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## Abstract

The main objective of this study is to examine the relationship of Foreign Direct Investment, CO<sub>2</sub> on public Health in 31 OIC & Non OIC countries facing health issues covering the time period of 2000 to 2022. The study also provides the empirical and theoretical literature on the health issues. Firstly, it gives an outline of FDI, GDP, CO<sub>2</sub>, urbanization and renewable energy on public health (Infant motility rate, life expectancy and education). Secondly, it also examines published literature on the bases of empirical and theoretical perspective. In addition to that this paper explains that how Foreign Direct Investment, GDP, Carbon di Omissions, urbanization, renewable energy Infant motility rate, life expectancy and education are associated with each other. Thirdly, this study suggests future research directions for researchers. The study also adds literature on the part of Foreign Direct Investment, CO<sub>2</sub>, GDP, urbanization, renewable energy and public health (Infant motility rate, life expectancy & education) in some OIC and Non OIC countries by evaluating and summarizing available theories and research on FDI, CO<sub>2</sub>, Renewable energy and public health.

**Keywords:** FDI, Renewable energy, CO<sub>2</sub>, OIC and non OIC Countries

## 1. Introduction

The development of economy directly relates to human development or progress as per traditional approach. The theory has been discussed with UNDP United Nation Development Program and other external bodies since long. The increase in FDI inflows resulting the latest technology in the host country which provides new job openings by enhancing productivity. Public health is affected by the increase of Foreign Direct Investment in many ways. Foreign Direct Investment would have positive impact on income of the people. It may improve medical facilities in the host country by paying more to the doctors (specialists) for better healthcare of the public. Foreign Direct Investment associates with renewable energy consumption may causes reduction in CO<sub>2</sub> emissions which helps to improve the health in some cases, Foreign Direct Investment has negative impacts on health (Parveen et al., 2024; Amin et al., 2024; Sadia Bint Raza et al., 2024; Huang et al., 2024; Ali, 2022).

Firstly, it may cause to raise income inequality level which results to have better medical facilities for rich and less for poor. Further with the rise in income level, purchasing power for toxic commodities like Tobacco may also rise. (Urbanization, Trade openness, health expenditures, market size, infrastructure indicators, social indicators, inflation rate and spending on education are various variables used for analysis of economic growth and importance of FDI by different researchers (Rabbia Syed, Sehrish Arshad, 2024; Zubair et al., 2024; Ali, 2022).

FDI is significant for economic growth and development. Furthermore, With the raise in secondary industry like construction, mining, tourism, education & management facilities, there is increase in environmental pollution which provide bases for renewable energy. FDI and CO<sub>2</sub> has debatable and inexact relationship. According to some researchers like (Song et al., 2024; Saeed et al., 2024) there is positive relationship between Co<sub>2</sub> emissions and Foreign direct Investment. However, some researchers (Shen et al., 2024; Shahid et al., 2023; Ali, 2022) determine negative relationship between them. Remittance is a type of foreign inflow that raises income of households which may results in increase CO<sub>2</sub> emission with the increase in purchasing power of public in their daily life. In addition to that saving portion of the people will also enhance which leads to investment in, market also results CO<sub>2</sub> emissions (Arshad et al., 2024; Irfan et al., 2023; J. Saeed et al., 2024).

Pollution Heaven is one of the problem faced by the developing countries with the increase in Foreign Direct Investment that leads to the increase in CO<sub>2</sub> emissions. There is negative impact on health quality, and life expectancy due to increase in CO<sub>2</sub>. Many respiratory diseases caused by air pollution which affect the kids by weakening their immune system. On the other hand, balanced diet along with low CO<sub>2</sub> emission helps to improve healthy life style and human health. (Ahmad Shahid et al., 2023; Tanveer Ahmad Shahid, 2023; Nazik Maqsood, 2024; Ali & Bibi, 2018; Arshad & Ali, 2016; Audi et al., 2021).

Human life quality has been combined with Foreign Direct Investment by some researchers with respect of health indicators but impact of Foreign Direct Investment on health gets less attention. The present study aims to analyze the impact of FDI on improving public health. The study also examines the nonlinear effect in long-run and short-term relationship between health dimensions, namely, infant mortality, life expectancy, school enrollment at secondary and tertiary level, GDP, urbanization, number of physicians, and FDI-renewable energy in OIC Countries over the period of 2000-2022 (Shahid, 2024; Maqsood1 et al., 2023; Minhas et al., 2024; Abro et al., 2024; Ali & Audi, 2018; Ali & Rehman, 2015; Ali et al., 2016).

The study adds knowledge in existing literature in many ways; Firstly, we developed health quality index which has not been used in previous studies. Secondly, it also provides impact of FDI, renewable energy and CO<sub>2</sub> on public health in 31 OIC & Non OIC countries OIC Countries (18) Mozambique, Nigeria, Somalia, Syria, Yemen, Afghanistan, Burkina Faso, Cameroon, Iran, Iraq, Libya, Niger, Palestine, Pakistan, Sudan, Chad, Djibouti, Mali and Non-OIC Developing Countries (13) Ethiopia, South Sudan, Angola, Burundi, Ethiopia, Malawi, Myanmar, Sao Tome, Ukraine, Zimbabwe, Kenya, Tanzania and Namibia facing health issue as per OIC health report 2019 by using the dimensions e.g infant mortality, life expectancy, school enrollment at secondary and tertiary level, GDP, urbanization, number of physicians. Thirdly, we use the NARDL approach, which could provide both short and long-run estimations of FDI-renewable energy and CO<sub>2</sub> for public health in the study (Rahman & Bakar, 2019; Tabassum et al., 2023; A. U. Shahid et al., 2022; Ur Rahman & Bakar, 2018; Zulfiqar et al., 2022; Audi et al., 2021).

A few scholars have integrated the impact of FDI on important aspects of human life quality, such as health indicators. But the health effects of FDI get little attention. This study analyzes the effect of foreign direct investment on improving the social development of the nation in developing countries facing health issues.

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### 1.1. Problem Statement

Human capital, including health, significantly influences FDI inflows in developing economies, making it a key factor to consider (Chaudhary et al., 2023; Chaudhary et al., 2023). FDI boosts CO<sub>2</sub> emissions due to industrial expansion, while foreign aid and effective governance promote cleaner industrial technologies, reducing emissions and promoting sustainable development. Farooq (2022). Foreign Direct Investment (FDI) can induce structural transformations, leading to sector contraction and expansion. The composition effect, which involves composition and technique effects, suggests that a shift towards services driven by FDI could result in energy savings, while industrialization driven by FDI is expected to increase energy consumption. Studies by (Dawood et al., 2023; Zhao et al., 2023; Li et al., 2022; Audi et al., 2023).

### 1.2. Research Question

- Is there any correlation between public health, Foreign Direct Investment-renewable energy and CO<sub>2</sub> in some developing countries facing health issues?
- What are the asymmetric effects of Foreign Direct Investment-renewable energy and CO<sub>2</sub> in improving the public health in some OIC and Non OIC countries facing health issues as per OIC health report 2019?
- Is there any long-run and short-run non-linear relationship of foreign direct investment-renewable energy and CO<sub>2</sub> in improving the public health in 31 developing countries?

### 1.3. Research Objectives

- To examine the asymmetric effects foreign direct investment-renewable energy and CO<sub>2</sub> in improving the public health in some developing countries.
- To analyse the long-run and short-run non-linear impact foreign direct investment-renewable energy and CO<sub>2</sub> in improving the public health in some OIC & Non OIC countries facing health issues as per OIC health report 2019.
- To investigate the causal relationship between health dimensions namely, infant mortality, life expectancy, school enrollment at secondary and tertiary level, GDP, urbanization, number of physicians and FDI-renewable energy and CO<sub>2</sub> in 31 developing countries.

## 2. Literature Review

The first section of literatures review focuses on FDI and public health, the second and third section deals with renewable energy & public health and CO<sub>2</sub> & public health, while the last part summarizes the research gaps and offers the contributions of the study.

### 2.1. FDI and Public Health

One of the concepts regarding FDI is that it has positive impact on development of the economy. Many researchers provide evidences for FDI growth theories that helps the host country to develop their development rate (Shahzadi et al., 2023; Rahman et al., 2022). On the other hand, some studies reflect negative relationship of Foreign Direct Investment with economic growth (Zahra et al., 2023). Corruption and human capital are the factors which also have influence on the relationship between Foreign Direct Investment and economic growth (Ullah et al., 2023; Awan et al., 2023; Roussel et al., 2021).

There is a positive impact of Foreign Direct Investment (FDI) on health, enhancing availability of health-related goods and services. The research examined 85 countries from 1974 to 2012, showing a strong correlation between adult mortality and FDI. Burns, (2018). There is a study of 179 countries which found a positive correlation between foreign direct investment (FDI) and public health in low-wage nations, while adverse effects were observed in high-wage economies. (Qureshi et al., 2022; Javaid et al., 2023) examine in a study of Pakistan from 1972 -2012 that FDI, food supply, lack of education, urbanization, poverty, health spending, and life expectancy were linked factors like health spending. Increased health spending improved life expectancy, while lack of education decreased it. One more study of 25 developing countries from the period of 1995-2014 found a positive correlation between FDI and health conditions in, especially when FDI is actively encouraged. (Saif Ur Rahman, Salyha Zulfiqar Ali Shah, n.d.; Khawaja Hisham Ul Hassan, 2021) examined in a study of Tanzania from the period 1980-2014 that FDI in Tanzania has a positive impact on poverty reduction, notably in reduction of child mortality rates and improvements in life expectancy, despite not directly addressing poverty.

### 2.2. Renewable energy and Public Health

Air pollution significantly impacts mental health, with foreign direct investment moderating this relationship. (Bakar, 2019) examined in a study of China using the data for the period of 2015-2018 by using applied fixed-effects panel regression and threshold model. This study also found that regional factors like location, medical resources, and technology investment also play a role. The researchers investigate the relationship between renewable energy consumption and Foreign Direct Investment in BRICS countries over the period of 1990-2019 by using ARDL and NARDL techniques and the results shows that changes in FDI do not significantly impact renewable energy consumption in the long run.

The NARDL-PMG model showed that a decrease in FDI improves environmental quality and health. They also recommend implementing environmental technologies to enhance renewable energy utilization. (Ghazia Khoula, 2022), In China, Data from different provinces for the period of 1995-2017 was examined to investigate the link between Foreign Direct Investment and Renewable energy consumption and they found that combining FDI with renewable energy can reduce environmental degradation and improve population health. The study also suggested that certain regions in China should optimize their energy structure and increase renewable energy reliance to promote better health. Previous studies have primarily focused on the relationship between FDI, CO<sub>2</sub> emissions, and renewable energy consumption (Hafiza et al., 2022).

### 2.3. CO<sub>2</sub> and Public Health

The researcher examines the impact of remittances and FDI on CO<sub>2</sub> emissions in China from 1981 to 2019 by using NARDL approach and found a negative correlation between remittances and CO<sub>2</sub> emissions, with FDI having a stronger effect in the long run. The study also recommends that the government should reconsider its environmental policies to attract foreign investors and improve local environmental quality (Shahzadi, Ali, et al., 2023; Sajid & Ali, 2018). Another study found that fixed asset construction reduces pollution in 15 OECD countries, except for the mining industry. They also noted pressure from the tradable sector in all countries. They recommended governments to encourage FDI focused on energy efficiency and emphasize the importance of host countries implementing laws and regulations to regulate CO<sub>2</sub> emissions generated by FDI.

(Naz et al., 2022) conducted a study in 68 developing countries from 1990 to 2017 on the impact of CO<sub>2</sub> emissions on life expectancy. The results showed a negative correlation between CO<sub>2</sub> emissions and life expectancy in emerging countries, indicating that emissions have a detrimental impact regardless of the source. The positive impact of CO<sub>2</sub> emissions on life expectancy is linked to consumption, not production. This study also concluded that increased income does not necessarily lead to reduced environmental degradation and healthier living. The researchers found a strong correlation between variables and emissions, and suggested implementing environmental protection laws to improve health quality and reduce emissions while having a study on CO<sub>2</sub> emissions in top 10 emitting countries using the ARIMA approach. It also highlights the importance of addressing these factors (T. A. Shahid, 2024).

This study explores the link between FDI, renewable energy, CO<sub>2</sub> and public health (Infant motility rate, life expectancy & education) in some OIC & Non OIC countries facing health issues as per OIC health report, 2019. The study will also highlight the potential for renewable energy to improve living conditions, environmental health, and labor productivity.

### 3. Methods

The author uses systematic literature review principles (Jesson, Matheson, & Lacey, 2011) in this investigation to conduct a comprehensive analysis of relevant literature. They create a review by scrutinize the key aspects of prior studies including focus, bibliography, research philosophy (T. A. Shahid et al., 2023), methodology, and definitions related to FDI, renewable energy, and public health in different countries. The review also includes a theoretical and practical review, concluding with an exploration of limitations. The researcher searched for relevant papers on Globalization and Finance using various sources, including economic journals, databases like Business Source Premier, Google Scholar, and a cross-disciplinary bibliography on FDI, renewable energy, and public health. The search included several references from many journals. After removing duplicates, nearly 300 articles were identified. The author assessed the relevance of each paper by examining its abstract, title, and methodology, ensuring a comprehensive understanding of the subject matter.

### 4. Conclusion

After the critical review of the literature, it is concluded that, as compare to total value FDI, renewable energy, CO<sub>2</sub> and public health in 18 OIC and 13 Non OIC developing countries facing health issues as per OIC Health report 2019. Both the negative and the positive effects are revealed. It is very much interesting to see both the findings are separately fill the gap in the literature. So, the effect of FDI, renewable energy, CO<sub>2</sub> and public health in 31 countries are still under discussion and various studies have been conducted to check the impact of FDI and renewable energy on the overall economy.

### 5. Future Direction

The literature review underscores the necessity for further research on three distinct areas. First It is observed during the literature review, Non-Linear Autoregressive Distributed Lag method (NARDL) is implemented only limited studies to investigate the FDI, renewable energy, CO<sub>2</sub> and public health. Generally, OLS regression, VECM method, ARDL and GMM approach were used. The NARDL procedure can also capture any existing indirect effects and feedback. Previous studies on FDI, renewable energy, CO<sub>2</sub> and public health have primarily focused on host country GDP and economic growth, with a limited number exploring these aspects in the context of specifically 31 countries (18 OIC countries and 13 Non OIC countries) to the best of my knowledge. Previous studies have focused on specific countries, but there has been limited exploration of 31 countries (18 OIC countries and 13 Non OIC countries).

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