Pooled OLS and FMOLS show that human capital development significantly reduced income inequality. Under the fixed effects and FMOLS, human capital development was found to be a factor which be available in the recipient country before foreign aid can significantly reduce income inequality in selected emerging markets. Foreign direct investment and unemployment significantly led to the increase in income inequality across all the three econometric estimation methodologies. Trade openness and financial development produced similar results but only under the pooled OLS. Trade openness significantly reduced income inequality under the FMOLS and the fixed effects. Responsible authorities are therefore urged to implement policies that increases human capital development, financial development and trade openness to enhance income inequality reduction in selected emerging markets.

Keywords: Foreign Aid; Income Inequality; Emerging Markets; Panel Data

JEL Classification: D52; E44

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1. Introduction

Background, contribution and structure of the study are the three aspects covered in this section.

1.1. Background

It is no longer contestable that foreign aid enhances economic growth through increasing domestic savings (Griffin and Enos. 1970; Rahnama et al. 2017). What is still not yet concluded is the impact of foreign aid on economic development (income inequality, poverty, education, unemployment), consistent with Younsi et al (2019). Although majority of empirical research work on foreign aid's influence on income inequality noted that the former reduces the latter, other studies which contradicts the results are available (Pham. 2015; Shafat and Najid. 2013; Nosheen et al. 2021). In a nutshell, the empirical studies on the effect of foreign aid on income inequality produced results which are mixed, divergent and far from agreeing to a common position. Majority noted that income inequality is reduced by foreign aid, few observed that foreign aid increases income inequality, others indicated that there is a bi-directional relationship between foreign aid and income inequality whilst the others said that certain absorption capacities must be available in the recipient countries before foreign aid enhances income inequality reduction. Moreover, the available empirical research is also characterised by methodological shortcomings. For example, majority of them wrongly assumed that the relationship between foreign aid and income inequality is linear in nature. They used outdated data sets and ignored the impact of complementarity variables on income inequality. These concerns are adequately addressed in this study.

1.2. Contribution of the Study

Four ways in which the current study made contribution towards literature are enunciated in this section. Firstly, this is the first study to author's best knowledge to investigate the impact of foreign aid on income inequality using emerging markets as a unit of analysis. Secondly, majority of empirical research on the linkage between foreign aid and income inequality wrongly assumed that the two variables follows a linear relationship. This study addressed this aspect by taking into account the non-linearity nature between income inequality and foreign aid. Thirdly, contrary to majority of studies on a similar subject matter, this study used the most recent data (2004-2019). Fourthly, this study is the first of its kind to examine if human capital development is a channel through which foreign aid enhances income inequality. The existing empirical research on the foreign aid-income inequality nexus never explored how the absorption capacities enhanced the influence of foreign aid on income inequality reduction.

1.3. Organization of the Paper

The rest of the study is organized into seven sections. Section 2 discuss the relevant theoretical literature whilst Section 3 describes the empirical literature. Section 4 explains the relevant control variables for the model used. Section 5 describes the trend analysis for the foreign aid and income inequality in selected emerging markets. The research methodological framework and main data analysis is included in Section 6. Section 7 summarizes the paper. Section 8 is the reference list.

2. Theoretical Literature Review

Consistent with Herzer and Nunnenkamp (2012), foreign aid normally is allocated to the most deserving and needy group of population thereby helping in reducing income inequality. The same authors also argued that foreign aid meaningfully contributes towards income inequality reduction if the responsible authorities make sure that it reaches its intended recipients. In line with Berthelemy (2006), foreign aid does not normally reach the poor people because politicians and local authorities in most instances divert aid funds for their own selfish benefit. An argument put forward by Younsi et al (2018) is that foreign aid exacerbates income inequality for two reasons. Firstly, foreign aid encourages corrupt activities in the allocation of funds. Secondly, foreign aid increases over-reliance on foreign entities, which can never be a permanent and sustainable solution towards income inequality. Theoretical literature indicates that there are still some contradictions on the way foreign aid affects income inequality.

3. Empirical Literature Review

Table 1. Related Empirical Research -Impact of Foreign on Income Inequality.

Author	Unit of analysis	Approach	Findings
Letsoalo and Ncanywa (2021)	Southern African Development Community member states (SADC)	Panel data analysis	Foreign aid reduced income inequality in a non-significant manner.
Calderon et al (2006)	Developing countries	Time series analysis	Income inequality was reduced by the inflow of foreign aid.
Herzer and Nunnenkamp (2012)	Developing countries	Panel data analysis	Foreign aid had an income inequality reduction effect in developing countries.
Chong et al (2009)	Developing countries	Panel data analysis	Foreign aid had an insignificant negative influence on income inequality.
Hyangmi (2014)	OECD	Panel data analysis	Income inequality was reduced by foreign aid inflows.
Younsi et al (2019)	African countries	System generalized methods of moments (GMM)	Foreign aid, trade openness and foreign direct investment had an income inequality reduction influence in African countries
Shafiullah (2011)	94 countries	Random and fixed effects	Foreign aid caused significant negative effect on income inequality.
Kim (2022)	156 countries	GMM and pooled ordinary least squares (OLS)	A negative relationship running from foreign aid towards income inequality.
Pham (2015)	Sub Saharan African countries	Panel data analysis	Income inequality was increased by foreign aid in Sub Saharan African countries
Saidon et al (2013)	75 recipient countries	GMM	Foreign aid had a significant reduction effect on income inequality.
Tim (2008)	24 recipient countries	Feasible Generalized Least Squared model	Foreign aid had a significant negative effect on income inequality.
Castells-Quintana and Larru (2014)	Latin American countries	Panel data analysis	Foreign aid's influence on income inequality was found to be significantly negative in Latin American countries.

Kabir (2020)	Africa, South America and South Asian countries	Panel data analysis	Foreign aid reduced income inequality.
Nosheen et al (2021)	Developing countries	Fully Modified Ordinary Least Squares	Foreign aid had a significant positive effect on income inequality in developing countries.
Magnon (2000)	Sub Saharan African countries	Panel data analysis	A non-significant negative relationship running from foreign aid towards income inequality in Sub Saharan Africa.
Mouneer et al (2022)	Developing countries	GMM	Foreign aid reduced income inequality in developing countries.
Shafat and Najid (2013)	Pakistan	Vector Error Correction Model (VECM)	Foreign aid, labour force and foreign direct investment had a significant positive impact on income inequality.
Lassoued (2021)	Sub Saharan Africa	System GMM approach	Income inequality was reduced by foreign aid in Sub Saharan African countries.
Saidon and Zainal (2019)	Developing countries	System GMM	A statistically significant negative relationship running from foreign aid towards income inequality.

Source: Author compilation

Several contradictions are evident on the empirical literature results (see Table 1). Some empirical researchers observed that foreign aid increases income inequality, others noted that income inequality is reduced by foreign aid and the other group of empirical researchers produced results which show a bi-directional relationship between income inequality and foreign aid. Others noted that there is no relationship at all between the two variables whilst the other group of existing empirical researchers on the subject matter shows that there are certain conditions that must be available in the receiving country to allow foreign aid to play its role of poverty alleviation. These contradictions in the empirical research results is evidence that the topic on the influence of foreign aid on income inequality is still virgin and further research is necessary to unlock the logjam.

4. Variables Used for Control in the Model

Table 2. Explanatory Variables for Income Inequality

Variable	Theoretical explanation	Expected sign	Proxy of the variable
Human capital development (HCAP)	According to Chiswick (2003), highly educated and better skilled employees are more likely to earn higher levels of income. In other words, high levels of human capital development enable an individual employee to earn higher income levels at a workplace. This reduces income disparities.	-	Human capital development index
Unemployment (UNEMPL)	Consistent with Cysne (2009), unemployed people do not have adequate income to buy food, pay school fees and other consumables. Their chances of securing a decent job is very remote because they are not skilled, healthy and educated. This increases the vicious cycle of poverty and further entrenched income inequality in the society.	+	Unemployment total (% of total labour force)
Foreign direct investment (FDI)	Foreign direct investment brings in capital, skills, education and employment, all of which enables the poor to get jobs, reduce poverty and income inequality (Le et al. 2021). Nam (2016) also noted that foreign direct investment gives employment to majority of people who are already skilled thus leaving the poor out, entrenching poverty and income inequality.	+/-	Net FDI inflows (% of GDP)
Infrastructural development (INFR)	According to Jacoby (2000), improved road infrastructure enables the underprivileged and the poor to easily access the markets and other important	-	Individuals using internet (% of population)

	economic activities. Telecommunication and road infrastructure improvements allows the underprivileged to have cheaper access to key economic opportunities and activities thereby helping the poor to get out of poverty and narrow the income inequality gap (Ghosh and De. 2005).		
Trade openness (OPEN)	High levels of trade openness allow a country to import critical equipment, raw materials and labour, necessary in the enhancement of the production processes, economic growth stimulation, job creation, poverty reduction and ultimately income inequality easing (Zhu and Trefler. 2005). The same authors also noted that high levels of trade openness bring in more foreign currency which helps to stabilise the local currency value, inflation and the general macroeconomic conditions in the country.	-	Total of exports and imports (% of GDP)
Financial development (FIN)	Developed financial markets are very strict in terms of their collateral security requirements when applying for a loan. This ensures that the rich becomes richer whilst the poor remains poorer, hence perpetuating and widening the income inequality gap (Destek et al. 2020). Financial markets provide education loans and or small loans to low income earners which they use to commence income generating projects. Availing such financial opportunities helps to reduce income inequality and poverty (Liu et al. 2017).	+/-	Domestic credit to private sector (% of GDP)

Source: Author

Income inequality (INEQ) was proxied by the GINI co-efficient, consistent with other similar empirical studies (Castells-Quintana and Larru. 2014; Lassoued. 2021; Mouneer et al. 2022). Foreign aid (FAID) was measured by net official development assistance and official aid received (% of GDP), in line with other empirical research work done by Pham (2015), Saidon et al (2013) and Hyangmi (2014).

Saidon and Zainal (2019), Shafat and Najid (2013), Nosheen et al (2021), Castells-Quintana and Larru (2014), Saidon et al (2013), Kim (2022), Herzer and Nunnenkamp (2012) and Hyangmi (2014) are some of the empirical studies which informed the proxies which were used in this study (see Table 2).

5. Foreign Aid and Income Inequality Trends in Selected Emerging Markets

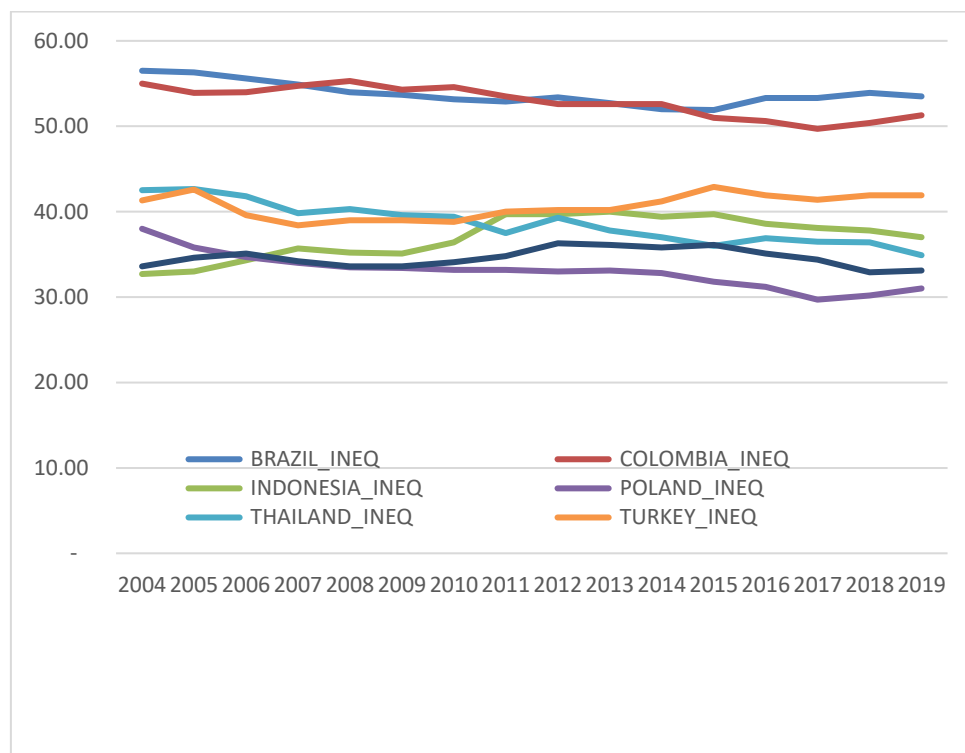


Figure 1. GINI Co-Efficient (Income Inequality) Trends for Selected Emerging Markets

Source: Author

Using the GINI co-efficient as a proxy for income inequality, Brazil’s income inequality went down by 4.96% during the five-year period from 2004 to 2009. Its

income inequality also went down by 3.17% during the subsequent five-year period (from 53.70 in 2009 to 52 in 2014). However, the five-year period ranging from 2014 to 2019 saw Brazil's income inequality increasing by 2.88% (from 52 in 2014 to 53.50 in 2019).

The pattern of income inequality for Indonesia and Greece is similar. The five-year period ranging from 2004 to 2009 saw income inequality going up for both Indonesia (7.34%) and Greece (0.01%) before it further increased during the subsequent five-year period for both Indonesia (12.25%) and Greece (6.55%). Indonesia's income inequality then declined by 6.09% during the subsequent five-year period, from 39.40 in 2014 to 37 in 2019. On the other hand, Greece's income inequality also decreased by 7.54% (from 35.8 in 2014 to 33.1 in 2019) during the subsequent five-year period.

The income inequality for Turkey slumped by 5.57% (from 41.30 in 2004 to 39.00 in 2009) during the five-year timeframe from 2004 to 2009. It then went up by 5.64% during the subsequent five-year time-period before further increasing by 1.70% during the subsequent five-year timeframe (from 41.20 in 2014 to 41.90 in 2019). For Colombia, income inequality went down by 1.27% during the period from 2004 to 2009. It also decreased by 3.13%, from 54.30 in 2009 to 52.60 in 2014 before further plummeting by 2.47% during the subsequent five-year timeframe (from 52.60 in 2014 to 51.30 in 2019).

Regarding Poland, its income inequality declined by a massive 12.11% during the five-year period ranging from 2004 to 2009. It again decreased by 1.80%, from 33.40 in 2009 to 32.80 in 2014. It then further went down by 5.40% during the subsequent five-year timeframe (from 32.80 in 2014 to 31.03 in 2019). A similar pattern of income inequality trends was observed for Thailand. A massive 6.82% decline in income inequality was observed for Thailand during the period ranging from 2004 to 2009. The subsequent five-year period saw Thailand's income inequality declining by 6.57%, from 39.60 in 2009 to 37 in 2014. Thailand's income inequality further plummeted by 5.68% during the next five years ranging from 2014 to 2019. Precisely, Thailand's income inequality declined from 37 in 2014 to 34.90 in 2019, representing a 5.68% decrease.

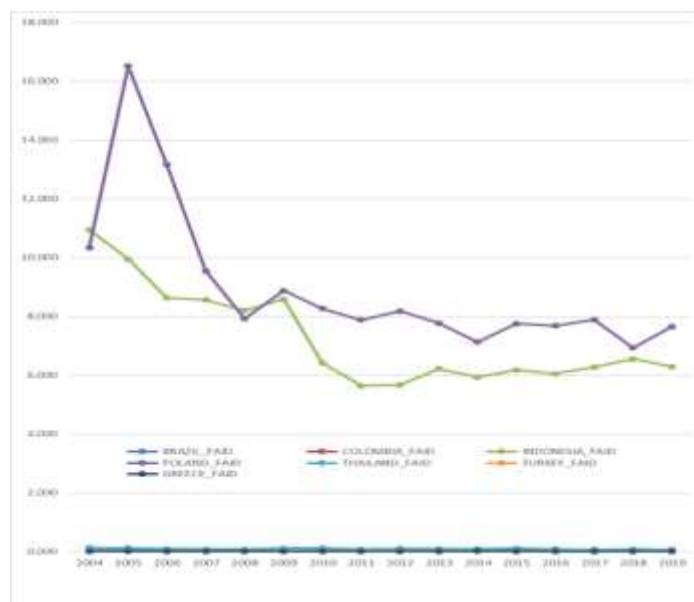


Figure 2. Foreign Aid Trends in Selected Emerging Markets (2004-2019)

Source: Author

Foreign aid net inflow for Brazil went down by 0.004 percentage points, from 0.027% in 2004 to 0.022% in 2009, increased by 0.015 percentage points during the subsequent five-year period before declining by 0.022 percentage points in 2019 (from 0.037% in 2014 to 0.015% in 2019). For Colombia, the five-year period ranging from 2004 to 2009 shows that foreign aid net inflows remained unchanged. It however slightly declined by 0.002 percentage points during the five-year period from 0.022% in 2009 to 0.020% in 2014. Colombia's net inflow of foreign aid then went up by 0.005 percentage points during the subsequent time horizon, from 0.020% in 2004 to 0.024% in 2019.

Regarding Indonesia, foreign aid net inflows went down by 2.36 percentage points, from 10.95% in 2004 to 8.58% in 2009. Another decline (2.65 percentage points) in Indonesia's foreign aid net inflows was experienced during the five-year period ranging from 2009 to 2014. However, the five-year period ranging from 2014 to 2019 saw Indonesia's foreign aid net inflows marginally going up by 0.36 percentage points (from 5.93% in 2014 to 6.29% in 2019). Poland's foreign aid net inflows followed a similar pattern to that of Indonesia.

Greece's foreign aid net inflows marginally increased by 0.007 percentage points during the period ranging from 2004 to 2009 before registering another minor increase of 0.003 percentage points during the subsequent five-year period (from 0.014% in 2009 to 0.017% in 2014). On the contrary, a 0.01 percentage points

decline was observed for Greece's foreign aid net inflows during the subsequent five-year period (from 0.017% in 2014 to 0.007% in 2019).

For Turkey, foreign aid net inflows remained unchanged at 0.002% during the five-year period ranging from 2004 to 2009. Turkey's net inflow of foreign aid then experienced a marginal increase of 0.001 percentage points, from 0.002% in 2009 to 0.003% in 2014. Turkey then recorded a slight increase in foreign aid net inflows of 0.001 percentage points during the subsequent five-year horizon (from 0.003% in 2014 to 0.004% in 2019). As for Thailand, its net inflows of foreign aid followed a downward trend during the sixteen years (2004-2019) under study. It experienced a 0.027 percentage points decline during the period from 2004 to 2009, also decreased by a 0.018 percentage during the five-year period ranging from 2009 to 2014 before experiencing a further 0.02 percentage points decrease during the period from 2014 to 2019.

6. Research Methodological Framework and Data Analysis

6.1. Data

Using panel data (2004 -2019) which spans for a period of sixteen years, the study examined the impact of foreign aid on income inequality. The secondary data used was extracted from World Bank Development Indicators.

6.2. Pre-Estimation Diagnostics

Table 3. Correlation Analysis

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

***/**/* represents 1%, 5% and 10% significant level respectively

Source: E-Views

According to Table 3, a significant negative relationship was observed between the following variables, (1) foreign aid and income inequality, (2) human capital development and income inequality, (3) trade openness and income inequality and (4) financial development and income inequality. A non-significant negative

relationship between infrastructural development and income inequality was also noted. These results are well supported in literature which says that trade openness, human capital development, foreign aid, financial development and infrastructural development helps to reduce income inequality. Foreign direct investment and income inequality were found to be positively and significantly related to each other. Unemployment and income inequality were also positively related in a non-significant way. The correlation between trade openness and financial development was found to be the largest at 66%. In line with Stead (2007), such a result means that multi-collinearity problem does not exist in this data set.

Table 4. Descriptive Statistics

	INEQ	FAID	HCD	FDI	UNEMP	INFR	OPEN	FIN
Mean	41.52	2.34	0.78	2.60	8.85	41.49	63.09	63.37
Median	39.35	0.03	0.76	2.50	8.73	41.53	51.87	51.47
Maximum	56.5	16.51	0.94	7.03	27.47	80.44	140.44	149.37
Minimum	29.7	0.002	0.64	0.15	0.25	2.60	22.11	22.20
Standard. deviation	8.08	3.86	0.08	1.39	5.64	21.09	33.28	35.33
Skewness	0.60	1.36	0.30	0.42	1.03	-0.06	0.95	1.01
Kurtosis	1.87	3.74	2.08	2.93	4.77	1.86	2.78	2.86
Jarque-Bera	12.74	36.94	5.56	3.32	34.61	6.18	16.95	18.99
Probability	0.00	0.00	0.06	0.19	0.00	0.05	0.00	0.00
Observations	112	112	112	112	112	112	112	112

Source: E-Views

The range (difference between maximum and minimum values) was found to be greater than 100 in trade openness and financial development variables only. The results are an indication that there exist outliers in the financial development and trade openness data. Only infrastructural development is skewed to the left whilst all other remaining variables are skewed to the right, an indication that the data is not normally distributed. The probabilities of the Jarque-Bera criteria were zero for variables such as income inequality, foreign aid, unemployment, trade openness and financial development. Consistent with Tsaurai (2021), the results show evidence that the data set is not normally distributed. The drive to deal away with multi-collinearity problem, outliers and abnormally distributed data set triggered the author to transform the data into natural logarithms before main analysis could be done. The strategy resonates with Aye and Edoja (2017).

6.3. Model Specifications

A general model specification is in the form of equation 1.

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

Shafat and Najid (2013), Saidon and Zainal (2019), Castells-Quintana and Larru (2014), Nosheen et al (2021), Saidon et al (2013), Herzer and Nunnenkamp (2012), Kim (2022) and Hyangmi (2014) are examples of empirical research work which informed the choice of the explanatory variables of income inequality.

Consistent with Hyangmi (2014), econometric model in equation 2 is a manifestation of the transformation of equation 1.

$$\begin{aligned} \text{INEQ}_{it} = & \beta_0 + \beta_1 \\ & \text{FAID}_{it} + \beta_2 \text{HCD}_{it} + \beta_3 (\text{FAID}_{it} \cdot \text{HCD}_{it}) + \beta_4 \text{FDI}_{it} + \beta_5 \text{UNEMP}_{it} + \beta_6 \text{INFR}_{it} \\ & + \beta_7 \text{OPEN}_{it} + \beta_7 \text{FIN}_{it} + \mu + \varepsilon \end{aligned} \quad (2)$$

Table 5. Decomposition of Equation 2

β_0	Intercept term
t	Time
β_1 to β_7	Explanatory variables' co-efficients
i	Country
μ	Time invariant and unobserved country specific effect
ε	Error term
INEQ_{it}	Income inequality in country i at time t
FAID_{it}	Foreign aid in country i at time t
HCD_{it}	Human capital development in country i at time t
FDI_{it}	Foreign direct investment in country i at time t
UNEMP_{it}	Unemployment in country i at time t
INFR_{it}	Infrastructural development in country i at time t
OPEN_{it}	Trade openness in country i at time t
FIN_{it}	Financial development in country i at time t

Source: Author

In line with Herzer and Nunnenkamp (2012) and Berthelemy (2006), foreign aid helps to reduce income inequality if it is channelled to the most deserving beneficiaries who will utilise it for education, skills development and health upkeep. It is against this background that this study introduced the complementarity variable as one of the independent variables influencing income inequality in selected emerging markets. Fully modified ordinary least squares (FMOLS), pooled OLS and fixed effects are the approaches which were employed to econometrically estimate equation 2.

6.4. Panel Stationarity Tests

According to Table 6, not all the variables were found to be stationary. On the other hand, first difference indicates that all the variables used were stationary. Consistent with Tsaurai (2021), all the variables in Table 6 are integrated of the first order hence allowing the next econometric procedure (panel co-integration) to be undertaken.

Table 6. Panel Root Tests –Individual Intercept

Level	Levin, Lin and Chu (2002) tests	Im, Pesaran and Shin (2003) tests	ADF Fisher Chi Square tests	PP Fisher Chi Square tests
INEQ	-1.94**	-0.34	13.09	13.14
FAID	-6.05***	-3.57***	38.86***	32.51***
HCD	-2.70***	-1.97**	23.73**	42.24***
FDI	-2.99***	-2.32**	26.32**	52.57***
UNEMP	-1.73**	-0.20	12.42	9.25
INFR	-7.14***	-3.39***	46.21***	101.85***
OPEN	-1.31*	0.29	12.26	14.83
FIN	-2.23***	-1.46***	-0.22**	-2.17**
First difference				
INEQ	-2.08**	-2.70***	30.43***	61.10***
FAID	-7.18***	-7.38***	71.82***	109.49***
HCD	-12.47***	-10.62***	102.30***	162.19***
FDI	-7.85***	-7.32***	72.22***	161.35***
UNEMP	-2.88***	-2.15**	25.99**	39.65***
INFR	-4.93***	-3.40***	36.73***	52.65***
OPEN	-7.55***	-5.74***	57.79***	120.276***
FIN	-5.21***	-4.92***	-3.15***	-4.69***

Source: E-Views

6.5. Panel Co-Integration Tests

Table 7. Kao's (1999) Results

Series	ADF t-statistic
INEQ FAID HCD FDI UNEMP INFR OPEN FIN	0.0186***

Source: Author

This study used the Kao (1999) approach of panel co-integration. Table 7 shows that a long run relationship between all the variables exist. In other words, a null hypothesis which says there is a long run relationship between variables could not be rejected.

6.6. Main Data Analysis

Table 8. Impact of Foreign Aid on Income Inequality - Main Data Analysis

	Fixed effects		Fully Modified Least Squares		Pooled OLS	
	Co-efficient	t-statistic	Co-efficient	t-statistic	Co-efficient	t-statistic
FAID	-0.01	-0.9066	-0.02	-1.2457	-0.04	-1.3575
HCD	-0.18	-1.6553	-0.31*	-1.9543	-2.54***	-10.9996
FAID.HCD	-0.05*	-1.6898	-0.09**	-2.3533	-0.14	-1.5421
FDI	0.02**	2.0363	0.02*	1.8172	0.18***	5.1039
UNEMP	0.06***	4.8395	0.07***	3.8166	0.30***	10.7904
INFR	-0.0002	-0.0150	-0.01	-0.3413	0.03	0.6360
OPEN	-0.15***	-3.7685	-0.16***	-3.0023	0.14**	2.2476
FIN	-0.01	-0.3455	0.01	0.1390	0.42***	4.5529
Adjusted R-squared 0.7083 F-statistic 156.18 Prob (F-statistic) 0.0000			Adjusted R-squared 0.6152 F-statistic 87.16 Prob (F-statistic) 0.0000		Adjusted R-squared 0.5839 F-statistic 110.37 Prob (F-statistic) 0.0000	

Source: E-Views

Across all the three econometric methods, foreign aid's influence on income inequality was observed to be insignificantly negative. The results mean that foreign aid reduced income inequality, in line with findings by Chong et al (2009) whose study observed that foreign aid had a non-significant negative impact on income inequality in developing countries. They also resemble Magnon (2000) findings in the case of Sub-Saharan countries.

Human capital development was found to have had an insignificant negative effect on income inequality under the fixed effects whilst FMOLS and pooled OLS noted that income inequality was negatively and significantly affected by human capital development. These results indicate that human capital development reduced income inequality, consistent with Chiswick (2003), whose argument was that high levels of human capital development (which normally benefits the poor) enable an individual employee to earn higher income levels at a workplace.

The complementarity between foreign aid and human capital development had a significant negative influence on income inequality under the FMOLS and fixed effects whilst pooled OLS indicates the presence of a non-significant negative relationship running from the complementarity variable towards income inequality. These results show that the complementarity between foreign aid and human capital development generally reduced income inequality in selected emerging markets, in line with arguments by Berthelemy (2006) and Herzer and Nunnenkamp (2012)

which says that foreign aid reduces income inequality if the recipient country has got high levels of human capital development, among other absorption capacities.

Foreign direct investment had a significant positive influence on income inequality across all the three econometric methods. The results mean that foreign direct investment increased income inequality, consistent with Nam (2016), whose study observed that foreign direct investment gives employment to majority of people who are already skilled thus leaving the poor out, entrenching poverty and income inequality.

As expected, unemployment's influence on income inequality was significantly positive under the FMOLS, fixed effects and pooled OLS. This means that unemployment increased income inequality, in support of the available theoretical literature by Cysne (2009), whose study argued that unemployed people do not have adequate income to buy food and pay school fees to decent education hence entrenching income inequality and poverty.

Under the fixed effects and FMOLS, infrastructural development had a non-significant deleterious impact on income inequality. Such results mean that infrastructural development reduced income inequality albeit in a non-significant manner, consistent with Ghosh and De (2005) whose study argued that telecommunication and road infrastructure improvements allow the underprivileged to have cheaper access to key economic opportunities and activities thereby helping the poor to get out of poverty and narrow the income inequality gap. In contradiction to available literature, pooled OLS shows that infrastructural development increased income inequality in a non-significant manner.

Consistent with Zhu and Trefler (2005), fixed effects and FMOLS produced results which show that trade openness significantly reduced income inequality. The opposite is true under the pooled OLS approach which shows that income inequality was significantly increased by trade openness, a finding which contracts the available and dominant literature (Zhu & Trefler. 2005) on the subject matter.

Fixed effects show that financial development non-significantly reduced income inequality, consistent with Liu et al (2017) whose study argued that financial assistance availed by credit market helps to provide capital necessary to begin income generating projects. FMOLS produced results which show that financial development non-significantly increased income inequality whilst pooled OLS indicates the existence of a significant positive relationship running from financial development towards income inequality. These results mean that financial development increased income inequality, in line with Destek et al (2020) whose study noted that developed financial markets are detrimental towards efforts to reduce income inequality and poverty reduction.

7. Conclusion

This paper investigated the influence of foreign aid on income inequality in selected emerging markets using panel data (2004-2019) analysis methods such as fully modified ordinary least squares (FMOLS), fixed effects and pooled ordinary least squares (OLS). The study also examined whether human capital development is a channel through which foreign aid influenced income inequality or whether human capital development is one of the conditions which must be fulfilled in the recipient country before foreign aid can have a significant reduction effect on income inequality in selected emerging markets. What necessitated the undertaking of this study is the absence of consensus on the impact of foreign aid on income inequality.

Foreign aid was found to have non-significantly reduced income inequality across all the three estimation methods. Pooled OLS and FMOLS show that human capital development significantly reduced income inequality. Under the fixed effects and FMOLS, human capital development was found to be a factor which be available in the recipient country before foreign aid can significantly reduce income inequality in selected emerging markets.

Foreign direct investment and unemployment significantly led to the increase in income inequality across all the three econometric estimation methodologies. Trade openness and financial development produced similar results but only under the pooled OLS. Trade openness significantly reduced income inequality under the FMOLS and the fixed effects. Responsible authorities are therefore urged to implement policies that increases human capital development, financial development and trade openness to enhance income inequality reduction in selected emerging markets.

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