

# Research on the Impact of Digital Economy on Resident Consumption

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**Abstract:** Based on the cross-sectional data of 203 cities, this paper uses OLS and quantile regression to empirically test the impact of the digital economy on the consumption expenditure of urban and rural residents and the law of digital economy under different consumption levels. The empirical results show that:(1) The digital economy can significantly promote the consumption of urban residents, but the impact on the consumption of rural residents is not significant;(2) For urban residents, the impact of the digital economy on different levels of consumption expenditure is in an inverted "U" shape, indicating that the development of the digital economy has a more obvious impact on residents with medium consumption expenditure.

**Keywords:** Digital Economy; Resident Consumption; Quantile Regression

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## 1. Introduction

Since the reform and opening up, although China has achieved rapid economic growth by virtue of its advantageous geographical location, resource endowments and demographic dividend, this extensive development has not only slowed economic growth due to the loss of demographic dividends and the increasingly complex international environment<sup>[1]</sup>, but also slowed the transformation of its industrial structure<sup>[2]</sup>. The people's needs for a better life and the unbalanced and inadequate development have become the main social contradictions. High-quality economic development is inseparable from the support of technological innovation. At present, the global digital wave is rising, and China's digital economy has maintained a rapid expansion. It is of great significance to promote the development of the digital economy.

At present, research on digital economy mainly focuses on two aspects. One is to enhance employability. The digital economy can not only provide new jobs through digital industrialization, but also increase the number of flexible employment through industrial digitalization. The second is to improve economic efficiency. Firstly, as a technological innovation, the digital economy can effectively improve TFP; secondly, the digital economy reduces production costs through economies of scope, economies of scale, and long tail effects<sup>[3]</sup>; finally, the digital economy uses digital technology to match supply and demand, forming a perfect price mechanism, thereby improving the economy Balance level. Resident consumption is an important livelihood topic, and there are few literatures on the relationship between the digital economy and it. Therefore, this paper draws on the existing results and tests the relationship between residential consumption and the digital economy by constructing a quantile regression model, trying to provide suggestions for the development of the digital economy from the perspective of residential consumption.

## 2. Research design

### 2.1 Theoretical mechanism

On the one hand, the digital economy increases the number of employees by creating job opportunities, improving the completion structure and improving employment methods. On the other hand, through continuous integration with the real economy, it promotes the transformation of the development model from "supply creates demand" to "demand guides supply". The increase in the number of employment can increase the disposable income of residents, and further increase the

consumption demand and spending power of residents. The digital transformation of the real economy can not only generate a service system with interactive functions based on data collection, analysis and push, and accurately match the diverse consumer needs of residents. Moreover, digital economy products have the characteristics of short production cycle, unlimited replication, and large supply flexibility, which can effectively support the cultural and entertainment industry to move toward the middle and high end, and effectively meet the diversified consumption needs of residents.

## 2.2 Data description and model construction

### 2.2.1 Variable selection and data description

(1) Explained variable: household consumption level (C). It is characterized by per capita consumption expenditure in urban and rural areas;(2) Explanatory variable: Digital Economy (DE). It is characterized by the comprehensive score of the digital economy calculated in the 《2020 China Internet + Digital Economy Index Report》; (3) Control variables: Control variables mainly involve three aspects: the level of economic development, fiscal policy, and technological innovation. Among them, the level of economic development is characterized by per capita GDP and the number of industrial enterprises above designated size, fiscal policies are characterized by government science and technology expenditures, and technological innovation is mainly characterized by R&D internal expenditures.

This paper excludes some cities with incomplete data and uses cross-sectional data from 203 prefecture-level cities for empirical research. The data mainly comes from the 《2020 China Internet + Digital Economy Index Report》 and the 《2020 China Statistical Yearbook》.

### 2.2.2 Model construction

Construct the following linear regression model to first test the impact of the digital economy on the consumption of urban and rural residents, and secondly test the changing law of the impact of the digital economy under different consumption levels.

$$C_{it} = \alpha_0 + \alpha_1 DE_{it} + \alpha_2 con_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Where  $C_{it}$  represents the consumption expenditure of urban and rural residents;  $DE_{it}$  represents the level of digital economy;  $con_{it}$  represents a series of control variables.

## 3. Empirical analysis

Because cross-sectional data is prone to heteroscedasticity, the null hypothesis was rejected at the 0.05 level by White test, indicating that the same square hypothesis was accepted. The results in Table 1 show that the digital economy has a significant impact on urban per capita consumption expenditure, but it has no significant impact on rural per capita consumption expenditure. Therefore, the 10%, 50%, and 90% quantiles are selected to represent the low, medium, and high levels of urban consumption expenditure respectively. Through quantile regression to further explore the influence of digital economy under different levels of urban per capita consumption expenditure

**Table1 OLS regression results**

| variable       | Urban residents | Rural residents |
|----------------|-----------------|-----------------|
| constant       | 0.597*          | 1.540*          |
| DE             | 0.098***        | 0.0766*         |
| con1           | 0.047**         | 0.029*          |
| con2           | 0.160**         | 0.746*          |
| con3           | -0.034          | 0.058**         |
| con4           | -0.022*         | -0.193          |
| R <sup>2</sup> | 0.817           | 0.535           |
| F              | 11.58***        | 2.99*           |

**Table2 Quantile regression results**

| variable       | Low level | Medium level | High level |
|----------------|-----------|--------------|------------|
| constant       | 0.482     | 0.665*       | 0.700*     |
| DE             | 0.101**   | 0.108**      | 0.043      |
| con1           | 0.0662    | 0.0828       | -0.0238    |
| con2           | 0.217**   | 0.158*       | 0.0387     |
| con3           | -0.0668   | -0.0442      | 0.0241     |
| con4           | 0.0035    | -0.0215      | 0.187      |
| R <sup>2</sup> | 0.743     | 0.673        | 0.794      |
| F              | 9.58***   | 7.15***      | 10.62***   |

Table2 shows that:(1)As the level of consumption expenditure increases, the regression coefficient shows a trend of first rising and then falling, indicating that the digital economy has an inverted U-shaped impact on the consumption of urban residents;(2) With the increase in consumption expenditure of urban residents, the regression coefficients of the control variables of GDP per capita and the number of industrial enterprises above designated size have changed from positive to negative, resulting in a crowding out effect; (3) The regression coefficient of government expenditure on science and technology and R&D internal expenditure varies from negative to positive, which shows that as the level of urban residents' consumption expenditure is higher, the demand for technological innovation is also stronger, which also reflects that technological innovation can improve the high consumer groups' consumption.

#### 4. Analysis conclusion

This article uses cross-sectional data from 203 cities in 2020 to empirically demonstrate the impact of the digital economy on urban and rural residents' consumption. The results show that : (1)The digital economy has a weaker impact on the consumption expenditure of rural residents. From the perspective of consumption level, the reason is that the disposable income of rural residents is low and the overall consumption desire is biased. From the perspective of consumption structure, the reason is that the consumption expenditure is concentrated on daily necessities. The impact of the digital economy on residents' consumption is not limited to basic living needs, but also involves culture, entertainment, education, and tourism. Therefore, the digital economy can better meet the diversified consumption needs of urban residents; (2) The digital economy has an inverted U-shaped impact on the consumption of urban residents. The reason is that the services and commodities involved in the digital economy are mainly the potential consumption targets of residents with moderate consumption expenditures. For high and low consumer groups, the level of disposable income weakens the impact of the digital economy. This also shows that urban residents with medium consumption expenditures will benefit from the development of the digital economy

#### References

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