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The Impact of the Digital Economy on Supply Chain Security: Evidence from China's Wooden Furniture Industry

Yiyi Luo [1], Yilin Chen [1], Chenlu Tao [2], Chao Yang [1], Futao Xiang [3], Chang Xu [3] and Fanli Lin [3,*]

[1] School of Economics and Management, Beijing Forestry University, No. 35 Tsinghua East Road, Beijing 100083, China; luoyiyi0127@bjfu.edu.cn (Y.L.); elaainee0912@163.com (Y.C.); taochenlu@ncepu.edu.cn (C.Y.)
[2] School of Economics and Management, North China Electric Power University, No. 2 Beinong Road, Beijing 100096, China; yangchao99@163.com
[3] School of Finance and Public Administration, Anhui University of Finance and Economics, No. 962 Caoshan Road, Bengbu 233030, China; xiangfutao@aufe.edu.cn (F.X.); xuchang@aufe.edu.cn (C.X.)
* Correspondence: linfanli@aufe.edu.cn

Abstract: Supply chain security is a major prerequisite for China's successful industrial modernization, while the digital economy has significantly contributed to industrial transformation and upgrading. This study considers China's wooden furniture industry as its research object, constructing an evaluation index system of the digital economy and supply chain security of the wooden furniture industry. Then, it studies the impact of the digital economy on supply chain security through theoretical analysis and empirical methods using the two-way fixed model of provinces and time. The findings demonstrate that the digital economy effectively enhances the level of supply chain security in China's wooden furniture industry, further validating the digital economy's positive externality impact on the traditional real economy. The impact mechanism test shows that inventory turnover capacity is the focal point for the digital economy to improve the supply chain security of the wood furniture industry, specifying the starting point for that industry's digital transformation. The heterogeneity findings show that the role of the digital economy in improving the wood furniture industry's level of supply chain security is more significant in inland areas than in coastal areas. Additional analyses found a threshold effect of the digital economy's impact on supply chain security, indicating its limitations. This study explores the impact of the digital economy on the real economy from a traditional manufacturing industry, enriching research on the positive externalities of the digital economy as well as providing a reference for traditional manufacturing industries, such as that of wooden furniture, to probe the embedding points of the digital economy and appropriate digital transformation.

Keywords: digital economy; supply chain security; wooden furniture industry; mediation effect; threshold effect

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1. Introduction

Supply chain security is essential to promoting the high-quality development of national industries, ensuring smooth operation of the real economy, and building new development patterns, as well as maintaining national economic security as the cornerstone [1]. However, with the anti-globalization and trade protectionism trend, China's supply chain security has been greatly threatened [2,3], such that unblocking the supply chain security blockages caused by various developed countries in the process of desinicization is urgent. Digital technology offers application value in the process of social and economic development, as well as being a driver of China's breakthrough industrial transformation and upgrading, together with high-quality economic growth [4]. Therefore, an in-depth analysis of the impact of China's digital economy on supply chain security and specifically the practical problem of digital and real economy integration is of practical significance

for China to cope with global supply chain risks, such as chain-breaking, short-chaining, and regionalization. The wooden furniture industry is a typical traditional manufacturing industry in China with status in the international trade market. According to the United Nations (UN) Commodity Trade Statistics Database, in 2021 the global furniture gross output value was USD 490 billion, with China accounting for 37%; while global furniture consumption was USD 477 billion (China accounted for 28%); and global furniture exports were USD 160 billion (China accounted for 35%). China has become the world's largest producer, exporter, and consumer of wooden furniture. Despite the industry's large volume, there remains supply chain network confusion and supply channel issues [5]. There are also real problems of high dependence on external sources in the production process of wooden furniture, such as automation and digital machinery, and the supply of raw materials for the production of logs, sawn timber, hardware, paints, and glues [6].

To explore the impact of the digital economy on the supply chain security of China's wooden furniture industry, analyze the problems and blockages, and identify the inherent influence mechanism, this study constructs an evaluation index system for the digital economy and supply chain security using a comparison method. The digital economy mechanism affecting the supply chain security of the wooden furniture industry is revealed through the mediating effect model, identifying a specific direction for deep integration between the digital economy and traditional manufacturing industry. In addition, regional heterogeneity in the digital economy's impact was explored from the perspective of economic geography. The reason for such heterogeneity was also probed using the threshold effect test.

This article aims to explore ways to enhance the security of the furniture supply chain, analyze the impact of the digital economy on its supply chain security, and to some extent enrich and expand the research scope of the impact of the digital economy on the traditional manufacturing industry. Specifically, this study contributes to the literature in the following two aspects. First, through quantitative analysis, it verifies the effectiveness of the digital economy in enhancing the supply chain security of China's wooden furniture industry, which provides evidence for the integration of the digital economy with the real economy, thus optimizing supply chain security. Compared to existing research results on the modernized manufacturing industry, this study discusses the impact of the digital economy on the supply chain security of a traditional industry, offering a further exploration and supplement to its digital transformation and upgrading. Second, it identifies the limitations of the digital economy in improving the supply chain security of the traditional manufacturing industry and provides empirical evidence for the appropriateness of digital transformation in such industries. Compared with high-tech manufacturing, selecting proper digital embedding points and an adequate digital transformation path are more likely to improve the level of supply chain security in the industry. At the same time, these findings have practical significance for the digital transformation and upgrading of the traditional manufacturing industry, optimizing the supply structure, alleviating the "bullwhip effect" to improve supply chain efficiency, and improving the security of other traditional manufacturing supply chains.

The following sections are organized as follows: The Section 2 provides a comprehensive literature review, summarizing relevant research on the intersection of the digital economy and supply chain in the context of the wooden furniture industry. The Section 3 focuses on the development and implementation of a supply chain security evaluation index system, highlighting the integration of supply chain security and digital economy metrics. The Section 4 outlines the theoretical framework and introduces two key research hypotheses central to this study. The Section 5 delves into the research design, detailing methodology, data selection, and sources. Section 6 presents analysis, discussion, and avenues for further research based on empirical findings. Lastly, Section 7 offers policy recommendations informed by the conclusions drawn in this paper.

2. Literature Review

The digital economy has dramatically driven economic growth [7]. A careful review of relevant literature on the digital economy shows that scholarly attention to the digital economy's conceptual connotations has gradually shifted from initial topics, such as e-commerce and the digital divide [8,9], to informatization, digitization, innovation R&D, platform economy, big data, and artificial intelligence, among others [10,11], with an in-depth discussion of the positive externalities brought about by the digital economy [12]. For instance, some scholars note that the digitization of the customer base and knowledge spillovers are effective in enhancing suppliers' innovation capabilities [13], while others believe that the continuous optimization of human resource structures by means of digital technology is a priority for enhancing enterprises' innovation capacity [14]. Studies have also discussed the impact of the digital economy on the transformation of the division of labor in the value chain from a more macroscopic point of view, arguing that digital transformation effectively improves the resilience of supply chains in various industries [15]. Measuring the digital economy development level is also a research hotspot in this field. Current studies mainly consider two aspects. The first accounts for the size of the digital economy through input-output tables, growth accounting frameworks, and the construction of satellite accounts [16], whose basic logic lies in stripping away the economic growth achieved through digital forms in the national economy and evaluating the degree of digitalization development in different industries through measuring the value-added of the digital economy [15]. The second aspect uses an evaluation index system constructed through the comparative method to assess the development level of the digital economy by integrating evaluation indices directly related to digital technology [17]. For example, Xu et al. [18] portrayed the level of development of the digital economy in Chinese provinces (cities and districts) with the help of a digital financial inclusion index, while Serna et al. [19] constructed a system of evaluative indicators through textual analysis and the construction level of relevant infrastructure to assess the progress of Latin American higher education institutions in digital transformation.

In the latest round of the scientific and technological revolution, modernization of the supply chain is an inevitable trend along with industrial change, and the stability of supply chain security is an inevitable requirement for national modernization [20,21]. Specific research has focused on current supply chain problems and methods to improve supply chain security. Dong [22] identified the lack of basic capabilities and innovation capacity as important constraints on supply chain security in China. The argument that although China's supply chain security problems have always existed, they have been resolved at different stages of history is also being made. Li and Zhao [23] reviewed China's economic achievements at various stages since the People's Republic's (PRC) founding and the strategies adopted to secure its supply chain, noting that China's supply chain security has benefited from the government's ability to change the path of industrial modernization from exogenous to endogenous based on national conditions [24]. These changes include the reform of the economic system and continuous opening to the outside world to stabilize and optimize supply chain security. Regarding improving the level of supply chain security, a supply chain modernization logic-based analysis by Yang [25] found that to increase supply chain resilience, the most important direction is to optimize the supply chain's knowledge configuration and then shape a more durable, competitive, and innovative modern supply chain.

High innovation, strong permeability, and wide coverage are the significant features and advantages of the digital economy [26], which practically contribute to improving supply chain security; thus, exploring how the digital economy can do so is also a hot research topic. Globally, Yang et al. [27] discussed the impact of the digital economy on global supply chain security, concluding that building a platform economy and a virtual digital image of the supply chain network through the Internet can effectively promote more small- and medium-sized enterprises (SMEs) to participate in inclusive trade globally, thus improving supply chain security. Other perspectives also suggest that data resources

are effective in enhancing the added value of products and services and bringing growth effects to corresponding markets [28]; therefore, data are the foundation for the digital economy's impact on supply chain security [29]. In addition, Peng and Zhou [30] argued that information sharing and information transfer efficiency are crucial for the digital economy to improve supply chain security. From an internal governance perspective, digitalization enhances enterprises' risk-taking capacity [31], reduces business management costs, and ensures supply chain security and stability [32]. The digital economy's impact on the supply chain security of China's wooden furniture industry garnered fewer research results, with the focus on problems existing in the wooden furniture industry itself and the research scope being dominated by the development of the local wooden furniture industry, rarely from the supply chain perspective [33,34].

In summary, the positive impact of the digital economy on society and the economy has been fully affirmed in the existing literature, and measuring the digital economy's development has also been discussed from multiple perspectives and dimensions. The significant body of research on supply chain security provides reference value for this study regarding research concepts and methodologies. While the topic is exploratory based on the needs of the times, the research object mostly focuses on the high-tech industry, and there remains a gap for further research in the traditional manufacturing industry. The wooden furniture industry, as a typical representative of China's traditional manufacturing industry, has been the subject of qualitative research but little quantitative research. Therefore, this paper can expand academic research to a certain extent.

3. Constructing and Accounting a Supply Chain Security Evaluation Index System for the Wooden Furniture Industry

3.1. Constructing Supply Chain Security Evaluation Indicators for the Wooden Furniture Industry

Supply chain security can be measured from two primary aspects: (1) Considering possible supply chain risks and summarizing factors that negatively affect supply chain security and (2) exploring the ways in which supply chain security can be better safeguarded and providing solutions to supply chain crises. This study considers the basic needs for developing the wooden furniture industry as a starting point and constructs an evaluation index system for wooden furniture supply security from four supply perspectives: capital, labor, production technology, and raw material supply.

Regarding capital supply, this study takes the total assets and gearing ratio of the furniture manufacturing industry as the reference indices for the level of capital supply. This is because, first, the furniture manufacturing industry's total assets are a more intuitive reflection of China's provinces (cities and districts) in the overall development of the wood furniture industry. In general, having more total assets is more conducive to the sustainable development of an industry [35]. Second, from the view of ease of access to capital, although enterprises' gearing ratio is not uniformly higher or lower, the more favorable or unfavorable it is to the development of the enterprise, the relatively higher the gearing ratio reflects the degree of social capital to the development of the wood furniture industry [36]. Moreover, when an enterprise has a strong solvency capacity, it tends to obtain financial support through financing loans [37]. Therefore, the total assets and gearing ratio of the wood furniture manufacturing industry were used as the evaluation indices of capital supply in the wood furniture industry.

Next, the employment rate is mostly used in the existing literature to reflect labor supply [38]. However, because the wooden furniture industry is a traditional, labor-intensive industry, the income level of those engaged in furniture manufacturing is relatively low and unattractive to those already employed [39]. Thus, it would be more reasonable to use the number of under-employed people as an indicator of labor supply.

Regarding production technology supply, this indicator mainly refers to the supply of wood furniture production and processing equipment. A lower import dependence on such equipment indicates a higher level of supply chain security in the industry [40], and the greater the number of importing source countries, the higher the security of the supply

chain [41]. Moreover, higher exports of wood furniture processing equipment produced in China reflect higher self-sufficiency in furniture production equipment. Thus, the import and export values of wood furniture production and processing equipment as well as import diversification are used as indicators to examine production technology supply [42].

Finally, raw material supply is determined by forest resource endowment, timber transshipment conditions, and raw materials supply. First, forest resource endowment is a basic condition for the stable and sustainable development of the wood processing industry [43]. Therefore, this study selected provinces (cities and districts) as the volume of live wood storage, and the total production of logs and sawn timber as the index of forest resource endowment. Second, timber transshipment is key to solving the "last mile" problem of raw materials from the source to wood furniture producers, hence the gross value of timber harvesting as an indicator [44]. In addition, current research indicates that raw material supply is supplemented by the production of manmade boards and the import of logs and sawn timber [45]. The details are presented in Table 1.

Table 1. Evaluation index system of supply chain security in China's wooden furniture industry.

Primary Indicator	Secondary Indicator	Data Source	Mean	Std.	Character
Capital supply	Log of total assets of the furniture manufacturing industry	China Furniture Yearbook	3.08	2.69	+
	Log of gearing ratio	China Economic Census	3.55	1.91	+
Labor supply	Log of urban registered unemployed population	National Bureau of Statistics	3.04	0.72	+
Production technology supply	Log of imports of wood furniture production and processing equipment	Statistical Yearbook of China's Light Industry	−2.74	2.56	-
	Log of exports of wood furniture production and processing equipment	Statistical Yearbook of China's Light Industry	16.52	2.80	+
	Diversification of processing equipment imports	Database of the General Administration of Customs of China	2.11	1.05	+
Raw material supply	Log of standing tree stock	National Bureau of Statistics	9.85	1.71	+
	Log of total log sawn timber production	Database of the General Administration of Customs of China	5.33	1.63	+
	Log of gross value of timber harvesting and transportation	National Bureau of Statistics	1.87	1.87	+
	Log of wood-based panel production	Database of the General Administration of Customs of China	5.09	2.16	+
	Log of imports of sawn timber	Database of the General Administration of Customs of China	5.66	5.13	-
	Log of total imports of wood-based panels	Database of the General Administration of Customs of China	−3.09	3.32	+

Note: "-" indicates that this indicator has a negative impact in the entire indicator system, while "+" indicates that this indicator has a positive impact in the entire evaluation indicator system.

3.2. Constructing an Evaluation Index System for the Digital Economy

This study aims to explore the impact of the digital economy on China's wood furniture industry's supply chain security and analyze its intrinsic impact mechanism and the

heterogeneity of the impact. Hence, it is necessary to assess the level of digital economic development in Chinese provinces (cities and districts) accurately as a core explanatory variable. Given data accessibility and completeness, this study adopted a comparative approach to assess the level of digital economic development, referring to Pei and Yun's [46] selection method for digital economy evaluation indices to construct China's provincial digital economy development evaluation index. The index system has three dimensions: Digital industry activity, digital innovation activity, and digital user activity. These dimensions were selected as follows. First, digital industry activity effectively reflects the degree of social and economic utilization of digital technology, which is the material basis for the development of the digital economy. Second, digital innovation activity is critical to reflecting the digital economy's potential for future development and its endogenous dynamics. Finally, digital user activity further refines the application of digital technology at the micro level, fully mirroring the completeness of the digital economy's foundation. The details are presented in Table 2.

Table 2. Evaluation index system of digital economy development level.

Primary Indicator	Secondary Indicator	Data Source	Mean	Std.	Character
Digital industry activity	Log of main business income of high-tech enterprises	China Economic Census	6.76	1.90	+
	Employed in the information transmission, software and information technology services industry	China Statistical Yearbook	1.66	1.01	+
	Density of Internet broadband access ports	China Statistical Yearbook	3.09	2.69	+
	Mobile telephone exchange capacity	China Statistical Yearbook	8.21	1.02	+
Digital innovation activity	R&D full-time equivalents (10,000 people per year)	China Statistical Yearbook	10.31	13.15	+
	Log of R&D internal expenditures	China Statistical Yearbook	4.95	1.57	+
	Log of domestic patent applications granted	China Statistical Yearbook	9.38	1.75	+
	Log of technology market turnover	China Statistical Yearbook	4.09	1.95	+
Digital user activity	Mobile telephones per 100 people	China Statistical Yearbook	4.18	0.62	+
	Log of the number of Internet users	China Statistical Yearbook	7.11	1.25	+
	Log of total telecommunication business	China Statistical Yearbook	4.02	1.09	+
	Log of the number of Internet access services places	China Statistical Yearbook	7.99	0.90	+

Note: "+" indicates that this indicator has a positive impact in the entire evaluation indicator system.

After processing the above indicators, the entropy weight method was used to measure the supply chain security index of the wooden furniture industry and the evaluation index of digital economy development. The contribution and uncertainty of the attributes are quantified by calculating the weights and entropy values of each indicator. In the calculation process, the decision matrix is first standardized, and then the attribute weight and entropy value are calculated by using the entropy value formula, and then the contribution degree of the attribute is obtained through normalization and multiplication operations.

4. Theoretical Basis and Research Hypotheses

4.1. Theoretical Basis

Chain theory is an essential cornerstone for studying supply chain security issues. The realization and creation of value are the fundamental logic of supply chain formation, while the social division of labor is its specific performance. Thus, the supply chain is continuously extended under the constant action of the trading mechanism [47]. Supply chain security refers to the application of industry chain theory to social and economic activities. Its connotation lies in the integration and optimization of the resources required for industrial development, including the purchase of raw materials, transportation, and capital supply. By exploring the influence of different links and elements in supply chain security, the influence elements of supply chain security on the wooden furniture industry and its internal mechanisms can be elucidated. The digital economy is a new form of economy in which information is digitized, data driven, and resource driven [48]. Research on digital economy theory is a practical exploration of industrial modernization and intellectualization and a vital link for the integration of digital technology with the real economy. Therefore, digital economy theory provides support and the basis for this study. In the era of the digital economy, data have become a new type of production element necessary for the industrial chain in each link. Meanwhile, the integration and innovation of open sharing brought about by digital technology make data an indispensable element for improving the supply chain security of the wooden furniture industry, thereby providing technical support and safeguarding supply chain security. It provides a theoretical foundation for the formulation of the research hypotheses and the construction of empirical models in this study.

4.2. Research Hypotheses

From the perspective of capital acquisition and utilization in the wood furniture industry, the development of the digital economy provides enterprises with richer financing channels, whereas real-time detection based on enterprise operating data can effectively improve the capital utilization rate [49]. This prompts the real economy to obtain financial gains in addition to goods sales, further ensuring the capital supply security of the wood furniture industry. Next, along with the increased popularity of digital technologies, such as mobile Internet, more accurate job search and recruitment matching effectively reduces the degree of information asymmetry between enterprises' labor demands and the labor market [50], ensuring labor supply to the industry. Moreover, the development of the digital economy integrates informatization, digitization, and intellectualization with the real economy [51], providing technological support for the sawing, cutting, chipping, planning, and even carving processes in the wooden furniture industry. Finally, regarding the raw materials supply of wooden furniture production, from the perspective of internal control, the development of digital technology can both provide enterprises with timely and accurate feedback production data to develop a reasonable production plan and provide richer procurement channels, standardized stocking processes, and accurate time schedules. Based on the external environment of the wooden furniture industry, the use of digital technology effectively simplifies the trading process and improves the efficiency of import customs clearance of raw materials, thus ensuring supply chain security for overseas supplies. Simultaneously, the development of digital technology can effectively improve the degree of informatization and modernization in forestry management, which in turn reduces risk in commercial forestry operations and guarantees raw materials supply security for the wooden furniture industry. Therefore, the following research hypothesis is proposed:

H1. *The development of the digital economy has a significant positive impact on improving the level of supply chain security in China's wooden furniture industry.*

Inventory turnover is a major indicator of an enterprise's supply chain performance [52]. The wooden furniture industry is a typical resource-intensive industry in which lightweight and precise inventory management is important for supply chain security. The development of the digital economy for the industry's inventory management ability plays an important and positive role in reducing the cost of supply information. The enterprise can screen all kinds of raw materials through the Internet and compare prices, consequently decreasing non-essential costs due to intermediaries. Moreover, the digital economy enables the industry to realize the intelligent management of the entire process of warehousing, replenishment, production, and delivery of raw materials using a digital warehouse management system, thus improving the enterprise's capital utilization efficiency and inventory management capability. Furthermore, digital technology enables enterprises to effectively engage with the wooden furniture market, accurately grasping the wooden furniture consumer market and identifying consumer demand to achieve customized production. This allows for the development of a more targeted and time-sensitive raw material procurement plan, effectively avoiding popular furniture being out-of-stock or off-sale and an excessive backlog in the remainder of the product, leading to funding fluctuations. Therefore, data mining, processing, analysis, and utilization of digital technology can effectively improve an enterprise's inventory turnover rate.

Inventory management is an essential factor in securing sustainable production in the wood furniture industry. Supply chain security includes not only labor supply and support for production technology but, more importantly, maintaining the supply of raw materials such as lumber, sawn timber, and panels needed for production, as well as capital chain security. Inventory turnover is a way for enterprises to convert products into capital and balance reserve funds and inventory volume, thus reducing operating costs. On the one hand, efficient inventory management effectively improves the short-term solvency of the enterprise and provides financial security. On the other hand, a high level of inventory turnover means a higher frequency of ordering, not only strengthening links with the suppliers of wood furniture enterprises but also modulating purchase decisions based on supplier prices in a timely manner. Additionally, efficient inventory management capability allows sufficient inventory space for the upcoming arrival of raw materials and avoids additional costs associated with expanding warehousing sites due to insufficient space.

The deep integration of digital technology into the real economy is an essential factor in expanding business boundaries. Wooden furniture enterprises can use digital technology to integrate and analyze the industry chain upstream and downstream key data information to formulate production, as well as the purchase of goods planning and decision-making to improve inventory management efficiency and effectiveness. Improving inventory management will further improve the solvency of wooden furniture enterprises and reduce operating costs, creating a predecessor for the supply chain security of the wooden furniture industry. Therefore, the following research hypothesis is proposed:

H2. *The digital economy has a significant positive impact on supply chain security through improving the inventory management capability of the wooden furniture industry.*

5. Research Design

5.1. Research Design

To deeply explore the impact of the digital economy on the supply chain security of China's wooden furniture industry and verify the research hypotheses, this study uses a two-way fixed effects model at the province and time levels for analysis. The regression equation is as follows:

$$supsec_{i,t} = \beta_0 + \beta_1 dig_{i,t} + \beta_k control_{i,t} + \gamma + \theta + \varepsilon_{i,t} \quad (1)$$

Equation (1) uses ordinary least squares (OLS) regression analysis, where $supsec_{i,t}$ denotes the supply chain security index of the wooden furniture industry for sample i in

year t and $dig_{i,t}$ denotes the digital economy development index of sample i in year t. The control are the control variables: β_k is the impact coefficient of the variables, γ and θ denote time and province fixed effects respectively, and $\varepsilon_{i,t}$ is the random error term.

Based on the above theoretical foundation, the inventory capacity of the wooden furniture industry is used as the mechanism variable, with reference to the classic literature, to construct the mediated effect regression equation [53] and explore the mechanism of the digital economy's influence on the industry's supply chain security. In addition, this study complements the Sobel and bootstrap tests as robustness tests after using the stepwise regression method as an initial test of the mediating effect. The specific regression equations are as follows:

$$sup_{i,t} = a_0 + a_1 dig_{i,t} + a_2 K_1 + \varepsilon_1 \quad (2)$$

$$sto_{i,t} = b_0 + b_1 dig_{i,t} + b_2 K_2 + \varepsilon_2 \quad (3)$$

$$sup_{i,t} = c_0 + c_1 dig_{i,t} + c_2 sto_{i,t} + c_3 K_2 + \varepsilon_3 \quad (4)$$

where $dig_{i,t}$ indicates the digital economy development index of province (cities and districts) i in year t; $sup_{i,t}$ and $sto_{i,t}$ indicate the supply chain security index and inventory of the wooden furniture industry in province (cities and districts) i in year t, respectively; a_0, b_0, and c_0 are constant terms, K_1 and K_2 are control variables; and ε_i is a random disturbance term. Specifically, when the estimated coefficients a_1, b_1, and c_1 are all significant, this indicates that the development of the digital economy can improve the level of supply chain security by enhancing the inventory management capability of the wooden furniture industry. That is, the inventory optimization capability of furniture manufacturers has a mediating effect on the digital economy's impact on the supply chain security of the wooden furniture industry.

Finally, China is a major international timber-importing country, and maritime shipping is its most important import channel. Therefore, this study further explores whether the impact of the digital economy on the supply chain security of the wooden furniture industry varies according to geographic location by considering whether the sample provinces are in the coastal area as a geographic differentiation condition. The availability of port conditions in the sample provinces was also used as a supplement to the heterogeneity discussion to explore the impact of the digital economy on the supply chain security of China's wooden furniture industry in different samples. Moreover, to explore whether there is a difference in the impact of the digital economy on the supply chain security of the wooden furniture industry at different development stages and if this difference also exists in different geographic locations, this study draws on the results of existing research to construct a threshold effect model to carry out a more in-depth analysis. The specific regression equations are as follows:

$$sup_{i,t} = \begin{cases} \alpha_0 + \alpha_1 dig_{i,t} + controls + \varepsilon_{i,t}, dig \le \delta \\ \alpha_0 + \alpha_2 dig_{i,t} + controls + \varepsilon_{i,t}, dig > \delta \end{cases} \quad (5)$$

where subscripts i and t in Equation (5) represent the data corresponding to province and time, respectively. The model indicates that when the development index *dig* of the digital economy is located on the left side of the threshold δ, the impact coefficients of the digital economy on the supply chain security are α_1 and α_2 when it is on the right side.

It should be noted that a number of empirical tests were carried out to ensure the validity of the research results, as detailed below.

1. Multicollinearity test. Considering the large number of variables involved in the econometric analysis, the variance inflation factor (VIF) was used to avoid multicollinearity that could lead to bias in the regression results. The test results showed that the maximum VIF value was 4.12. The mean value was 2.05, which is less than the strict VIF reference value of 5, indicating that there was no multicollinearity among the variables in the regression analysis.

2. Heteroskedasticity test. In order to avoid heteroskedasticity in the regression analysis that could reduce the explanatory validity of the impact of the digital economy's development on the supply chain security of China's wooden furniture industry, the regression model was subjected to the White test. The test results showed a *p*-value of 0.000, rejecting the original hypothesis of homoskedasticity at the 1% significance level. Consequently, robust standard errors were included in all subsequent empirical studies to address the problem of reduced explanatory validity due to heteroskedasticity.
3. Hausman test. The Hausman test was used to determine whether to choose a fixed effects model or a random effects model in the empirical analysis. The result of the test shows a *p*-value of 0.000, which rejects the original hypothesis of choosing a random-effects model at the 1% level of significance. Therefore, a fixed effects model was selected for the subsequent research.

5.2. Variable Selection

The dependent variable in this study is the wood furniture industry supply chain security index, and the independent variable is the digital economy development index. The mechanism variable is the inventory turnover ratio, which is an evaluation index reflecting the inventory management ability of the wood furniture industry and can effectively reflect enterprises' utilization efficiency in the production of raw materials. In this study, the selection of control variables is mainly considered from the following aspects. First, because of the differences in supply chain security requirements for wood furniture enterprises of different sizes, fixed assets as well as production factors in the furniture industry are controlled for. Second, given socioeconomic factors, the development of financial credit may affect the supply of funds in the wood furniture industry [54]; therefore, differences in the financial lending business development level across provinces (cities and districts) and supplementing the social employment rate as a reflection of the supply chain's labor supply were controlled for. Third, from the perspective of the consumer market for wooden furniture, population density differences directly affect the total demand for the product [55], which may affect the level of supply chain security. Fourth, forest cover was selected as a control variable for forest resource endowment, and road freight turnover was added to the control variables considering the impact of the transportation industry on industrial supply chain security [56].

5.3. Data Sources and Descriptive Statistics

The data used in this study were mainly obtained from the National Bureau of Statistics and the database of China's General Administration of Customs. The import and export data of wooden furniture, logs, sawn timber, artificial boards, wooden furniture processing, and production equipment involved in the calculation of the supply chain security index were all obtained from the database of China's General Administration of Customs, and the related trade commodities were screened using the HS 8-digit code. Statistics on the wooden furniture industry were obtained from the China Furniture Yearbook, China Light Industry Yearbook, and relevant reports published by the China National Furniture Association. Other macro data were mainly obtained from the China Statistical Yearbook, China Economic Census Yearbook, and provincial statistical yearbooks (cities and districts). In this study, 30 provinces (municipalities and autonomous regions in China, excluding Hong Kong, Macao, Taiwan, and Tibet) were selected as the research subjects from 2003 to 2021, and a total of 570 samples.

The selected variables and descriptive statistics are shown in Table 3. As can be seen, the development of China's wood furniture industry has large differences based on region or time. First, there is considerable variation in the industry's supply chain security level, with the lowest at 1.183 and the highest at 48.084. Similarly, the inventory turnover variable has a minimum value of 0.06 and a maximum value of 28.350, with a large standard deviation. Second, regarding the other variables affecting supply chain

security, the financial development level of each province (cities and districts) was relatively balanced, and the difference between the mean (1.271) and maximum value (2.759) was relatively small. Regarding forest cover, there was a large variation between the samples, with a maximum value of 66.8% and a minimum value of 2.94%, which is significantly different from the mean value of 31.156, indicating a large disparity in the forest resources of the provinces (cities and districts). Finally, regarding employment rate and transportation, the differences were small.

Table 3. Names and meanings of variables.

Variable	Name *N*	Symbol	Meaning	Mean	Std.
Dependent variable	Supply chain security index	sup	Index of supply chain security in the wood furniture industry	25.034	5.623
Independent variable	Digital economy index	dig	Index of evaluation of digital economy development level	3.678	1.458
Mediating variable	Inventory turnover ratio	sto	Industry's operating costs/Average balance of net inventories	18.799	7.278
Control variables	Original cost of fixed assets in the furniture manufacturing industry	fas	Log of the original cost of fixed assets in the furniture manufacturing industry by province	2.381	2.184
	Log of wood furniture production	lnpro	Log of annual wood furniture production by province	4.703	2.617
	Development level of financial and credit operations	fina	Percentage of loan balances of financial institutions in GDP by province	1.271	0.447
	Log of population density	lnpden	Log of total population density by province	5.441	1.314
	Forest cover	cove	Percentage of forested area in each province in relation to its administrative area	31.156	17.698
	Log of road freight turnover	frei	Log of freight transported per kilometer of road	8.761	0.684
	Employment rate	empl	Overall employment rates by province	96.523	0.704

6. Results and Discussion

6.1. Benchmark Regression Results

To further analyze the impact of the digital economy development level of China's provinces (cities and districts) on the supply chain security of the wooden furniture industry, the results of different regression models were listed together. The regression results of Model 1 do not control for the effects of province and time. Model 2 only controls for time; Model 3 only controls for province; and Model 4 controls both the effects of time and region. The details are shown in Table 4.

Table 4. Empirical test results.

Variables	1	2	3	4
	Sup	**Sup**	**Sup**	**Sup**
dig	2.725 *** [0.210]	2.842 *** [0.316]	1.881 *** [0.247]	2.159 *** [0.362]
ln Road freight turnover	1.178 *** [0.331]	1.481 *** [0.471]	1.670 *** [0.430]	1.376 *** [0.494]
ln Wooden furniture production in 10,000 pieces	−0.1 [0.149]	0.002 [0.138]	0.083 [0.136]	0.063 [0.137]
Financial development level	−1.227 *** [0.448]	0.171 [0.709]	−0.051 [0.528]	0.859 [0.758]
Log of population density	−0.267 [0.165]	0.445 [0.470]	11.867 *** [2.380]	13.110 *** [2.404]
Forest cover	0.017 * [0.009]	0.013 [0.026]	−0.037 [0.037]	0.017 [0.042]
Log of original cost of fixed assets	0.703 *** [0.197]	0.158 [0.184]	0.066 [0.177]	0.231 [0.186]
Employment rate	−1.698 *** [0.283]	−0.663 ** [0.312]	−0.530 * [0.302]	−0.404 * [0.218]
Constant term	190.466 *** [27.329]	88.838 *** [30.002]	−12.514 [34.676]	−42.079 [36.971]
Province fixed	No	No	Yes	Yes
Time fixed	No	Yes	No	Yes
Observed value	570	570	570	570
Fitted value	0.566	0.387	0.389	0.620

Note: Within [] are standard errors. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Same as below.

According to the regression results, the impact of the digital economy on the supply chain security of China's wooden furniture industry passed the 1% significance level in all four regression results. Comparing the four regressions, the regression results showed a higher fit value of 0.620 when the two-way fixed-effects model was used, whereas the fit value was reduced to 0.387 in the model without two-way fixed effects. According to the regression results in Model 4, when controlling for other unchanged factors, for every 1 unit increase in the digital economy's development level, the supply chain security of the wood furniture industry increased by 2.159 units. Therefore, H1 is valid; that is, digital economy development has a significant positive impact on the supply chain security of the wooden furniture industry.

The regression results in the regression coefficients and significance analysis of the control variables also show that road freight turnover has a significant positive impact on the supply chain security of the wood furniture industry; that is, the transportation industry can effectively improve the supply chain security level of the wood furniture industry. The production of wooden furniture has a positive effect on the supply chain security level but does not pass the significance test. Financial industry development also passes significance only in the baseline regression, but the positive and negative regression coefficients differ depending on whether fixed effects are taken. However, when controlling for the time factor, the development of the financial industry has a negative impact on the supply chain security of the wooden furniture industry, whereas when the time factor is not controlled for, the impact is positive. This is likely because the wood furniture industry has a relatively long return on assets cycle, and the profit-seeking nature of capital makes it less willing to invest in such an industry with a lower long-term rate of return on assets [57]. Population density has a significant positive impact on supply chain security.

Areas with relatively high population density have a higher level of demand for wooden furniture and will also provide more adequate labor capacity resources for the industry, thus improving supply chain security. The effect of forest cover on supply chain security is positive, but this result does not pass the significance test. This may be due to the fact that raw materials for the production of wooden furniture in China rely more on imports, while policy implementation banning the logging of natural forests may further weaken the effect of forest cover on supply chain security [19]. There is a positive effect of total fixed assets in the furniture manufacturing industry on supply chain security; however, this result is only significant in the baseline regression and is no longer significant after controlling for year and province. The employment rate has a significant negative impact on the supply chain security of the wood furniture industry, which may be due to the fact that the wage level of jobs in the industry is relatively low, and thus the higher the social employment rate, the more difficult it is to seek labor resources.

6.2. Robustness Test

To further verify the positive impact of the digital economy on supply chain security in the wooden furniture industry, this study used three methods to test the robustness of the empirical results.

1. Replacing the independent variable. The rapid development of the digital economy has benefited from investment in scientific and technological R&D by governments at all levels, as well as by all sectors of society. and a relatively higher investment in R&D will result in a higher level of economic development. Therefore, R&D intensity is used as a proxy variable for the digital economy to explore its impact on supply chain security in the wood furniture industry.
2. Replacing the dependent variable. Compared to the high-tech manufacturing industry, the wood furniture industry requires many laborers; thus, the number of existing laborers engaged in the wood furniture manufacturing industry also reflects the difference in the level of supply chain security of the industry to a certain extent. However, the employed population engaged in the industry does not affect the level of digital economy development in society, thus satisfying the fourth condition and avoiding the endogeneity problem to a certain extent. Therefore, this study replaces the supply chain security index with the existing number of employees engaged in the furniture manufacturing industry as the dependent variable to verify the impact of the digital economy on supply chain security.
3. Lagging 1–2 periods of the digital economy's level of development Considering that the wood furniture industry is a traditional manufacturing industry, the actual use of digital technology may lag behind the actual digital economy development, which leads to bias in the estimation results; thus, the digital economy development level of the lagged period is used as an instrumental variable in the regression analysis of the supply security of wood furniture. The results are summarized in Table 5.

Table 5. Robustness test.

	Replacing Variables		**Lagging 1–2 Period**	
	Replacing the Independent Variable	**Replacing the Dependent Variable**	**Lagging 1 Period**	**Lagging 2 Periods**
Variables	sup	lnlab	sup	sup
dig		0.287 *** [0.097]	2.521 *** [0.336]	2.764 *** [0.328]
rede	4.000 *** [0.537]			
Control variables	Control	Control	Control	Control

Table 5. *Cont.*

	Replacing Variables		Lagging 1–2 Period	
	Replacing the Independent Variable	Replacing the Dependent Variable	Lagging 1 Period	Lagging 2 Periods
Time fixed	Yes	Yes	Yes	Yes
Province fixed	Yes	Yes	Yes	Yes
Sample size	570	567	540	510
Goodness of fit	0.44	0.495	0.426	0.416

Note: Within [] are standard errors. *** $p < 0.01$.

As can be seen, after replacing the independent and dependent variables, the positive impact of the digital economy on the supply chain security of the wooden furniture industry still passes the 1% significance level, which proves that the empirical results are robust. With a lag of 1 or 2 periods, the impact of the digital economy on the supply chain security of the wooden furniture industry remains significant, further verifying that the digital economy's positive impact on the supply chain security of China's wooden furniture industry is robust.

6.3. Impact Mechanisms Test

The benchmark regression analysis and robustness test results confirm the impact of the digital economy on supply chain security in China's wooden furniture industry. To further reveal the intrinsic mechanism of the impact of the digital economy on supply chain security, additional analyses are conducted. In the wooden furniture manufacturing industry, digital technology can effectively improve enterprises' production, supply, and marketing supervision and control. Through real-time data analysis and organization, the coordination and development of incoming and outgoing production and sales plans can clear the obstacles to sustainable operation. The inventory turnover rate is an important link between the use of digital technology and supply chain security for wooden furniture enterprises. Therefore, this study holds that the core logic lies in the following: The deep integration of the wooden furniture industry and the digital economy improves the industry's inventory management capability, which in turn provides prospective supply chain security. Details of the impact mechanism test are shown in Table 6.

Table 6. Impact mechanisms test.

Variables	Basic Regression Analysis			Two-Way Fixed Effects		
	1 Sup	2 Sto	3 Sup	4 Sup	5 Sto	6 Sup
sto			5.585 *** [0.562]			3.206 ** [1.275]
dig	2.725 *** [0.210]	0.189 *** [0.015]	2.431 *** [0.299]	2.159 *** [0.362]	0.312 *** [0.012]	1.280 ** [0.538]
Control variables	Control	Control	Control	Control	Control	Control
Time fixed	No	No	No	Yes	Yes	Yes
Individual fixed	No	No	No	Yes	Yes	Yes
Sample size	570	570	570	570	570	570
R^2	0.566	0.525	0.631	0.420	0.722	0.427

Note: Within [] are standard errors. *** $p < 0.01$, ** $p < 0.05$.

The data in the table show that the coefficients a1, b1, and c1 pass the 1% significance level test regardless of whether the year or province are controlled for; that is, the inventory management capability of the wood furniture industry plays a mediating role in the impact of the digital economy on supply chain security. After controlling for time and individual

effects, the extent to which the digital economy influences the improvement in inventory management capability in the wood furniture industry was significantly higher than that in the benchmark regression. In the benchmark regression, for every 1 unit increase in the digital economy development level, the supply chain security level increased by 2.725 units and the inventory turnover ratio increased by 0.189. Whereas, in a two-way fixed effects regression, for every 1 unit increase in the digital economy development level, the supply chain security level increased by 2.159 units and the inventory turnover ratio increased by 0.312, which means that the digital economy has a significant positive impact on the inventory management capability of the wooden furniture industry and improves supply chain security through inventory management.

To ensure the robustness of these empirical results, the Sobel and bootstrap tests were used for further validation. According to the research of mediating effects in the existing literature, the Sobel test is more persuasive than the traditional three-step test [58], which can directly calculate the proportion of the mediating effects. Depending on the statistic $z = \hat{a}\hat{b}/s_{ab}$, where $\hat{a}$ and $\hat{b}$ are the estimates of a and b, respectively, the standard error is: $se(ab) = \sqrt{\hat{a}^2 se_b^2 + \hat{b}^2 se_b^2}$. In contrast, the bootstrap test takes a sample with a larger sample size as a whole and draws from it with putbacks to obtain a more accurate standard error [55]. Therefore, the test was conducted with 500 times of sampling with replacement in 30 provinces (cities and districts). The test results are shown in Table 7.

Table 7. The Sobel test and bootstrap test.

Statistics	Sobel Test						Bootstrap Test	
	Sobel	**Coefficient a**	**Coefficient b**	**Mediating Effect**	**Direct Effect**	**Total Effect**	**Indirect Effect**	**Direct Effect**
Coefficient	0.999	0.312	3.206	0.999	1.160	2.159	0.999	1.160
Std.	0.399	0.012	1.275	0.399	0.536	0.362	0.354	0.565
Z-value	2.503	25.018	2.515	2.503	2.165	5.969	2.82	2.050
p-value	0.012	0.000	0.012	0.012	0.030	0.000	0.005	0.040

As shown in Table 8, the z-value in Sobel's test was 2.503, with a *p*-value of 0.012. In the bootstrap test, the z-value was 2.82 and the *p*-value was 0.005. Therefore, both tests rejected the original hypothesis of H0: ab = 0 at the 5% significance level. The impact of the digital economy on the supply chain security of the wooden furniture industry is mediated by the inventory turnover rate, accounting for 46.27%; in essence, almost 46% of the digital economy's influence on supply chain security is attained through the enhancement of inventory management capabilities.

Table 8. Regional heterogeneity tests.

Variables	All-Sample	Coastal Province	Non-Coastal Province	With Ports	Without Ports
	Sup	**Sup**	**Sup**	**Sup**	**Sup**
dig	2.159 ***	0.254	4.601 ***	0.140	3.231 ***
	0.362	0.539	0.995	0.473	0.419
Control variables	Control	Control	Control	Control	Control
Time fixed	Yes	Yes	Yes	Yes	Yes
Province fixed	Yes	Yes	Yes	Yes	Yes
Sample size	570	570	570	570	570
Goodness of fit	0.420	0.381	0.712	0.316	0.682
p-value	/	0.000 ***		0.026 **	

Note: *** $p < 0.01$, ** $p < 0.05$; *p*-values for coefficient differences are based on estimates from the Chow test of the interaction model. In addition, the results based on the likelihood of no correlation test and the Fisher's combination test are in general agreement.

6.4. Further Study

Raw materials supply is vital for supply chain security in the wood furniture industry. Combined with the current development of China's forestry industry, the raw material supply for many forest products still relies on overseas imports [59]. UN trade statistics show that China's dependence on timber imports has remained above 50% over the past ten years, and the availability of ports of entry for foreign trade has become an important factor in the supply chain security of the wooden furniture industry. Generally, compared with inland provinces, coastal provinces have a higher level of economic development because of their geographic location, and the degree of integration of digital technology with the real economy is increased accordingly. Shipping is a major import channel for primary raw materials, such as logs and sawn timber, thus inferring that there may be regional differences in the impact of the digital economy on the supply chain security of China's wooden furniture industry. Therefore, a more in-depth analysis from economic and geographical perspectives is necessary. Together with the development conditions of the wooden furniture industry, this study takes the sample province "Whether coastal or not" 1 as the grouping condition to do further research, and the sample province "Whether port or not" 2 was taken as a supplement. The Chow test was conducted as the robustness of heterogeneity test. The test results are shown in Table 8.

Based on the test results, the impact of the digital economy on the supply chain security of the wooden furniture industry in coastal areas was non-existent, while in non-coastal areas or samples without ports, it had a significant impact. Table 9 shows that when controlling for other factors that remain unchanged in non-coastal provinces, every 1 unit increase in the digital economy increases the supply chain security index of the wood furniture industry by 4.601. In provinces without ports, for every 1 unit increase in the digital economy's development level, the supply chain security level of the wood furniture industry increases by 3.231. Furthermore, the Chow test results show that the *p*-values of the differences in the coefficients of the grouped interaction terms all reject the original hypothesis that the residuals ε are independently and identically normally distributed with unknown variance at the 5% significance level.

Table 9. The threshold regression test.

	All-Sample	**Whether Coastal or Not**		**Whether Port or Not**	
		Yes	**No**	**With**	**Without**
Variables	sup	sup	sup	sup	sup
θ	1.825 **	5.205	1.749 ***	5.533	1.748 **
dig $\leq \theta$	4.547 ***	2.414 **	6.489 ***	2.542 ***	5.717 ***
	[1.026]	[0.702]	[1.136]	[0.559]	[1.247]
dig > θ	1.866 ***	1.789 **	2.396 ***	1.952 ***	1.960 **
	[0.398]	[0.722]	[0.526]	[0.460]	[0.709]
95% confidence interval	[1.724, 1.897]	[5.0941, 5.3211]	[1.580, 1.760]	[5.415, 5.651]	[1.566, 1.760]
Control variables	Control	Control	Control	Control	Control
Province fixed	Yes	Yes	Yes	Yes	Yes
Time fixed	Yes	Yes	Yes	Yes	Yes
R^2	0.458	0.658	0.425	0.650	0.368

Note: Within [] are standard errors. *** $p < 0.01$, ** $p < 0.05$.

However, considering that the test results fall short of intuitive expectations, one possible reason is that, at this stage, digital technology has not yet made new breakthroughs, and technological tools applied to the wooden furniture industry have a limited role in improving supply chain security [60]. This leads to the nonlinear impact of the digital economy on the supply chain security of the wooden furniture industry. When the digital economy development level exceeds a certain degree, the positive promotion effect on the supply chain security of the wooden furniture industry is weakened. Therefore, a threshold

regression model was used to further explore the reasons for this heterogeneity. The test results are shown in Table 9.

As Table 9 demonstrates, in the overall sample, the coefficient of impact on supply chain security in China's wooden furniture industry was 4.547 when the digital economy development index is on the left side of the threshold of 1.825, and 1.866 when it is on the right side of the threshold; both pass the test at the 1% level of significance. Thus, it is evident that the digital economy's impact on the wood furniture industry's supply chain security has a threshold effect. This impact does exist in the case of a marginal diminution of the development level of the digital economy exceeding the threshold value, and the impact on supply chain security weakens. Moreover, the results of the "Whether coastal or not" and "Whether port or not" subgroups show that the threshold effect exists only in the non-coastal and non-port samples, with thresholds of 1.749 and 1.748, respectively, similar to the results in the full sample. For coastal provinces and provinces with ports, although the threshold value fails the significance test, the impact of the digital economy on the supply chain security of the wooden furniture industry on both sides of the threshold value shows the same change, from high to low. Specifically, in the non-coastal sample, the coefficient of impact on supply chain security was 2.396 when the digital economy index was on the right side of the threshold and improved to 6.489 when it was on the left side, both passing the 1% significance test. For samples without ports, the impact coefficient was 1.960 when the digital economy index was on the right side of the threshold and 5.717 when it was on the left; the test results passed the 5% significance test.

Clearly, the impact of the digital economy on the supply chain security of China's wooden furniture industry varied significantly under different geographic location conditions, further validating the heterogeneity test results. Moreover, the threshold effect test results show that the impact of the digital economy on the supply chain security of the wood furniture industry has a marginally decreasing trend, and this trend also exists in regional heterogeneity.

7. Conclusions and Recommendations

This study explored the impact of the digital economy on supply chain security by constructing an evaluation index system of the digital economy and supply chain security of the wooden furniture industry and reveals its intrinsic impact mechanism by constructing a mediating effect model. Further analysis revealed regional heterogeneity in the digital economy's impact, and the intrinsic reasons for the differences in heterogeneity are explored by constructing a threshold effect model. The following conclusions were drawn from the empirical test results of this study:

First, the digital economy can improve the supply chain security of China's wooden furniture industry. Second, inventory management capability is an essential link to the digital economy's impact. Inventory management capability guarantees the smooth coordination of China's wooden furniture industry chain upstream and downstream operations. Digital economy development accelerates the integration of traditional manufacturing and digital technology through platform integration, information sharing, data analysis, and other digital methods to promote the digital transformation of the wooden furniture industry and improve the inventory turnover rate. This is not only for back-end production to provide protection but also for the front-end purchase of goods to provide space for their preparation. Third, there is heterogeneity in the digital economy's impact on supply chain security. The digital economy has a significant positive impact on the non-coastal and non-port regions, whereas it is not significant in the coastal and port provinces. Fourth, there is a threshold effect on the impact of the digital economy on supply chain security in the wood furniture industry; the positive impact is significantly higher when the digital economy development level is on the left side of the threshold than on the right side. Compared to its modern high-tech counterpart, the wooden furniture industry, as a typical representative of the traditional manufacturing industry, has a relatively short supply chain, and the degree of integration and embeddedness of digital technology is limited, which does not achieve

sustained growth in improving the supply chain security of China's wooden furniture industry. Therefore, the enhancement of supply chain security is more effective in inland regions where the digital economy has a relatively low level of development, whereas the digital economy plays a more limited role in southeastern coastal regions.

Considering the findings of this study, the following policy recommendations are suggested. From the perspective of digital economic development, the intensity and breadth of digital infrastructure development should be increased. First, to accelerate the transformation of new and old kinetic energy between the digital economy and traditional manufacturing industries, improving the level of integration and embeddedness between the two increases investment in key digitalization research. This enhances innovation and creativity, laying the foundation for upgrading the basic industries of the digital economy and enhancing the core competitiveness of the digital technology industry. Second, to further expand the influence of the digital economy on the wood furniture industry and constantly expand its integration into traditional manufacturing and embeddedness from the coast to the inland, a deep integration of digital and traditional manufacturing industries should be undertaken to reduce the status quo of China's unbalanced regional development in the wood furniture industry.

From the perspective of supply chain security in China's wooden furniture industry, extending the length of the supply chain and seeking new combinations and growth points for the supply chain and modern technology are important. First, to further improve the degree of standardization and programming, of the various links in the supply chain and provide a more adequate basis for programmatic and intelligent embedding of digital technology. By introducing advanced information technology, such as ERP systems, production processes can be effectively managed, and efficiency and accuracy can be improved. Second, to improve the utilization rate of platforms and data in the wooden furniture industry, in terms of wood furniture market identification, big data and cloud computing technology can be used to analyze market demand and consumer behavior so as to guide product design and production. For example, by analyzing historical sales data, it is possible to predict future market trends and optimize inventory management and production planning. This data can help expand the supply channels of raw materials for the production of wooden furniture and seek the optimal supplier by combining information on consumer demand and operating costs. These changes improve market competitiveness while further compressing operating costs, increasing the digital economy's impact on the wooden furniture industry's ability to perform better.

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