# Foreign direct investment and the triangle of growth, inequality and poverty in north Africa

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**Abstract:**

This study examines the impact of foreign direct investment (FDI) on poverty in North Africa over the period 1995–2023. It distinguishes between two potentially conflicting effects of FDI on poverty: the growth effect and the inequality effect. The first part of the article provides a theoretical analysis of the relationships linking foreign direct investment to the "growth–inequality–poverty" triangle. The second part is empirical in nature. Using a simultaneous-equations econometric model applied to an unbalanced panel dataset, the study captures the interactions between FDI and the triangle as documented in the existing literature. The results indicate that FDI has a negative effect on inequality and a positive, though relatively modest, effect on economic growth. However, according to the model's estimates, FDI has not had a statistically significant impact on poverty levels in North Africa.

**Keywords:** FDI, growth, inequality, poverty, and simultaneous equations.

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## 1. Introduction

Poverty is a complex and multidimensional phenomenon whose assessment remains challenging. It has attracted sustained attention from the scientific community and international institutions, which seek to understand its determinants and to propose effective strategies to address it. The fight against poverty has become a priority and one of the main Millennium Development Goals adopted in the 2000s at the headquarters of the United Nations.

Economic studies often examine the relationship between foreign direct investment (FDI), per capita income growth, and inequality to understand their effects on poverty. The literature shows that the impact of FDI on poverty through these factors has evolved over time, reflecting both the growing sophistication of academic analysis on the complex interactions between growth and income inequality, and the varying levels of interest in poverty reduction within political circles. Indeed, the body of research on economic growth and poverty incidence is vast. Two main theories can be identified: the first argues that "growth is good for the poor" (Dollar and Kraay, 2000; Ravallion, 2004), while the second suggests that growth exacerbates inequality and does not benefit the poor. This second perspective emphasizes that "growth alone is not sufficient for poverty reduction; it is necessary but must be accompanied by policies that address inequalities both now and, in the future," (Bourguignon, 2003; Cling et al., 2002).

The literature also highlights the interdependence between growth and inequality, complicating policy choices for decision-makers. Should policies prioritize reducing inequality, even if it could impede growth? Or should growth be promoted, even if it leads to greater inequality and disproportionately benefits the rich? These questions are central to the "triangle" of growth, inequality, and poverty that Bourguignon (2003) refers to. To understand the impact of FDI on poverty reduction in North Africa, we need to revisit the effects of FDI on growth and inequality. Specifically, we must explore whether there is a trade-off between the effects of FDI on inequality and growth, and what the net outcome is for poverty incidence.

Our study differs from previous empirical work by examining a rectangular relationship that allows us to test the effect of FDI on the growth, inequality and poverty triangle.

The remainder of the paper is organized as follows: Section 2 provides an overview of the main empirical studies that have addressed the relationship between FDI and the components of the growth, inequality and poverty triangle, which are often treated in a binary manner. Section 3 is devoted to the methodology adopted. Section 4 presents the empirical results. Section 5 discusses the study's limitations and directions for future research. The final section concludes the paper.

## 2. Theoretical analysis of the relationship between FDI, Growth, Inequality and Poverty

## 2.1: Foreign Direct Investment and Economic Growth

FDI plays a crucial role in driving economic growth across countries, with its impact on economic dynamics being so significant that it influences growth and competitiveness. Numerous studies in the economic literature have examined the relationship between FDI and growth, particularly in developing countries. Researchers have employed various econometric methods, such as the Granger causality test and the Toda-Yamamoto test, to analyze the link between FDI and economic growth. For example, Chowdhury and Mavrotas (2006) applied the Toda-Yamamoto method to examine the relationship between FDI and GDP growth in three major FDI-receiving countries: Chile, Malaysia, and Thailand, over the period 1969-2000. Their findings revealed that in Chile, GDP growth led to net FDI inflows, while in Malaysia and Thailand, there was a bidirectional causal relationship between GDP growth and FDI inflows.

In another study, Hansen and Rand (2006) explored the links between FDI and economic growth in 31 developing countries from 1970 to 2000, using two-variable autoregressive vector models for GDP and FDI ratios. They concluded that a strong causal relationship exists between these two variables. However, Carkovic and Levine (2005) studied the link between FDI and economic growth in 72 countries and found no evidence that FDI accelerates economic growth, contrasting with the findings of the earlier studies. Given these varying results on the general causal relationship between FDI and economic growth,

researchers have looked at specific sectors or regions to better understand this link. For instance, Alfaro (2003) examined the implications of FDI for growth in the primary, manufacturing, and services sectors. His findings were mixed, and based on data from multiple countries between 1981 and 1999, Alfaro concluded that the impact of FDI on growth is ambiguous. In a more recent study, Lipsey (2000) found that FDI, when combined with educational attainment, significantly contributed to the increase in real per capita income in developing countries from 1970 to 1995. Unlike Bronstein, Gregoric, and Lée (1998), who suggested that FDI alone has a positive, though less pronounced, effect on growth, Lipsey highlighted the importance of educational factors. Moreover, FDI can significantly enhance productivity in the host economy by promoting domestic capital and technological progress (Mello, 1997). According to Mello, the impact of FDI is smaller when the technological gap between the home and host countries is large.

## 2.2. The relationship between foreign direct investment and inequality

The effects of FDI on inequality can be understood through two main models: the standard international trade model and models of the new institutional economics. Theoretically, the effects of FDI on income distribution are similar to the effects of trade liberalization. In this context, the Stolper-Samuelson (1940) model suggests that international trade alters the relative prices of factors of production, thus influencing their incomes by favoring owners of abundant and exportable factors, while disadvantaging those with no comparative advantage. This can lead to increased inequality, at least in the short term, especially in labor-intensive FDI. Wood and Berge (1997) adapted the Heckscher-Ohlin-Samuelson model to study the specialization of African countries. They replaced the traditional factors of "capital" and "labor" with "human capital" and "land," showing that African countries have a comparative advantage in natural resources, given their limited human capital. Consequently, FDI in capital-intensive sectors would primarily benefit owners of natural resources. In democratic systems, the state's enrichment could potentially contribute to improving overall well-being through institutions. However, in systems with institutional distortions characterized by predatory behaviors and rent-seeking, the increase in FDI could exacerbate inequalities.

## 3. Methodology

To assess the impact of FDI on poverty in North Africa, a simultaneous equation model is used, which links growth, inequality, and poverty. Several mechanisms contribute to poverty reduction, as shown by Dollar and Kraay (2000), who argue that poverty decreases with rising average income, or through better income redistribution, which reduces inequalities, or through a combination of both policies. In this model, FDI serves as an exogenous external shock, and its effects on poverty are estimated by considering its simultaneous effects on growth and inequality.

The econometric model used here consists of three equations. The first equation explains economic growth (Barro, 2001; Borenztein et al., 1998), the second equation explains inequality (Forbes, 2000; Deininger and Squire, 1998; Lyn and Squire, 2003), and the third equation uses the Human Poverty Index (HPI) as a measure of well-being, as data on absolute poverty rates are unavailable for countries like Libya and Algeria. The HPI focuses on three critical dimensions of human life: longevity, education, and living conditions, which are also considered in the Human Development Index (HDI). These three equations are estimated simultaneously to account for the existing interactions between endogenous variables and the indirect effects of instrumental variables. The explanatory variables are categorized into three types: endogenous variables, common explanatory variables, and specific explanatory variables. These sets are incorporated into the following models.

**Growth equation**:

$$G_{i,t} = \beta_1 I_{i,t} + E_1 FDI_{i,t} + D_1 X_{i,t} + \mu_{i,t} \quad (1)$$

**Inequality equation**:

$$I_{i,t} = A_2 G_{i,t} + E_2 FDI_{i,t} + D_2 W_{i,t} + e_{i,t} \quad (2)$$

**Poverty equation**:

$$HPI_{i,t} = A_3 G_{i,t} + \beta_3 I_{i,t} + E_3 FDI_{i,t} + D_3 Z_{i,t} + \varepsilon_{i,t} \quad (3)$$

The variables "Gi,t", "Ii,t", and "HDI" represent GDP growth, income inequality (measured by the Gini coefficient), and the Human Development Index (HDI), respectively. In the three equations, FDI is assumed to be the only

explanatory variable. The specific variables are represented by the following vectors:

- "X"[1] represents the vector of variables related to economic growth (inflation, education, trade openness).
- "W"[2] represents the vector of variables related to income inequality (Gini Index).
- "Z"[3] represents the vector of variables related to poverty, including population growth, access to drinking water, and the inactive population in both rural and urban areas.

Once the model and its components are defined, we proceed to interpret the relevant econometric results.

## 4. Discussion and Interpretation of the Results

The interactions between the key variables growth, inequality, and poverty will be explored in the econometric model, emphasizing the role of FDI in each equation. We will first interpret the results of the growth equation, followed by the inequality equation, and conclude with the poverty equation, which will allow us to derive the reduced form of the model.

### 4.1. The Growth Equation

Equation (1) is used to analyze the effects of FDI, inequality, and other variables that influence growth in North Africa, as outlined in the following table. The results from the growth equation reveal that the trade openness variable is both positive and significant in all estimation methods. This suggests that trade

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[1] **Notes for the growth equation table**
 (LGDP) is growth; (LINV) is gross fixed capital formation (% of GDP); (LOP) is the trade openness ratio [(X+M)/GDP]; (LEDUS) is the enrolment rate; (LINFL) is the inflation rate; (LGINI) is the GINNI coefficient that represents inequality.

[2] **Notes for the inequality**
 (LGDP) is GDP growth.; (LCCRP) is the corruption control; (Linf) is the inflation rate; (Louv) is the trade openness ratio [(X+M)/GDP]; (LINV) is gross fixed capital formation (% of GDP).

[3] **Notes for the Poverty Incidence Equation table**
(LHPI): this is the Human Poverty Index (HDI); (LPIB) is the annual GDP growth rate; (LEDUCS) is the enrolment rate; (LCDEM) is population growth. (LBDP) is the connection of drinking water; (LINACPOP) is the number of the inactive population; (LGINI) is the GINNI coefficient that represents inequality

openness is an important indicator for economic openness policies in North Africa. In contrast, the empirical results from Noomen Lahimer (2009) show that trade openness is not a reliable indicator of economic openness policies in Sub-Saharan Africa. Additionally, the findings indicate that education has a positive but statistically insignificant effect on growth in North Africa. This result can be attributed to the role of the institutional environment in the countries studied, which, despite encouraging access to education, has not sufficiently promoted research and innovation among the educated population.

**Table 1: Results of the growth equation in North Africa (1995-2023)**

| LGDP | 2SLS | 3SLS |
|---|---|---|
| LINV | 0.089 (0.638) | 0.026 (0.052) |
| LFDI | 0.161* (0.033) | 0.108*** (0.40) |
| LCO | 0.123** (0.088) | 0.023* (0.001) |
| LGINI | -0.307*** (0.05) | -0.298*** (0.106) |
| LEDUCTS | 0.063 (0.05) | 0.010 (0.025) |
| LINFL | -0.011 (0.05) | -0.045 (0.069) |
| CONSTANT | 8.978*** (1.11) | 11.370*** (2.17) |

**In parentheses are the absolute values of Student's "t" *** Significant at the 1% threshold; ** Significant at the 5% threshold; * Significant at the 10% threshold.**

Turning to the impact of FDI on economic growth, the results indicate that FDI is both significant and positive in both estimation methods. Specifically, a 1-point increase in FDI leads to an increase in economic growth ranging from 0.061 to 0.18 points. The positive effects of FDI on growth are primarily observed through capital accumulation models, as these FDI flows do not

generate the positive technological spillovers associated with endogenous growth models. These effects challenge the hypothesis of "Dutch disease" in North Africa. From an institutional economic perspective, FDI is expected to have neutral or even negative effects on growth, potentially causing tensions and distortions in economic, political, and institutional development. After analyzing the impact of FDI on growth using two estimation methods, we examine the effects of income inequality on growth in North Africa. Drawing on the work of Addison and Cornia (2001), we test for an inverse "U" relationship between inequality and growth, as high inequality tends to impede the equitable distribution of the benefits of growth. To test this, the Gini index is incorporated into the growth equation.

The first results confirm the validity of the linearity hypothesis. An increase in the Gini index by 1 point leads to a decline in growth, ranging from 0.307 (2SLS) to 0.298 (3SLS). These results are in line with the findings of Noomen Lahimer (2009), who reported a coefficient between 0.130 and 0.63 points based on three estimation methods (2SLS, short-term 3SLS, long-term). This contrasts with the findings of Forbes (2000), who found that the effect of inequality on growth was 0.0036, and Deininger and Squire (1998), whose studies found effects between 0.047 and 0.063. However, all of these studies involve heterogeneous panels subject to various biases, making simple controls of silent variables insufficient to account for structural effects. Thus, our results are more aligned with those from Sub-Saharan Africa, particularly the work of Noomen Lahimer (2009). According to the results in Table (1), inequality negatively affects growth in North African countries.

These findings from the growth equation yield several important insights. First, the relationship between FDI and economic growth shows that FDI contributes to economic growth in North Africa. This results from the inflow of foreign capital, improving the balance of payments, and the exploitation of natural resources, which are then processed into manufactured goods by multinational companies. Furthermore, the trade openness ratio is a key indicator in the region's openness policies. On the other hand, domestic investment does not appear to significantly impact growth, which may indicate

a crowding-out effect where multinational firms reduce the space for domestic companies.

The second key point is the negative relationship between inequality and economic growth. These negative effects can be attributed to barriers between social classes and economic distortions. Finally, the analysis of education's effect on growth shows a positive but statistically insignificant relationship. As noted by Collier (2007), concentrating access to education in one segment of the population can increase disparity, exacerbating inequalities and fostering institutional distortion. This analysis underscores the important role income inequality plays in determining economic growth.

## 4.2. The inequality equation

In this equation, we explore the effects of FDI, institutional variables, and growth on inequality. The level of inequality in North Africa is largely explained by the institutional characteristics of these countries. In this context, we test the effect of corruption control on inequality. The results from both estimation methods indicate that a 1-point increase in the corruption control variable leads to a reduction in inequality in North Africa, ranging from 0.9 to 1.8. This finding suggests that combating corruption can help reduce inequality in the region. Corruption directly impacts interactions between economic agents, including contract enforcement, property rights, administrative procedures, and the functioning of the public sector. Reducing corruption fosters greater equality in access to opportunities, thereby promoting a fairer redistribution of resources and helping to reduce inequalities.

**Table 2: Estimation of the determinants of inequality in North Africa (1995-2023)**

| Gini | Growth and FDI | | With IDE and without growth | | With growth and without FDI | |
|---|---|---|---|---|---|---|
| | 2SLS | 3SLS | 2SLS | 3SLS | 2SLS | 3SLS |
| LGDP | -2.280** (0.870) | -2.613** (1.286) | .......................... | | -0.089 (0.063) | -0.175 (0.663) |
| LFDI | 0.254*** (0.072) | 0.239** (0.096) | 0.102*** (0.036) | 0.104** (0.056) | .......................... | |

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|---|---|---|---|---|---|---|
| Linv | 0.089 (0.063) | .0023 (0.008) | 0.018** (0.07) | 0.010** (0.007) | 0.013*** (0.01) | 0.0030*** (0.007) |
| Linf | -0.037*** (0.008) | -0.058*** (0.008) | -0.012*** (0.011) | -0.014*** (0.008) | -0.035*** (0.008) | -0.066*** (0.008) |
| LCCRP | -0.007 (0.0112) | -0.009** (0.011) | -0.009 (0.11) | -0.014 (0.12) | -0.008 (0.108) | -0.018* (0.010) |
| Lopening | 0.189*** (0.025) | 0.219*** (0.024) | 0.139*** (0.021) | 0.061*** (0.020) | 0.192*** (0.024) | 0.221*** (0.023) |
| CONSTANT | 2.138 (0.26) | 2.165 (0.25) | 2.83 (0.150) | 4.837 (0.145) | 2.114 (0.253) | 2.193 (0.24) |

**In parentheses are written the absolute values of Student's "t": *** Significant at the 1% threshold; ** Significant at the 5% threshold; * Significant at the 10% threshold.**

Economic theories have highlighted the strong connection between FDI and inequality, arguing that FDI is highly sensitive to inequality levels in host countries. The results show that FDI has a positive and significant effect in both estimation methods. Specifically, an increase in FDI by 1 point leads to an increase in the Gini coefficient ranging from 0.239 to 0.254 points. Political economy models provide insight into this outcome, suggesting that multinational corporations indirectly contribute to the concentration of income among the elite, thereby exacerbating inequality. This positive relationship between FDI and inequality is observed in both regressions presented in Table (2). However, these regressions are subject to potential endogeneity between FDI and growth. To address this, the first step involves excluding growth from the equation and then omitting FDI.

The effects of FDI on inequality remain positive and significant across both estimation methods. A 1-point increase in FDI results in a modest rise in the Gini coefficient, ranging from 0.102 points (2SLS) to 0.104 points (3SLS). However, these positive effects of FDI are moderated by the presence of appropriate institutional mechanisms in North Africa. Maria Angels et al. (2002) studied the relationship between political institutions, FDI, and inequality across 119 developing countries. They concluded that the corruption

control index has a significant positive impact on FDI, as a well-functioning democracy encourages foreign investment, which in turn drives economic growth. Consequently, they recommend that governments focus on establishing and maintaining the rule of law and transparency. Henri (2013) further demonstrated that political stability and regulatory frameworks positively influence economic growth in Africa.

Regarding the relationship between inequality and growth, the equation shows that an increase in economic growth by 1 point results in a decrease in inequality of 0.107 points (column 1) to 0.175 points (column 2). This result is robust across both estimation methods. Similar findings were observed in the studies of Mbabazi and Ly (2002) and Noomen Lahimer (2009), which demonstrated that growth reduces inequality, with coefficients of 0.8 and 1.1 points, respectively, in Sub-Saharan Africa. When applying Kuznets' assumptions, the results diverge in the quadratic effect, where the relationship between the logarithm of GDP and the Gini coefficient is confirmed in both columns. Fosu (1992) and d'Haan and Siemann (1996) found that political instability negatively affects economic performance, hindering the ability to reduce inequality. Guillaumont and Brun (1999) shared a similar conclusion, though they contested this effect in the context of African countries, showing that political instability defined by coups and civil wars directly influences economic growth but does not bias accumulation or investment.

From the previous two equations on growth and inequality (inequality with and without FDI, and inequality with and without growth), it is clear that FDI has a positive impact on growth in North Africa in both estimation methods. However, FDI appears to have a negative effect on inequality. Regarding the relationship between inequality and growth, the latter demonstrates a positive effect in reducing inequality. Given these findings on the interplay between FDI, growth, and inequality, several questions arise: Are the positive effects of FDI on growth sufficient to offset inequality in North Africa? Or is there a leverage effect of FDI on the "growth, inequality, and poverty" triangle? The poverty equation will help address these questions.

## 4.3. The Poverty Equation

The analysis of the poverty equation centers on examining the effects of FDI, income growth, and inequality. Estimating this equation is the primary goal of this study.

**Table 3: Estimating the determinants of poverty incidence in North Africa (1995-2023)**

| LHPI | Growth and FDI | | With IDE and without growth | | With growth and without FDI | |
|---|---|---|---|---|---|---|
| | 2SLS | 3SLS | 2SLS | 3SLS | 2SLS | 3SLS |
| **LGDP** | 0.037*** (0.011) | 0.098 (0.015) | ........................... | | 0.063* (0.022) | 0.146*** (0.037) |
| **LFDI** | 0.018** (0.003) | 0.029* (0.0013) | 0.012*** (0.132) | 0.0130 (0.0246) | ........................... | |
| **LGINI** | 1.951** (0.132) | -0.143* (0.014) | -0.123** (0.48) | -0.153** (0.052) | -0.130** (0.450) | -0.168** (0.677) |
| **LEDUC** | 0.426*** (0.808) | 0.040*** (0.480) | 0.412*** (0.130) | 0.418** (0.134) | 0.402*** (0.130) | 0. 22*** (0.140) |
| **LCDEM** | -0.122 (0.15) | -0.122 (0.144) | -0.320** (2.24) | -0.320** (0.142) | 0.310** (0.138) | -0.089 (0.140) |
| **LDWC** | 0.339** (0.15) | 0.339** (0.152) | 0.428*** (0.162) | 0.428*** (0.157) | 1.240** (0.556) | 0.370** (0.150) |
| **LINAC POP** | -0.042 (0.033) | -0.038 (0.31) | -0.044 (0.031) | -0.027 (0.030) | -0.089 (0.144) | -0.030 (0.018) |
| **CONSTANT** | 7.935 (6.01) | 7.135 (5.80) | 12.72 (5.67) | 14.72 (5.60) | 5.414 (5.67) | 5.48 (5.50) |

**Note : in brackets are the absolute values of Student's "t" *** Significant at the 1% threshold; ** Significant at the 5% threshold; * Significant at the 10% threshold.**

The impact of economic growth on the poverty indicator in North Africa is relatively modest, as indicated by the poverty equation. An increase of 1 point in growth results in a rise in the Human Development Index (HDI) from 0.037 to 0.1 (2SLS). According to the World Bank's 2012 Human Development Report, most countries show a positive correlation between high GDP per capita growth and improvements in HDI, with a tendency toward convergence to higher living standards. For instance, between 1980 and 2011, GDP per capita

grew at an average rate of 7.8% per year, resulting in an average annual increase in HDI of 1.73%. In contrast, Ethiopia, with an average annual increase in living standards of just 1.6%, saw little improvement in HDI. The 2010 Human Development Report highlights the progress in human development through various indicators.

For the effects of FDI, the impact mirrors that of economic growth. A 1-point increase in FDI results in a rise in the HDI from 0.018 (Cologne 1) to 0.03 (Cologne 2). Over the long term, FDI does not appear to significantly reduce poverty in North Africa. Education, however, has a positive and significant effect on poverty reduction in both estimation methods. An increase of 1 point in education results in a slight increase in the HDI, from 0.040 (Cologne 1) to 0.426 (Cologne 2). On the other hand, population growth and inactive populations have negative and insignificant effects in both methods. Infrastructure, such as drinking water access, has positive and significant effects on the HDI, which in turn aids in poverty reduction.

Following the analysis of the effects of growth and FDI on the poverty indicator, the effects of exogenous variables, namely growth and FDI, are considered separately. The effect of growth on the HDI is positive and significant in the final two estimation methods. A 1 point increase in growth results in an increase in the HDI from 0.063 (2SLS) to 0.146 (3SLS). When economic growth outpaces population growth, it translates into an improved standard of living, typically measured by GDP per capita. This increase in material wealth corresponds to a better quality of life and enhanced human development. Growth also alleviates poverty, which can be defined as the inability to meet either physiological (absolute) or social (relative) needs.

Regarding FDI's effect on the HDI, it also becomes positive and significant in both methods. A 1-point increase in FDI results in a lighter rise in the HDI, ranging from 0.012 to 0.03 points. The results suggest that inward FDI in North Africa has a direct positive impact on the HDI, particularly from 1995 to 2021. These results highlight several points:

First, they underscore the importance of FDI for sustainable development in North Africa, particularly for improving social conditions and the population's standard of living. The fact that FDI inflows significantly affect the

HDI supports theories of endogenous growth and sustainable development. In these theories, integrating foreign investment into the local economy yields substantial direct benefits for domestic businesses and the active workforce. Consequently, FDI improves the quality of life and worker qualifications in North Africa.

Moreover, the arrival of foreign investors and workers creates ripple and imitation effects across the population. The efforts of companies and the state to build a workforce capable of meeting investment need lead to societal changes, adapting to new lifestyles. Multinational companies' involvement in building rural infrastructure such as education, drinking water access, and rural electrification plays a key role in this process. However, the high vulnerability of North African economies to the international economic and financial environment limits the expected economic impact of foreign investments. These limitations may explain the relatively modest increase in the HDI (0.012 to 0.03 points).

In conclusion, the effects of growth and FDI on poverty reduction in North Africa are limited. Regarding the impact of inequality on the HDI, the estimates in Table (3) show that inequality has negative and significant effects in both estimation methods. A 1-point decrease in inequality leads to an increase in the HDI from 0.143 to 1.951 points. Conversely, an increase in the Gini coefficient exacerbates poverty. These results suggest that reducing inequality is a powerful tool for redistributing wealth and reducing poverty in North Africa.

The simultaneous equations for all three models show that FDI has a reciprocal effect between growth and inequality. In the growth equation, FDI positively affects growth, and growth in turn influences inequality. Additionally, FDI influences inequality and inequality impacts economic growth through various social and political mechanisms, contributing to social unrest, as seen in the Arab countries.

After analyzing the total effect of FDI on poverty reduction through growth and inequality, these effects are broken down into two components: the indirect effect via growth and inequality equations, and the direct effect through the poverty incidence equation.

## 5. Limitations and future research

The effect of foreign investment on poverty levels in North Africa extends beyond the relationship between foreign investment, economic performance, and social justice to encompass issues of good governance and domestic investment, which will be addressed in future work.

This article examined the relationship between economic growth, foreign direct investment (FDI) flows, and poverty reduction. However, since economic growth is a relatively broad concept in development economics, we propose several directions for future research as part of a deeper analysis:

1) **Causality effects:** This study is limited to analyzing the correlation between economic growth, inequality, FDI flows, and poverty reduction. In order to identify the direction of influence among these variables, it would be necessary to apply causality tests. This would help clarify whether the relationship between economic growth and FDI inflows is unidirectional or bidirectional.

2) **Incorporating additional economic indicators:** The analysis primarily focused on the impact of economic growth and FDI inflows on poverty reduction. However, this approach could be extended to include other key economic variables, such as domestic investment and the quality of governance.

3) **The impact of economic growth and FDI on poverty in other countries:** This study focuses on developing countries, with particular emphasis on North Africa. Nevertheless, as economic growth and FDI increasingly play a crucial role in poverty reduction -especially in other regions such as the MENA area-it would be valuable to conduct more in-depth analyses in these contexts.

4) **The impact of FDI on economic growth:** Given that FDI inflows are generally driven more by economic factors than by institutional or governance-related factors, a case study approach could be adopted to better understand the impact of FDI on economic growth and, indirectly, on poverty reduction in developing countries.

## 6. Conclusion

This article provides an empirical study of the relationship between FDI, growth, inequality, and poverty in North African countries, yielding several important findings. FDI's effects on poverty reduction can be understood through three key relationships. The first is its positive impact on economic growth, which contributes to improvements in social well-being. However, the limited integration of FDI with local firms in landlocked countries complicates the transfer of technology. The second relationship shows that FDI exacerbates inequality, driven by the nature of multinational firms and the prevailing institutional conditions. In corrupt or politically unstable states, this often leads to social conflicts.

The third relationship involves the reciprocal effects between growth and inequality, with growth initially increasing inequality but eventually reducing it. The Kuznets curve shows that the impact depends on institutional characteristics. The decline in corruption control leads to institutional consolidation, which helps reduce inequality.

Finally, regarding the direct effect of FDI on poverty reduction, while FDI has a modest positive effect, it is not statistically decisive. Poverty reduction is more closely tied to effective institutional policies that control corruption, reduce inequalities, and ultimately foster poverty alleviation.

In summary, the total effects of FDI on poverty reduction in North Africa are positive but limited. FDI has a positive but smaller effect on growth and a negative effect on inequality, consistent with the model results, which suggest that FDI alone cannot significantly reduce poverty. The negative effects of poor institutional integration with multinational firms hinder wealth distribution and have adverse consequences for the poorest populations.

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