Impacts and Mechanisms of the Host Country's Digital Economy on the OFDI of Chinese Enterprises

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Abstract. This study develops a framework for evaluating the digital economy and empirically examines the effects of the host country's digital economy on Chinese enterprises' outward foreign direct investment. The sample consists of 41 nations along the "Belt and Road" from 2010 to 2019. The findings indicate that the growth of the host country's digital economy plays a vital role in fostering the outward investment of Chinese enterprises. Additionally, it influences the size of the outward investment by enhancing system quality and lowering trade costs. Finally, this paper offers relevant recommendations on how to improve the digital economy and the high-quality outward investment in China.

Keywords: Host countries; Digital economy; OFDI; Intermediation effects

1 Introduction

On October 17, 2023, President Jinping Xi delivered a speech entitled "Building an Open and Inclusive, Interconnected and Co-developing World". It was pointed out that only through friendly exchanges and peaceful cooperation can countries achieve mutual development and win-win result. Since the in-depth implementation of the "going out" strategy, how to expand the OFDI market has been an urgent problem to be solved. Simultaneously, digital economy has become one of the increasingly popular issues recently. The "14th Five-Year" Digital Economy Development Plan deploys the development of the digital economy from the national level and clearly defines the development goals of the digital economy. It's clear that the digital economy is now a major driver of development.

With the improvement of digital infrastructure construction, the content of local investment is also changing. Regarding the association between the digital economy and the China's OFDI, it has attracted extensive attention from scholars. It's mainly divided into two views: One is that the OFDI will decline as the digital economy grows. Banalieva (2019), from the standpoint of internalization, points out that the digital economy enables multinational corporations to enter the foreign market without taking the form of the real economy. The exchange through virtual economies may lead to a weakening of OFDI. Another view is that the OFDI will be aided by the growth of the digital economy. Dong(2019), by constructing an index system, conclude that digital infrastructure construction and technology application level have a significant positive relationship with China's OFDI [1].

In general, most of the literature starts from the view of the host country, but this paper will

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focus on the impact and intermediary mechanism of host country's digital economy on China's OFDI, hoping to provide a new perspective. There are some possible marginal contributions: First, expand the time series. Limited to the Global Information Technology Report, most of the literature's timeframe is cut off at 2016. This paper enriches the time series to 2019 through the improvement of the variables. Second, not only focusing on the improvement of the host country's digital economy, this paper also puts forward effective suggestions on how China can improve its own digital economy in the process of OFDI.

2 Theoretical analysis and hypothesis

2.1Theoretical analysis

From the eclectic theory of international production, whether a firm undertakes OFDI is determined by its ownership, internalization, and location advantages, but the importance of these advantages has changed in the digital economy era [2]. In terms of ownership, since digital products are more replicable and easier to spread, the traditional monopoly can no longer be realized by having advantages in capital, technology and so on. In terms of internalization, the purpose of OFDI is to reduce the high transaction costs due to uncertainty, but the digital economy has made the external costs drop dramatically, so the traditional theory is no longer a strong motivation [3]. In terms of location, in the digital economy, direct investment to avoid trade barriers will decrease and to avoid digital barriers will increase, so location factors become more critical [4].In summary, hypothesis one is proposed: The improvement of the host country's digital economy can promote OFDI of Chinese enterprises.

2.2Mechanism analysis

First, institutional quality effects. In the age of digital economy, the conduct of OFDI has a higher level of need for the institutional quality of the host country. For instance, Asiedu (2016) concludes that OFDI is more inclined to flow to countries with stable political systems. Rao(2019) use the extended investment attraction model to conclude that countries with more political stability and better regulatory quality are more attractive to China's OFDI [5]. In general, higher institutional quality implies better privacy protection mechanisms and higher government efficiency. Based on the above analysis, the second hypothesis put forth in this paper is that the growth of the host country's digital economy fosters institutional quality improvement, thus promoting OFDI of Chinese enterprises.

Second, cost-cutting effects. This paper will explain the impact through information exchange costs, production and transportation costs, and friction costs [6]. First of all, the development of AI makes the language barrier lower, and it is easier for people in different countries to communicate, so it will also reduce the information exchange costs [7]. Additionally, compared with physical products, digital products can be easily produced and copied, so the transportation cost of information stored in the form of "bits" is almost zero. Finally, the popularization of digital economy makes it more convenient to release information and provide high-quality services, thus reducing the friction cost in the process of governance. In summary, this paper proposes hypothesis three: Increased level of the host country's digital economy promotes Chinese enterprises' OFDI by reducing the trade costs.

3.Variable selection and data description

3.1The dependent variable: China's OFDI

China's OFDI is divided into two kinds: stock and flow, but the flow data is susceptible to short-term uncertainties, missing more and less continuous. Therefore, this paper uses stock data to represent China's OFDI which is more stable [8]. Data sourced from Statistical Bulletin on China's Foreign Direct Investment.

3.2The explanatory variable: digital economy level (DEL)

This paper selects 41 countries along the Belt and Road, including 26 countries in Asia and 15 countries in Europe. Drawing on the ideas of Li and Chang(2023), a digital economy evaluation system is constructed, as shown in table 1. Missing data are filled in by linear interpolation and trend prediction method. The weights of each indicator and the DEL scores of 41 countries in each year from 2010-2019 are calculated by entropy method.

Table 1. The digital economy evaluation system and the weight of each index.

Primary Index	Secondary index	Sources	Index weights
Digital infrastructure development	Landline subscriptions (per 100 population)	WDI	0.0441284
	Fixed broadband subscriptions (per 100 population)	WDI	0.064216
	Internet user rate	WDI	0.0259759
	Mobile cellular network subscriptions (per 100 population)	WDI	0.013701
Digital economy development environment	Secure Internet Server	WDI	0.3912985
	Level of intellectual property protection	WEF	0.0314841
	Risk capital availability	WEF	0.0227933
Competitiveness of the digital economy	Share of high-tech exports	WDI	0.1057588
	Share of ICT services exports	WDI	0.1967791
	Share of ICT goods exports	WDI	0.1038649

3.3 Control variable

Referring to Wen [3], Cui [9]'s studies, this paper selected the indicators from table 2 as the model's control variables. Data sourced from WDI database.

Table 2. Meaning of control variables and data sources.

Abbreviation	Variable name	Metrics
TOPEN	Foreign trade dependence	Total external trade as a percentage of GDP
IMP	Import share	Total imports as a percentage of GDP
RES	Natural resource	Proportion of ores, metals and fuels export
FDI	Investment openness	Net FDI inflows as a percentage of GDP
GDP	Market size	Host country GDP
TAX	Taxation level	Total host country tax rate
GDPG	Market development potential	Host country GDP growth rate

3.4 Intermediary variable

First, institutional quality (REGIME). In this paper, we refer to Huang's (2013) methodology

and select the average of the six variables of the Worldwide Governance Index (WGI) as a proxy indicator of institutional quality [10]. Second, trade costs (LnCOST). This article uses the improved gravity model of Novy (2013) [11], which is calculated as equation (1). And drawing on Zhao (2022) [12] , Zhang(2022) [6], σis set to 8.

$$\tau_{ij} = \left(\frac{x_{ii}x_{jj}}{x_{ij}x_{ji}}\right)^{\frac{1}{2(\sigma-1)}} - 1 \quad (1)$$

4 Empirical tests and analysis of results

4.1 Correlation test

This paper first conducted descriptive statistic and concluded that there are significant differences between China's OFDI and the host nation's digital economy. The model can be submitted to benchmark regression analysis since it does not have significant multicollinearity issues, according to the correlation and multicollinearity tests.

4.2 Benchmark regression

To investigate the specific impact, this paper builds the following econometric model given in equation (2), where i and t represent the country and year of the study respectively, σ_i is the individual fixed effect, and ε_{it} is the random perturbation term.

$$LnOFDI_{it} = \beta_0 + \beta_1 DEL_{it} + \beta_2 LnTOPEN_{it} + \beta_3 LnIMP_{it} + \beta_4 RES_{it} + \beta_5 FDI_{it} + \beta_6 LnGDP_{it} + \beta_7 TAX_{it} + \beta_8 GDPG_{it} + \sigma_i + \varepsilon_{it} \quad (2)$$

Fixed effects are used in this paper's empirical analysis based on the Hausman test results. Table 3 displays the results of the regression. According to the results, the core explanatory variable DEL is positive at the level of 1%, indicating that the host country's digital economy and China's OFDI have a substantial positive correlation. The higher level of a country's digital economy, the more likely it is to attract Chinese enterprises to make direct investment in it, and the digital economy is gradually becoming a key competitiveness in drawing foreign investors. Hypothesis one is valid.

Next, control variables. External trade dependence. The coefficient of TOPEN is significantly negative at the level of 1%, which is a slight deviation from other scholars' theories. The reason may lie in the fact that most of the selected countries are developing countries, with a poor economic level, and the attraction lies more in the resources, labor and preferential policies; Import share. IMP is positively correlated, indicating that the more open a country's economy, the easier it is to attract high-tech and other high-quality resources, which is conducive to the construction of the digital economy; Natural resource endowment. China's OFDI is entering a high-quality development stage. The type of investment has gradually shifted from resource-oriented to technology-oriented, no longer limited to the natural resource, but more focused on improving their competitiveness through the technology innovation.

4.3 Robustness test and endogeneity test

This paper verifies the robustness of the model by replacing DEL with the global innovation

index (GII). As the secondary indicators of GII such as intellectual property protection, transformation of scientific achievements overlap with DEL, this paper chooses GII as the replacement variable, and the specific regression results are displayed in table 4, indicating that the model is robust; Since the level of digital economy in the current period will affect the inflow of OFDI in the next period, this paper selects DEL in the lagged period as the core explanatory variable and re-runs the regression to solve the endogeneity problem. The results are shown in table 5. It's evident that L.DEL continues to significantly influence China's OFDI, suggesting that this model is accurate and reliable.

Table 3. Benchmark regression results.

Variables	LnOFDI
DEL	5.266***
	(1.128)
LnTOPEN	-0.887***
	(0.341)
LnIMP	1.864***
	(0.378)
RES	-0.044***
	(0.009)
FDI	-0.009
	(0.007)
LnGDP	2.327***
	(0.266)
TAX	-0.030**
	(0.014)
GDPG	-0.024
	(0.016)
_cons	-50.889***
	(7.345)
N	410.000
r2	0.397
Fixed effect	Settled

Table 4. Robustness test.

Variables	LnOFDI
GII	0.095*
	(0.055)
LnIMP	-0.489
	(1.001)
LnTOPEN	-0.691
	(0.788)
RES	-0.079***
	(0.030)
FDI	-0.003
	(0.009)
TAX	-0.060***
	(0.022)
GDPG	-0.048
	(0.031)
LnGDP	2.435***
	(0.588)
_cons	-47.333***
	(17.125)
N	410.000
r2	0.450
fixed effect	settled

Table 5. Endogeneity test.

Variables	LnOFDI
L. DEL	7.181***
	(1.502)
LnTOPEN	-1.101***
	(0.376)
LnIMP	1.620***
	(0.442)
RES	-0.041***
	(0.010)
FDI	-0.009
	(0.007)
LnGDP	1.988***
	(0.339)
TAX	-0.026*
	(0.015)
GDPG	-0.013
	(0.019)
_cons	-41.089***
	(9.492)
N	369.000
r2	0.320
fixed effect	settled

Standard errors in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

4.4 Intermediation effects

The test methodology of intermediation effects is based on the practice of Wen (2004) [13]. Table 6 presents the results which show that an increase in the level of the host nation's digital economy improves system quality and reduces trade costs. Meanwhile, after adding mediating variables, the coefficient of digital economy is still significant, so the mediating effect is established and hypotheses two and three are verified.

Table 6. Regression results of the mediated effects model.

Variables	(1) LnOFDI	(2) REGIME	(3) LnOFDI	(4) LnCOST	(5) LnOFDI
DEL	5.266***	1.338*	6.930***	-0.386**	4.809***
	(1.128)	(0.753)	(1.495)	(0.158)	(1.123)
REGIME			-0.324***		
			(0.040)		
LnCOST					-1.185***

					(0.370)
LnTOPEN	-0.887***	0.035	-0.126	-0.060	-0.959***
	(0.341)	(0.228)	(0.386)	(0.048)	(0.338)
LnIMP	1.864***	-0.348	1.030**	-0.121**	1.721***
	(0.378)	(0.252)	(0.522)	(0.053)	(0.376)
RES	-0.044***	-0.011*	0.004	0.002	-0.043***
	(0.009)	(0.006)	(0.005)	(0.001)	(0.009)
FDI	-0.009	-0.010**	0.029**	0.001	-0.008
	(0.007)	(0.004)	(0.015)	(0.001)	(0.006)
LnGDP	2.327***	0.622***	1.080***	-0.116***	2.190***
	(0.266)	(0.177)	(0.101)	(0.037)	(0.266)
TAX	-0.030**	0.010	-0.058***	0.008***	-0.021
	(0.014)	(0.009)	(0.010)	(0.002)	(0.014)
GDPG	-0.024	0.026**	0.179***	-0.002	-0.026*
	(0.016)	(0.011)	(0.032)	(0.002)	(0.016)
_cons	-50.889***	-14.558***	-20.996***	4.735***	-45.277***
	(7.345)	(4.904)	(3.383)	(1.031)	(7.461)
N	410.000	410.000	410.000	410.000	410.000
r2	0.397	0.123	0.500	0.146	0.414
fixed effect			settled		

Standard errors in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

4.5 Heterogeneity analysis

4.5.1 By size of host countries' GDP

GDP can reflect the economic level of a country, which can be used to judge the comprehensive strength. In this paper, the sample is divided into low and high GDP group. Table 7's results demonstrate a substantial correlation between DEL and China's OFDI for the high GDP group, but not for the low GDP group. The reason may lie that there are fewer relevant policies and national support to promote the digital economy in developing countries, and the early stages of the digital development could be the causes. While in the developed countries, the digital economy system is superior, and there are more high end talents and technologies, so the increase in the digital economy level will stimulate the foreign investment more obviously.

4.5.2By country region

According to the classification of the region, it can be divided into two categories: Europe and Asia. The results show that the correlation coefficient of Europe is larger than that of Asia, indicating that China's direct investment in Europe more emphasis on the level of digital economy development. The reason for which is that in addition to the large difference in the level of economic development, it may also be related to factors such as policy and distance.

Table 7. Heterogeneity analysis.

Variables	Low GDP lnofdi	High GDP lnofdi	Asian lnofdi	European lnofdi
DEL	1.810	4.885***	4.255***	5.468**
	(2.410)	(1.384)	(1.431)	(2.190)
LnTOPEN	0.018	-1.631***	-1.290***	1.954
	(0.486)	(0.534)	(0.330)	(2.297)

LnIMP	1.059*	2.351***	1.544***	2.758
	(0.547)	(0.548)	(0.361)	(2.881)
RES	-0.027***	-0.080***	-0.046***	-0.028
	(0.010)	(0.018)	(0.011)	(0.019)
FDI	-0.016	-0.002	-0.007	-0.005
	(0.011)	(0.008)	(0.010)	(0.009)
LnGDP	2.438***	2.673***	2.257***	1.847*
	(0.319)	(0.507)	(0.254)	(1.111)
TAX	-0.052***	0.031	-0.058***	0.005
	(0.016)	(0.027)	(0.016)	(0.027)
GDPG	-0.005	-0.009	-0.038**	0.002
	(0.023)	(0.023)	(0.017)	(0.044)
_cons	-52.084***	-60.192***	-44.433***	-58.010**
	(8.832)	(13.269)	(7.102)	(27.418)
N	200.000	210.000	280.000	130.000
r2	0.441	0.431	0.478	0.370
fixed effect			settled	

Standard errors in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01.

5 Conclusions and policy recommendations

The primary findings of this article are as follows: China's OFDI is postively impacted by the host nation's digital economy, and it is influenced by the growth of the digital economy, which improves institutional quality and reduces trade costs. Several recommendations are made in this study based on the above conclusions.

First, accelerate the construction of digital infrastructure and vigorously develop the digital economy. Building the digital economy requires the joint efforts of the State, enterprises and society. Before we concluded that we attach more importance to the digital economy level of the developed countries, indicating that China's digital economy level lagged behind them. Therefore, we ought to increase the development funding, establish sound digital laws and regulations, and strengthen the cultivation of digital talents. At the same time, in the investment process, we should also actively use the host country's advanced technology to further improve own innovation capacity, so as to achieve mutual benefit and win-win situation between countries.

Secondly, we should grasp the development situation of the countries and adapt to the local conditions. In the process of OFDI, Chinese enterprises should focus more on the host nation's development and make the most of the location when engaging in OFDI. From the government's view, on the one hand, it can adopt different trade policies for different countries. On the other hand, it helps the enterprises better understand the host country's development policies so as to encourage more SMEs to invest abroad. Enterprises themselves can adjust the direction of their investment and make more quality investment through the information, thus promoting the common development of two countries.

Thirdly, China should demonstrate its great power style and assume the role of a great power. At present, there is a serious "digital divide" in global economic development. China, as an influential big country, should take up the responsibility of a great power and take the initiative to strengthen its investment and economic assistance to countries with weak digital

economic level. China should actively participate in the global economic governance of the United Nations, and contribute to the maintenance of global economic stability and the promotion of global economy development.

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