

The Impact of Digital Government on Chinese Companies Going Global

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Abstract. With the trend of globalisation, how can the construction of digital government help Chinese enterprises "go global" is a hot topic at all levels. Based on the data of Chinese A-share listed companies from 2009 to 2023, a fixed-effects model is employed in this paper to explore how the development of digital government affects the scale of enterprises' overseas investment and what reasons may lead to such an effect. Based on the above study, the construction of a digital government can help expand the scope of enterprises' overseas investment by reducing the cost of information search, cross-border compliance expenses and risks in overseas operation, etc. According to the homogeneity test, the promotional effect of digital government on non-state-owned enterprises is relatively small. A robustness test is to examine the stability of the results by varying the independent and dependent variables, extending the model, etc. It was also found that the digital government can reduce the "outsider disadvantage" of enterprises by optimising the institutional supply at home and thus provide a new model for government service support of enterprises going global in the era of the digital economy. This paper will extend the field of international governance in the theory of digital government and provide empirical support from China to support enterprise internationalisation theory; At the same time, it will propose policy ideas to help governments optimize their foreign-related digital service systems and cultivate globally competitive multinational enterprises.

Keywords: digital government, overseas expansion of enterprises, digital empowerment, transaction costs, institutional quality

1. Introduction

As a world trend, the development of digital government is not only about improving the efficiency of government work; at the same time, many other aspects will also change. It will be a main driving force to advance the modernisation of our country's governance system and capabilities. Economically, with the help of data elements, digital government will be able to reduce institutional transaction costs, change the relationship between the government and enterprises, and create an open, efficient and stable business environment. It will not only help to improve the operating conditions in China's domestic market but also enhance the nation's soft power and its voice in the international rule of law. Most of the current studies have focused on the impact of digital government on domestic market entities, such as private enterprises and small and medium-sized

enterprises, but there has been little research on its supporting role for transnational economic activities in an open economy; this will be the focus of future studies.

To achieve the new "dual circulation" development mode, we need to promote the high-quality overseas expansion of Chinese enterprises. With the deepening of changes in international politics and economy, as well as increasing competition for high-tech talents around the world, more and more Chinese enterprises have begun to look abroad for market space, industrial chain links, new business plans, etc. However, there is a serious problem of "liability of foreignness" in the foreign operation, and it is subject to all kinds of traditional obstacles, such as information asymmetry, compliance risk, political risk and cultural differences, as well as new risks such as unilateralism and protectionism. The first two are close together: Digital government can gather data on foreign trade and the laws and policies around the world, and at the same time, through platform cooperation, "one-stop" services for foreign affairs among departments can be offered; finally, big data analytics will be employed to predict overseas risks intelligently. The purpose of this solution is to address the main problems of Chinese enterprises in carrying out overseas operations and provide them with 24/7, all-encompassing digital public goods and services to reduce institutional costs and uncertainties in foreign business effectively. However, there is no systematic study in the existing literature on the relationship between the two major problems of "digital government" and "Chinese enterprises going global". Therefore, this paper aims to fill the research gap mentioned above and explore how to improve the foreign business development of Chinese enterprises through the construction of a digital government. Specifically, this paper will try to address the following key questions: What is the baseline effect, and does the level of development of digital government support significantly boost the expansion of overseas business by local enterprises, such as overseas revenue and investment scale? What is the nature and pathway of transmission for the effect of the channel? Will it reduce the cost of obtaining information by providing this information, improve the efficiency of cross-border cooperation through simpler procedures, or increase people's awareness of risks and promote compliance with laws and rules and risk control? In terms of heterogeneity analysis, are there significant differences in the above effects among different types of enterprises, such as enterprises with different ownership structures and industry technology levels, as well as among different host country environments, such as host countries with different institutional quality and digital infrastructure?

Theoretically and practically, this paper has also made some contributions. Theoretically, it can broaden our study of the digital economy by introducing foreign governance experience and thus expand the scope of research on digital government. Second, it adds to the theory of corporate internationalization by providing the first empirical evidence that the digital institutional infrastructure in the home country is a necessary condition to help companies overcome the disadvantage of being outsiders, and it also offers new data from China for classical theories such as LLL. Thirdly, it offers a theoretical basis for the concept of digital government, empowerment mechanisms and overseas performance, etc. The application of this will be to help the local government build foreign-related digital service platforms and make good use of such resources. The research results can provide some references for determining the main areas of digital empowerment in enterprises going global, offer more concrete targets for government policies, build all-weather digital service platforms for Chinese enterprises going global, and promote the construction of intelligent data empowerment models that do not rely on the old administrative service model.

2. Literature review

The building of the digital government is now one of the main directions for modernising global governance. Its main idea is to use big data, artificial intelligence and other new-generation information technologies to reform the mode of government operation and achieve a change in governance from "department-centered" to "user-centered" [1]. This change is to improve the efficiency of government services and to better sense changes in social and economic activities and adjust policies in time through data. As a strategy for the globalisation of Chinese enterprises, the overseas expansion of Chinese enterprises has gone beyond traditional export trade and foreign investment to participate in the global value chain and obtain strategic resources through OFDI [2]. Although the current research has reached some agreement on the domestic governance effects of digital government and the influencing factors of overseas expansion of Chinese enterprises, there is still a lack of interdisciplinary studies in these two areas.

According to the previous studies, the construction of a digital government has reduced the transaction costs of enterprises through optimisation of the business environment. For example, the reform of the "one-stop online service" has shortened the time and cost for enterprises to complete online applications, and with the application of big data technology, the accuracy of policy implementation has also been improved [3, 4]. However, most of the existing research is limited to the scope of domestic governance, and there is a lack of discussion on how digital government can cross borders and affect the internationalization behaviour of enterprises.

In earlier studies on the reasons for Chinese enterprises going abroad, a three-dimensional analysis system has been built that covers the attributes of the enterprise, the environment of the host country and institutional support at home. Enterprise productivity, scale and technological innovation capacity are generally considered the main factors for this reason [5, 6]. The size of the host country's market, quality of institutions and bilateral relations are external factors. In terms of the institutional support provided by the home country, the function of traditional policy instruments, such as industrial policy and diplomatic agreements, has been verified, but the new-era form of government service model in the digital age has not been fully explored [7, 8].

There are three main problems with the current studies: First, the scope of the research is scattered; for a long time, studies on digital government and internationalization theory have been conducted independently without integrating the analysis of their connection. Second, the understanding of institutional tools is out of date; most studies are based on old policies and do not reflect the revolutionary changes in digital government, data empowerment and intelligent decision-making. Third, the "black box" of the mechanism is not known; there has been no empirical study on how digital government reduces the cost of enterprises going global. This paper is the first to introduce the concept of digital government in the theoretical system of enterprise internationalization and studies how it can help enterprises go global by reducing information costs, compliance costs and risk costs; it also puts forward a new theoretical path to address the "disadvantage of outsiders".

The theoretical basis of this paper is the "outsider disadvantage" theory in corporate internationalization and Transaction Cost Economics. Multinational enterprises will have higher costs due to the distance and institutional differences of the host country, so support can be provided by the home country's institutions. It is also put forward in this paper that, through digital means, the digital government can improve the traditional institutional supply, unify scattered government data in an official public information pool, and use intelligent technology to predict overseas risks and reduce the total cost of enterprises going global systematically. The goal of the theoretical logic is to

extend the scope of international governance for the theory of digital government and provide empirical support for research on corporate internationalisation in China.

In short, the main idea of this paper is that by improving the data empowerment and process optimisation functions of digital government construction, we can reduce the "outsider disadvantage" and cross-border transaction costs for Chinese enterprises going global and promote their overseas expansion. The core idea of this paper will be verified experimentally.

3. Mechanism analysis and research hypotheses

Going global is a relatively large-scale investment for the company; thus, it will either benefit the company or cause it harm, based on the expected advantages and disadvantages. Digital government is a new kind of institutional supply and public good that has changed the cost function and information set of enterprises going global through technological empowerment, thus affecting their optimal decisions. According to the theory of transaction costs, the boundaries of a firm are set by market transaction costs. Overseas markets are far away and have different institutions and cultures; as a result, there are high transaction costs compared with the domestic market, including the expenses of information collection and negotiation, signing contracts, addressing policy uncertainty, etc [7, 8]. The high costs are unable to attract many more enterprises to go global. The economic idea of digital government is to reduce the costs of cross-border transactions by means of institutional and technological reforms. Data integration and process re-engineering have built a "single window" for enterprises to use services provided by the local government, and many old, high-cost offline operations have been changed to low-cost online ones. It will increase the cost of operating abroad for the company, making some that were previously non-profitable overseas.

Digital government can reduce information asymmetry through the channel of information costs and promote the overseas development of Chinese enterprises. Information Asymmetry is a Reason for Market Failure. Enterprises going global face a serious "information disadvantage in overseas markets" and have to pay very high costs to find information on the market demand, policies and regulations, partners, etc., of the host country. Digital Government is the organisation and provision of public information. It has established some overseas enterprise service platforms that can address the problem of information asymmetry in the foreign market by providing reliable, centralised and low-cost public information. It can reduce the marginal cost of information search for enterprises and help them better find overseas investment opportunities.

Digital government will reduce the institutional transaction costs of compliance and promote the expansion of Chinese enterprises abroad. The cost of dealing with the government is one of the reasons for high transaction costs. When a company plans to go global, it needs to obtain approval from many domestic departments, such as the National Development and Reform Commission, the Ministry of Commerce and the State Administration of Foreign Exchange; the process is long and difficult, and this represents a typical institutional transaction cost. With the development of the digital government, the reform of "one-stop online service" aims to simplify the administrative approval process for foreign-related matters by going online and standardizing the handling of business processes to reduce processing time and lower the marginal administrative cost of compliance for enterprises.

The digital government will reduce the risk in China's foreign expansion and promote the growth of foreign enterprises. There are too many risks abroad that cannot be covered by insurance, such as political instability and sudden policy changes. Under the new government model, Big Data and early warning systems will be used to change some risks in the new urbanisation into probabilities,

and enterprises will be given public risk management tools. It will lower the marginal risk premium for the enterprise and raise its expected return and confidence in going abroad.

Therefore, we put forward the main hypothesis H1: Digital government can promote their overseas expansion.

4. Variable setting and model selection

4.1. Data source: the data is generally from the past 10 years

Data from A-share listed companies in my country from 2009 to 2023 are used in this paper. The following are the steps of the data processing: (1) Companies in the ST category were excluded; (2) Samples with severe abnormalities in the financial data were deleted; (3) Samples missing data for the statistical year were deleted; (4) To reduce the possible impact of extreme values on the test results, continuous variables were truncated by 1% above and below. All the variable data come from the Wind and CSMAR databases, and Stata 18.0 econometric analysis software was used to process the data.

4.2. Variable setting

Digital government (diggov) is the independent variable in this paper, and word frequency analysis is used to examine the attention of the government to digital issues. As the prefecture-level municipal government promotes the development of the digital economy and the construction of a digital government through relevant policies, this paper will summarize the word frequencies of digital technology and digital transformation-related terms in local government documents and announcements, and then divide these frequencies by the total text length to determine the level of attention and focus on the digital field of the government. When the dependent variable is the overseas investment (Invest) of Chinese multinational corporations, relevant indicators such as whether overseas investment has been carried out, the amount of overseas investment, and the number of overseas investments are used for measurement.

In addition, the control variables in this paper are: company size (Size) is calculated as the natural logarithm of total assets; debt-to-equity ratio (Lev) is calculated as total liabilities/total assets; net profit margin on total assets (ROA) is calculated as net profit margin on total assets ROAB; firm age; and the shareholding ratio of the largest shareholder (Top1) is calculated as the equity concentration index 1/100.

4.3. Model selection

To examine the impact of digital government (diggov) on Chinese companies going global (ofdi), a fixed effects model was used for regression testing, and regression model (1) was constructed. of $di_{it} = \beta_0 + \beta_1 * diggov_{it} + \sum \alpha_k controls_{it} + \varepsilon_{it} + \lambda_t + \mu_i$ (1) ε_{it} Represents a random disturbance term; i and t represent the company and year, respectively. The annual fixed effect λ_t and individual fixed effect μ_i , k represents the number of control variables. β_0 represents the constant term. β_1 represents the coefficient of the independent variable.

5. Empirical analysis

5.1. Descriptive statistical analysis

As shown in Table 1, the number of valid observations in the sample is 43,199. Among the main factors, the mean of overseas investment (ofdi) was 0.264 and its standard deviation was 0.519. The difference between the minimum value of 0 and the maximum value of 2.398 shows that there is a considerable disparity in the internationalization progress of enterprises; some have achieved extensive overseas development. The mean and standard deviation of the level of digital government construction (diggov) were both 0, and the minimum and maximum values were 0 and 0.01, respectively. The control variables are in line with previous research, and the data in this paper have also been verified.

Table 1. Descriptive statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
ofdi	43199	0.264	0.519	0.000	2.398
diggov	43199	0.000	0.000	0.000	0.010
Lev	43199	0.425	0.208	0.027	0.990
Size	43199	22.111	1.313	19.333	26.452
ROA	43194	0.041	0.067	-0.375	0.255
FirmAge	43181	2.860	0.384	1.099	3.638
Top1	43141	0.345	0.150	0.075	0.758

5.2. Benchmark regression

Table 2 is the baseline regression results. Model (1) in Table 2 is a two-way fixed-effects model, and the results show that the diggov coefficient is 12.2309 and is significant at the 10% level ($t=6.25$). After gradually adding enterprise characteristic control variables and industry fixed effects, the diggov coefficient in models (2) and (3) is about 13.1723-13.2764, and its significance has risen to 5% ($t=6.23$). It can be seen that for every increase in the level of development of digital government, the scale of overseas investment by enterprises expands by about 12.2% - 13.3%, and this effect is still strong after controlling for industry fixed effects. Among the control variables, the coefficient of enterprise size is positive and statistically significant at 0.0536-0.0543 ($*p<0.01*$); thus, it can be concluded that an economy of scale is beneficial for going abroad. The coefficient of return on assets (ROA) is approximately -0.0991 to -0.1000 and is also significantly negative ($p<0.05$), indicating that due to profit pressure, short-term investment intentions may decrease.

Table 2. Benchmark regression analysis

	(1)	(2)	(3)
	ofdi	ofdi	ofdi
diggov	12.2309*	13.1723**	13.2764**
	(6.25)	(6.23)	(6.23)

Table 2. (continued)

Lev		0.0222 (0.02)	0.0243 (0.02)
Size		0.0543*** (0.01)	0.0536*** (0.01)
ROA		-0.1000** (0.04)	-0.0991** (0.04)
FirmAge		-0.0101 (0.04)	-0.0049 (0.04)
Top1		-0.0386 (0.04)	-0.0327 (0.04)
_cons	0.3430*** (0.01)	-0.7823*** (0.15)	-0.9208*** (0.18)
N	34326	34269	34269
R2	0.156	0.160	0.162
adj. R2	0.025	0.029	0.030
IND	NO	NO	YES
FE	YES	YES	YES
YEAR	YES	YES	YES

Standard Errors in Parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.3. Robustness test

Robustness tests can be carried out in several ways to verify the results. Table 3, column (1) has replaced the measurement indicator of the independent variable "Digital Government Construction" with "DID". If the region where the enterprise is located is in the scope of the government's digital governance pilot in year t , then the variable will be 1 in year t and subsequently; otherwise, it will be 0. Given that there is a certain time lag in the reflection of the enterprise's investment activities on changes in efficiency, that is to say, when the "Opinions" were implemented in 2016, the effects of the policy may not be seen until the next period. Therefore, for enterprises in the 80 pilot cities, this paper takes a value of 1 in 2017 and thereafter, otherwise it takes a value of 0. In the Robustness Analysis part. Table 3, column (2) changes the measurement indicator for the dependent variable to the logarithm of the enterprise's amount of foreign investment. Table 3, column (3) replaces the measurement indicator of the dependent variable with a binary variable of whether the enterprise engages in foreign direct investment. Table 3, column (4) is the measurement indicator for the independent variable, and it has been logarithmically transformed from the original independent variable. Column (5) in Table 3 is a new corporate governance control variable, and it consists of enterprise market value TobinQ, enterprise growth rate and board size. As shown in columns 1-5 of

Table 3 of the regression results, even after changing the measurement indicators of the variable and expanding the regression model, the conclusion is the same, which further supports hypothesis one.

Table 3. Results of robustness tests

	(1)	(2)	(3)	(4)	(5)
	ofdi	ofdi	ofdi	ofdi	ofdi
DID	0.0481*** (0.01)	26.9470* (14.74)	10.5515** (5.25)	13.2958** (6.25)	13.1511** (6.23)
Lev	-0.0746*** (0.02)	0.0531 (0.05)	0.0232 (0.02)	0.0243 (0.02)	0.0341 (0.02)
Size	0.0859*** (0.00)	0.0910*** (0.01)	0.0290*** (0.00)	0.0536*** (0.01)	0.0538*** (0.01)
ROA	-0.0220 (0.04)	-0.2672*** (0.10)	-0.0829** (0.03)	-0.0991** (0.04)	-0.0624 (0.04)
FirmAge	-0.0931*** (0.01)	-0.0464 (0.10)	-0.0314 (0.03)	-0.0049 (0.04)	-0.0047 (0.04)
Top1	-0.0307 (0.02)	0.0046 (0.09)	0.0127 (0.03)	-0.0327 (0.04)	-0.0283 (0.04)
TobinQ					-0.0012 (0.00)
Growth					-0.0150*** (0.01)
Board					0.0286 (0.02)
_cons	-1.2341*** (0.06)	-1.3713*** (0.42)	-0.3547** (0.15)	-0.9208*** (0.18)	-0.9865*** (0.18)
N	34269	34269	34269	34269	34248
R2	0.123	0.101	0.098	0.162	0.162
adj. R2	0.122	-0.041	-0.044	0.030	0.030
IND	YES	YES	YES	YES	YES
FE	NO	YES	YES	YES	YES
YEAR	YES	YES	YES	YES	YES

Parenthetical Standard Errors

* p < 0.1, ** p < 0.05, *** p < 0.01

5.4. Heterogeneity test

According to the heterogeneity test results of state-owned enterprises and non-state-owned enterprises, it was found in this paper that the promoting effect of digital government construction on non-state-owned enterprises was significantly greater than that on state-owned enterprises. In the state-owned enterprise group (sample size 11,963), although the coefficient of the digital government variable (diggov) was positive (5.6803), it failed to pass the significance test, and thus it did not significantly promote overseas investment by state-owned enterprises. However, the coefficient in the non-state-owned enterprise group (sample size 22,306) reached 18.3417 and was significant at the 5% level (** $p < 0.05$); that is to say, for every unit increase in the level of digital government development, the scale of overseas investment by non-state-owned enterprises expands by about 18.34%. The above can be summarised in the following three ways.

First of all, state-owned enterprises (SOEs) have administrative advantages and internal resources, so they do not need to obtain information and optimisation services from digital governments as often. Overseas expansion is usually due to the company's long-term plan or national policies. State-owned enterprises (SOEs) have a relatively small amount of internal funds and are therefore more dependent on the outside institutional system. The digital government will reduce the inconvenience for citizens seeking information and make life easier. Secondly, due to the many links and long-term approval processes of State-owned enterprises (SOEs), they are too slow to obtain and spread information on policy changes released by the digital government, such as host country risk alerts. Non-state-owned enterprises are relatively small and adaptable, so they are more capable of making all the necessary decisions promptly and using new technologies for go global. Non-state-owned enterprises are relatively concentrated in the areas that are sensitive to policy changes, such as high-tech industries and services; they require more institutional transparency and cross-border compliance; they are easily affected by changes in policies from the digital government, etc. State-owned enterprises are concentrated in the older areas of energy and infrastructure, and their investment plans have long been based on strategy and have shown little demand for digital technology recently. Non-state-owned enterprises (SOEs) have a relatively small number of overseas assets and weak risk resilience in the field of risk management; thus, they are more reliant on digital government risk warnings and legal aid services. SOEs can spread the risk of investment by diversifying the scope of work in the home country and are therefore less dependent on digital tools. Finally, there may be a selection bias in the samples; SOE overseas investments are often in line with strategic plans, so the decision-making process may be less affected by the digital government than that of non-SOE enterprises, which are more driven by market demand and will have a different marginal effect of institutional supply of digital government on cost-benefit analysis.

In short, the differences in the empowering effects of digital government mainly originate from the different resources, decision-making processes and strategic directions of various enterprises. Based on the above analysis, we put forward that in terms of policy formulation, more targeted digital service systems should be constructed for non-state-owned enterprises, such as SME information platforms, and state-owned enterprises need to be led to work together with digital government tools to boost the overall competitiveness of Chinese enterprises going global.

Table 4. Heterogeneity analysis

	(1)	(2)
	ofdi	ofdi
diggov	5.6803 (8.45)	18.3417** (8.87)
Lev	0.0045 (0.04)	0.0351 (0.03)
Size	0.0233*** (0.01)	0.0641*** (0.01)
ROA	-0.1041 (0.08)	-0.0700 (0.05)
FirmAge	-0.2132*** (0.07)	0.0600 (0.05)
Top1	-0.0493 (0.05)	0.0329 (0.05)
_cons	0.5417 (0.34)	-1.3827*** (0.22)
N	11963	22306
R2	0.091	0.204
adj. R2	-0.016	0.059
IND	YES	YES
FE	YES	YES
YEAR	YES	YES

Parenthetical Standard Errors

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6. Conclusions and recommendations

6.1. Conclusion

The theoretical basis of "digital government - empowerment mechanism - overseas performance" will be used in this paper to explore how and why the construction of a digital government can promote overseas investment in enterprises in China. Based on the benchmark regression results, the development level of digital government positively affects the increase in corporate overseas investment, and thus it can be determined that digital government serves as a new kind of home-country institutional supply. Based on the analysis above, the three kinds of costs the digital government hopes to reduce for enterprises' overseas expansion are information search costs, cross-border compliance costs and overseas operating risks. In short, through the combination of the

theory of digital government and the theory of corporate internationalisation, this paper has extended the scope of research on the international governance dimension of digital government and provided new theoretical ideas and empirical data to address the "outsider disadvantage" of Chinese enterprises.

6.2. Research recommendations

Based on the above research results, the following policy recommendations are put forward in this paper: Continue to strengthen the construction of a digital government, promote cross-departmental data sharing and business process re-engineering, build an all-encompassing service platform for global trade and economic information, policies and regulations, risk warnings, etc., to reduce the information search and compliance costs of enterprises entering the global market. At the same time, the international adaptability of digital government services should be enhanced, and in conjunction with countries along the Belt and Road Initiative, a digital governance cooperation mechanism needs to be established to improve the institutional environment in the host country for foreign enterprises. In addition, it is proposed that the relevant departments of the government strengthen their monitoring work on how the new digital government service platforms are actually working for companies engaged in overseas business, and adjust the combination of policy tools based on changes in the external environment of foreign business in a timely manner. The above measures will help China build a strong global supply chain network and foster a cluster of world-class multinational enterprises in the era of the digital economy.

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