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Applying meta-analysis and structural equation modelling (SEM) to explore the path of corporate marketing strategies on consumer purchase intention

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ABSTRACT
In order to study the role of digital economy on the transformation of regional economic structure, firstly, the mechanism of the role of datatized economy on the change of regional economic form is elaborated, and on the basis of the analysis of theoretical model, the structure of the distribution of capital factors in each industry and the ideal factor are determined. Determine the index system and weights of regional economic structure transformation through the selection of weight indicators, and complete the measurement of the data-based economic situation under the construction of the index system of data-based economic situation. Two hypotheses are proposed that digital industrialization can have an ideal effect on the structural transformation of local development but the shape of the effect is inverted U-shape, and that industrial digitalization can have an ideal effect on the structural transformation of local development. The empirical analysis finds that the Moran's I index of structural transformation of local development from 2008 to 2020 is prominent in the 1% case, and the FP and UE within, central, eastern, western regions of China and the level of structural transformation of local economy is prominent in the 1% case. It is concluded that there is a prominent spatial isotropic relationship between the datadriven economy on regional economic structural change resilience in the whole region, and the constructed research model has a good robustness.

Keywords: digital economy, regional economic structure, mechanism of action, theoretical model, capital factor

1. Introduction

In recent years, with the rapid development of the global economy, many regions have begun to focus

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on in-depth planning of regional coordination, and regional coordinated development can not be separated from the change of local development patterns [1]. In this context, the economic development of many countries has become more and more robust, economic structure adjustment and optimization and transformation and upgrading of the effectiveness of the obvious, but there are also individual regional economic structure transformation effect is not obvious, and in the process of transformation is still facing multiple challenges. Accompanied by the global economy began to undergo major changes, the global governance system to accelerate the change, the international market black swan events occur frequently, the countries of their own economic maintenance behavior is more and more, the global economic uncertainty has increased, the individual regional economic structural transformation is faced with a more turbulent international environment [2]. Countries in order to quickly move towards the stage of high-precision technology, industrial system reform direction determination, development pattern change, conversion of the development goals of the offensive period, the regional economy of high-quality progress on its growth dynamics, direction of change in the way of high requirements [3].

In recent years, many scholars have begun to conduct a large number of studies on the relationship between the data-based economy and the transformation of the development structure. In the literature [4], it is believed that the advantages and disadvantages of the location, its own resource endowment and enterprise form change, etc. in different scales will affect the regional economic growth rate, but in different scales of the strength of industrial development, the level of urbanization and industrialization, the level of education, and other factors on the regional economy of the pulling force of the regional economy is different. The researchers of literature [5] pointed out in their study that the economic structure of urban regions is affected by physical capital, human capital, informationization level, the degree of government support, the degree of openness to the outside world, innovation capacity, transportation infrastructure and other factors, and the economic resilience of the city shows a polarized distribution. Literature [6] in the agricultural economy in the agricultural insurance, agricultural total factor productivity is considered to be the main factors affecting the transformation of regional economic structure. In literature [7] it is stated that the development of informatization refers to infrastructure, information and communication technologies and production-related activities directly related to digital technologies. Literature [8] discusses that informatization development is the data as the main content, embodying data through the network, improving the state of development through the related technology and the broader development of the development of the form of improving the sum of development activities. Literature [9] in the literature that information technology development is applied in many ways, the degree of influence is deep, and has a prominent role in a number of development aspects, including the overall strength of the local, the attention to the introduction of foreign funds, the deployment of the relevant state departments, the situation of manpower household pay situation, and so on. Literature [10] analyzes that the rise of informatization development can create an increase in innovation capacity, but also promote the structural transformation of the regional economy through foreign investment on the basis of high-tech discovery, which will have a desirable spatial spillover effect on the economy of a region that is not far away.

This paper mainly divides the data-based economy into data-based enterprise and enterprise data, and data entrepreneurship needs to be accomplished through self-development, digital divide, innovation ability, digital infrastructure and information transmission. The digitalization of industry needs to be completed through its own development, innovation ability and industry chain globalization, and finally, regional economic development, regional innovation ability, regional industrial structure optimization, and regional openness are completed in multiple fields to improve the change of local development pattern. Through theoretical model analysis, we determine the most reasonable and effective distribution structure of capital factors in various industries, and analyze the principle of data-based economy in regional economic structure transformation through

empirical model. The spatial autocorrelation test model is analyzed to calculate whether the variables are spatially correlated, and the panel threshold model of digital economy and regional economic structure transformation is constructed through the robustness test. The weights of the indicators of the evaluation system of regional economic structural transformation during the relevant years are obtained through the selection of weight indicators. The proposed research can effectively promote local economic structure change and create a theoretical basis for future regional development.

2. Mechanisms for the impact of the digital economy on the structural transformation of the regional economy

The data-based economy perfects the development of industry, and the reform of industry needs to be realized through data entrepreneurship or enterprise data. Figure 1 shows the impact mechanism of digital economy, digital industrialization form, need to be completed through its own development, digital divide, innovation capacity, digital infrastructure and information transfer [11]. The digitalization of industry needs to be completed through its own development, innovation capacity and industrial chain globalization, and ultimately in a number of fields together to complete the regional economic development, regional innovation capacity enhancement, optimization of regional industrial structure and regional openness to increase the degree of change in the form of perfect local development.

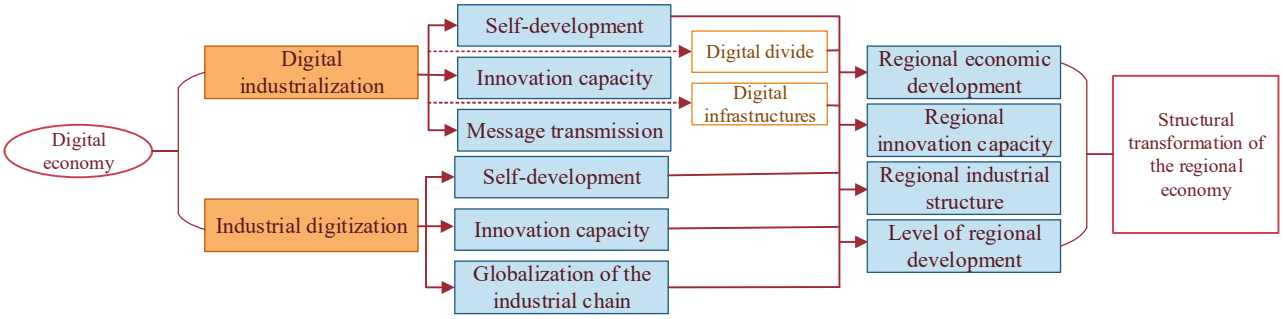

Fig. 1. Mechanisms for the impact of the digital economy

3. Theoretical analysis and empirical modeling

3.1. Theoretical models

Factor pattern is the distribution of the stock of factors of production, such as capital, invested in the economy of a country or region at a given point in time. From the point of view of the structure of industrial inputs of factors of production, the factor pattern refers to the rational distribution of each factor of production within an industry. Economic development requires inputs of means of production, and the results of inputs of means of production depend on the factor structure, which is the factor that determines the change of regional economic structure. Regional economic restructuring is the process of the joint action of a variety of materials [12]. In this paper, we analyze the rationality of factor input structure through the marginal revenue analysis of economics, assuming that the factors of production in economic production activities are only capital and labor, and its total production output function is:

$$Y = f(K, L) \tag{1}$$

where K is the capital and L is the input manpower information, which can be obtained by solving for labor capital K, respectively:

$$r = MP_K = \frac{\partial Y}{\partial K} = \frac{f^{'}(K,L)}{\partial K} \tag{2}$$

Derivation on the labor force can be obtained:

$$w = MP_L = \frac{\partial Y}{\partial L} = \frac{f^{'}(K,L)}{\partial L} \tag{3}$$

where r denotes the interest rate, i.e., the price of capital, and w denotes the wage level, i.e., the price of labor. According to the condition of maximum output under cost minimization, the manufacturer must choose the most appropriate information such that the technical interchangeability of the information is equal to the information divided by, i.e.:

$$MRTS_{LK} = \frac{MP_L}{MP_K} = \frac{w}{r} \tag{4}$$

If the two factors are technologically interchangeable $MRTS_{LK} > \frac{w}{r}$, without changing the total cost of expenditure, the demand for labor will grow and firms will replace capital with labor. On the contrary, when the technological interchangeability of the two factors is $MRTS_{LK} < \frac{w}{r}$, firms will replace labor with capital, the demand for capital will grow and the demand for labor will decrease [13]. Thus the optimal factor input structure is one in which final expenditures are consistent with the marginal output calculated regardless of the information used to obtain them.

Rationality of the input structure of factor industries According to input and output, the more factor inputs in an industry, the greater the output of that industry accordingly. However, subject to the limitations of the number of factors of production, factor inputs cannot grow indefinitely in an industry, and an increase in factor inputs in one industry will inevitably result in a decrease in factor inputs in other industries. Due to the differences in the level of technology between industries must lead to different factor productivity, so the proportion or structure of factor inputs in each industry will have a corresponding effect on the overall development [14-15].

The marginal productivity of labor and capital in sector 1 and sector 2 are respectively:

$$\begin{cases} w_1 = MP_L^1 = \frac{\partial Y_1}{\partial L_1} = \frac{f_1^{'}(K_1,L_1)}{\partial L_1}, r_1 = MP_K^1 = \frac{\partial Y_1}{\partial K_1} = \frac{f_1^{'}(K_1,L_1)}{\partial K_1} \\ w_2 = MP_L^2 = \frac{\partial Y_2}{\partial L_2} = \frac{f_2^{'}(K_2,L_2)}{\partial L_2}, r_2 = MP_K^2 = \frac{\partial Y_2}{\partial K_1} = \frac{f_2^{'}(K_2,L_2)}{\partial K_2} \end{cases} \tag{5}$$

From the above, it can be seen that when $w_1 < w_2$, driven by the pursuit of high wage income, labor will be transferred from the first industry to the second industry, and from the diminishing marginal returns, it can be seen that when the wage level of the two industries reaches equality, the labor transfer will be stopped, at which time the distribution of labor in the industries has the most rational and efficient structure [16]. The reverse is also true, when $r_1 < r_2$, driven by the pursuit of a high rate of return on capital, capital will be transferred from the first industry to the second industry. Again the transfer stops when the marginal rate of return to capital in the two industries is equal, when the allocation structure of capital factors across industries is most rational and efficient.

3.2. Empirical model construction

The model elaborates that informatization development has a corresponding effect on the transformation of regional morphological change, creating a corresponding basis for the next empirical analysis. In the empirical model analysis, this paper firstly applies the benchmark regression to analyze the effect of data-based economy on regional economic structure change. Secondly, on the basis of enterprise form, using the threshold regression and mediation regression

analysis method, analyzing the principle of datadriven economy's role in the transformation of regional economic structure [17].

To analyze the size of the role of the data-based economy on the structural transformation of local development, an econometric model is constructed here with the help of previous research:

$$REST_{i,j} = \alpha + \beta Dig_{i,j} + \gamma X + \varepsilon_{i,j} \tag{6}$$

$REST$ is the structural change in local development, Dig denotes the datamined economic situation, i and j represent regions and years, respectively, X denotes control variables such as human capital, government intervention, level of urbanization, and level of economic development, α is a constant term, β and γ are both coefficients, and ε represents a random error perturbation term.

3.3. Spatial autocorrelation test model

Here, whether the variables are spatially correlated or not is calculated through Moran's I index, which is greater than 0 indicates spatial homotropy and the index is directly proportional to the homotropy. The index less than 0 indicates spatial anisotropy and the index is inversely proportional to the anisotropy, and when it is equal to 0, there is no research value. The test formula is as follows:

$$I = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} W_{ij}\left(X_i - \bar{X}\right)\left(X_j - \bar{X}\right)}{S^2 \sum_{i=1}^{n}\sum_{j=1}^{n} W_{ij}} \tag{7}$$

where S^2 denotes the sample variance and W_{ij} denotes the elements of the spatial weight matrix (i, j) as the length between such regions, the sample variance is calculated as:

$$S^2 = \frac{\sum_{i=1}^{n}\left(X_i - \bar{X}\right)^2}{2} \tag{8}$$

Measuring spatial spillover effects, the model is constructed as follows:

$$\begin{aligned} QR_{it} = {} & C + \rho W \times QR_{it} + \beta_1 DI_{it} + \beta_2 DI_{it} + \beta_3 FP_{it} + \beta_4 Urb_{it} + \beta_5 DFT_{it} \\ & + \beta_6 UE_{it} + \beta_7 FAV_{it} + \beta_8 W \times DI_{it} + \beta_9 W \times DI_{it} + \beta_{10} W \times FP_{it} + \beta_{11} W \times \\ & Urb_{it} + \beta_{12} W \times DFT_{it} + \beta_{13} W \times UE_{it} + \beta_{14} W \times FAV_{it} + \mu_i + v_t + \varepsilon_{it} \end{aligned} \tag{9}$$

Reflect spatial economic relationships between regions by constructing a binary adjacency space matrix W_{ij}:

$$W_{ij} = \begin{cases} 1 & i, j \quad adjoin \\ 0 & i, j \quad no \quad adjoin \end{cases} \tag{10}$$

where subscript i represents province, j represents year, QR is an explanatory variable denoting i regional economic resilience at j time, and DI, ID, FP, Urb, DFT, UE, and FAV are explanatory variables denoting digital industrialization, industrial digitization, total factor productivity, urbanization rate, foreign trade dependence, urban unit of employment, and value added of the financial sector, respectively. Where, C is a constant term, ρ is a measure of the relevance of local development, β is a coefficient to be estimated, W is a spatial matrix, and μ_i and v_t are fixed, respectively.

3.4. Robustness test model construction

This paper establishes a panel threshold data model as a way to conduct a specific empirical investigation of the interaction between digital economy and regional economic structure transformation in different regions of China. According to the theoretical analysis, it is found that there is variability in the degree of influence of the digital economy on regional economic structural transformation based on the industrial structure level perspective. Based on the benchmark regression model, this paper constructs a panel threshold model of digital economy and regional economic structure transformation with reference to the research method of Yi Xingjian et al:

$$\begin{aligned} REST_{i,j} &= \alpha + \beta_1 Dig_{it} \times I\left(M \leqslant \theta_1\right) + \beta_2 Dig_{it} \times I\left(\theta_1 < M \leqslant \theta_2\right) + L \\ &+ \beta_n Dig_{it} \times I\left(\theta_{n-1} < M \leqslant \theta_n\right) + \beta_{n+1} Dig_{it} \times I\left(M > \theta_n\right) + \gamma X_{it} + \varepsilon_{it} \end{aligned} \tag{11}$$

where $I(\square)$ is the schematic function, M denotes the threshold variable, θ is the threshold to be estimated, γ denotes the coefficients on the control variables, β_1、β_2、β_n、β_{n+1} denotes the coefficients on the effects of the explanatory variables. Effects and random effects, and ε_{it} is the random error term.

3.5. Selection of weighting indicators

In order to effectively make up for the defects of artificially determined values of hierarchical analysis method and ensure the credibility of indicator weights, entropy value method is used here to construct the regional economic resilience evaluation system and datatized economic evaluation system. Selecting m province and n indicators, the j th indicator of the i rd region is $X(i=1,2,\ldots,m; j=1,2,\ldots,n)$, as follows:

1) Eliminate the influence of the indicators on the evaluation results in terms of magnitude and positive and negative aspects through information standardization [18]. In this case, the processing formula for the ideal indicator is:

$$y_{ij} = \frac{x_{ij} - min\left(x_{1j}, x_{2j}, ..., x_{mj}\right)}{max\left(x_{1j}, x_{2j}, ..., x_{mj}\right) - min\left(x_{1j}, x_{2j}, ..., x_{mj}\right)} \tag{12}$$

Negative indicators are treated with the formula:

$$y_{ij} = \frac{max\left(x_{1j}, x_{2j}, ..., x_{mj}\right) - x_{ij}}{max\left(x_{1j}, x_{2j}, ..., x_{mj}\right) - min\left(x_{1j}, x_{2j}, ..., x_{mj}\right)} \tag{13}$$

2) Calculate the division of the indicator for the j nd year of the i st region as:

$$X_{ij} = \frac{y_{ij}}{\sum_{i=1}^{m} y_{ij}} \tag{14}$$

3) Obtain the information entropy of the j st indicator:

$$z_j = -\frac{1}{lnm} \sum_{i=1}^{m} X_{ij} \times lnX_{ij}, 0 \leq z_j \leq 1 \tag{15}$$

4) Calculate the information redundancy of the j st indicator:

$$e_j = 1 - z_j \tag{16}$$

5) Calculation of indicator weights:

$$w_j = \frac{e_j}{\sum_{j=1}^{n} e_j} \tag{17}$$

6) Calculate the combined score:

$$s_j = \sum_{j=1}^{n} w_j \times y_{ij} \tag{18}$$

Finally, the weights of the indicators of the evaluation system of the structural transformation of the regional economy for the period 2008-2020 are obtained, as well as the structural transformation of the economy of 30 regions over the years.

4. Variables and data sources

4.1. Level of structural transformation of the regional economy

Regarding the construction of the indicator system for structural transformation of local development, this paper, based on the former relevant model mentioned above, the indicator system for structural transformation of the regional economy and the weights are shown in Table 1. Among them, a regional economic structural transformation indicator system with 5 secondary indicators and 17 tertiary indicators is constructed.

Table 1. Indicator system and weights for structural transformation of the regional economy

Level 1 indicators	Secondary indicators	Weights	Tertiary Indicators	Weighting of indicators at three levels
Structural transformation of the regional economy	Economic Development	0.1249	GDP (billion yuan)	0.4175
			GDP per capita (yuan/person)	0.0331
			Economic growth rate (%)	0.2613
	Openness	0.4166	Foreign direct investment per capita ($/person)	0.3713
			Per capita foreign investment stock ($/person)	0.3779
			Total import and export trade per capita (USD/person)	0.2508
	Innovative capacity	0.1908	Full-time equivalent of personnel of industrial enterprises above scale per 100 persons (persons/million persons)	0.257
			Per capita funding of industrial enterprises above designated size (yuan/person)	0.2697
			Number of students enrolled in general colleges and universities per million people (persons/million people)	0.0748
			Per capita financial research expenditure (yuan/person)	0.3986
	Institutional Security	0.149	General budget revenue of local finance (billion yuan)	0.3643
			General budget expenditure of local finances (billion yuan)	0.2359
			Number of participants in unemployment insurance (ten thousand)	0.3998
	Industrial Structure	0.1186	Share of primary industry output value in total value (%)	0.2825
			Share of industrial added value in total value (%)	0.1080
			Share of output value of high-tech industry in total output value (%)	0.6095

Regarding the measurement of the transformation of local economic forms, the constructed index system of structural transformation of local development was comprehensively weighted under the entropy value method to measure the level of regional economic structural transformation of 30 provinces in China [19].

4.2. Digital economy

In the construction of the index system of the level of datatized economy, this paper refers to the selection of weight indicators and selects five three-level indicators to construct the factors of digital economic development, and Table 2 shows the evaluation index system of digital economic development. The entropy value method is used to calculate the level of data-based economy in 30 provinces in China.

Table 2. Digital economy development evaluation index system

Level 1 indicators	Secondary indicators	Tertiary indicators	Indicator Properties
Informationization development	Probability of network use	Number of network users	Ideal
	Number of network staff	Divided by network services and IT employees	Ideal
	Network output	Business generated per person	Ideal
	Number of network users	Number of cell phone users	Ideal
	Probability of data financial use	Data Inclusion Index	Ideal

For the calculation of informatization development development, here obtaining informatization

development under the entropy method for comprehensive weighting to calculate the data-based economy of 30 provinces in China.

4.3. Calculation of other variables

Regarding the mediator and threshold variables, the variables are all business form change UIS, and here we refer to the robustness test/ the data obtained by dividing the value added of the third business with the value added of the second business to confirm the business form situation [20].

In order to make this variable more precise, four variables of human capital, government intervention, urbanization level, and economic development are selected for further measurement with reference to the theoretical model. The variable descriptions and expectations are shown in Table 3, which is divided into nine variable categories, including explained variables, explanatory variables, and mediating and threshold variables.

Table 3. Description of variables and expectations

Variable Name	Category of variables	Variable Description
Explained Variable	Regional Economic Structural Transformation (REST)	Composite Index Value
Explanatory Variable	Digital Industrialization (DI)	Composite index value
	Industrial Digitization (ID)	Composite index value
Control Variables	Total Factor Productivity (FP)	Quantity of all factors per unit of product
	Urbanization (Urb)	Urban population/total population
	Trade Dependence (DFT)	Total foreign trade of cities and towns
	Urban Unit Employment (UE)	Number of laborers in enterprises
	Financial Added Value (FAV)	Value added through production activities in a certain period of time
Mediating and Threshold Variables	Industrial Structure Upgrading (UIS)	Value added of tertiary industry / value added of secondary industry

4.4. Theoretical assumptions

Digital industrialization changes the regional economic form mainly through three paths, the first is the data-based economic changes can optimize the local development enterprise form. The second is that informationization development can enhance the regional innovation ability and change the local economic form, and the third is that data-based economy can avoid information asymmetry and transaction costs. The speed of information dissemination can change the enterprise resistance to pressure, the enterprise material input reduction can accelerate the development of the situation, both can improve the local development pattern change. In addition, the data-based economy may have a non-promotional effect on the transformation of regional economic structure, the development of information technology development may be too large a data discrepancy phenomenon, which will lead to the prominent gap between the rich and the poor, the strengthening of the monopoly of the market, the weakening of the innovation capacity of the economy and the intensification of the social division and other problems, which will have a non-promotional effect on the change of the local economic pattern. Moreover, the data-based economy relies on the support of digital infrastructure, and when the data industrialization is overdeveloped, the problem of digital infrastructure lagging behind may occur, inhibiting the desired effect of information technology development on the change of regional development patterns. Through the analysis of the mechanism of action, the following hypotheses exist:

Hypothesis H1: Digital industrialization can have a desirable effect on the transformation of regional economic structure, but the shape of the effect is inverted U-shaped.

Industrial digitization can also improve the local development pattern change through three paths, one is that the development of industrial digitization itself can accelerate the initial enterprise data change, enhance the capacity and development power of traditional industries, accelerate the comprehensive strength of the region, and then enhance the transformation of the regional economic pattern. Secondly, industrial digitization can enhance regional innovation capacity and accelerate product and technology innovation. Third, industrial digitization can promote the process of regional industrial chain globalization and promote regional economic opening. Since enterprise data is the transformation of existing industries and industrial chains, and the current level of industrial data is still limited, only industrial digitization needs to be realized in a single industry or even a single enterprise rather than the entire industrial chain, and the lagging level of data infrastructure plays a lower role in industrial digitization. The digital divide problem is less likely to appear in the industrial side, so it is believed that industrial digitization cannot form an inverted U-shaped role pattern. By analyzing the above action mechanisms, two hypotheses are therefore proposed.

Hypothesis H2: Industrial digitization can have a positive impact on regional economic structure transformation.

5. Analysis of impact results

5.1. Spatial autocorrelation test

The index values of the resilience of structural transformation of development in 30 regions of China from 2008 to 2020 are calculated by STATA15, and Table 4 shows the Moran's I index of structural transformation of regional economy from 2008 to 2020. It can be seen that the Moran's I values of regional economic structural transformation toughness are all positive and pass the spatial autocorrelation test at the 1% significance level. This indicates that the prominent spatial positive correlation of the datatized economy on the regional economic structural change resilience in the whole territory means that the spatial effect should be taken into account when constructing the model of the regional economic structural transformation resilience in order to be consistent with the objective facts.

Table 4. Moran's I index of structural transformation of the regional economy, 2008-2020

Particular year	QR	Particular year	QR	Particular year	QR
2008	0.271***	2013	0.284***	2018	0.284***
2009	0.281***	2014	0.288***	2019	0.305***
2010	0.290***	2015	0.296***	2020	0.317***
2011	0.295***	2016	0.290***	-	-
2012	0.294***	2017	0.294***	-	-

Note: ***, **, and * are at 1%, 5%, and 10%, with data differences highlighted.

Then, based on the decomposition of spillover effects by SDM model, the explanatory variables redundant regional economic structure transformation effect is shown in Table 5.

Which can be seen from the results of equation (7) and equation (8), data industrialization has a linear or inverted U-shaped positive promotion effect on the regional economic resilience of the region. From the values of coefficient significance, R2 and Log-likelihood, the results of Eq. (7) show that DI is positive and significant, and the results of Eq. (8) show that DI is positive and DI2 is negative, then the indirect effect only exists in an inverted U-shaped mechanism of action. That is, the spillover effect of digital industrialization exists a threshold, in the data industrialization situation is not higher than the specified value range, the higher the level of digital industrialization in the region the stronger the promotion of economic resilience in the surrounding areas. However, when the level

of digital industrialization in the region is too high and breaks through the threshold, the spillover effect of digital industrialization is gradually weakened. From the results of Eq. (7) and Eq. (9), the ID values are both positive and significant, while the ID in Eq. (9) is not prominent, so there is only a linear and desirable effect of industrial datatization on the regional economic resilience of the region. While the results of non-direct effect and total effect show that ID values are positive and significant, and ID in equation (10) is also significant, so then there are two possible mechanisms of linear and inverted U-shaped effects. And from the results of Eq. (7), Eq. (8) and Eq. (9), it can be found that the coefficients of industrial digitization are generally higher than those of digital industrialization, and the action pattern of industrial digitization under the direct effect is linear, while digital industrialization is inverted U-shape, so it can be assumed that industrial digitization has a stronger effect of enhancing the resilience of the regional economy than digital industrialization. From the results of equation (10), it can be seen that data enterprises and enterprise digitization not only affect regional economic resilience individually, but also are able to affect regional economic resilience by affecting each other, and then affecting regional economic resilience. This is more significant in the indirect and total effects, but not in the direct effect. And the role of both data enterprise and enterprise digitization is mutual inhibition, and the empirical results verify that research hypotheses H1 and H2 hold.

Table 5. Explanatory variables redundant regional economic structure transformation effects

Explanatory variable	Basic equation (math.)	The Role of Digital Industrialization Path	Pathways to the role of industrial digitization	A common path of action for both
	Formula (7)	Formula (8)	Formula (9)	Formula (10)
DI	0.0490(0.43)	0.6877***(4.45)	0.0629(0.58)	0.3734***(3.32)
DI^2	-	-1.2007***(-5.06)	-	-
ID	1.0292***(5.89)	1.4048***(7.97)	1.9485***(6.40)	1.9744***(7.94)
ID^2	-	-	-1.6575***(-3.66)	-
DI×ID	-	-	-	-1.8628***(-5.20)
R^2-within	0.8797	0.8879	0.8879	0.8894
Log-likelihood	936.2584	948.8006	949.3299	951.6261

5.2. Robustness Tests

In order to ensure the reliability of the conclusions of the study, this paper for the above results of the data for the robust can be seen, the parameter coefficients and symbols did not stand out to change, indicating that this paper puts forward the digital economy and regional economic structure transformation model is more robust, the conclusions of the study is desirable. To further improve the economic strength of China's regions and comprehensively explore the potential of information technology development, this paper analyzes from four perspectives: China, central, eastern and western. Firstly, in the scope of China region, the five control variables and regional economic structural transformation are all prominent at 1%, as shown in Table 6.In the scope of Central China region, among the five control variables, only UE and regional economic structural transformation are all prominent at 1%. Whereas FP, Urb, and FAV are prominent at 5% with the structural transformation of the regional economy, within the Eastern region, Urb and FAV are prominent at 5% with the structural transformation of the regional economy, and the rest of the three control variables structural transformation of the regional economy are all prominent at 1%. In the western region, only FP and UE are associated with regional economic structural transformation are prominent on the 1% case, and the rest of the three control variables regional economic structural transformation are prominent on the 5% case, so the robustness of regional economic structural transformation in this paper is ideal.

Table 6. Robustness test for structural transformation of the regional economy

Control	National Region	Central Region	Eastern Region	Western Region
FP	0.2451***(0.0211)	0.346**(0.1053)	0.1860***(0.0238)	0.3476***(0.8580)
Urb	0.2216***(0.0263)	0.2243**(0.0812)	0.1462**(0.0313)	0.3865**(0.1019)
DFT	0.2540***(0.0182)	0.1542(0.0423)	0.3178***(0.0212)	0.1385**(0.0479)
UE	1.4456***(0.1225)	3.9613***(0.5521)	4.0802***(0.1621)	2.8186***(0.3816)
FAV	0.2327***(0.0374)	0.2354**(0.0923)	0.1573**(0.0424)	0.3976**(0.1120)
R^2	0.9793	0.8721	0.9790	0.9606**

Note: Robust clustered standard errors in parentheses, *** denotes prominence at 1%, ** denotes prominence at 5%, and * denotes prominence at 10%.

6. Conclusion

This paper constructs a system of indicators of informatization development factors and regional economic structural transformation, measures its development trend, and applies a test method to find out the extent of informatization development on local economic structural transformation. It also explores the mechanism of informatization development on the resilience of regional economic structural transformation by using the annual data from 2008 to 2020 of many regions in China, focusing on the fact that the development of informatization can be regarded as the synthesis of information industrialization and industrial informatization, so as to analyze the role of the development of informatization in the transformation of the regional development structure in a more detailed way. In the two aspects of spatial autocorrelation test and robustness test, the hypotheses of this paper are verified, and the hypotheses H1 and H2 of this paper are established if the Moran's I index of regional economic structure transformation is prominent in the 1% case from 2008 to 2020. China's five control variables and regional economic structural transformation are all prominent in the 1% case, and the central UE and regional economic structural transformation are all prominent in the 1% case. Eastern FP, DFT, and UE are all prominent at the 1% level with the structural transformation of the regional economy, and Western FP and UE are all prominent at the 1% level with the structural transformation of the regional economy. The research content of this paper can promote the growth of strength, and improve the transformation of enterprise form, and lay a solid foundation for improving regional creative capacity and narrowing the regional development gap.

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