

# *The Impact of Urbanisation on Household Consumption Levels: An Empirical Analysis Based on Provincial Panel Data from China*

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**Abstract.** This study employs panel data from 31 provinces (autonomous regions and municipalities) in China, spanning the years 2011 to 2024. Using urbanisation as the primary independent variable and per capita household consumption expenditure as the outcome variable, this study takes digital economic development as the core moderating variable, while regarding government intervention, fixed asset investment and openness to the outside world as control variables. In this way, it systematically examines the impact of urbanisation on household consumption levels and its underlying mechanisms. Using a panel data random-effects model, the empirical analysis reveals that the urbanisation rate significantly increases household consumption levels; the development level of the digital economy exerts a notably positive moderating function in the process whereby urbanisation affects household consumption; this indicates that the greater the development level of the digital economy, the more pronounced the boosting impact of urbanisation on consumption. The findings remain robust after reliability checks, covering endogeneity resolution and the exclusion of data pertaining to municipalities directly governed by the central government.

**Keywords:** urbanisation, household consumption levels, level of digital economic development

## 1. Introduction

Urbanisation serves as the core engine of modernisation and a key vehicle for expanding domestic demand. By 2024, China's urbanisation rate based on permanent residents had exceeded 66%, marking the formal entry of urbanisation into a phase of high-quality development centred on enhancing quality. In this phase, the focus of urbanisation has gradually shifted from the rural-urban migration of people to their all-round development, with issues such as urban renewal, the equalisation of public services and the development of digital infrastructure increasingly becoming the focus of policy attention. At the same time, as resident consumption serves as a fundamental driver of economic growth, the realisation of its potential is directly linked to the consolidation of the domestic economic cycle's central role. The advancement of urbanisation in some regions has not been matched by the provision of basic public services and the construction of digital

infrastructure. This limits the upgrading of residents' consumption structure and makes it difficult to fully transform the dividends from urbanisation into consumption power.

The 2025 Central Economic Work Conference proposed to promote urban renewal with high quality, and to make equalisation of public services and integration of the digital economy with the real economy important tasks of new urbanisation. This shows that high-quality development cannot be achieved by increasing the urbanisation rate alone, and how to improve the quality of urbanisation and rely on the digital economy to stimulate the consumption potential of the population is a realistic problem that needs to be solved at present.

In this context, an in-depth analysis of the impact of urbanisation on household consumption levels and an exploration of the moderating role of digital economic development in the relationship between the two are of great practical significance to the implementation of the strategy of expanding domestic demand and the promotion of the high-quality development of new urbanisation. Existing academic research has explored the impact of urbanisation on household consumption patterns, but the intervention role of the digital economy in this analysis has not been sufficiently explored in the existing literature.

Based on this, this paper empirically analyses the impact of urbanisation rate on household consumption levels and examines the role of the digital economy in this context, using panel data from 2011-2024 for 31 provincial-level administrative regions in China. The contributions and innovations of this study are mainly in three aspects: (1) The results of the study show that the urbanisation rate can significantly increase the level of household consumption, enriching the research results in the field related to urbanisation and residents' consumption. (2) The ability of the level of digital economic development to reinforce the positive effect of urbanisation rates on household consumption further deepens the theoretical understanding of the relationship. (3) The conclusions of this paper can provide a more targeted policy reference for expanding domestic demand in the new phase of relying on the digital economy.

## 2. Literature review

Most scholars recognise the positive impact of urbanisation on the level of household consumption, and previous studies have also shown that the orderly promotion of urbanisation can effectively promote the level of consumption of urban and rural residents [1]. Further testing through the Durbin spatial model reveals that both demographic urbanisation and social urbanisation significantly contribute to higher levels of household consumption, and that this effect is not only present locally but also positively affects neighbouring regions [2]. Some studies have also found that the relationship between urbanisation and consumption is more complex. In China, the relationship between urbanisation and household consumption levels tends to be N-shaped [3].

The rapid development of digital technology in recent years has provided new perspectives for studying the relationship between urbanisation and consumption. Scholars have begun to pay attention to the moderating role of the digital economy. It has been pointed out that building a virtuous circle between the digital economy and urbanisation can help promote the deep integration and coordinated development of urban and rural areas [4]. An empirical study of 280 cities in China from 2007-2019 shows that the development of the digital economy can unleash the impact of new urbanisation on household consumption [5].

### 3. Theoretical framework and research hypotheses

The impact of urbanisation on household consumption comes mainly from resource agglomeration effects. From the supply side, the supply of public services can increase the degree of agglomeration of high-tech industries [6]. After improving infrastructure and public services, the economies of scale created by population and industrial agglomeration have broadened consumption channels and innovated consumption patterns. This can cultivate new markets and new consumer demand, and promote a marked change in consumer preferences and consumption levels. From the demand side, population agglomeration brings sufficient labour and consumption demand [7]. Based on this, Hypothesis 1 is proposed.

H<sub>1</sub>: Urbanisation rate exhibits a notably positive association with household consumption levels.

The digital economy has an important moderating role in the process of urbanisation affecting household consumption. The rapid development of digital technology and the platform economy has had an increasing impact on consumption. The digital economy can effectively promote the upgrading of household consumption, increase overall consumption expenditure and shift household consumption from basic needs to developmental and enjoyment-oriented consumption [8]. Urbanisation level has a notably positive direct impact on the coupling coordination degree between the digital economy and common prosperity [4]; conversely, the emergence of the digital divide inhibits household consumption [9] and widens consumption disparities [10]. Therefore, the level of digital economic development may exert a positive moderating effect on the process by which urbanisation influences consumption. Accordingly, Hypothesis 2 is put forward.

H<sub>2</sub>: The greater the level of digital economic development, the more pronounced the boosting impact of urbanisation on consumption.

### 4. Empirical design

#### 4.1. Selection of variables

##### 4.1.1. Dependent variable

Level of household consumption (cons). As per capita household consumption expenditure is a key indicator of living standards and quality of life, it is used to measure the level of household consumption [11].

##### 4.1.2. Explanatory variables

Level of urbanisation (urban). The level of urbanisation is measured using the urbanisation rate [12], which is calculated by dividing the urban population by the permanent resident population.

##### 4.1.3. Moderator variables

The scale of digital economic advancement (dig). The development of digital economy is complex and fast-changing, using only a single indicator is not objective and comprehensive enough, and many scholars construct an indicator system to measure the level of digital economic development. In this paper, we measure the regional digital economy development from two dimensions, namely, Internet infrastructure construction and digital inclusive finance, and use principal component analysis to measure the annual digital economy development level of each province [13].

#### 4.1.4. Control variables

Some studies have shown that the more open a region is to the outside world, the higher the level of local household consumption usually is [14]. Government regulation to reduce the cost of consumer credit is effective in increasing the marginal propensity of households to consume, which in turn expands aggregate demand [15]. Fixed asset investment growth will directly drive the consumption of building materials, construction machinery and other means of production, while also creating jobs and raising residents' incomes, which in turn boosts final consumer demand [16]. Therefore, this paper controls for three variables in the model: the extent of external openness (trade), the degree of government intervention (gov), and the volume of fixed asset investment (fix).

#### 4.2. Model development

This paper constructs a fixed-effects panel data model and a moderation model incorporating interaction terms, which are used to test hypotheses H1 and H2 respectively.

$$cons_{it} = \alpha_0 + \beta_1 urban_{it} + \beta_2 dig_{it} + \beta_3 gov_{it} + \beta_4 fix_{it} + \beta_5 trade_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

$$cons_{it} = \alpha_0 + \beta_1 urban_{it} + \beta_2 inter_{it} + \beta_3 gov_{it} + \beta_4 fix_{it} + \beta_5 trade_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

In this context,  $cons_{it}$  represents the level of household consumption in a province during the period,  $urban_{it}$  represents the urbanisation rate in a province during the period, where  $gov_{it}$  denotes the extent of governmental intervention in the province during the period,  $fix_{it}$  denotes the level of fixed asset investment in the province during the period,  $trade_{it}$  denotes the extent of external openness in the province during the period,  $dig_{it}$  denotes the scale of digital economic advancement in the province during the period, and  $inter_{it}$  denotes the product of the urbanisation rate ( $urban_{it}$ ) and the scale of digital economic advancement ( $dig_{it}$ ) after decentralisation;  $\mu_i$  is the individual fixed influence, and  $\lambda_t$  is the time fixed effect. In Model 1,  $\varepsilon_{it}$  is the random error term.

If  $\beta_1$  in Model (1) is significantly positive, this confirms Hypothesis H1; if  $\beta_2$  in Model (2) is significantly positive, this confirms Hypothesis H2.

#### 4.3. Data notes

This research analyses China's 31 provincial-level administrative jurisdictions across the period spanning 2011 to 2024. Data on per capita consumer expenditure (cons) are sourced from the National Bureau of Statistics and the \*China Statistical Yearbook\*, data on the urbanisation rate (urban) and the degree of openness to the outside world (trade) are sourced from the \*China Statistical Yearbook\*, data on the scale of digital economic advancement (dig) are sourced from the National Bureau of Statistics, and data on fixed asset investment (fix) are sourced from the \*China Statistical Yearbook\*, the \*China Fixed Asset Investment Statistical Yearbook\* and the \*China Fixed Asset Investment Statistical Annual Report\*.

## 5. Empirical findings and analysis

### 5.1. Descriptive statistics

Table 1. Descriptive statistics

	count	mean	sd	min	max
cons	434	19072.244	8494.611	5063.000	52722.000
urban	434	0.602	0.129	0.227	0.899
dig	434	0.239	0.181	0.038	1.000
gov	434	0.279	0.201	0.105	1.379
fix	434	20367.979	16035.667	516.310	69501.312
trade	434	0.262	0.271	0.008	1.464
inter	434	0.017	0.039	-0.013	0.199

The table presents descriptive statistics for 434 samples: the mean value for household consumption (cons) is 19,072.244, with a standard deviation of 8,494.611, and significant inter-regional variation; the mean urbanisation rate (urban) is 0.602, with a relatively concentrated distribution; the mean level of digital economic development (dig) is 0.239, with fairly pronounced regional disparities; The values for the interaction term (inter) range from -0.013 to 0.199, providing a data foundation for testing moderating effects; amongst the control variables, fixed asset investment (fix) exhibits the greatest degree of fluctuation.

### 5.2. Correlation analysis

Table 2. Correlation analysis

	cons	urban	dig	gov	fix	trade
cons	1.000					
urban	0.854***	1.000				
dig	0.735***	0.743***	1.000			
gov	-0.303***	-0.504***	-0.256***	1.000		
fix	0.261***	0.146***	-0.006	-0.470***	1.000	
trade	0.620***	0.717***	0.835***	-0.311***	0.053	1.000

Correlation analysis indicates that household consumption (cons) is significantly positively correlated at the 1% significance level with the urbanisation rate (urban), the scale of digital economic advancement (dig), fixed asset investment (fix) and the extent of external openness (trade), with correlation coefficients of 0.854, 0.735, 0.261 and 0.620 respectively; it is significantly negatively correlated with government intervention (gov) (-0.303); Meanwhile, the urbanisation rate shows a strong positive correlation with the scale of digital economic advancement (0.743), and both are strongly correlated with the level of openness to the outside world. This provides preliminary validation of the direction of association between the variables and lays the foundation for subsequent regression analysis.

### 5.3. Regression against a benchmark

Column (1) of Table 3 presents the regression findings for Model (1), where the outcome variable is household consumption. It is evident that the estimated coefficient of the core independent variable—the urbanisation rate—remains significantly positive, suggesting urbanisation exerts a marked favourable influence on household consumption; advances in urban development have effectively lifted household consumption levels.

Table 3 Column (2) reports the regression results for Model (2). The coefficient of the interaction term is significantly positive, demonstrating that the development of the digital economy exerts a marked positive moderating influence on the association between urbanisation and consumption. In other words, with a rising urbanisation rate, the marginal boosting influence of the digital economy on consumption becomes further strengthened; digital economic advancement can effectively amplify the favourable impact of urbanisation on household consumption.

Table 3. Model results

	(1)	(2)
	cons	cons
urban	6.9e+04*** (9.4354)	8.4e+04*** (11.0169)
inter		1.3e+05*** (3.6329)
gov	-6.7e+03 (-1.3348)	-8.6e+03* (-1.8403)
fix	0.1397** (2.6377)	0.1021** (2.3868)
trade	-2.0e+04*** (-3.8011)	-1.8e+04*** (-4.4983)
dig	-1.9e+03 (-0.1698)	
_cons	-1.8e+04*** (-5.0250)	-2.9e+04*** (-5.4922)
N	434	434
r2_w	0.8366	0.8633

## 6. Robustness testing

### 6.1. Endogeneity tests

To mitigate potential issues of bidirectional causality and omitted variable bias, this paper employs an instrumental variables model to conduct robustness tests. Since the one-period lagged urbanisation rate is highly correlated with the current urbanisation rate but does not directly affect current household consumption, it satisfies the requirements of correlation and exogeneity for an instrumental variable. Therefore, this paper selects the one-period lagged urbanisation rate as the

instrumental variable and uses 2SLS to re-examine the impact of urbanisation on household consumption levels.

The regression results for Model (1) are shown in Columns (1) and (2) of Table 4. In the first stage regression, the coefficient proves significantly positive at the 1% statistical level, revealing a strong correlation between the instrumental variable and the endogenous urbanisation indicator. In the second-stage regression analysis, the estimated coefficient for urbanisation rate remains significantly positive at the 1% significance level. This aligns with the baseline regression outcomes, thereby confirming the robustness of urbanisation’s positive influence on household consumption patterns. The regression results for Model (2) are shown in Column (3) of Table 4. The interaction term registers a significantly positive coefficient at the 1% statistical level, signifying that the digital economy retains a robust positive moderating influence on the urbanisation-consumption nexus following endogeneity mitigation; the core conclusion is not affected by endogeneity.

Table 4. Endogenous test results

	(1)	(2)	(3)
	urban	cons	cons
urban		7.1e+04*** (20.2855)	8.7e+04*** (21.0782)
lurban	0.9190*** (55.7033)		
dig	0.0023 (0.4567)	-1.5e+03 (-0.2996)	
inter			1.4e+05*** (6.5675)
gov	0.0021 (0.2792)	-6.5e+03** (-2.1550)	-8.8e+03*** (-3.0534)
trade	0.0042 (1.0286)	-1.8e+04*** (-6.1599)	-1.6e+04*** (-5.4457)
fix	0.0000 (1.2246)	0.1510*** (5.7530)	0.1102*** (4.9493)
_cons	0.0565*** (6.2361)		
N	403	403	403
r2_w			

## 6.2. Exclude municipalities directly under the central government

Given the variations in city size and level of development, regional urbanisation levels and residents’ consumption behaviour may be affected. In China, the four centrally-administered municipalities—Beijing, Tianjin, Shanghai and Chongqing—boast advanced economic development alongside distinctive policy privileges. Consequently, residents’ consumption behaviour and preferences differ from those in other provinces and municipalities, which may influence the main conclusions of this paper. Accordingly, this study excludes samples from the four aforementioned

municipalities and re-estimates Formula (1); the corresponding outcomes for Models (1) and (2) are presented in Table 5.

It is evident that, following the exclusion of the municipality samples, the signs of the core variables remain highly consistent with those of the baseline regression: the positive direction of the effect of urbanisation on household consumption remains unchanged, and the direction of the impact of digital economic development on household consumption aligns with that of the baseline regression. the positive moderating effect of the digital economy on urbanisation remains significant; furthermore, the direction of influence of each control variable has not deviated markedly from the core findings, and the significance levels of the parameter estimates remain generally consistent with the baseline conclusions. This indicates that the findings of this study are not distorted by the inclusion of specific urban samples and possess strong robustness.

Table 5. Exclude results from municipalities directly under the central government

	(1)	(2)
	cons	cons
urban	7.3e+04*** (12.4082)	8.0e+04*** (9.7711)
inter		1.1e+05** (2.4443)
gov	-6.0e+03* (-1.7420)	-4.0e+03 (-0.8955)
fix	0.1607*** (3.1955)	0.1068** (2.1492)
trade	-3.3e+03 (-0.8897)	-5.4e+03 (-0.9366)
dig	-1.9e+04*** (-3.5188)	
_cons	-2.2e+04*** (-7.2153)	-2.9e+04*** (-5.7827)
N	378	378
r2_w	0.8981	0.9001

## 7. Conclusions and implications

Based on panel data covering 31 provincial administrative regions in China from 2011 to 2024, this study systematically explores how urbanisation affects household consumption levels and verifies the moderating influence of digital economic advancement within this correlation. This research confirms urbanisation exerts a marked positive influence on household consumption levels, while digital economic advancement plays a notable moderating role in the correlation between urban development and consumer spending. This suggests that in regions with a higher level of digital economic development, the stimulative effect of urbanisation on consumption is more pronounced. The digital economy amplifies the consumption-stimulating effects of urbanisation by optimising the consumption environment, enhancing the convenience of consumption, and expanding the boundaries of consumption.

This study offers the following insights. Firstly, deepening urbanisation efforts to unlock the potential of household consumption. We should adhere to the ‘people-centred’ approach to new-type urbanisation, placing greater emphasis on improving the quality of urbanisation whilst steadily increasing the urbanisation rate. Priority should be given to promoting coordinated progress in areas such as the equalisation of public services, urban regeneration and green, low-carbon development, thereby enhancing the capacity and appeal of towns and cities to support consumption, and effectively transforming the ‘urbanisation dividend’ into ‘consumption vitality’. Second, we should accelerate digital economy empowerment to strengthen urbanisation’s capacity to boost household consumption. Efforts should be made to expedite the deployment of digital infrastructure, promote the deep integration of digital technologies with the real economy, and increase the coverage of digital inclusive finance. We must fully leverage the amplifying role of the digital economy in reducing transaction costs, expanding consumption scenarios and optimising the consumer experience, thereby strengthening its positive regulatory function in promoting consumption through urbanisation.

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