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# HOST GOVERNMENT DIGITALIZATION AND CHINESE OFDI ENTRY MODE CHOICE: GREEN-FIELD INVESTMENT VS CROSS-BORDER M&A

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**Abstract.** Based on a theoretical framework based on the perspectives of open governance, transparent governance, and smart governance, the article comprehensively explains the potential impact of host country government digitalization on Chinese enterprises' OFDI entry mode selection. The results indicate that host government digitalization significantly promotes the probability of Chinese enterprises investing by greenfield investment mode; After using instrumental variable to eliminate endogenous interference and undergoing a series of robustness checks, this conclusion remains robust; Host government digitalization influences the OFDI mode choices of Chinese enterprises by suppressing corruption and strengthening intellectual property protection. Based on the research conclusions, we put forward policy suggestions on "how Chinese enterprises should make OFDI entry mode decision and optimize the project management after entry based on the level of host government digitalization".

**Keywords:** government digitalization, OFDI entry mode choice, green-field investment, cross-border M&A.

**JEL Classification:** F21, F23.

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## 1. Introduction

Globalization provides developing countries with opportunities to participate in the global division of labor system. As the largest developing country, China's main ways of participating in globalization are international trade and outward foreign direct investment (OFDI), namely China's strategy of "Go Global". The strategy has led to the rapid development of China's OFDI, with an increasing number of Chinese enterprises seeking to optimize their resource allocation and maximize profits in the global market through international expansion. According to the "Statistical Bulletin of China's Outward Foreign Direct Investment" (Ministry of Commerce of the People's Republic of China et al., 2022), China's OFDI flow increased from $ 5.53 billion in 2004 to $ 163.12 billion in 2022, with its share of global OFDI flow rising from 0.9% to 10.9%, ranking among the top three globally for six consecutive years. As a critical means of connecting to globalization, China's OFDI is closely linked to the construction of a modern industrial system in China. This is due to the significant dual characteristics of China's OFDI: on one hand, Chinese enterprises make investments in many developing countries,

such as those along the Belt and Road Initiative (BRI), transferring mature technologies or less advanced industrial sectors; on the other hand, they make investments in developed countries to acquire high-quality technologies and transfer them back to China (Rui & Yip, 2008; Li et al., 2012). Therefore, making appropriate strategic decisions to enhance the success rate of China's OFDI is crucial for the construction of China's modern industrial system.

"Entry mode choice" is a critical strategic decision in OFDI (Brouthers & Hennart, 2007). Greenfield investment and cross-border mergers and acquisitions, due to their intrinsic attributes (degree of organizational control, level of resource commitment, and risk resistance capability), significantly determine whether the motives and expected returns of OFDI can be successfully realized. So how should Chinese enterprises choose the appropriate entry mode? As a comprehensive classic theory of foreign direct investment, the eclectic paradigm of international production proposed by Dunning (1977) posits that firms' foreign direct investment decisions should follow the Ownership, Location and Internationalization (OLI) framework, considering Ownership, Internalization, and Location factors simultaneously. Rugman (1985) further simplified the OLI framework by combining ownership advantages and internalization advantages into firm-specific advantages (FSA), representing the internal resource base of the enterprise, and referring to location advantages as country-specific advantages (CSA), representing the external environment of the host country. The CSA/FSA matrix is now widely used to explain or predict the strategic decisions of multinational enterprises. Among these factors, the quality of host country governance is an important component of CSA. Numerous studies have shown that the quality of host governance is closely related to multinational enterprises' OFDI entry mode decisions (Meyer et al., 2009; Buckley et al., 2016; Xie & Yin, 2024).

With the rapid development of ICT technology, government digitalization has revolutionized global governance models, providing a new perspective for studying the relationship between government governance and OFDI entry mode decisions. Compared to traditional governance, digital governance exhibits a series of advantages: standardized online administrative approvals make government operations more efficient and convenient; effective disclosure and interaction of information make governance more open and transparent; and big data-based supervision makes governance more intelligent and agile. Since the UK first proposed a government digitalization reform strategy in 2012, 155 countries have proposed national-level digital government strategies, implementing top-down digital government reform practices, and the level of global government digitalization has continuously improved. According to the United Nations E-Government Survey (United Nations, n.d.), the average global E-Government Development Index increased from 0.488 in 2012 to 0.610 in 2022, and the average Online Service Index rose from 0.433 to 0.555. By the end of 2022, out of 193 surveyed countries, 133 had government digitalization levels classified as "very high" or "high," accounting for 69%, while 70 countries were in the "medium" or "low" categories, accounting for 31%, with only seven countries classified as "low."

In this context, studying the relationship between host government digitalization and the OFDI entry mode choices of Chinese enterprises is of significant theoretical and practical importance. Theoretically, it helps provide support for OFDI strategic decisions in the context of global digital governance. Practically, it assists Chinese enterprises in making more reasonable entry mode choices based on the quality of the host government digitalization , thereby enhancing the success rate of China's OFDI.

## 2. Literature review

Existing research mainly explores the relationship between the institutional environment and OFDI entry mode choices of multinational enterprises based on Williamson's (1975) transaction cost theory and the "Institutional-Based View," one of the strategic tripods proposed by Peng (2002). Transaction cost theory considers the minimization of transaction costs for FDI enterprises, while the "Institutional-Based View" focuses on obtaining external legitimacy in the host country market. Yiu and Makino (2002) applied both transaction cost theory and the Institutional-Based View to propose a comprehensive theoretical framework on the impact of host country institutional environment on FDI entry mode decisions, suggesting that FDI enterprises should find a balance between transaction cost efficiency and obtaining external legitimacy. Additionally, using either one theoretical perspective or a combination of both, many scholars have analyzed and empirically tested the relationship between institutional quality and FDI entry mode choices (Alon et al., 2020; Amendolagine et al., 2024; Xie & Yin, 2024) or the relationship between institutional distance and FDI entry mode choices (Xu & Shenkar, 2002; Estrin et al., 2009; Arslan & Larimo, 2011).

In the context of the institutional perspective on OFDI entry mode decisions, academic attention to the OFDI of emerging market multinational enterprises (EMNEs) is increasing. Existing research suggests that the OFDI of EMNEs does not conform to mainstream foreign direct investment theories (Buckley et al., 2008). For instance, Dunning's eclectic paradigm of international production (OLI framework) posits that possessing ownership, location, and internalization advantages simultaneously is a sufficient and necessary condition for enterprises to engage in foreign direct investment. However, EMNEs' foreign direct investment often does not meet these criteria, especially when making counter-cyclical investments in developed countries. Unlike the incremental internationalization approach of developed country MNEs, EMNEs adopt an accelerated internationalization strategy, often driven by significant strategic asset-seeking motives (Bonaglia et al., 2007). Mathews (2006), Luo and Tung (2007) respectively proposed the LLL (linkage–leverage–learning) framework and the "springboard perspective" to summarize the accelerated internationalization phenomenon of EMNEs.

Considering this, Rienda et al. (2013) suggested that when studying the relationship between the institutional environment of host countries and the OFDI entry mode choices of EMNEs, it is necessary to integrate the investment motives of enterprises with the institutional pressures of host countries. Beyond applying transaction cost theory and the "Institutional-Based View," the resource-based view should also be considered. Numerous studies on Chinese enterprises' OFDI indicate that Chinese firms tend to seek high-quality strategic assets through cross-border mergers and acquisitions in developed countries (Rui & Yip, 2008; Li et al., 2012; Hong & Sun, 2006; Deng, 2009). Based on this, studies such as Xie and Yin (2023, 2024) have explored the moderating effect of Chinese enterprises' resource-seeking motives on the influence of host country institutional environments on the choice of entry mode.

Existing research widely acknowledges the governance optimization effects of government digitalization. From the perspective of "efficient governance," government digitalization can enhance the efficiency of government approvals (Mahmoodi & Nojedeh, 2016) and improve customs clearance efficiency (Kim & Kim, 2020). From the perspective of "transparent governance," government digitalization can curb bureaucratic corruption and increase resi-

dents' perceived transparency of the government (Kim et al., 2009; Andersen, 2009; Elbahnasawy, 2014; Lupu & Lazăr, 2015). From the perspective of "open governance," government digitalization can ensure the effective disclosure of public information (Jun et al., 2014) and strengthen citizens' participation in governmental affairs (Twizeyimana & Andersson, 2019). Based on these governance optimization effects, existing research consistently indicates that government digitalization can help FDI enterprises overcome the liability of foreignness, thereby promoting FDI inflows (Kachwamba, 2011; Prasetyo & Susanto, 2017; Mohamed et al., 2020).

The term "liability of foreignness" was first introduced by Zaheer (1995) and further elaborated by numerous studies such as Zaheer and Mosakowski (1997), Kronborg and Thomsen (2009), referring to all the additional economic and social costs that foreign subsidiaries face compared to local companies in the host country. Government digitalization can improve information accessibility, reducing information search costs for FDI enterprises; accelerate administrative approval efficiency, lowering institutional transaction costs for FDI enterprises; and promote citizen participation in governmental affairs, reducing negotiation and supervision costs for FDI enterprises. These are all important channels through which government digitalization promotes FDI inflows. Among these studies, Kachwamba (2011), Al-Azzam and Abu-Shanab (2014) used theoretical frameworks to comprehensively analyze these various channels. Prasetyo and Susanto (2017) conducted a single case study with Banyuwangi in East Java, Indonesia, as the subject of analysis. Mohamed et al. (2020) empirically examined the relationship between government digitalization and FDI inflows using ASEAN countries as their sample. Their research reached relatively consistent conclusions.

Overall, there has been no research focusing on the relationship between government digitalization and the OFDI entry mode choices of multinational enterprises. Existing studies mainly concentrate on the impact of government digitalization on FDI location choices, agreeing that government digitalization can alleviate the liability of foreignness faced by multinational enterprises, thereby promoting FDI inflows. However, due to differences in their inherent attributes, multinational enterprises face heterogeneous "liability of foreignness" in the two entry modes. The question of how host government digitalization alleviates different pain points under the two entry modes, thereby ultimately influencing Chinese enterprises' choice of entry mode, remains unanswered. Moreover, while existing research on the institutional environment and OFDI entry mode is based on transaction cost theory and the Institutional-Based View, proposing strategies for multinational enterprises to choose OFDI entry modes according to the host country's institutional environment, there has been no study focusing on how host government digitalization, in the context of the deepening integration of ICT technology and government governance, will innovate governance models and consequently affect OFDI entry mode choices.

Addressing the shortcomings of existing research, this paper examines the impact of host government digitalization on the OFDI entry mode choices of Chinese enterprises. First, a new theoretical framework is constructed, comprehensively explaining the governance optimization effects of government digitalization from the perspectives of open governance, transparent governance, and smart governance. Next, based on the liability of foreignness theory, transaction cost theory, institutional-based view, and resource-based view, we ana-

lyzes how host government digitalization alleviates the heterogeneous liability of foreignness under the two entry modes and proposes research hypotheses. Finally, using Probit Model and Logit Model, we empirically tests the impact and mechanisms of host government digitalization on Chinese enterprises' OFDI entry mode choices by matching the data of Chinese A-share listed companies' OFDI entry modes with E-Government Index. Specifically, from the perspective of open governance, we analyze and test the direct impact of government digitalization on Chinese enterprises' OFDI entry mode choices by helping themovercome "information deficit" and "legitimacy deficit" under the two entry modes. From the perspective of transparent governance, we analyze and test how government digitalization influences the "corruption friction effect" and "corruption lubrication effect" experienced by Chinese enterprises by inhibiting corruption, thus indirectly impacting their OFDI entry mode choices. Additionally, considering the emphasis on technology in Chinese outward direct investment, wefrom the perspective of smart governance, analyze and test how government digitalization affects Chinese enterprises' technology seeking and technology transferring by strengthening intellectual property protection, thereby indirectly influencing their OFDI entry mode choices.

The contributions of this paper are reflected in the following two points: First, compared to research on "government digitalization and OFDI location choice," we provide a detailed discussion based on the intrinsic attributes of the two entry modes, specifically addressing how host government digitalization helps overcome the heterogenous "liability of foreignness" for multinational enterprises under the two entry modes, thereby ultimately influencing Chinese enterprises' choice of entry mode. This represents a further deepening of research on the impact of host government digitalization on OFDI location choice. Second, compared to studies on the "institutional environment and OFDI entry mode choice," we focuse on how host government digitalization, in the context of the deepening integration of ICT technology and government governance, will innovate governance models and consequently affect enterprises' OFDI entry mode choices. This presents a novel perspective, enriching the research on the impact of the institutional environment on OFDI entry mode choices.

## 3. Theoretical analysis and research hypothesis

### 3.1. Government digitalization and Chinese firms' OFDI entry mode choice

The "liability of foreignness" theory indicates that "information deficit" and "legitimacy deficit" are two important aspects of the disadvantages faced by foreign enterprises (Zaheer, 1995; Zaheer & Mosakowski, 1997; Daamen et al., 2007; Kronborg & Thomsen, 2009). "Information deficit" is similar to the "knowledge gap" proposed in the Uppsala model (Johanson & Vahlne, 1977), while the "legitimacy deficit" is largely related to identity recognition. Kronborg and Thomsen (2009) summarized the "information deficit" as the difficulty foreign enterprises face in obtaining necessary policy and market information due to unfamiliarity with the host country environment, leading to erroneous investment decisions, inaccurate risk assessments, and post-investment management difficulties. They described the "legitimacy deficit" as the difficulty foreign enterprises encounter in quickly understanding the local institutional environment and establishing networks with key stakeholders such as the government, suppliers,

and consumers, which may result in discrimination in market access and the acquisition of critical resources.

Government digitalization enhances the openness of governance and helps alleviate the "information deficit" and "legitimacy deficit" faced by foreign enterprises. Layne and Lee (2001) proposed a four-stage model of e-government evolution – cataloging, transaction, vertical integration, and horizontal integration. The "cataloging" stage involves the dissemination of public information through government portals for citizens' inquiries, while the "transaction" stage involves e-government modules such as online applications and approvals, reflecting both one-way and two-way open governance under government digitalization.

"One-way open governance" of government to citizens under host government digitalization helps alleviate the "information deficit" faced by Chinese enterprises. Regarding public information disclosure, host country government portals provide timely and comprehensive updates on policy developments. Some host country governments have established "one-stop investment service platforms" to promote FDI inflows, which can automatically sense and analyze FDI enterprises' needs and push targeted policy services. This significantly helps Chinese enterprises understand the host country's policies, regulations, and procedural obligations, alleviating potential public information gaps. In terms of market information disclosure, big data technology has transformed how host country market regulatory authorities collect, analyze, and apply data, driving market regulation toward comprehensiveness, precision, dynamism, and intelligence. By locating enterprises on electronic map regulatory grids, regulatory authorities accurately integrate enterprises' basic information, regulatory information, and credit information, and based on integrated analysis, disclose industry trends, investment trends, bidding dynamics, and other intelligence information. This helps Chinese enterprises grasp market potential, competitive conditions, and entry barriers, alleviating potential market information gaps. For example, many countries and regions use XBRL (eXtensible Business Reporting Language), which can intelligently identify and categorize unstructured financial statements into structured financial data modules, greatly enhancing regulatory audit quality and ensuring effective disclosure of corporate financial information, facilitating regulatory authorities' credit rating of enterprises. "TWo-way open governance" between government and citizens under host government digitalization helps alleviate the "legitimacy deficit" faced by Chinese enterprises. Host country government portals typically feature e-government modules such as online approval applications, administrative process consultations, departmental complaints, online interviews, and opinion solicitations. This ensures that Chinese enterprises receive public services equivalent to those enjoyed by local enterprises and can protect their legitimate rights through online governance and accountability (Li et al., 2021). This reduces the necessity for Chinese enterprises to establish close networks with host country stakeholders, decreasing discrimination in market access and acquisition of key resources (Yan & Lyu, 2023).

Although both entry modes face the "information deficit" and "legitimacy deficit," their intrinsic attributes determine that the "information deficit" poses a greater risk to the cross-border M&A mode, while the "legitimacy deficit" poses a greater risk to the greenfield investment mode. From the "information deficit" perspective, compared to the greenfield investment mode, the cross-border M&A mode has more complex entry procedures, requiring the

host country to have highly transparent commercial information disclosure for the acquirer's due diligence of the target enterprise. If serious "information deficit" is encountered, due diligence errors may lead to high acquisition premium risks or integration failures (Young et al., 2008). Additionally, since the cross-border M&A mode involves one-time equity purchases, its irreversibility is lower, and erroneous acquisition decisions may result in substantial sunk costs (Nguyen & Phan, 2007; Bonaime et al., 2018). Conversely, the low entry efficiency of the greenfield investment mode provides an advantage in avoiding "information deficit" (Almor, 2018). When Chinese enterprises choose the greenfield investment mode, they can adopt a gradual investment approach, initially entering the host country market and making additional investments later after gaining a deeper and more detailed understanding of the market and policy conditions through experiential direct learning, keeping the "information deficit" within a controllable range. From the "legitimacy deficit" perspective, under the cross-border M&A mode, the existing networks and social capital of the target enterprise in the host country are key soft assets. If Chinese enterprises adopt the cross-border M&A mode, they can directly absorb this social capital (Agarwal, 1994), avoiding government discrimination and unequal treatment, and quickly achieving operational legitimacy (Peng, 2006). In contrast, greenfield investment enterprises need to establish networks with host country governments from scratch and facing more severe "legitimacy deficit" due to the difficulty in quickly gaining recognition from host country governments (Hennart & Park, 1993).

Overall, "one-way open governance" under host government digitalization may promote Chinese enterprises' choice of the cross-border M&A mode by overcoming "information deficit," while "two-way open governance" may promote Chinese enterprises' choice of the greenfield investment mode by overcoming "legitimacy deficit." The ultimate choice of entry mode by Chinese enterprises depends on their trade-off between "information deficit" and "legitimacy deficit." Based on this, we propose Hypothesis 1:

**H1a:** *Host government digitalization promotes Chinese enterprises' choice of the greenfield investment mode.*

**H1b:** *Host government digitalization promotes Chinese enterprises' choice of the cross-border M&A mode.*

### 3.2. Government digitalization, corruption inhibition and Chinese firms' OFDI entry mode choice

Klitgaard (1991) proposed the famous formula for corruption: Corruption = Monopoly + Discretion – Accountability, indicating that monopoly power and discretion granted to officials will foster corrupt behavior, while accountability will curb it. Therefore, the key to controlling corruption lies in "keeping power in a cage," restructuring the principal-agent relationship between the government and public officials, reducing officials' monopoly power and discretion, and establishing effective oversight mechanisms to hold corrupt behavior accountable.

Government digitalization can curb bureaucratic corruption and achieve transparent governance. Based on standardized e-government processes, government digitalization can effectively prevent public officials from artificially intervening in administrative procedures, ensuring that every enterprise and citizen receives equal public services. This reduces offi-

cials' discretionary power and diminishes the positive incentives for enterprises and citizens to engage in bribery, thereby curbing both rent-seeking behaviors of public officials and enterprises (Shim & Eom, 2008). Moreover, through effective preservation of operational information and online accountability functions, government digitalization ensures that every operation by public officials leaves a trace and is subject to supervision by enterprises and citizens. When a public official is complained about due to corruption, the government can trace and analyze the system's log files, including operational information, evaluation information, and feedback handling of each business process, thereby holding corrupt officials accountable at minimal cost (Anderson, 2009).

Host government corruption exerts both "friction effect" and "lubrication effect" on foreign direct investment (FDI). According to the "corruption friction effect" theory, bureaucratic corruption hinders market efficiency and fairness, causing foreign enterprises to face extortion from host country officials and increasing uncertainty in investment activities (Wei, 2000). However, the "corruption lubrication effect" theory suggests that in host countries with poor institutional quality and distorted administrative practices, foreign enterprises can use rent-seeking behavior to expedite bureaucratic processes, bypass inherent institutional obstacles, and achieve quick market entry or access to key resources (Egger & Winner, 2005). Therefore, existing research suggests that the impact of corruption on foreign enterprises is the result of a balance between the "friction effects" and "lubrication effect" (Brada et al., 2012).

As mentioned in the previous Section, cross-border M&A enterprises are more vulnerable to the threat of the "information deficit" due to complex pre-entry procedures, while the "legitimacy deficit" faced by greenfield investment enterprises is more prominent after entry. Therefore, when entering the host country, Chinese enterprises may focus more on the impact of host government corruption on the pre-entry stage for the cross-border M&A mode, while focusing more on the post-entry stage for the greenfield investment mode. Before obtaining investment entry, the cross-border M&A mode usually undergoes rigorous merger reviews in the host country (Zhang et al., 2011). Especially since 2018, developed countries have increasingly focused on national security issues in cross-border M&A, proposing or updating merger security laws to restrict foreign enterprises' acquisitions in key technology, infrastructure, and sensitive data sectors, such as the United States, Germany, the European Union, the United Kingdom, Australia, and Canada. This has subjected Chinese enterprises to broader international merger security reviews. If a merger security review is unsuccessful or delayed, it not only affects the efforts made for the merger case, but Chinese enterprises may also have to pay a "reverse breakup fee" or a "demurrage" to extend the time period for obtaining government approval. In 2017, Ant Group's proposed $1.2 billion acquisition of U.S. money transfer service MoneyGram was rejected three times by the Committee on Foreign Investment in the United States, ultimately abandoned in January 2018, with a $30 million "reverse breakup fee" paid. The disadvantaged position and potential high sunk costs in merger security reviews make foreign enterprises more susceptible to extortion by host country officials, suffering from the "corruption friction effect". However, for those Chinese enterprises adept at using rent-seeking tactics (Morck et al., 2008), they can use rent-seeking behavior such as promising political donations or offering executive positions to attract local government officials during interactions and negotiations, securing favorable project evaluations. At this

time, the "corruption lubrication effect" may help expedite merger reviews and facilitate quick market entry (Subasat & Bellos, 2011). Under the greenfield investment mode, the "corruption friction effect" disrupt market competition mechanisms, making it difficult for enterprises to enjoy equal public services, hindering their business activities (Habib & Zurawicki, 2002). However, if Chinese enterprises choose to adhere to the implicit corruption rules of the host country, they can quickly establish networks with host country officials through bribery, gaining equal treatment from the government and even some scarce key resources (Blackburn & Forgues, 2009). In this case, the "corruption lubrication effect" become an effective means for greenfield investment enterprises to overcome operational obstacles and quickly achieve institutional isomorphism with the local environment.

Overall, the "corruption control effect" of host government digitalization exerts both encouraging and obstructive effect on both entry modes. Under the cross-border M&A mode, host government digitalization can curb the adverse impact of the "corruption friction effect" on the pre-entry stage but also hinders Chinese enterprises from using the "corruption lubrication effect" to expedite merger security reviews. Under the greenfield investment mode, host government digitalization curbs the adverse impact of the "corruption friction effect" on the post-entry stage but also hinders Chinese enterprises from using the "corruption lubrication effect" to quickly integrate into the local institutional environment and overcome operational obstacles. The ultimate choice of entry mode by Chinese enterprises depends on their trade-off between the "friction effects" and "corruption lubrication effect". Based on this, we propose Hypothesis 2:

**H2a:** *By curbing bureaucratic corruption, host government digitalization promotes Chinese enterprises' choice of the greenfield investment mode.*

**H2b:** *By curbing bureaucratic corruption, host government digitalization promotes Chinese enterprises' choice of the cross-border M&A mode.*

### 3.3. Government digitalization, IPR protection enhancement and Chinese firms' OFDI entry mode choice

The complete intellectual property (IP) protection process includes four main stages: examination, confirmation, transaction, and protection of intellectual property rights. Traditional IP regulatory systems rely on a multi-layered functional department structure to decentralize the preservation of IP resources and the regulation of IP protection stages, resulting in significant localization and non-market characteristics. Under such a regulatory framework, the IP transaction market is highly fragmented, information flow is insufficient, and there is a lack of unified transaction rules and standards. This leads to difficulties in reasonably pricing, circulating, and monetizing intellectual assets, and when rights holders encounter infringement, the mutual restraints and hierarchical transmission among regulatory departments can impact the efficiency of rights protection.

Government digitalization can enhance IP protection through intelligent regulatory methods (Goel & Tripathi, 2007). Currently, some countries have established integrated IP management service systems based on big data and blockchain technology, horizontally integrating various IP information resources and vertically merging different IP protection stages. This

not only effectively mitigates market failures in IP transactions but also reduces the difficulty of rights protection when enterprises encounter infringement, comprehensively enhancing the effectiveness of IP protection. Electronic classification modules provide clear archiving of various IP resources, allowing demanders to quickly and easily retrieve the required IP assets and make reasonable judgments on their value based on the technical descriptions provided by the owners, greatly accelerating the matching of IP supply and demand. The embedding of fully automated registration systems significantly improves the timeliness of IP confirmation for owners, accurately records the original ownership, transfer process, and data content, providing important guarantees for rights protection. The IP automatic transaction system, established and embedded based on smart contracts, enables all potential buyers to participate in a fair and transparent bidding process, effectively preventing black-box operations in traditional bidding, promoting reasonable valuation and quick monetization of IP. By tracing the electronically stored ownership and transaction information, it is possible to quickly identify infringement activities and associated infringers, greatly enhancing the efficiency of enterprise rights protection. For example, the WIPONET, a global IP information network with multiple member countries, covers functions such as IP search, document network transmission, confidential data exchange, arbitration centers, and research and certification tools. Mature IP protection systems in Western countries, such as those of "Innovaro" and "Innocentive" in the United States, already support demand-driven IP production, helping enterprises identify and publish technical needs and linking them to enterprises with technical solutions, effectively solving their technical problems.

The level of IP protection in the host country determines whether Chinese enterprises can successfully achieve their technological motives. As mentioned earlier, Chinese enterprises exhibit a dual characteristic of seeking technology in developed countries and transferring technology to developing countries. When conducting technology-seeking investments in developed countries, Chinese enterprises may acquire mature enterprises to quickly obtain the required technological assets (Anderson & Sutherland, 2015). Luo and Tung (2007) explained this using the springboard perspective, suggesting that technology-seeking cross-border mergers and acquisitions (M&As) serve as a "resource springboard" for enterprises from emerging markets like China, rapidly enhancing their technological capabilities. However, when Chinese enterprises lack the financial strength to acquire high-quality enterprises, they may adopt the greenfield investment mode, obtaining technological assets through "technology licensing" and "technology purchasing" from host country enterprises, or integrating into the host country's local technology industry cluster to promote their technological upgrade through reverse technology spillover (Chen et al., 2012; Elia et al., 2020). Mathews (2006) explained this using the LLL framework, stating that technology-seeking greenfield investments by enterprises from emerging markets like China are driven by linkage, leverage, and learning, which refers to the resource imitation and resource transfer carried out by Chinese enterprises through repeated cooperation with local enterprises after they embed a global network with specific resource advantages.

When conducting technology-transfer greenfield investments in developing countries, technological assets are the monopoly advantage on which Chinese enterprises rely. Chinese enterprises do not want to see their proprietary technologies disseminated, as this would

reduce the quasi-rents they can obtain from these technologies (Hill & Kim, 1988). To protect their technological monopoly advantage, Chinese enterprises may prefer the greenfield investment mode with a higher degree of organizational control, using the parent company's specific management systems to enhance the efficiency of technology transfer between the parent and subsidiary companies, and reduce the risk of external technology dissemination and imitation (Ti et al., 2023).

The alleviation of market failures in IP transactions due to host government digitalization can accelerate the matching of supply and demand for technological assets and enable reasonable pricing of these assets (Buckley & Casson, 1998). On one hand, this helps Chinese enterprises find ideal target enterprises for acquisition in the host country market, complete due diligence smoothly, and avoid the risk of asset overvaluation (Alon et al., 2020; Xie & Yin, 2024), encouraging Chinese enterprises to engage in technology-seeking cross-border M&As. On the other hand, it also helps Chinese enterprises obtain the necessary technological assets through external market transactions such as "technology licensing" and "technology purchasing" in the host country market (Nicholson, 2007), encouraging Chinese enterprises to engage in technology-seeking greenfield investments. Furthermore, the reduction in the difficulty of rights protection due to host government digitalization can prevent opportunistic infringements on enterprise technological assets, meeting the technological control needs of Chinese enterprises conducting outward direct investment based on technological monopoly advantages (Gatignon & Anderson, 1988; Adams, 2010; Tanaka & Iwaisako, 2014), which may encourage Chinese enterprises to engage in technology-transfer greenfield investments. However, the resulting barriers to technology diffusion and technology imitation may also hinder Chinese enterprises from absorbing reverse technology spillovers through technology-seeking greenfield investments (Yoo & Reimann, 2017), potentially negatively impacting Chinese enterprises' engagement in technology-seeking greenfield investments.

Overall, the "IPR enhancement effect" of host government digitalization positively incentivizes Chinese enterprises to engage in technology-seeking cross-border M&As and technology-transfer greenfield investments, while having both positive and negative impacts on technology-seeking greenfield investments. The ultimate promotion of a particular entry mode by host government digitalization depends on the technological motives of Chinese enterprises' outward direct investment. Based on this, we propose Hypothesis 3:

**H3a:** *By enhancing IP protection, host government digitalization promotes Chinese enterprises' choice of the greenfield investment mode.*

**H3b:** *By enhancing IP protection, host government digitalization promotes Chinese enterprises' choice of the cross-border M&A mode.*

Based on the above analysis, we create an impact mechanism figure (see Figure 1).

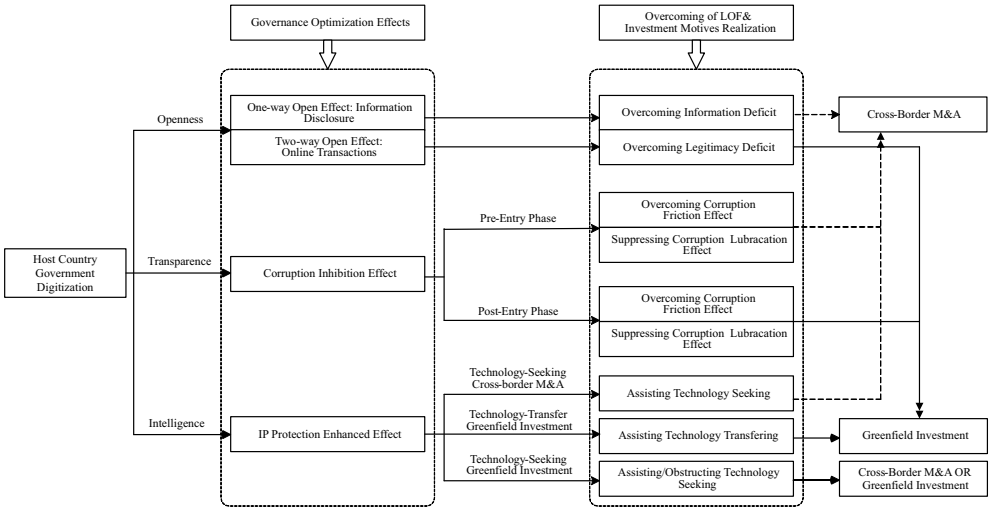


**Figure 1.** Influence mechanism

# 4. Econometric model, variables and data

## 4.1. Model construction

To test whether Hypothesis 1 holds, we constructed the following binary discrete choice model:

$$\text{Probit}(mode_{ijt} = 1) = \alpha + \beta egov_{jt} + \gamma X + \mu_j + \eta_h + \nu_t + \varepsilon_{ijt}; \quad (1)$$

$$\text{Logit}(mode_{ijt} = 1) = \alpha + \beta egov_{jt} + \gamma X + \mu_j + \eta_h + \nu_t + \varepsilon_{ijt}, \quad (2)$$

where *i*, *j*, *t* denotes firm, country, and year respectively; $mode_{ijt}$ denotes the entry mode chosen by the *i–th* firm for its outward investment to the *j–th* country in year *t*; $egov_{jt}$ denotes the E-Government Index of the *i–th* country in year *t*; *X* denotes the set of control variables. To mitigate omitted variable bias, the model controls for country fixed effect $\mu_i$, industry fixed effect $\eta_h$, and year fixed effect $\nu_t$. β is the coefficient of interest in this paper, if $\beta > 0$, it means that host government digitalization will promote Chinese firms to choose the green-field investment mode, if $\beta < 0$, it means that host government digitalization will promote Chinese firms to choose the cross-border M&A mode.

## 4.2. Variables and indicators selection

### *4.2.1. Explained variables*

The dependent variable is the OFDI mode chosen by Chinese firms (*mode*), which is a binary discrete variable. A value of 1 indicates that the enterprise has chosen the green-field investment mode, while a value of 0 indicates that it has chosen the cross-border M&A mode. The data for this variable is sourced from the overseas investment database in the CSMAR database (n.d.).

### 4.2.2. Core explanatory variables

Government Digitalization Level(*egov*): We use the E-Government index index from the "United Nations E-Government Survey" for measurement (United Nations, n.d.). The UN's Department of Economic and Social Affairs initiated a survey of 166 countries on the state of Government digitalization development from 2001, with ten years of surveys conducted until 2020, including 2001, 2003, 2004, 2005, 2008, 2010, 2012, 2014, 2016, 2018, and 2020. "E-Government Index" is calculated by averaging three sub-indicators: "Online Service Index", "Telecommunication Infrastructure Index", and "Human Capital Index".

### 4.2.3. Control variables

Drawing on previous research regarding OFDI mode choice, we selected a set of control variables at the host country level, industry level, and firm level, which are identified by their variable names, measurement indicators, and data sources as explicitly outlined in Table 1.

**Table 1.** Selection of control variables and measurement indicators

| Level | Variable name | Measurement methods | Data source |
|---|---|---|---|
| Country level | Market size (*lngdp*) | Real GDP (in logarithm) | World Development Indicators (WDI) Database (World Bank, n.d.-b) |
| | Rising speed of labor costs (*pgdpp*) | Annual growth rate of per capita GDP | |
| | Resource endowments (*source*) | Ore and metal exports as a proportion of total product exports | |
| | Technical endowments (*ict*) | Information and communications technology exports as a proportion of total exports of products | |
| | Bilateral exchange rate (*exchange*) | The average annual exchange rate of the RMB against the host country 's currency (indirect method) | |
| | Tax burden level (*tax*) | The comprehensive tax rate of the host country productivity | |
| | Institutional quality (*institute*) | Mean values of five indicators in the WGI database other than corruption control, including citizen voice and accountability, political stability, government efficiency, regulatory quality and rule of law level | Worldwide Governance Indicators (World Bank, n.d.-a) |
| | Institutional distance (*ins_dist*) | The squared sum of the difference between the scores of China and the host country on the five WGI indicators above | |
| Industry level | Competitive (*hhi*) | The reciprocal of the Herfindahl index computed using companies' sales data within the industry | Calculated from data in the Osiris Database (Bureau van Dijk, n.d.) |
| | Irreversibility (*fixed*) | The median ratio of fixed assets among companies in the industry. | |
| | Growth opportunities (*pb*) | The median P/B ratio among companies in the industry | |

*End of Table 1*

| Level | Variable name | Measurement methods | Data source |
|---|---|---|---|
| Company level | Productivity (*tfp*) | Total factor productivity measured by LP method | CSMAR Database (n.d.) |
| | Profitability (*roe*) | Ratio of net income of the parent company to its net assets | |
| | Gearing ratio (*debtratio*) | Ratio of total liabilities of the parent company to its total assets | |
| | Capital Intensity (*capital*) | The sum of liabilities plus owner 's equity divided by the total number of employees | |
| | Development prospects (growth) | Development prospects | |
| | Ownership concentration (structure) | The sum of the shareholding ratios of the top five shareholders | |

#### *4.2.4. Mechanism variables*

Level of corruption (*corrupt*): Measuring with the "Control of Corruption" index from the Worldwide governance Indicators, with values ranging from –2.5 to 2.5. We negatively processed the index for our analysis so that a higher value indicates a greater level of corruption.

Level of IPR protection (*ipr*): Measuring with the indicator "intellectual property protection" in the Global Competitiveness Report (Schwab et al., 2020), with values ranging from 1 to 7. We perform linear interpolation on some missing values.

### 4.3. Sample description

We obtained information on Chinese firms' OFDI events from 2004 to 2019 using overseas investment database in the CSMAR database. To ensure data quality, we firstly excluded three types of investment events during the cleaning process: those with destinations in tax havens such as Hong Kong, Bermuda, Virgin Islands, and Cayman Islands, those belonging to later continuing operations rather than the first year of investment, and those without information on investment mode and destination. In this process, we find that the third type of dropped data accounts for less than 10% of the remaining data set after deleting the first two types of data, which indicates that the possibility of sample selection bias is low, and the cleaned samples are more representative. Moreover, there are indeed instances where a Chinese firm invests in several overseas subsidiaries within the same year. These instances can be categorized into three scenarios: First, the Chinese firm invests in subsidiaries located in different host countries. This type of data does not require cleaning. Second, the Chinese firm invests in subsidiaries located in the same host country using the same entry mode. This data is considered redundant, and after removing duplicates, only one valid data point is retained. Third, the Chinese firm invests in subsidiaries located in the same host country using different entry modes. In this case, all data points are deleted. Upon examination, only six samples in the initial dataset fall into this category, and the sample selection bias caused by their deletion is negligible.

To mitigate the endogeneity interference caused by bidirectional causality, we lagged Government Digitalization Level (*egov*) and all control variables by one period before matching them with OFDI entry modes of Chinese enterprises (*mode*). This resulted in an unbalanced panel dataset covering nine non-consecutive years, 113 host countries, and 1202 a-share listed companies in 2004, 2005, 2006, 2009, 2011, 2013, 2015, 2017, and 2019, with a sample size of 3211. The data years of "*mode*" are 2004, 2005, 2006, 2009, 2011, 2013, 2015, 2017, and 2019, while the data years of "*egov*" and control variable data are 2003, 2004, 2005, 2008, 2010, 2012, 2014, 2016, and 2018. Table 2 presents descriptive statistics for each variable for the entire sample. The multi-collinearity test indicates that the average variance inflation factor (VIF) is 1.88, which is well below the threshold of 10, indicating that there is no significant issue of multi-collinearity among the variables.

**Table 2.** Descriptive statistics of variables

| Variables | Samples | Mean | S.D. | Min. | Max. |
|---|---|---|---|---|---|
| Explained variable | | | | | |
| *mode* | 3211 | 0.701 | 0.458 | 0 | 1 |
| Core explanatory variable | | | | | |
| *egov* | 3211 | 0.746 | 0.168 | 0.133 | 0.946 |
| Control variables | | | | | |
| *lngdp* | 3211 | 9.450 | 1.946 | 2.027 | 12.183 |
| *pgdpp* | 3211 | 2.307 | 2.221 | –10.841 | 12.509 |
| *source* | 3211 | 4.998 | 8.514 | 0.012 | 86.420 |
| *ict* | 3211 | 10.281 | 10.681 | 0 | 49.018 |
| *exchange* | 3211 | 191.516 | 697.355 | 0.067 | 4652.714 |
| *tax* | 3211 | 0.031 | 0.081 | –0.060 | 4.316 |
| *ins_dist* | 3211 | 3.624 | 1.455 | 0.687 | 6.038 |
| *institute* | 3211 | 6.005 | 0.397 | 3.051 | 6.381 |
| *hhi* | 3211 | 1.210 | 0.608 | 0.010 | 1.929 |
| *pb* | 3211 | 16.168 | 2.988 | 8.040 | 30.170 |
| *fixed* | 3211 | 42.361 | 11.004 | 22.360 | 81.310 |
| *tfp* | 3211 | 7.050 | 0.944 | 4.314 | 11.001 |
| *roe* | 3211 | 0.090 | 0.176 | –7.556 | 0.584 |
| *debtratio* | 3211 | 0.450 | 0.199 | 0.013 | 0.957 |
| *capital* | 3211 | 420.380 | 1019.584 | 15.362 | 31913.601 |
| *growth* | 3211 | 1.430 | 35.550 | –136.244 | 1524.092 |
| *structure* | 3211 | 0.493 | 0.189 | 0.200 | 0.970 |
| Mechanism variables | | | | | |
| *invest* | 3088 | –2.318 | 0.186 | –2.485 | –1.099 |
| *corrupt* | 3211 | –0.908 | 1.018 | –2.390 | 1.388 |
| *property* | 3185 | 5.071 | 1.040 | 1.682 | 7 |

# 5. Empirical results and analysis

## 5.1. Baseline regression

Based on Equations (1) and (2), this paper estimates the impact of host government digitalization on the OFDI entry mode choices of Chinese enterprises, with the estimation results shown in Table 3. All four columns in Table 3 include all control variables. Columns (1) and (3) control for country fixed effect and year fixed effect, while columns (2) and (4) further control for industry fixed effect. Considering that Chinese enterprises' OFDI entry mode choices might exhibit similar tendencies when investing in the same host country, all four columns use robust standard errors clustered at the country level. The results from all four regressions show that the coefficients of "*egov*" are significantly positive, indicating that higher levels of host government digitalization make Chinese enterprises more inclined to choose the greenfield investment mode, supporting hypothesis H1a. According to the theoretical analysis presented earlier, this suggests that Chinese enterprises are more troubled by the "legitimacy deficit" than "information deficit," thus the incentivizing effect of two-way open governance under host government digitalization on the greenfield investment mode outweighs the incentivizing effect of one-way open governance on the cross-border M&A mode.

The coefficients and significance of the control variables are generally consistent between the Probit and Logit models. At the country level, the coefficients of "*institute*" and "*tax*" are significantly positive in both models, indicating that higher institutional quality or tax burden levels in the host country make Chinese enterprises more likely to choose the greenfield investment mode. The coefficients of "*exchange*" are significantly negative in both models, suggesting that RMB appreciation promotes Chinese enterprises' choice of the cross-border M&A mode. At the industry level, industry competitiveness and growth opportunities significantly influence the entry mode choices of Chinese enterprises; intense industry competition and good growth prospects both promote the choice of the greenfield investment mode. At the enterprise level, Chinese enterprises with higher profitability, higher capital intensity, or higher equity concentration are more inclined to choose the cross-border M&A mode.

## 5.2. Robustness test

To test the reliability of the baseline regression results, this paper employs four robustness checks: changing the estimation method, replacing the measure of government digitalization level, changing the clustering of robust standard errors, and excluding certain special samples.

First, keeping the original indicators unchanged, were-estimates using Fixed Effect Model in linear regression, with the results presented in column (1) of Table 4. Second, we re-measures Government Digitalization Level using "Online Service Index", the core sub-indicator of "E-Government Index", and estimates using Equation (1), Equation (2) and Fixed Effect Model. The results are shown in columns (2) to (4) of Table 4. Third, we replace the robust standard error of national clustering with the robust standard error of industry clustering, enterprise clustering and country-industry clustering in turn, then re-estimates Equations (1) and (2), and presents the results in columns (1) to (3) of Tables 4 and 5. Fourth, we sequentially excludes from the total sample the four host countries with the highest inflows of Chinese OFDI (USA,

**Table 3.** Baseline regression results

| Variable | Probit Model (1) | Probit Model (2) | Logit Model (3) | Logit Model (4) |
|---|---|---|---|---|
| *egov* | 1.138*** | 1.349*** | 1.933*** | 2.248*** |
| | (0.410) | (0.436) | (0.686) | (0.734) |
| *lngdp* | 0.008 | –0.143 | –0.055 | –0.312 |
| | (0.473) | (0.439) | (0.815) | (0.734) |
| *pgdpp* | 0.020 | 0.014 | 0.036 | 0.026 |
| | (0.017) | (0.017) | (0.028) | (0.030) |
| *source* | –0.013 | –0.007 | –0.025 | –0.015 |
| | (0.015) | (0.016) | (0.026) | (0.027) |
| *ict* | 0.020 | 0.024 | 0.036 | 0.042 |
| | (0.016) | (0.017) | (0.032) | (0.032) |
| *exchange* | –0.001*** | –0.001** | –0.002*** | –0.002** |
| | (0.000) | (0.000) | (0.001) | (0.001) |
| *tax* | 2.853*** | 2.204** | 4.884*** | 3.709* |
| | (1.022) | (1.108) | (1.825) | (1.999) |
| *institute* | 1.687*** | 1.986*** | 2.835*** | 3.340*** |
| | (0.611) | (0.632) | (1.022) | (1.078) |
| *ins_dist* | –0.320 | –0.319 | –0.519 | –0.502 |
| | (0.204) | (0.198) | (0.355) | (0.341) |
| *hhi* | 0.161** | 0.395* | 0.273** | 0.625 |
| | (0.068) | (0.222) | (0.113) | (0.385) |
| *pb* | –0.003 | 0.054** | –0.005 | 0.094** |
| | (0.016) | (0.023) | (0.026) | (0.040) |
| *fixed* | –0.004 | –0.015 | –0.006 | –0.028 |
| | (0.004) | (0.015) | (0.006) | (0.025) |
| *tfp* | 0.027 | 0.039 | 0.046 | 0.062 |
| | (0.040) | (0.036) | (0.067) | (0.061) |
| *roe* | –0.583** | –0.706*** | –0.978** | –1.181** |
| | (0.259) | (0.270) | (0.459) | (0.485) |
| *debtratio* | 0.033 | –0.159 | 0.051 | –0.263 |
| | (0.166) | (0.164) | (0.279) | (0.277) |
| *capital* | –0.000* | –0.000** | –0.000* | –0.000** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| *growth* | 0.002 | 0.002 | 0.004 | 0.004 |
| | (0.002) | (0.002) | (0.004) | (0.003) |
| *structure* | –0.450*** | –0.454*** | –0.763*** | –0.773*** |
| | (0.122) | (0.138) | (0.208) | (0.235) |
| *_cons* | –6.252** | –8.452*** | –9.964* | –13.650** |
| | (3.091) | (3.241) | (5.102) | (5.474) |
| Country-fixed effect | Yes | Yes | Yes | Yes |
| Industry-fixed effect | NO | Yes | NO | Yes |
| Year-fixed effect | Yes | Yes | Yes | Yes |
| N | 3124 | 3119 | 3124 | 3119 |
| Pseudo $R^2$ | 0.081 | 0.106 | 0.081 | 0.106 |

*Notes*: Robust standard errors are clustered by country. Statistical significance of coefficients: *** $P < 0.01$, ** $P < 0.05$, * $P < 0.1$. The same applies to the following tables.

Germany, Singapore, and Japan), host country samples with less than 10 instances of Chinese OFDI investment stock, and samples of OFDI enterprises with foreign equity (wholly foreign-owned enterprises and Sino-foreign joint ventures). The results are presented in columns (4) to (6) of Table 5.

All regression results in Tables 4 and 5 show that the coefficients of "*egov*" are significantly positive, indicating that the baseline regression results are robust – Chinese OFDI enterprises are more inclined to choose the greenfield investment mode in host countries with higher levels of government digitalization.

**Table 4.** Robustness test results: replace estimation method and replace measurement index

| Variable | Fixed Effect Model (1) | Probit Model (2) | Logit Model (3) | Fixed Effect Model (4) |
|---|---|---|---|---|
| *on_serv* | | 0.587** | 0.975** | 0.138* |
| | | (0.264) | (0.440) | (0.076) |
| *egov* | 0.319** | | | |
| | (0.125) | | | |
| *_cons* | –2.140** | –8.251** | –13.404** | –2.057** |
| | (0.844) | (3.211) | (5.436) | (0.857) |
| Control variables | Yes | Yes | Yes | Yes |
| Country-fixed effect | Yes | Yes | Yes | Yes |
| Industry-fixed effect | Yes | Yes | Yes | Yes |
| Year-fixed effect | Yes | Yes | Yes | Yes |
| N | 3187 | 3119 | 3119 | 3187 |
| pseudo $R^2$/ $R^2$ | 0.134 | 0.106 | 0.106 | 0.134 |

**Table 5.** Robustness test results: replace cluster robust standard error and excluding special samples

| Variable | Probit (1) | Probit (2) | Probit (3) | Probit (4) | Probit (5) | Probit (6) |
|---|---|---|---|---|---|---|
| *egov* | 1.349** | 1.349* | 1.349** | 1.343*** | 1.640** | 1.658*** |
| | (0.560) | (0.759) | (0.632) | (0.439) | (0.727) | (0.462) |
| *_cons* | –8.452*** | –8.452* | –8.452** | –9.494** | –7.639** | –8.476** |
| | (2.695) | (4.415) | (4.105) | (4.001) | (3.423) | (3.609) |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes |
| Country-fixed effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry-fixed effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Year-fixed effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Clustering standard error | Industry | Company | Country-industry | Country | Country | Country |
| N | 3119 | 3119 | 3119 | 2981 | 1803 | 2672 |
| pseudo $R^2$ | 0.106 | 0.106 | 0.106 | 0.099 | 0.158 | 0.115 |

## 5.3. Endogeneity test

To eliminate endogenous interference, we refered to Bartik (1991) 's Shift-Share instrumental variable (IV) to construct IV. The Share-Shifting IV is the product of the non-zero initial share of each individual in the population and the overall growth rate. It is highly correlated with the actual value, while independent of the error term, satisfying the necessary conditions of correlation and exogeneity as an IV.

In our specific application, we initially calculated the annual mean value of government digitalization level across all sample countries, followed by determining the global growth rate of the mean value, with the initial year serving as the reference period. Subsequently, we multiplied the initial government digitalization level of each country by the corresponding global growth rate for each year, utilizing this product as the instrumental variable for Government Digitalization Level (*egov*).

Sincethe "*ivprobit*" command in Stata does not facilitate the weak identification test with clustered robust standard errors, we supplemented theendogeneity testswith the commands "*ivreghdfe*" and "*ivregress*". The results of these tests are presented in Table 6. The first-stage

**Table 6.** Endogeneity test results

| Variable | Ivprobit (1) | Ivreghdfe (2) | Ivregress (3) |
|---|---|---|---|
| *egov* | 1.370* | 0.324** | 0.324** |
| | (0.795) | (0.130) | (0.128) |
| *_cons* | –8.452* | | –1.536*** |
| | (4.448) | | (0.559) |
| Control variables | Yes | Yes | Yes |
| Country-fixed effect | Yes | Yes | Yes |
| Industry-fixed effect | Yes | Yes | Yes |
| Year-fixed effect | Yes | Yes | Yes |
| First stage regression results | | | |
| *egoviv* | 0.996*** | 0.994*** | 0.994*** |
| | (0.003) | (0.013) | (0.014) |
| *_cons* | –0.162*** | | –0.200*** |
| | (0.013) | | (0.053) |
| Control variables | Yes | Yes | Yes |
| Country-fixed effect | Yes | Yes | Yes |
| Industry-fixed effect | Yes | Yes | Yes |
| Year-fixed effect | Yes | Yes | Yes |
| F-value | 30576.08 | | 768519.35 |
| AR (chi2) | 2.97 | | 4.38 |
| | [0.085] | | [0.036] |
| Wald (chi2) | 2.97 | | 6.38 |
| | [0.085] | | [0.012] |
| KP-LM statistic | | 17.040 | |
| CD-Wald F statistic | | 15000 | |
| N | 3119 | 3187 | 3211 |

estimation outcomes indicate that the IV has successfully passed Weak identification test under all three commands and the underidentification test under the "*ivreghdfe*" command, substantiating its validity. The second-stage estimation results further reveal that the coefficient of "*egov*" remains significantly positive, corroborating the findings of our preliminary estimations. The endogeneity tests demonstrate the robustness of our baseline regression results, suggesting that Chinese OFDI firms are more inclined to select the green-field investment mode in host countries with advanced levels of government digitalization.

## 6. Further analysis

### 6.1. Heterogeneity test

First, we divided all countries into developed (31) and developing (82) countries according to the World Bank's classification, with the grouped regression results presented in columns (1) and (2) of Table 7. The results show that higher levels of government digitalization in developed countries encourage Chinese enterprises to choose the greenfield investment mode, whereas government digitalization levels in developing countries have no significant effect on the OFDI entry mode decisions of Chinese enterprises. This may be because government digitalization in developing countries has not significantly improved governance. On one hand, due to issues like the digital divide and funding constraints for system development, many developing countries face significant resistance to digital transformation. The "United Nations E-Government Survey 2022" (United Nations, 2022) found a significant positive correlation between "E-Government Index" and economic development levels through correlation analysis. On the other hand, effective improvement of governance through digitalization requires strong institutional support, which is often lacking in developing countries. Without necessary legislation to constrain government behavior, even digital transformation efforts may not effectively improve governance.

Secondly, considering the significant impact of the "Belt and Road Initiative" (BRI) on Chinese OFDI, we divided all host countries into BRI countries (47) and non-BRI countries (66), with the grouped regression results presented in columns (3) and (4) of Table 7. The results show that in non-BRI countries, higher levels of government digitalization make Chinese enterprises more inclined to choose the greenfield investment mode. However, the government digitalization in BRI countries does not significantly affect the OFDI entry mode choices of Chinese enterprises. Many BRI countries are underdeveloped, and the impact of their government digitalization on improving governance is limited. Additionally, Chinese OFDI in BRI countries are often driven by the BRI with many greenfield investments directed towards infrastructure construction and energy development, which are encouraged sectors. These two factors may lead to a lack of significant correlation between government digitalization in BRI countries and Chinese enterprises' OFDI entry mode choices.

Drawing from Yin et al. (2018), which classified the industries of listed companies based on fixed asset ratios and R&D expenditure remuneration ratios, we categorized the industries of all the sample enterprises into technology-intensive industries, capital-intensive industries, and labor-intensive industries. The grouped regression results are presented in columns (5) to (7) of Table 7. The results show that host government digitalization encourages Chinese technology-intensive enterprises to choose the greenfield investment mode and capital-intensive

enterprises to choose the cross-border M&A mode, while it does not significantly influence the OFDI entry mode choices of Chinese labor-intensive enterprises. Technology-intensive enterprises' pursuit of technological assets often subjects them to rigorous entry reviews, necessitating more interactions with host country officials in the pre-entry stage. Conversely, capital-intensive enterprises' reliance on local resources such as land and facilities necessitate more interactions with host country officials in the post-entry stage. As discussed in the subsection, these heterogeneous results may indicate that the negative impact of the "corruption friction effect" on Chinese technology-intensive enterprises in the pre-entry stage outweighs the positive impact of the "corruption lubrication effect". Conversely, the positive impact of the "corruption lubrication effect" on Chinese capital-intensive enterprises in the post-entry stage outweighs the negative impact of the "corruption friction effect".

Based on ownership type, we divided all the sample enterprises into state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs), with the grouped regression results presented in columns (8) and (9) of Table 7. The results show that host government digitalization promotes non-SOEs to choose the greenfield investment mode but does not significantly affect the entry mode choices of SOEs' OFDI. This may be due to two reasons: First, Chinese SOEs' OFDI typically has significant political objectives and does not solely consider economic benefits in choosing entry modes. Second, the political nature of Chinese SOEs imposes higher constraints on their entry mode choices. Due to political risk considerations, host countries often subject Chinese SOEs to stringent reviews in cross-border M&As, forcing SOEs to opt for the greenfield investment mode more frequently. Furthermore, Chinese SOEs enjoy strong policy support and resource advantages, and do not rely on the "liability of foreignness" alleviation effects brought by government digitalization.

**Table 7.** Heterogeneity test results

| Variable | Developed | Developing countries | B&R countries | Non-B&R countries | Technology-intensive industry | Capital-intensive industry | Labor-intensive industry | State-owned enterprise | Non-State-owned enterprise |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| *egov* | 1.409* | –0.230 | 0.300 | 1.698** | 2.916*** | –2.500* | 0.095 | –0.558 | 1.548** |
| | (0.732) | (1.463) | (0.598) | (0.716) | (1.037) | (1.404) | (2.290) | (1.359) | (0.714) |
| *_cons* | –28.033 | –5.996 | –8.783* | –5.499 | –0.400 | –4.666 | –26.251 | –16.757*** | –3.713 |
| | (18.495) | (5.115) | (4.756) | (5.897) | (9.611) | (6.656) | (20.503) | (5.695) | (4.137) |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Country-fixed effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry-fixed effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year-fixed effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 2103 | 1004 | 1199 | 1910 | 1547 | 864 | 482 | 768 | 2239 |
| pseudo $R^2$ | 0.096 | 0.189 | 0.143 | 0.097 | 0.119 | 0.226 | 0.193 | 0.213 | 0.108 |

## 6.2. Mechanism tests

We adopted the Stepwise Regression Method proposed by Wen and Ye (2014) to test Hypotheses 2 and 3, using a set of Fixed Effect Models, specifically Equations (3) to (7). Equation (3) estimates the impact of government digitalization on the OFDI entry mode choices of Chinese enterprises, with all settings identical to those in Equation (1) except for the regression model. This represents the first step in the Stepwise Regression Method. Equations (4) and (5) estimate the impact of government digitalization on the levels of corruption and IP protection, respectively, constituting the second step in the Stepwise Regression Method. Equations (6) and (7) respectively incorporate an mediating variable into Equation (3) to test the direct impact of host government digitalization on the OFDI entry mode choices of Chinese enterprises after excluding the indirect effects mediated through corruption or IP protection. This represents the third step in the Stepwise Regression Method. Equations (3), (4), and (6) form one set, while Equations (3), (5), and (7) form another set, respectively, to test the "corruption inhibition effect" and the "IP Protection enhancement effect."

Using the "corruption inhibition effect" test as an example, if both $\beta_1$ and $\varphi_1$ are significant under the premise that $\beta$ is significant, then the mediation effect is significant. Here, $\beta$ represents the total effect of government digitalization on the OFDI entry mode choices of Chinese enterprises, $\beta_1 * \varphi_1$ represents the indirect effect through corruption inhibition, and $\beta_1^{'}$ represents the direct effect. Additionally, considering that the entry mode choice (*mode*) is a discrete variable, using Fixed Effect Model in the third step ensures unbiased estimation but may affect the efficiency of the estimation. Therefore, we also employed Probit Models, specifically Equations (8) and (9), to re-test the third step of the Stepwise Regression Method, to verify the reliability of the mediation effect test results derived from the Stepwise Regression Method.

$$mode_{ijt} = \alpha + \beta egov_{jt} + \gamma X + \mu_j + \eta_h + \nu_t + \varepsilon_{ijt}; \tag{3}$$

$$corrupt_{jt} = \alpha + \beta_1 egov_{jt} + \gamma X + \mu_j + \eta_h + \nu_t + \varepsilon_{jt}; \tag{4}$$

$$property_{jt} = \alpha + \beta_2 egov_{jt} + \gamma X + \mu_j + \eta_h + \nu_t + \varepsilon_{jt}; \tag{5}$$

$$mode_{ijt} = \alpha + \beta_1^{'} egov_{jt} + \varphi_1 corrupt_{jt} + \gamma X + \mu_j + \eta_h + \nu_t + \varepsilon_{ijt}; \tag{6}$$

$$mode_{ijt} = \alpha + \beta_2^{'} egov_{jt} + \varphi_2 corrupt_{jt} + \gamma X + \mu_j + \eta_h + \nu_t + \varepsilon_{ijt}; \tag{7}$$

$$\text{Probit}(mode_{ijt} = 1) = \alpha + \beta_1^{''} egov_{jt} + \varphi_1^{'} corrupt_{jt} + \gamma X + \mu_j + \eta_h + \nu_t + \varepsilon_{ijt}; \tag{8}$$

$$\text{Probit}(mode_{ijt} = 1) = \alpha + \beta_2^{''} egov_{jt} + \varphi_2^{'} property_{jt} + \gamma X + \mu_j + \eta_h + \nu_t + \varepsilon_{ijt}. \tag{9}$$

The regression results of Equation (3) are presented in Table 4, showing that the coefficient of "*egov*" is significantly positive, indicating that host government digitalization promotes Chinese enterprises' choice of the greenfield investment mode. The results of Equations (4) to (7) are presented in columns (1) to (4) of Table 8.

From the "corruption inhibition effect" test results, the result in column (1) shows that the coefficient of "*egov*" is significantly negative, indicating that government digitalization leads to a decrease in the level of corruption in the host country. The result in column (3) shows that the coefficient of "*corrupt*" is significantly positive. Combining this with the coefficient of

"*egov*" in column (1), we find that the indirect effect is negative, opposite to the direction of the total effect. This indicates that host government digitalization promotes Chinese enterprises' choice of the cross-border M&A mode by inhibiting corruption, supporting Hypothesis H2b. According to the theoretical analysis presented earlier, this suggests that compared with the greenfield investment model, the net positive influence effect of host government digitization on cross-border M&A model is larger by changing the "corruption friction effect" and the "corruption lubrication effect" or the net negative influence effect is smaller.

From the "IP protection effect" test results, the result in column (2) shows that the coefficient of "*egov*" is significantly positive, indicating that government digitalization improves the level of IP protection in the host country. The result in Column (4) shows that the coefficient of "*ipr*" is significantly negative. Combining this with the coefficient of "*egov*" in column (2), we find that the indirect effect is also negative. This indicates that host government digitalization promotes Chinese enterprises' choice of the cross-border M&A mode by enhancing IP Protection, supporting Hypothesis H3b. According to the theoretical analysis presented earlier, this suggests that compared to the greenfield investment mode (including technology-seeking and technology-transfer greenfield investments), compared with the greenfield investment mode, the net positive effect of host government digitization on the technology-seeking cross-border M&A model through enhanced intellectual property protection is larger or the net negative effect is smaller.

**Table 8.** Mediating effect test results

| Variable | OLS | OLS | OLS | OLS | Probit | Probit |
|---|---|---|---|---|---|---|
| | *corrupt* | *ipr* | *mode* | *mode* | *mode* | *mode* |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *egov* | –0.341* | 1.190** | 0.367** | 0.378*** | 1.532*** | 1.455*** |
| | (0.187) | (0.527) | (0.141) | (0.130) | (0.481) | (0.416) |
| *corrupt* | | | 0.140* | | 0.549** | |
| | | | (0.082) | | (0.270) | |
| *ipr* | | | | –0.050* | | –0.216* |
| | | | | (0.030) | | (0.114) |
| *_cons* | 4.313*** | –2.758 | –2.744*** | –2.292** | –11.338*** | –2.292** |
| | (1.581) | (3.065) | (0.853) | (0.894) | (3.428) | (0.894) |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes |
| Country-fixed effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry-fixed effect | Yes | Yes | Yes | Yes | Yes | Yes |
| Year-fixed effect | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 3187 | 3163 | 3187 | 3163 | 3119 | 3107 |
| *pseudo* $R^2$/$R^2$ | 0.995 | 0.955 | 0.134 | 0.132 | 0.107 | 0.106 |
| F | 10.014 | 21.071 | 7.833 | 8.334 | — | — |

Additionally, the result in Column (5) indicate that the significance and direction of the estimated coefficients for "*egov*" and "*corrupt*" derived from Equation (8) are consistent with those obtained from Equation (6). Similarly, the result in Column (6) show that the significance and direction of the estimated coefficients for "*egov*" and "*corrupt*" derived from Equation (9) are consistent with those obtained from Equation (7). This indicates that the mediation effect test results obtained from the Stepwise Regression Method are reliable.

## 7. Conclusions and policy recommendations

### 7.1. Main conclusions

With the deep integration of information and communication technology and government governance, host government digitalization has transformed governance models and influenced Chinese enterprises' choices of OFDI entry modes by affecting the "liability of foreignness". Based on this, this paper examines the impact of host government digitalization on the OFDI entry mode choices of Chinese enterprises, using all OFDI events of Chinese a-share listed companies as the research object and measuring the level of government digitalization with "E-Government Index" from the United Nations E-Government Survey (United Nations, n.d.). The main research conclusions are as follows:

1. Host government digitalization promotes Chinese enterprises' choice of the greenfield investment mode. This conclusion holds significant robustness after undergoing a series of robustness checks, including changing estimation methods, replacing measurement indicators, changing the clustering of robust standard errors, excluding certain special samples, and using the instrument variable for endogeneity testing.
2. Heterogeneity test results indicate that host government digitalization promotes the choice of the greenfield investment mode when Chinese enterprises invest in developed countries and non-Belt and Road Initiative (BRI) countries, their industry types are technology-intensive, or their property rights are non-state-owned. Host government digitalization encourages the choice of the cross-border M&A mode when Chinese enterprises' industry types are. Host government digitalization does not affect entry mode decisions when Chinese enterprises invest in developing countries and BRI countries, their industry types are labor-intensive, or their property rights are state-owned.
3. Mechanism analysis shows that host government digitalization promotes Chinese enterprises' choice of the cross-border M&A mode by inhibiting corruption and enhancing IP Protection.

### 7.2. Policy recommendations

Based on the research conclusions, we recommend that Chinese enterprises have an in-depth understanding of the host government's digitalization process, choose the optimal entry mode and optimize the project management after entry.

When assessing the level of host government digitalization from the perspective of overcoming the "liability of foreignness", Chinese OFDI enterprises should consider two aspects: whether the "One-way Open Governance" can effectively mitigate the "information deficit", and whether the "Two-way Open Governance" can effectively alleviate the "legitimacy deficit".

When assessing the level of host government digitalization from the perspective of the "corruption inhibition effect," it should be noted that while government digitalization reduces the "corruption friction effect", it also prevent enterprises from using the "corruption lubrication effect" to overcome operational obstacles. When assessing government digitalization from the perspective of the "IP Protection effect," it is important to note that government digitalization is beneficial for technology-seeking cross-border M&As and technology-transfer greenfield investments, but it may have both positive and negative impacts on technology-seeking greenfield investments. Chinese enterprises should consider their own investment motives in conjunction with host government digitalization level to select the most suitable entry mode.

Additionally, Chinese enterprises should deeply utilize the advantages of digital governance after successfully entering the host country, seeking developmental conveniences while mitigating investment risks.

### 7.3. Limitations and future research directions

This study has certain limitations. First while this study considers that host government digitalization can help multinational enterprises overcome the "information deficit" and the "legitimacy deficit" through "One-way Open Governance" and "Two-way Open Governance", it only conducts theoretical analysis due to the lack of suitable indicators to measure the quality of these two types of open governance. Future studies may consider selecting appropriate measurement indicators and conducting empirical tests on these two channels. Secondly, when analyzing the "IP Protection Effect", although the motivation of OFDI of Chinese enterprises is distinguished for theoretical analysis, the motivation of each enterprise is not identified for empirical test. Future studies could further work on this. Additionally, this study explores the relationship between host government digitalization and OFDI entry mode decisions in the Chinese context. Future research could extend this investigation to a global scale.

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## Author contributions

Xiaoge Li: conceptualization, investigation, resources, software, data curation, visualization, writing – original draft, writing – review and editing. Guangqin Li: conceptualization, funding acquisition, investigation, methodology, formal analysis, project administration, supervision, validation, writing – original draft, writing – review and editing. Xin Li: funding acquisition, supervision, validation, writing – original draft, writing – review and editing.

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