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Effect of Relative Redistribution on Environmental Pollution in Oil-Exporting Countries

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Abstract:
Objective: Recent literature emphasizing the importance of income distribution for pollution. The GINI index is the most common indicator for measuring income inequality in previous studies. The new literature has focused on relative redistribution, which is quantified by the GINI coefficientis defined as the difference between the GINI based on market income and GINI based on disposable income. Thus, this study relies on the redistributive effect of taxes and transfers and its impact on carbon dioxide emissions.
Methods: The study is conducted using aggregated data from oil-exporting countries including Canada, the United States, the UK, Mexico, the Netherlands, Russia, and China between 2010 and 2020 by using a simultaneous equations system consisting of two equations so that economic growth and pollution emission are as endogenous variables. Elative redistribution, good governance, oil income, trade openness, and CO2 emission are the exogenous variables.
Results: Based on model estimates, income inequality, good governance, and oil income have a positive and significant impact on economic growth over the years studied, while inequalities in human development and population growth rates have a negative impact. Economic growth and trade openness also have a negative and significant impact on the spread of pollution
Conclusion: Taxes and transfer payments, as redistribution tools can stimulate economic growth. Relative redistribution as a more equitable way can lead to increased economic growth and economic growth reduces carbon dioxide emissions. Therefore, providing an appropriate standard of income inequality can help to better understand and formulate effective policies for income equality.

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1. Introduction

Numerous experimental research has looked at two significant obstacles—increasing income inequality and environmental degradation—given the threats to the rise of sustainable development. Recent years have brought attention to the huge disparity between the rich and the poor, which has spurred a heated discussion regarding the scope, causes, and effects of this inequality. Given the wide-ranging political, economic, and social ramifications, governments in the nation's economy view achieving a fair distribution as a primary objective. To ensure equitable distribution and promote economic growth and development, a variety of instruments are employed, including taxation and redistribution laws. Economic policymakers and strategists have long focused on how redistribution affects economic growth by balancing the margins of the rich and enhancing the stories of the less fortunate. The intricate relationship between redistribution and economic growth is crucial for economic recession planning, particularly for developing nations that aim to follow a course that aligns with their unique objectives. (2018 United Nations)

Environmental degradation is another issue that has recently been examined. The incorrect premise made by the EKC when analyzing the relationship between income and environmental degradation can be represented by a distorted U and U. The methods for altering the results vary depending on how distribution policies affect the average peripheral and average pollution emissions of the affluent and the poor. Different outcomes have been produced by particular national circumstances, legislation, and technological advancements, such as disruptive EKCs, income disparities, and opportunities that may be linked to environmental deterioration. Among the consequences are higher levels of trash production, energy consumption, and air pollution. One of the main environmental degradation drivers, air pollution, can exacerbate social and economic inequality, particularly in underprivileged populations and low-income nations. Social and economic inequality are made worse by environmental degradation, particularly in low-income nations. Groups with lower socioeconomic status are less able to manage environmental hazards. Their susceptibility is heightened when they are deprived of preventive services and robust infrastructure. In the end, environmental degradation exacerbates the gap in opportunities and results, endangering the health, economics, and well-being of marginalized groups and producing a vicious cycle of stability that impacts them. In the end, environmental degradation exacerbates the gap in opportunities and results, endangering the health, economics, and well-being of marginalized groups and producing a vicious cycle of stability that impacts them. Reducing welfare and preserving the environment can do this to aid in the reduction of inequality. (2018 United Nations)

In many circumstances, the outcomes of experimental evaluations conducted for distinct samples over varying times are incalculable when it comes to the veracity

of the two quarantine-related assumptions that deal with difficulties. Since there doesn't seem to be much research on the topic, particularly in oil-exporting countries, these two assumptions are being examined in our study for these countries to look at the correlations between the hypotheses. Because the income generated from this finite source is frequently concentrated in the hands of a small number of people or institutions, dependence on oil exports as the main source of crude oil in many oil-exporting countries adds to crude inequality. This concentration of wealth may result in access to resources and opportunities for the general public, as well as marginal inequality. Mass inequality can worsen social tensions and disparities in society, which can raise rates of poverty, social unrest, crime, and criminal activity in oil-exporting nations. This can lead to a vicious cycle of inequality as people at the bottom strive to get better off financially and keep closing the gap between the affluent and the marginalized. Widespread inequality in nations that export oil stands in the way of economic expansion and advancement. Economic advancement may be impeded when a considerable segment of the populace lacks the purchasing capacity to support the economy, hence limiting total consumption and demand for goods and services. In addition, unequal access to opportunities and resources can impede economic sustainability and diversity as well as marginalization and employability. (2018 United Nations

Recent years have seen an increase in greenhouse gases in the Earth's atmosphere, including methane, carbon dioxide, water, and nitrogen oxide. This has raised global temperatures and brought about unfavorable changes to the climate. As a result, the Kyoto Protocol was signed in 1997 following extensive negotiations aimed at reducing greenhouse gas emissions, which are major factors affecting climate change (2009). In terms of their economy's impact on oil, they extract their mineral and fossil resources for both domestic consumption and exports, and on the other hand, they attempt to expand the industry to achieve greater growth and development, turning to some highly demanding sectors for this purpose. As a result, it is anticipated that these nations will experience a rise in greenhouse gas emissions and environmental deterioration, which will cause serious environmental issues in these nations. (Houshmand and Khani 2018)

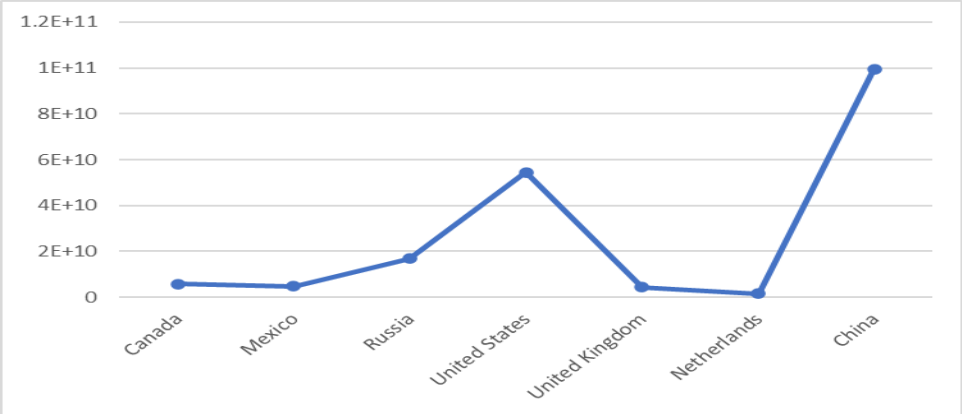
Should oil production rise, there will be less disparity in nations with low oil production, and more income inequality in those with high oil output. This topic's portrayal of oil dependency is truthful. The results indicate some unsettling channels. For instance, oil-dependent nations are more susceptible to rent-to-rent practices, which may have an unfavorable effect on the income distribution gap due to rising oil output and income. However, shocks to commodity prices have a greater impact on oil-dependent nations, which can lead to greater wealth disparity. (Berisha et al 2021).

Better environmental consequences can result from a fair distribution of money, which more equally distributes wealth throughout society. People may be more inclined to invest in environmentally friendly technologies, adopt sustainable practices, and support environmental regulations when they have more equitable access to resources and opportunities. Furthermore, equitable economic distribution can support social sustainability, which is frequently linked to greater environmental stewardship. However, unequal income distribution, which is marked by stark disparities in wealth, can make pollution in the environment worse. Environmental issues may not receive as much attention in areas where a tiny portion of the populace possesses a comparatively great amount of money. Rich people's or corporations' industries could prioritize profits over environmental sustainability, which could result in environmentally harmful practices such as pollution, deforestation, or unsustainable resource extraction (Bergh & Nilsso 2013).

Oil-exporting nations' carbon dioxide emissions demonstrate the variations in their environmental effects. Even though they produce a lot of oil, some of these nations emit fewer greenhouse gases than their peers because they may have implemented stronger environmental laws or diversified their economies to lessen their reliance on oil.

The various geographic and climatic circumstances in these regions are also reflected in changes in carbon dioxide emissions amongst oil-exporting nations. In contrast to Canada, which experiences colder temperatures and may rely more heavily on renewable energy sources, countries such as Mexico, which is situated in arid wilderness regions, can have distinct energy requirements and emission profiles (Smith & Jones 2019).

Chart 1- Average annual emission(Smith & Jones 2019)s of 2CO in oil-exporting countries during the 2010-2020 period



Source: https://ourworldindata.org

Instead of harming the environment and reducing pollution, technological advancements are changing the mix of industrial commodities and subsidiary facilities that are less polluting. The idea that developing countries often harm the environment to boost their GDP is reinforced by technological advancement. In the early phases of development, people's attempts to increase wealth growth are causing a rising amount of environmental pollution. Compared to higher income levels, pollution will decline as a result of rising national financial capacities, increased usage of less polluting technologies, and the adoption of new artistic forms along with wealth growth. Because environmental quality is currently seen as a luxury good, demand for it is rising concurrently with income levels. Even though oil exports have brought these nations immense riches, a sizable section of their populations still live in poverty, have limited access to basic amenities, and have little opportunity to advance economically and socially (Heidebrink & Antle, 1995).

In nations like the United States, for instance, oil wealth is frequently concentrated in the hands of a small number of powerful individuals or companies, while the bulk of the population seeks to fulfill their fundamental necessities. This creates stark conflicts between affluent non-residents and resident populations. Social indices including life expectancy, access to clean water, and marginalized inequality have all shown disparities in human development in oil-exporting nations. These nations frequently exhibit high levels of extreme inequality, with the wealthy and powerful reaping disproportionate benefits from oil revenue, creating a widening wealth gap. Oil-exporting nations' low investment in human development can be linked to several issues, such as resource mismanagement, corruption, and a preference for quick profits over long-term sustainable growth. Because of this, many of these nations are working hard to maintain the cycle of poverty and inequality while offering their inhabitants high-quality welfare, health care, and other necessities. A multifaceted strategy that incorporates governance changes, greater accountability and transparency in the administration of natural resources, and a dedication to investing in the empowerment and well-being of all residents is needed to address the disparities in human development in oil-exporting nations. Good governance in the context of environmental resources is a means of controlling decision-making to support sustainable development, which incorporates environmental protection. (Jones and Smith 2020)

A survey of experimental studies reveals that various nations have varied relationships between environmental performance and gender inequality. Inequality has been linked to a decrease in the spread of pollutants, according to some earlier research, while other investigations came to the opposite conclusion. Two holes in earlier research are filled in this paper. First, a more precise criterion for the distribution of pollution is investigated: relative redistribution, or

genetic tax computation based on post-tax fraud and transitional compensation. Due to the occurrence of oil dramas both after the release of pollution and after distribution, neither of the oil-exporting nations has looked into the matter yet. The impact of comparatively redistributing on investment is examined in this study, considering the significance of redistribution as a tool to minimize redundancy in society. To achieve this, the second section presents the theoretical framework; the third portion presents prior research; and the fourth section presents models and findings. In the fifth segment, conclusions are also covered.

2. Literature review

Economists are now increasingly focused on comprehending the dynamics of distribution and its effects as a result of the growing uncertainty and inequality that many emerging nations have experienced as a result of the expansion of international economic ties.

The environmental Kuzentes Curve (EKC), as it is known in the environmental economics literature, is based on a crucial component of the examination of the environmental effects of economic growth (expansion). In essence, the U-Warron plan the general income economic power and the value of living space have an unmatched association. (Harati et al 2016).

Early economic development has a negative correlation between income and environmental quality, with environmental degradation increasing and quality decreasing. However, income growth will start to improve environmental quality once it reaches a specific income level, or "return point." The two affluent and poor groups in society (the environmental expectations of the rich and the poor groups) determine the relationship between income disparity and environmental performance, which may be analyzed in three different ways (Hao et al 2016).

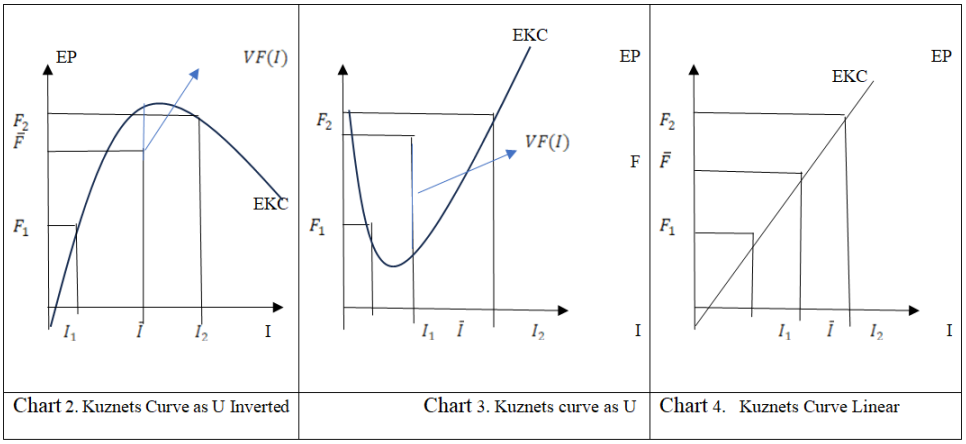


Chart 2. Kuznets Curve as U Inverted

Chart 3. Kuznets curve as U

Chart 4. Kuznets Curve Linear

1- The case where the EKC is reversed in U:

Assume that a society consists of two rich and poor people according to Chart 1, the poor person's income level and the level of pollution corresponding to it F_1Consider also for the wealthy person, the income level and contamination corresponds to it (F_2 ، I_2). While the EKC is distorted in U, the average pollution level ($\bar{F}$) is lower than the average income level of the two rich and poor people ($\bar{I}$). In other words, the redistribution of income from the rich to the poor is accompanied by an increase in the level of income of the poor and a decrease in the income level of the wealthy) a reduction in income inequality (the tendency to increase levels of pollution in the community compared with before the redistribution of income); therefore, there is a sharp relationship between income disparity and environmental contamination. The difference between the average level of pollution of the community ($\bar{F}$) and the level of contamination is consistent with the average income of and I_2 ($\bar{I}$), compared with VF(I).

2- The case where the EKC curve is U:

In the case of the EKC curve as U, the average level of population pollution ($\bar{F}$) is higher than the average level of pollution corresponding to the average level of income of the poor and the rich ($\bar{I}$). In other words, in this case, the redistribution of income from rich to poor which is associated with increasing income levels of poor and decreasing income levels (decreasing income inequality) reduces the level of pollution of society compared to before income redistribution. Therefore, between income inequality and pollution, the environment is a direct relationship.

3 - The case where the EKC curve is linear:

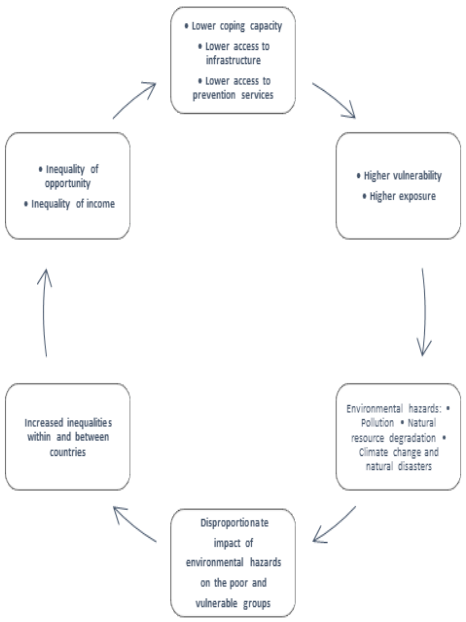
In this case, income inequality does not affect the quality of the environment. Therefore, we conclude that the relationship between income inequality and environmental performance depends on the form of the EKC curve, on the other hand, the impact of income inequality on the quality of the environment depends on other factors.

The two variables of per capita production and environmental pollution are taken into consideration in the theoretical literature of the environmental Kuznets hypothesis, which was developed to model the impact of various factors on the quality of the environment. However, the relationships between these two variables have been overlooked. (Toras and Boise, 1998, Grossman and Kruger 1995) characterize these relationships in the form of environmental regulation, technology, and industry structure. New studies discuss They suggest that factors other than income can determine the extent of environmental pollution. One of the economic variables that have been considered in recent years is the distribution of income. (Boise 1994) was the first to propose that income distribution significantly affects environmental quality. (Ebrahimi et al 2016)

The main mechanism, as illustrated in Chart 4, is the unequal impact of natural hazards on low-income and disadvantaged communities. These communities are

characterized by three factors: (1) limited capacity to mitigate environmental hazards; (2) insufficient access to infrastructure for environmental hazard protection; and (3) low or nonexistent availability of environmental hazard prevention services. These groups can be more affected by environmental dangers because they are more susceptible to them and have a higher degree of resilience to them. The degradation of the environment poses a threat to the health, livelihood, and general well-being of marginalized communities, which in turn impacts the inequality of opportunity and income and perpetuates an unsuitable cycle.

Chart 4 - Inequality and environmental impact



Source: (United Nations 2018)

Most articles examine the impact of income redistribution on economic growth. Rahimi and Esfandiari (2022) study the impact of relative redistribution on economic growth from 1978 to 2017 using the Generalized Techniques of Moments (GMM) for Iran. Based on their findings، indirect relationship between economic growth and income inequality measured using the Relative Redistribution Index was confirmed. Since tax serves as a tool to improve income distribution، calculating the Gini coefficient Based on deferred income and taxes، can provide a more accurate picture of the distribution of income in society and its consequences. The results of this study show that planning for a fairer income

distribution (after taxation) acts as a stimulus for economic growth، while conventional Gini coefficients suggest that income inequality leads to increased economic growth. Bonnefond, et al. (2020) investigated the relationship between China's environmental quality and economic inequality using a semi-parametric analysis of province panel data. Several air and water pollutants have been added to the list of environmental factors in this investigation. To capture social and regional characteristics, various measures of income inequality at the provincial level have also been created by combining data from various sources. Potential non-linearities in the relationship between inequality and environmental quality have been analyzed using flexible semi-parametric techniques. Their findings highlight the complexity of this relationship beyond what has been previously demonstrated. The study's findings indicate that (i) provincial inequality has less of an effect on pollution of the air and water. (ii) The main cause of this negative correlation is inequality between urban and rural areas, which also has a detrimental effect on the state of the environment. This result is particularly significant because it indicates that policies intended to reduce regional income disparity through industrialization are likely to alter the effects of pollution reduction programs. (iii) The detrimental effects of inequality on local pollution are confirmed by the fact that inequality in urban income leads to higher soot emissions and water pollution.

Ota Tatsuyuki (2017) The difficulties associated with rising income disparity and environmental degradation have been thoroughly researched in light of the growing dangers to sustainable development. The two linked Kuznets theories addressing these issues, however, are frequently not definitively validated by the results of surveys done over varying periods. Her study fills this gap by investigating these theories within the framework of Asia, where there is a dearth of existing literature on the subject. There has been conflicting acceptance of the Kuznets inverted U-curve hypothesis, which links income and income inequality. Piketty's recent work casts doubt on its universality but with scant attention to Asia, a region where income disparity is rising significantly. In a similar vein, the Environmental Kuznets Curve (EKC), which connects income to environmental degradation, produces a range of findings, especially in Asia, a region that contributes significantly to greenhouse gas emissions. Our examination of twenty Asian nations indicates that, with some restrictions, the Kuznets inverted U-curve theory is correct. Although environmental deterioration and economic disparity typically follow Kuznets' curve, high-income economies show different trajectories because of national characteristics. These curves' irregularities show how growth has different effects on inequality and the environment in different economies. While high-income nations employ a variety of tactics to address these issues, low-income nations generally lack income and environmental regulations. Since Kuznets curve irregularities are caused by conditions unique to

each country, customized methods may be needed for econometric analysis. This research calls into question how fair economic growth can coexist with environmental conservation, and it calls on high-income nations—which account for a significant portion of global emissions—to create policies that strike a balance between environmental protection and development.

Oanh et al. (2023) The influence of human capital and MIC on climate change in Asian countries between 2007 and 2020 is examined in the article "The Impact of Miscellaneous Inequality on Climate Change in Asia: The Role of Human Capital Using Different Regression Providers in Balanced Panel Data." The results of GMM verify that in equal countries, investing in human capital and raising inequality will exacerbate environmental deterioration. However, the data reveals that, among the three, human capital is the one that most significantly lessens the effect of inequality on carbon dioxide emissions. The study also shows how other factors, like population growth, economic expansion, the production of goods and services, trade openness, government spending, and overall economic investment, affect CO2 emissions. Furthermore, significant policy recommendations are made to guarantee Asia's sustainable economic growth.

Yang Jun, Yang Zhong-kuai, and Sheng Peng-Fei (2011) in their study They used data from the China State Panel from 1996 to 2008 and built synchronous equations, such as the income distribution equation and the ecological quality equation, to examine how income, human capital, and environmental quality are distributed in China. The survey's findings indicate that disparities in income distribution in China and environmental quality are now significantly correlated negatively. Enhancing human capital can lessen the negative consequences of wealth inequality and raise environmental standards in China.

Nico Heerink, Abay Mulatu, and Erwin Bulte (2001) in their research environmental Kuznets curve (EKC) have shown an inverse relationship between environmental damage and per capita income. Recently, it has been argued in the literature that in addition to income levels, inequality in power and income distribution is positively related to environmental degradation. When the relationship between environmental damage and household income such as the environmental Kuznets curve has been concave, income inequality is negatively related to the total environmental damage. The results of empirical analysis show that cumulative effect can cope with the political and economic impacts of some environmental indices. Faizi (2016) examines the impact of oil income on good governance in 54 oil-exporting countries over the period 2002–2013. The results show that oil revenues have a negative and significant impact on good governance indicators identified by the World Bank, namely government responses to political stability, government effectiveness, rule of law, quality regulations, and corruption control. In addition, variations in the degree of economic openness, GDP, business freedom, and investment freedom have a

positive and significant impact on six good governance indicators. Mohammadzadeh & Ghahremani (2017) examined the role of good governance and government scale on environmental performance in selected countries in the world, focusing on government performance, including good government, the scale of government, and openness of the economy to examine their impact on EPI[1]in 30 selected world countries during the period 2002-2012. For the calculation of different models for governance indicators, Dynamic Panel Data approaches have been used. The results of the study show that improving good governance indicators has a positive impact on environmental performance. Also, the large size of the government and the closed economy has a negative impact on environmental performance. Furthermore, the findings confirmed the Kuznets theory; that with increased economic growth, the EPI would initially deteriorate, but could be improved but by passing the threshold, it can be improved. Population density has also weakened EPI, indicating the need for focused policies.

3. Data

In this paper, the effect of relative redistribution on environmental pollution in oil-exporting countries including Russia, Iran, China, Britain, Netherlands, Mexico, and during the period 2010-2020 has been investigated through a simultaneous equation system. The equations are:

$$GDP_{it} = f(lrd_{it}, ihdi_{it}, up_{it}, oil_{it}, rl_{it}) \quad (1)$$

$$CO_{2_{it}} = f(GDP_{it}, GDP_{it}^{2}, Trade_{it}, ihdi_{it}) \quad (2)$$

As such, the Real Economic Growth Rate the Relative redistribution of income ، up Population Growth Rate ،idiot Inequality of human development and oil_{it} Oil Rent ، Rule of law as an indicator of good governance ،CO2 (Per capita carbon dioxide emissions)، $GDP_{it}^{2}{}_{t}$ The real economic growth rate and $trade_{it}$ Openness is trade. Statistical description, definition of variables, and their source are listed in Table 1.

[1] . Environmental Performance Index

Table 1: definitions, source, and summary statistics of variables

Variable	Definition	source	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
CO2	CO2 emissions (metric tons per capita)	WD I	9.810558	9.290243	17.43174	3.040766	4.265896	77
GDP	GDP growth (annual %)	WD I	2.191392	2.220258	10.63587	-10.35990	3.283639	77
OIL	difference between the value of crude oil production at regional prices and the total costs of production	WD I	1.906047	0.639286	10.67789	0.007525	2.810965	77
LRD	Tax Redistributive Effect and Deferred Payment	SWD I	27.34156	27.20000	44.00000	4.600000	12.99708	77
IHDI	Inequality-Adjusted Human Development Index	HDR	0.763468	0.810000	0.877000	0.584000	0.102618	77
UP	Urban population growth (annual %)	WD I	77.77286	81.13700	92.23600	49.22600	10.30932	77
TRADE	Trade (% of GDP)	WD I	66.16205	59.70040	158.8232	23.39271	37.13592	77
RL	Rule of Law: Estimate	WD I	0.723568	1.562773	1.973513	-0.857621	1.145368	77

Source: Researcher's calculations

4. Research Methodology

In the modern world, distribution and pollution are two of the biggest problems. The effect of distribution on economic growth appears conflicting in experimental investigations. Different results have been obtained in different nations and at different eras as a result of the influence of economic expansion on the spread of pollution. Examining the impact of relative redistribution on pollution emissions in oil-exporting nations is the current focus of research. There is simultaneous use of the equation system. There are two equations for economic growth and pollutant propagation in this system.

Before estimating the system of simultaneous equations, the stability of variables has been investigated using the LLC test, and its results are presented in Table 2.

Table 2: unit root test

Levin, Lin & Chu Test		
Variable	Statistic	Prob.
CO2	-2.40521	0.0081
GDP(D)	-2.01439	0.0220
OIL	-2.07970	0.0188
LRD	-2.09693	0.0180
IHDI	-2.61592	0.0044
UP	-4.66664	0.0000
TRADE(D)	-3.50527	0.0002
RL	-1.75267	0.0398
Kao Residual Cointegration Test	-2.832214	0.0023

The results of Table 2 indicate that the variables of the model were at the surface and some with a one-time difference were persistent, and the results of the Kao cointegration test indicate that the variables lack false regression.

5. Model estimation and results

Finally, the model uses a simultaneous system of equations with panel data of GMM cross section (white cov.) The results are reported in Table 3:

Table 3. Results of Model Estimation by GMM cross section (white cov.)

	Variabie	**Coefficient**	**t-Statistic**	**Prob.**
Equation 1	C	42.16681	9.389058	0.0000
	LRD	0.150406	2.445983	0.0157
	RL	3.040707	4.973861	0.0000
	UP	-0.181866	-5.114879	0.0000
	OIL	0.458719	3.371574	0.0010
	IHDI	-0.427686	-4.799079	0.0000
	R-squared	0.513019		
Equation 2	C	8.384275	10.84431	0.0000
	GDP	0.283682	4.797804	0.0000
	GDP^2	-0.072357	-5.840547	0.0000
	TRADE	-0.076976	-11.22745	0.0000
	LRD	0.281653	8.153370	0.0000
	R-squared	0.238351		

The results are presented to examine the relative redistribution, the disparity of human development, the rate of growth of the urban population, the rule of law and the impact of oil on economic growth in the first equation, and the effect of economic growth, the margin of economic development and the openness of trade on carbon dioxide emissions in the second equation in Table 3.

As the findings show, relative redistribution, good governance, and oil yields have a positive and meaningful effect on economic growth. The disparity in human development and the rate of population growth in cities has led to a decrease in economic growth. Economic growth and relative redistribution also have a positive impact on pollution emissions, and economic growth and trade disruption have a negative and significant impact on emissions. All variables are at the level of 5%.

Distribution and pollution are two major challenges in today's world. In experimental studies, the impact of distribution on economic growth is contradictory. The impact of economic growth on pollution spread has also led to different outcomes in different countries and at different times. The study is currently underway to examine the role of relative redistribution in pollution emissions in oil-exporting countries. The equation system is used simultaneously. In this system, there are two equations of economic growth and pollution spread. The model shows that increased inequality has increased economic growth and pollution spread. Increasing inequalities in human development have led to decreased economic growth. Good environmental improvement also has a positive and meaningful impact on environmental performance through improved economic growth. The results of this review show that improved management of its sectors has a positive and meaningful impact on environmental performance. Therefore, some of the environmental degradation in countries can be rooted in the inadequate quality of institutions and good governance indicators. The lack of control over corruption and the lack of proper legal treatment of people who destroy public interests and resources will accelerate this issue to the general population of society ignoring the law and lack a sense of responsibility for the public goods of society, which will be very difficult to control this extent of the law for governmental institutions. The fact is that many people who can be safe from law and supervision are likely to be a very strong part of government institutions themselves. Thus, they can obtain the necessary permits for harmful environmental activities and also benefit the community's welfare facilities. to earn it.

The large size of the government increases precisely this possibility, because it increases the number and volume of such people by one hundred and, on the other hand, reduces the possibility of proper surveillance equally. Therefore, a faulty cycle and a blockade of dealing with the pernicious environment arise. The other point in this discussion is rooted in the failure of the government's economic activities, which, on the one hand, was high due to the low efficiency

of the intensive consumption of resources for the Nile to the intended objectives, and on the other hand, monitoring these activities is not easy to monitor the activities of the private sector. With the increase in the size of the government, the government's credit has also increased, which leads to the deterioration of environmental performance due to the state's influence on the economy. There are different models of the relationship between economic growth and distribution. The level of economic development, technological development, political-social unrest, savings rates, insufficient credit markets, political economy, institutions, and fertility rates have been considered as the differentiation of these models from each other. Based on the transfer mechanism of these models, the impact of marginal distribution on economic growth can be positive, negative, or ineffective. The first three models showed negative effects, the fourth model showed positive effects, and the other models indicated negative effects. Models that have undermined institutions, fertility rates, political economies, and poor credit markets, and (2021) Mdingi& Hu have resulted in the negative impact of distribution on economic growth. Current findings show the impact of increasing inequality on economic growth. That is aligned with studies that have considered savings rates as a transfer mechanism of impact.

Human development is among other factors affecting the quality of the environment. If we present human development as a criterion for economic development and believe that development should be more aware of improving the lives of people in society by measuring human capabilities through knowledge and education, then we are witnessing that good governance indicators can provide economic development as one of the criteria through mechanisms such as optimized allocation of human capital to entrepreneurship and equalization of opportunities in areas of improvement of human development. (Janati Mashkani et al 2011)

So good governance is directly linked to human development (Yang et al 2011) as well as improving human development, including raising public awareness and education can significantly reduce the process of increasing environmental degradation. Thus, higher levels of human development could be accompanied by better environmental quality indicators (Ahmadnia et al 2014; Mohammadi and Sakhi 2013) so the results showed that the greater the disparity in human development, the slower economic growth, and due to the sluggish link between economic growth and carbon dioxide emissions, increased human development disparity is associated with environmental degradation.

The theory of the ecological environment was first introduced as a consensus for the relationship between economic growth and income inequality between individuals and then entered the discussion of environmental economics. According to this theory, economic growth is accompanied by environmental degradation in its early stages, but by exceeding the threshold it can ultimately

contribute to the improvement of environmental quality. Many studies have been conducted on confirmation or rejection of this theory that has generally focused on economic growth and greenhouse gas emissions, especially CO2 emissions. More economic growth has led to more energy consumption to meet the growing demands of, industries and households. Economic growth in the early stages of development has been detrimental to the environment, and then, beyond a certain margin of income, economic growth leads to improved environmental conditions. The impact of economic growth on the emission of carbon depends on the development stage of a population. The result is an indication of the existence of a distorted U-relation in the Kuznets ecological environment. The countries surveyed are on the rise of this twist, and economic growth has increased the emissions of carbon dioxide in the countries studied. This result is compatible with the studies of (Delgarm et al. 2023) and (Karimzadeh et al. 2023).

Environmental performance can also be affected by free trade in a country. Since the Industrial Revolution, the world has become increasingly interconnected and open to trade. The impact of exports and imports on carbon emissions is largely dependent on whether the exported and imported coal is compatible with the environment or not. Although previous studies have anticipated that oil and coal exporters will experience excessive carbon emissions, these sharks are compressed coal. Meanwhile, on the other hand, companies that produce cleaner energy or products that are compatible with the environment will experience quantum carbon emissions (Delgarm et al. 2023) and (Karimzadeh et al. 2023).

On the other hand, there are two contradictory views on the role of free trade in environmental performance. Opponents of trade liberalization argue that the expansion of free trade and increased competitive pressures between domestic and foreign sectors will lead to the mitigation of appropriate ecological policies and even delay the adoption and implementation of national ecological environmental laws in the face of the trade liberalization process. (Shahabadi and Ganji 1394).

Therefore, the performance of the free trade environment can have a negative impact on environmental performance (2008; Copeland & Taylor, 2003; Li & Hewitt). As a result of countries responding to competitive pressures resulting from the expansion of free trade and access to the relative advantage of resource use, thereby reducing resource and energy waste and associated depletion (Barghi Oskouie 2008).

Grossman & Krueger (1991) divided the environmental impact of trade liberalization into three scale effects of combination and technology. According to their study, if the commercial liberalization of the effect of technology is overcome by the scale and effect of the combination (in a country with a relative advantage in emerging industries), or if the effects of technology combined with the combined effect (in the state with a relative advantage in clean industries) are overtaken by the measurement, then the trade liberalization will experience

positive environmental results. In a previous study, opening up trade had a negative impact on carbon dioxide emissions. This is due to improved environmental performance.

The rate of urban population is among other factors affecting the quality of the environment. If government policies and operations in the economy are in a way that does not ultimately lead to the support and development of the rural sector and agricultural industry, urbanization and concentration in industrial cities will increase. There are also two different perspectives on the relationship between urban population and environmental pollution. The first view points out that with the rise of urbanization, the use of sub-structures, transportation, and energy increases. The second view emphasizes that urban culture makes energy use in cities more optimized than in villages and reduces pollution (Alam & et.al, 2007)

And since the urban population rate in the current study has caused economic growth to decline, the rise in urban population rates in previous countries due to the use of infrastructure transport and energy will lead to increased carbon dioxide emissions and environmental degradation.

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تاثیر توزیع مجدد نسبی بر آلودگی محیط زیست در کشورهای صادر کننده نفت

چکیده:

هدف: توزیع درآمد و نابرابری آن عمدتا به عنوان یکی از مهمترین مسائل عدالت اجتماعی مطرح می‌شود. طبق مطالعات جدید، عوامل دیگری به غیر از درآمد بر میزان آلودگی زیست محیطی اثر دارند. یکی از متغیرهای اقتصادی که در سال‌های اخیر مورد توجه قرار گرفته، توزیع درآمد است. این موضوع باعث شده است همواره تلاش برای شناسایی عواملی که به انحراف در توزیع درآمد منجر می‌شوند، ادامه یابد. پژوهشهای زیادی در زمینه توزیع درآمد و نابرابری انجام شده است و سیاستگذاران هم برنامه‌های بسیاری را برای بهبود توزیع درآمد اتخاذ نموده‌اند. در این مطالعاتو برنامه‌ها، ضریب جینی، شایع‌ترین شاخص برای اندازه‌گیری نابرابری درآمد است. از آنجا که مالیات‌ها به عنوان ابزار مهمی برای بهبود توزیع درآمد مورد نظر قرار می‌گیرند، محاسبه ضریب جینی براساس درآمد پس از مالیات می‌تواند تصویر دقیق‌تری از توزیع درآمد و تأثیرات آن را ارائه دهد. از این رو در این مطالعه، تأثیر توزیع مجدد نسبی درامد بر انتشار گاز کربن دی‌اکسید بررسی می‌گردد.

روش: مطالعه حاضر با استفاده از داده‌های منتخبی از کشورهای صادر کننده نفت شامل کانادا، ایالات متحده آمریکا، بریتانیا، مکزیک، هلند، روسیه و چین در فاصله سال های2010 و 2020 و بهره گیری از روش سیستم معادلات همزمان انجام شده است.

یافته ها: بر اساس برآورد مدل، شاخص توزیع مجدد نسبی و افزایش نابرابری درآمد، حکمرانی خوب و رانت نفتی، تأثیر مثبت و معناداری بر رشد اقتصادی در سال‌های مورد مطالعه دارند، در حالی که نابرابری توسعه انسانی و نرخ رشد جمعیت تأثیر منفی و معناداری دارند. همچنین رشد اقتصادی و بازبودن تجاری تاثیر منفی و معنی داری بر انتشار آلودگی دارد.

نتیجه گیری: می‌توان نتیجه گرفت که مالیات و پرداخت‌های انتقالی، به عنوان ابزارهای توزیع درآمد، می‌توانند رشد اقتصادی را تحریک کنند. توزیع مجدد نسبی به عنوان روشی عادلانه‌تر می‌تواند منجر به افزایش رشد اقتصادی شود، و رشد اقتصادی می‌تواند به کاهش انتشار گاز کربن دی‌اکسید منجر شود. بنابراین، ارائه یک معیار مناسب از نابرابری درآمد می‌تواند به درک بهتر و تدوین سیاست‌های کارآمد برای برابری درآمد کمک کند.

کلمات کلیدی: توزیع مجدد نسبی، آلودگی محیط زیست، کشورهای صادر کننده نفت، ضریب جینی.