

# Research on the Impact of Digital Economy on Residents' Consumption Upgrade: Taking Shanghai as an Example

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## ABSTRACT

In the information age, the development of the digital economy has brought increasingly important influences on residents' consumption concepts, consumption scale, consumption methods, consumption structure, etc. This paper first summarizes the performance of the digital economy in driving the improvement of residents' consumption methods and enriching consumption content, and constructs a theoretical model; then, based on the time series data of Shanghai from 2005 to 2022, this paper empirically studies the impact of the development of the digital economy in Shanghai on residents' consumption; finally, from the perspective of regional differences, this paper proposes effective paths and optimization policies for the digital economy to drive the expansion of consumption scale, optimize the upgrading of consumption structure, and promote economic development.

## KEYWORDS

Digital economy; Residents' consumption; Consumption upgrade

## 1. INTRODUCTION

At present, my country's resident consumption structure is accelerating its improvement and upgrading, entering an era of optimized consumption structure. Consumption is showing the characteristics of pursuing quality interaction and personalized customization. With the development of digital technology, digital consumption is becoming an important channel for resident consumption and a driving force for economic growth. Therefore, seizing the opportunity of optimizing and upgrading the consumption structure under the digital economy is of particular significance to promoting industrial transformation and upgrading and enhancing economic vitality.

While the digital economy will move towards a new stage of deepening application, standardized development, and inclusive sharing, under the new normal of the economy, the consumption concept of the public is gradually changing. While expanding domestic demand, it is also necessary to focus on innovation-driven development and meet social needs through high-quality supply, thereby gradually improving the social supply system. In recent years, digital technology has been used in many industries and is closely related to various links such as social production, circulation, and consumption. It can promote the optimization and upgrading of the industrial structure, bring positive impacts to industrial adjustment and social consumption transformation and upgrading in the new era, and bring new driving forces for the upgrading of residents' consumption. With the development of digital technology, digital consumption is becoming an important channel for residents' consumption and a driving force for economic growth. Therefore, seizing the opportunity of optimizing and upgrading the consumption structure under the digital economy is of particular significance to promoting industrial transformation and upgrading and enhancing economic vitality. This paper analyzes the current situation and existing problems of China's consumption structure under the

digital economy, and through targeted countermeasures analysis, finds a practical path to use the digital economy to lead the optimization and upgrading of the consumption structure and provide impetus for China's economic development.

## **2. LITERATURE REVIEW**

At present, digital technology has deeply influenced the national economic system and has had an all-round and far-reaching impact on residents' consumption. The academic community has carried out a lot of research on the issues of digital economy and consumption, and has achieved rich results at the theoretical level. This chapter sorts out the research on the relationship between digital economy and residents' consumption upgrades, and explores its impact mechanism and action path.

### **2.1. Research on the Impact of Digital Economy on Residents' Consumption Behavior**

Zhang Feng and Liu Lulu (2020) believe that traditional consumption patterns are beginning to transform towards digital consumption, and digital consumption plays an important role in improving consumer experience. Zhao Guangming (2023) found that the digital economy can make users' consumption needs more personalized, promote the improvement of consumption quality, promote competition among enterprises, and provide a consumption experience that is more in line with individual consumer needs. Ma Xiangpin (2020) realized that big data facilitates the dissemination of consumer information on social platforms, further enhancing the demonstration effect of consumption.

### **2.2. Analysis of the Impact of Digital Economy on Consumption Upgrading**

Xu Xiaofei (2023) found that the level of digital trade is significantly correlated with the level of high-quality economic development, and part of it is achieved through consumption upgrading. Ren Baoping and Song Wen (2019) clearly explained the mechanism by which the digital economy promotes the high-quality development of the real economy. The digital economy optimizes the factor endowment structure, accelerates the transformation and upgrading of the industrial structure, and reshapes the supply driving force. At the same time, through the promotion of smart products and the popularization of smart services, it meets the personalized needs of consumers and enhances demand-driven forces. Ma Qiang and Wang Xiaoyuan (2023) found empirically based on CFPS data that the digital economy is conducive to household consumption upgrading, and there is regional heterogeneity, urban-rural heterogeneity, and income level heterogeneity.

### **2.3. Analysis on the Impact of Digital Economy on Consumption Structure Upgrade**

Shi Bo (2020) believes that the path for the digital economy to drive consumption upgrading is for the digital economy to stimulate and accelerate green consumption and smart consumption, increase the quantity and quality of consumption of education and medical services, and thus achieve consumption upgrading. Zhang Jing and An Shaokai (2023) found that in the context of the development of the digital economy, digital empowerment has become the key to realizing the modernization of the circulation industry and helping to build a multi-level consumer service supply system. Zou Yujia (2023) established a structural model and found that the digital economy promotes high-quality economic development as a whole, but the driving force has certain heterogeneity. The digital economy in eastern cities and small-scale cities has a greater driving impact on high-quality development.

From the existing research results, from a micro perspective, most studies focus on the transformation of residents' consumption patterns, levels, and structures under the background of digital economic

development; from a macro perspective, most literature approaches the research from the perspectives of behavioral analysis, transmission mechanism, and structural upgrading of residents' consumption. However, these studies are mostly focused on the theoretical level, and few literature analyzes the internal mechanism of the digital economy and residents' consumption, and there is a lack of empirical analysis of the specific effects of digital economic development on residents' consumption. This article will discuss the internal transmission mechanism of the digital economy on residents' consumption in Shanghai.

### **3. THEORETICAL ANALYSIS**

Digital economy refers to economic activities based on information technology, characterized by digitization, networking, and intelligence, with the provision of digital products and services as the main business form. With the development of digital economy, residents' consumption habits and methods are also undergoing profound changes. The impact of digital economy on residents' consumption upgrade has become a topic of great concern. This section will explore the impact of digital economy on residents' consumption upgrade from the perspective of theoretical analysis.

The digital economy promotes personalized consumption: the development of digital products and services enables consumers to obtain personalized goods and services more conveniently. For example, e-commerce platforms can provide consumers with personalized product recommendations through data analysis and recommendation algorithms; smart home products can provide customized intelligent services based on the actual needs of residents. These personalized products and services meet the diverse and personalized needs of consumers and promote consumption upgrades.

The digital economy improves consumer experience: The development of digital products and services has greatly improved consumer experience. For example, online shopping allows consumers to purchase goods from all over the world without leaving home; the sharing economy model allows consumers to enjoy more services at a lower cost; unmanned stores and smart payment systems provide a more convenient shopping experience. These digital consumer experiences meet consumers' needs for convenience, efficiency, and comfort, and promote consumption upgrades.

The digital economy has expanded consumption scenarios: the development of digital products and services has enabled consumers to consume in more scenarios. For example, the popularity of mobile payments has enabled consumers to make convenient payments on the streets, in subways and buses, and even in remote rural areas; online education has enabled consumers to obtain high-quality educational resources at home; and online travel products have enabled consumers to plan their vacations in the office. These expansions in digital consumption scenarios have enabled consumers to consume anytime and anywhere, driving consumption upgrades.

The digital economy has enriched consumer choices: The development of digital products and services has provided consumers with more abundant consumer choices. For example, cross-border e-commerce allows consumers to purchase goods from all over the world; digital content platforms allow consumers to access various types of content at any time; and the sharing economy model allows consumers to choose more shared products and services. These rich digital consumer choices allow consumers to enjoy a more diverse consumer experience and promote consumption upgrades.

In summary, the impact of the digital economy on the upgrading of residents' consumption is multifaceted. The digital economy promotes personalized consumption, improves consumer experience, expands consumption scenarios, and enriches consumer choices. These impacts enable consumers to consume more conveniently, comfortably, and diversely in the era of the digital economy, thereby promoting the improvement of the overall consumption level. Therefore, in the future, the impact of the digital economy on the upgrading of residents' consumption will become more and more significant, becoming an important topic in economic research and policy making.

## 4. EMPIRICAL ANALYSIS

### 4.1. Model Construction

The impact of the digital economy on the upgrading of residents' consumption can be unfolded from three aspects: the supply side, the demand side and the matching of supply and demand. The digital economy can effectively reduce transaction costs and optimize product prices; it can provide personalized services based on digital platforms, while tapping into more potential customer groups for products; from the perspective of matching supply and demand, the digital economy can effectively improve matching efficiency and solve the problem of information asymmetry.

Based on the above analysis, the following hypothesis is proposed:

H0: The development of the digital economy can promote the upgrading of residents' consumption

Taking Shanghai Province as an example, based on the panel data of prefecture-level cities in Shanghai Province from 2000 to 2022, the following econometric model is constructed:

$$\text{Log}y = \beta_0 + \beta_1 x_1 + \beta_2 \log x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon$$

In the formula,  $y$  represents per capita consumption expenditure,  $x_1$  represents the digital economy development index,  $x_2$  represents per capita disposable income,  $x_3$  represents the consumer price index, and  $x_4$  represents the number of people participating in urban medical insurance at the end of the year. The above data are all from Shanghai 's statistical data from 2005 to 2022 .

### 4.2. Selection of Indicators

**Table 1.** Variable data table

	Per capita consumer expenditure	Digital Economy Development Index	Per capita disposable income	Consumer Price Index	Number of people participating in urban medical insurance at the end of the year
2005	14135	19.8685447	17738	100	830.0078
2006	15284	20.83343369	19647	101.2	891.7338
2007	18001	22.48216259	22459	104.4384	932.4297
2008	20345	26.3004818	25385	110.4958272	967.6948
2009	22230	28.28850901	27500	110.0538439	1001.104
2010	24758	30.40406609	30436	113.4655131	1049.47
2011	26858	34.27828062	34731	119.3657197	1382.657
2012	28152	35.49942315	38550	122.7079599	1416.896
2013	30400	39.56321895	42174	125.530243	1429.882
2014	33065	44.24649119	45966	128.9195595	1457.435
2015	34784	46.78667521	49867	132.0136289	1493.801
2016	37458	49.33417535	54305	136.2380651	1527.138
2017	39792	51.31049085	58988	138.5541122	1548.222
2018	43351	53.2880733	64183	140.770978	1573.373
2019	45605	55.41497231	69442	144.2902524	1589.573
2020	42536	52.52991652	72232	146.7431867	1616.672
2021	48879	60.26065779	78027	148.504105	1654.363
2022	46045	58.98255754	79610	152.2167076	1659.383

### 4.3. Regression Analysis

**Table 2.** OLS regression analysis table

OLS regression analysis results ( n = 18)					
	Regression coefficient Coef	Standard error Std.Err	t	p	95% CI
constant	9797.614	17770.350	0.551	0.591	-25031.632 ~ 44626.860
Digital Economy Development Index	631.130	160.337	3.936	0.002**	316.875 ~ 945.385
Per capita disposable income	0.205	0.127	1.615	0.130	-0.044 ~ 0.453
Consumer Price Index	-115.488	233.007	-0.496	0.628	-572.174 ~ 341.197
Number of people participating in urban medical insurance at the end of the year	1.138	4.456	0.255	0.802	-7.595 ~ 9.871
R <sup>2</sup>	0.993				
Adjust R <sup>2</sup>	0.991				
F	F (4, 13)=462.247, p =0.000				
DW value	0.950				
Dependent variable: Per capita consumption expenditure					
* p < 0.05 ** p < 0.01					

From the above table, we can see that: From the above table, we can see that the digital economy development index, per capita disposable income, consumer price index, and the number of people participating in urban medical insurance at the end of the year are used as independent variables for OLS regression analysis. From the above table, we can see that the model R - square value is 0.993, which means that the digital economy development index, per capita disposable income, consumer price index, and the number of people participating in urban medical insurance at the end of the year can explain 99.30% of the changes in per capita consumption expenditure. When the model is tested by F, it is found that the model passes the F test (F=462.247, p=0.000<0.05), which means that at least one of the digital economy development index , per capita disposable income, consumer price index, and the number of people participating in urban medical insurance at the end of the year will have an impact on per capita consumption expenditure, and the model formula is: Per capita consumption expenditure = 9797.614 + 631.130\* digital economy development index + 0.205\* per capita disposable income -115.488\* consumer price index + 1.138\* number of people participating in urban medical insurance at the end of the year.

The regression coefficient of the digital economy development index is 631.130, and it is significant at the 0.01 level (t=3.936, p=0.002<0.01), which means that the digital economy development index will have a significant positive impact on per capita consumer expenditure. The regression coefficient of per capita disposable income is 0.205, but it is not significant (t=1.615, p=0.130>0.05), which means that per capita disposable income does not have an impact on per capita consumer expenditure. The regression coefficient of the consumer price index is -115.488, but it is not significant (t=-0.496, p=0.628>0.05), which means that the consumer price index does not have an impact on per capita consumer expenditure. The regression coefficient of the number of people participating in urban medical insurance at the end of the year is 1.138, but it does not show significance (t=0.255,

$p=0.802>0.05$ ), which means that the number of people participating in urban medical insurance at the end of the year does not have an impact on per capita consumption expenditure.

The summary and analysis show that the digital economy development index will have a significant positive impact on per capita consumer expenditure. However, per capita disposable income, the consumer price index, and the number of people participating in urban medical insurance at the end of the year will not have an impact on per capita consumer expenditure. The digital economy development index will have a significant positive impact on per capita consumer expenditure. However, per capita disposable income, the consumer price index, and the number of people participating in urban medical insurance at the end of the year will not have an impact on per capita consumer expenditure.

**Table 3.** Heteroskedasticity Results

Heteroskedasticity test results			
White heteroskedasticity test		BP heteroskedasticity test	
$\chi^2$	p	$\chi^2$	p
16.023	0.312	2.972	0.563

For the heteroscedasticity of the model, White test and BP test are used for testing. The null hypothesis is that the model has no heteroscedasticity. If  $p<0.05$ , it means that the null hypothesis is rejected, that is, the model has heteroscedasticity; otherwise, it means that the null hypothesis is accepted, that is, the model does not have heteroscedasticity. The above table shows that the model does not have heteroscedasticity.

## 5. OPTIMIZING STRATEGIES FOR DIGITAL ECONOMY TO PROMOTE RESIDENTS' CONSUMPTION UPGRADE

**Providing personalized products and services:** Digital technology can help companies better understand consumer needs and preferences, thereby providing more personalized products and services. Through data analysis and artificial intelligence technology, companies can grasp consumers' consumption habits and needs and customize production and services according to individual characteristics. Personalized products and services can meet the needs of different consumer groups and improve consumer satisfaction and loyalty.

**Strengthen digital marketing and channel expansion:** Companies should use digital technology and online platforms to combine marketing activities and channel expansion with traditional sales methods. Through channels such as the Internet and social media, companies can reach potential consumers more widely, improve brand awareness and market influence. At the same time, through digital channel expansion, consumers can more easily obtain product information, shop and experience services, and improve shopping experience and consumption convenience.

**Improve service quality and innovation capabilities:** In the digital economy era, consumers have higher and higher demands for service quality and innovation capabilities. Enterprises should strengthen the improvement of service quality, improve service processes and service efficiency through digital technology, and strive to provide a better consumer experience. In addition, enterprises should also focus on innovation, continuously launch new products, new services and new experiences to meet consumers' pursuit of freshness and uniqueness.

**Strengthen education and skills training:** The development of the digital economy has put forward new requirements for the labor market. Consumers need to have more digital skills and innovation capabilities. Educational institutions and enterprises should strengthen training and education, provide courses and training related to the digital economy, and help consumers improve their

professional skills and entrepreneurial capabilities, so as to better adapt to and participate in the consumption upgrade in the digital economy era.

In summary, the optimization strategies for the digital economy to promote residents' consumption upgrades include providing personalized products and services, strengthening digital marketing and channel expansion, improving service quality and innovation capabilities, and strengthening education and skills training. These strategies help meet consumer needs, improve consumer experience, promote consumption upgrades, and promote sustainable economic development.

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