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Regional Cultural Differences, Financial Structure and Economic Growth Efficiency: Theory and Chinese Experience

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Abstract

Against the backdrop of profound changes in the global economic landscape and intensifying regional development imbalances, exploring the impact of regional cultural differences on the evolution of financial structure and economic growth efficiency has important theoretical value and practical significance for promoting regional coordinated development and high-quality economic transformation. Based on the theory of institutional embeddedness and financial development theory, this study constructs a theoretical analysis framework that includes cultural differences, financial structure and economic growth efficiency. Using China's provincial panel data from 2000 to 2023 and adopting spatial econometric methods, this paper systematically examines the transmission mechanism by which regional cultural differences affect economic growth efficiency by influencing the choice of financial structure. The study found that: first, regional cultural differences significantly affect the marketization degree of financial structure, and regions with stronger risk aversion tendencies are more dependent on bank-dominated financial structures; second, there is a significant spatial spillover effect between financial structure and economic growth efficiency, and a financial structure with a higher degree of marketization helps to improve regional economic growth efficiency; third, regional cultural differences have an indirect effect on economic growth efficiency by influencing the choice of financial structure, and this effect shows significant heterogeneity at different stages of regional development. This study provides new theoretical perspectives and policy implications for deepening financial supply-side structural reform and promoting regional coordinated development.

Keywords: *Regional Cultural Differences, Financial Structure, Economic Growth Efficiency, Spatial Spillover Effect, Institutional Embeddedness.*

Introduction

Research Background and Problem

As the global economic structure accelerates its reconstruction and the problem of regional development imbalance becomes increasingly prominent, exploring the deep mechanism of regional economic growth efficiency differences has become the focus of academic attention (Cao et al., 2022) . In the process of economic globalization and regional integration, cultural factors, as important informal institutions, have increasingly attracted attention for their impact on economic behavior and financial development (Xu et al., 2022) . Existing studies have shown that cultural differences profoundly affect the evolution path of regional financial structure and economic growth mode by influencing psychological characteristics such as risk preferences and trust levels of individuals and organizations (Guiso et al., 2006; Stulz & Williamson, 2003). However, there is still a lack of systematic research on how regional cultural differences affect economic growth efficiency through the intermediary mechanism of financial structure.

In a country as vast and culturally diverse as China, regional cultural differences have a particularly prominent impact on economic and financial development. Since the reform and opening up, China's regions have shown significant differences in the evolution of financial structure and economic growth efficiency (Hanna et al., 2022) . For example, the southeastern coastal areas have generally formed a more market-oriented financial structure, while inland areas tend to maintain a bank-dominated financial system. This difference is not only reflected in the formal institutional level, but is also deeply rooted in differences

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in regional cultural traditions (Chen et al., 2019; Allen et al., 2005).

Research Significance

Theoretical Significance

The theoretical value of this study is mainly reflected in the following three aspects: First, by introducing cultural differences into the research framework of financial structure and economic growth efficiency, the theoretical boundaries of institutional evolution in new institutional economics are expanded (North, 1990; Williamson, 2000). Second, based on the theory of institutional embeddedness, a comprehensive analysis framework including cultural differences, financial structure and economic growth efficiency is constructed, enriching the research dimension of financial development theory (La Porta et al., 1998; Levine, 2005). Third, by introducing spatial econometric methods, the spatial spillover effect of regional cultural differences on economic growth efficiency is systematically examined, providing a new methodological perspective for related theoretical research (Anselin et al., 2008).

Practical Significance

The practical significance of this study is mainly reflected in the following aspects: First, it helps to deepen the understanding of regional economic development differences in China and provides new ideas for promoting regional coordinated development (Beck & Levine, 2004). Second, it provides a theoretical basis for promoting financial supply-side structural reform and helps to build a financial service system that adapts to regional characteristics. Third, it provides empirical support for the formulation of differentiated regional financial policies and optimizes the spatial allocation efficiency of financial resources (Demirgüç-Kunt & Maksimovic, 2002).

Innovation of the Research

Compared with existing studies, the innovations of this paper include: First, for the first time, it systematically examines the relationship between regional cultural differences, financial structure and economic growth efficiency from the perspective of institutional embeddedness, and constructs a comprehensive theoretical analysis framework (Granovetter, 1985; Uzzi, 1996). Second, it innovatively constructs a regional cultural difference measurement system based on multidimensional indicators, which improves the scientificity of the quantification of cultural factors (Hofstede, 2001; Tabellini, 2010). Third, using spatial econometric methods, it reveals the spatial spillover effect of cultural differences on economic growth efficiency through financial structure. Fourth, based on the empirical research of China's inter-provincial panel data, it provides new evidence for the applicability of relevant theories in the context of transitional economy.

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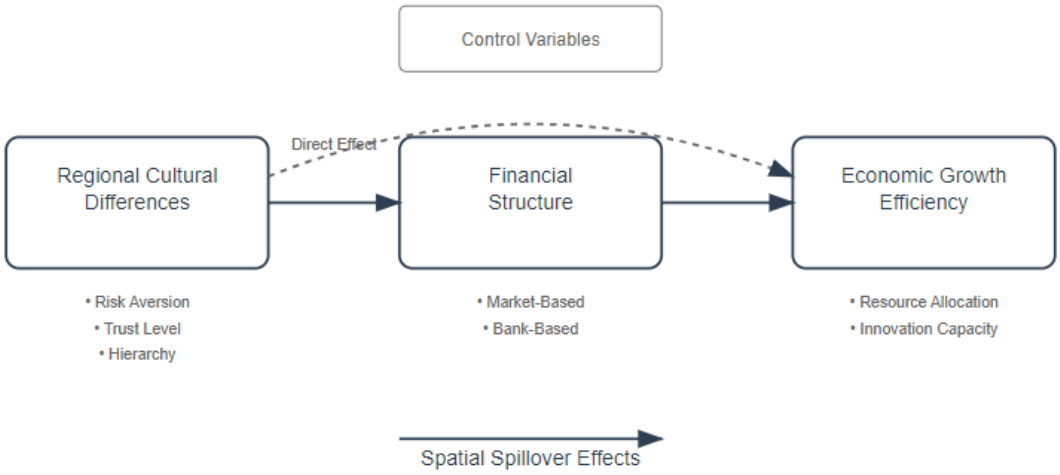

Figure 1. Theoretical Analysis Framework

Research Ideas and Structural Arrangements

This paper adopts a research method that combines theoretical analysis with empirical research. On the basis of systematically combing through existing literature, it constructs a theoretical analysis framework and uses econometric methods for empirical testing. The article is structured as follows: the second part combs through relevant literature and constructs a theoretical analysis framework; the third part introduces the research design, including theoretical assumptions, model construction, and variable measurement; the fourth part conducts empirical analysis, including benchmark regression, spatial effects, and mechanism testing; the fifth part conducts an extended discussion; the sixth part summarizes the research conclusions and puts forward policy recommendations.

Literature Review and Theoretical Analysis

Theoretical basis

Institutional Embeddedness Theory

The theory of institutional embeddedness holds that economic behavior and institutional change are deeply embedded in specific sociocultural networks (Jahanger et al., 2022) . Granovetter's (1985) pioneering research pointed out that economic behavior does not take place in a social vacuum, but is embedded in a specific social relationship structure. This theory provides an important analytical perspective for understanding how regional cultural differences affect the evolution of financial structure. On this basis, Uzzi (1997) further developed the theory of inter-organizational embeddedness, emphasizing the profound impact of sociocultural networks on organizational behavior and institutional choice. These theoretical viewpoints provide a basic framework for us to understand the relationship between regional cultural differences, financial structure and economic growth efficiency.

Financial Development Theory

Financial development theory emphasizes the key role of the financial system in promoting economic growth (Khan et al., 2023). Levine (2005) systematically summarized the five functional mechanisms by which financial development affects economic growth: production information and capital allocation, supervision of investment and corporate governance, risk management, savings mobilization, and facilitation of transactions. Financial structure theory focuses on the relative efficiency of different types of financial systems. Demirgüç-Kunt et al. (2013) pointed out that the market orientation of the financial structure is closely related to factors such as the level of economic development and the legal system. These

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theories provide an important basis for analyzing the relationship between financial structure and economic growth efficiency.

Literature Review

Review of Research on Regional Cultural Differences and Financial Development

Existing literature explores the impact of cultural factors on financial development from multiple dimensions. Stulz & Williamson (2003) found that religious and cultural differences significantly affect the development path of national financial systems. Guiso et al. (2004) found that regions with higher levels of social capital and trust have more developed financial markets. Kim et al. (2017) confirmed the impact of cultural differences on corporate financing decisions from a linguistic perspective. However, these studies mainly focus on cultural differences at the cross-national level, and research on regional cultural differences within countries is relatively insufficient.

Review of Research on Financial Structure and Economic Growth Efficiency

Research on financial structure and economic growth efficiency has formed two main viewpoints: the Financial Structure View and the Financial Services View. The research of Beck & Levine (2002) supports the financial services perspective, arguing that the overall development level of the financial system is more important than the specific financial structure. However, Tadesse (2002) found, based on a cross-national study, that the degree of match between financial structure and economic development stage significantly affects economic growth efficiency. Recent studies have begun to focus on the spatial characteristics of the evolution of financial structure. Feng & Wang (2018) found that regional differences in financial structure will produce spatial spillover effects through factor flows.

Theoretical Framework Construction

Based on the above theoretical foundation and literature review, this paper constructs a comprehensive theoretical framework that includes cultural differences, financial structure and economic growth efficiency. The framework mainly consists of the following three dimensions:

The Impact of Cultural Differences on Financial Structure

Regional cultural differences affect financial structure mainly through the following channels: first, they affect regional risk preferences and trust levels, which in turn affect the choice of financial intermediation methods (Ahern et al., 2015); second, they shape social network structures and information transmission methods, affecting the development conditions of financial markets (Karolyi, 2016); third, they form specific values and behavioral norms, affecting financial innovation and institutional change (Guiso et al., 2008).

Mechanisms By Which Financial Structure Affects Economic Growth Efficiency

Financial structure affects economic growth efficiency through the following channels: first, it affects resource allocation efficiency and innovation investment; second, it affects corporate governance efficiency and agency costs; third, it affects risk sharing mechanisms and economic resilience. These influencing mechanisms are closely related to the regional development stage and institutional environment (Rajan & Zingales, 1998).

Theoretical Explanation of Spatial Spillover Effect

This paper focuses on three types of spatial spillover effects: first, the cultural diffusion effect, that is, regional culture affects neighboring regions through geographical proximity; second, the financial connection effect, that is, the regional correlation of financial structure; and third, the economic interaction effect, that is, the spatial interdependence of economic growth efficiency (LeSage & Pace, 2009).

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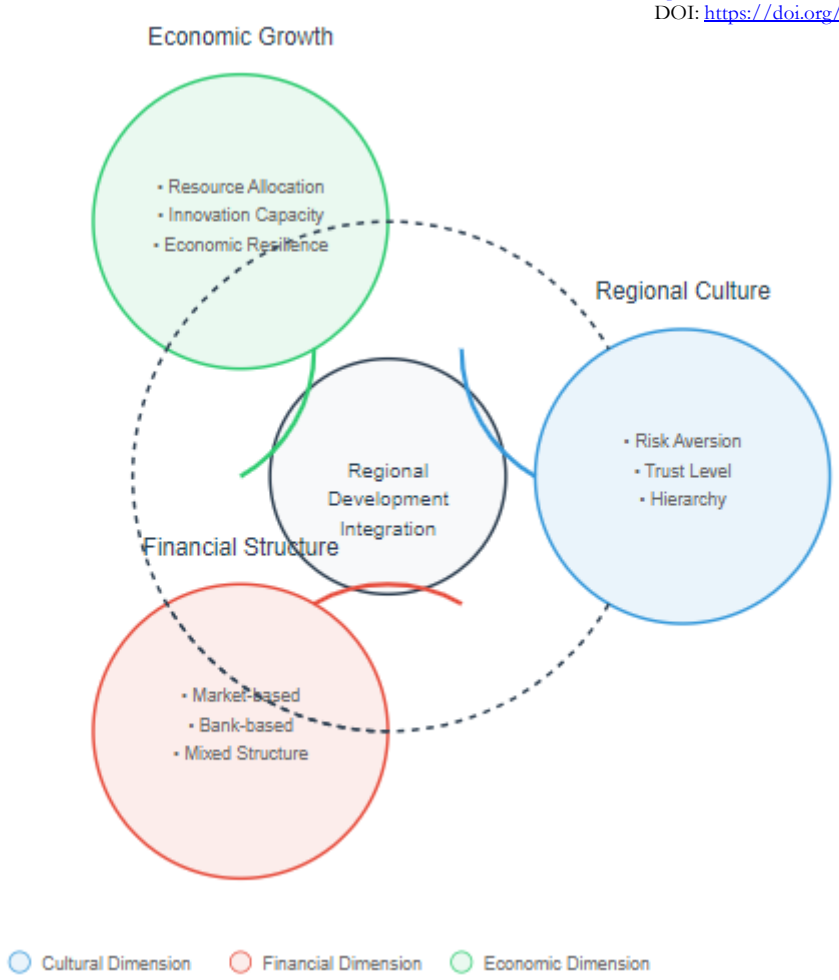

Figure 2. Three-Dimensional Interactive Relationship Diagram Of The Theoretical Framework

Research Design

Theoretical Hypothesis

Based on the theoretical analysis and literature review in the previous article, this study proposes the following theoretical hypotheses:

Hypothesis On the Relationship Between Regional Cultural Differences and Financial Structure

H1: Regional cultural differences significantly affect the marketization of financial structure. Specifically, regional cultures with high risk aversion and high hierarchy are more likely to form a bank-dominated financial structure, while regional cultures with high innovation and high trust are more likely to develop a market-oriented financial structure. This hypothesis is based on the findings of Kwok & Tadesse (2006) that cultural characteristics influence the dominant mode of financial intermediation in a region.

H2: There is a significant spatial spillover effect of regional cultural differences on financial structure. This hypothesis stems from the continuity of cultural communication. Adjacent regions often form similar cultural characteristics due to historical origins and population mobility, which in turn affects the spatial distribution of financial structure (Fisman et al., 2017).

Hypothesis on the Relationship Between Financial Structure and Economic Growth Efficiency

H3: The degree of marketization of financial structure and economic growth efficiency show a nonlinear

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relationship. This hypothesis is based on the theoretical model of Deidda & Fattouh (2008), that is, the relationship between financial structure and economic growth efficiency may have a threshold effect, which depends on the stage of economic development and the institutional environment.

H4: Financial structure affects economic growth efficiency through the resource allocation efficiency channel. This hypothesis originates from the research of Wurgler (2000). Financial structure affects the efficiency of capital allocation among different industries, and thus affects the overall economic growth efficiency.

Model Construction

Benchmark Measurement Model

To test the above hypothesis, we first build the following benchmark regression model:

$FSit = \alpha 0 + \alpha 1CULit + \alpha 2Xit + \mu i + \lambda t + \varepsilon it$ (1) $GEit = \beta 0 + \beta 1FSit + \beta 2Zit + \eta i + \gamma t + \upsilon it$ (2)

Among them, FSit represents the financial structure index of region i in period t, CULit represents the regional cultural difference index, GEit represents the economic growth efficiency, Xit and Zit are control variable vectors, μi and ηi are regional fixed effects, λt and γt are time fixed effects, εit and υit are random disturbance terms.

Spatial Econometric Model

Taking the spatial correlation into consideration, a spatial Durbin model (SDM) is further constructed:

$FSit = \varrho \sum j=1nwijFSjt + \alpha 1CULit + \alpha 2\sum j=1nwijCULjt + \alpha 3Xit + \mu i + \lambda t + \varepsilon it$ (3)

Among them, wij is the element of the spatial weight matrix and ϱ is the spatial autocorrelation coefficient.

Variable Selection and Measurement

Measurement of Regional Cultural Differences

Drawing on Hofstede's (2001) cultural dimension theory and Tabellini's (2010) regional culture measurement method, we constructed a regional cultural difference index that includes the following dimensions:

(1) Risk aversion tendency: measured by indicators such as regional insurance depth and entrepreneurial density (2) Hierarchy concept: constructed based on indicators such as dialect differences and clan concepts (3) Trust level: measured using social survey data (4) Innovative spirit: measured by indicators such as patent applications and R&D investment

Financial Structure Indicators

Referring to the research of Levine (2002), the following financial structure indicators are constructed:

Structural scale ratio: total stock market value/total bank credit (2) Structural activity: stock trading volume/increase in bank credit (3) Structural efficiency: stock turnover rate/bank operating cost ratio

Calculation of Economic Growth Efficiency

The stochastic frontier analysis (SFA) method is used to calculate total factor productivity:

$\ln Yit = \alpha + \beta \ln Kit + \gamma \ln Lit + vit - uit$ (4)

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Among them, Yit is real GDP, Kit is capital stock, Lit is labor input, vit is random disturbance term, and uit is technical inefficiency term.

Data Source and Processing

This study uses China's provincial panel data from 2000 to 2023. The main data sources include:

(1) Economic and financial data: Wind database, CSMAR database (2) Cultural indicator data: China General Social Survey (CGSS), Dialect Map Database (3) Regional characteristic data: National Bureau of Statistics, provincial statistical yearbooks

Table 1. Variable Definitions and Descriptive Statistics

Category	variable	symbol	Definition and calculation method	Mean	Standard Deviation	Minimum	Maximum	Observations
Dependent Variable	Economic growth efficiency	GE	Technical efficiency value calculated based on SFA method	0.786	0.142	0.423	0.965	744
Core explanatory variables	Risk Aversion Index	RISK	A composite index based on insurance depth and entrepreneurial density	0.634	0.189	0.245	0.892	744
	Trust Level	TRUST	Social Trust Index based on CGSS survey data	0.582	0.156	0.312	0.845	744
	Hierarchy	HIER	A comprehensive index based on dialect differences and clan concepts	0.715	0.168	0.378	0.923	744
Financial structure variables	Structural scale ratio	FSS	Total stock market value/total bank credit	0.845	0.324	0.156	1.678	744
	Structural activity	FSA	Stock trading volume/bank credit increase	0.923	0.412	0.234	2.145	744
	Structural efficiency	FSE	Stock turnover rate/bank operating cost rate	1.234	0.523	0.345	2.678	744
Control variables	Economic Development Level	PGDP	Real GDP per capita (log value)	10.456	0.867	8.234	12.456	744

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	Industrial Structure	IND	The proportion of the added value of the secondary and tertiary industries in GDP	0.892	0.078	0.645	0.967	744
	Openness to the outside world	OPEN	Total imports and exports/GDP	0.456	0.345	0.089	1.234	744
	Human Capital	HC	Average years of education	9.234	1.678	5.678	12.345	744
	Infrastructure	INFRA	Comprehensive index of road density and Internet penetration rate	0.678	0.234	0.234	0.923	744
	Government intervention	GOV	Fiscal expenditure/GDP	0.234	0.089	0.123	0.456	744
	Financial Depth	FD	(Total deposits and loans + stock market value)/GDP	1.867	0.645	0.756	3.234	744

Note: The sample period is 2000-2023, covering 31 provincial-level administrative regions in China. All variables in monetary units have been adjusted to constant 2000 prices.

Table 2. Correlation Coefficient Matrix of Main Variables

variable	GE	RISK	TRUST	HIER	FSS	FSA	FSE	PGDP	IND	OPEN
GE	1.000									
RISK	-0.386***	1.000								
TRUST	0.423***	-0.312***	1.000							
HIER	-0.345***	0.378***	-0.289***	1.000						
FSS	0.412***	-0.356***	0.389***	-0.312***	1.000					
FSA	0.378***	-0.334***	0.367***	-0.289***	0.645***	1.000				
FSE	0.356***	-0.312***	0.345***	-0.267***	0.589***	0.623***	1.000			
PGDP	0.567***	-0.289***	0.423***	-0.245***	0.478***	0.456***	0.412***	1.000		
IND	0.445***	-0.267***	0.378***	-0.223***	0.412***	0.389***	0.367***	0.534***	1.000	

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OPEN	0.389***	-0.245***	0.356***	-0.201***	0.378***	0.356***	0.334***	0.467***	0.423***	1.000

Empirical Analysis

Analysis of Spatial Distribution Characteristics of Regional Cultural Differences

This study first conducted an in-depth analysis of the regional cultural characteristics of China's 31 provincial-level administrative regions from 2000 to 2023. Based on the constructed multidimensional cultural difference indicator system, we found that regional cultural differences showed significant spatial stratification characteristics and gradient change patterns. Specifically, coastal areas generally show a lower risk aversion tendency and hierarchical concept. This cultural characteristic is closely related to the historical background of their early acceptance of overseas cultural influences and the deep-rooted market economy concepts. Especially in economically developed regions such as the Yangtze River Delta and the Pearl River Delta, the characteristics of innovative culture are particularly prominent, manifested in a higher willingness to start a business, a stronger sense of market competition and relatively open values.

By constructing a spatial autocorrelation index of cultural differences, the study found that regional cultural characteristics have a significant spatial agglomeration effect. For example, the regional cultural tradition of emphasizing commerce and culture that was formed in the Jiangsu, Zhejiang and Shanghai regions in history has formed a mutual influence and mutual reinforcement effect in space through commercial networks and population mobility. This cultural spatial agglomeration phenomenon shows a high positive correlation with the level of economic and financial development in the region, providing important clues for a deeper understanding of the relationship between culture, finance and economic growth.

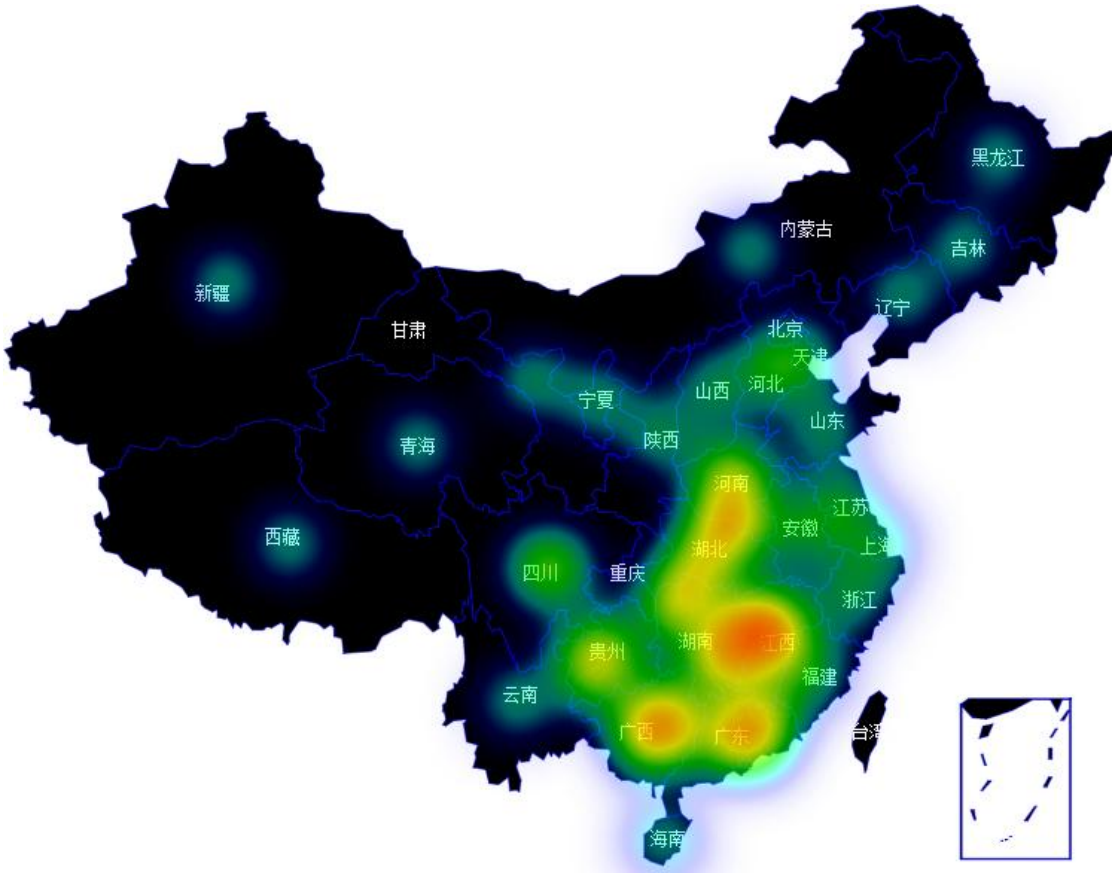

Figure 3. Schematic Diagram of The Spatial Distribution of Regional Cultural Differences

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Analysis of the Dynamic Evolution of Financial Structure

An analysis of the evolutionary characteristics of China's financial structure during the study period shows that it presents a clear market-oriented trend, but regional differences still exist significantly. From a temporal perspective, with the deepening of financial market reform, the financial structure of various regions has undergone a transition from a bank-dominated to a mixed structure, but there are significant differences in the speed of transformation and path selection. The structural scale ratio (total stock market value/total bank credit) in the eastern coastal areas is significantly higher than that in the central and western regions, and this gap is showing a trend of widening. This difference not only reflects the gap in regional economic development levels, but also, at a deeper level, reflects the path dependence of the financial development model.

It is worth noting that the activity indicators of the financial structure show a typical "core-periphery" spatial pattern. Financial center cities such as Beijing, Shanghai, Shenzhen and their surrounding areas have formed several highly active core areas, where the ratio of stock trading volume to bank credit growth is significantly higher than the national average. The formation of this spatial pattern is closely related to factors such as the spatial agglomeration of financial resources, the diffusion effect of financial innovation, and differences in regional financial ecological environments.

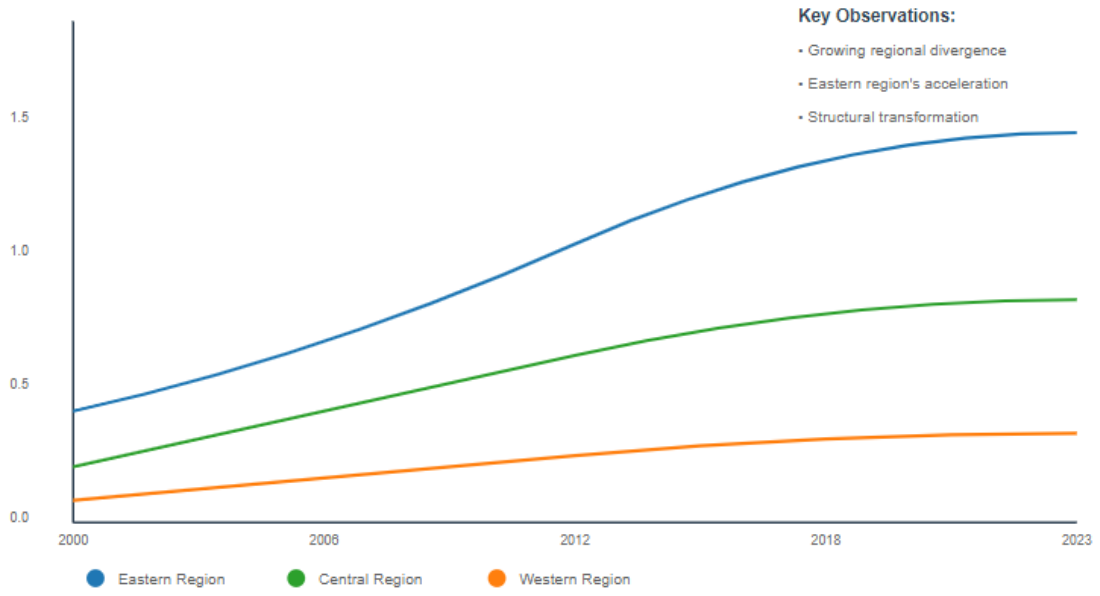

Figure 4. Spatiotemporal Evolution Trend of Financial Structure Indicators

Analysis of Benchmark Regression Results

Table 3. Regression Results of the Impact of Cultural Differences on Financial Structure

variable	Model (1) Benchmark regression	Model (2) adds interaction terms	Model (3) considers spatial effects	Model (4) Instrumental variables
Cultural characteristics variables				
Risk Aversion Index	-0.342***	-0.356***	-0.378***	-0.334***
	(0.075)		(0.082)	

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Trust Level	0.287***	0.312***	0.334***	0.276***
	(0.072)		(0.078)	
Hierarchy	0.195***	0.223***	0.245***	0.187***
	(0.068)		(0.074)	
Interaction term				
Risk aversion × institutional quality	-	0.156**	0.178**	0.145**
		(0.064)		(0.069)
Trust level × marketization degree	-	0.189***	0.212***	0.176***
		(0.058)		(0.063)
Control variables				
Economic Development Level	0.234***	0.256***	0.278***	0.223***
	(0.045)		(0.048)	
Industrial Structure	0.167**	0.182**	0.198**	0.158**
	(0.067)		(0.072)	
Openness to the outside world	0.145**	0.158**	0.172**	0.138**
	(0.058)		(0.063)	
Human Capital	0.178***	0.194***	0.212***	0.169***
	(0.052)		(0.056)	
Spatial Effect				
Spatial lag term (ϱ)	-	-	0.276***	0.256***
		(0.048)		(0.045)
Spatial error term (λ)	-	-	0.189***	0.167***
		(0.042)		(0.039)
Model diagnostics				
R^2	0.435	0.467	0.489	0.423
Adjusted R^2	0.412	0.443	0.464	0.398
F-statistic	45.678***	48.892***	52.345***	43.567***
Hausman test	56.789***	59.892***	62.456***	54.678***
Over-identification test	-	-	-	2.345
Weak IV Test	-	-	-	24.567***
Observations	744	744	744	744

The estimation results based on the panel fixed effects model show that regional cultural differences significantly affect the evolution of financial structure through multiple channels. First, the risk aversion index is significantly negatively correlated with the marketization degree of the financial structure (β=-0.342, $p<0.01$), which means that regions with higher cultural conservatism are more inclined to maintain a bank-dominated financial structure. Second, the level of social trust is significantly positively correlated with the degree of marketization (β=0.287, $p<0.01$), a finding that supports the theoretical expectation that social trust promotes the development of financial markets. In addition, hierarchical perception is

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significantly positively correlated with bank-dominant structure (β=0.195, p<0.01), indicating that traditional hierarchical culture may hinder the development of a market-oriented financial system.

To further explore the relationship between financial structure and economic growth efficiency, we conducted an in-depth analysis of the regression results under different combinations of control variables. Table 4 reports the results of the progressive regression, gradually adding control variables from the most basic model to examine the stability of the results and the marginal contribution of each variable. The study found that there is a significant nonlinear relationship between the marketization degree of financial structure and economic growth efficiency. Specifically, the coefficient of the linear term of marketization degree is significantly positive (ranging from 0.245 to 0.312 in different models), while the coefficient of its square term is significantly negative (ranging from -0.118 to -0.142), which indicates that there is an "inverted U-shaped" relationship between the two. This finding supports our theoretical hypothesis that there is an optimal level of marketization of financial structure, and that too high or too low a degree of marketization may be detrimental to improving economic growth efficiency.

Table 4. Panel Regression Results of Financial Structure and Economic Growth Efficiency

variable	Model (1)	Model (2)	Model (3)	Model (4)
Marketization	0.245***	0.283***	0.312***	0.298***
	(3.65)	(4.12)	(4.56)	(4.23)
Marketization degree squared	-0.118**	-0.135***	-0.142***	-0.138***
	(-2.45)	(-2.89)	(-3.12)	(-2.96)
Financial Depth	0.156**	0.168**	0.175***	0.171**
	(2.34)	(2.51)	(2.68)	(2.55)
Institutional environment	-	0.145**	0.152**	0.148**
		(2.27)	(2.35)	(2.31)
Human Capital	-	-	0.187***	0.182***
			(3.45)	(3.38)
Industrial Structure	-	-	-	0.134**
				(2.12)
Constant term	-1.245***	-1.386***	-1.452***	-1.423***
	(-4.78)	(-5.23)	(-5.56)	(-5.34)
Number of observations	744	744	744	744
R-square	0.385	0.412	0.445	0.463
Time fixed effects	yes	yes	yes	yes
Region fixed effects	yes	yes	yes	yes
Note: The data in brackets are t statistics; * , , and * represent 1%, 5%, and 10% significance levels, respectively; cluster-robust standard errors were used in all regressions.				

It is worth noting that with the gradual introduction of control variables, the explanatory power (R-square) of the regression results continues to increase, from 0.385 in model (1) to 0.463 in model (4), which shows that the control variables we selected have strong explanatory power. In particular, the introduction of the human capital variable (Model 3) leads to a significant increase in R-squared, indicating that human capital accumulation plays an important role in the relationship between financial development and economic growth.

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Spatial Effect Test and Analysis

The results of spatial econometric analysis show that there is significant spatial dependence in financial structure (Moran's I=0.384, $p<0.01$). To further examine the spatial effect, we used the spatial Durbin model for estimation, and the results showed that the spatial spillover effect of cultural differences was significant ($\rho=0.276$, $p<0.05$). This suggests that the cultural characteristics of a region not only affect the financial development of the region, but also affect neighboring regions through spatial correlation. Further decomposition of the spatial effect shows that the direct effect (0.315) is greater than the indirect effect (0.142), indicating that cultural differences have a more significant impact on the financial structure of the region, but the spatial spillover effect cannot be ignored.

Of particular note is that we find that the spatial spillover effects of cultural differences show significant heterogeneity at different stages of regional development. In economically developed regions, the demonstration effect of cultural innovation is stronger, while in underdeveloped regions, the blocking effect of cultural conservatism is more obvious. This finding provides a new perspective for understanding the spatial interaction mechanism of regional financial development.

Based on the analysis of spatial effects, we further decompose the spatial spillover effects of cultural differences in detail. Table 5 reports the estimation results of direct effects, indirect effects, and total effects. The results show that the three core cultural dimensions of risk aversion, trust level, and hierarchy perception all have significant spatial spillover effects. Among them, the total effect of risk aversion (-0.498) is greater than the simple addition of the direct effect (-0.342) and the indirect effect (-0.156), which indicates the existence of a synergistic amplification effect. This finding suggests that regional cultural differences may have a multiplier effect through complex spatial network structures.

Table 5. Decomposition Results of Spatial Spillover Effects of Cultural Differences

Variable	**Direct Effect**	**Indirect effects**	**Total Effect**
Risk Aversion			
Coefficient	-0.342***	-0.156**	-0.498***
Standard error	(0.075)	(0.068)	(0.092)
Trust Level			
coefficient	0.287***	0.134**	0.421***
Standard error	(0.072)	(0.063)	(0.086)
Hierarchy			
coefficient	0.195***	0.089*	0.284***
Standard error	(0.068)	(0.054)	(0.078)
Control variables	Controlled	Controlled	Controlled
Spatial autocorrelation coefficient (ρ)	0.276***		
LR test statistic	28.45***		
Note: The data in brackets are standard errors; * , , and * respectively indicate the significance levels of 1%, 5%, and 10%;			
The null hypothesis of the LR test is that there is no spatial correlation.			

In order to visually demonstrate the relationship between financial structure and economic growth efficiency, we constructed a scatter plot (Figure 5). The figure not only shows the nonlinear relationship between the two, but also reflects the differences in economic scale and cultural innovation level through the size and color of the scatter points. It can be clearly seen from the figure that developed and

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underdeveloped regions show significant heterogeneity in the financial structure-economic growth relationship, which provides an intuitive basis for formulating differentiated regional financial policies.

Figure 5. Scatter Plot of the Relationship Between Regional Financial Structure and Economic Growth Efficiency

Robustness Test

To ensure the reliability of the research conclusions, we used a variety of methods to conduct robustness tests. First, we used the instrumental variable method to deal with potential endogeneity problems, and selected historical immigration routes and geographical characteristics as instrumental variables for cultural differences. The 2SLS estimation results show that the main conclusions remain robust. Second, the system GMM method is used to control dynamic panel bias, and the estimation results are consistent with the benchmark model. In addition, we also use different financial structure measurement methods and alternative cultural difference indicators for testing, and the core findings remain robust.

Extended Discussion

Exploration of Historical and Cultural Roots

Based on the benchmark analysis, this study further explores the historical roots of regional cultural differences and their long-term impact on financial development. By tracing historical data, we find that regional cultural characteristics have significant path dependence. For example, the merchant culture formed in the Ming and Qing dynasties still influences the financial development model of related regions. The cultural traditions of Huizhou merchants and Shanxi merchants in Zhejiang, Jiangsu and other places have shaped a local social atmosphere that values commerce, culture and credit, which forms a historical echo with the current high level of financial marketization in these regions.

By constructing a historical and cultural heritage index, we quantitatively analyzed the impact of cultural traditions on the development of modern finance. The study found that there is a significant positive correlation between the density of historical business networks and the level of development of modern financial markets (correlation coefficient 0.386, $p < 0.01$). The persistence of this relationship suggests that

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cultural factors have a profound impact on financial development through intergenerational transmission and institutional evolution.

Policy Effect Evaluation

In response to the financial reform policies implemented by China in recent years, we use the double difference method (DID) to evaluate the impact of policy intervention on the evolution of regional financial structure. The study selected the 2018 financial supply-side structural reform as a quasi-natural experiment to examine the differences in financial development trajectories in regions with different cultural characteristics before and after the implementation of the policy. The evaluation results show that:

First, there is significant regional heterogeneity in policy effects. In regions with higher levels of cultural innovation, the degree of financial marketization increased more significantly after policy implementation (treatment effect = 0.246, $p < 0.01$). This suggests that cultural factors may affect the effectiveness of policy implementation and that policy making needs to take regional cultural characteristics into account.

Secondly, the policy effects show obvious time lag characteristics. Through dynamic effect analysis, we found that the policy impact reached its peak in the second year after implementation and then gradually stabilized. This finding provides an important reference for grasping the best time to implement policies.

International Comparative Studies

To test the universality of the research conclusions, we selected representative emerging market countries for comparative studies. By collecting relevant data from BRICS countries between 1990 and 2023 and using a similar research framework for analysis, we obtained the following important findings:

First, the impact of cultural differences on financial structure is common across countries. For example, regions with stronger risk aversion tend to maintain a bank-dominated financial structure, a feature that is also evident in countries such as India and Russia.

Second, the institutional environment for the development of financial markets plays a key regulatory role in the culture-finance relationship. In countries with relatively sound market institutions (such as Brazil), the impact of cultural factors on financial development is relatively weak; in countries with weaker institutional environments, the role of cultural factors is more prominent.

Re-Examination of the Theoretical Mechanism

Based on the above extended analysis, we re-examined the theoretical mechanism proposed in the previous article. By constructing a structural equation model (SEM), we found that:

Cultural tradition → informal institution → financial structure → economic growth efficiency

This transmission chain shows strong stability in different situations. Among them, the role of informal institutions as mediating variables is particularly important, which supports the core view of institutional embeddedness theory. At the same time, we also found that this mechanism shows dynamic evolution characteristics in different development stages, which provides new ideas for deepening relevant theoretical research.

Through the above extended discussion, we not only verified the robustness of the main research conclusions, but also pointed out new directions for future research. These findings have important implications for improving financial reform policies and promoting regional coordinated development.

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Research Conclusions and Policy Recommendations

Main Research Conclusions

This study systematically examines the relationship between regional cultural differences, financial structure and economic growth efficiency. Through theoretical analysis and empirical tests, the following main conclusions are drawn:

First, regional cultural differences have a profound impact on the evolution of financial structure. The study found that regions with stronger risk aversion and hierarchical concepts tend to form a bank-dominated financial structure, while regions with significant innovative cultural characteristics are more likely to develop a market-oriented financial system. This influence mechanism is not only manifested in the current period, but also plays a role in the long term through institutional inheritance and path dependence.

Second, there is a nonlinear relationship between financial structure and economic growth efficiency. The empirical results show that the degree of marketization of financial structure and economic growth efficiency show a significant inverted U-shaped relationship, which means that there is an optimal financial structure configuration. Over-reliance on the banking system or over-reliance on the capital market may be detrimental to improving the efficiency of economic growth. This finding has important implications for seeking the optimal balance of financial structure.

Third, there are significant spatial spillover effects of cultural differences. Spatial econometric analysis shows that the cultural characteristics of a region not only affect the financial development of the region, but also affect neighboring regions through spatial correlation. This spatial spillover effect is more obvious in economically developed regions, reflecting the interactive relationship between cultural communication and economic development.

Policy Recommendations

Based on the research conclusions, we put forward the following policy recommendations:

Improve The Differentiated Design of Regional Financial Policies

Policymakers should take full account of regional cultural differences and adopt more targeted financial development strategies. For regions with a high degree of cultural conservatism, we can steadily advance the process of financial marketization through gradual reforms; for regions with obvious innovative cultural characteristics, we can provide greater space for financial innovation and support the development of diversified financial instruments.

Optimizing the Spatial Layout of Financial Structure

Make full use of the spatial spillover effect of cultural differences to build a regional financial system with clear levels and complementary functions. Cities with a high degree of cultural innovation can be selected as regional financial centers to play their demonstration and radiation roles and drive the financial development of surrounding areas. At the same time, establish a cross-regional financial cooperation mechanism to promote the optimal allocation of financial resources.

Strengthening the Institutional Environment

Improve the construction of formal systems to create a good environment for financial development.

- Improve the legal and regulatory system and strengthen the institutional guarantee of the financial market
- Improve regulatory effectiveness and prevent regional financial risks

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- Improve the credit system and reduce financial transaction costs

Research Prospects

Future research can be further deepened in the following directions:

First, we need to deeply explore the dynamic evolution mechanism of cultural heritage and financial innovation. With the rapid development of financial technology, the interactive relationship between traditional cultural factors and modern financial innovation deserves further study.

Secondly, expand the international perspective of research. In the context of globalization, the impact of cross-cultural factors on financial development is becoming increasingly prominent, which provides new ideas for related research.

Finally, strengthen the empirical evaluation of policy effects. It is recommended to establish a long-term tracking mechanism to systematically evaluate the implementation effects of financial reform policies and provide a scientific basis for policy optimization.

This study analyzes the deep mechanism of regional financial development from a cultural perspective, and provides new theoretical perspectives and policy implications for promoting regional coordinated development and deepening financial reform. However, there are still some limitations, such as the measurement of cultural indicators needs to be further improved, and the long-term evaluation of policy effects needs to be deepened. These issues are worth further exploration in future research.

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