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Intelligent Transformation, Digital Transformation and Corporate Outward Foreign Direct Investment: Evidence from China

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Abstract: *This paper examines the effect of intelligent transformation and digital transformation, jointly termed ITDT, on corporate outward foreign direct investment (OFDI). Using panel data on Chinese A-share listed manufacturing firms from 2011 to 2024, we estimate a two-way fixed effects model that incorporates both transformation dimensions. We find that ITDT significantly increases OFDI. The coefficients on intelligent transformation and digital transformation are positive and statistically significant, and the results remain robust to endogeneity correction and a series of robustness checks. Mechanism analysis reveals that ITDT promotes OFDI by reducing the inventory ratio and improving corporate social performance. Heterogeneity analysis shows that the effect is more pronounced in non-technology-intensive industries, firms with smaller supervisory boards, and regions with higher marketization. These findings extend research on the economic consequences of ITDT and provide micro-level evidence for differentiated transformation strategies and manufacturing internationalization policy.*

Keywords: *Intelligent Transformation, Digital Transformation, Outward Foreign Direct Investment*

1. Introduction

Global production networks are undergoing rapid restructuring. Advances in information technology, artificial intelligence, and industrial digitalization have changed how firms organize production, coordinate supply chains, and enter foreign markets [1,2,3,4]. In this context, outward foreign direct investment has become a central channel through which manufacturing firms acquire strategic assets, expand market reach, and improve international competitiveness [5,6]. At the same time, the digital economy has become a major force shaping corporate strategy. Firms are increasingly embedding digital tools and intelligent systems into production, management, and decision making [7,8]. The combination of intelligent transformation and digital transformation is therefore not merely an internal efficiency issue. It also influences the scale and direction of corporate internationalization [9,10,11,12].

Existing research has examined the internationalization effects of digital transformation and intelligent transformation separately. Studies on digital transformation show that it can promote OFDI by improving innovation, easing financing constraints, reducing transaction costs, and enhancing information access [8,9,11,13,14]. Research on intelligent transformation finds that intelligent manufacturing can increase OFDI decisions and investment frequency through productivity improvement, green transition, and risk-bearing capacity [7]. However, digital transformation and intelligent transformation are often implemented together in practice. Treating them as separate processes may obscure their joint effect and may overstate or understate the role of one dimension. In addition, existing studies pay limited attention to inventory management and social performance as channels through which ITDT affects OFDI. These two channels connect internal operational efficiency with external stakeholder recognition, and they are particularly relevant for manufacturing firms that face uncertain demand and complex host-country environments.

This paper addresses these gaps by bringing intelligent transformation and digital transformation into a single analytical framework. Using data on Chinese A-share listed manufacturing firms from 2011 to 2024, we estimate the effects of both transformation dimensions on OFDI while controlling for each other. We further examine two mechanisms: the inventory ratio and corporate social performance. We also investigate heterogeneity across industry technology intensity, supervisory board size, and regional marketization. The main findings are as follows. ITDT significantly promotes OFDI. The coefficients of

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intelligent transformation and digital transformation are both positive and significant. The inventory ratio and social performance serve as partial mediating channels. The effect is stronger in non-technology-intensive industries, firms with smaller supervisory boards, and regions with a higher degree of marketization.

The main contributions are threefold. First, the paper identifies the net effects of intelligent transformation and digital transformation on OFDI within a unified model. Second, it reveals inventory ratio and social performance as two mechanisms that link ITDT to OFDI. Third, it provides evidence on how industry attributes, internal governance, and external institutional environments shape the effectiveness of ITDT.

The remainder of the paper is organized as follows. Section 2 reviews related literature and develops the hypotheses. Section 3 describes the data, variables, and empirical design. Section 4 reports the baseline results, endogeneity tests, robustness checks, mechanism analysis, and heterogeneity analysis. Section 5 concludes and discusses policy implications. Section 6 lists the references.

2. Literature and Hypotheses

2.1 Digital transformation and OFDI

Digital transformation refers to the adoption of digital technologies such as big data, cloud computing, blockchain, the Internet of Things, and artificial intelligence in corporate operations. It changes information collection, resource allocation, and decision-making processes [1]. Prior research shows that digital transformation can improve corporate performance, stimulate innovation, reduce information asymmetry, and enhance capital market outcomes [15,16,17,18,19,20,21]. These changes can also affect international investment behavior.

Several studies directly examine the relationship between digital transformation and OFDI. Hao et al. [11] find that digital transformation promotes OFDI through improved ESG performance, relaxed financing constraints, and stronger innovation capacity. Wang et al. [9] show that digital transformation significantly increases OFDI, especially for state-owned firms, firms in competitive industries, and firms with executives who have overseas experience. Zhu [8] reports that digital transformation has a positive and significant effect on OFDI and that this effect is stronger for state-owned enterprises. Digital transformation can also reduce transaction and management costs, improve total factor productivity, and strengthen the ability of firms to bear the risks of foreign expansion [7]. From a market layout perspective, digital transformation supports the expansion of OFDI markets and generates supply chain spillovers [10]. These findings suggest that digital transformation improves the information, resource, and capability conditions that firms need for international investment.

2.2 Intelligent transformation and OFDI

Intelligent transformation refers to the application of artificial intelligence, intelligent manufacturing, automation, industrial robots, and related technologies in production and management. It changes the production function by combining physical capital with intelligent systems and by enabling human-machine collaboration [2]. Intelligent transformation can improve production efficiency, product quality, and risk management. It can also reduce labor costs and improve management efficiency.

Research on intelligent transformation and OFDI is still developing. Existing evidence suggests that intelligent manufacturing promotes OFDI decisions and increases investment frequency. The underlying mechanisms include productivity improvement, green transition, and stronger risk-bearing capacity. Intelligent transformation may also affect OFDI through knowledge spillovers, human capital upgrading, and supply chain coordination. However, the effect of intelligent transformation may depend on firm absorptive capacity. Firms with weak digital infrastructure or limited managerial capabilities may not immediately convert intelligent technologies into international expansion. This implies that intelligent transformation and digital transformation should be examined jointly rather than in isolation.

2.3 ITDT and OFDI

Intelligent transformation and digital transformation are mutually reinforcing. Digital transformation provides data collection, storage, and analysis capabilities that support intelligent production and decision making. Intelligent transformation creates application scenarios and value space for digital

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technologies. When the two processes are implemented together, they can improve production efficiency, resource allocation, and market responsiveness. These improvements help firms overcome the productivity threshold for OFDI. According to heterogeneous firm trade theory, only firms with sufficient productivity and capability can bear the sunk costs of entering foreign markets. ITDT can raise productivity, reduce information asymmetry, and improve coordination across production and supply chain activities. These effects lower the marginal cost of foreign expansion and increase the likelihood that firms will engage in OFDI. We therefore propose the following hypothesis.

H1. ITDT significantly promotes corporate OFDI.

2.4 Mechanisms

Inventory connects supply and demand. A high inventory ratio indicates that capital is tied up in inventory and that operational efficiency is low. A low inventory ratio can improve asset turnover and release financial resources. ITDT can reduce the inventory ratio through three channels. First, digital technologies improve demand forecasting by analyzing market trends and customer behavior. Better forecasting reduces inventory accumulation caused by prediction errors. Second, intelligent production systems use industrial internet and scheduling technologies to match production pace with order demand. This shortens production cycles and reduces work-in-process inventory. Third, digital platforms improve information sharing across supply chain partners. Firms can purchase materials on demand and reduce buffer inventory. Lower inventory ratios release working capital and improve operational control. These financial and operational resources support foreign market expansion and help firms manage the complexity of cross-border supply chains. Therefore, we propose Hypothesis 2.

H2. ITDT promotes OFDI by reducing the inventory ratio.

Social performance reflects how firms treat employees, customers, suppliers, communities, and other stakeholders. According to stakeholder theory, strong social performance builds trust with external actors and reduces institutional friction [22]. ITDT can improve social performance in several ways. Intelligent transformation can reduce energy consumption and emissions by optimizing production processes. Digital transformation can improve environmental monitoring and information disclosure. Digital tools also make it easier for stakeholders to observe and evaluate corporate social responsibility practices. As a result, ITDT can improve the quality of relationships between firms and their external environment.

Strong social performance can promote OFDI in two ways. First, multinational firms face institutional and cultural differences in host countries. Firms with better social performance are more likely to gain recognition from host-country governments, communities, and consumers. This recognition reduces entry barriers and compliance costs. Second, strong social performance can increase trust among international investors and financial institutions. It broadens financing channels and provides financial support for overseas expansion. These arguments lead to Hypothesis 3.

H3. ITDT promotes OFDI by improving corporate social performance.

2.5 Heterogeneity

The effect of ITDT on OFDI may vary across firms and regions. Industry technology intensity is one source of heterogeneity. Technology-intensive industries already have relatively high digital and innovation capabilities. The marginal improvement from ITDT may therefore be smaller. Non-technology-intensive industries often start from a lower digital base. For these industries, ITDT can produce larger marginal gains in efficiency and information access. Internal governance is another source of heterogeneity. Firms with smaller supervisory boards may have shorter decision chains and greater managerial flexibility. They can convert transformation outcomes into international actions more quickly. External institutional environment also matters. Regions with a higher degree of marketization have lower institutional transaction costs, stronger property rights protection, and better contract enforcement. These conditions help firms transform ITDT into competitive advantages in foreign markets. By contrast, regions with a lower degree of marketization may face administrative intervention and factor market distortions that weaken the effect of ITDT. These arguments are consistent with prior evidence on the role of governance and institutions in shaping corporate internationalization [5,23,24,25,26].

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3. Research Design

3.1 Data and Sample

The initial sample consists of Chinese A-share listed manufacturing firms from 2011 to 2024. Data on OFDI are collected from the Zephyr global merger and acquisition database and the fDi Markets global greenfield investment database. This approach follows recent studies that measure OFDI by the number of foreign investment activities [5,8]. Data on intelligent transformation and digital transformation are obtained through textual analysis of annual reports. Financial data and corporate governance data are from the CSMAR database and the CNRDS database.

We process the sample as follows. First, we exclude financial and insurance firms. Second, we exclude firms with special treatment status, firms with delisting risk, and firms that delisted during the sample period. Third, we exclude observations with missing values for key variables. Fourth, we winsorize all continuous variables at the 1st and 99th percentiles to reduce the influence of outliers. The final sample is an unbalanced panel of Chinese A-share listed manufacturing firms from 2011 to 2024. These procedures are consistent with prior research on corporate digitalization and internationalization [7,9].

3.2 Variables

3.2.1 Dependent Variable

OFDI is measured by the number of outward foreign direct investment activities undertaken by a firm in a given year. This measure captures the frequency of foreign investment and follows recent research on corporate internationalization [5,8].

3.2.2 Independent Variable

The two independent variables are intelligent transformation and digital transformation. Both are constructed through textual analysis. Following Wu et al. [15] and Zhao et al. [27], we build keyword dictionaries for intelligent transformation and digital transformation. The frequency of relevant keywords in annual reports is used to measure the level of each transformation dimension. We use ln_Intelligent to denote the logarithm of one plus the frequency of intelligent transformation keywords. We use ln_Digital to denote the logarithm of one plus the frequency of digital transformation keywords. This text-based approach has been widely used in studies on digital transformation and corporate outcomes [7,8].

Table 1 presents the keyword dictionary.

Table 1: Keyword Dictionary for Intelligent Transformation and Digital Transformation2

Dimension	Category	Keywords
Intelligent transformation	Intelligent technology and applications	artificial intelligence, intelligent manufacturing, intelligent technology, intelligent system, intelligent equipment, intelligent production, intelligent management, industrial intelligence, intelligent robot, automation, automatic control, machine substitution, smart factory, intelligent monitoring, human-machine interaction, machine learning, deep learning, image recognition, speech recognition, expert system
Digital transformation	Digital technology and applications	big data, cloud computing, blockchain, Internet of Things, mobile Internet, data mining, data platform, data center, digitalization, digital technology, industrial Internet, Internet platform, cloud service, data management, data visualization, cyber-physical system, digital twin, digital marketing

3.2.3 Mediating Variables

The first mediating variable is the inventory ratio, denoted as INV. It is measured as net inventory divided by total assets. A higher value indicates that more capital is tied up in inventory. This measure is consistent with prior research on operational efficiency and supply chain management [28]. The second mediating variable is social performance, denoted as S_score. It is measured by the social dimension score in the Huazheng ESG rating system. This dimension covers human capital, product responsibility, supply chain, social contribution, data security, and privacy. A higher score indicates better social performance. This measure follows recent studies on ESG and corporate internationalization [11].

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3.2.4 Control Variables

Following prior research, we include the following control variables. SOE is a dummy variable that equals one if the firm is state-owned and zero otherwise. Age is the natural logarithm of the number of years since firm establishment. TobinQ is the ratio of market value to total assets and captures growth opportunities and market expectations. Lev is total liabilities divided by total assets. ROA is net income divided by total assets. These variables control for ownership, firm maturity, growth, leverage, and profitability. The choice of controls follows Tian et al. [7] and Zhu [8].

3.2.5 Model Specification

To test the effect of ITDT on OFDI, we estimate the following two-way fixed effects model:

$$OFDI_{it} = \beta_0 + \beta_1 Intelligent_{it} + \beta_2 Digital_{it} + \gamma Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} (1)$$

where i and t denote firm and year.$OFDI_{it}$ is the number of outward foreign direct investment activities. $Intelligent_{it}$ and $Digital_{it}$ measure intelligent transformation and digital transformation. Controls_it includes SOE, Age, TobinQ, Lev, and ROA. μ_i is the firm fixed effect λ_t is the year fixed effect. ε_{it} is the error term. This specification follows recent studies on digital transformation and corporate investment [7,8].

To examine the mechanisms, we estimate the following mediating effect models

$$Mediator_{it} = \alpha_0 + \alpha_1 Intelligent_{it} + \alpha_2 Digital_{it} + \gamma Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} (2)$$

$$OFDI_{it} = \theta_0 + \theta_1 Intelligent_{it} + \theta_2 Digital_{it} + \theta_3 Mediator_{it} + \gamma Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3)$$

where $Mediator_{it}$refers to INV or S-score. If α_1 and α_2 are significant in equation (2) and θ_3 is significant in equation (3), while θ_1 and θ_2 decrease relative to the baseline coefficients, then a partial mediating effect exists. This approach is consistent with prior mediation analyses in corporate finance [29].

4. Empirical Analysis

4.1 Descriptive Statistics

Table 2 reports descriptive statistics. The mean OFDI count is 1.065, indicating that the average firm in the sample undertakes about one foreign direct investment activity during the sample period. The mean of Intelligent is 2.151, with a standard deviation of 1.388. The mean of Digital is 1.326, with a standard deviation of 1.418. Both variables range from zero to values above five, which indicates substantial variation in ITDT across firms. The mean SOE is 0.399, suggesting that state-owned firms account for about 40 percent of the sample. The average firm age is 2.847 in logarithm terms. The mean TobinQ is 2.096. The average leverage ratio is 0.426, and the average return on assets is 0.057. These values are within reasonable ranges and are comparable to those reported in prior studies on Chinese listed firms.

Table 2: Variable Definitions and Descriptions

Variable	Obs.	Mean	Std. Dev.	Min	Max
Intelligent	17,079	2.151	1.388	0	5.263
Digital	17,079	1.326	1.418	0	5.176
OFDI	17,079	1.065	2.383	0	12
SOE	17,079	0.399	0.49	0	1
Age	17,079	2.847	0.348	1.792	3.555
TobinQ	17,079	2.096	2.476	0.641	259.146
Lev	17,079	0.426	0.201	0.008	0.988
ROA	17,079	0.057	0.056	-0.382	0.255

4.2 Baseline Results

Table 3 reports the baseline regression results. Column (1) includes only the two independent variables and does not control for fixed effects. Column (2) adds year fixed effects. Column (3) adds control variables and year fixed effects. Column (4) is the baseline specification and includes firm fixed effects, year fixed effects, and control variables. Across columns (1) to (4), the coefficients of Intelligent and Digital are positive and statistically significant. In column (4), the coefficient of Intelligent is 0.0542

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and the coefficient of Digital is 0.0674. Both are significant at the 5 percent level. In economic terms, a one standard deviation increase in intelligent transformation and digital transformation is associated with an increase in OFDI count of about 5.42 percent and 6.74 percent, respectively. These results support H1 and are consistent with prior findings that digital transformation promotes OFDI [8,9,11].

Table 3: Baseline Regression Results

	(1) OFDI	(2) OFDI	(3) OFDI	(4) OFDI
Intelligent	0.2095***	0.0908***	0.0790***	0.0542**
	(7.0877)	(3.3756)	(2.9527)	(2.7002)
Digital	0.1058***	0.0915***	0.0862***	0.0674**
	(4.2885)	(3.8657)	(3.6805)	(2.3596)
Controls	NO	NO	YES	YES
Time FE	NO	YES	YES	YES
Firm FE	NO	NO	NO	YES
N	16,837	16,837	16,837	16,821
adj. R2	0.028	0.156	0.171	0.211

4.3 Endogeneity

Reverse causality may affect the baseline results. Firms with more OFDI activities may have greater resources and may therefore be more likely to adopt intelligent and digital technologies. Following Tian et al. [7] and Chen et al. [5], we address this concern by lagging the two independent variables by one period. This specification reduces the influence of current OFDI on current ITDT. Table 4 reports the results. In column (1), the coefficient of L.Intelligent is 0.0672 and significant. The coefficient of L.Digital is 0.0816 and also significant. Column (2) reports the current-period baseline results. The coefficients of Intelligent and Digital are 0.0538 and 0.0666, respectively, and both are significant at the 5 percent level. The sign and significance of the lagged variables are consistent with the baseline results, which suggests that reverse causality is unlikely to drive the main finding.

Table 4: Endogeneity Test

	(1) OFDI	(2) OFDI
L.Intelligent	0.0672**	
	(2.9527)	
L.Digital	0.0816**	
	(2.1709)	
Intelligent		0.0538**
		(2.7036)
Digital		0.0666**
		(2.3018)
Controls	YES	YES
Time FE	YES	YES
Firm FE	YES	YES
N	12,166	16,818
adj. R2	0.171	0.211

4.4 Robustness

We conduct three robustness checks, following standard practice in the literature [5,7]. First, we exclude observations from 2020 because the COVID-19 pandemic disrupted global economic activity and cross-border investment. The results in column (1) of Table 5 show that the coefficient of Intelligent is 0.0510 and the coefficient of Digital is 0.0798. Both are significant at the 5 percent level. Second, we control for city-year interactive fixed effects. This specification absorbs unobserved city-level factors that vary over time. The results in column (2) show that Intelligent has a coefficient of 0.0533 and Digital has a coefficient of 0.0691. The former is significant at the 1 percent level and the latter at the 5 percent level. Third, we winsorize all continuous variables at the 5 percent level. The results in column (3) show that the coefficient of Intelligent is 0.0574 and the coefficient of Digital is 0.0728. In general, the three robustness tests do not alter our baseline conclusions, and our core findings demonstrate satisfactory robustness.

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Table 5: Robustness

	(1) Exclude 2020	(2) City-year fixed	(3) OFDI
Intelligent	0.0510**	0.0533***	0.0574***
	(2.6743)	(2.7756)	(3.0443)
Digital	0.0798**	0.0691**	0.0728**
	(2.6420)	(2.3383)	(2.4640)
Controls	YES	YES	YES
Time FE	YES	YES	YES
Firm FE	YES	YES	YES
City FE	NO	YES	NO
N	15,606	15,829	16,818
adj. R2	0.213	0.254	0.211

4.5 Mechanism Analysis

Table 6 reports the mechanism tests. Columns (1) and (2) examine the inventory ratio channel. In column (1), the dependent variable is INV. The coefficient of Intelligent is -0.0040 and is significant at the 10 percent level. The coefficient of Digital is -0.0051 and is also significant. These results indicate that ITDT significantly reduces the inventory ratio. In column (2), INV and the two transformation variables are included in the OFDI equation. The coefficient of INV is -0.6749 and is significant at the 5 percent level. The coefficient of Intelligent is 0.0556, which is slightly higher than the baseline coefficient. The coefficient of Digital is 0.0580, which is lower than the baseline coefficient. These results suggest that the inventory ratio plays a partial mediating role. ITDT improves inventory management through demand forecasting and supply chain coordination. A lower inventory ratio releases working capital and improves asset turnover, which provides financial resources and operational capacity for foreign expansion. H2 is supported. The operational efficiency logic here is consistent with Berger and Bouwman [28], who emphasize the role of efficient resource allocation in corporate finance.

We then turn to the social performance channel. The estimates indicate that ITDT significantly improves social performance: the coefficient on Intelligent is 0.3136 and that on Digital is 0.3763, both significant at the 1 percent level. When S_score is included in the OFDI equation, its coefficient is 0.0062 and significant. The coefficients on Intelligent and Digital drop to 0.0519 and 0.0642, respectively, both lower than the baseline estimates. These results indicate that social performance plays a partial mediating role. Intelligent transformation reduces negative environmental effects through automated production, while digital transformation improves information disclosure and stakeholder communication. Together they increase host-country recognition and compliance capacity, which promotes OFDI. H3 is supported. This pattern is in line with stakeholder theory [22] and recent evidence that social performance promotes OFDI [11].

Table 6: Mediation Effect Results

	(1) INV	(2) OFDI	(3) S_score	(4) OFDI
Intelligent	-0.0040*	0.0556***	0.3136***	0.0519**
	(-1.7716)	(2.9648)	(3.7119)	(2.5777)
Digital	-0.0051***	0.0580**	0.3763***	0.0642**
	(-2.9052)	(2.1240)	(4.3214)	(2.2106)
INV		-0.6749**		
		(-2.2005)		
S_score				0.0062***
				(3.3802)
Controls	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
N	16,762	16,762	16,821	16,821
adj. R2	0.216	0.211	0.180	0.211

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4.6 Heterogeneity Analysis

Tech. Table 7 reports heterogeneity results. Columns (1) and (2) divide the sample by industry technology intensity. In technology-intensive industries, the coefficients of Intelligent and Digital are not statistically significant. In non-technology-intensive industries, the coefficient of Intelligent is 0.0665 and is significant at the 10 percent level. The coefficient of Digital is 0.0855 and is significant at the 1 percent level. These results indicate that the OFDI-promoting effect of ITDT is stronger in non-technology-intensive industries. Firms in these industries often start from a lower digital and intelligent base, so the marginal improvement from ITDT is larger. This result is consistent with Tian et al. [7], who show that the marginal benefit of digitalization depends on initial technology levels.

Board. We next consider supervisory board size. In firms with larger supervisory boards, neither coefficient is significant. In firms with smaller supervisory boards, the coefficient on Intelligent is 0.0559 and that on Digital is 0.0720, both significant at the 5 percent level. Smaller supervisory boards may have shorter decision chains and greater flexibility, allowing firms to convert transformation outcomes into international actions more quickly. Larger supervisory boards may face more complex internal governance and decision procedures, which delays the release of the ITDT effect. This result echoes Diaz and Huang [23], who document the role of governance in corporate financial decisions.

Market. We divide the sample by regional marketization. In regions with a high degree of marketization, the coefficient on Intelligent is 0.0643, significant at the 1 percent level, and that on Digital is 0.1002, significant at the 10 percent level. In regions with a low degree of marketization, neither coefficient is significant. High-marketization regions rely more on market mechanisms, have lower institutional transaction costs, and provide stronger property rights protection and contract enforcement. These conditions help firms convert ITDT into competitive advantages in foreign markets. This pattern aligns with Chen et al. [5], who document the importance of investment facilitation and institutional quality for OFDI.

Table 7: Heterogeneity Analysis

	Tech		Board		Market	
	(1) Tech-Intensive	(2) Non-Tech-Intensive	(3) Large board	(4) Small board	(5) High market	(6) Low market
Intelligent	0.0140	0.0665*	0.0034	0.0559**	0.0643***	0.0342
	(0.4711)	(2.0096)	(0.0965)	(2.1760)	(3.0037)	(1.2715)
Digital	0.0762	0.0855***	0.0851	0.0720**	0.1002*	0.0044
	(1.4740)	(3.2762)	(1.4854)	(2.6708)	(1.8098)	(0.1759)
Controls	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
N	7,643	9,161	4,647	12,153	9,356	7,447
adj. R2	0.262	0.209	0.201	0.234	0.217	0.169

5. Conclusion and Implications

This paper asks whether the joint adoption of intelligent transformation and digital transformation shapes corporate internationalization. We bring the two transformation dimensions into a single empirical framework and estimate their effects on outward foreign direct investment using panel data on Chinese A-share listed manufacturing firms from 2011 to 2024. The evidence points to a clear answer. ITDT significantly increases the number of OFDI activities, and the coefficients on both intelligent transformation and digital transformation are positive and statistically significant. The result is not an artifact of reverse causality or of a particular modeling choice. It survives lagging the independent variables, excluding the pandemic year, absorbing city-year interactive fixed effects, and applying stricter winsorization.

The more informative part of the analysis concerns how this effect operates. Two channels emerge. The first is operational. ITDT lowers the inventory ratio by improving demand forecasting, production scheduling, and supply chain coordination. The released working capital and the improvement in asset turnover give firms the financial and operational slack they need to absorb the sunk costs of foreign

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expansion. The second channel is relational. ITDT improves corporate social performance, which in turn raises host-country recognition and compliance capacity. Firms that are seen as responsible investors face lower institutional friction and broader financing options when they enter unfamiliar markets. Taken together, the two channels connect internal efficiency with external legitimacy and show that the internationalization payoff of ITDT is not confined to the production floor.

The heterogeneity results qualify the headline finding. The effect is strongest where the marginal return to transformation is highest, namely in non-technology-intensive industries, firms with smaller supervisory boards, and regions with a higher degree of marketization. Firms with a low initial digital base and short decision chains capture the largest gains, while those already near the technological frontier face diminishing improvements. The institutional environment reinforces this logic, since market-oriented regions allow firms to convert transformation outcomes into foreign investment more efficiently.

Implications. These findings carry three implications. Governments should sustain support for intelligent and digital upgrading in manufacturing, with priority given to industries that face the steepest initial transformation barriers. Firms should treat ITDT as part of their internationalization strategy rather than as a standalone efficiency project, using digital tools to tighten inventory management and intelligent technologies to strengthen stakeholder communication. And policymakers should also recognize that the returns to ITDT are conditional. Improving market institutions, protecting property rights, and reducing institutional transaction costs are as important as direct subsidies in enabling firms to translate transformation into outward investment.

Limitations. The study has limitations that point to future work. The measurement of ITDT relies on textual analysis of annual reports, which captures disclosure intensity alongside actual transformation activity. More direct measures, such as patent filings, equipment investment, or survey-based indicators, would sharpen the estimates. The sample is also confined to Chinese listed manufacturing firms. Extending the analysis to other emerging economies and to service firms would test whether the mechanisms documented here travel beyond the Chinese setting.

References

[1] Goldfarb A, Tucker C. Digital economics[J]. Journal of Economic Literature, 2019, 57(1): 3-43.
[2] Acemoglu D, Restrepo P. Robots and jobs: Evidence from US labor markets[J]. Journal of Political Economy, 2020, 128(6): 2188-2244.
[3] Thakor A V. Fintech and banking: What do we know?[J]. Journal of Financial Intermediation, 2020, 41: 100833.
[4] Fuster A, Plosser M, Schnabl P, et al. The role of technology in mortgage lending[J]. Review of Financial Studies, 2019, 32(5): 1854-1899.
[5] Chen J, Liu Y, Liu W. Investment facilitation and China's outward foreign direct investment along the belt and road[J]. China Economic Review, 2020, 61: 101458.
[6] Zheng X, Chen Y. Does supply-chain-finance help to improve the efficiency of outward foreign direct investment?[J]. Finance Research Letters, 2024, 59: 104703.
[7] Tian G, Li B, Cheng Y. Does digital transformation matter for corporate risk-taking?[J]. Finance Research Letters, 2022, 49: 103107.
[8] Zhu L J. The influence of digital transformation on Chinese firms' outward foreign direct investment[J]. Finance Research Letters, 2025, 72: 106567.
[9] Wang G Y, Lamadrid R L, Huang Y. Digital transformation and enterprise outward foreign direct investment[J]. Finance Research Letters, 2024, 65: 105593.
[10] Khurram M U, Abbassi W, Chen Y, et al. Outward foreign investment performance, digital transformation, and ESG performance: Evidence from China[J]. Global Finance Journal, 2024, 60: 100963.
[11] Hao S S, Chen W H, Mu Q. The mechanism of digital transformation promoting enterprise outward foreign direct investment: An analysis based on panel quantile regression and multiple mediation effects[J]. International Economics and Economic Policy, 2025, 23(1): 3.
[12] Zhang W, Sun C. How does outward foreign direct investment affect enterprise green transition? Evidence from China[J]. Journal of Cleaner Production, 2023, 428: 139331.
[13] Whited T M, Wu G. Financial constraints risk[J]. Review of Financial Studies, 2006, 19: 531-559.
[14] Fan H, Peng Y, Wang H, et al. Greening through finance?[J]. Journal of Development Economics, 2021, 152: 102683.
[15] Wu F, Hu H, Lin H, et al. Enterprise digital transformation and capital market performance:

ISSN 2616-5902 Vol. 8, Issue 10: 14-23, DOI: 10.25236/AJBM.2026.081003

Empirical evidence from stock liquidity[J]. Management World, 2021, 37: 130-144.
[16] Wen H, Zhong Q, Lee C C. Digitalization, competition strategy and corporate innovation: Evidence from Chinese manufacturing listed companies[J]. International Review of Financial Analysis, 2022, 82: 102166.
[17] Zhai H, Yang M, Chan K C. Does digital transformation enhance a firm's performance? Evidence from China[J]. Technology in Society, 2022, 68: 101841.
[18] Wu K, Fu Y, Kong D. Does the digital transformation of enterprises affect stock price crash risk?[J]. Finance Research Letters, 2022, 48: 102888.
[19] Guo F, Wang J, Wang F, et al. Measuring China's digital financial inclusion: Index compilation and spatial characteristics[J]. China Economic Quarterly, 2020, 19(4): 1401-1418.
[20] Yue P, Korkmaz A G, Yin Z, et al. The rise of digital finance: Financial inclusion or debt trap?[J]. Finance Research Letters, 2022, 47: 102604.
[21] Zhou L, Shi X, Bao Y, et al. Explainable artificial intelligence for digital finance and consumption upgrading[J]. Finance Research Letters, 2023, 58: 104489.
[22] Freeman R E. Strategic Management: A Stakeholder Approach[M]. Boston: Pitman, 1984.
[23] Diaz V, Huang Y. The role of governance on bank liquidity creation[J]. Journal of Banking and Finance, 2017, 77: 137-156.
[24] Berger A N, Hasan I, Zhou M. Bank ownership and efficiency in China: What will happen in the world's largest nation?[J]. Journal of Banking and Finance, 2009, 33(1): 113-130.
[25] Hansen B E. Threshold effects in non-dynamic panels: Estimation, testing, and inference[J]. Journal of Econometrics, 1999, 93(2): 345-368.
[26] Zhang D, Kong Q. How does energy policy affect firms' outward foreign direct investment: An explanation based on investment motivation and firms' performance[J]. Energy Policy, 2021, 158: 112548.
[27] Zhao J, Li X, Yu C H, et al. Riding the FinTech innovation wave: FinTech, patents and bank performance[J]. Journal of International Money and Finance, 2022, 122: 102552.
[28] Berger A N, Bouwman C H. Bank liquidity creation[J]. Review of Financial Studies, 2009, 22(9): 3779-3837.
[29] Hao J, Peng M, He W. Digital finance development and bank liquidity creation[J]. International Review of Financial Analysis, 2023, 90: 102839.