

A study on the Impact of business environment on the Efficiency of China's OFDI

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Abstract: The increasingly widespread impact of the business environment has profoundly changed the efficiency, structure, regional layout, and investment patterns of cross-border enterprises in the current international investment arena. This study examines the digital economy of China's trade using panel data of 53 countries from 2010-2019. The empirical results show that the development of digital economy in host countries can improve the efficiency of China's outward OFDI. After multiple robustness tests, the results remain robust. Finally, the results of the heterogeneity test indicate that the level of digital economy development in high-income countries has the greatest impact on the efficiency of China's OFDI. Therefore, this paper proposes that countries should strengthen the digital economy.

Keywords: Business environment, Global, OFDI, SFA.

1. Introduction

In the context of global economic integration, China, as the second-largest economy in the world, has been increasing the scale and influence of its Outward Foreign Direct Investment (OFDI). However, this process is not a smooth one, and the advantages and disadvantages of the business environment have become one of the key factors affecting the efficiency of China's OFDI. The purpose of this paper is to discuss the impact of the business environment on the efficiency of China's OFDI and to provide theoretical support and practical guidance for Chinese enterprises to seek more efficient investment paths in the global context. 2013, during his visit to Central Asia and Southeast Asia, President Xi Jinping proposed the joint construction of the Silk Road Economic Belt and the 21st Century Maritime Silk Road (from now on referred to as the Belt and Road Initiative). (From now on, referred to as the 'Belt and Road Initiative'). The 20th report stressed the importance of creating a first-class business environment that is market-oriented, rule-of-law-oriented, and internationalized and promoting the high-quality development of the Belt and Road Initiative. Over the past decade or so, the industrial structure of China's outward foreign direct investment (OFDI) has been continuously optimized, and OFDI in the real economy has been growing steadily.

Doing business is an important manifestation of a country or region's economic soft power, which includes the degree of perfection of policies and regulations, the efficiency of government services, the fairness of market competition, the perfection of infrastructure, and the inclusiveness of society and culture. A high-quality business environment can provide investors with stable market expectations, reduce transaction costs, improve operational efficiency, and thus promote the smooth implementation of OFDI activities.

In recent years, the Chinese government has actively promoted the optimization of the business environment and created a more relaxed and convenient investment environment for enterprises through measures such as decentralization and reforms. However, due to the differences in the business environment in different countries and regions,

Chinese enterprises still face many challenges in the process of outbound investment. Therefore, an in-depth study of the impact of the business environment on China's OFDI efficiency not only helps enterprises better respond to changes in the external environment but also provides a scientific basis for the Chinese government to formulate more accurate and effective OFDI policies.

Based on these issues, this paper evaluates the efficiency of China's outward FDI through empirical analysis based on the panel data of 53 countries along the 'Belt and Road' from 2010 to 2019. We hope that by clarifying the logical relationship between the host country's business environment and the efficiency of China's OFDI at the theoretical level, we can further provide specific policy suggestions for optimizing the business environment. In this paper, we will analyze the specific impact mechanism of the business environment on China's OFDI efficiency from multiple dimensions. Through theoretical model construction and empirical data analysis, this paper aims to reveal the intrinsic relationship between the business environment and China's OFDI efficiency and provide strategic suggestions for Chinese enterprises to achieve efficient investment on a global scale. At the same time, this paper also expects to provide valuable references for policymakers to promote the sustainable and healthy development of China's OFDI business.

2. Literature Review

2.1. Business Environment

Doing Business includes the various institutional rules involved in the entry, production, and exit processes of market players, such as the indicators covered in the World Bank's Doing Business report (dealing with construction permits, registering property, trading across borders, enforcing contracts, etc.). In a broader sense, Doing Business is the investment environment, i.e., the country that finances investment activities, due to the sum of the various investment environments that influence the investment behavior of the host country, with the addition of many macro and non-institutional influences. The business environment indicators provided by the World Bank tend towards the latter meaning

and are currently used by many scholars as a highly authoritative source of data.

2.2. Business environment and China's OFDI

Research on the relationship between the host country's business environment and domestic OFDI has received increasing academic attention; however, what is the relationship between the host country's business environment and the home country's OFDI? Is it a facilitator or an obstacle, or is it irrelevant? So far, relevant studies have yet to reach a consensus. Most scholars believe that the optimization of the business environment has a positive impact on China's OFDI. (Xie and Yin, 2024) found that the better the business environment in the host country, the more favorable the choice of cross-border mergers and acquisitions (M&A) for Chinese firms. Different investment motives and the Belt and Road Initiative moderate firms' choice of OFDI entry mode. (Gao et al., 2024) argued that Regarding business environment factors, regulatory governance, civic discourse, government accountability, and regulatory quality in host countries positively impact China's OFDI. (Qian et al., 2022) found that the host country's business environment significantly reduces the success rate of OFDI and increases the cost of OFDI, thereby reducing the size of OFDI. (Weiguang et al., 2020) However, some scholars have reached different conclusions, Chen Weiguang et al. (2020) believe that there is no significant correlation between the host government's governance level and China's OFDI. (Jie et al., 2022) found that Chinese companies tend to invest in countries with generally poorer business environments in their outbound investments in Belt and Road and ASEAN countries.

In summary, a favorable business environment can attract high-quality foreign investment. On the one hand, a good business environment is often accompanied by a sound regulatory system, an efficient government service environment, a transparent and open rule of law environment, and a stable and orderly business environment. Specifically, sound regulations and systems in host countries can stimulate the enthusiasm of OFDI enterprises in independent innovation and industrial upgrading, thus attracting more inward investment enterprises. On the other hand, a good business environment in the host country also means a sound legal system for obtaining credit, enforcing contracts, handling bankruptcy, etc., which can reduce the risks in the operation process. Once the investment is landed and enters the long-term operation stage, a more sound and stable legal system can provide an essential guarantee for inward investors (Xia et al., 2022). Based on the above analysis, this paper makes the following assumptions:

Hypothesis 1: The business environment in host countries increases the efficiency of Chinese OFDI

2.3. Heterogeneity Assumption

The investment motivation of enterprises will directly impact their choice of investment location. On the one hand, the business environment of host countries with different levels of economic development may have different impacts on China's OFDI. Compared with developed countries, improving the business environment in developing countries significantly impacts China's OFDI more. However, some studies suggest that China's outward investment prefers countries or regions with high monetary and good investment freedom. On the other hand, there are differences in the role

of the host country's business environment on China's OFDI depending on investment motives. Through empirical analyses of representative countries along the 'Belt and Road' route, (Zhengxin and Qian, 2019) further proposes that OFDI with different investment motives has heterogeneous preferences for the host country's business environment, while (Kolstad and Wiig, 2012) points out that China's investment in developed countries is based on the motive of strategic asset-seeking, while its investment in developing countries is based on the motives of market-seeking and resource-seeking.

Developing countries are lagging in the business environment but have large markets, abundant natural resources, and cheap labor (Jinming, 2011). They also have more room for development and use in these areas, which provides OFDI enterprises with more opportunities to reap dividends. Countries with a better business environment are usually more stable politically, economically, and socially, and what enterprises have to consider when making OFDI is the uncertainty brought by the host country's political, economic, and social factors. Countries with a good business environment are conducive to our multinational enterprises fully mobilizing the potential market, resources, and labor force, which is conducive to China's OFDI. Therefore, China tends to invest in developing countries with better business environments. Therefore, this paper puts forward the hypothesis2as follow.

Hypothesis2: The business environment is more capable of improving the efficiency of China's outward FDI in countries with high income levels.

3. Model Construction and Data Description

3.1. Model Construction

With reference, this paper constructs the SFA theoretical model to measure the efficiency of China's OFDI as follows:

$$OFDI_{ijt}^* = f(X_{ijt}, \beta) \exp(v_{ijt}) \quad (1)$$

$$OFDI_{ijt} = f(X_{ijt}, \beta) \exp(v_{ijt}) \exp(-u_{ijt}), u_{ijt} \geq 0 \quad (2)$$

$$OFDIE_{ijt} = OFDI_{ijt} / OFDI_{ijt}^* = \exp(-u_{ijt}) \quad (3)$$

$$u_{ijt} = \sigma_k z_{ijt} + w_{ijt} \quad (4)$$

Eq. (1) is a time-varying stochastic frontier gravity model of China's outward FDI, where $OFDI_{ijt}^*$ is the theoretical optimal level of China's outward FDI from i to host country j in period t. X_{ijt} denotes the significant factors affecting the level of the OFDI frontier, β is a vector of parameters to be estimated, and v_{ijt} a random error term. In equation (2), $OFDI_{ijt}$ is the actual size of China's outward FDI in the host country in period t. u_{ijt} is the inefficiency of China's OFDI, which is assumed to be independent from v_{ijt} . In equation (3), A represents the efficiency of China's OFDI, which is the ratio of the actual scale of OFDI to the theoretical optimal level; It can be seen that the actual scale of OFDI is smaller than the theoretical optimal level when the effect of investment inefficiency is present, i.e., $u_{ijt} > 0$, thus $OFDIE_{ijt} \in (0,1)$. In equation (4), z_{ijt} represents the factors affecting the inefficiency term of China's OFDI, σ_k is the coefficient of

z_{ijt} to be estimated, and w_{ijt} is the stochastic disturbance term.

$$\ln ofdi_{it} = \alpha_i + \beta_1 \ln pop_{it} + \beta_2 \ln gdp_{it} + \beta_3 \ln pgdp_{it} + \beta_4 \ln dist_{it} + \beta_5 clang_{it} + \beta_6 ctig_{it} + v_{it} - u_{it} \quad (5)$$

In Eq. (5), pop_{it} , gdp_{it} , $pgdp_{it}$, $dist_{it}$, $clang_{it}$ and $ctig_{it}$ denote respectively the population, economic size, economic growth, geographical distance from China's capital, linguistic proximity to China, and border variables of the host country j in time period t. The investment inefficiency equation is set as:

$$u_{it} = \delta_0 + \delta_4 \ln DB_{it} \quad (6)$$

$$\ln ofdi_{it} = \alpha_i + \beta_1 \ln pop_{it} + \beta_2 \ln gdp_{it} + \beta_3 \ln pgdp_{it} + \beta_4 \ln dist_{it} + \beta_5 clang_{it} + \beta_6 ctig_{it} + v_{it} - (\delta_0 + \delta_4 \ln DB) \quad (7)$$

3.2. Data Description

Significant gaps in the data generated by linear interpolation are due to missing data for some years in some countries. Therefore, this paper chooses to exclude missing values and outliers, and the valid observations for the empirical regression after excluding missing values are 530. Due to the different scales of each variable, to reduce the sample heteroscedasticity, this paper logarithms all the

Based on the above framework, we construct the following basic panel model:

In Eq. (5), $timg_{it}$ is level of development of the digital economy of China's outward FDI from i to host country j in period t. $nature_{it}$ denotes the natural resource endowment of the host country. In this paper, the investment frontier equation and the investment inefficiency equation are simultaneously included in equation (7), i.e. one-step OFDI inefficiency model is constructed for estimation.

The specific form is as follows:

variables in this paper except for the business environment, distance variable, and bordering variable. The descriptive statistics of the main variables are shown in Table 1. The standard deviation of the level of business environment across countries is 0.13, and the maximum and minimum values are 3.69 and 4.49, respectively. *Pop*, *gdp*, *pgdp*, from the World Bank database. *Distcap*, *comlang*, *contig* are from CEPII. Data on China's outward foreign direct investment from China Statistical Yearbook.

Table1. Descriptive Statistics for Key Variables

variable	Average value	Standard deviation	Minimum value	Maximum values
lnofdi	10.94	2.28	5.30	18.67
lnDB	4.26	0.13	3.69	4.49
lnpop	16.64	1.10	14.35	18.52
lngdp	35.59	5.27	23.45	40.42
lnpgdp	21.70	0.99	14.49	23.02
lndistcap	8.84	0.51	6.86	9.87
comlang off	0.06	0.23	0.00	1.00
contig	0.04	0.19	0.00	1.00

4. Regression Results and Analyses

4.1. Baseline Regression Analysis

The regression results are shown in Table 2; according to the results of Table 2, the regression coefficient of *lnDB* is significantly positive at 1% level in the inefficiency equation, which indicates that hat the host country's business environment can reduce the inefficiency of China's outward FDI, thus increasing the efficiency of China's outward FDI, this is because the level of development of the host country's digital economy can contribute to the growth of China's outward FDI by lowering the cost of trade. Meanwhile, according to the results of the regression coefficients of the control variables, it can be seen that the coefficients of *lnpop*, *lngdp*, *lnpgdp*, *lndistcap*, *comlang_off*, and *contig* are all significantly positive in the production frontier equation. This indicates that these control variables significantly affect the efficiency of China's OFDI.

Table 2. Baseline regression analysis

	(1)	T-value
	MD4	
Frontier		
lnpop	0.688***	(9.25)
lngdp	0.129***	(8.26)
lnpgdp	0.270***	(4.06)
lndistcap	-0.166	(-1.13)
comlang_off	2.378***	(7.32)
contig	2.344***	(5.96)
_cons	-6.058***	(-2.63)
Mu		
lnDB	-5.031***	(-8.04)
_cons	25.08***	(9.40)
Usigma		
_cons	0.769***	(11.14)
Vsigma		
_cons	-15.59	
N	530	

4.2. Robustness Tests

In order to test the accuracy of the conclusions of this paper, we used the Chinese OFDI flows instead of the Chinese OFDI stock to conduct a robustness test of the benchmark regression results. Column (1) of Table 3 reports the results of the robustness test, in which the estimated coefficients of the core explanatory variable *lnDB* are all significantly negative at the 1% confidence level, i.e., the host country's business environment reduces the inefficiency of China's outward FDI, and thus improves the efficiency of China's outward FDI, which indicates that the regression results are robust.

In order to exclude the impact of endogeneity problems on the estimation results, this paper regresses the core explanatory variables with one period lag. The regression results are shown in column (2) of Table 3, and the resultant coefficients are still significantly negative, which indicates that the results are robust. The above results are consistent with the initial benchmark regression results, indicating that the empirical results are robust, i.e., the host country business environment promotes the efficiency of China's OFDI.

Table 3. Robustness Tests

	(1)	(2)
	MD5	MD6
Frontier		
lnpopulation	0.997***	0.977***
	(6.96)	(6.46)
lngdp	0.299***	0.296***
	(9.95)	(9.07)
lnpgdp	0.580***	0.568***
	(7.50)	(7.00)
Indistcap	-0.505*	-0.543*
	(-1.71)	(-1.77)
comlang_off	4.360***	4.336***
	(6.63)	(6.29)
contig	4.498***	4.426***
	(5.70)	(5.37)
_cons	-11.82***	-10.79**
	(-2.86)	(-2.48)
Mu		
lnDB	-10.67***	
	(-8.20)	
lnDB_1		-10.60***
		(-7.83)
_cons	51.39***	50.95***
	(9.32)	(8.88)
Usigma		
_cons	2.156***	2.139***
	(27.00)	(25.13)
Vsigma		
_cons	-2.812***	-2.826***
	(-2.93)	(-2.89)
N	530	477

4.3. Heterogeneity Analysis

According to the income level of the sample countries, they are divided into high-income countries and low-income countries. The regression results are shown in Table 4, from

which it can be seen that the business environment of both high-income countries and low-income countries has a significant impact on the efficiency of China's OFDI, indicating that regardless of the level of development of the country, the impact of the business environment on the efficiency of China's OFDI is positive; however, the impact of the high-income countries is relatively significant, and the low-income countries have a relatively small impact. This is because the business environment in developed countries is more favorable and relatively mature, and the business environment in developed countries is more conducive to improving China's OFDI efficiency.

Table4. heterogeneity analysis

	(1)	(2)
	MD8	MD9
Frontier		
lnpop	1.336***	0.777***
	(7.05)	(3.87)
lngdp	0.194***	0.357***
	(3.85)	(7.70)
lnpgdp	0.283	0.0961
	(1.18)	(0.77)
Indistcap	-2.399***	-0.202
	(-4.05)	(-0.64)
comlang_off	1.215***	2.98e-12
	(3.21)	(.)
contig	5.641***	2.844***
	(5.30)	(2.68)
_cons	10.44	-4.343
	(1.34)	(-0.88)
Mu		
lnDB	-17.36***	-6.279***
	(-8.23)	(-3.89)
_cons	79.93***	31.18***
	(8.79)	(4.46)
Usigma		
_cons	2.022***	2.211***
	(17.12)	(14.20)
Vsigma		
_cons	-12.69	-2.364**
	(-1.21)	(-1.99)
N	240	290

5. Conclusion and Recommendations

This paper empirically investigates the impact of the host country's digital economy development approach on China's outward FDI efficiency by using panel data from 53 countries from 2013-2019 and applying stochastic frontier analysis. The results show that the development of host countries' business environment has a significant positive impact on China's OFDI efficiency, and the results remain robust after switching the core explanatory variables. In addition, this paper divides the sample countries into high-income and low-income countries, and the impact of high-income countries on China's OFDI efficiency is more significant.

This paper puts forward the following policy recommendations based on the above empirical findings. Firstly, when choosing investment target countries, the Chinese Government and enterprises should prioritize those

countries with excellent business environments, stable and transparent policies, and sound rule of law. At the same time, the Chinese government can also actively cooperate with these countries to promote the further improvement of their business environment and provide more robust protection for China's outward investment. Strengthen cooperation with high-income countries. Secondly, China should continue to strengthen economic and trade cooperation with high-income countries, deepen investment relations, and promote the growth of two-way investment. At the same time, it should also pay attention to the development potential of low-income countries and help them improve their business environment and investment attractiveness by providing technical support and talent training. Third, China should actively promote the development of the digital economy, strengthen the R&D and application of information and communication technologies, and improve the construction of digital infrastructure to provide more convenient and efficient support for China's outbound investment. At the same time, it should also pay attention to the risks and challenges of the digital economy and strengthen cooperation in areas such as data security and privacy protection. Finally, China should actively participate in international investment cooperation, establish a more just, reasonable, and transparent system of international investment rules, and promote the liberalization and facilitation of global investment. At the same time, it should also strengthen its relations with significant investment partners and promote the development of bilateral and multilateral investment cooperation.

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