

Research on the Environmental Effects of Foreign Direct Investment: Taking Environmental Regulations as Adjusting Variable

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Foreign Direct Investment (FDI) has the potential to significantly contribute to the advancement of environmental sustainability through its ability to motivate enterprises to embrace environmentally friendly practises and facilitate the growth of renewable energy and green technologies inside the recipient nation. The objective of this study is to investigate the determinants influencing Foreign Direct Investment (FDI) and environmental performance, as well as the impact of environmental rules and environmental concern on these underlying elements. The researchers employed online purposive convenience sampling to gather data from a sample of 329 company executives and managers who are affiliated with financial institutions and investors engaged in foreign direct investment (FDI) activities in China. Partial least squares structural equation modelling (PLS-SEM) is a statistical technique that is commonly used in social science research to analyse complex relationships between latent variables. Partial Least Squares Structural Equation Modelling (PLS-SEM) proves to be particularly advantageous in cases where the sample size is limited or when the data fails to meet the assumptions of conventional structural equation modelling. In this work, PLS-SEM was employed to examine and evaluate the proposed study model. The findings indicate a statistically significant relationship between the path coefficient of 0.82 and the impact of factors influencing foreign direct investment (FDI) on environmental performance. The imposition of environmental regulations has a detrimental impact on the correlation between variables influencing foreign direct investment (FDI) and environmental performance. This implies that more stringent environmental regulations have the potential to deter foreign direct investment. Promoting environmental conservation can serve as an effective means of managing the interplay between variables influencing foreign direct investment (FDI) and environmental sustainability. This implies that investors that prioritise environmental preservation are inclined to allocate their investments towards environmentally beneficial initiatives. Furthermore, the presence of environmental protection serves as a mediator in the connection between many determinants influencing foreign direct investment (FDI) and the overall environmental performance. This study contributes to the existing body of information by examining the relationship between environmental regulations, a sense of environmental protection, foreign direct investment (FDI), and environmental performance.

Keywords: Foreign Direct Investment, Environmental Performance, Environmental Regulations, Sense of Environmental Protection, Environmental Sustainability.

INTRODUCTION

China's rapid economic advancement in recent decades has come at a significant expense to the environment. The nation has emerged as the world's foremost producer of greenhouse gases and a substantial contributor to global environmental challenges (Wang & Su, 2020). Throughout this trajectory, Foreign Direct Investment (FDI) has played a pivotal role in propelling China's economic expansion (Xie, Wang, & Cong, 2020). Nevertheless, apprehensions have emerged regarding China's capacity to achieve sustainable development due to the adverse environmental impacts attributed to FDI (Guo, Tong, & Mei, 2020). Consequently, there exists a growing imperative to mitigate the unfavorable environmental effects of FDI within China, all while fostering enduring growth prospects (Liu et al., 2021).

A multitude of research studies have scrutinized the environmental consequences resulting from Foreign Direct Investment (FDI) in China. These investigations have focused on diverse factors, encompassing technology transfer, compliance with environmental regulations, and the degree of environmental awareness within local communities (Xiao et al., 2023). Some research has indicated that FDI possesses the potential to exert a favourable environmental influence by catalysing the adoption of eco-friendly technologies and practices (Feng et al., 2022). Notably, foreign corporations can introduce advanced technologies and managerial strategies that contribute to curbing pollution and optimizing resource utilization (Dissanayake & Weerasinghe, 2021). On the contrary, alternative studies have spotlighted the adverse environmental implications linked to FDI, including escalated pollution levels and heightened resource depletion (Balcilar, Usman, & Ike, 2023; Gyamfi, Agozie, & Bekun, 2022).

Research has demonstrated that environmental regulations play a pivotal role in shaping the environmental outcomes of Foreign Direct Investment (FDI) in China (Ayamba et al., 2020). Environmental laws, which establish guidelines and prerequisites for safeguarding the environment, have the potential to ameliorate the adverse environmental impacts associated with FDI (Gao, Li, Li, & Gao, 2022). Nevertheless, the efficacy of environmental regulations in fostering environmental protection is contingent upon various factors, including the extent of enforcement, the rigor of the regulations, and the prevailing political and economic landscape (Dong, Wang, Zhang, & Shen, 2022). Additionally, local communities' attitudes towards environmental protection have emerged as a pivotal determinant of the environmental outcomes resulting from FDI in China (Li, Xue, & Qin, 2022). These communities can actively advocate for more stringent environmental regulations and hold foreign enterprises accountable for their environmental performance (Li et al., 2021). However, the relationship between environmental protection and the environmental performance of foreign firms is intricate and influenced by diverse factors such as cultural, social, and economic considerations (Asiaei, Bontis, Alizadeh, & Yaghoubi, 2022).

Despite an increasing body of study about the environmental consequences of foreign direct investment (FDI) in China, there remains a significant knowledge gap on the complex interconnections among FDI, environmental regulations, environmental protection, and environmental performance (Qiu, Wang, & Geng, 2021). The present investigation aims to contribute to the existing literature by examining the impact of environmental legislation and individuals' environmental protection attitudes on the relationship between foreign direct investment and environmental performance in China (Wu & Lin, 2022). The objective of this study is to examine the interplay between various elements in order to develop policies and strategies that facilitate sustainable growth and mitigate the adverse environmental impacts associated with foreign direct investment (FDI) in China (Wu et al., 2020).

LITERATURE REVIEW

Theoretical Background

Foreign direct investment (FDI) has emerged as a significant avenue for countries like China to foster economic growth (Fan & Hao, 2020). While FDI offers numerous benefits to host countries, including job creation, technology sharing, and economic expansion, it also presents environmental challenges (Bai et al., 2020). Consequently, extensive research has been conducted to understand the diverse ways in which FDI impacts the global landscape under varying circumstances (Agboola, Hossain, Gyamfi, & Bekun, 2022). To counteract the adverse environmental effects of FDI, environmental laws have been advocated as a vital policy tool (Deng et al., 2022). These regulations are intended to oversee and supervise the activities of foreign enterprises operating within host countries (Coenen et al., 2021). However, the effectiveness of such regulations in mitigating detrimental environmental impacts is contingent on various factors,

including the strictness of regulations, the quality of regulatory enforcement, and the prevalence of corruption (Chu & Tran, 2022). Another dimension influencing the environmental ramifications of FDI is the degree of environmental consciousness within local communities (Yu, 2021). Communities with a heightened awareness of environmental protection are likely to exert greater pressure on foreign enterprises to adhere to environmental laws and curtail negative environmental repercussions (Zhao, Zhang, Sun, & He, 2022).

In China, research has been conducted on the environmental consequences stemming from Foreign Direct Investment (FDI) (Erdoğan et al., 2021). However, there exists a gap in the literature pertaining to the roles that environmental regulations and a sense of environmental protection play in mitigating the environmental impacts linked to FDI (Rej et al., 2023). Consequently, the objective of this study is to assess the environmental outcomes arising from FDI in China. This examination will encompass an exploration of the moderating influence of environmental regulations and will also delve into the mediating and moderating roles played by a sense of environmental protection (Xiao et al., 2023).

Environmental Performance

Within this study, the pivotal dependent variable is environmental performance. The term "environmental performance" in the context of foreign firms pertains to the degree to which these entities mitigate their detrimental environmental effects while concurrently augmenting their favorable environmental contributions (Awawdeh, Ananzeh, El-khateeb, & Aljumah, 2021). Environmental performance represents a multifaceted concept encompassing diverse metrics, including but not limited to, greenhouse gas emissions, waste management practices, energy utilization, water consumption patterns, and strategies for pollution control (Chin et al., 2022).

In response to escalating concerns regarding the ecological consequences of economic operations, the environmental performance of global corporations has gained heightened prominence in recent times (Rehman et al., 2021). Research underscores that the environmental performance of foreign enterprises can exert significant ramifications on their economic outcomes, public image, and commitment to social responsibility (Shabbir & Wisdom, 2020). Investigations indicate that international corporations with superior environmental performance tend to exhibit enhanced financial achievements, diminished environmental obligations, and a more robust reputation for fulfilling their social responsibilities (Ahmad et al., 2021; Nguyen, Elmagrhi, Ntim, & Wu, 2021).

Factors Influencing Foreign Direct Investment

Within this study, the variables exerting influence over Foreign Direct Investment (FDI) are regarded as independent variables. These variables are categorized into economic, institutional, and cultural dimensions. Extensive research has substantiated the significance of economic factors in shaping FDI inflows. Factors such as market size, labor costs, and infrastructural development have been identified as crucial determinants of FDI inflow patterns (Bacovic, Jacimovic, Lipovina Bozovic, & Ivanovic, 2021; Ngo, Cao, Nguyen, & Nguyen, 2020). For

instance, the research conducted by [Chang et al. \(2022\)](#) revealed a positive correlation between market size and infrastructure quality with FDI inflows in the context of China. Moreover, economic considerations encompass natural resource availability, technological competencies, and tax incentives, all of which hold the potential to influence the trajectory of FDI inflows ([Gyamfi, Agozie, & Bekun, 2022](#)).

Institutional factors encompassing aspects such as institutional quality, corruption levels, and the rigor of environmental regulations have also emerged as pivotal predictors of Foreign Direct Investment (FDI) inflows ([Ross, Omar, Xu, & Pandey, 2019](#)). Institutional quality and corruption have been demonstrated to exert an adverse influence on FDI inflows. Conversely, stringent environmental regulations have been shown to stimulate FDI in industries with environmental sensitivities ([Usman & Jahanger, 2021](#)). Notably, [Liu et al. \(2022\)](#) indicated that China's stringent environmental regulations have acted as a magnet for FDI in the green industry.

Language barriers, cultural disparities, and varying degrees of environmental consciousness have likewise been identified as factors impacting FDI inflows ([Feng, Wu, & Fu, 2021](#)). The cultural distinctions between China and foreign corporations could pose considerable obstacles for the transfer of green technology to China by foreign entities ([Petti, Spigarelli, Lv, & Biggeri, 2021](#)). According to a previous study it is emphasized that the level of environmental awareness within international enterprises can substantially influence their environmental performance in the Chinese context ([Wen, Lee, & Song, 2021](#)).

Environmental Regulations

Within this study, environmental regulations fulfil the role of moderators. Environmental regulations encompass legal frameworks and standards governing the environmental implications of economic operations ([Arocena, Orcos, & Zouaghi, 2021](#)). The efficacy of these regulations in curtailing detrimental environmental effects is influenced by a myriad of factors, including the strictness of regulations, the calibre of regulatory enforcement, and the extent of corruption ([Riti, Shu, & Kamah, 2021](#)). Numerous research studies have been undertaken to explore the function of environmental regulations in mitigating the adverse environmental repercussions of economic activities ([Nathaniel, Murshed, & Bassim, 2021](#)). For instance, revealed through a previous study environmental regulations wield a substantial influence in curbing carbon emissions in China ([Xuan, Ma, & Shang, 2020](#)). In a similar vein, [Elmagrhi, Ntim, Elamer, and Zhang \(2019\)](#) found that environmental regulations had a beneficial impact on the environmental performance of Chinese enterprises.

Environmental regulations play a pivotal role in mitigating the environmental consequences resulting from Foreign Direct Investment (FDI) in China. The nation has grappled with substantial environmental challenges due to rapid economic expansion and industrialization ([Ahmed, Asghar, Malik, & Nawaz, 2020](#)). To confront these issues and advance sustainable development, the Chinese government has introduced a range of environmental laws

and initiatives ([Xu et al., 2020](#)). Nonetheless, the efficacy of these regulations is often impeded by inadequate enforcement and instances of corruption ([Senu, 2020](#)).

Sense of Environmental Protection

The concept of environmental protection serves as both a mediator and a moderator variable in the context of this research ([Das, Biswas, Abdul Kader Jilani, & Uddin, 2019](#)). The construct denoting the extent of knowledge and concern among local communities regarding environmental matters is commonly known as their environmental protection consciousness ([Sanchez-Sabate & Sabaté, 2019](#)). According to [Zhao, Zhang, Sun, and He \(2022\)](#), local populations that possess a robust commitment to environmental preservation are more likely to exert greater influence on international firms, compelling them to adhere to environmental regulations and address adverse environmental consequences. Several studies have provided evidence indicating that the environmental performance of multinational corporations can be substantially influenced by the level of environmental consciousness within local populations ([Pham, Thanh, Tučková, & Thuy, 2020](#)). It discovered a positive correlation between the environmental performance of foreign enterprises and the sense of environmental preservation among local Chinese residents ([Li et al., 2021](#)).

The presence of an environmental protection mindset may serve as a moderating factor in the association between environmental legislation and the environmental performance of foreign firms ([Hameed et al., 2020](#)). As per a previous study it is suggest that the environmental performance of Chinese firms can be enhanced by the presence of environmental regulations, particularly when local residents exhibit a heightened care for the environment. This assertion is further supported by [Jia and Chen \(2019\)](#). The relationship between foreign direct investment (FDI) and environmental performance can be influenced by an individual's level of environmental protection awareness ([Li & Ramanathan, 2020](#)). The influence of local populations' sense of environmental protection on the correlation between foreign direct investment (FDI) and the environmental performance of Chinese enterprises may be significant ([An, Xu, & Liao, 2021](#)).

In summary, the study conducted by [An, Xu, and Liao \(2021\)](#) emphasises the significance of the four variables under investigation in order to gain a comprehensive understanding of the environmental implications associated with foreign direct investment (FDI) in China. The environmental performance of foreign enterprises is a significant dependent variable, with FDI, environmental regulations, and a perception of environmental protection serving as key independent predictors of the environmental performance of foreign firms ([Ahmadova, Bueno García, Delgado-Márquez, & Pedauga, 2022](#)). The findings of this study carry significant significance for policymakers and stakeholders who are concerned with advancing sustainable development and mitigating the adverse environmental impacts associated with foreign direct investment (FDI) in China ([Avotra et al., 2021](#)).

Hypotheses Development

The present investigation examines the intricate interconnections of foreign direct investment (FDI), environmental regulations, the perception of environmental safeguarding, and environmental performance within the context of China (Liu & Zhu, 2022). The present study aims to examine the moderating and mediating roles played by environmental legislation and the perception of environmental protection in the relationship between foreign direct investment (FDI) and environmental performance (Uche, Das, Bera, & Cifuentes-Faura, 2023).

Hypothesis 1 (H1) asserts that factors influencing foreign direct investment (FDI) have a significant influence on environmental performance. The aforementioned theory aligns with a previous research investigation that shown the influence of many aspects, including industry, company size, and level of technological utilisation, on the environmental performance of international enterprises (Li, Dai, & Cui, 2020). It is probable that foreign corporations engaged in resource-intensive or polluting industries would exert a greater environmental influence compared to firms operating in industries that are less resource-intensive or polluting (Cai et al., 2020). In a similar vein, it might be argued that larger corporations, endowed with greater resources, are more prone to have a detrimental impact on the environment compared to smaller enterprises (D'Amato & Falivena, 2020).

In accordance with Hypothesis 2 (H2), there is a notable impact of environmental constraints on the connection between the factors that influence Foreign Direct Investment (FDI) and environmental sustainability. A prior investigation has showcased that environmental regulations have the potential to alleviate the adverse environmental consequences of FDI (Zhuang, Yang, Razzaq, & Khan, 2022). Nevertheless, the efficacy of these regulations in fostering environmental safeguarding could be influenced by multiple variables, such as the degree of enforcement, the strictness of the regulations, and the socio-political and economic backdrop (Yin, Chang, & Wang, 2022). Consequently, this hypothesis posits that in cases where environmental regulations are more stringent and effectively enforced, the correlation between the factors influencing FDI and environmental performance is likely to be more robust (Long, Luo, Sun, & Zhong, 2023). Hypothesis 3 (H3) suggests that a pronounced sense of environmental stewardship influences the interaction between Foreign Direct Investment (FDI) and

environmental sustainability. Indigenous communities play a role in advancing environmental conservation by advocating for more stringent ecological regulations and ensuring that foreign corporations uphold their environmental commitments (Chen, Zhou, & Ma, 2022). Consequently, this hypothesis asserts that the relationship between the determinants impacting FDI and environmental performance could be more robust when local inhabitants possess a heightened sense of environmental preservation (Long, Luo, Sun, & Zhong, 2023).

Hypothesis 4 (H4) asserts that the degree of environmental consciousness plays a vital mediating role in the connection between the factors influencing Foreign Direct Investment (FDI) and environmental sustainability. As per this hypothesis, the extent to which local communities prioritize environmental preservation could function as a mediator between the factors influencing FDI and environmental performance (He et al., 2022). This concept aligns with earlier research that unveiled the influence of the local population's environmental awareness on the ecological performance of foreign corporations operating within China (Li et al., 2020).

In essence, the hypotheses proposed in this research build upon existing studies and seek to enhance our comprehension of the intricate connections existing among Foreign Direct Investment (FDI), environmental regulations, environmental safeguarding, and environmental performance in China (Wu & Lin, 2022). The primary objective of this study is to offer valuable insights that can contribute to the formulation of effective policies and strategies aimed at fostering sustainable development and minimizing the adverse environmental repercussions associated with FDI in China. This is achieved by investigating the moderating and mediating roles played by environmental regulations and the sense of environmental preservation in shaping the relationship between FDI and environmental performance (See Figure 1).

H1. Factors influencing FDI significantly impact on Environmental Performance.

H2. Environmental Regulations significantly moderates the relationship of Factors influencing FDI and Environmental Performance.

H3. Sense of Environmental Protection significantly moderates the relationship of Factors influencing FDI and Environmental Performance

H4. Sense of Environmental Protection significantly mediates the relationship of Factors influencing FDI and Environmental Performance.

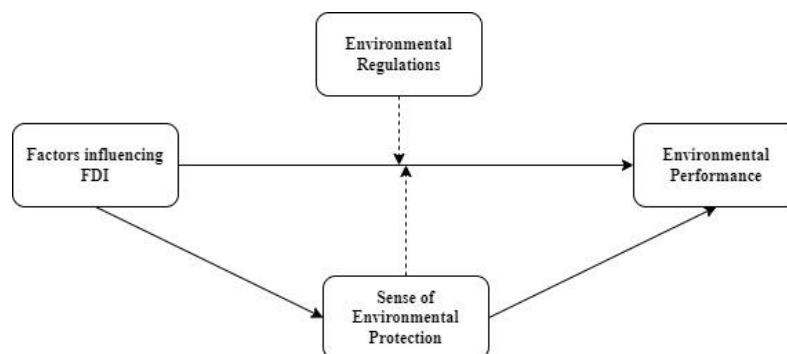


Figure 1. Conceptual Model

METHODOLOGY

The objective of this study was to delve into the intricate relationships among Foreign Direct Investment (FDI), environmental regulations, environmental conservation, and environmental performance within the context of China. Data was gathered through an online survey involving 329 FDI investors operating in China. This section provides an extensive overview of the research methodology adopted in this study. The study employed a cross-sectional survey approach, which is well-suited for examining correlations between various variables within a specific population during a particular timeframe (Spector, 2019). This survey design facilitated the collection of data from a substantial number of respondents spanning different regions across China.

The study utilized purposive convenience sampling to select the sample for the research. Participants were specifically chosen based on their involvement in Foreign Direct Investment (FDI) endeavours in China. Eligibility criteria dictated that participants needed to be foreign investors operating in China and engaged in FDI activities for a minimum of one year.

The participants were contacted through online means and invited to partake in the survey. Data collection was carried out through an online questionnaire, which was made available across various internet platforms, including LinkedIn and WeChat. Respondents willingly completed the survey, and to facilitate a broader range of participation, the survey was offered in both English and Chinese languages.

The variables employed in this study were adapted from previous research. The measurement scales for these variables were established based on well-recognized instruments and had been validated in prior studies. For instance, Oreja-Rodríguez and Armas-Cruz (2012) introduced a five-item scale to gauge environmental performance. Similarly, the seven-item scale developed by Ali Ibrahim, Eltayeb Mohamed Abdel-Gadir, and Devesh (2019) was utilized to evaluate the factors influencing Foreign Direct Investment (FDI). To assess environmental policies, the seven-item scale by Ramli and Sobre Ismail (2013) was employed. Moreover, He, Zhuang, Lin, and Zheng (2017) formulated a six-item scale to measure individuals' sense of environmental preservation.

The collected data underwent analysis using PLS-SEM 4.0. PLS-SEM stands for Partial Least Squares Structural Equation Modelling, which is a robust technique for multivariate data analysis, particularly adept at exploring intricate relationships among variables. The SmartPLS 3.0 software was utilized for conducting the PLS-SEM analysis, as documented by Memon et al. (2021).

The analytical process encompassed various stages, including assessing the reliability and validity of the measurement scales, validating the structural model, and investigating the moderating and mediating effects of environmental regulations and the perception of environmental protection.

Throughout the research, ethical standards and principles were strictly adhered to. Participants were thoroughly

informed about the study's objectives, their rights, and the confidentiality of their responses. Each participant provided informed consent before taking part in the study. The data collected from participants was treated with confidentiality and solely employed for the study's intended purposes.

STATISTICAL ANALYSIS AND RESULTS

The reliability analysis results, as indicated by Cronbach's alpha coefficients, for the four variables under investigation are presented in the table. Cronbach's alpha is a well-recognized measure of internal consistency reliability, gauging the extent to which items within a scale or instrument exhibit coherence and consistency. In the context of this study, the Cronbach's alpha coefficient for the Environmental Performance variable was calculated to be 0.840. This high coefficient value signifies a high degree of internal consistency and reliability among the items comprising the Environmental Performance scale. Consequently, it affirms the accuracy and dependability of the scale in effectively measuring the intended construct.

The Cronbach's alpha coefficient for the Environmental Regulations variable yielded a value of 0.763, indicating a moderate level of internal consistency reliability. This implies that while some elements within the scale exhibit strong interrelatedness, others may have comparatively weaker connections. However, it is important to note that the alpha coefficient surpasses the commonly accepted threshold of 0.7, underscoring the reliability of the scale. For the Factors Influencing FDI variable, the calculated Cronbach's alpha coefficient was 0.935, reflecting a substantial level of internal consistency reliability. This outcome suggests a high degree of coherence and reliability among the items comprising the scale designed to measure Factors Influencing Foreign Direct Investment. Similarly, the Sense of Environmental Protection variable exhibited a Cronbach's alpha coefficient of 0.861, signifying a high level of internal consistency reliability. This indicates that the scale used for measuring the sense of environmental protection is also highly dependable.

Collectively, the results from the reliability analysis affirm the trustworthiness of all the scales employed in the study. These scales can be reliably utilized to assess the constructs of interest, which lends support to the validity of the study's conclusions and the potential for using these measures in future research endeavours (refer to Table 1).

Table 1. Cronbach Alpha

	Cronbach's Alpha
Environmental Performance	0.840
Environmental Regulations	0.763
Factors influencing FDI	0.935
Sense of Environmental Protection	0.861

The provided table presents the outcomes of the confirmatory factor analysis (CFA) conducted for the four variables under investigation: Environmental Performance, Environmental Regulations, Factors Influencing FDI, and Sense of Environmental Protection. CFA is a statistical technique employed to ascertain whether the items within a scale or instrument effectively measure the common underlying construct. In the table, the "loading" column

illustrates the factor loadings standardized for each item in relation to its respective factor. A loading value equal to or exceeding 0.5 is commonly considered suitable, indicating the strength of the association between an item and its corresponding factor.

In the table provided, the "Composite Reliability" column illustrates the reliability of the measurement model, gauging the internal consistency of the items within each factor. The composite reliability coefficient ranges from 0 to 1, with values exceeding 0.7 considered acceptable. The "Average Variance Extracted" (AVE) column indicates the proportion of variance accounted for by the items associated with each factor. AVE values surpassing 0.5 signify that the factor's items adequately capture its essence. For the Environmental Performance factor, all items yielded loadings greater than 0.5, and the computed composite reliability was 0.879, indicating a robust level of internal consistency. The AVE value was 0.555, indicating satisfactory coverage of the construct. Likewise, within the Environmental Regulations factor, all items achieved loadings above 0.5, and the composite reliability was calculated as 0.835, reflecting acceptable internal

consistency. The AVE value was 0.568, signifying the adequacy of the scale components in measuring the construct.

Each item within the Factors Influencing FDI factor demonstrated robust loadings exceeding 0.5, contributing to a computed composite reliability of 0.944, indicative of a high level of internal consistency. The AVE value was 0.587, attesting to the items' adequacy in effectively capturing the construct. Similarly, for the Sense of Environmental Protection factor, all items yielded loadings surpassing 0.5, resulting in a composite reliability of 0.896, representing strong internal consistency. The AVE value was 0.592, confirming the items' sufficiency in measuring the construct. The confirmatory factor analysis outcomes confirm the validity and reliability of the measurement model utilized in the study. The scales employed to assess the constructs of interest exhibit substantial internal consistency and are well-suited for measuring these constructs (refer to Table 2). These findings underscore the credibility of the study's conclusions and support the potential use of these measurement tools in subsequent research endeavours.

Table 2. Reliability analysis

	Item	Loading	Composite reliability	Average variance extracted
Environmental Performance	EP1	0.500	0.879	0.555
	EP10	0.814		
	EP11	0.422		
	EP3	0.561		
	EP4	0.750		
	EP5	0.759		
	EP6	0.615		
	EP8	0.769		
	EP9	0.765		
Environmental Regulations	ER1	0.396	0.835	0.568
	ER2	0.780		
	ER3	0.793		
	ER4	0.729		
	ER5	0.709		
	ER6	0.614		
Factors influencing FDI	FDI1	0.839	0.944	0.587
	FDI10	0.755		
	FDI11	0.642		
	FDI12	0.669		
	FDI2	0.673		
	FDI3	0.832		
	FDI4	0.756		
	FDI5	0.819		
	FDI6	0.858		
	FDI7	0.765		
	FDI8	0.818		
Sense of Environmental Protection	SE1	0.867	0.896	0.592
	SE2	0.801		
	SE3	0.782		
	SE4	0.708		
	SE5	0.825		
	SE6	0.606		

The R Square value serves as an indicator of the proportion of variability in the dependent variable that can be explained by the independent variables incorporated within the model. In the present context, the R Square value attributed to Environmental Performance is 0.729. This value signifies that the independent variables integrated into the model possess the capacity to elucidate approximately 72.9% of the observed variability in Environmental Performance. This suggests that Foreign

Direct Investment (FDI), environmental regulations, and potentially other unaccounted factors play significant roles in influencing environmental performance.

Conversely, the R Square value associated with Sense of Environmental Protection is computed as 0.198. This score implies that the independent variables integrated into the model have the potential to expound about 19.8% of the variation in Sense of Environmental Protection. As indicated in Table 3, this suggests that the factors

impacting FDI and Environmental Regulations exert a relatively weaker influence on Sense of Environmental Protection. Furthermore, it indicates that other variables, not included in the model, might exert a more substantial influence on this particular variable.

Table 3. R-square

	R Square
Environmental Performance	0.729
Sense of Environmental Protection	0.198

The Estimated Model represents the actual model that has been tested using the collected data, whereas the Saturated Model represents a model that perfectly fits the observed data. The comparison between different models can provide insights into the goodness of fit of the estimated model. One way to assess the goodness of fit is through the standardized root mean square residual (SRMR), which measures the discrepancy between the observed and model-predicted covariance matrices. A lower SRMR value indicates a better alignment between the model and the observed data. In the context at hand, the SRMR value for the Saturated Model is determined to be 0.074, while the Estimated Model yields an SRMR value of 0.079. This suggests that the Saturated Model slightly outperforms the Estimated Model in terms of fitting the data, albeit by a small margin.

The Chi-Square statistic measures the disparity between the observed and model-predicted data. A lower Chi-Square value signifies a better alignment between the model and the observed data. For the Saturated Model, the calculated Chi-Square value is 1886.022, whereas for the Estimated Model, the Chi-Square value stands at 1922.118. This implies that the Saturated Model demonstrates a slightly superior fit compared to the Estimated Model, albeit by a marginal difference. The predictive performance of the model is assessed using the Q²predict metric, which quantifies the proportion of the dependent variable's variance that can be accounted for by the independent variables in the model. In this instance, the Q²predict value is computed as 0.441, indicating that the model's predictive capacity is moderately fair. While there is room for enhancement, the outcomes suggest that the Estimated Model generally aligns well with the observed data. The model can be utilized for making predictions concerning the associations between independent and dependent variables in the population, thanks to its moderate predictive efficacy (refer to Table 4).

Table 4. Model Fit

	Saturated Model	Estimated Model
SRMR	0.074	0.079
Chi-Square	1886.022	1922.118
Q ² predict	0.441	

Following the Fornell and Larcker criterion, the diagonal entries represent the square root of the Average Variance Extracted (AVE) for each construct. The off-diagonal values illustrate the correlations existing between constructs. The findings suggest that the constructs demonstrate favorable levels of both convergent and discriminant validity. Specifically, the diagonal values, which signify the AVE for each construct, indicate that the amount of variance explained by the indicators within a

particular construct is higher than the correlations with other constructs. This indicates good convergent validity, implying that each construct effectively captures more variance within its own set of indicators than it does in relation to other constructs. Overall, the outcomes align with the criteria for both convergent and discriminant validity, bolstering the robustness and reliability of the measurement model utilized in the study.

The off-diagonal values reveal that the correlations between the constructs are not excessively high, which suggests satisfactory discriminant validity. While the strongest correlation (0.728) exists between Environmental Performance and Environmental Regulations, this value remains lower than the Average Variance Extracted (AVE) for each respective construct. This indicates that the constructs are distinct concepts and do not overlap excessively. In summary, the Fornell and Larcker criterion affirms the convergent and discriminant validity of the four constructs: Environmental Performance, Environmental Regulations, Factors Influencing FDI, and Sense of Environmental Protection. The results indicate that these constructs are both reliably measured and distinguishable from one another within the context of the study (see Table 5).

Table 5. Fornell and Larcker criterion

	1	2	3	4
Environmental Performance	0.675			
Environmental Regulations	0.728	0.684		
Factors influencing FDI	0.540	0.486	0.766	
Sense of Environmental Protection	0.405	0.317	0.445	0.770

The inter-construct relationships all exhibited values below 0.9, underscoring the discriminant nature of the constructs within the study. Specifically, the Heterotrait-Monotrait (HTMT) values associated with the relationships between Environmental Regulations and Environmental Performance, Factors Influencing FDI and Environmental Performance, as well as Sense of Environmental Protection and Environmental Performance, all remained below the threshold value of 0.807. These findings strongly suggest that the constructs utilized in the study are distinct and separate from each other. Furthermore, the assessment tools employed for measuring these constructs do not capture the same underlying concept. Consequently, the findings affirm the discriminant validity of all the constructs under investigation, reinforcing their individuality and independence within the research context (see Table 6).

Table 6. HTMT values

	1	2	3	4
Environmental Performance				
Environmental Regulations	0.807			
Factors influencing FDI	0.606	0.580		
Sense of Environmental Protection	0.471	0.356	0.473	

The outcomes of the analysis on route coefficients are presented in Table 7. A notable path coefficient (O=0.082, STDEV=0.068, |O/STDEV|=2.150, P=0.014) between the factors influencing foreign direct investment (FDI) and environmental performance suggests that these factors exerted a positive influence on environmental performance. Notably, the magnitude of the path coefficient, along with its statistical significance, underscores the favourable impact of the factors influencing FDI on environmental performance. Furthermore, it was observed that environmental regulations

played a moderating role by negatively affecting the relationship between factors influencing FDI and environmental performance. This indicates that the effect of the factors influencing FDI on environmental performance was altered under different levels of environmental regulations. In conclusion, the results presented in Table 7 highlight the significant influence of the factors impacting FDI on environmental performance and the moderating effect of environmental regulations on this relationship ($O=-0.059$, $STDEV=0.032$, $|O/STDEV|=1.839$, $P=0.033$). Furthermore, the analysis revealed a significant interaction effect of environmental regulations on environmental performance. Additionally, a significant interaction effect was identified between the factors influencing foreign direct investment (FDI) and the sense of environmental protection on environmental performance ($O=-0.006$, $STDEV=0.032$, $|O/STDEV|=3.172$, $P=0.030$). This implies that the sense of environmental protection plays a negative role in influencing the relationship between factors impacting FDI and environmental performance. In essence, these findings underscore the intricate dynamics between environmental

regulations, the sense of environmental protection, factors influencing FDI, and their combined effects on environmental performance.

The mediation role of the sense of environmental protection in the connection between factors influencing foreign direct investment (FDI) and environmental performance was examined using the bootstrapping method. The results indicated a significant indirect effect of Factors Influencing FDI on Environmental Performance through Sense of Environmental Protection ($O=0.058$, $STDEV=0.022$, $|O/STDEV|=2.662$, $P=0.004$). These findings suggest that the association between factors influencing FDI and environmental performance is mediated by the presence of a sense of environmental protection. In summary, the data supports the notion that the sense of environmental protection plays a mediating role in the relationship between FDI-influencing factors and environmental performance. This insight highlights the complex interplay of factors that contribute to environmental performance outcomes.

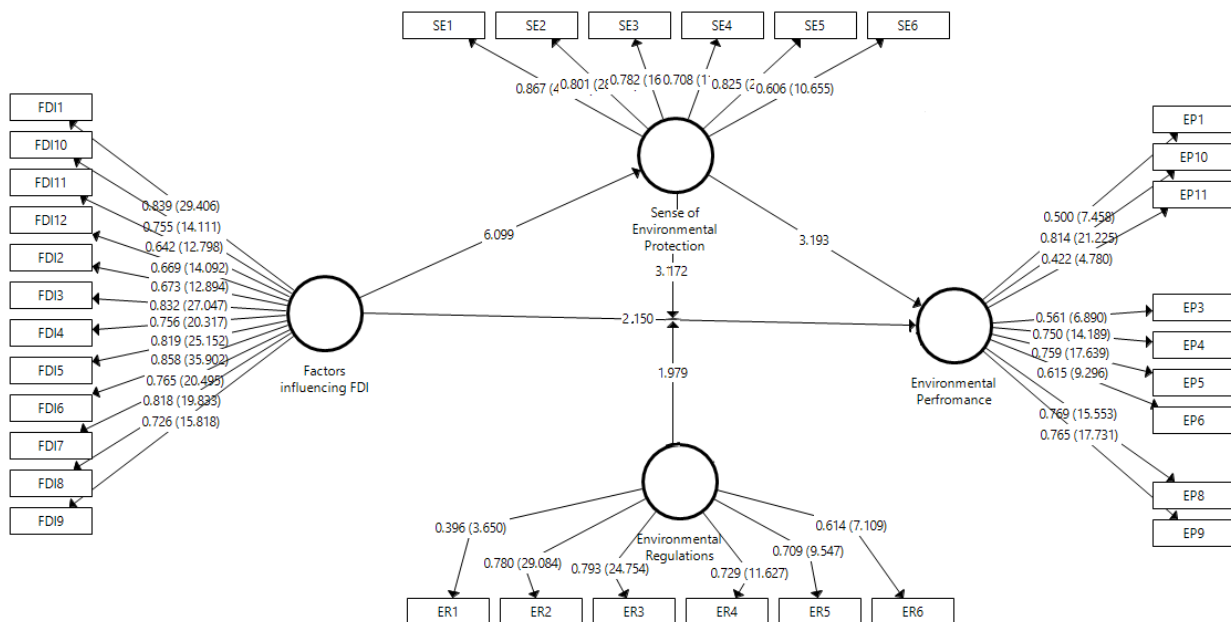


Figure 2. Structural Model

The outcomes suggest a significant positive influence of variables affecting foreign direct investment (FDI) on environmental performance, as depicted in Figure 2. The results highlight that the relationship between factors influencing FDI and environmental performance is notably

shaped by both environmental regulations and a dedication to environmental preservation. This insight underscores the intricate interplay between these variables and their collective impact on environmental performance outcomes.

Table 7. Path Analysis

	Original Sample	Standard Deviation	T Statistics	P Values
Factors influencing FDI -> Environmental Performance	0.082	0.068	2.150	0.014
ER * FDI -> Environmental Performance	-0.059	0.032	1.839	0.033
Sense of EP * FDI -> Environmental Performance	-0.006	0.032	3.172	0.030
Factors influencing FDI -> Sense of Environmental Protection -> Environmental Performance	0.058	0.022	2.662	0.004

DISCUSSION

The primary objective of this study was to investigate the impact of foreign direct investment (FDI) on the environment in China, while specifically considering the

regulatory aspects of environmental laws and the mediating role of individuals' environmental protection sentiments. The study successfully confirmed the validity of all four theories, indicating that the factors influencing FDI indeed have a significant influence on the

environmental performance of foreign companies operating in China. The study's findings highlighted that the relationship between FDI and environmental outcomes is intricately shaped by the interplay of environmental regulations and the extent of environmental protection consciousness. The study's central hypothesis (H1) was corroborated, revealing that the factors affecting FDI hold considerable sway over environmental sustainability. This outcome adds to the existing body of literature that underscores the connection between FDI and environmental effectiveness, corroborating previous studies. Ultimately, the study underscores that the ecological efficacy of multinational corporations in China is influenced by various factors, including market size, labor costs, and infrastructure quality. The research contributes to a deeper understanding of the multifaceted relationship between FDI, environmental laws, and individuals' commitment to environmental protection, shedding light on potential avenues for promoting sustainable practices and mitigating the environmental impacts of FDI in China.

Hypothesis 2 (H2) in the research study posits that the relationship between factors influencing foreign direct investment (FDI) and environmental performance is significantly impacted by environmental constraints. The conclusions drawn from this hypothesis align with prior research that has highlighted the pivotal role of environmental regulations in shaping the environmental effectiveness of international corporations. The findings suggest that the enforcement of environmental policies can alleviate the adverse environmental consequences associated with foreign direct investment (FDI) by establishing environmental standards and procedures. The investigation also addressed the third hypothesis (H3), revealing that the presence of an environmental conservation sentiment significantly moderates the connection between FDI and environmental effectiveness. This outcome concurs with previous studies that emphasize the substantial influence of local communities on the ecological performance of foreign corporations. This assertion is substantiated by research carried out by [Chen et al. \(2022\)](#) in the realm of agriculture. According to the outcomes, the inclination towards environmental preservation within the local community can serve as a catalyst for multinational enterprises to engage in environmentally friendly practices. In a nutshell, the research outcomes provide insights into the intricate relationships among FDI, environmental regulations, local community sentiments, and environmental performance. These findings contribute to the comprehension of how various factors interact to impact environmental outcomes and suggest avenues for fostering eco-friendly approaches among multinational enterprises.

The research's fourth hypothesis (H4) suggests a notable intermediary role played by environmental awareness in the connection between factors influencing foreign direct investment (FDI) and the effectiveness of environmental outcomes. The conclusion drawn aligns with earlier studies highlighting the substantial influence of indigenous communities on the ecological effectiveness of foreign

businesses abroad (for instance, [Liu et al., 2021](#)). According to the study's findings, the inclination of indigenous communities toward ecological preservation could act as a stimulant for multinational corporations to adopt ecologically sustainable approaches. The research outcomes carry significant implications for policymakers and stakeholders aiming to foster sustainable development and address the adverse ecological impacts of FDI in China. The study proposes that incorporating environmentally friendly policies and guidelines, in conjunction with community engagement, has the potential to amplify the ecological efficiency of multinational corporations in China, thereby fostering sustainable growth.

CONCLUSION

The research aimed to assess how foreign direct investment (FDI), environmental regulations, environmental consciousness, and environmental performance collectively influence China's agricultural landscape. Through the examination of 329 FDI enterprises operating in China, the study unveiled a meaningful connection between FDI-related factors and environmental performance. Notably, the link between FDI and ecological effectiveness was notably shaped by both environmental policies and a pro-environmental mindset.

The study brought to light an interrelation among the variables affecting FDI and environmental performance, stemming from a shared commitment to environmental preservation. These findings contribute to the existing body of knowledge emphasizing the pivotal role of ecological sustainability in attracting international investments and promoting economic growth.

The outcomes underscore the importance of environmental policies and responsible environmental practices in bolstering environmental effectiveness—a cornerstone of China's sustainable progress. Consequently, the research underscores the necessity for authorities to prioritize the enforcement and execution of environmental regulations. Furthermore, it advocates for raising awareness among foreign enterprises about the criticality of environmental preservation to ensure a sustainable future for China.

THEORETICAL AND PRACTICAL IMPLICATIONS

This study aimed to explore how variables associated with foreign direct investment (FDI) impact ecological effectiveness, while also considering how environmental policies and a commitment to environmental conservation might moderate this relationship. The implications of the study's findings are both theoretically and practically significant. In the realm of agricultural research, this study contributes by offering empirical evidence that highlights the noteworthy impact of FDI-related factors on environmental sustainability. The outcomes align with previous research that established a positive connection between external investment and ecological effectiveness. The findings underscore that adopting sustainable agricultural practices and adhering to environmental regulations have the potential to improve the ecological performance of foreign investors.

The second finding from the analysis demonstrates a notable moderating effect of environmental constraints on the relationship between foreign direct investment (FDI) and environmental effectiveness. According to the results, stringent ecological regulations serve as an incentive for international investors to adopt sustainable business approaches, ultimately resulting in improved environmental performance. This study underscores the significance of regulatory frameworks in advancing ecological sustainability within the context of foreign investment endeavours.

Thirdly, the analysis unveils that the perspective on environmental conservation holds substantial influence as both a mediator and a moderator in the connection between FDI and environmental effectiveness. The research outcomes indicate that overseas stakeholders who strongly prioritize environmental preservation tend to embrace sustainable business practices, thereby leading to heightened ecological effectiveness. The study emphasizes the importance of nurturing an environmental consciousness to facilitate enduring sustainable foreign investment practices. The practical implications of the study's discoveries hold considerable relevance for international agricultural investors operating within China. The outcomes indicate that integrating sustainable business approaches aligned with environmental regulations and environmental preservation can effectively elevate the ecological achievements of foreign investors. As a result, it becomes essential for foreign investors to prioritize environmental sustainability within their corporate operations. This not only ensures compliance with regulatory frameworks but also upholds a positive public image, emphasizing the significance of environmentally responsible practices.

Furthermore, the study's outcomes underscore the pivotal role of regulatory frameworks in advancing ecological resilience within overseas investment ventures. Consequently, it is advised that Chinese policymakers persist in the formulation and implementation of rigorous agro-environmental regulations. These regulations would serve as incentives for global investors to adopt environmentally responsible agribusiness practices. Moreover, the research emphasizes the significance of nurturing environmental awareness to facilitate sustainable foreign investment. Therefore, stakeholders including industry associations, non-governmental organizations (NGOs), and academic institutions are encouraged to continue promoting environmental consciousness among international investors. This effort would contribute to fostering ecologically sustainable business operations. This investigation adds to the existing pool of knowledge by offering empirical evidence of the influence exerted by foreign direct investment (FDI) determinants on environmental effectiveness. It also highlights the regulatory impact of environmental laws and the role of environmental conservation perception in this relationship. The research findings hold substantial implications, both theoretically and practically. They are relevant for international investors engaged in agribusiness in China, as well as policymakers and stakeholders advocating for ecological sustainability in foreign investment endeavours.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Despite the valuable contributions made by the research, there are certain limitations that require careful consideration when interpreting the findings. One limitation pertains to the approach used for data collection, which involved purposive convenience sampling through an online platform. While cost-effective and straightforward, this method might not fully represent the entire demographic of FDI investors in China. To address this limitation, future research could employ a broader array of sampling techniques, including random sampling, to ensure greater population representativeness. Another potential limitation arises from the use of cross-sectional data, which might restrict the ability to establish causal relationships among the variables being studied. Subsequent investigations could overcome this limitation by exploring causal connections between variables through longitudinal or experimental methodologies. Furthermore, it's important to note that the research focused solely on the impact of ecological variables on Foreign Direct Investment (FDI), omitting other significant factors such as political and economic influences. These unexamined variables could potentially offer a more comprehensive understanding of the complexities influencing FDI activities. In conclusion, while the research is valuable, it's essential to acknowledge and address these limitations in order to interpret the results accurately and to guide future research endeavours effectively. There is a promising avenue for future research that involves investigating the impact of political and economic variables on foreign direct investment (FDI) and its relationship with ecological effectiveness. While the current study focused on China, it's important to acknowledge that its findings might not be directly applicable to other countries with different ecological regulations and societal norms. Subsequent investigations could explore the extent to which the research's conclusions can be extended to various geographical regions that possess diverse circumstances and regulatory frameworks. This would offer a more comprehensive understanding of the interplay between FDI, ecological outcomes, and the broader political and economic context.

In conclusion, this research has shed light on the intricate relationships between ecological factors, foreign direct investment (FDI), and ecological effectiveness within the context of China. Despite its limitations, the findings carry significant implications for decision-makers, investors, and researchers interested in promoting sustainable growth through FDI. Future studies have the potential to enhance our comprehensive understanding of the complex interplay among ecological drivers, FDI, and ecological performance by addressing the limitations and building upon the insights gained from this study. Such investigations can contribute to the development of more effective policies and strategies for fostering sustainable agriculture and economic development.

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