The Relationship between economic Growth, Inequality of income distribution and Poverty in Egypt

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Abstract:

The study aims to determine the nature of the relationship between economic growth, inequality of income distribution, and poverty in Egypt during the period (1998-2022), using a multiple linear regression analysis model.

The study aimed to test the validity or falsehood of the proposed research hypotheses, which are there is an inverse correlation between inequality and GDP growth rate in Egypt, and there is an inverse correlation between poverty and GDP growth rate in Egypt.

The study found an inverse correlation between both the inequality in income distribution, poverty and the growth rate in Egypt. In other words, reducing both inequality of income distribution and the level of poverty in Egyptian may enhancing the economic growth rate. Thus, the validity of the study hypotheses was confirmed.

The study concluded that it is necessary for the Egyptian government to adopt appropriate policies to reduce the level of poverty and reducing inequality income distribution. These policies should focus on improving employment prospects, providing job opportunities for the poorest groups, and enhancing education and vocational training, and providing adequate job opportunities for youth and the poorest groups.

Keywords: poverty - inequality - Gini - GDP - the Egyptian economy

1. Introduction

There has been increasing attention on poverty reduction in the economic development literature over the past two decades. Progress in poverty reduction has become a key measure of the success of economic development policies. In the 1970s and 1980s the focus was on growth and the need for economies and incomes to grow. Hence, growth was considered a prerequisite for improving well-being. In the 1980s, many developing countries implemented Structural Adjustment Programs (SAP) aimed at promoting growth. The implementation of these programs has led to many countries recording positive real growth rates.

In the development literature of the 1990s, the prevailing idea was that growth was the central element of any strategy aimed at reducing poverty. Studies show that countries that have made significant progress in reducing poverty are those that have recorded rapid and high growth rates (World Bank 2000, Dollar and Kraay 2000). This view has changed somewhat to suggest that it is not the growth itself that is important, but the structure of growth that is important (Ravallion and Datt, 1996, Mellor 1999). The importance of income inequality when it comes to making progress in poverty reduction has also been recognized (Addison and Cornia, 2001), as it has been noted that progress in poverty reduction is difficult to achieve when levels of inequality are high and rising. This contradicts previous development theories that indicate that inequality stimulates growth and thus reduces poverty through growth. This attracted the attention of researchers to the role of inequality in the process of growth and poverty reduction.

Therefore, the study will investigate the nature of the relationship between growth and both poverty and income inequality, to determine the direction of the relationship between them by applying it to Egypt's data during the period (1998-2022), using multiple linear regression analysis, at a significance level of 5%, This is to ensure the validity or error of the study hypotheses, which are:

1- There is an inverse correlation between inequality and GDP growth rate in Egypt
2- There is an inverse correlation between poverty and GDP growth rate in Egypt

2. Theoretical and empirical literature

The literature can be divided into four sections: first, a look at the development of economic growth theories, second, literature that reports the impact of economic growth on inequality, third, literature that tests the impact of inequality on economic growth, and fourth, literature that tests the relationship between economic growth and poverty.

2.1. Development of economic growth theories

According to neoclassical theory, there is a direct relationship between inequality of income distribution and economic growth, as changes in the tax structure, which have a direct impact on saving, can affect growth rates, depending on changes in the capital-labor ratio. In this framework, savings returns determine people's motivations to accumulate income or wealth, which changes the distribution of income or wealth. Therefore, an economy with a decreasing income tax makes society more unequal in income, which may provide strong incentives for the wealthy to save or accumulate their wealth and thus stimulate faster economic growth.

Growth theories have evolved from theories that predict the convergence of growth rates between countries, which were criticized by empirical studies, to theories that explain the significant variation in economic growth rates between countries, which has captured the attention of much of the economic literature.

The neoclassical growth theory put forward by Solow (1957, 1994) made a controversial prediction about the convergence of per capita income between countries after controlling for factors such as saving rates, population growth, etc. This hypothesis can significantly explain differences in per capita income between countries through variations in savings rates and population growth. However, recent empirical evidence suggests that factors such as endogenous technological progress, human capital accumulation, returns to research and development (R&D), and government policies may have stronger and better explanatory power in determining variation in per capita income across countries. These factors are actually the focus of endogenous growth theories built on neoclassical theory.

Endogenous growth theories came to explain the lack of convergence in per capita income levels between developing and developed countries in terms of allocating resources to research and development Temple (1999). Moreover, there are other factors that contribute to long-term economic growth, focusing on the role of technology, international free trade, human capital, returns to scale, externalities, and others.

2.2. Literature examining the impact of economic growth on inequality

Kuznets (1955, 1963) conducted studies to determine the factors that affect the levels and trends of inequality in the long run and its relationship with economic growth. He was able to explain the relationship between inequality and economic growth in industrialized countries until the 1970s, which was later known as an inverted curve. U for income inequality, and there are many studies that support these findings. These studies began with Kravis (1960), then the study of Oshima (1962) who "fully confirmed" Kravis's own findings, and the studies of Adelman and Morris (1971), Paukert (1973), Ahluwalia (1974, 1976) who considered Kuznets' hypothesis "true." Innovative", Robinson (1976) who said that the hypothesis was an "economic law", in addition to the study of Ram (1988).

With the emergence of many comparative studies between countries in the 1970s, the Kuznets hypothesis gained the status of the latest models and formulas that express the relationship between income equity and growth Saith (1983), as the relationship became of great importance in developing poverty reduction strategies if inequality increases in the stage early development.

In the 1980s, some questions began to be raised about the Kuznets hypothesis, with Anand and Kanbur (1984) criticizing studies that supported the Kuznets hypothesis, arguing that they used incomplete data and questionable methodology. Recently, Oshima (1994) concluded that Kuznets' hypothesis is completely absent and its conclusions do not apply in present-day Asian countries. Deininger and Squire's (1996) study provided a newly compiled dataset on inequality, which was an opportunity for a deeper investigation of this topic, as it included data on a larger and more representative number of income data, containing 682 Gini index observations in 108 countries. By analyzing this data, the results of the study by Deininger and Squire (1998) did not support Kuznets' hypothesis of the inverted U-shape. When tested on a country-by-country basis, they found that 90% of the countries studied did not confirm the validity of Kuznets' hypothesis.

There is also a slightly modified "dynamic version" of Kuznets' hypothesis, which posits that inequality increases when the rate of income growth increases. Fields's (1989) study also found no systematic relationship between changes in inequality and the rate of income growth. Deininger and Squire (1998) also studied the relationship between changes in inequality and the rate of economic growth, and concluded that there was no systematic relationship between growth and changes in inequality; periods of growth were as often associated with increases in inequality as with declines.

In the end, the non-uniformity of Kuznets' hypothesis becomes clear. Because there is no strong evidence that inequality increases as a result of economic growth, on the contrary, Ravalli on and Chen (1997) provide evidence that the inequality index decreases with economic growth. They studied a sample of 64 countries during the years 1981 and 1994, and found an inverse relationship between economic growth and changes in inequality. However, this correlation disappears when the transitional economies of Eastern Europe and Central Asia are excluded. Recent research seems to indicate that inequality as measured by the Gini index is stable over time in a large number of countries Li et al. (1998).

2.3. Literature testing the impact of inequality of income on economic growth

Much literature has been interested in studying the impact of inequality of income distribution on economic growth, as it is assumed that economies that suffer from inequality of income distribution will grow faster than those economies with an equal distribution of income. This thinking is based on standard economic theory, which assumes that the marginal propensity to save is higher for the rich than for the poor. Thus, economies with higher income or wealth inequality are more likely to have higher rates of saving, which translates into higher investment and hence output growth.

Although according to the neoclassical theory, there is a direct relationship between the index of inequality of income distribution and economic growth, there are empirical studies that agreed with the neoclassical theory, and there are other studies that strongly criticize these arguments, as Korea experienced high growth in GDP per capita in addition to low inequality. And stable over the past three decades. In contrast, Thailand achieved high growth rates compared to other countries in Asia and beyond, but inequality remained high throughout the development process.

On the other hand, some studies show agreement confirming the existence of an inverse relationship, whereby the lower the indicator of inequality of income distribution, the better the growth rates, as in the study of Aghion et al. (1999), where this study suggests that reducing inequality will enhance investment and growth incentives in the short run to increase inequality as a result of the technological progress it stimulates. What is therefore needed are permanent distribution policies in order to control the level of inequality and promote growth. Hence, future research should focus on the design and implementation of such policies.

Banerjee and Duflo (2003), Alesina and Rodrik (1994), and Perotti (1996) also found an inverse relationship between a decline in income inequality and growth in cross-section data, but later, Li and Zou (1998) and Forbes (2000) found the opposite result using data across multiple time periods. Barro (2000) found that inequality of income distribution can affect growth in different ways depending on a country's income level, while Panizza (2002) finds that results may depend on the model specification and the quality and type of data (Deininger and Squire 1998).

The multiplicity of factors that influence both inequality of income distribution and growth accounts for these contradictory results. For example, increasing inequality of income distribution could be the result of technological change that promotes growth and benefits talented individuals at the top (Goldin and Katz 2008). In contrast, if the pursuit of profits is the primary force behind increased incomes of the rich, then greater inequality of income distribution may be associated with lower growth (Stiglitz 2012).

In this context, Gallagher and Mawson (2004) assert that replacing physical capital accumulation with human capital accumulation as the main driver of economic growth may fundamentally change the effect of inequality of income distribution on growth. The study by Marrero and Rodríguez (2013) emphasizes that the degree to which the unequal distribution of income affects growth depends on the type of unequal distribution of income seen, which may be either the unequal distribution of income in opportunities or the unequal distribution of income in efforts. The study of Fučíkski (2005), Van der and Weide, and Milanović (2018) also indicates that the effect of inequality of income distribution is negative on income growth for the poor and positive on income growth for the rich, meaning that inequality of income distribution tends to reinforce itself. The effects of inequality of income distribution may depend on the structure of the economic sector (Ehrmann and Teece 2019) and on the degree of freedom between generations (Ayres and Abik 2020).

According to the study (Azariadis and Drazen 1990), a prominent mechanism of "boundary effects" includes several outcomes, such as indivisibility or increasing returns. If poverty is linked to credit constraints, the result is that economic individuals may be so poor that they are unable to afford the investments (in human or physical capital) or technologies needed to increase their income (Galor and Zeira 1993; Banerjee and Newman 1993). Malnutrition provides another example. In developing countries, poverty is associated with high rates of malnutrition (Dasgupta and Ray 1986), which affects cognitive abilities and school attendance and spills over into children's ability to learn. This difference in education also hinders growth (Galor and Moav 2004).

According to the study of (Mookherjee and Ray 2002; Engerman and Sokoloff 2006), institutional arrangements that place economic opportunities beyond the reach of the poor can also reduce income growth. The study (Banerjee 2000) also presented another mechanism that reinforces poverty, which is risk aversion, due to Because poorer individuals are typically more risk-averse, in the absence of well-functioning insurance and credit markets, they will ignore lucrative investment opportunities that they view as too risky. Poverty can also influence individuals' decision-making processes, causing them to move toward activities that promote less growth. For example, the poor allocate a large proportion of their income to meeting basic needs (Shah et al. 2012) and to purchasing "temptation goods" (Banerjee and Mullainathan 2010) and reduce resources allocated to education, health, and investment. Poor individuals also show lower ambitions, as they anticipate that their current situation will hinder their future success (La Ferrara 2019).

Despite the diversity of these analytical models, evidence regarding their applied relevance remains largely inconclusive. Some papers (Durlauf 2006) have searched for different empirical conformations that are consistent with these models, such as total nonentity (Azariadis and Stachurski 2005) and convergence clubs (Quah 1993). A more comprehensive empirical review of advanced mechanisms in the literature did not find strong evidence that they may be effective, except perhaps in remote or deprived areas (Kraay and McKenzie 2014). More recently, large-scale randomized evaluations have been conducted, such as that by Bandiera et al. (2017) in Bangladesh,

It provides strong evidence that the poor face capital market imperfections that keep them in a poverty trap associated with low assets and low employment. It is somewhat surprising that few papers have captured the basic macro implication

of the poverty trap literature, namely that countries with a higher level of poverty should grow more slowly, as both Marrero and Servén (2018), as well as López and (2015) show. Servén and Ravallion (2012) all conclude that poverty hinders growth, while Easterly (2006) shows that poverty has a negligible impact on growth.

Different mechanisms affecting growth generally operate in conflicting directions through different channels, leading to conflicting conclusions. In the empirical scientific literature, a growing prevailing view finds that the long-run effect of inequality on growth is largely negative, and only when considering relatively short time periods does the relationship turn positive (Halter et al. 2014; Brueckner et al. 2015; Berg et al. al. 2018; Brueckner and Lederman 2018).

2.4. Literature examining the relationship of economic growth with poverty

The prevailing view in development theories in the 1950s and 1960s was that economic gains could be achieved by achieving rapid rates of economic growth that spread automatically across all segments of society and reduced poverty rates. This view is based on the theory of upward accumulation which posits a vertical flow from the rich to the poor that occurs through economic activity, such that the gains from economic growth go first to the rich and then in the second stage the poor begin to benefit as the rich begin to spend their gains. Hence, the poor benefit from economic growth only indirectly through a vertical flow from the wealthy. This means that the relative gains in growth accruing to the poor will always be smaller. However, it was believed that growth would reduce poverty quickly. Therefore, the main interest of investors in the 1950s and 1960s was to promote growth through increased saving and investment. In the early seventies. The upper accumulation theory has lost some of its luster.

This opinion is supported by many results of studies that analyze data from a large sample of different countries, indicating that there is a close, inverse relationship between growth and poverty, meaning that the higher the growth rates, the lower the poverty, and thus countries that witness high growth over a sustainable period achieve a greater reduction in poverty. Ravalli on and Chen (1997) showed that a 10% increase in the average standard of living leads to an average reduction of 31% in the proportion of the population living below the poverty line. This result suggests that growth can reduce the incidence of poverty very quickly. This explains the emergence of doubts about the phenomenon of

"upper accumulation" in the post-1970 period, as poverty may continue to be widespread despite good growth rates. Hence the keen interest in the concept of pro-poor growth.

Some empirical studies have shown that the rate of poverty reduction with growth also depends on initial inequalities in income and assets. Using cross-country comparative analyses, Ravallion (1997) estimates the elasticity of poverty to growth with different levels of initial inequality. Poverty elasticity, which measures the ability of poverty to respond to growth, is found to be lower the higher the level of initial inequality. For example, a country with a Gini index of 0.25 is likely to have a poverty elasticity of -3.3, meaning that a 1 percent growth rate will reduce the amount of measured poverty by 3.3 percent, while a country with a Gini index of 0.6 is likely to have a poverty reduction of 1.8 percent. These results clearly demonstrate the importance of primary income inequality in explaining differences in the rate of poverty reduction in different countries. Deininger and Squire (1998) also reach a roughly similar conclusion that "primary unfairness primarily harms the poor, not the rich." They assert that this finding is consistent with the theoretical literature that emphasizes credit tightness and the inability of the poor to make productive investments as a mechanism that transmits the effects of initial inequality and growth.

Bergstrom (2020) also finds that 90% of the variation in poverty can be explained by variation in GDP per capita across a large group of countries. However, this is because the variance of per capita population returns is much larger than the inequality of income distribution; In fact, in most countries in the group, the estimated income inequality elasticity of poverty exceeds the estimated income elasticity of poverty, suggesting that a decrease in income inequality offers significant (and largely untapped) potential for reducing poverty rates. In comparative terms.

There is broad agreement that growth reduces poverty (Dollar and Kraay (2002), while the most recent and subsequent study by Kraay (2006), Dollar et al. 2016, in which alternative databases were used, came with results confirming the existence of evidence that the income of the poorest deciles changes at the same rate. by which median income changes and, thus, promotes poor inclusive growth (see also Ferreira et al. 2010 or Loayza and Raddatz (2010). Recent work confirms this finding (Fosu (2017; Bluhm et al. (2018); Bergstrom 2020).

It can be concluded that experimental studies indicate the stability of indicators of income inequality in many countries over time, which represents a criticism

of Kuznets' theory, which assumes an effect of the growth rate on the inequality index, which is represented by an inverted U. On the one hand, according to the neoclassical theory, there is A positive relationship is expected between the indicator of inequality in income distribution and economic growth. However, there are experimental studies that agree and confirm this theory, while other studies strongly criticize these arguments.

As for the relationship between poverty and economic growth, there is broad agreement that economic growth reduces the level of poverty. This view is consistent with development theories adopted in the 1950s and 1960s, which expected that achieving rapid rates of economic growth would result in economic improvement that would spread to all segments of society and reduce poverty rates.

3. Analysis of growth, inequality of income distribution, and poverty in Egypt

Egypt has followed multiple economic policies during the last twenty-five years, which is the period under study, that is, since 1998, that is, through the nineties and first millennium until now, in cooperation with the International Monetary Fund and the World Bank. Below we will provide an overview of some of these policies.

In the 1990s, Egypt began implementing the Structural Reform Program (ESAP) in cooperation with the International Monetary Fund. These policies aimed to achieve financial and economic stability by implementing structural reforms and liberalizing the economy. Key policies include reducing public spending, reducing subsidies for basic goods, liberalizing the exchange rate, and increasing foreign direct investment. Egypt also focused on implementing human development programs in cooperation with the World Bank. This program aims to improve social, health and educational services in the first millennium, enhance employment opportunities and improve the standard of living of citizens. In recent years, Egypt has cooperated with the International Monetary Fund and the World Bank in implementing the economic reform and sustainable development program. This program aims to enhance economic stability, improve the investment climate, and achieve sustainable growth by implementing structural reforms in various sectors such as energy, taxes, trade, and the financial sector.

What also cannot be ignored is the major impacts that the Egyptian economy has witnessed since the Arab Spring in 2011, as a result of the political changes and economic liberalization policies that were implemented in cooperation with the International Monetary Fund, where the exchange rate liberalization policy was implemented in Egypt to achieve a balance of supply and demand for the currency. Locally in 2016. This liberalization initially led to a decline in the value of the Egyptian pound against the US dollar and an increase in inflation. However, in the long term, this policy aims to enhance the competitiveness of Egyptian exports and attract foreign investments.

Policies were also implemented to reduce financial support for basic commodities such as fuel and electricity, and this led to an increase in the prices of these commodities and its impact on the costs of living for citizens. However, this policy aims to improve the sustainability of the state's financial resources and direct support to the neediest groups. All of these economic and political changes have had complex and diverse impacts on poverty rates and the equity of income distribution in Egypt. Despite the expected improvements in economic benefits in the long term, there may be a short-term impact on some poor groups affected by high inflation and increased Cost of living. This emphasizes the importance of implementing balanced policies to mitigate these effects and enhance financial inclusion.

We summarize the status of the Egyptian economy in the three aspects of interest of the study: the rate of economic growth, the level of poverty, and ending with income distribution over the past twenty-five years, as the Egyptian economy witnessed important transformations and developments in these areas:

3.1. Egyptian economic growth rate:

From 1999 to 2024, the Egyptian economy witnessed fluctuations in the rate of economic growth. In the first years of this period, from 1998 to 2007, the average economic growth rate averaged about 5%, then it declined to 3.8% during the period 2008 to 2015, as growth was affected by challenges such as the global financial crisis in 2008 and the political turmoil in Egypt after the 2011 revolution. The Egyptian economy during the period from 2016 to 2022 witnessed a relative improvement, as the average economic growth reached 4.7%, and this reflects the restoration of economic stability and the structural reforms taken by the Egyptian government (World Development Indicators).

3.2. Poverty in Egypt:

Despite the improvement during the period from 2016 to 2022 in the rate of economic growth, Egypt still faces major challenges in combating poverty. Although Egypt has witnessed some progress in poverty indicators, there are still high rates of poverty. The poverty rate in Egypt reached 24.1% of the total population during the period from 1998 to 2004, then this percentage decreased to 17.7% of the total population during the period 2008 to 2015, rising to 19.8% of the total population during the period 2016 to 2022, and this is mainly due to economic challenges, including high inflation, budget deficits, lack of cash reserves, and high unemployment, despite the Egyptian government's adoption of economic reform program measures that were implemented with support from the International Monetary Fund starting in 2016, which included liberalizing the exchange rate, reducing financial support, and implementing structural reforms in Government sectors (World Development Indicators).

Most of the poor live in the governorates of Upper Egypt. Through the poverty indicators that do not improve during the study period, it can be said that Egypt faces challenges with regard to poverty, especially since the recent reforms in Egypt have begun to address some of the challenges of economic sustainability in the Egyptian economy, as the recommendations of the World Bank Group study (2019) come in that they must Targeted social protection programs remain an essential element of poverty reduction policy, and addressing these challenges would enable poor and middle-income groups to participate and benefit from Egypt's efforts towards market-oriented economic development.

Extreme poverty in Egypt, as measured by the international poverty line estimated at US$1.90 per day in 2011 purchasing power parity, fell from 4.3 percent in 2005 to 1.35 percent in 2015. Using the national basic needs barrier, the estimated poverty rate was in 2015 it is 29.2 percent, compared to a slight decrease of 30.4 percent in 2012-2013.

Disparities between Egypt's regions in poverty assessments dating back nearly two decades still exist in Egypt today. Upper Egypt still faces the highest poverty rate in the country, especially in Assiut, Minya, and Sohag governorates. About 30% of Egyptians are considered to be at risk of falling into the category of poor, and about 28% of them can be considered part of the middle class. Poverty rates

in the governorates of Upper Egypt are usually higher than those in the governorates of northern Egypt and urban areas. The middle class also spends more than the poor and those at risk of falling below the poverty line on non-food items such as health care, transportation, and education. Vulnerable groups and the middle class are somewhat better off than the poor on several indicators, due to non-financial aspects of the poor such as large family size, a large share of dependents, and lower access to sanitation facilities in their residential areas.

On the other hand, the current generation in Egypt has witnessed an improvement in the field of education over previous generations, but the poor, especially women, have not fully benefited from this improvement compared to other groups, as the percentage of people completing vocational and technical education has witnessed an increase of approximately five-fold over the generations. As a result of past public policy efforts. This increase in the proportion of people obtaining secondary vocational and technical education was even higher for the poor and those living rurally. However, many studies have shown that due to the high number of workers with these certificates and the poor quality of technical training provided, the labor market returns are very low for these graduates.

3.3. Inequality income distribution in Egypt (measured by the GINI index)

The GINI index is used to measure the fairness of income distribution in Egypt. This index ranges between (0 and 1), where the value (0) is considered to represent an ideal distribution (absolute justice), while the value (1) is considered to represent an unfair distribution (absolute unfairness).). (World Development Indicators). Egypt witnessed slight fluctuations in the GINI index in the period from 1998 to 2024. We find that during the period 1998 to 2007 it averaged 32.2, then decreased, which indicates a slight improvement in the duration of the fairness of income distribution, to 30.4 during the period 2008 to 2015, then increased slightly again, which It indicates greater inequality in income distribution, as it reached 31.7 during the period 2016 to 2022. From the above, it is clear that there has been a slight change, whether increasing or rising, despite the efforts of the Egyptian economy, which reflects the need to reconsider the evaluation of the policies used to reduce income inequality in Egypt.

Studies on the inequality of income distribution in Egypt generally focus on three distinct periods. Initial studies focused on inequality of income distribution in the land and rural sector, and were conducted in the backdrop of major land reforms in the 1950s and 1960s. The following period was characterized by studies of the unequal distribution of income between urban and rural areas in line with the period of migration influx and strong urbanization of the 1970s and 1980s. The 1990s and recent decade have perhaps seen a decline in interest in income inequality, with growth, liberalization and allocation in the economy attracting most attention and studies of income inequality often appearing in the context of poverty studies.

Different measures have been used to measure income inequality in cross-sectional studies, but the Gini coefficient has been the most commonly used. One of the most important sources of information on income distribution in Egypt since the late 1960s has been the Family Budget Surveys (FBS), also known as the Household Income, Expenditure and Consumption Surveys (HIECS) from 1990/91. . Nine surveys were conducted between 1959 and 2009 with different lags between them, making the comparability of their time estimates statistically imprecise. In addition, it was not until the 2000s that researchers gained access to the complete household data set. Before 2000, only aggregated data from FBS and HIECS were used to measure the inequality of income distribution in Egypt.

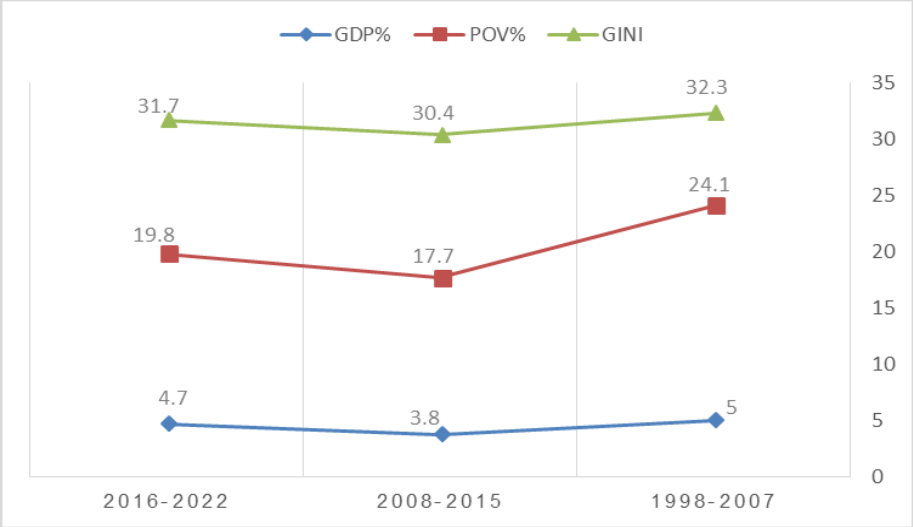
A review of studies on inequality of income distribution since the 1950s revealed the following facts. First, since 1958/59, income distribution in Egypt has been relatively fair compared to developing countries, as the peak level of inequality of income distribution reached 0.45 in 1990/91 and decreased to 0.31 in 1990. 09/2008. Secondly, the unequal distribution of income that Egypt witnessed during the 60 years studied ranges within a relatively narrow range with many of the radical changes that the economy has undergone over this long period. Thirdly, there is a noticeable difference in the estimates of the Gini index of household consumption for any given year. Between different studies, and sometimes even between studies of the same writers.

In general, it is possible to trace the evolution of income distribution between sub-periods over the past 50 years, but we cannot use current values of these estimates to confirm whether or not income inequality improved between 1958/59 and 2008/09. The changes are too small to warrant any firm conclusion

about the direction of income distribution. All we can say is that the stark inequality of income distribution that characterized rural areas in the 1950s improved in the mid-1960s, but likely fluctuated around the same values over the following decades. Although the losses in income shares of the poorest groups were greater in the urban sector than in the rural sector, and thus the gains of the richest groups were greater in the urban sector than in the rural sector, it is not clear whether income distribution has changed significantly over the course of the last 50 years Paola Veme, Branko Milanovic (2014)

Table No. (1) Egyptian economic indicators

GINI	POV%	GDP%	
32.3	24.1	5.0	2007-1998
30.4	17.7	3.8	2015-2008
31.7	19.8	4.7	2022-2016



Source: World Development Indicators

From the above summary of the economy's performance and through the previous table and figure, it can be noted that during the last period from 2006 to 2022, economic growth in Egypt recorded positive rates, reaching 4.7%, as a result of the structural reforms that were implemented and improved performance in various sectors such as tourism, construction, and manufacturing. As a result

of the implementation of infrastructure improvement projects, including the new Suez Canal project and development projects, this improvement in economic growth has not yet translated into a decrease in poverty rates and equity in income distribution. Rather, poverty increased to 19.8 and the GINI rate increased to 31.7, which indicates that the relationship between them is positive. This is consistent with the theory of upward accumulation, which means that the relative gains in growth accruing to the poor will always be less.

4. The statistical model used and the data

The study will use a multiple linear regression analysis model to determine the direction and strength of the relationship between growth and inequality in income distribution, as well as the direction and strength of the relationship between growth and poverty and the strength of this relationship, at a 5% significance level, in order to confirm the validity or error of the study hypothesis. .

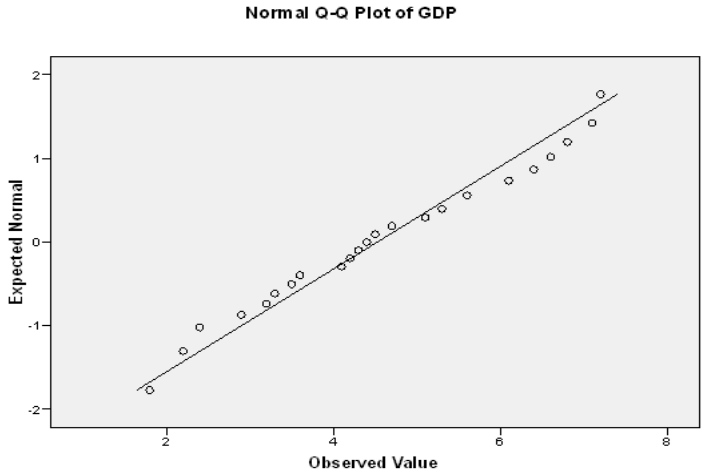
The model used can be formulated mathematically as follows: GDP = β_0 + β_1GINI + β_2POV +e

Where:

GDP	GDP growth rate	GINI	Inequality Income distribution of income
β0	constant term (gradient constant)	POV	Poverty
B	Regression coefficient of variables	e	Variables that are not visible or outside the measurement of this model

The applied study includes a dependent variable, which is gross domestic product, and independent variables, which are (equity of income distribution and poverty), during the time period covered by the study, which is thirty years from (1998-2022). It is worth noting that all values of the dependent variable and independent variables were obtained from World Bank data.

4.1. Results from applying the model:



We notice from the previous figure that the points are located very closely on the line connecting the upper corner and the lower corner, or these points are distributed randomly on both sides of this line, and therefore it can be said that the errors are distributed normally, which means that the residuals are distributed moderately (i.e. they follow the normal distribution).

Tests of Normality

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
GDP	.076	25	.200(*)	.961	25	.443

* This is a lower bound of the true significance.

a Lilliefors Significance Correction

It is clear from the results of the statistical analysis of the Kolmogorov - Smirnov test that the value of Sig (P.vlaue) is equal to 20% and is greater than the level of significance of 5%. Therefore, we accept the null hypothesis that the sample data follows a normal distribution.

Model Summary (b)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.643(a)	.413	.178	1.36689	2.472

a Predictors: (Constant), POV, GINI

b Dependent Variable: GDP

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	-14.118	12.024		-1.174	.293
	GINI	.568	.406	.518	1.399	.221
	POV	.065	.104	.231	.624	.560

a Dependent Variable: GDP

From the results of the previous tables, it is clear that the correlation between the independent variables and the dependent variable is a moderately strong inverse correlation, as the regression coefficient is a negative value, and the correlation between the variables reached (R = 0.643), which indicates the strength of the independent variables' interpretation of the change in the dependent variable, i.e. The independent variables (equality of income distribution and poverty) explain approximately 64.3% of the change in the dependent variable (GDP growth rate), and the remaining 35.7% of the changes that occur in the growth rate are due to other factors, including random error. The regression model can be formulated as follows:

GDP = -14.118 + GINI 0.568 + POV 0.065

5. Results and drawing recommendations

The study used a multiple linear regression analysis model, and results confirmed the validity of the study's hypotheses, which are:

1- There is an inverse correlation between inequality and GDP growth rate in Egypt
2- There is an inverse correlation between poverty and GDP growth rate in Egypt

The model used was able to explain 64.3% of the variance in independent variable GDP growth rate. It also turns out that there is an inverse relationship between the growth rate and both inequality of income distribution and poverty. By comparing these results, we find that they agree with Frank and Webb (1977), Lipton and Ravalli on (1993), Aghion et al. (1999), Ravalli on and Chen (1997), the study of Banerjee and Duflo (2003), and the study of Alesina and Rodrik (1994).) and Perotti (1996), where these studies suggest that reducing inequality of income distribution will enhance investment and growth incentives in the short run to increase inequality as a result of the technological progress it stimulates. What is therefore needed are policies that reduce levels of poverty and inequality and promote growth.

It can be concluded that if the Egyptian government wants to improve its growth rates, it might implement a set of policies that will reduce poverty and reduce the indicator of inequality of income distribution by implementing policies aimed at achieving a more equitable distribution of wealth and income. Taxes on the higher classes of society could be increased and aid and support provided to the poorest classes. The government should strengthen social protection by providing temporary support programs for needy and poor families, providing free or low-cost health care and education to the poorest groups, improving infrastructure in rural governorates and providing basic services such as safe water, sanitation, and electricity.

The Egyptian government need to focus on promoting development in the governorates of Upper Egypt, providing job opportunities, and improving basic services in those areas. Investment in local industries can be encouraged and support and facilities provided to companies established in these regions. The government should allocate more resources to improving health care and education in poor areas. Hospitals, health centers, schools, universities and scholarships can be provided in those areas to enhance opportunities and improve the overall standard of life. The government must take strict measures to combat corruption and ensure transparency in the political and economic process. Integrity can be enhanced and a more equitable distribution of wealth can be achieved through implementation. The government must also work to provide an attractive investment environment and encourage the private sector to increase investment and create new job opportunities.

The study and its results are considered a contribution to the body of studies in this field and support one of the views that there is an inverse relationship between poverty and inequality in the distribution of income and gross domestic product. The study also calls for more applied studies support this hypothesis with more and evidence of its validity.

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DATA AND SOURCE:

Years	GDP growth (annual %)	Gini index	Poverty headcount ratio at $3.65 a day (2017 PPP) (% of population)
1998	5.6	..	..
1999	6.1	32.8	20.1
2000	6.4	..	..
2001	3.5	..	..
2002	2.4	..	..
2003	3.2	..	..
2004	4.1	31.8	28.1
2005	4.5	..	..
2006	6.8	..	..
2007	7.1	..	..
2008	7.2	31.1	26
2009	4.7	..	..
2010	5.1	30.2	17.8
2011	1.8	..	..
2012	2.2	28.3	13.7
2013	2.2	..	..
2014	2.9	..	..
2015	4.4	31.8	13.2
2016	4.3	..	..
2017	4.2	31.5	22
2018	5.3	..	..
2019	5.6	31.9	17.6
2020	3.6	..	..
2021	3.3	..	..
2022	6.6	..	..

Data from database: World Development Indicators

العلاقة بين النمو الاقتصادي وعدم المساواة في توزيع الدخل والفقر في مصر

الملخص:

تهدف الدراسة إلى تحديد طبيعة العلاقة بين النمو الاقتصادي وعدم العدالة في توزيع الدخل والفقر في مصر خلال الفترة (١٩٩٨-٢٠٢٢)، وذلك باستخدام نموذج تحليل الانحدار الخطي المتعدد.

قامت الدراسة باختبار مدى صحة أو خطا فرضيات البحث المقترحة، وهي وجود علاقة عكسية بين عدم العدالة ومعدل نمو الناتج المحلي الإجمالي في مصر، ووجود علاقة عكسية بين الفقر ومعدل نمو الناتج المحلي الإجمالي في مصر.

وتوصلت الدراسة إلى نتائج تؤكد صحة الفرضيات، حيث تم التوصل الى وجود علاقة عكسية بين كل من عدم العدالة في توزيع الدخل والفقر ومعدل النمو في مصر. وهو ما يعني أن تخفيض مؤشرات كل من عدم العدالة في توزيع الدخل ومستوى الفقر في مصر قد يعزز معدل النمو الاقتصادي.

وخلصت الدراسة إلى ضرورة قيام الحكومة المصرية بتبني سياسات مناسبة لخفض مستوى الفقر والحد من عدم العدالة في توزيع الدخل. وضرورة تركيز هذه السياسات على تحسين فرص العمل للفئات الأشد فقراً، وتعزيز التعليم والتدريب المهني لكافية للشباب والفئات الأشد فقراً.

الكلمات المفتاحية: الفقر - عدم العدالة - الدخل - معامل جيني - الناتج المحلي الإجمالي - الاقتصاد المصري