

Article

Digital Transformation, Corporate Innovation, and International Strategy: Empirical Evidence from Listed Companies in China

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Abstract: This paper empirically investigates the impact of digital transformation on corporate international strategy. With a dataset of the Chinese stock market from 2014 to 2020, our empirical results reveal that digital transformation has a positive impact on the international strategy of Chinese enterprises. More specifically, firms with digital transformation are more likely to implement international strategy, and firms with a higher degree of digital transformation are associated with a higher level of internationalization. In addition, our empirical results reveal that corporate innovation exhibits the mediation effect. Moreover, our findings show that the impact of digital transformation is more pronounced for private firms and non-high-tech enterprises, and this impact is also moderated by high institutional development in eastern China. Our findings survive numerous robustness checks.

Keywords: digital transformation; international strategy; corporate innovation



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1. Introduction

As the main body of the national and industrial innovation system, enterprises build the dual-core of enterprise innovation through the innovation of technical elements such as technology investment and R & D and the use of new technologies, as well as the change and innovation of non-technical elements, such as their own organizational and institutional systems, which also promote innovation to become the driving force of enterprise progress and development [1]. Because it requires enterprises to invest a lot of money to obtain benefits through innovation, many enterprises will pay attention to the uncertainty and risk in the process of R & D and innovation [2]. However, innovation will eventually bring higher benefits to enterprises, enhance enterprise value, and bring enterprises stronger international competitiveness, better social responsibility, more government subsidies, smoother financing channels, etc. [3–5]. Thus, most firms are still willing to actively participate in innovation activities. In recent years, the Chinese government and enterprises have continued to increase their investment in innovation. Since 2001, the total R & D expenditure in China increased more than 20 times in the past 20 years (see Figure 1). In 2019, 507 Chinese firms were shortlisted as the top 2500 global R & D investments recognized by international organizations, and the number of high-tech enterprises reached 225,000, which represents an increase of 1.8 times over 2015. Even though COVID-19 had a great impact on social and economic development, the innovation investment of Chinese enterprises has still increased significantly. In 2021, China's R & D investment in the whole society was CNY 2.79 trillion, a year-on-year increase of 14.2%, and the R & D investment intensity increased by 2.44% (the data are collected from the China Stock Market and Accounting Research database (CSMAR)).

In recent years, with the development of a new round of scientific and technological revolution and industrial transformation, the digital economy, driven by a new generation of information technologies such as the internet, big data, cloud computing, artificial

intelligence, blockchain, and financial technology, is promoting profound changes in the production mode, lifestyle, organization form, governance model, and business model of human society. These digital economic elements have also become the basis for reorganizing global factor resources and reshaping the global economic structure. Therefore, Chinese President Xi Jinping clearly pointed out in his signed article “Continue to Grow Stronger, Better and Bigger China’s Digital Economy” that we should “promote the deep integration of digital technology and the real economy, enable the transformation and upgrading of traditional industries, foster new industries, new forms and models of business, and continue to grow stronger, better and bigger China’s digital economy”. As an important participant in the digital economy, through the introduction of digital technology, firms build digital industrial chains, supply chains, and ecological chains in many ways, such as business digitization, operation digitization, management digitization, and industry digitization, so as to promote the digital transformation of all-round reform and system evolution. It is not only an effective path for enterprises to meet the digital economy and drive high-quality development but also an important manifestation of corporate innovation [6,7].

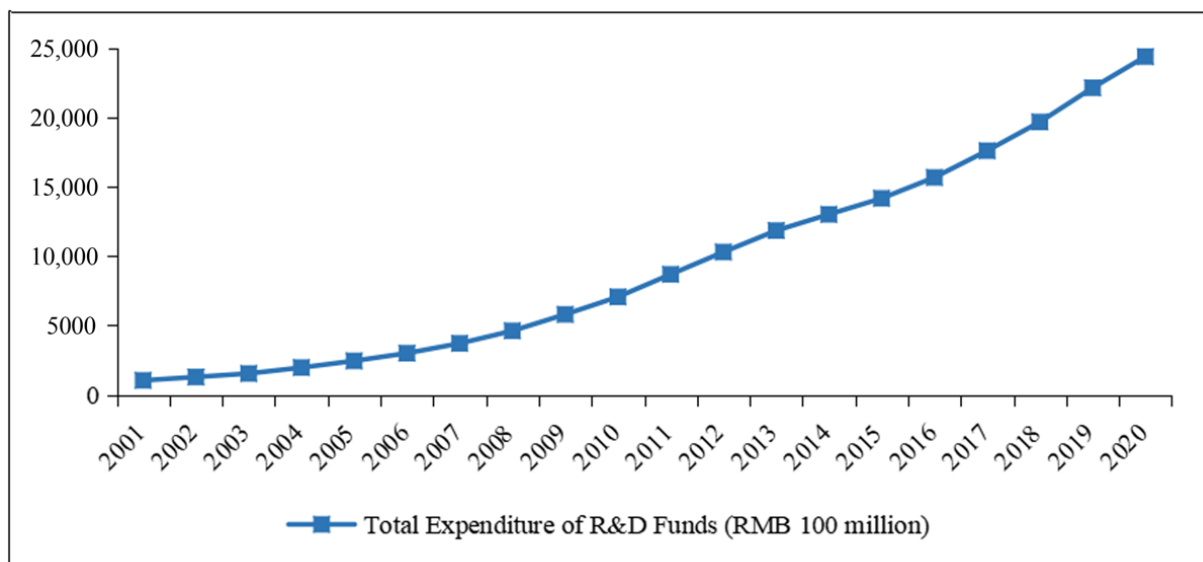


Figure 1. Total expenditure of R & D funds in China from 2001 to 2020.

Digital technology is fast growing and widely applied in China, which helps firms exerting international trade realize strategic transformation and reshape their international competitiveness. In recent years, a lot of cross-border digital platforms have emerged, and numerous Chinese firms achieved internationalization through these digital platforms. With the data from the ministry of commerce, in 2019, the total value of exports and imports for cross-border e-commerce was CNY 186 billion, with a growth rate of 38.3%. More specifically, exports achieved CNY 94.4 billion, with a growth rate of 68.2%. With these platforms, some traditional companies can identify and contact customers; for example, Safewell Group Holdings (China) can sell products directly to their international clients, which increases their profits. In addition, digital platforms help firms engaging in the domestic market explore the international market, such as Ningbo Meike Cultural Development Company and Ruian Aorui Electronic Commerce Company. They use these platforms to identify international opportunities, and they can modify their products to meet the requirements of overseas customers.

What can digital transformation bring to enterprises? Some findings show that digital transformation has improved the total factor productivity of enterprises by driving enterprise innovation, human capital structure, deep integration of the manufacturing industry and modern service industry, and enterprise operation levels [8]. And in the process of

digital transformation, firms have improved their management efficiency and technical level so as to improve their productivity [9]. Moreover, digital transformation reduces the external transaction costs faced by firms, effectively promotes the level of the professional division of labor, and improves the productivity of enterprises [10]. Digital transformation can also promote firms to converge towards the goal of sustainable development, enable firms to better meet the expectations of relevant stakeholders, and promote better sustainable development by improving their business performance [11]. The digital economy reduces the labor share through the productivity improvement effect, factor bias effect, and scale return change effect [12]. They show that digital transformation can bring substantial changes to firms, promote firms to reduce their operating costs by introducing digital technology in the business process, enable firms to improve the efficiency and accuracy of enterprise decision-making by integrating digital thinking and mode, and improve the internal governance system and governance level so that enterprises can obtain a better operating income.

However, when the existing literature pays attention to the impact of digital transformation on enterprise decision-making, it rarely pays attention to whether digital transformation affects the international strategy of firms. As an important strategic decision of enterprises, international strategy will undoubtedly be affected by digital transformation [13]. With the promotion of enterprise digital transformation, enterprises can break the path of dependence on traditional operations at a lower cost, expand their own business boundaries more widely, and make it easy for enterprises to go deep into the international market [14]. With the implementation of various measures such as developing an open economy and improving the level of opening to the outside world, more and more Chinese firms gain market share by opening up the international market to enhance their international competitiveness. In 2012, China entered the world's three largest foreign investors. In 2014, China's foreign investment flow exceeded the absorption of foreign capital and became a net capital exporter. From 2002 to 2018, China's foreign direct investment soared from USD 2.7 billion to USD 143.04 billion, with an average annual growth rate of 33.8%. In 2017, China's total foreign trade in goods reached USD 4.10 trillion, accounting for 11.5% of the total global foreign trade, ranking first in the world [15,16]. It can be seen that the reality of Chinese enterprises actively exploring overseas markets provides a good realistic background for this study. Based on the background of the new scientific and technological revolution, exploring whether digital transformation can affect enterprise internationalization decision-making can not only reveal how Chinese enterprises affect enterprise decision-making through business model transformation and governance system upgrading in the process of digital transformation, but it also has important theoretical and practical significance for fully understanding the problem of Chinese enterprises' continuous development of overseas markets under the background of global economic integration.

Therefore, this paper takes Chinese A-share listed companies as samples to theoretically and empirically test the influence of digital transformation on the international strategy of enterprises. Compared with the existing literature, the marginal contribution of this paper is as follows: First, existing studies on the economic consequences of enterprises' digital transformation mostly focus on the impact of digital transformation on firms' business performance and production efficiency, while few pieces of literature focus on the impact of digital transformation on enterprises' international strategy decisions even though international strategy is the first choice for Chinese enterprises to expand markets in recent years. Therefore, the research of this paper can not only expand the research on the economic consequences of digital transformation but also be more in line with the reality of Chinese enterprises. Second, although much literature has studied the international strategy of Chinese enterprises, there is no literature discussing the international strategy decisions of Chinese enterprises from the perspective of digital transformation under the background of a new scientific and technological revolution. Therefore, this study not only expands the research perspective on the international strategy decisions of

Chinese enterprises. It is also helpful for exploring more influential factors that influence Chinese enterprises' international strategy decisions. Third, by analyzing the influence mechanism and heterogeneity of digital transformation on international business decisions, the research conclusion can provide more accurate suggestions for Chinese enterprises to further implement digital transformation decisions.

2. Theoretical Analysis and Research Hypothesis

2.1. Digital Transformation and International Strategy

As an adaptation to the current era of the digital economy, digital transformation is the first choice for the strategic transformation of many Chinese enterprises. Starting from their own needs, firms look for transformation schemes suitable for their own maturity and development strategy by introducing digital technology and actively promoting digital construction and enterprise reform and reconstruction. In the process of digital transformation, on the one hand, due to the application of digital technologies such as big data and artificial intelligence, firms can reallocate resources and capabilities, make them easier to enter the new business ecosystem, obtain more market opportunities, and face more market investors and consumers [17]. On the other hand, due to the digital transformation of enterprise in the mode of production, organization form, marketing mode, management mode, management strategy, and so on, firms operate in a more sophisticated way so that they can function in the face of the new business model of uncertainty and risk, obtain a better business performance, and enhance their own value [18]. Moreover, digital transformation will also affect the internal management model and governance system of firms while affecting the production and operation of enterprises. Through the digital management transformation and reform of core management links and management positions, the enterprise can promote the data sharing and opening within the enterprise, release the data application value, promote the circulation of data elements of enterprise management, and enable the enterprise to obtain sustainable competitive advantages [19,20]. This means that digital transformation will also affect the cost of enterprises' international market development, the economic basis for international strategy, and the market boundary they face, which will affect the decision of international strategy.

Firstly, digital transformation reduces the cost for enterprises to explore the international market [10,12]. The application of digital technology promotes opportunities for enterprises in new markets, reduces the cost of developing new markets, and enables enterprises to find market customers more accurately by relying on new marketing technology and new marketing models [21]. In the process of developing the international market, firms explore more market customers and market space at a lower cost based on the mining, processing, and analysis of big data. Without digital technology, enterprises need more labor force to expand the international market. The application of big data can not only enable enterprises to know the market situation through data analysis and reduce the cost of labor to expand the market, but also improve the timeliness and accuracy of enterprises to judge market opportunities. For example, in 2015, China instructed enterprises in the Linyi City of Shandong Province to use the cloud computing technology composed of the ORACLE database and distributed server to realize the real-time tracking and analysis of the trade environment, competitors, and international buyers through the calculation of import and export trade data of various countries around the world, so as to formulate marketing strategies for enterprises to explore the international market. It can be seen that in the process of digital transformation, enterprises have reduced the cost of exploring the international market, including the cost of obtaining international market information, developing the international market, international marketing, and international market maintenance, etc., and the international market information that enterprises can obtain is more objective, real, and reliable than when they do not use digital technology, It also makes enterprises more dynamic when facing international decision-making [22].

Secondly, digital transformation provides enterprise performance and a good economic foundation for enterprises to explore the international market. Digital transformation

drives the reform of traditional production, operation mechanisms, and the management mode of enterprises, promotes the optimization of resource allocation efficiency and innovation of the management mode of enterprises, improves the efficiency of production and operation, and makes enterprises have better business performance and value [23]. Then, under the support of good business performance, enterprises' use of digital technology will improve and they can also effectively use digital technology to improve information processing abilities, enhance the understanding of foreign markets, and further improve the enterprise's ability to evaluate and predict the local market demand [24]. This also means the enterprise can rely on effective information decision systems analysis for information, calibration, and to grasp market opportunities. Moreover, digital transformation can also reduce the financing cost of enterprises so that enterprises not only have more capital and cash flow that can expand the international market but also have a better financial environment, so as to ensure that enterprises do not need to put more energy in the financial field and can allocate more resources to international business, so as to achieve the desired effect of developing the international market [25].

Finally, digital transformation breaks the traditional path dependence in the process of enterprise production and operation. It also expands the enterprise market boundary. The use of digital technology provides enterprises with the opportunity to cross the original market boundary so that they can move the original market boundary or blur their own established market boundary and take advantage of the possible cross-border market opportunity by constantly designing digital value propositions [26]. Therefore, digital transformation can make it easier for enterprises to break the inherent dependence on the internationalization path so that they are no longer limited to the established international or domestic market boundary, can re-establish the exclusive operation process adapted to the international market, and improve the success rate of enterprises operating in multiple countries to expand the market. For example, by introducing digital platform technology and using a digital platform operating system, e-commerce platform, and intelligent manufacturing system in digital technology infrastructure, enterprises can actively expand internationalization channels, improve internationalization efficiency and competitiveness in the international market, and make enterprises more flexible and changeable in the international market [27]. At the same time, the integration of digital technology and production technology improves the production technology level of enterprises, promotes intelligent, mechanized, and automated products, improves the value and added value of products, and enables enterprises' products to better integrate into the overseas market environment [28,29].

We, therefore, propose the following research hypothesis:

Hypothesis 1 (H1). *There is a positive relationship between digital transformation and the international strategy of enterprises.*

2.2. Digital Transformation, Innovation, and International Strategy

As the core driving force and important means of competition for high-quality development of enterprises, innovation behavior can help enterprises establish core competitiveness, improve production efficiency, and boost enterprises to obtain better profits in a long period of time, which is conducive to change the way of economic growth of enterprises, so as to achieve sustainable value creation. Although innovation is a resource-consuming activity of enterprises, with uncertain output factors and financing constraints, more enterprises are still willing to actively innovate and change their current operation mode, management mode, and market mode through innovation so as to ensure that enterprises have the power of sustainable development [30]. As the development of globalization expands the market scope faced by enterprises and intensifies the degree of market competition, enterprises can accumulate more knowledge reserves, technology reserves, and resource reserves in the international market through the R & D effect and learning effect of

innovative behavior, so as to improve their production efficiency and enter the international market with lower cost and higher quality [31,32].

Digital transformation is an important form of enterprise innovation behavior. Enterprises in the process of digital transformation to restore the original production of the physical form of the product can assign a new attribute, change the enterprise's value creation logic, and even reshape the ecological system to form the unique path of enterprise value [33]. It can also lead to a sustainable competitive advantage for the companies, improved traditional innovation modes, and ensure that enterprises receive an "innovation bonus" in the process of digital innovation [34].

It can be seen that, as the process of digital transformation deepens, firms will pay more attention to the success of digital transformation through innovative behavior and realize the effect of digital transformation. Entrepreneurship will also stimulate enterprises to better release the power of digital transformation by entering the international market [35]. Innovation behavior will form a mediation effect between digital transformation and the enterprise's international strategy decision. On the one hand, the improvement of the degree of innovation will strengthen the degree of digital transformation of enterprises, which will improve the influence of digital transformation on international decision-making. The enhancement of innovation dynamics ensures the success of digital transformation, improves the efficiency of the application of digital transformation in firms [36], and encourages enterprises to make better use of data mining in the information resources with the international market, which makes firms more convenient to enter the international market. On the other hand, innovation is also an effective way for firms to expand their business boundaries. Driven by innovation, firms can not only enter new forms of business but also actively expand the boundaries of original forms of business by means of regional expansion. In other words, in the process of digital transformation, through the increase in innovation investment, firms can strengthen the ability and power basis of breaking through the original production and operation boundary, profoundly change the ability value, resource value and information value of firms, stimulate the awareness and power of enterprises to actively enter the international market, and reduce the risk for enterprises entering the international market.

We, therefore, propose the following research hypothesis:

Hypothesis 2 (H2). *There is an influence mechanism of digital transformation on the international strategy of enterprises, that is, corporate innovation plays a mediation effect between digital transformation and the international strategy of firms.*

3. Study Design

3.1. Data Selection and Description

Since 2013, Chinese firms have gradually begun to use digital technology to create corporate value. In 2014, the Chinese Government Work Report mentioned the concept of "big data" for the first time. Therefore, this paper takes Chinese A-share listed companies from 2014 to 2020 as a sample to empirically test the impact of digital transformation on the international strategy of Chinese enterprises. Firms in the financial industry and firms with special treatment are excluded from our sample. In addition, firms with their main business engaged in the digital industry are also eliminated. Finally, our sample contains 15,199 observations of 2635 listed companies from 2014 to 2020.

3.2. Variable Design

3.2.1. Dependent Variable: International Strategy

This paper measures the international strategy (IS) of enterprises by whether the sample companies adopt international strategy (ISW) and the degree of international strategy (ISD).

Firstly, this paper constructs the dummy variable of whether the sample company operates internationally. If there is international business income disclosed in the annual financial report of the sample company, then $ISW = 1$, otherwise, $ISW = 0$.

Secondly, this paper constructs the variable of the international strategy degree of firms using the proportion of the international business income in the total operating income.

3.2.2. Independent Variable: Digital Transformation

The digital transformation (DT) in this paper is also measured by whether the firm is digitally transformed (DTW) and the degree of digital transformation (DTD).

First, referring to the research methods of current studies [37,38], this paper extracts the word frequency involved in “digitization” in the disclosure contents of a firm’s regular financial reports by Python. Among them, the dimensions of “digitalization” are defined as “artificial intelligence technology”, “blockchain technology”, “cloud computing technology”, “big data”, and “digital technology application”, and specific keywords are captured again based on each dimension (see Figure 2).

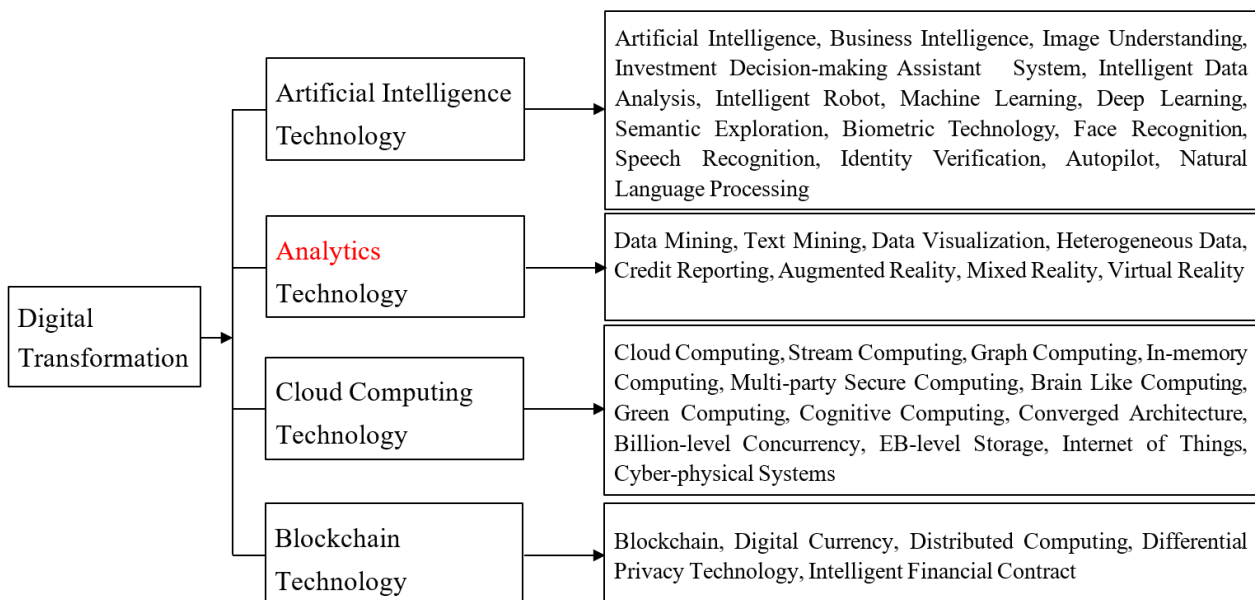


Figure 2. Lexical composition of digital transformation.

Secondly, this paper constructs the dummy variable of whether the sample company has digital transformation, that is, if the content disclosed in the annual financial report involves the word frequency of digital transformation, $DTW = 1$, otherwise $DTW = 0$.

Furthermore, this paper constructs the variable of the digital transformation degree of firms, which is defined as follows, $DTD = \ln(\text{number of word frequency of 'digital' keywords} + 1)$.

3.2.3. Intervening Variable: Innovation

In this paper, the annual R & D investment of sample companies is used to measure innovation behavior (Inn), namely $Inn = \ln(\text{Annual R \& D investment} + 1)$.

3.2.4. Controlled Variables

The following control variables are added in this paper:

Total Assets (Size): measured by the natural logarithm of the total assets at the end of the year;

Asset-liability Ratio (Debt): measured by the ratio of the total liabilities at the end of the year to the total assets;

Return on Assets (Roa): measured by the ratio of year-end net profit to total assets;

Stock Ownership (SO): measured by whether the sample company belongs to Chinese state-owned enterprises (SOEs) or Chinese non-state-owned enterprises (Non-SOEs). If it belongs to SOEs, then it is equal to 1, otherwise, it is 0;

Ownership Concentration (H10): measured by the squared sum of the shareholding proportion of the top 10 shareholders at the end of the year;

Team size of executives (TSE): measured by the natural logarithm of the total number of senior management teams at the end of the year.

3.3. Empirical Model Design

3.3.1. Benchmark Regression Test Model Design

To test the impact of digital transformation on the international strategy of Chinese enterprises, this paper constructs the following multiple regression model:

$$IO_{i,t} = \alpha_1 DT_{i,t} + \alpha_i Control_{i,t} + Year + Industry + C + \varepsilon_{i,t} \quad (1)$$

In Equation (1), the Year and Industry factors of the sample company are simultaneously controlled. In addition, all variables are winsorized at 1% and 99%.

3.3.2. Mediation Effect Test Model Design

From the previous analysis, innovation will have a mediation effect. Therefore, this paper constructs a mediation effect model to test. Based on Equation (1), this paper constructs a mediation effect model, that is:

$$Inn_{i,t} = a_1 DT_{i,t} + a_i Control_{i,t} + Year + Industry + C + \varepsilon_{i,t} \quad (2)$$

$$IO_{i,t} = b_1 DT_{i,t} + b_2 Inn_{i,t} + b_i Control_{i,t} + Year + Industry + C + \varepsilon_{i,t} \quad (3)$$

In Equations (2) and (3), if there is a mediating effect, the coefficient value a_1 in Equation (2) and coefficient value b_2 in Equation (3) are significant. If the coefficient value b_1 is not significant, it means that there is a complete mediation effect, while if the coefficient value b_1 is significant, it means that there is a partial mediation effect. However, if at least one of a_1 and b_2 is not significant, a further Sobel test is required.

3.3.3. Endogeneity Test Model Design

Although this paper has added control variables to Equations (1) and (2), there may still be endogenous problems in the empirical model. One possibility is that the location of the enterprise has a good foundation in the digital economy, which makes the enterprise more likely to carry out digital transformation so that there is a false relationship between digital transformation and international strategy. Therefore, this paper uses the two-stage least squares method for the endogenous test. In the first stage, the instrumental variable estimates the explanatory variable DT , that is:

$$DT_{i,t} = \alpha_1 Mobile_{i,t} + \alpha_i Control_{i,t} + Year + Industry + C + \varepsilon_{i,t} \quad (4)$$

In Equation (4), the variable *Mobile* is an instrumental variable which is measured by the natural logarithm of the total number of mobile phone users in the location of the sample company with reference to the method of previous literature [8]. The reason why this variable is selected as an instrumental variable is that, on the one hand, the greater

the number of local mobile phone users, the better the digital economy infrastructure in the region and the greater the probability of digital transformation of firms, which meets the correlation requirements of instrumental variables. On the other hand, the number of local mobile phone users will not affect the international strategy decision-making of enterprises, so the instrumental variables also meet the exogenous requirements. After fitting the variable *DT* through Equation (4), we test it through Equations (1) and (2).

4. Results and Analysis of Empirical Tests

4.1. Descriptive Statistical Results and Analysis

Table 1 gives the descriptive statistical results of the main variables of the whole sample. Among the explained variables, the average value of the variable *ISW* is 0.543, indicating that about 54.3% of Chinese enterprises will choose the decision of international strategy, which suggests that more than half of Chinese enterprises will expand the international market. The average *ISD* is 0.109, indicating that about 10.9% of the operating income of Chinese enterprises comes from the international market, while about 20.2% of the operating income of enterprises with international business comes from the international market. Among the explanatory variables, the mean value of variable *DTW* is 0.568, indicating that about 56.8% of Chinese enterprises have carried out digital transformation, and more than half of Chinese enterprises will recognize digital transformation. The mean value of variable *DTD* is 1.117, which indicates that the digital word frequency appears twice in the annual financial report of Chinese enterprises, while the digital word frequency appears 6 times in the annual financial report of enterprises with digital transformation. It can be seen that there are some differences in the degree of digital transformation of different enterprises. The mean of the mediation variable *Inn* is 14.829, indicating that the average annual R & D investment of Chinese firms is about CNY 2.75 million, but there are great differences in R & D investment among different firms.

Table 1. Descriptive statistical results of full sample.

Variable	Mean	Median	Standard Deviation	Maximum	Minimum	25%	75%
ISW	0.543	1.000	0.498	1.000	0.000	0.000	1.000
ISD	0.109	0.004	0.189	1.000	0.000	0.000	0.141
DTW	0.568	1.000	0.495	1.000	0.000	0.000	1.000
DTD	1.117	0.693	1.253	6.071	0.000	0.000	1.946
Inn	14.829	17.683	7.049	24.104	0.000	15.959	18.777
Size	22.540	22.364	1.346	28.636	14.942	21.632	23.300
Debt	0.450	0.442	0.206	4.026	0.008	0.293	0.598
Roa	0.054	0.050	0.089	1.305	−3.978	0.028	0.081
SO	0.418	0.000	0.493	1.000	0.000	0.000	1.000
H10	0.164	0.135	0.119	0.810	0.000	0.075	0.225
TSE	2.841	2.833	0.232	3.912	2.079	2.708	2.996

Table 2 reports the descriptive statistical results grouped by variables *DTW*, *DTD*, and *Inn*. In the grouping test according to the variable *DTW*, the value of the variable *DTW* is 1. The mean and median values of the variables *ISW* and *ISD* in the group are higher, and the significance test of the conventional confidence level is confirmed, which shows that compared with the firms without digital transformation, the enterprises with digital transformation have higher international strategy probability and degree of international strategy. In the grouping test according to the variable *DTD*, the mean and median values of the variables *ISW* and *ISD* in the high *DTD* group are higher, which shows that compared with the enterprises with lower digital transformation degrees, the enterprises with higher digital transformation degrees also have higher probability and degree of international strategy. In the grouping test according to the variable *Inn*, the mean and median of the variables *ISW* and *ISD* in the high *Inn* group are higher, which can also pass the significance test of the conventional confidence level, which shows that compared with the firms with

lower innovation investment, the enterprises with higher innovation investment will have higher probability and degree of international strategy.

Table 2. Descriptive statistical results of groups.

Variable	DTW = 1			DTW = 0			T Test	Wilcoxon Z
	N	Mean	Median	N	Mean	Median		
ISW	8634	0.566	1.000	6565	0.513	1.000	6.472 ***	5.577 ***
ISD	8634	0.115	0.007	6565	0.102	0.001	4.380 ***	4.901 ***
Variable	High DTD			Low DTD			T Test	Wilcoxon Z
	N	Mean	Median	N	Mean	Median		
ISW	7063	0.569	1.000	8136	0.521	1.000	5.978 ***	5.152 ***
ISD	7063	0.115	0.007	8136	0.105	0.002	3.460 ***	4.246 ***
Variable	High Inn			Low Inn			T Test	Wilcoxon Z
	N	Mean	Median	N	Mean	Median		
ISW	7600	0.711	1.000	7599	0.376	0.000	44.027 ***	35.775 ***
ISD	7600	0.144	0.048	7599	0.075	0.000	22.626 ***	36.066 ***

Note: *** indicates that they have passed the significance test at the 1% confidence level.

4.2. Correlation Test Results and Analysis

Table 3 shows the correlation coefficient values between the main variables. Firstly, the correlation coefficients between variables *DTW* and *DTD* and variables *ISW* and *ISD* are significantly positive, indicating that there is a positive correlation between digital transformation variables and enterprise international strategy variables. Secondly, the correlation coefficient between explanatory variables and control variables is not high, indicating that there is no problem of multicollinearity between variables.

Table 3. Correlation test results.

Variable	ISW	ISD	DTW	DTD	Inn	Size	Debt	Roa	SO	H10	TSE
ISW	1										
ISD	0.530 ***	1									
DTW	0.052 ***	0.036 ***	1								
DTD	0.060 ***	0.031 ***	0.778 ***	1							
Inn	0.387 ***	0.193 ***	0.151 ***	0.126 ***	1						
Size	0.024 ***	−0.026 ***	0.071 ***	0.050 ***	0.057 ***	1					
Debt	−0.027 ***	−0.020 **	−0.017 **	−0.020 **	−0.131 ***	0.462 ***	1				
Roa	−0.003	−0.031 ***	0.036 ***	0.026 ***	0.073 ***	0.063 ***	−0.228 ***	1			
SO	−0.122 ***	−0.132 ***	−0.108 ***	−0.092 ***	−0.155 ***	0.303 ***	0.225 ***	−0.066 ***	1		
H10	−0.060 ***	−0.050 ***	−0.030 ***	−0.025 ***	−0.041 ***	0.234 ***	0.024 ***	0.101 ***	0.190 ***	1	
TSE	0.012	−0.004	−0.012	−0.005	0.007	0.064 ***	0.042 ***	−0.007	0.117 ***	0.024 ***	1

Note: *** and ** indicate that they have passed the significance test at the 1% and 5% confidence levels, respectively.

4.3. Empirical Results and Analysis

4.3.1. Benchmark Regression Test Results

Table 4 shows the benchmark regression test results in this paper. In the regression results (1) and (2), when the control variables are not added, there is a significant positive correlation between the explanatory variable *DTW* and the explained variables *ISW* and *ISD*, which indicates that compared with the enterprises without digital transformation, the enterprises with digital transformation are more inclined to carry out international strategy, and the degree of international strategy is also higher. In the regression results (3) and (4), after the control variables are added, the explanatory variable *DTW* is still related to the explained variables *ISW*, which reveals a significant positive correlation. In the regression results (5) and (6), when the control variables are not added, there is also a significant

positive correlation between the explanatory variable *DTW* and the explained variables *ISW* and *ISD*, which indicates that the stronger the degree of enterprise digital transformation, the greater the probability of the enterprise choosing international strategy and the higher the degree of international strategy. Similarly, in the regression results (7) and (8), after the control variables are added, the explanatory variable *DTW* and the explained variables *ISW* are still positively correlated with *ISD*. From the benchmark regression results, there is a positive correlation between digital transformation and international strategy. With more and more Chinese enterprises carrying out digital transformation, these digital transformation firms are also more inclined to use the international market to develop their own business. The benchmark regression results verify the previous research hypothesis 1.

Table 4. Benchmark regression test results.

	ISW	ISD	ISW	ISD	ISW	ISD	ISW	ISD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DTW	0.212 *** (0.033)	0.014 *** (0.003)	0.125 *** (0.034)	0.008 ** (0.003)				
DTD					0.097 *** (0.013)	0.005 *** (0.001)	0.069 *** (0.013)	0.003 ** (0.001)
Size			0.147 ***	0.004 ***			0.146 ***	0.004 ***
Debt			−0.472 ***	−0.010			−0.468 ***	−0.011
Roa			−0.586 ***	−0.088 ***			−0.583 ***	−0.088 ***
SO			−0.543 ***	−0.052 ***			−0.540 ***	−0.052 ***
H10			−0.915 ***	−0.042 ***			−0.914 ***	−0.042 ***
TSE			0.220 ***	0.009			0.218 ***	0.009
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.053 **	0.102 ***	−3.201 ***	0.032 ***	0.065 ***	0.104 ***	−3.195 ***	0.031 ***
Adj R ²	0.003	0.001	0.024	0.020	0.004	0.001	0.025	0.020
F-statistics	41.892 ***	19.187 ***	55.044 ***	45.741 ***	55.218 ***	14.883 ***	56.944 ***	45.583 ***

Note: *** and ** indicate that they have passed the significance test at the 1% and 5% confidence levels, respectively.

4.3.2. Intermediary Effect Test Results

Table 5 shows the results of the mediation effect in this paper. Based on the empirical results in Table 4 above, the regression results (1) and (2) show that the values of variable *DTW* and *DTD* coefficients are significantly positive, indicating that the innovation investment of enterprises undergoing digital transformation is also higher. In the regression results (3) and (4), the value of the variable *Inn* coefficient is significantly positive, which verifies the mediation effect of innovation between enterprise digital transformation and international strategy and the existence of the influence mechanism of corporate innovation, which verifies the previous research hypothesis 2. At the same time, in the regression results (3) to (6), the variables *DTW* and *DTD* are significantly positive, which proves that after considering the impact of the innovation intermediary mechanism, digital transformation still has a positive impact on international strategy, and innovation has a mediation effect.

4.3.3. Endogeneity Test Results

Table 6 shows the endogeneity test results in this paper. In the 1st Stage regression results (1) and (2), the *Mobile* coefficient of the variable is significantly positive, which indicates that the more mobile phone users in the region where the sample company is located, the higher the probability of digital transformation and the stronger the degree of digital transformation, which verifies the correlation of the instrumental variables. In the 2nd Stage regression results (3) and (4), the variable *DTW* coefficient is significantly

positive, while in the 2nd Stage regression results (5) and (6), the variable *DTD* coefficient is also significantly positive, which shows that after considering endogenous factors, digital transformation can still promote the international strategy of enterprises. At the same time, the *J* statistics of the 2nd Stage regression results failed to pass the significance test of the conventional confidence level, which shows that the instrumental variables selected by the endogenous test are reasonable.

Table 5. Intermediary effect test results.

	Inn	Inn	ISW	ISD	ISW	ISD
	(1)	(2)	(3)	(4)	(5)	(6)
DTW	1.662 *** (0.112)		0.071 ** (0.037)	0.059 *** (0.003)		
DTD		0.543 *** (0.044)			0.091 *** (0.014)	0.026 *** (0.001)
Inn			0.130 *** (0.003)	0.005 *** (0.001)	0.129 *** (0.003)	0.005 *** (0.001)
Size	0.982 ***	1.013 ***	0.038 ***	−0.001 ***	0.035 ***	−0.001 ***
Debt	−6.153 ***	−6.203 ***	0.270 **	0.020 **	0.275 **	0.020 **
Roa	0.865	0.926	−0.856 **	−0.093 **	−0.858 ***	−0.093 **
SO	−2.166 ***	−2.234 ***	−0.360 ***	−0.041 ***	−0.350 ***	−0.041 ***
H10	−2.970 ***	−3.067 ***	−0.676 ***	−0.027 **	−0.665 ***	−0.027 **
TSE	0.698 ***	0.681 ***	0.162 **	0.006	0.163 **	0.006
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−6.110 ***	−6.359 ***	−2.902 ***	0.062 *	−2.864 ***	0.062 *
Adj R ²	0.078	0.074	0.157	0.051	0.157	0.051
F-statistics	184.970 ***	174.467 ***	354.810 ***	102.330 ***	354.375 ***	102.325 ***

Note: ***, **, and * indicate that they have passed the significance test at the 1%, 5%, and 10% confidence levels, respectively.

Table 6. Endogeneity test results.

	1st Stage			2nd Stage		
	DTW	DTD	ISW	ISD	ISW	ISD
	(1)	(2)	(3)	(4)	(5)	(6)
Mobile	0.263 *** (0.026)	0.115 *** (0.016)				
DTW			0.014 * (0.008)	0.059 *** (0.003)		
DTD					0.022 *** (0.003)	0.026 *** (0.001)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−6.230 ***	−1.860 ***	−0.109	0.062 *	−0.102	0.062 *
Adj R ²	0.046	0.030	0.157	0.051	0.157	0.051
F-statistics	93.377 ***	59.694 ***	354.810 ***	102.330 ***	354.375 ***	102.325 ***
J-statistics	—	—	1.099	1.405	1.056	1.396

Note: *** and * indicate that they have passed the significance test at the 1% and 10% confidence levels, respectively.

4.3.4. Robustness Check

- (1) Robustness test 1: Lag phase I inspection. In the benchmark regression, this paper takes the current international strategy as the explained variable. Considering the lag of the impact of digital transformation on a firm's decision-making, in the robustness test, this paper further takes the lagging international strategy variable as the explained variable for the empirical test;
- (2) Robustness test 2: International strategy sample test. The original samples in this paper include international business samples and non-international business samples. In the robustness test, this paper conducts an empirical test on the explained variable *ISD* for the international business samples;
- (3) Robustness test 3: Reject sample inspection. The difference in the administrative level of the enterprise location will lead to the difference in the degree of enterprise digital transformation. In China, Beijing, Shanghai, Tianjin, and Chongqing are municipalities directly under the central government. The administrative level of these four cities is higher than that of other cities. Therefore, this paper makes an empirical test after excluding the sample enterprises located in these four cities.
- (4) Table 7 shows the results of the robustness check. The three groups of robustness test results all proved that the explanatory variables *DTW* and *DTD* coefficient values are significantly positive, indicating that there was still a positive correlation between digital transformation and international strategy even after controlling the robustness factors, which verified the correctness of the empirical results mentioned above.

Table 7. Robustness test results.

	Robustness Test 1				Robustness Test 2		Robustness Test 3			
	ISW	ISD	ISW	ISD	ISD	ISD	ISW	ISD	ISW	ISD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
DTW	0.118 *** (0.037)	0.005 * (0.003)			0.020 *** (0.005)		0.099 *** (0.038)	0.009 *** (0.004)		
DTD			0.075 *** (0.015)	0.002 * (0.001)		0.012 *** (0.002)			0.064 *** (0.015)	0.003 ** (0.001)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−3.073 ***	0.043	−3.061 ***	0.043	0.363 ***	0.362 ***	−2.843 ***	0.100 **	−2.826 ***	0.098 **
Adj R ²	0.026	0.021	0.027	0.021	0.016	0.016	0.024	0.023	0.025	0.023
F-statistics	48.325 ***	38.712 ***	50.544 ***	38.922 ***	19.929 ***	19.968 ***	44.188 ***	42.560 ***	45.892 ***	42.328 ***

Note: ***, **, and * indicate that they have passed the significance test at the 1%, 5%, and 10% confidence levels, respectively.

4.4. Heterogeneity Grouping Regression Test Results and Analysis

4.4.1. Grouping Test between SOEs and Non-SOEs

Chinese SOEs and Chinese Non-SOEs have great differences in government resources, management style, and governance awareness, so different enterprises are also different in development goals, incentive goals, and pursuit goals. Compared with Chinese Non-SOEs, Chinese SOEs not only need to achieve the basic profit goal of the enterprise but also need to undertake the government goal and social responsibility goal of promoting local economic and social development. Then, in SOEs and Non-SOEs, this paper will test whether there are differences in the impact of digital transformation on international business decisions.

Table 8 reports the grouping test results of Chinese SOEs and Chinese Non-SOEs. It can be seen that in the test results of SOEs, although the correlation coefficient values between variable *DTW*, *DTD*, and explained variable *ISW* are significantly positive, the correlation coefficient values between variable *DTW*, *DTD*, and explained variable *ISW* cannot pass the significance test of conventional confidence level. In the test results of Non-SOEs, the values of variable *DTW* and *DTD* coefficients are significantly positive, which shows that

the digital transformation of Chinese SOEs can significantly promote international business decisions. Compared with Chinese SOEs, Chinese Non-SOEs tend to be small in scale and have shorter enterprise management and decision-making chains. It is more convenient to make digital transformation decisions and international decisions, especially with more power and lower cost, so it is easier to play the role of digital transformation.

Table 8. Grouping test results for SOEs and Non-SOEs.

	Sample of SOEs				Sample of Non-SOEs			
	ISW	ISD	ISW	ISD	ISW	ISD	ISW	ISD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DTW	0.107 ** (0.051)	0.002 (0.004)			0.147 *** (0.045)	0.012 ** (0.005)		
DTD			0.080 *** (0.021)	0.002 (0.002)			0.064 *** (0.017)	0.004 ** (0.002)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−4.463 ***	−0.019	−4.452 ***	−0.012	−3.113 ***	−0.006	−3.126 ***	−0.017
Adj R ²	0.021	0.012	0.022	0.002	0.009	0.002	0.009	0.012
F-statistics	23.542 ***	13.438 ***	25.287 ***	3.558 ***	14.175 ***	4.393 ***	14.677 ***	14.188 ***

Note: *** and ** indicate that they have passed the significance test at the 1% and 5% confidence levels, respectively.

4.4.2. Grouping Test between High-Tech Enterprise and Non-High-Tech Enterprise

Scientific and technological attributes will affect enterprise decision-making. Due to its high degree of digitization and its relatively special business model, the degree of digital transformation reflected by high-tech enterprises will be weaker than that of non-high-tech enterprises. Although the cost of non-high-tech enterprises in the process of digital transformation will be higher, the impact of digital transformation on enterprises, especially in promoting the transformation of enterprise organization systems and reducing enterprise risks, will be higher. Therefore, this paper tests the samples of high-tech enterprises and non-high-tech enterprises, respectively.

Table 9 reports the grouping test results of high-tech enterprises and non-high-tech enterprises. It can be seen that in the test results of high-tech enterprise samples, the values of variable *DTW* and *DTD* coefficients are not significant, which indicates that the impact of digital transformation on enterprise internationalization decision-making is not obvious in high-tech enterprises. In the test results of non-high-tech enterprises, the values of variable *DTW* and *DTD* coefficients are significantly positive, which proves that the digital transformation of non-high-tech enterprises has an obvious positive effect on internationalization decision-making. Because the business of high-tech enterprises is more closely related to digital technology, the application of digital technology in the process of digital transformation of non-high-tech enterprises can more effectively promote the obvious transformation of enterprises, and the digital transformation of non-high-tech enterprises is a more effective strategic transformation of enterprises. The management of non-high-tech enterprises will also cherish and pay more attention to the digital transformation behavior of enterprises, which will make the digital transformation play a stronger role in enterprise decision-making.

Table 9. Grouping test results for high-tech enterprise and non-high-tech enterprise.

	Sample of High-Tech Enterprise				Sample of Non-High-Tech Enterprise			
	ISW	ISD	ISW	ISD	ISW	ISD	ISW	ISD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DTW	0.075 (0.054)	0.001 (0.005)			0.087 ** (0.046)	0.025 *** (0.004)		
DTD			0.009 (0.021)	0.001 (0.002)			0.062 *** (0.019)	0.021 *** (0.002)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−6.662 ***	−0.164 ***	−6.561 ***	−0.165 ***	−4.146 ***	0.037	−4.151 ***	0.038
Adj R ²	0.034	0.025	0.034	0.025	0.026	0.014	0.027	0.014
F-statistics	37.405 ***	27.500 ***	37.176 ***	27.528 ***	31.991 ***	17.281 ***	33.125 ***	17.512 ***

Note: *** and ** indicate that they have passed the significance test at the 1% and 5% confidence levels, respectively.

4.4.3. Grouping Test between High Institutional Development and Low Institutional Development

Institutional development is an important part of enterprise external governance. Good institutional development can not only create a fair relationship between government and enterprises and a good business environment for enterprises in the region, but it can also build good technical and trading conditions for enterprises to carry out digital transformation [39]. This means that the advantages and disadvantages of the regional institutional development where the enterprise is located will have different external effects on the enterprise so that the impact of digital transformation on international business decisions is different. Therefore, this paper will test the samples of enterprises in high institutional development and low institutional development, respectively.

Table 10 reports the grouping test results of areas with high institutional development and areas with low institutional development. It can be seen that in the test results of high institutional areas, the values of variable *DTW* and *DTD* coefficients are significantly positive, which shows that in the test results of high institutional areas, digital transformation can have an obvious positive effect on enterprise internationalization decision-making. In the low institutional development, the variables *DTW* and *DTD* can only have a significant positive effect on the explained variable *ISW*, but the test results with the explained variable *ISD* are not significant. Compared with areas with low institutional development, areas with high institutional development can form more institutional support and institutional supplement for enterprises, which is conducive to enterprises obtaining more external resources in the process of digital transformation, and enable enterprises to better control the costs and risks in the process of digital transformation, which is conducive to releasing the “dividend” of digital transformation.

4.4.4. Grouping Test between Eastern China and Non-Eastern China

Although China’s overall economic development has been very fast in recent years, the phenomenon of unbalanced regional development still exists, so there are differences in the degree of digital transformation of enterprises in different regions. The degree of digitization of enterprises in eastern China is generally higher than that in central and western China [40]. Therefore, this paper will test the samples of enterprises in eastern China and non-eastern China, respectively.

Table 10. Grouping test results for high institutional development and low institutional development.

	Sample of High Institutional Development				Sample of Low Institutional Development			
	ISW	ISD	ISW	ISD	ISW	ISD	ISW	ISD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DTW	0.121 *** (0.048)	0.009 ** (0.005)			0.099 ** (0.047)	0.001 (0.004)		
DTD			0.062 *** (0.019)	0.022 *** (0.002)			0.066 *** (0.019)	0.001 (0.001)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−1.934 ***	0.004	−1.921 ***	0.003	−4.650 ***	0.034	−4.645 ***	0.036
Adj R ²	0.027	0.018	0.028	0.018	0.023	0.016	0.024	0.016
F-statistics	31.264 ***	20.826 ***	31.968 ***	20.507 ***	26.569 ***	18.945 ***	27.671 ***	18.978 ***

Note: *** and ** indicate that they have passed the significance test at the 1% and 5% confidence levels, respectively.

Table 11 reports the results of grouping tests for eastern and non-eastern China. It can be seen that in the test results of the samples in eastern China, the variables *DTW* and *DTD* coefficient values are significantly positive, which indicates that digital transformation can have a significant positive effect on enterprise internationalization decisions in eastern China. However, in the test results of samples from non-eastern regions, the variable *DTW* and *DTD* coefficient values did not all pass the significance test. Compared with the central and western regions, the eastern region of China has a better digital economy foundation, which is not only conducive to the digital transformation of enterprises but also promotes the digital transformation to play a better role.

Table 11. Grouping test results for eastern China and non-eastern China.

	Sample of Eastern China				Sample of Non-Eastern China			
	ISW	ISD	ISW	ISD	ISW	ISD	ISW	ISD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DTW	0.109 *** (0.041)	0.008 ** (0.004)			0.076 (0.061)	0.006 (0.004)		
DTD			0.064 *** (0.016)	0.028 *** (0.002)			0.054 ** (0.025)	0.001 (0.002)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−2.336 ***	0.062 ***	−2.332 ***	0.061 ***	−5.605 ***	−0.037	−5.574 ***	−0.034
Adj R ²	0.023	0.018	0.024	0.018	0.025	0.015	0.025	0.015
F-statistics	37.293 ***	28.436 ***	38.604 ***	28.276 ***	17.433 ***	10.858 ***	17.920 ***	10.659 ***

Note: *** and ** indicate that they have passed the significance test at the 1% and 5% confidence levels, respectively.

5. Conclusions

Digital technologies, such as big data, cloud computing, blockchain, and artificial intelligence, have become an important force driving China's economic development by changing the factors of production in the traditional economic system. In recent years, more and more Chinese enterprises have carried out digital transformation, trying to seize the trend of digital economy transformation and obtain opportunities for future development. Therefore, this paper empirically examines the impact of digital transformation on enterprises' internationalization decisions by taking listed companies on the main boards of Shanghai and Shenzhen A-share markets during 2014–2020 as samples and considers the impact mechanism of innovation. It is found that digital transformation has a positive impact on the internationalization operation decisions of Chinese enterprises, that is,

compared with the enterprises without digital transformation, the probability and degree of internationalization operations of digital transformation enterprises are higher, and the probability and degree of internationalization operations of enterprises with a higher degree of digital transformation are also higher. At the same time, innovation is the influencing mechanism of digital transformation on international strategy, that is, innovation has a mediating effect between digital transformation and international strategy. This conclusion still holds after controlling for endogenous and robust factors. The heterogeneity grouping test found that the impact of digital transformation on the international strategy of Chinese enterprises is more obvious in Chinese Non-SOEs, non-high-tech enterprises, areas with high institutional development, and eastern China. Empirical evidence in this paper verifies that digital transformation can effectively promote Chinese enterprises' international strategy decisions, expands the research on the economic consequences of Chinese enterprises' digital transformation, and helps to better understand the behavior of Chinese enterprises' digital transformation.

Our research contributes to current studies in the following aspects: first, this paper employs the text mining method to construct indices to reflect a firm's digital transformation. Most current studies apply provincial or city-level indices of digital transformation, but they cannot perfectly reflect the digital level of each firm. Second, this paper investigates the impact of digital transformation on international strategy. Whereas previous literature focuses on the exports of firms, our study concentrates on a firm's strategy, which is extremely crucial for firms. Third, we investigate the mechanism of how international strategy is impacted by digital transformation. We show that innovation channels can explain the relationship between digital transformation and international strategy. Finally, heterogeneity is considered. We test whether the impact of digital transformation differs across different features of firms.

The empirical evidence of this paper shows that the digital transformation of Chinese enterprises can promote international business decision-making. Combined with the research conclusions of the existing literature, although there are some risks and uncertainties in the digital transformation, on the whole, the advantages outweigh the disadvantages for Chinese enterprises. First, China's national and local governments should actively guide Chinese enterprises in digital transformation. Through the formulation and implementation of supporting policies, such as financial support, fiscal and tax support, policy support, and technical support for digital transformation enterprises, they should encourage enterprises to actively carry out digital transformation and encourage universities and R & D institutions to cooperate with enterprises to assist them in R & D and innovation from the technical level, so as to reduce the worries of digital transformation enterprises. Second, for enterprises, they should establish the confidence and determination of digital transformation. Enterprises should seize the development opportunities of the digital economy era, relying on a good external environment, first to solve their own "dare not transformation" and "do not want to transition" point of view and take the initiative to contact, identify, and adapt the digital transformation to build their own digital transformation plan. Through technological innovation, management innovation, and operation innovation, the problem of "no transformation" can be solved to enhance the core competitiveness of enterprises and provide sustainable development paths. Third, for market investors, they should pay more attention to digital transformation enterprises and obtain the "dividend" of enterprise digital transformation in time. Digital transformation can not only bring benefits to enterprises themselves but also ensure the benefits of market investors. Therefore, market investors should strengthen their investment in digital transformation enterprises, which can not only ensure that market investors obtain sufficient income but also provide a stable source of funds for digital transformation enterprises to form a "win-win" between digital transformation enterprises and market investors.

From the perspective of future research, first, the current research on enterprise digital transformation focuses on testing the economic consequences of digital transformation, while there is less research on the influencing factors of digital transformation. Is why enter-

prises choose digital transformation due to the guidance of external policies, the decision of enterprises' own operation and development, or the factors of enterprise management? Exploring the influencing factors of digital transformation is also of great significance to understand the digital transformation of enterprises and its economic consequences. Second, the current research on the economic consequences of enterprise digital transformation mostly focuses on the enterprise level, such as the impact on corporate performance, the influence of total factor productivity on the enterprise, the fulfilment of the social responsibility of the enterprise, and the influence of the impact on enterprise information disclosure, etc., but does not pay attention to the impact of digital transformation on other levels. For example, whether digital transformation will have an impact on the performance of enterprises in the stock market is also a matter of concern for further research. Third, the current research on the digital transformation of Chinese enterprises is an empirical test for China's main board-listed companies. However, in China's capital market, in addition to the main board-listed companies, there are also many types of enterprises, such as GEM-listed companies and science and innovation board-listed companies. These enterprises are very different from the main board-listed companies due to their own scale differences and industry attribute differences. It is worth further studying the impact of digital transformation on enterprises. In particular, the high risk and high return of Chinese GEM-listed companies have attracted the attention of many market investors, so the digital transformation of GEM-listed companies is more worthy of attention.

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