Research article

Do Environmental Regulations Attract Foreign Direct Investment Inflows in OIC Countries?

Ana Santika[1*], Muhammad Adnan Azzaki[2], Ah. Ali Arifin[1]

[1] Department of Sharia Economics, Faculty of Islamic Economics and Business, State Islamic University of Sunan Ampel, Surabaya, Indonesia
[2] Islamic Economics Program, Postgraduate School, State Islamic University of Sultan Syarif Kasim, Riau, Indonesia
* Corresponding author email: anasantika277@gmail.com

A B S T R A C T

This study investigates the controversial impact of environmental regulations and foreign direct investment (FDI) inflows, specifically in 32 Organization of Islamic Cooperation (OIC) countries from 2005 to 2020. Challenging the widely debated "pollution haven" hypothesis—which posits that lax environmental standards attract FDI—we investigate whether stringent environmental policies deter investment inflows in this underexplored region. Our comprehensive panel data analysis reveals a surprising outcome, strict environmental regulations in OIC nations do not deter FDI. in fact, they may even encourage it. These findings defy conventional wisdom and offer crucial insights for policymakers, suggesting that robust environmental frameworks can enhance a country's attractiveness to foreign investors. This research encourages a fundamental reassessment of how we understand the interplay between environmental stewardship and global investment.

1. INTRODUCTION

For decades, foreign direct investment (FDI) has captivated researchers and policymakers alike, and for good reason. FDI acts as a powerful engine for economic growth, sparking job creation, nurturing entrepreneurship, and bolstering infrastructure, ultimately elevating a nation's quality of life (Lall, 1995). Yet, the escalating developmental needs of many countries often outstrip their available resources, leaving critical gaps unfilled. This study steps into that void, offering a fresh perspective on the relationship between environmental regulations and FDI inflows, specifically within the Organization of Islamic Cooperation (OIC) countries. While much existing literature explores the "pollution haven" hypothesis—the idea that lax environmental rules attract FDI—we challenge this conventional wisdom. Our research investigates whether stringent environmental policies, far from deterring investment, might actually cultivate a more stable and sustainable environment that attracts foreign capital.

Many developing nations grapple with a significant hurdle: a shortage of investment capital. This often stems from low domestic savings across public, private, and household sectors. This scarcity is particularly acute in OIC countries, where a large number fall into the lower middle-income bracket (Sajilan et al., 2019). Given this context, our study offers a fresh exploration into what drives FDI in OIC nations, especially considering the growing trend among investors to favor socially and environmentally conscious economies. This shift in investor preference isn't accidental. It's a direct response to the ongoing global economic crisis and the urgent threat of climate change,

both of which have exposed weaknesses in our global economic system and contributed to rising global temperatures. These challenges highlight the critical need for a sustainable economic model—one that prioritizes not just growth, but also environmental and social well-being. Consequently, the concept of a green economy has gained significant traction, seen by experts as a vital path to both environmental preservation and global economic recovery.

The green economy, as Mentes (2023) aptly describes, forms the bedrock of sustainable development, resting on three essential pillars: economic, social, and environmental. Chipalkatti (2021) further enriches this framework by adding an institutional pillar, emphasizing the crucial role of development governance. This expanded understanding leads us to posit that a nation's commitment to green economy policies will profoundly influence investor decisions and, consequently, its ability to attract foreign investment. Despite its growing prominence, empirical evidence linking the green economy directly to foreign direct investment remains surprisingly limited in academic discourse. Much of the existing literature fails to clearly delineate this vital connection. Research that does venture into the intersection of the green economy and FDI often faces challenges related to indicator diversity, including inconsistencies in defining, measuring, and interpreting the myriad facets of a green economy as they relate to investment. This gap presents a compelling opportunity for future research. Incorporating environmental regulatory variables as a key component in assessing green economy efficiency, as suggested by Tao & Wang (2022), could prove particularly insightful. Indeed, recent studies by Huang (2022); and Luo et al. (2021) offer compelling evidence that stringent environmental regulatory policies can, in fact, drive increased corporate investments in research and the adoption of environmentally sustainable practices, ultimately augmenting overall investment flows. These findings underscore the transformative potential of robust environmental policies in shaping investment landscapes.

Further challenging conventional wisdom, Gao et al. (2021) explored environmental concerns and investment decisions within China. Their research unveiled a negative correlation with the carbon tax, yet a positive influence from renewable energy use and improved green productivity on investment decisions. This body of literature directly contradicts the widely cited "pollution haven" theory, which argues that multinational corporations gravitate towards countries with lax environmental regulations to minimize pollution abatement costs (Zhang et al., 2020). The "pollution haven" effect poses a significant hurdle for developing countries, often deterring them from adopting robust environmental regulations, especially as these nations frequently struggle with insufficient domestic investment. For them, FDI from developed countries is a crucial source of capital. Indeed, numerous studies, including those by Chung (2014); and Luo et al. (2021), lend support to the "pollution haven" hypothesis. Consequently, the "pollution haven" effect and its underlying hypothesis have fueled considerable debate among policymakers and environmentalists. However, despite prevalent beliefs, empirical evidence surrounding the "pollution haven" effect has remained largely inconclusive, presenting a mixed bag of results. In this study, we directly address this critical gap by empirically re-evaluating whether stringent environmental regulations truly deter FDI inflows, utilizing comprehensive and updated data specifically for OIC countries.

Our empirical analysis, leveraging panel data from 32 OIC countries between 2005 and 2020, reveals a fascinating truth: stringent environmental regulations significantly attract FDI, directly contradicting the "pollution haven" effect. We rigorously tested the robustness of these findings by incorporating various institutional quality indicators, consistently confirming their stability. Furthermore, we found no evidence to support the idea that strict environmental regulations increase outbound FDI in OIC nations; instead, our consistent results suggest a net increase in FDI inflows. Traditional research has largely concentrated on advanced economies, especially the United States, due to readily available environmental regulation data (Singhania & Saini, 2021). Studies on developing countries, however, have been limited to specific regions, leaving a substantial gap concerning the majority of OIC nations, which are still in their developing stages. To address this, we innovatively use the green economy as a comprehensive indicator of a country's environmental regulatory stringency, allowing for a more inclusive examination of the data. Our study also distinguishes itself by analyzing country-level aggregate data rather than firm-level data, thus further enriching the current research landscape. The remainder of this article is structured as

follows, we first detail our methodology, followed by a presentation and discussion of our results, and finally, we offer our conclusions, practical implications, and recommendations.

2. RESEARCH METHODS

2.1. Data

Our research delves into a comprehensive panel dataset spanning 32 Asian developing countries from 2005 to 2020. This diverse group includes Saudi Arabia, Armenia, Azerbaijan, Bahrain, Bangladesh, Bhutan, Brunei, Indonesia, Iran, Iraq, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, Malaysia, Maldives, Mongolia, Oman, Pakistan, Palestine, Qatar, Sri Lanka, Syria, Tajikistan, Thailand, Timor-Leste, Turkey, Turkmenistan, Uzbekistan, Vietnam, Yemen, and Jordan. We sourced our FDI data, measured as net inflows (% of GDP), directly from the World Bank. Similarly, key macroeconomic variables like gross domestic product (GDP), gross fixed capital formation (GFCF), Freedom Index (FI), and trade openness (TO) were retrieved from the World Bank's World Development Indicators (WDI). To clarify, trade openness is calculated as the ratio of the sum of exports and imports of goods and services to GDP, while the GDP growth rate represents the annual growth. It's worth noting that all these variables, except for the GDP growth rate, are incorporated into our model in logarithmic form to account for potential non-linear relationships.

Table 1. The Operational Definition of Variables

Symbol	Variable Definition	Unit	Data Source
FDI	Foreign direct investment, net inflows	% of GDP	World Bank
GDP	Gross domestic product, constant	USD	World Bank (WDI)
GFCF	Gross fixed capital formation	USD	World Bank (WDI)
FI	Freedom index represented institutional measure of political and economic freedom	Index (0-100 scale)	World Bank (WDI)
TO	Trade openness represented the ratio of the sum of exports and imports of goods and services to GDP	Ratio (exports + imports / GDP)	World Bank (WDI)
GE	Green economy index as a proxy for environmental regulation stringency is driven by several compelling reasons	index	World Bank (WDI)
CC	Corruption control is a measure to assess the extent to which public power is used for private gain	Index (-2.5 to 2.5 scale)	World Bank (WGI), Kaufmann & Kraay, 2008)
PS	Political stability is a measure to the government's vulnerability to unrest, violence, and terrorism	Index (-2.5 to 2.5 scale)	World Bank (WGI), Kaufmann & Kraay, 2008)
VA	Voice and accountability is measure to reflecting citizens' ability to participate in government selection and enjoy freedoms of expression, association, and media	Index (-2.5 to 2.5 scale)	World Bank (WGI), Kaufmann & Kraay, 2008)
GOVE	Government effectiveness is a measure to evaluates the quality and political independence of public service	Index (-2.5 to 2.5 scale)	World Bank (WGI), Kaufmann & Kraay, 2008)
RQ	Regulatory quality is a measure to robustness of government policy for private sector development	Index (-2.5 to 2.5 scale)	World Bank (WGI), Kaufmann & Kraay, 2008)
RL	rule of law is a measure to the host country's adherence to legal principles in areas like intellectual property, contract enforcement, property rights, and crime	Index (-2.5 to 2.5 scale)	World Bank (WGI), Kaufmann & Kraay, 2008)

For insights into institutional quality, we turned to the World Bank's worldwide governance indicators database, an updated version of the well-regarded dataset by Kaufmann & Kraay (2008).

These indicators are carefully constructed estimations based on surveys of enterprises, citizens, and experts, offering a nuanced view of governance. Crucially, our study uses the Green Economy (GE) index from the World Development Indicators as a primary measure of environmental regulation stringency. As highlighted by Loiseau et al. (2016), the GE concept encompasses environmental, social, and economic dimensions. It provides a robust indicator of a country's commitment to addressing high-priority environmental issues, from environmental health to climate change. The GE assesses each nation's performance across over 25 indicators, covering aspects like resource management, ecosystems, emissions, climate change, economy, human capital, and employment, all while aiming to align national performance with established international targets.

Our decision to use the GE as a proxy for environmental regulation stringency is driven by several compelling reasons. First, the GE is widely considered essential for achieving economic growth while simultaneously minimizing environmental risks and ensuring social equity (UNEP, 2011). Second, contemporary investors are increasingly demonstrating ethical preferences for social and environmental issues (Qoyum et al., 2021; and Sultana et al., 2018), making the GE a relevant metric for attracting investment. Furthermore, while the green economy is a relatively new concept with diverse characteristics and measurement approaches, a substantial body of prior research, such as Xiao et al. (2023), has established a strong link between environmental regulations and the green economy. Environmental regulations play a pivotal role in shaping policies that encourage eco-friendly business practices, and conversely, a green economy approach can enhance the effectiveness of these regulations by recognizing the economic value of natural assets, thereby motivating stakeholders to protect them. It's important to acknowledge that while the GE serves as our proxy for environmental regulation stringency, it might also correlate with other indicators of governance quality, given that countries with strong environmental policies often exhibit robust governance in other areas as well (Kim & Rhee, 2019).

2.2. Model Specification

To understand how environmental regulations influence foreign direct investment at the country level, our study employs a robust empirical model. Building upon the explanatory factors identified by Saini & Singhania (2018), we consider not only environmental regulations but also gross fixed capital formation, the freedom index, and trade openness as key predictors of FDI. We analyze our panel data using a fixed effects model, which is crucial for accounting for unobserved, country-year-specific variables that might otherwise bias our results. Equation (1) below represents the baseline model for our empirical investigation.

$$log(FDI)_{kit} = \beta_0 + \beta_1 log(GE)_{it-1} + \beta_2 log(GDP)_{it} + \beta_3 log(GFCF)_{it} + \beta_4 log(FI)_{it} + \beta_5 log(TO)_{it} + \alpha_i + \lambda_t + \epsilon_{it} \tag{1}$$

Our empirical model carefully selects key variables to shed light on what drives FDI. GDP per capita captures a host country's income level, which, as empirical literature suggests, often correlates with higher FDI inflows due to increased purchasing power and a more favorable business environment (Kim & Rhee, 2019). The GFCF, defined by the OECD, represents the acquisition of produced assets by producers, indicating investment within the economy. The FI is a comprehensive measure encompassing various aspects of economic freedom, such as fiscal, business, and investment freedoms. Past studies consistently show a positive relationship between the FI and FDI, reflecting a supportive policy framework and ease of doing business (Sambharya & Rasheed, 2015; and Saini & Singhania, 2018). The TO, acting as a proxy for policy framework, inversely relates to restrictions on international transactions. It's a vital indicator for FDI as it reflects a host country's legal and political systems, crucial elements of the investment environment (David & Jane, 2019). Therefore, we anticipate a positive association between trade openness and inbound FDI. This comprehensive model, integrating these vital governance indicators, is represented by Equation (2) as follows:

$$log(FDI)_{it} = \beta_0 + \beta_1 log(GE)_{it-1} + \beta_2 log(GDP)_{it} + \beta_3 log(GFCF)_{it} + \beta_4 log(FI)_{it} + \beta_5 log(TO)_{it} + \beta_6 CC_{it} + \beta_7 PS_{it} + \beta_8 VA_{it} + \beta_9 GOVE_{it} + \beta_{10} RQ_{it} + \beta_{11} RL_{it} + \alpha_i + \lambda_t + \epsilon_{it} \tag{2}$$

The GE variable is central to our study, representing the stringency of environmental regulations. It assesses a host country's performance on critical environmental issues. Given the varying definitions of the green economy, we've adapted a model from existing literature (Loiseau et al., 2016; and Khoshnava et al., 2019) that uses a composite of environmental, economic, and social dimensions. If the "pollution haven hypothesis"—which claims stringent environmental regulations deter FDI—holds true, our estimated coefficient for GE should be significantly negative. To further bolster the robustness of our findings, we've enhanced our baseline model by incorporating a comprehensive set of institutional quality indicators from the World Bank's Worldwide Governance Indicators (WGI). These six dimensions of governance have been widely recognized for their significant impact on a host country's business environment (Sabir et al., 2019; Aziz, 2018; and Ullah & Khan, 2017). For instance, Bouchoucha & Benammou (2020) empirically demonstrated the positive and substantial effects of government effectiveness, regulatory quality, control of corruption, and voice and accountability on FDI attraction in Africa.

Building on Asiedu's (2003) emphasis on the critical role of institutional efficiency, political and economic stability, and corruption control in attracting FDI, we further refine our model. We introduce a comprehensive set of institutional quality indicators into Equation (2). These independent variables include control of corruption (CC), which assesses the extent of public power used for private gain; political stability (PS), measuring the government's vulnerability to unrest, violence, and terrorism; and voice and accountability (VC), reflecting citizens' ability to participate in government selection and enjoy freedoms of expression, association, and media. Additionally, we incorporate government effectiveness (GOVE), which evaluates the quality and political independence of public service; regulatory quality (RQ), linked to the robustness of government policy for private sector development; and finally, the rule of law (RL), serving as a proxy for the host country's adherence to legal principles in areas like intellectual property, contract enforcement, property rights, and crime.

3. RESULTS AND DISCUSSION

3.1. The Results of Descriptive Statistics

Table 2 reports descriptive statistics for several variables based on 512 observations. For the log(FDI), the mean is 4.120 with a standard deviation of 4.216, ranging from a minimum of -5.160 to a maximum of 33.795. The log(GE), or green economy indicators, has a mean of 6.024, a standard deviation of 0.742, and values from 3.550 to 7.350. Next, the log(GDP) has a mean of 4.370, a standard deviation of 5.057, and values spanning from -33.492 to 34.500.

Table 2. The Result of Descriptive Statistics

Variables	Obs.	Mean	Std. dev	Min	Max
log(FDI)	512	4.120	4.216	-5.160	33.795
log(GE)	512	6.024	0.742	3.550	7.350
log(GDP)	512	4.370	5.057	-33.492	34.500
log(GFCF)	512	7.352	17.486	-53.036	257.680
log(FI)	512	58.396	7.596	40.300	77.70
log(TO)	512	4.260	0.466	2.794	5.317
CC	512	-0.463	0.623	-1.580	1.560
PS	512	-0.517	0.830	-2.810	1.220
VA	512	-0.676	0.535	-1.910	0.370
GOVE	512	-0.317	0.638	-1.790	1.510
RQ	512	-0.314	0.640	-2.130	1.110
RL	512	-0.392	0.601	-1.640	1.000

Note : FDI net inflows (% of GDP), GDP growth (annual%), GFCF (annual % growth), FI refers to an index that measures and assesses the level of political, civil and economic freedoms in a given country or region, trade openness is the ratio of the sum of exports and imports of goods and services to GDP, Green economy (GE) indicators refer to a set of metrics or parameters used to measure the economic performance of a country or region with respect to environmental impact and sustainability. The remaining factors (CC, PS, VA, GOVE, RQ, and RL) constitute indices.

Hereinafter, the log(GFCF) shows a mean of 7.352, a large standard deviation of 17.486, and a wide range from -53.036 to 257.680, suggesting considerable variability in gross fixed capital formation. Further, regarding freedom and openness, the log(FI) has a mean of 58.396 and a standard deviation of 7.596, with values between 40.300 and 77.700. The lastly, log(TO), representing trade openness, has a mean of 4.260 and a standard deviation of 0.466, with a relatively tighter range of 2.794 to 5.317. The remaining variables, which are indices, show negative mean values, such as the CC has a mean of -0.463 and a standard deviation of 0.623, ranging from -1.580 to 1.560. The PS has a mean of -0.517 and a standard deviation of 0.830, with values from -2.810 to 1.220. The VA has a mean of -0.676 and a standard deviation of 0.535, ranging from -1.910 to 0.370. The GOVE has a mean of -0.317 and a standard deviation of 0.638, with values between -1.790 and 1.510. The RQ has a mean of -0.314 and a standard deviation of 0.640, ranging from -2.130 to 1.110. Finally, the RL has a mean of -0.392 and a standard deviation of 0.601, with values from -1.640 to 1.000. The negative means for these indices suggest that, on average, the observed entities tend to be below the global average or a specific reference point for these governance indicators.

3.2. The Result of Unit Root test

Table 3 presents the probability values (*p*-value) of four different unit root tests namely LLC test, IPS test, ADF-Fisher test, and PP-Fisher test for first differences in all variables. The *p*-value less than 0.05 typically indicates that the null hypothesis of a unit root can be rejected, suggesting stationarity. For all variables tested in their first difference form Δlog(FDI), Δlog(GDP), Δlog(GFCF), Δlog(FI), Δlog(TO), Δ(GE), Δ(CC), Δ(PS), Δ(VA), Δ(GOVE), Δ(RQ), and Δ(RL), the p-values across all four tests are consistently below 0.05. Specifically, Δlog(FDI), Δlog(GDP), and Δlog(GFCF) shows the p-values in all tests are significant at the 1% and 5% levels., indicating strong evidence of stationarity after first differencing. Similarly, Δlog(FI), Δlog(TO), and Δ(GE) also exhibit p-values well below 0.05, confirming their stationarity in first differences.

Table 3. The Result of Unit Root test in First Differences

Variables	LLC test	IPS test	ADF-Fisher test	PP-Fisher test
Δlog(FDI)	0.000***	0.000***	0.000***	0.000***
Δlog(GDP)	0.000***	0.000***	0.000***	0.000***
Δlog(GFCF)	0.000***	0.000***	0.000***	0.000***
Δlog(FI)	0.005***	0.010**	0.015**	0.013**
Δlog(TO)	0.008***	0.011**	0.018**	0.018**
Δ(GE)	0.003***	0.005***	0.002***	0.002***
Δ(CC)	0.008***	0.009***	0.007***	0.006***
Δ(PS)	0.001***	0.001***	0.000***	0.000***
Δ(VA)	0.001***	0.001***	0.001***	0.001***
Δ(GOVE)	0.001***	0.000***	0.000***	0.000***
Δ(RQ)	0.002***	0.002***	0.001***	0.001***
Δ(RL)	0.001***	0.001***	0.000***	0.000***

Note: significance is reported in asterisks at the levels *** p-value < 0.01, ** p-value < 0.05, and * p-value < 0.1.

The various governance indicators—Δ(CC), Δ(PS), Δ(VA), Δ(GOVE), Δ(RQ), and Δ(RL)—also consistently yield p-values below 0.05 across all unit root tests, suggesting that these indices become stationary after being differenced once. The widespread rejection of the unit root hypothesis at conventional significance levels of 5% for all variables in their first difference implies that all the series are integrated of first order or I(1). This outcome is crucial for subsequent econometric analyses, such as cointegration or panel data regressions, as it indicates that the variables are indeed stationary in their first difference, fulfilling a common prerequisite for many time series models.

3.3. Empirical Result

Table 4 presents the empirical results of panel regression analyses examining the determinants

of FDI across four different models (1) to (4) through pooled ordinary least squares (POLS) without considering fixed effects, regression with year fixed effects (YFE), regression with country fixed effects (CFE), and regression considering both year and country fixed effects (YCFE), respectively. All models are based on 512 observations from 32 countries. Table 4 reports the primary regression outcomes concerning the determinants of FDI inflows. When omitting country fixed effects in model (1) and (2), nearly all coefficients are estimated to be insignificant. However, upon controlling for country fixed effects in model (3) and (4), the coefficients of most explanatory variables attain significance. This aligns with prior research and established theories, underscoring the importance of considering country-specific characteristics in explaining FDI inflows.

Table 4. The Empirical Results of FDI Determinants

Dependent variable = log(FDI)				
	Panel A: Baseline estimate			
Variables	(1)	(2)	(3)	(4)
	POLS	YFE	CFE	YCFE
Constant	-13.828	-8.718	-9.378	-8.992
log(GE)	1.017	1.113	1.047***	1.716***
log(GDP)	0.211***	0.311***	0.803***	0.909***
log(GFCF)	0.012	1.011	0.090	0.010*
log(FI)	-0.399	-0.004	0.001	0.004
log(TO)	12.88***	2.950	3.039	2.960***
Year Dummy	No	Yes	No	Yes
Country dummy	No	No	Yes	No
R^2	0.198	0.202	0.224	0.127
Observations	512	512	512	512
Countries	32	32	32	32

Note: significance is reported in asterisks at the levels *** p-value < 0.01, ** p-value < 0.05, and * p-value < 0.1.

Equation (1) in this study, illustrated in model (4) of Table 4, represents our main estimation model. As anticipated, log(GDP), log(GFCF), and log(TO) exhibit significant positive coefficients, implying that income levels, investment spending, and trade openness are substantial factors attracting FDI. However, the coefficients for the log(FI) are found to be nonsignificant. Notably, the coefficient for the log(GE) is unexpectedly positive and statistically significant at the 1% level. This contradicts the pollution haven effect, which predicts a significantly negative coefficient for the log(GE), suggesting that stringent environmental regulations in host countries increase costs for foreign firms, consequently deterring FDI inflows. The obtained positive coefficient for the GE, however, indicates that stringent environmental regulations in OIC countries actually attract FDI. Specifically, the estimated coefficient suggests that a 1% enhancement in environmental regulation leads to a 1.7% increase in FDI inflows.

The R^2 values vary across models, with the country-fixed effects model explaining the most variance (0.224), while the year and country-fixed effects model explains the least variance (0.127). The inclusion of year and country-fixed effects aims to address endogeneity and unobserved heterogeneity, providing more robust estimates, although sometimes leading to lower R^2 values for within-variation. Overall, the results highlight the strong positive effects of GDP and, to some extent, green economy indicators on FDI, while the impacts of GFCF, freedom, and trade openness appear less consistent or significant once country-specific and time-specific effects are controlled for.

Table 5 presents the empirical results of various panel regression models examining the determinants of FDI, specifically incorporating different institutional quality indicators (CC, PS, VA, GOVE, RQ, and RL). All models control for both country and year fixed effects and include 512 observations from 32 countries. Across all seven models, log(GDP) consistently exhibits a positive and statistically significant impact on FDI, in model (3) with coefficients ranging from 0.066 to 0.183 in model (7), mostly significant at the 1% or 5% level. This reinforces the finding from Table 4 that economic size remains a crucial determinant of FDI. The log(GFCF) generally shows a positive and weakly significant effect on FDI across most models, e.g., 0.016 (Model 1), 0.013 (Model 2), and

0.011 (Model 3), though its significance and magnitude vary. In contrast, the log(FI) remains consistently insignificant across all models, with small negative coefficients, suggesting no discernible impact on FDI in these specifications. The log(TO) consistently demonstrates a strong positive and highly significant relationship with FDI across all seven models, with coefficients ranging from 1.035 in model (3) and 3.703 in model (4), all significant at the 1% level. This robust finding highlights the importance of trade openness in attracting FDI. The log(GE) also consistently shows a positive and statistically significant effect on FDI across all models, e.g., 1.107 in model (1), and 1.924 in model (6), with most coefficients significant at the 1% and 5% level. This indicates that a commitment to green economy principles is a significant factor in attracting FDI.

Table 5. Empirical Results of FDI Determinants of Considering Institutional Quality Indicators

Variables	Panel B: by Institutional Quality Indicators						
Dependent variable = log(FDI)							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Constant	-9.827	-9.742	0.823	-13.934	-11.565	-10.765	-15.662
log(GE)	1.107**	1.205***	1.536***	1.190***	1.663*	1.924***	1.709***
log(GDP)	0.170***	0.174***	0.066**	0.080***	0.110***	0.070**	0.183***
log(GFCF)	0.016**	0.013*	0.011***	0.008*	0.011*	0.013**	0.620**
log(FI)	-0.016	-0.081	-0.023	-0.191	-0.209	-0.108	-0.011
log(TO)	2.943***	3.182***	1.035***	3.703***	3.415***	3.128***	3.163***
CC	0.602***	-	-	-	-	-	-1.113
PS	-	0.348***	-	-	-	-	0.106
VA	-	-	0.655***	-	-	-	0.850
GOVE	-	-	-	0.605*	-	-	-1.203
RQ	-	-	-	-	0.455*	-	0.600
RL	-	-	-	-	-	0.613***	1.100
R^2	0.310	0.353	0.336	0.445	0.324	0.364	0.352
Observations	512	512	512	512	512	512	512
Countries	32	32	32	32	32	32	32

Note: Country and year dummies are controlled for in all the regressions. Significance is reported in asterisks at the levels *** p-value < 0.01, ** p-value < 0.05, and * p-value < 0.1.

Additionally, regarding the institutional quality indicators, the CC in model (1) has a positive and highly significant effect (0.602) on FDI, however, in model (7), its coefficient is negative and insignificant (-1.113). The PS in model (2) has a positive and highly significant effect (0.348), but in model (7), its effect is positive but insignificant (0.106). The VA in model (3) has a positive and highly significant effect (0.655), but in model (7) it's also positive but insignificant (0.850). The GOVE in model (4) has a positive and weakly significant effect (0.605), but in model (7), it shows a negative and insignificant effect (-1.203). The RQ in model (5) has a positive and weakly significant effect (0.455*), but in model (7), its effect is positive but insignificant (0.600). The last, RL in model (6) has a positive and highly significant effect (0.613), but in model (7) it's positive but insignificant (1.100). The varying significance and signs of the institutional quality indicators when included individually versus when all are included together in model (7) suggest potential multicollinearity or complex interactions among these variables. When introduced individually, many institutional quality indicators appear to positively influence FDI, but their individual significance or direction might change when other institutional factors are simultaneously considered. The R^2 values, ranging from 0.310 to 0.445, indicate that these models explain a moderate to good portion of the variation in FDI, with model (4) including GOVE having the highest explanatory power.

3.4. Discussions

Table 5 shows supplementary regression findings by integrating institutional quality indicators to validate the robustness of the estimation result observed in model (4) of Table 4. This approach is adopted due to the potential correlation between governments' approaches to environmental concerns and their overall institutional capabilities. The result across model (1) to (6) indicate significantly positive coefficients for all six governance indicators, signifying that enhanced

institutional quality positively influences FDI inflows. This observation aligns with the findings of Buchanan et al. (2012); and Chen & Jiang (2021). Importantly, even after accounting for the governance indicators, the coefficients for the green economy (GE) remain positive and statistically significant. In model (7), where all six governance indicators are simultaneously considered, the GE's coefficient remains positive and significant. Across model (1) to (7), it is evident that the explanatory power of the GE stands distinct from the broader realm of institutional quality.

The empirical result presented in Tables 5 align partly with the research of Bu & Wagner (2016); and Kim & Rhee (2018), both identify specific conditions under which stringent environmental regulations attract FDI inflows. The findings of this study challenge the traditional view embodied in the pollution haven hypothesis, particularly within the context of OIC countries. It indicates that, after the 2005 period, the green haven effect outweighs the pollution haven effect, showing that FDI flows to OIC countries with stricter environmental regulations. This shift suggests a more complex and evolving global investment landscape, where companies may no longer prioritize lower regulatory burdens but instead seek stable, sustainable environments that align with long-term business goals and corporate social responsibility considerations. This shift is particularly relevant in the post-2005 period, where changes in global economic conditions, greater awareness of environmental sustainability, and international investment trends may have reshaped the way FDI behaves in the presence of stringent environmental regulations. By focusing on a sample of OIC countries and utilizing aggregate data, the study not only adds empirical evidence but also provides a fresh lens for understanding the interaction between environmental governance and foreign investment. This perspective may encourage policymakers in OIC countries to reconsider their environmental regulation strategies, highlighting that fostering a strong environmental governance framework might not only protect natural resources but also contribute to economic growth through increased FDI inflows.

The stringent environmental regulations not only fail to deter FDI inflows in OIC countries but actually serve to attract such inflows. Moreover, these regulations do not create an adverse business environment for domestic firms. The implications of these findings are noteworthy, presenting evidence that stringent environmental regulations are conducive to increasing net FDI inflows. These results challenge the traditional notion of the pollution haven effect and can be elucidated by several factors. Firstly, as highlighted by Contractor et al. (2020), the cost of environmental regulations for firms is just one of many determinants of a country's business environment. In fact, this cost may be of lesser significance in a firm's location decision compared to factors such as the host country's overall technological level, labor quality, and effective governance. Stringent environmental regulations might be correlated with a host country's level of environment-related technology, thereby providing a superior business environment for multinational firms from advanced economies. Porter & Van der Linde (1995) argue that stringent environmental regulations tend to enhance productivity associated with resource utilization, a situation that may attract FDI. Secondly, multinational firms' ethical reputations have gained increasing importance, especially concerning environmental issues (Qoyum et al., 2022). Simultaneously, environmental monitoring by non-governmental organizations (NGOs) has become more active. Increased emphasis on corporate social responsibility (CSR), as discussed in Boulouta & Pitelis (2014), deters firms from locating in countries with weak environmental regulations. If a multinational corporation from an advanced economy is inclined to cause environmental pollution issues in developing countries, this would tarnish the company's reputation, leading to product boycotts and affecting its stock prices.

Consequently, it has become more costly for multinational firms to exploit lenient environmental standards in foreign countries compared to stringent environmental standards in their home countries. Hence, lax environmental regulations in developing countries may not attract multinational firms. In this context, study by Hashmi et al. (2015) find that foreign firms are not only more energy-efficient but also employ more environmentally friendly technologies. However, it's essential to interpret the results with caution. Firstly, this study employs country-level aggregate data instead of firm-level or industry-level data. Therefore, while the results suggest that environmental regulations do not reduce FDI inflows at the country level, they do not eliminate the possibility that a specific pollution-intensive industry may tend to avoid countries with stringent

environmental regulations. If pollution haven effects exist in specific industries, these effects might be negligible at the country level or outweighed by the opposite effects from other industries. This aligns with Dean et al. (2009), find that pollution-intensive industries from certain developing countries are attracted by lax environmental standards, while firms from advanced economies are not significantly impacted by environmental regulations. Secondly, it's important to note that, unlike prior influential studies such as those by Keller & Levinson (2002); and List & Co (2000), this study utilizes data from after 2005. Thus, it's plausible that pollution haven behavior was more prevalent in the 1980s and 1990s and diminished in the 2000s due to substantial advancements in environmental technology in advanced economies and the increasingly active role of NGOs in monitoring environmental matters. The rise in the significance of firms' social reputation and CSR may have also weakened the pollution haven effect in recent times, as discussed in Qoyum et al. (2022). Study by Cai et al. (2020) also pointed out the possibility that firms engaged in highly polluting activities may have already relocated by the time the data were collected. Hence, if such firms from advanced economies had already relocated to pollution havens before the 2000s, the data from the 2000s onwards may not reflect the pollution haven effect. Finally, it's worth noting that the measurement of green economy indicators encompasses various approaches due to its complex dimensions, including economic, environmental, and social aspects (Loiseau et al., 2016). This research adopts a green economy approach within the context of OIC countries, considering the availability of relevant data.

4. CONCLUSIONS

In this study, we contribute novel empirical evidence showcasing that stringent environmental regulations do not act as a deterrent to FDI inflows in OIC countries, contradicting the traditional notion of the pollution haven effect. Moreover, our results demonstrate that these stringent regulations, in fact, entice FDI, leading to what we term a "green haven." It's plausible that a host country's environmental regulations could bolster domestic productivity, consequently attracting multinational firms from foreign shores. Additionally, multinational corporations now face heightened difficulty in capitalizing on lenient environmental standards in OIC countries, as this approach could harm their international reputation, negatively affecting marketing environments and, ultimately, shareholders' interests. Furthermore, the empirical results exhibit robustness when controlling for various indicators of institutional quality. This article specifically focuses on the effects of the green economy on FDI inflows using country-level aggregate data. However, the study does not delve into the specific mechanism that inclines multinational firms to prefer countries with stringent environmental regulations over those with weaker regulations.

In future research, exploring this mechanism using firm-level data would be intriguing, as well as investigating whether the study's results hold true for other measures of environmental regulations. The study's findings suggest that OIC countries should not hesitate to implement stringent environmental regulations, fearing a reduction in FDI inflows. Moreover, the results underscore that environmental regulations are significant factors that foreign firms should consider when making investment decisions at an aggregate level. Additionally, if environmental regulations bolster domestic productivity, they can serve as attractive factors for foreign investors. Future research should explore the specific mechanisms behind these investment decisions, particularly at the firm level, and examine whether the findings hold true for other measures of environmental regulation. This could deepen the understanding of how environmental policies influence FDI behavior across different contexts.

REFERENCES

Aziz, O. G. (2018). Institutional quality and FDI inflows in Arab economies. *Finance Research Letters, 25*, 111-123. https://doi.org/10.1016/j.frl.2017.10.026

Bu, M., & Wagner, M. (2016). Racing to the bottom and racing to the top: The crucial role of firm characteristics in foreign direct investment choices. *Journal of International Business Studies, 47*, 1032-1057. https://doi.org/10.1057/s41267-016-0013-4

Bouchoucha, N., & Benammou, S. (2020). Does institutional quality matter foreign direct investment? Evidence from African countries. *Journal of the Knowledge Economy, 11*, 390-404. https://doi.org/10.1007/s13132-018-0552-y

Boulouta, I., & Pitelis, C. N. (2014). Who needs CSR? The impact of corporate social responsibility on national competitiveness. *Journal of Business Ethics, 119*, 349-364. https://doi.org/10.1007/s10551-013-1633-2

Cai, X., Zhu, B., Zhang, H., Li, L., & Xie, M. (2020). Can direct environmental regulation promote green technology innovation in heavily polluting industries? Evidence from Chinese listed companies. *Science of the Total Environment, 746*, 140810. https://doi.org/10.1016/j.scitotenv.2020.140810

Chen, F., & Jiang, G. (2021). Investigating the impact of institutional quality on FDI: Are there promotional effects in economic integration regions?. *Sustainability, 13*(20), 11309. https://doi.org/10.3390/su132011309

Chipalkatti, N., Le, Q. V., & Rishi, M. (2021). Sustainability and society: Do environmental, social, and governance factors matter for foreign direct investment?. *Energies, 14*(19), 6039. https://doi.org/10.3390/en14196039

Chung, S. (2014). Environmental regulation and foreign direct investment: Evidence from South Korea. *Journal of Development Economics, 108*, 222-236. https://doi.org/10.1016/j.jdeveco.2014.01.003

Contractor, F. J., Dangol, R., Nuruzzaman, N., & Raghunath, S. (2020). How do country regulations and business environment impact foreign direct investment (FDI) inflows?. *International Business Review, 29*(2), 101640. https://doi.org/10.1016/j.ibusrev.2019.101640

Dean, J. M., Lovely, M. E., & Wang, H. (2009). Are foreign investors attracted to weak environmental regulations? Evaluating the evidence from China. *Journal of development Economics, 90*(1), 1-13. https://doi.org/10.1016/j.jdeveco.2008.11.007

Dechezleprêtre, A., & Sato, M. (2017). The impacts of environmental regulations on competitiveness. *Review of Environmental Economics and Policy, 11*(2), 183-206. https://doi.org/10.1093/reep/rex013

Gao, D., Li, G., Li, Y., & Gao, K. (2022). Does FDI improve green total factor energy efficiency under heterogeneous environmental regulation? Evidence from China. *Environmental Science and Pollution Research, 29*(17), 25665-25678. https://doi.org/10.1007/s11356-021-17771-1

Fahad, S., Bai, D., Liu, L., & Baloch, Z. A. (2022). Heterogeneous impacts of environmental regulation on foreign direct investment: do environmental regulation affect FDI decisions?. *Environmental Science and Pollution Research, 29*(4), 5092-5104. https://doi.org/10.1007/s11356-021-15277-4

Han, Y. (2023). Promoting green economy efficiency through fiscal decentralization and environmental regulation. *Environmental Science and Pollution Research, 30*(5), 11675-11688. https://doi.org/10.1007/s11356-022-22952-7

Hashmi, M. A., Damanhouri, A., & Rana, D. (2015). Evaluation of sustainability practices in the United States and large corporations. *Journal of Business Ethics, 127*, 673-681. https://doi.org/10.1007/s10551-014-2056-4

Huang, S. Z. (2022). The effect of natural resources and economic factors on energy transition: New evidence from China. *Resources Policy, 76*, 102620. https://doi.org/10.1016/j.resourpol.2022.102620

Keller, W., & Levinson, A. (2002). Pollution abatement costs and foreign direct investment inflows to US states. *Review of Economics and Statistics, 84*(4), 691-703. https://doi.org/10.1162/

003465302760556503

Khoshnava, S. M., Rostami, R., Zin, R. M., Štreimikienė, D., Yousefpour, A., Strielkowski, W., & Mardani, A. (2019). Aligning the criteria of green economy (GE) and sustainable development goals (SDGs) to implement sustainable development. *Sustainability, 11*(17), 4615. https://doi.org/10.3390/su11174615

Kim, Y., & Rhee, D. E. (2019). Do stringent environmental regulations attract foreign direct investment in developing countries? Evidence on the "Race to the Top" from cross-country panel data. *Emerging Markets Finance and Trade, 55*(12), 2796-2808. https://doi.org/10.1080/1540496X.2018.1531240

Lall, S. (1995). Employment and foreign investment: Policy options for developing countries. *International Labour Review, 134*(4-5), 521.

List, J. A., & Co, C. Y. (2000). The effects of environmental regulations on foreign direct investment. *Journal of Environmental Economics and Management, 40*(1), 1-20. https://doi.org/10.1006/jeem.1999.1095

Loiseau, E., Saikku, L., Antikainen, R., Droste, N., Hansjürgens, B., Pitkänen, K., Leskinen, P., Kuikman, P., & Thomsen, M. (2016). Green economy and related concepts: An overview. *Journal of Cleaner Production, 139*, 361-371. https://doi.org/10.1016/j.jclepro.2016.08.024

Luo, Y., Salman, M., & Lu, Z. (2021). Heterogeneous impacts of environmental regulations and foreign direct investment on green innovation across different regions in China. *Science of the Total Environment, 759*, 143744. https://doi.org/10.1016/j.scitotenv.2020.143744

Lv, C., Shao, C., & Lee, C. C. (2021). Green technology innovation and financial development: Do environmental regulation and innovation output matter?. *Energy Economics, 98*, 105237. https://doi.org/10.1016/j.eneco.2021.105237

Mentes, M. (2023). Sustainable development economy and the development of green economy in the European Union. *Energy, Sustainability and Society, 13*(1), 1-18.

Porter, M., & Van der Linde, C. (1995). Green and competitive: ending the stalemate. *Harvard Business Review, 33*, 120-134.

Qoyum, A., Al Hashfi, R. U., Zusryn, A. S., Kusuma, H., & Qizam, I. (2021). Does an Islamic-SRI portfolio really matter? Empirical application of valuation models in Indonesia. *Borsa Istanbul Review, 21*(2), 105-124. https://doi.org/10.1016/j.bir.2020.08.002

Sabir, S., Rafique, A., & Abbas, K. (2019). Institutions and FDI: evidence from developed and developing countries. *Financial Innovation, 5*(1), 1-20. https://doi.org/10.1186/s40854-019-0123-7

Saini, N., & Singhania, M. (2018). Determinants of FDI in developed and developing countries: A quantitative analysis using GMM. *Journal of Economic Studies, 45*(2), 348-382.

Sajilan, S., Islam, M. U., Ali, M., & Anwar, U. (2019). The determinants of FDI in OIC countries. *International Journal of Financial Research, 10*(5), 466-473. http://dx.doi.org/10.5430/ijfr.v10n5p466

Sambharya, R. B., & Rasheed, A. A. (2015). Does economic freedom in host countries lead to increased foreign direct investment?. *Competitiveness Review, 25*(1), 2-24. https://doi.org/10.1108/CR-05-2013-0047

Shuai, S., & Fan, Z. (2020). Modeling the role of environmental regulations in regional green economy efficiency of China: Empirical evidence from super efficiency DEA-Tobit model. *Journal of Environmental Management, 261*, 110227. https://doi.org/10.1016/j.jenvman.2020.110227

Sultana, S., Zulkifli, N., & Zainal, D. (2018). Environmental, social and governance (ESG) and investment decision in Bangladesh. *Sustainability, 10*(6), 1831. https://doi.org/10.3390/su10061831

Tao, H., Tao, M., & Wang, R. (2022). Do education human capital and environmental regulation drive the growth efficiency of the green economy in China?. *Sustainability, 14*(24), 16524. https://doi.org/10.3390/su142416524

Ullah, I., & Khan, M. A. (2017). Institutional quality and foreign direct investment inflows: evidence from Asian countries. *Journal of Economic Studies, 44*(6), 1030-1050.

https://doi.org/10.1108/JES-10-2016-0215

United Nations Environment Programme. International Resource Panel. (2011). *Decoupling natural resource use and environmental impacts from economic growth*. UNEP/Earthprint.

Wanner, T. (2015). The new 'passive revolution'of the green economy and growth discourse: Maintaining the 'sustainable development'of neoliberal capitalism. *New Political Economy, 20*(1), 21-41. https://doi.org/10.1080/13563467.2013.866081

Xiao, D., Gao, L., Xu, L., Wang, Z., & Wei, W. (2023). Revisiting the Green Growth Effect of Foreign Direct Investment from the Perspective of Environmental Regulation: Evidence from China. *International Journal of Environmental Research and Public Health, 20*(3), 2655. https://doi.org/10.3390/ijerph20032655

Zhang, W., Li, G., Uddin, M. K., & Guo, S. (2020). Environmental regulation, foreign investment behavior, and carbon emissions for 30 provinces in China. *Journal of Cleaner Production, 248*, 119208. https://doi.org/10.1108/CR-05-2013-0047

THIS PAGE INTENTIONALLY LEFT BLANK