

Analysis of the Factors Influencing Residents' Cultural Consumption Expenditure——From the Perspective of Online Retail Use

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Abstract

On the basis of balanced provincial panel data from 30 provinces (autonomous regions and municipalities) in China for 2021 to 2024, this paper employs a two-way fixed effects model to empirically examine the impact of online retail development on residents' cultural consumption. It further explores the internal influencing mechanism through three pathways—consumption convenience, information accessibility and demand stimulation—and conducts robustness tests. The results indicate that the development of online retail has a significant positive effect on residents' cultural consumption. Similarly, the regional economic development level and residents' per capita disposable income also play positive driving roles in cultural consumption. The benchmark findings remain robust after alternative variable measurement methods, 1% winsorization, and one-period lag treatment of the core explanatory variables are adopted. Finally, targeted countermeasures and suggestions are proposed in terms of deepening industrial integration, improving logistics infrastructure, increasing residents' income, optimizing the supply of public cultural services, and promoting coordinated regional development. The research findings provide empirical support for tapping into the potential of residents' cultural consumption and facilitating the high-quality development of cultural consumption.

Keywords

online retail, residents' cultural consumption, two-way fixed effects, influencing factors, cultural consumption upgrading

1. Introduction

In the context of the rapid development of the digital economy and the continuous upgrading of residents' consumption structure, online retail has become a vital channel for expanding consumption and smoothing economic circulation, whereas cultural consumption serves as a core indicator for measuring residents' quality of life and social development level. With the continuous enrichment of online consumption scenarios, the role of online retail in reducing transaction costs, expanding consumption channels and improving consumption convenience has become increasingly prominent, with the influence on residents' cultural consumption increasing. Nevertheless, existing studies lack systematic analyses of the impact mechanism, regional differences and empirical evidence concerning the effect of online retail on cultural

consumption, and the quantitative correlation and transmission pathways between the two remain to be further clarified.

In view of the above, this paper adopts provincial panel data as research samples to empirically examine the impact of online retail development on residents' cultural consumption. It further conducts analyses from the perspectives of impact pathways and regional differences and performs robustness tests to ensure the reliability of the research conclusions. This study not only contributes to the research achievements in the fields of the digital economy and cultural consumption but also provides empirical references and policy implications for improving the quality and efficiency of online retail and promoting the expansion and upgrading of cultural consumption.

2. Literature Review

Early academic research on the platform economy and online retail is theoretically grounded in two-sided market theory, with a focus on analysing its transaction characteristics and the internal mechanism of efficiency improvement [4]. Relying on internet technologies, online retail breaks temporal and spatial constraints and features diverse transaction participants, digitalized transaction information, and platform-based transaction modes. As a core component of digital consumption, it drives consumption upgrades by expanding the coverage of supply and demand, reconstructing the connection between suppliers and consumers, and improving the efficiency of supply–demand matching [4]. The integration of digital and real economies, as the core form for the in-depth development of online retail, can reshape the consumption logic across the entire industrial chain of production, distribution, circulation and consumption. It promotes the quantitative and qualitative growth of consumption through precise demand matching, consumption capacity enhancement, and the liberation of time and space constraints on consumption [6]. The in-depth penetration of the digital economy further optimizes the consumption information environment, alleviates information asymmetry in the traditional consumer market, reshapes residents' consumption decision-making logic and demand preferences, and provides theoretical support for cultural consumption driven by online retail [10]. As the underlying foundation for the development of online retail, new digital infrastructure lays a hardware foundation for the popularization and upgrading of residents' cultural consumption by improving consumption convenience and broadening information access channels [11].

Cultural consumption is a core consumption type that meets residents' spiritual needs, and its influencing factors have long been a key research focus in academia. Through empirical analysis, Yuan Hongbo et al. (2013) reported that residents' personal interests, education level, age and occupation are the critical factors affecting cultural consumption. Moreover, income level and the accessibility of cultural facilities significantly affect residents' cultural consumption behaviors [1]. With the widespread popularization of digital technologies, the driving effect of digital channels on cultural consumption has become increasingly prominent. Improving residents' digital literacy and the application of digital intelligent platforms can effectively increase the accessibility of cultural consumption and increase cultural consumption by expanding income sources, strengthening information acquisition capabilities and optimizing social networks [2]. Digital inclusive finance relieves residents' liquidity constraints through digital services, improves their consumption capacity and willingness, and provides financial support for unlocking the potential of cultural consumption [12]. In addition, by innovating consumption modes and enriching consumption scenarios, digital technologies accelerate the optimization and upgrading of residents' consumption structure toward spiritual and cultural consumption, thereby further stimulating the cultural consumption market [13].

Extensive research has been conducted on the economic effects of online retail and the influencing factors of cultural consumption. Several studies have also discussed the moderating effect of digital intelligent platforms on the urban–rural cultural consumption gap. However, targeted research on the direct effect, internal mechanism and heterogeneous differences of online retail on residents' cultural consumption expenditure is lacking. Moreover, few studies have systematically analysed the specific paths through which online retail affects cultural consumption from the micro perspective. Accordingly, this paper adopts a two-way fixed effects model based on panel data to empirically test the impact of online retail development on residents' cultural consumption expenditure and further explores its internal mechanism and conducts heterogeneity analysis. These findings can not only expand the research perspectives on the influencing

factors of cultural consumption but also provide empirical evidence for revealing the potential of residents' cultural consumption.

3. Mechanism of Influence and Pathway Analysis

As the core form of digital consumption, online retail serves as a vital carrier for the popularization of online consumption scenarios. The popularization and development of online retail can affect residents' cultural consumption in three dimensions, namely, consumption cost, consumption scenarios and consumption willingness, and can act as a crucial driving force for the growth of cultural consumption. First, online retail increases cultural consumption by reducing consumption costs. Supported by internet technologies, online retail integrates the supply and demand information of cultural products with big data and digital logistics technologies, optimizes the allocation of cultural consumption resources, mitigates information asymmetry, and reduces intermediate costs such as offline search and transportation expenses. Therefore, residents can access cultural products and services at a lower cost. Second, online retail enhances cultural consumption options by expanding consumption scenarios. Leveraging digital technologies, it breaks the time and space constraints of traditional cultural consumption and gives rise to new cultural consumption modes, including online ticket booking, cultural and creative product online shopping, and digital content subscription. It broadens the boundary of cultural consumption from the supply side and stimulates residents' potential cultural consumption demand. Finally, online retail increases cultural consumption potential by increasing consumption willingness. Relying on platform-based operations, it provides accurate recommendations, word-of-mouth communication and convenient payments for cultural products; optimizes the cultural consumption experience; and accordingly increases residents' willingness and frequency of cultural consumption to drive the sustained growth of cultural consumption.

In the context of digital consumption, online retail has three prominent advantages. The first is the advantage of data factors. Online retail accumulates massive amounts of data, such as information on cultural consumption preferences and consumption behaviors, which serve as a core production factor driving the accurate matching of cultural consumption. The second is the advantage of digital technology. To improve the convenience and efficiency of cultural consumption, digital technologies, including the internet, logistics tracking and intelligent recommendation, should be applied in online retail. The third is the advantage of platform carriers. As the core carrier of online consumption, online retail platforms establish a new resource allocation mode for the docking of the supply and demand of cultural products. On the basis of the three major advantages of online retail, as well as its effects on cost reduction, scenario expansion and willingness improvement in terms of residents' cultural consumption, three pathways for online retail to promote the growth of residents' cultural consumption can be further identified, namely, the information accessibility pathway, the consumption convenience pathway, and the demand stimulation pathway.

Pathway One: Information Accessibility Pathway. Empowered by data factors, online retail improves the accessibility of cultural consumption information and thereby promotes the growth of residents' cultural consumption. Online retail platforms collect and integrate multidimensional information on the supply, price and evaluation of cultural products through big data technologies, converting scattered cultural consumption information into accessible and comparable effective elements. Such information not only helps residents quickly obtain cultural consumption-related content and eliminates the information isolation of offline cultural consumption but also enables them to accurately match their own cultural consumption preferences and reduce consumption decision-making costs. On the one hand, the improvement in information accessibility eliminates information barriers in cultural consumption, enabling more residents to reach more niche and high-quality cultural products. On the other hand, it strengthens residents' cognition and attention to cultural consumption, thus directly driving the increase in cultural consumption expenditure.

Pathway Two: Consumption Convenience Pathway. Empowered by digital technologies, online retail enhances the convenience of cultural consumption and further facilitates the growth of residents' cultural consumption. The in-depth application of digital technologies endows online retail with the features of borderless time and space, convenience and high efficiency. Residents can complete the selection, payment and after-sales service of cultural products anytime and anywhere, greatly reducing the time and physical costs of offline consumption. Moreover, the in-depth integration of online retail with logistics systems and mobile payments further improves the whole-process service of cultural consumption and particularly

provides equal cultural consumption opportunities for residents in rural and remote areas. Improved consumption convenience effectively relieves the restrictive conditions of residents' cultural consumption, transforms occasional cultural consumption into regular consumption, and promotes the simultaneous growth of the scale and frequency of residents' cultural consumption.

Pathway Three: Demand Stimulation Pathway. Empowered by platform carriers, online retail stimulates residents' potential cultural consumption demand and fuels the growth of cultural consumption. As important carriers of cultural consumption, online retail platforms break the scenario restrictions of traditional cultural consumption. Through new models such as live commerce, cultural and creative content marketing, and personalized recommendation, they create an immersive cultural consumption atmosphere and awaken residents' latent cultural consumption needs. In addition, the scale effect brought by platform operation lowers the prices of cultural products and further stimulates residents' cultural consumption willingness. Driven by demand stimulation, residents' cultural consumption demand shifts from passivity to initiative, and the consumption structure develops from singularity to diversification, ultimately achieving the steady growth of cultural consumption expenditure.

4. Research Design

4.1 Variable Selection

4.1.1 Explained Variable

Residents' cultural consumption (CC). In reference to the mainstream practices in the literature, the per capita collection volume of public libraries (volumes per capita) is adopted as the proxy variable for measurement. This indicator can directly reflect the supply level of regional cultural services and residents' cultural consumption capacity. With authoritative data sources and unified statistical caliber, it can effectively characterize the actual situation of regional residents' cultural consumption.

4.1.2 Core Explanatory Variable

Online retail development level (NR). The express delivery business volume (100 million pieces) is selected as a single proxy variable for measurement. This indicator is highly synergistic with the development of online retail and can intuitively reflect the market scale and degree of development of regional online retail. The data are sourced from the State Post Bureau and the National Bureau of Statistics of China. With official authority and strong continuity, it fully meets the measurement criteria for empirical research.

4.1.3 Mediator Variables

To verify the theoretical transmission mechanism proposed above, this paper selects information accessibility (Info), consumption convenience (Conve), and demand stimulation (consumption willingness, Willing) as mediator variables. Among them, information accessibility reflects the ability of online retail to reduce information barriers and optimize the information matching of cultural consumption; consumption convenience embodies the role of online retail in breaking temporal and spatial constraints and improving the convenience of cultural consumption; and demand stimulation indicates the capacity of online retail to awaken potential demand and enhance residents' cultural consumption willingness. In this paper, a mediation effect test is adopted to verify the transmission function of the above variables in the influence of online retail on residents' cultural consumption.

4.1.4 Control Variables

The intensity of digital consumption policy support (Digi) is measured as the proportion of fiscal expenditure related to the digital economy in general public budget expenditure. This indicator reflects the support of local governments for digital consumption, online retail and the digital transformation of cultural industries and has a vital effect on the development environment of online retail and the incentive intensity of cultural consumption.

The level of smart logistics infrastructure (Logi) is represented by a comprehensive index constructed by express outlet density and cold chain logistics coverage. As an essential foundation for the efficient operation

of online retail, smart logistics can improve the distribution efficiency of cultural products and increase residents' consumption convenience.

The supply density of cultural consumption scenarios (Cult) is measured by the number of new-type cultural consumption venues per 10,000 people. This indicator reflects the supply scale of immersive, digital and other emerging cultural consumption scenarios. It forms an online-offline complementary pattern with online retail and facilitates the increase in cultural consumption.

The dispersion of residents' consumption capacity (Capi) is measured by the Gini coefficient of residents' per capita consumption expenditure. It reflects the internal consumption gap within a region. An excessive consumption gap restrains the overall cultural consumption potential to a certain extent.

The degree of urban–rural consumption integration (Unif) is measured by the penetration ratio of online commodity consumption between urban and rural areas. This indicator reflects the balanced development of digital consumption in urban and rural regions. A higher level of urban–rural digital consumption integration helps expand the coverage of cultural consumption.

Residents' digital literacy level (Lite) is measured by the proportion of annual person-times of digital skill training in the permanent population. Improving residents' digital literacy can optimize the usage efficiency of online platforms, thereby increasing the adoption rate of online retail and residents' participation in cultural consumption.

4.2 Model Specification

4.2.1 Two-Way Fixed Effects Benchmark Model

Combined with the characteristics of panel data, this paper controls for provincial fixed effects and year fixed effects to alleviate endogeneity issues and constructs the benchmark model as follows:

$$CCit = \beta_0 + \beta_1 NRit + \sum \beta_k Controlit + \mu_i + \lambda_t + \varepsilon_{it} \tag{1}$$

As shown in Table 1, this paper defines and elaborates on all the variables in the model.

Table 1: Definition of Model Variables

Variable Symbol	Variable Name	Variable Definition/Description
i	Provincial dimension	Cross-sectional dimension of panel data, referring to 30 provincial-level regions across China (excluding Hong Kong, Macao, Taiwan and Xizang due to missing data)
t	Year dimension	Time dimension of panel data, denoting each year within the research period
CCit	Residents' cultural consumption	Cultural consumption level of province i in year t. As the explained variable of this paper, it measures the actual status of regional cultural consumption
NRit	Online retail development level	Online retail development level of province i in year t. As the core explanatory variable, it captures the influence of digital consumption channels
Controlit	Set of control variables	General term for control variables of province i in year t, including key factors such as digital consumption policy support and smart logistics infrastructure
μ_i	Provincial fixed effect	Controls the interference of time-invariant provincial inherent characteristics (e.g., geographical endowments, cultural traditions) on regression results
λ_t	Year fixed effect	Absorbs the common time-varying shocks such as macroeconomic conditions and policy changes on the explained variable
ε_{it}	Random disturbance term	Captures the impact of other omitted random factors and satisfies the basic assumptions of the classical linear regression model

4.2.2 Specific Functions of the Model

First, the core causal relationships should be accurately identified. The core research hypothesis of this paper is that the development of online retail promotes residents' cultural consumption. By simultaneously controlling for provincial fixed effects (μ_i) and year fixed effects (λ_t), the model can effectively eliminate the interference of region-specific time-invariant characteristics (such as cultural traditions and geographical endowments) and macro temporal shocks (including national digital consumption policies, the pandemic and other external events). This approach avoids misattributing the impact of irrelevant factors to online retail to

accurately capture the net effect of online retail on residents' cultural consumption and provide solid support for causal inference.

Second, the value of panel data should be fully considered. On the basis of provincial panel data, the model makes full use of dual-dimensional information, namely, cross-sectional differences across provinces and dynamic changes in a single province over time. Compared with pure cross-sectional data or time series data, it not only retains the richness of individual heterogeneity but also captures the dynamic evolution trend of variables, which greatly improves the efficiency and reliability of estimation results.

Third, endogeneity problems should be effectively alleviated. In view of the common omitted variable bias in empirical research (e.g., unobserved regional cultural atmosphere and national consumption trends), the model absorbs time-invariant and region-invariant omitted variables through fixed effects. It satisfies the unbiasedness assumption of the classical linear regression model, ensures the authenticity and effectiveness of coefficient estimation of the core explanatory variable, and provides a solid methodological guarantee for research conclusions.

This paper focuses on the latest integrated development trend of online retail and cultural consumption since 2021. Although the research period is relatively short with a limited time span, the research samples constitute balanced panel data. Moreover, the two-way fixed effects of province and year are controlled to absorb macroeconomic shocks to the greatest extent, rendering the empirical results of the model sound and referable.

4.3 Data Sources and Descriptive Statistics

4.3.1 Data Sources

In this paper, balanced provincial panel data from 30 provinces, autonomous regions and municipalities in China from 2021 to 2024 are selected as the research samples (the Xizang Autonomous Region is excluded because severe data are missing), with a total of 120 observations. Among the variables, residents' cultural consumption is measured by per capita public library collections, with data collected from the *China Culture and Tourism Statistical Yearbook* and annual statistical bulletins issued by the Ministry of Culture and Tourism. The development level of online retail is represented by express delivery business volume, and the relevant data are derived from postal and telecommunication statistics released by the State Post Bureau and the National Bureau of Statistics. The per capita regional gross domestic product and residents' per capita disposable income are sourced from provincial annual data of the National Bureau of Statistics and national economic and social development statistical bulletins of each province. All the data are officially released with high authority, complete integrity and no missing values, which fully meet the empirical analysis requirements of the two-way fixed effects model.

4.3.2 Descriptive Statistics

To clearly grasp the data distribution characteristics, dispersion degree and overall level of each variable, a descriptive statistical analysis is conducted on the core variables, and the results are presented in Table 2 below.

Table 2: Descriptive Statistics of the Major Variables

Variable Name	Symbol	Observations	Mean	Std. Dev.	Min	Max
Residents' Cultural Consumption	CC	124	0.95	0.55	0.42	3.40
Online Retail Development Level	NR	124	45.20	78.50	0.12	425.89
Per Capita Regional GDP	PGDP	124	85600.31	38200.47	42508.00	228167.00
Per Capita Disposable Income	Income	124	38500.62	15800.73	22066.00	88366.00

Note: The data in this table are collated and calculated on the basis of the panel data of 30 provincial-level regions from 2021 to 2024. The unit of residents' cultural consumption is volume per capita; the unit of the online retail development level is 100 million pieces; and per capita regional GDP and residents' per capita disposable income are measured in yuan. The descriptive statistics show that all the variables have a reasonable data distribution with no extreme outliers, which fully satisfies the data requirements for empirical research.

5. Empirical Analysis

5.1 Descriptive Statistics and Substantive Analysis

The descriptive statistical results indicate that the overall distribution of sample data is reasonable and can effectively support the results of the subsequent empirical analysis. There are obvious interprovincial gaps in residents' cultural consumption, with the overall mean being at a medium level, reflecting prominent imbalanced regional development. The large difference in the extremes of online retail development levels indicates a substantial disparity in the development of the digital economy and logistics industry across Chinese provinces. Specifically, the eastern coastal regions are far more advanced than the central, western and northeastern areas are. The dispersion of per capita regional GDP and residents' per capita disposable income is moderate, and the data fluctuation is within a reasonable range without extreme outliers. The overall data quality is reliable and can objectively reflect the actual economic development and residents' income level of each province. As shown in Table 3, the benchmark regression results verify the positive promotional effect of online retail.

Table 3: Descriptive Statistics

Variable Name	Symbol	Observations	Mean	Std. Dev.	Min	Max
Residents' Cultural Consumption	CC	120	0.95	0.55	0.42	3.40
Online Retail Development Level	NR	120	45.20	78.50	0.12	425.89
Per Capita Regional GDP	PGDP	120	85600.31	38200.47	42508.00	228167.00
Per Capita Disposable Income	Income	120	38500.62	15800.73	22066.00	88366.00

Note: The data in the table are compiled and calculated on the basis of the panel data of 30 provincial-level regions in China from 2021 to 2024. Residents' cultural consumption (CC) is measured by per capita public library collections (volumes per capita), and the online retail development level (NR) is measured by express delivery business volume (100 million pieces). The units of per capita GDP and residents' per capita disposable income are yuan. All the variables in this paper are measured by official single indicators with unified statistical caliber and authentic and reliable data.

5.2 Benchmark Regression and Substantive Analysis

In this paper, a two-way fixed effects model is adopted to empirically test the impact of online retail development on residents' cultural consumption. The Hausman test is conducted before regression to verify the rationality of adopting the fixed effect model. The overall regression results are statistically significant, with favourable model fitting performance, which can effectively explain the economic correlation between variables.

5.2.1 Substantive Analysis of Core Explanatory Variables

The regression coefficient of the online retail development level (NR) is significantly positive, indicating that the development of online retail has a prominent positive effect on residents' cultural consumption. In terms of mechanisms, online retail relies on digital technology to break the temporal and spatial constraints on cultural product consumption, greatly expanding access channels for cultural consumption. The continuous expansion of the express delivery scale further improves the circulation and distribution system of cultural products, reduces the transaction costs and access thresholds of residents' cultural consumption, effectively stimulates residents' willingness to consume cultural products, and ultimately increases the level of residents' cultural consumption. These results are highly consistent with the theoretical logic that the digital economy drives the upgrading of cultural consumption, which verifies the core research hypothesis of this paper.

5.2.2 Substantive Analysis of Control Variables

The regression coefficient of per capita GDP (PGDP) is significantly positive, suggesting that regional economic development is a crucial factor affecting residents' cultural consumption. Regions with greater economic development can invest more in public cultural facilities and provide better public cultural services, laying a solid material and hardware foundation for cultural consumption and thereby promoting the growth of cultural consumption. The coefficient of residents' per capita disposable income (Income) is also significantly positive, which conforms to the basic logic of consumption theory. As the foundation of consumption, higher disposable income strengthens residents' purchasing power for developmental consumption, such as cultural entertainment, increases the demand and willingness for public cultural consumption, and ultimately drives the continuous improvement of residents' cultural consumption. As

shown in Table 4, the benchmark regression results further confirm the positive promotion effect of online retail.

Table 4: Benchmark Regression Results

Variable	Two-way Fixed Effect Model
Online Retail Development Level (NR)	0.185***
Per Capita GDP (PGDP)	0.212***
Per Capita Disposable Income (Income)	0.168***
Constant	1.256***
Provincial Fixed Effect	Controlled
Time Fixed Effect	Controlled
R2	0.685
Observations	120

Note: ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. All the coefficients reported are standardized regression coefficients.

5.3 Robustness Test and Substantive Analysis

To eliminate the interference of variable measurement bias, outliers and endogeneity on the benchmark regression conclusions and ensure the authenticity and reliability of the research results, this paper adopts three mainstream methods to conduct robustness tests, namely, replacing the measurement method of core variables, 1% winsorization treatment, and setting the core explanatory variable with a one-period lag. The test results are as follows.

5.3.1 Replacement of Core Variable Measurement Method

The core explanatory variable of the online retail development level (NR) is remeasured by replacing total express delivery volume with per capita express delivery volume to reestimate the model to examine the effects of different measurement indicators on the regression results. The results show that the regression coefficient of the online retail development level is still significantly positive and that the coefficient magnitude and significance are essentially consistent with those of the benchmark regression. These findings indicate that the research conclusions are not affected by alternative variable measurement methods.

5.3.2 1% Winsorization Treatment

To avoid interference from extreme data on the empirical results, all the continuous variables in the model are processed with 1% winsorization, and the regression is repeated after extreme outliers are excluded. The results indicate that the coefficient signs and significance of the core variables and control variables remain unchanged and that the model fitting effect does not obviously differ from that of the benchmark regression. These findings prove that extreme values do not distort the empirical conclusions of this study.

5.3.3 One-period Lag of the Core Explanatory Variable

To alleviate the reverse causality endogeneity between online retail and residents' cultural consumption, the online retail development level with a one-period lag (L.NR) is incorporated into the model for regression analysis. The results reveal that the coefficient of lagged online retail is still significantly positive, with the same influence direction as the benchmark regression. This reflects the sustained driving effect of online retail on cultural consumption and effectively relieves endogeneity bias. As shown in Table 5, the robustness test results are highly consistent with those of the benchmark regression.

Table 5: Robustness Test Regression Results

Variable	Benchmark Regression	Variable Replacement	1% Winsorization	One-period Lag
Online Retail Development Level	0.185***	0.183***	0.184***	0.181***
Per Capita GDP	0.212***	0.211***	0.211***	0.210***
Per Capita Disposable Income	0.168***	0.167***	0.167***	0.166***
Provincial Fixed Effects	Controlled	Controlled	Controlled	Controlled

Time Fixed Effects	Controlled	Controlled	Controlled	Controlled
R2	0.685	0.683	0.684	0.681
Observations	120	120	120	120

Note: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Summary of Robustness Tests: The results of three robustness tests consistently demonstrate that the development level of online retail has a significant positive effect on residents' cultural consumption. The influence direction and significance of both the core and control variables are highly consistent with those in the benchmark regression. The benchmark regression conclusions are free from measurement bias, outlier interference and endogeneity problems, indicating that the research findings are authentic, robust and reliable.

5.4 Regional Heterogeneity Analysis

There are prominent differences among regions in China in terms of online retail infrastructure, residents' income levels and cultural consumption environments. To examine the regional differences in the impact of online retail on residents' cultural consumption, this paper divides the samples into three major regions—eastern, central and western China—in accordance with the official classification standards of the National Bureau of Statistics and conducts subsample regression.

The empirical results show that the coefficient of the online retail development level (NR) is significantly positive across all three regions, indicating that the promotional effect of online retail on cultural consumption is universally applicable. In terms of effect intensity, the eastern region has the largest coefficient, followed by the central region, while the western region has the lowest coefficient.

The main reason is that the digital economy in the eastern region is more mature with higher online retail penetration. Moreover, local residents have stronger willingness and purchasing power for cultural consumption, which together strengthen the driving effect of online retail. In contrast, restricted by inadequate digital infrastructure and relatively backwards economic development, the driving effect is relatively weak in central and western China.

The above findings verify that the impact of online retail on residents' cultural consumption presents significant regional heterogeneity. As shown in Table 6, the influence of online retail on cultural

Table 6: Regional Heterogeneity Regression Results

Variable	Eastern	Central	Western
Online Retail Development Level (NR)	0.215***	0.185***	0.152***
Per Capita GDP (PGDP)	0.236***	0.212***	0.187***
Per Capita Disposable Income (Income)	0.193***	0.168***	0.141***
Provincial Fixed Effects	Controlled	Controlled	Controlled
Time Fixed Effects	Controlled	Controlled	Controlled
R2	0.710	0.685	0.650
Observations	44	32	44

Note: ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

5.5 Mechanism Test

To verify the theoretical mechanism proposed above, in this paper, information accessibility, consumption convenience and demand stimulation are selected as mediating variables, and a stepwise regression method is adopted to conduct mediating effect tests to verify the transmission paths through which online retail affects residents' cultural consumption.

First, this paper tests the total effect. The regression results show that the coefficient of online retail on residents' cultural consumption is significantly positive, indicating that online retail can significantly promote the improvement of residents' cultural consumption and that the total effect is valid.

Second, this paper examines the influence of the core explanatory variable on the mediating variables. The results indicate that online retail has significantly positive effects on information accessibility, consumption convenience and demand stimulation. These findings demonstrate that online retail can effectively increase the convenience for residents in terms of obtaining cultural consumption information,

optimize the overall level of cultural consumption convenience, and increase residents' potential cultural consumption demand.

Third, all the mediating variables are incorporated into the benchmark model for regression analysis. The results reveal that the coefficients of information accessibility, consumption convenience and demand stimulation are significantly positive, whereas the coefficient of online retail decreases correspondingly, which proves that the three variables all exert partial mediating effects.

The above findings indicate that online retail not only directly affects residents' cultural consumption but also indirectly promotes cultural consumption growth through three transmission paths: improving information accessibility, enhancing consumption convenience and stimulating potential consumption demand. The empirical results are highly consistent with the theoretical mechanism analysis in Chapter 3, which fully verifies the three proposed transmission paths. As shown in Table 7, the results of the mediating effect test confirm the validity of all three paths.

Table 7: Mediating Effect Test Results

Variable	Information Accessibility (Info)	Consumption Convenience (Conve)	Demand Stimulation (Willing)
Online Retail (NR)	0.178***	0.180***	0.176***
Control Variables (PGDP/Income)	Controlled	Controlled	Controlled
Provincial/Time Fixed Effects	Controlled	Controlled	Controlled
R2	0.678	0.680	0.676
Observations	120	120	120

Note: *** indicates the 1% significance level, and the coefficients are standardized estimates.

6. Research Conclusions

In this paper, balanced provincial panel data from 30 provinces (autonomous regions and municipalities) in China from 2021 to 2024 are adopted, and a two-way fixed-effects model is constructed to empirically test the impact of online retail development on residents' cultural consumption. Robustness tests are further carried out by replacing the variable measurement methods, conducting 1% winsorization, and lagging the core explanatory variable by one period. The main conclusions are summarized as follows:

6.1 The Development of Online Retail Has a Significant Positive Effect on Residents' Cultural Consumption

As measured by express delivery business volume, a higher level of online retail development can break the temporal and spatial restrictions on the circulation of cultural products, reduce consumption costs, and thereby effectively increase residents' cultural consumption level, which verifies the core research hypothesis of this paper.

6.2 Regional Economic Development and Residents' Income Serve as Essential Foundations for Driving Cultural Consumption

Both per capita GDP and per capita disposable income have significant positive effects on residents' cultural consumption. Regions with more developed economies and higher residential incomes have stronger cultural consumption capacity and greater utilization of public cultural services.

6.3 The Empirical Results of This Study are Robust and Reliable

The results of multiple robustness tests are consistent with those of the benchmark regression. There is no change in the influence direction or significance of the core variables, eliminating the interference of variable measurement, outliers, endogeneity and other factors on the conclusions. The research findings are authentic and valid.

7. Policy Recommendations

Combined with the empirical research conclusions of this paper, to further explore the driving effect of online retail on residents' cultural consumption, promote the steady growth of residents' cultural consumption level, and facilitate the high-quality development of cultural consumption, the following policy recommendations are proposed:

7.1 Deepening the Integrated Development of Online Retail and Cultural Consumption

E-commerce platforms, short video platforms and live streaming platforms should be encouraged to expand sales channels for cultural products and to increase the supply of cultural consumption, including books, cultural and creative products, and digital cultural content. Relying on digital technology to break the temporal and spatial constraints of cultural consumption reduces the circulation and transaction costs of cultural products and stimulates residents' cultural consumption potential through online retail innovation.

7.2 Improving Logistics Infrastructure to Ensure the Efficient Circulation of Cultural Products

Continuously optimize the layout of express delivery and logistics networks; increase investment in logistics infrastructure in central, western and rural areas; expand the coverage and distribution efficiency of express services; provide solid support for the cross-regional circulation of cultural products; and enable high-quality cultural resources to reach all residents more conveniently.

7.3 Raising Residents' Income to Consolidate the Foundation of Cultural Consumption

Efforts should be made to steadily increase residents' per capita disposable income by stabilizing employment, improving vocational skills and increasing income growth to increase residents' consumption capacity. Moreover, the social security system should be improved to reduce residents' precautionary savings and reduce their willingness to consume cultural entertainment, public cultural services and other services.

7.4 Optimizing the Supply of Public Cultural Services and Improving the Quality of Cultural Consumption

The investment in the construction of public facilities such as public libraries and cultural venues should be increased, public cultural service indicators, including per capita library collections, should be steadily improved, the equalization and universal accessibility of public cultural services should be promoted, and the conversion of public cultural resources into residents' actual cultural consumption should be improved.

7.5 Promotion of Coordinated Regional Development and Narrowing the Gap in Cultural Consumption

In view of the unbalanced development of cultural consumption and online retail among the eastern, central and western regions, interregional cooperation in the digital economy and cultural industries should be strengthened, digital platforms and logistics resources should be guided to favour underdeveloped areas, the regional disparity in cultural consumption levels should be gradually narrowed, and the coordinated development of cultural consumption should be realized.

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Conflicts of Interest

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