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The Impact Of Aid-Recipient Goverence On Aggregate Welfare In Developing Countries

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Abstract: *The study investigates the impact of foreign aid on the Human Development Index (HDI), prioritizing this measure over poverty or economic growth. The research specifically aims to explore whether the effect of foreign aid on human development is contingent on the level of governance in recipient countries. It seeks to understand the extent to which the quality of governance influences aid in promoting developmental outcomes in beneficiary countries. These relationships are analyzed through econometric methods applied to panel data covering the period of 20 years (2002-2021), focusing on a sample of 63 developing countries identified as major aid recipients. The key findings reveal that foreign aid has a positive impact on human development only when it interacts with two out of the six governance indicators: control of corruption and political stability. Notably, the coefficient of foreign aid exhibits a negative impact on the Human Development Index.*

JEL classification: I31, F35, C23, C26, C43.
Keywords: Foreign Aid, governance, Human Development Index.

1. INTRODUCTION

The primary objective of foreign aid from developed nations to less affluent countries is to spur economic development and create conditions for impoverished individuals to enhance their incomes and lead healthier lives. The effectiveness of these goals is a widely debated topic among researchers focusing on aid outcomes. Over the past decades, there have been both notable successes and failures in foreign aid, with a significant reduction in extreme poverty globally, except in Sub-Saharan Africa. Page and Shimeles (2015) attribute Africa's challenges to a failure in generating sufficient quality employment. Presently, nearly three billion people live on less than $2.50 per day, and the aid literature points to various factors influencing this outcome. Positive results hinge on effective procedures and fund allocation, while negative outcomes are linked to issues like bad governance, corruption, and misallocation of aid. Fungibility, where funds are diverted to unintended expenses, contributes to aid misuse, hindering development (Easterly, 2003). The relationship between donors and recipients is impacted by issues like moral hazard, weak governance, and a lack of transparency (Svensson, 2000). High transaction costs associated with aid management pose challenges, emphasizing the need for better alignment with national systems. Efforts to reduce transaction costs, improve transparency, and enhance accountability are crucial for aid effectiveness. Transparency, defined as the availability of timely and reliable information, is seen as vital for public decision-making, government accountability, and corruption control. However, only a fraction of governments globally provides sufficient information, highlighting the need for increased transparency.

The United Nations' Millennium Development Goals emphasize the importance of aid transparency, urging recipient governments to align with national systems and implement anti-corruption reforms. This paper delves into the relationship between government transparency and foreign aid, exploring how information availability impacts aid efficiency. The analysis uses annual cross-country data from 2002 to 2021 to assess aid effectiveness in improving aggregate human welfare measured by the Human Development Index (HDI). Governance indicators, covering corruption control, government effectiveness, political stability, regulatory quality, rule of law, and voice and accountability, serve as proxies for transparency.

The inception of the Worldwide Governance Indicators (WGIs) dates back to 1999 when Daniel Kaufmann, Aart Kraay, and Zoido-Lobaton first developed them (refer to Kaufmann et al., 1999, 2006). Over the years, these indicators have evolved to become widely utilized in academia. In 1992, the World Bank defined better governance as the effective use of power in overseeing a country's economic and social resources for development. Governance necessitates comprehensive information and a profound understanding of how to influence recipient efforts by providing incentives for the improved implementation of aid projects. Bauhr and Grimes (2012) introduced government openness, whistleblower protection, and the likelihood of exposure as metrics for assessing government transparency. The World Governance Indicators comprehensively cover 212 countries and territories, evaluating six dimensions of governance from 1996 to 2006:

1. Control of Corruption: Assessing the extent and nature of corruption, including its costs, impact on public trust, incidence of bribery, political influence, instability of the political system, and involvement of officials in corrupt practices.
2. Government Effectiveness: Indicators on decentralization, efficiency of public-sector employees, government's ability, effectiveness of policies and program formulation, and optimal resource utilization.

3. Political Stability and Absence of Violence: Indicators gauging the likelihood of government destabilization or overthrow by unconstitutional means or violence, including the threat of a military coup, political terrorism, and instances of murder.
4. Regulatory Quality: Various indicators evaluating the government's capacity to formulate and implement policies and regulations, reducing regulatory burdens on business, and addressing distortions in the tax system to promote private sector development.
5. The Rule of Law: Primary indicators encompassing the likelihood of crime and violence, associated costs, extent to which agents trust and adhere to societal rules, and more.
6. Voice and Accountability: This indicator reflects external accountability, human rights, freedom of speech, institutional stability, effectiveness of public and institutional influence on government action, and the presence of a free media.

The index ranges approximately from -2.5 to +2.5, with a higher value indicating a superior level of governance. Svensson (2000) and Murshed and Sen (1995) argue that conflicting objectives between a recipient government and an altruistic donor may arise. Consequently, if foreign aid is misallocated and misused, significant effects cannot be anticipated. The study aims to answer two key questions: Does foreign aid contribute to increasing aggregate welfare in developing countries, as measured by HDI? And does the interaction between foreign aid and better governance positively influence the relationship between aid and the welfare of the poor?

The existing empirical support for the notion that foreign aid directly impacts human development is limited. Clemes and Gani's (2003) investigation suggests that health aid and food aid may have adverse effects on human development. Gomanee et al. (2003) propose that aid's impact on welfare indicators is often indirect, contributing to well-being through increased pro-public expenditure (PPE). McGillivray et al. (2004) found that aid shows neither greater nor lesser efficiency in influencing human development, particularly in conflict scenarios. Boone (1996) indicates a lack of significant impact of aid on improvements in infant mortality, primary schooling ratios, or life expectancy. Mosley et al. (2004) discover that foreign aid indirectly influences poverty and the welfare of recipient countries. Okon (2012) demonstrates a negative relationship between development aid and human development, suggesting that aid may lead to a deterioration in human development in Nigeria. Claudia R. Williamson (2008) argues that foreign aid is ineffective in enhancing overall health and proves to be an unsuccessful tool for human development.

This study seeks to shed light on the complex interplay among aid, governance, and overall welfare in developing nations. It provides several noteworthy contributions to the existing literature. Primarily, it assesses the aid-development relationship by scrutinizing its effects on human development. A substantial contribution is the estimation of the impact resulting from the interaction between improved governance and aid development on human development. Utilizing 2SLS estimation, the analyses unveil a positive influence on human development, particularly when interacting with two of the six governance indicators: control of corruption and political stability. Additionally, our findings indicate a significant and negative impact of foreign aid on welfare within our sample. The subsequent sections of the paper are structured as follows. Section 2 provides a comprehensive review of the literature on aid effectiveness. In Section 3, we detail our data and methodology. The empirical analysis is presented in Section 4. Finally, Section 5 offers concluding remarks.

2. LITERATURE REVIEW

Growth The extensive body of literature examining the economic effectiveness of aid has predominantly focused on the impact of aid flows on GDP growth. Despite the contention that foreign aid lacks efficacy, particularly with minimal or no discernible effect on economic growth in most developing countries, several studies present a nuanced perspective. Karras (2006) delves into the correlation between foreign aid and economic growth, analyzing annual data from 1960 to 1997 for 71 aid-receiving developing countries. His findings offer evidence supporting the positive impact of foreign aid on growth. Odusayana et al. (2011) utilize error-correction estimation for Nigeria spanning 1981 to 2008, revealing a positive effect of aid on both short-term and long-term growth. Mavrotas and McGillivray (2004) conclude, after analyzing trends in official aid to Africa from 1960 to 2002, that such assistance fosters growth and reduces poverty. Gomanee et al. (2005) identify investment as a crucial transmission mechanism through which aid influences economic growth, drawing on data from 25 Sub-Saharan African countries spanning 1970 to 1997, affirming the significant positive effect of foreign aid on economic growth. Ekanayake and Chatrna (2009) employ the panel least squares estimation method to investigate the consequences of foreign aid on the economic growth of 85 developing countries across four different time periods from 1980 to 2007, yielding mixed effects.

While some studies, such as Burnside and Dollar (2000), Collier and Dollar (2002), and Hansen and Tarp (2001), assert that foreign aid yields positive effects on investment and growth when recipient countries adopt appropriate and stable macroeconomic policies, others like Easterly (2003) contend that altering the definition of variables can lead to changes in results. Brautigam and Knack (2004) find a negative impact, while Mallik (2008) identifies a negative relationship between foreign aid and economic growth in specific African countries. Rajan and Subramanian (2008) provide evidence that total aid is ineffective at promoting growth, aligning with the findings of several other studies, suggesting that aid has no discernible impact on growth. The

effectiveness of aid is argued to be contingent on geographic location, with Dalgaard et al. (2004) positing that assistance may be less beneficial in tropical countries due to climate-related circumstances.

Revisiting the issue of aid effectiveness in Africa, John Loxley and Harry A. Sackey (2008) examine the effect of aid on growth for 40 member countries of the African Union. Their fixed-effects growth models reveal a positive and statistically significant effect of aid on growth. Some studies contend that aid is misallocated or misused, emphasizing the need for aid allocation to consider superior policies. Governance emerges as a crucial factor in enhancing economic growth, with Azmat Gani (2011) illustrating that enhancing a country's political stability and government effectiveness contributes to greater economic growth. Countries with high scores in government accountability and the rule of law, as discovered by Huynh and Jacho Chavez (2009), achieve higher levels of economic growth. Good governance significantly influences economic outcomes, as shown by Kaufmann, Kraay (2002), and Zoido-Lobatón (1999), emphasizing the positive direct effect of institutional quality of governance on income per capita. Governance is highlighted as a crucial tool for development, suggesting its role in achieving better economic outcomes and enhancing a country's policy-making (Rodrik, 2008). Emara and Jhonsa (2014) utilize a cross-sectional dataset of 197 countries with the Two-Stage Least Square method to explore the interrelationship between the improvement in the quality of governance and the increase in per capita income. Morita and Zaelke (2007) study the link between the rule of law, good governance, and economic development, emphasizing that these elements are necessary for sustainable development. They argue that achieving good governance and sustainable development goals requires more than enacting laws and regulations; it involves effective enforcement by governments. Santiso (2001) assesses the World Bank's approach to promoting good governance in developing countries, contending that the use of traditional methods is misguided. He argues against aid conditionality as the most appropriate approach to strengthening good governance in developing countries. Rajan and Subramanian (2007) find that aid inflows significantly impact the quality of governance, influencing the rate of growth in the manufacturing sector in developing countries. Fukuda et al. (2011) explore the relationship between the quality of the budget process and human development outcomes, discovering that countries with high levels of budget transparency tend to achieve positive development outcomes.

Human development, characterized by the enhancement of people's rights and opportunities while improving their well-being, is a focal point based on the Human Development Reports of the United Nations Development Program (UNDP). The literature explores the correlation between aid and various aspects of development that collectively influence overall life quality. Masud et al. (2005) investigates whether foreign aid positively impacts infant mortality and adult illiteracy, utilizing a dataset encompassing both bilateral aid and NGO aid flows to 58 countries from 1990 to 2001. They highlight that NGO aid is more effective in reducing infant mortality than official bilateral aid. Gomanee et al. (2003) test the hypothesis that foreign aid can enhance the welfare of the poor, employing a random effects method with cross-country data for 38 countries over 1980 to 1998. They consider two indicators of well-being: the Human Development Index (HDI) and infant mortality (IM), suggesting that aid is associated with improvements in welfare, particularly in countries with lower welfare values. They propose that the impact of aid on welfare indicators is often indirect, improving welfare through increased pro-public expenditure (PPE). Gomanee et al. (2005) investigate the effectiveness of aid in improving aggregate human welfare measured by the HDI and the infant mortality rate. Examining 104 low-income and middle-income countries from 1980 to 2000, they assert that while aid may not directly impact welfare, it can have an indirect effect via pro-poor expenditures (PPE) and government spending on social sectors. They provide evidence that aid contributes to improving welfare indicators, such as infant mortality, by financing consumption spending on social sectors like education, health, and sanitation, thereby increasing aggregate welfare. They argue that good economic policy is not a prerequisite for aid to be effective in promoting human development.

Kosack (2003) investigates aid's impact on the quality of life, examining links between aid, democracy, and the HDI. Using 2SLS estimation over three four-year periods (1974 to 1985), he finds that aid can directly increase welfare, but only when associated with democratic recipient governments. He suggests that aid may have an adverse impact on HDI growth in autocracies, while democracy alone may negatively affect HDI growth. Fielding et al. (2006) examine how aid influences human development indicators, including health, education, and fertility, using a sample of 48 countries with an over-identified 3SLS model. They find that aid has a substantial positive impact on many development outcomes. McGillivray et al. (2004) explore the impact of aid on the HDI level, considering conflict in the analysis. They investigate the interaction between foreign aid, conflict, and democracy using OLS and 2SLS.

3. DATA AND MEDTHOLOGY

This study explores the influence of aid on the Human Development Index (HDI) and investigates the connections between aid, transparency measured by governance indicators, and overall welfare. The ordinary least squares (OLS) estimates concerning the correlation between the human development index and foreign aid may face bias due to the possible endogeneity of foreign aid allocations. Typically, foreign aid is directed towards governments that struggle to deliver public goods to their citizens. Such nations may exhibit characteristics like high corruption, weak institutions, and a limited inclination for public goods.

3.1. Data

In this study, we conduct an analysis of data from 63 developing countries (refer to Appendix 1, Table 4) spanning a 20-year period (2002-2021), resulting in a total of 1260 observations. In this study, we conduct an analysis of data from 63 developing countries (refer to Appendix 1, Table 4) spanning a 20-year period (2002-2021), resulting in a total of 1260 observations. The empirical model employed in this study includes HDI as the dependent variable, following the approach used by Gomanee, Girma, and Morrissey (2003), Gomanee, Morrissey, Mosley, and Verschoor (2005). The independent variables consist of foreign aid, transparency indices represented by governance indicators, and the interaction between foreign aid and governance indicators. Additionally, the model incorporates several control variables, namely initial GDP per capita, foreign direct investment, military expenditures, and domestic investment. HDI, a composite index measuring human development, serves as the primary focus of analysis. On the other hand, foreign aid is provided to promote human development. Recognizing that foreign assistance is just one of several factors shaping human development, the model considers foreign direct investment, domestic investment, military expenditure, and initial GDP per capita. The expectation is that military spending, by diverting funds from their intended purposes, will likely reduce the Human Development Index (HDI). The Human Development Index (HDI) data is sourced from the Human Development Reports published by the UNDP. This index gauges a country's average achievements in three fundamental dimensions of human development: ensuring a long and healthy life, facilitating access to knowledge, and establishing a suitable standard of living (see Appendix 2). Countries are ranked based on these criteria, and the HDI value falls within a range from 0 to 1, providing a comprehensive measure of a nation's overall development. Additionally, a higher initial GDP per capita indicates income growth, enabling better access to essential life facilities for those facing economic challenges.

The net official development assistance received is introduced as a share of GDP in this paper. Both net official development assistance and GDP are expressed in current US dollars, ensuring that the ratio of aid to GDP remains unaffected by price fluctuations. Our regressions control for the previous year's GDP per capita (constant 2013 dollar). The inclusion of the log of GDP per capita in the model serves to reduce series variation and alter the distribution. By incorporating GDP per capita, we effectively control the impact of GDP on HDI, recognizing that any foreign aid received could contribute to an increase in GDP per capita in the current period. This rise in per capita income is anticipated to positively affect HDI and directly impact aggregate welfare in developing countries. Additionally, FDI as a percentage of GDP and military spending as a share of GDP data were obtained from the World Bank Indicators published by the World Bank. Notably, Clemes and Gani (2003) observed an inverse relationship between higher military expenditures and human development in low-income countries. Furthermore, domestic investment is expected to exert a positive effect on aggregate welfare.

Governance indicators, sourced from various survey institutes, are available for 1996, 1998, and 2000, with annual updates from 2002 to 2021. The sample includes 28 low-income countries, 26 low-middle-income countries, and 13 high-middle-income countries. Most variables are sourced from the World Bank's World Development Indicators. Table 1 details the variables and their sources, while Table 2 provides descriptive statistics for each variable. Governance quality is assessed using subjective indexes from the World Bank Governance Indicators dataset, covering criteria such as control of corruption, government effectiveness, political stability, regulatory quality, the rule of law, and voice and accountability. The indicators are based on data from 1996 (Kaufmann, Kraay, & Mastruzzi, 2005), and each country's composite indicator is normalized to a scale ranging from -2.5 to 2.5, with higher positive values indicating superior performance. Table 1 outlines the definitions and sources of the variables, while Table 2 presents the descriptive statistics for each variable.

Table 1. Variables: Description, Definition, and Data Sources

Variables	*Description*	*Definition*	*Source of data*
aid_{it}	Net Official development assistance (ODA) expressed as a percentage of the recipient country's GDP.	ODA, or Official Development Assistance, is characterized as government aid intended to enhance the economic development and well-being of developing countries. This definition explicitly excludes loans and credits directed towards military purposes. ODA encompasses grants, soft loans, and the facilitation of technical support.	World bank, Data Bank; World Development Indicators at https://databank.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG/1ff4a498/Popular-Indicators

COC_{it}	Control of Corruption	Measuring the degree to which individuals perceive the use of public authority for personal benefit, encompassing both minor and significant manifestations of corruption, as well as the influence of elites and private interests on the state.	The World Bank Governance indicators are available at www.govindicators.org.
GE_{it}	Government Effectiveness	Evaluating perceptions regarding the excellence of public services, the competence of the civil service with its independence from political influences, the effectiveness of policy formulation and implementation, and the government's commitment credibility to policies.	
PV_{it}	Political Stability and Absence of Violence/Terrorism	Evaluating perceptions related to the likelihood of government destabilization or overthrow through unconstitutional or violent means, including instances of politically motivated violence and terrorism.	
RQ_{it}	Regulatory Quality	Capturing perceptions of the government's competence in formulating and implementing effective policies and regulations that enable and support the development of the private sector.	
RL_{it}	The Rule of Law	Capturing perceptions of the degree to which individuals have confidence in and adhere to societal rules, and the effectiveness of contract enforcement, property rights, law enforcement, and the judicial system. Additionally, assessing the likelihood of crime and violence in society.	
VA_{it}	Voice and Accountability	Capturing perceptions of the degree to which the citizens of a country can engage in choosing their government, including aspects of freedom of expression, freedom of association, and the presence of a free media.	
$lpgdp_{it-1}$	Log of constant GDP per capita in the previous year to capture initial country specific effects.	It represents the income earned per individual in a specific region. The assumed correlation between GDPs per capita and foreign aid is negative. While there is a robust positive correlation between better governance and per capita income across countries, the impact of per capita income on governance is observed to be weak and, in some instances, even negative[1].	World bank, Data Bank; World Development Indicators at https://databank.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG/1ff4a498/Popular-Indicators
TO_{it-1} TO_{it-1}	Openness to trade: exports plus imports from the previous year, expressed as a share of GDP.	It serves as an indicator of economic policies that either impede or facilitate trade among nations. Additionally, it gauges the extent of economic interests held by donors. The presumed relationship between trade openness and foreign aid is considered positive.	World bank, Data Bank; World Development Indicators at https://databank.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG/1ff4a498/Popular-Indicators
$gpop_{it}$	Population growth	A growing population has the potential to reduce income per capita and diminish individual living standards.	World bank, Data Bank; World Development Indicators at

[1] Kaufmann, Daniel and Kraay, Aart, "Growth Without Governance" (November 2002). World Bank Policy Research Working Paper No. 2928.

	The presumed relationship between population growth and foreign aid is considered positive.	https://databank.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG/1ff4a498/Popular-Indicators

GDP per capita is expressed in constant US dollars, while GDP is in current US dollars. Since foreign aid is also estimated in current US dollars, the aid-to-GDP ratio remains unaffected by price fluctuations. The research conducted by Kaufmann and Kraay (2002) revealed a positive correlation between per capita incomes and the quality of governance across countries. The study suggests a strong positive causal relationship from improved governance to higher GDP per capita incomes. However, there is a limited and potentially negative causal effect from per capita incomes to governance. To address potential endogeneity, the researchers employed an instrumental variable (IV) method.

Table 2: The summary statistic of each variable

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
hdi_{it}	1224	0.514031	0.097681	0.273	0.769
aid_{it}	1224	8.584253	9.28879	-0.05801	81.79316
COC_{it}	1252	-0.78061	0.518787	-1.91646	1.66271
GE_{it}	1249	-0.87166	0.535811	-2.45031	0.796327
PV_{it}	1251	-0.80673	0.843759	-3.31295	1.284487
RQ_{it}	1249	-0.83356	0.502354	-2.54773	0.191378
RL_{it}	1251	-0.84893	0.536464	-2.59088	0.65718
VA_{it}	1251	-0.71419	0.654597	-2.23327	0.596758
TO_{it-1}	1230	64.96689	35.00459	0.756876	347.9965
aid_{it-1}	1247	20.13953	1.13997	16.87469	23.15968
fdi_{it}	1217	3.902249	7.091999	-18.9178	103.3374
$lpop_{it}$	1260	16.35665	1.69716	2.13779	21.06513
$dinv_{it}$	1017	23.12418	10.58533	-15.9166	76.78231
$MilEx_{it}$	1015	1.779761	1.49317	0.0054	20.86575
$pgdp_{it-1}$	1223	6.789794	0.750549	4.704661	8.537385

Sierra Leone exhibited the lowest HDI in the sample, standing at 0.273 in 2002. However, it experienced a notable improvement over several years, reaching 0.477 in 2021. Zambia demonstrated the most substantial advancement in HDI among the countries in the sample. Its HDI rose from 0.389 in 2002 to 0.586 in 2014, marking a noteworthy increase of 19.7%. Niger, South Sudan, and Mali recorded the lowest HDI in 2021 among the countries in the sample, with an HDI of 0.385.

3.2. Methodology

The study aims to explore how the presence of transparent systems in aid recipient countries can enhance the effectiveness of foreign aid, leading to improvements in the welfare of poor populations. Transparency, in this context, refers to government policies or strategies designed to reduce the uncertainty faced by donors. The key questions addressed in this paper are as follows: Does the presence of better governance indicators influence the allocation of foreign aid? Does foreign aid exhibit increased effectiveness in the presence of transparency and improved governance?

The utility of donors is conceptualized as a function of the impact of foreign aid on the welfare of the poor, with the well-being of the poor being contingent on the amount of assistance they receive. The paper utilizes the Human Development Index (HDI) as a dependent variable, serving as a proxy for the welfare of the poor. HDI, which equally weights education and health and includes indicators such as school enrollment, literacy, and wealth, is employed as a measure of well-being. The analysis adopts a simple specification that allows for the examination of direct effects of foreign aid, the interaction between foreign aid and governance indices on HDI, and the influence of government expenditures.

3.2.1 Controlling the endogeneity problem between aid and the intimal level of income.

The Ordinary Least Squares (OLS) model relies on the assumption that there is no correlation between the error term and any independent variables. However, the endogeneity problem may arise in the context of foreign aid, as developing countries might receive aid due to lower GDP per capita or their lower level of human development, leading to potential correlation with other variables. This situation poses a risk of bias in OLS results. To tackle endogeneity, we employ the Hausman test to assess whether GDP per capita and aid terms are endogenous. Following the approach of Gomanee et al. (2005), we utilize Two-Stage Least Squares (2SLS) estimation to examine the impact of foreign aid on HDI while accounting for endogeneity of foreign aid and other exogenous variables.

Donors aim to enhance the living standards of the poor in developing countries and promote economic growth through their support. Consequently, foreign aid is anticipated to positively affect the aggregate level of welfare. Therefore, a positive correlation is expected between foreign aid and the human development index. The existing literature on the relationship between foreign aid and economic growth presents varied scenarios, where the link may be positive, negative, or show no clear relationship. Easterly (2003) identifies a negative relationship between aid and economic growth. Conversely, considering that human development is expected to be positively associated with GDP increase, we anticipate a negative relationship between aid and human development.

4. ESTIMATION MODEL

To address the issue of endogeneity, we utilize both Ordinary Least Squares (OLS) and Two-Stage Least Squares (2SLS) estimation techniques. The 2SLS method is employed under the assumption that the aid variable is endogenous. Following the approach of Burnside and Dollar (2000), we use the logarithm of initial GDP per capita, population, and infant mortality as valid exogenous instruments for aid. Additionally, Boone (1996) demonstrates that lagging aid by two periods can serve as a valid instrument for current aid in the 2SLS framework.

The method includes two equations:

4.1 First equation:

$$aid_{it} = \beta_1 + \beta_2 lpgdp_{it-1} + \beta_3 lpop_{it} + \beta_4 TO_{it-1} + \beta_5 COC_{it} + \beta_6 GE_{it} + \beta_7 PV_{it} + \beta_8 RQ_{it} + \beta_9 RL_{it} + \beta_{10} VA_{it} + \varepsilon_{it}$$

Where "ι" indexes countries and "t" indexes time, aid_{it} represents ODA/GDP, which is the level of net official development assistance received relative to GDP, with ODA and GDP evaluated in current US dollars. Governance indicators are employed as a proxy for transparency, assuming that donors may provide or reward countries with better governance policies. In our model, we utilize the log of initial GDP per capita, population, and openness to trade, serving as instruments to address endogeneity.

4.2 Second equation:

In this equation, the Human Development Index (HDI) is regressed against the predicted aid values obtained from the first equation, along with additional exogenous variables.

$$hdi_{it} = \alpha_1 + \alpha_2 lpgdp_{it-1} + \alpha_3 aid_{it} + \alpha_4 fdi_{it} + \alpha_5 dinv_{it-1} + \alpha_6 COC_{it-1} + \alpha_7 GE_{it} + \alpha_8 PV_{it} + \alpha_9 RQ_{it} + \alpha_{10} RL_{it} + \alpha_{11} VA_{it} + \alpha_{12} aid_{it} * COC_{it} + \alpha_{12} aid_{it} * COC_{it} + \alpha_{13} aid_{it} * GE_{it} + \alpha_{14} aid_{it} * PV_{it} + \alpha_{15} aid_{it} * RQ_{it} + \alpha_{16} aid_{it} * RL_{it} + \alpha_{17} aid_{it} * VA_{it} + \alpha_{17} MilEx_{it} + \varepsilon_{it}$$

hdi_{it} represents the Human Development Index, $lpgdp_{it-1}$ represents initial income. The coefficients α 12, α 13, α 14, α 15, α 16, and α 17 on the interaction term between aid and the governance indicators address the hypothesis that the human development index depends on good governance indicators. A positive relation is expected between the human development index and Foreign Direct Investment (FDI), as well as with domestic public investment. The Hausman test for endogeneity introduces the IV regressions, explaining the choice of the estimation method.

Firstly, we employ Durbin (score) and Wu-Hausman statistical tests to assess the endogeneity of the aid variable. The null hypothesis, assuming that all variables are exogenous, is convincingly rejected with a P-value of 0 for both tests. Secondly, we examine weak instruments through the first-stage statistic regression. The null hypothesis, suggesting the presence of weak instruments, is firmly rejected, and the Partial R^2 indicates robust instrument strength. The F-statistic exceeds critical values, providing additional support for rejecting the weak instruments null hypothesis, with a probability of 0. Finally, we perform overidentifying restrictions tests using Sargan (score) and Basmann statistics. The null hypothesis, positing the validity of the instrument set and correct model specification, cannot be rejected. P-values of 0.7647 and 0.7673 for Sargan and Basmann, respectively, underscore the validity of our instruments and the validity of our model specification.

5. EMPIRICAL ANALYSIS

The initial step in the empirical model involves estimating Equation (1), where foreign aid is regressed against GDP per capita and other instrumental variables. The outcomes of this regression are detailed in Table 3.

Table 3: Regression results

hdi_{it}	*First stage*		*Second stage*	
	Coefficient	*t. statistic*	*Coefficient*	*t- statistic*
COC_{it}	1.87351*** (.4373312)	4.28	0.002104 (.0191668)	0.11
GE_{it}	0.9170738** (0.4237531)	2.16	0.1064403*** (.0156622)	6.80
PV_{it}	0.3920593** (.1725966)	2.27	0.0101002 (.0062528)	1.62
RQ_{it}	2.577957*** (.3765096)	6.85	0.0358648** (.017346)	2.07
RL_{it}	-.5337176 (.4595654)	-1.16	-0.0098539 (.0171672)	-0.57
VA_{it}	-.407837** (.1851133)	-2.2	-0.0271696*** (.0073286)	-3.71
$COC_{it} * aid_{it}$	-2.676829 (4.0028)	-0.67	0.3021918* (.1550778)	1.95
$GE_{it} * aid_{it}$	-32.12673*** (5.361374)	-5.99	-0.5409327** (.2207361)	-2.45
$PV_{it} * aid_{it}$	4.777209*** (1.745699)	2.74	0.1597456** (.0698303)	2.29
$RQ_{it} * aid_{it}$	-40.09434*** (3.439672)	-11.66	-0.9893777*** (.1901219)	-5.20
$RL_{it} * aid_{it}$	8.024335 (5.385227)	1.49	-0.279955 (.2086342)	-1.34
$VA_{it} * aid_{it}$	-5.988354*** (1.822631)	-3.29	-0.0575524 (.0714141)	-0.81
fdi_{it}	-.021863** (.0087124)	-2.51	0.0000705 (0.0003547)	0.20
$dinv_{it}$	.0212365*** (.007618)	2.79	-.0000137 (0.0002889)	-0.05
$pgdp_{it-1}$	-2.065949*** (.1113401)	-18.56	.0398037*** (.0076201)	5.22
$MilEx_{it}$	-.0043038 (.0535188)	-0.08	-.0154259*** (.0020678)	-7.46
$lpop_{it}$	-.8800298*** (.0753219)	-11.68		
TO_{it-1}	-.0198255*** (.002526)	-7.85		
aid_{it-1}			-.0190851*** (0.0028401)	-6.36
Cons	36.15809*** (1.532792)	23.59	.4167322*** (.0694112)	6

Table 3 illustrates the results of the 2SLS regression. The first column corresponds to the first-stage regression, which achieved an adjusted R^2 of 0.9389, indicating that the empirical model explains 93.89% of the variation in the dependent variable. GDP per capita, population, and trade openness are utilized to predict aid value.

In the first stage, foreign aid is regressed against governance indicators, initial GDP per capita, population, and openness to trade, serving as instruments to address endogeneity. The primary focus is on predicting aid values. The coefficients associated with governance indicators, excluding the rule of law, are notably significant at both the 0.01 and 0.05 levels. Specifically, control of corruption, government effectiveness, political stability and absence of violence, and regulatory quality exhibit positive signs, while the coefficient of voice and accountability shows a negative sign. Furthermore, the coefficients of the logarithm of initial GDP per capita, population, and openness to trade display significant negative values.

In the second-stage analysis, the Human Development Index is regressed against predicted aid values and governance indicators. The focus is on the interaction coefficients, anticipating positive signs. The coefficients associated with the interaction between foreign aid and governance indicators, excluding the rule of law and voice and accountability, prove to be statistically significant. Specifically, control of corruption and political stability and absence of violence exhibit positive signs, while the rule of law and regulatory quality display negative signs. Conversely, the coefficients of the interaction between aid and the rule of law, as well as voice and accountability, show an insignificant impact. Notably, Foreign Direct Investment (FDI) and domestic investment demonstrate an insignificant positive impact on HDI. The coefficient of the logarithm of initial GDP per capita significantly influences the Human Development Index in the second-stage equation. Interestingly, the coefficient of aid reveals a significant negative impact on human development, suggesting that foreign aid, in isolation, harms the aggregate welfare level in developing countries. This result may be attributed to the misallocation of foreign aid, as indicated by the significant positive interaction between foreign aid and the indicator of controlling corruption. Furthermore, the regression results underscore that an increase in domestic investment has no impact on human development. Additionally, military expenditure has a significantly negative coefficient at the 0.01 level, supporting the hypothesis that unproductive government expenditures adversely affect the welfare of the poor.

6. CONCLUSION

This study investigated the influence of governance indicators in aid recipient countries on the effectiveness of foreign aid. The hypothesis posits that better governance creates a conducive environment for foreign aid donors to achieve their objectives, with the assumption that donors are motivated by the impact of aid on aggregate welfare in developing countries. Human development at the national level is gauged through the Human Development Index (HDI), and the study particularly explored the relationships between governance, foreign aid, and human development in an econometric analysis spanning 2002-2021 across 63 developing countries.

The key findings highlight that aid positively influences the Human Development Index only when interacting with two governance indicators: control of corruption and political stability. Other governance indicators fail to counterbalance the negative impact of foreign aid on HDI when in interaction. The evidence suggests that the quality of governance, particularly control of corruption and political stability, significantly shapes aggregate welfare in developing countries. Foreign aid is most beneficial when coupled with better governance. However, the negative signs in the aid coefficient imply that increased aid diminishes aggregate welfare, possibly due to the misallocation of aid. The study also reveals a negative impact of military expenditures on the Human Development Index.

The study's implications aim to catalyze development reforms in aid recipient countries. As indicated by the results, foreign aid is most effective when interacting with robust control of corruption policies. Stable political systems are also crucial for achieving growth in aggregate welfare through foreign aid. Despite the overall negative effect of foreign aid on the Human Development Index, the interaction with better governance, including control of corruption, political stability, and the absence of violence, mitigates its adverse impact.

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APPENDICES

Appendix 1: Table 4. List of Developing Countries Included in the Study

N	Country name	Categories Income level
1	Afghanistan	Lower middle income
2	Angola	Lower middle income
3	Bangladesh	Lower middle income
4	Benin	Lower middle income
5	Bhutan	Lower middle income
6	Bolivia	Lower middle income
7	Burkina Faso	Low income
8	Burundi	Low income
9	Cambodia	Lower middle income
10	Cameroon	Lower middle income
11	Central African Republic	Low income
12	Chad	Low income
13	Comoros	Lower middle income
14	Congo, Dem. Rep	Low income
15	Congo, Rep	Lower middle income
16	Côte d'Ivoire	Lower middle income
17	Djibouti	Lower middle income
18	Egypt, Arab Rep.	Lower middle income
19	Eritrea	Low income
20	Ethiopia	Low income
21	Gambia,The	Low income
22	Ghana	Lower middle income
23	Guinea	Low income
24	Guinea-Bissau	Low income
25	Haiti	Lower middle income

26	Honduras	Lower middle income
27	India	Lower middle income
28	Kenya	Lower middle income
29	Lesotho	Lower middle income
30	Liberia	Low income
31	Madagascar	Low income
32	Malawi	Low income
33	Mali	Low income
34	Mauritania	Lower middle income

N	***Country name***	***Categories*** Income level
35	Morocco	Lower middle income
36	Mozambique	Low income
37	Myanmar	Lower middle income
38	Nepal	Lower middle income
39	Nicaragua	Lower middle income
40	Niger	Low income
41	Nigeria	Lower middle income
42	Pakistan	Lower middle income
43	Papua New Guinea	Lower middle income
44	Philippines	Lower middle income
45	Rwanda	Low income
46	Sao Tome and Principe	Lower middle income
47	Senegal	Lower middle income
48	Sierra Leone	Low income
49	Solomon Islands	Lower middle income
50	Somalia	Low income
51	South Sudan	Low income
52	Sudan	Low income
53	Tajikistan	Lower middle income
54	Tanzania	Lower middle income
55	Timor-Leste	Lower middle income
56	Togo	Low income
57	Tunisia	Lower middle income
58	Uganda	Low income
59	Uzbekistan	Lower middle income
60	Vietnam	Lower middle income
61	Yemen, Rep.	Low income
62	Zambia	Lower middle income
63	Zimbabwe	Lower middle income

Appendix 2

The calculation of the human development indices

The Human Development Index (HDI) is calculated as the geometric mean of three-dimension indices:

$$\textbf{HDI} = \left(I_{Life}^{\frac{1}{3}} \cdot I_{Education}^{\frac{1}{3}} \cdot I_{Income}^{\frac{1}{3}} \right)$$

We apply the following equation:

$$\text{Dimension index} = \frac{\text{actual value} - \text{minimum value}}{\text{maximum value} - \text{minimum value}}$$

The following three indices are used:

1. Life Expectancy Index $(I_{life}) = \frac{\text{LE}-20}{85-20}$

Thus,

Life Expectancy Index is $\begin{cases} 1 & if\ Life\ expectancy\ at\ birth\ is\ 85 \\ 0 & if\ Life\ expectancy\ at\ birth\ is\ 20 \end{cases}$

2. Education Index

$$(I_{education}) = \frac{\textbf{Mean Years of Schooling Index} + \textbf{Expected Years of Schooling Index}}{2}$$

Where Mean Years of Schooling Index = $\frac{\textbf{Mean Years of Schooling}}{15}$, 15 is the projected maximum of this indicator for 2025.

Where Mean Years of Schooling Index = $\frac{\textbf{Expected Years of Schooling}}{18}$, 18 is equivalent to achieving a master's degree in most countries.

3. Income Index $(I_{income}) = \frac{\ln(\text{GDP per capita}) - \ln(100)}{\ln(75000) - \ln(100)}$

The index = $\begin{cases} 1 & if\ GNI\ per\ capita\ is\ \$75{,}000 \\ 0 & if\ GNI\ per\ capita\ is\ \$100 \end{cases}$