

# Research on the impact of digital inclusive finance on new urbanization in Guangxi

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**Abstract:** *With the continuous improvement of urbanization speed in Guangxi, the new urbanization level of Guangxi is still at a low level in China. This paper takes 14 prefecture-level cities in Guangxi as the research object, collects the panel data from 2011 to 2019, uses the entropy method to measure and measure the new urbanization of Guangxi, and takes it as the explained variable, takes digital inclusive finance as the core explanatory variable, and conducts empirical analysis. This paper takes digital inclusive finance as the core explanatory variable and makes an empirical analysis. It concludes that digital inclusive finance can significantly promote the development of new urbanization in Guangxi. Second, optimize the service model of digital inclusive finance; Third, strengthen the integration of digital inclusive finance and rural economy to promote the development of rural economy; Fourth, strengthen the improvement of social security level and infrastructure construction. It is expected to provide reference for the development of new urbanization in Guangxi and help the construction of new urbanization in Guangxi.*

**Keywords:** *Digital inclusive finance; New urbanization; Guangxi*

## 1. Introduction

### 1.1. Research background

China has made great achievements in urbanization, but the development between urban and rural areas is not balanced. Due to the different topography, natural resources, population and other factors, as well as the imperfect fiscal and taxation systems and investment and financing systems, the capital constraint is a major problem in the process of urbanization development in Guangxi, and it is also a problem that needs to be solved in the process of urbanization development in all provinces in China.

In this context, the purpose of this study is to explore the enlightenment significance of the development of digital inclusive finance on the promotion of new urbanization in Guangxi, so as to provide targeted suggestions and measures for promoting the high-quality development of new urbanization in Guangxi.

### 1.2. Research significance

Digital inclusive finance plays an important role in the implementation of the rural revitalization strategy, the issues related to agriculture, rural areas and farmers, and the overall development of urban and rural areas. It brings a new development path and opportunity to the new urbanization.

#### 1.2.1. Theoretical significance

Theoretically, this study can provide useful supplement for the research on digital inclusive finance and new urbanization. This study will provide useful reference for the development of digital inclusive finance and new urbanization in China, and provide new ideas for Guangxi to promote new urbanization, which has important theoretical value.

#### 1.2.2. Practical significance

Digital inclusive finance is a major trend in China, mainly by promoting the development of digital inclusive finance, so as to promote the development of rural economy. This paper will further analyze the impact of digital inclusive finance on the level of new urbanization in Guangxi, hoping to further promote the construction and development of new urbanization in Guangxi, and provide more thinking

and updated perspective, which has its practical significance.

## 2. Literature review

### 2.1. Relevant research on digital inclusive finance

In terms of the value of digital inclusive finance, He Gang (2020) proposed that the innovative model of digital inclusive finance is to use Internet technology to provide low-cost, convenient, fast, safe and reliable financial financing<sup>[1]</sup> to vulnerable groups with insufficient financial services, such as farmers, small, medium and micro enterprises and low-income people. Gu Yu (2022) believed that compared with traditional inclusive finance, digital inclusive finance has more advantages in channels and data, which can play a positive role in promoting the financial financing of small and micro enterprises, and then promote innovation<sup>[2]</sup>.

In terms of measuring the level of digital inclusive finance, Guo Feng, Wang Jing et al. (2020) used the big data of Ant Financial accounts, and this index has been widely used<sup>[3]</sup> by many scholars engaged in the research of digital inclusive finance in China. Feng et al. (2021) constructed an index evaluation system for the development of digital inclusive finance in China's counties, proposed a method to measure the evaluation index score, and systematically reflected the development of digital inclusive finance in<sup>[4]</sup> these counties.

### 2.2. Related research on new urbanization

The new urbanization is based on urbanization. At present, the research on the new urbanization mainly focuses on the interpretation of its connotation and the measurement of its development level.

In terms of the interpretation of the connotation of the new urbanization, according to Peng Hongbian (2010), the strategic goal<sup>[5]</sup> of building a harmonious socialist society can only be achieved by taking the new urbanization path with Chinese characteristics and other paths suitable for China's development. According to Zhang Chunlong (2013), there are differences<sup>[6]</sup> between new urbanization and traditional urbanization. Dong Xiaofeng et al. (2017) argued that the connotation of new urbanization, and they summarized the essence<sup>[7]</sup> of new urbanization.

In terms of the measurement of the development level of new urbanization, two methods are commonly used to evaluate the development level of new urbanization: the main index method and the composite index method. Lyu Dan (2014) added the content<sup>[8]</sup> of public service equalization to the evaluation index system for the first time in the new urbanization development quality index system. LAN Qingxin (2017) constructed the evaluation index system<sup>[9]</sup> of the quality of new urbanization.

### 2.3. Relevant research on the impact of digital inclusive finance on new urbanization in Guangxi

At present, the academic research results on digital inclusive finance and Guangxi's new urbanization are still relatively scarce. Domestic and foreign literature focuses on the analysis of the role of digital inclusive finance in narrowing the income gap between urban and rural areas in China and the role in economic growth.

In terms of how the development of digital inclusive finance can narrow the urban-rural income gap, Li Na (2021) believes that digital inclusive finance has narrowed the urban-rural income gap<sup>[10]</sup>. According to Li et al. (2023), the development of digital inclusive finance can significantly reduce the urban-rural income gap<sup>[11]</sup> from the perspective of SME entrepreneurship.

In terms of how the development of digital inclusive finance can promote economic growth, Zhang et al. (2019) believed that digital finance is especially conducive to promoting the development<sup>[12]</sup> of entrepreneurial behavior of families with low physical capital or low social capital. According to Tang Yu et al. (2020), digital inclusive finance plays a role<sup>[13]</sup> in promoting inclusive economic growth in the western region. Yang Gang (2020) believed that digital inclusive finance and regional innovation significantly promoted economic growth<sup>[14]</sup>.

### 2.4. Literature review

In conclusion, the financial system can strongly support the development of urbanization, and the research conclusions show that the effect of digital inclusive finance is obvious. Therefore, based on the

existing research, this paper constructs a panel data model to explore the relationship between digital inclusive finance and new urbanization in Guangxi. □

### **3. Mechanism analysis**

#### ***3.1. Analysis of the direct effect mechanism of digital inclusive finance on new urbanization***

The new type of urbanization focuses on the improvement of "quality" and emphasizes the importance of considering urban and rural areas as a whole. There are multiple mechanisms for digital inclusive finance to directly affect the development of new urbanization, which are specifically reflected in the following aspects:

First, the development of digital inclusive finance can promote the development of small and micro enterprises, optimize the industrial structure, and promote economic urbanization. According to Yang et al. (2021), digital inclusive finance can be operated through three mechanisms, which can make digital inclusive finance more efficient in supporting small and micro enterprises, thus promoting their technological innovation and development<sup>[15]</sup>. Second, the development of digital inclusive finance can also guide the reasonable flow of funds, promote the access to public service carriers, and thus promote the development of social urbanization. Third, the development of digital inclusive finance can promote residents to enhance their awareness of green environmental protection, thus promoting the development of ecological urbanization. Fourth, the development of digital inclusive finance can improve the life of urban people and promote the urbanization of population.

Finally, digital inclusive finance can promote urban-rural integration and narrow the income gap between urban and rural areas. In view of the above points, H1 is proposed: digital inclusive finance can play a role in promoting the development level of new urbanization in Guangxi.

#### ***3.2. Analysis of the indirect effect mechanism of digital inclusive finance on new urbanization***

Digital inclusive finance also has an important indirect mechanism in the process of new urbanization, which is to promote the process of new urbanization by driving rural economic growth. This mechanism is based on the premise that digital inclusive finance directly promotes the rural economy. The mechanism of digital inclusive finance influencing the development of new urbanization is mainly reflected in three specific aspects, which are the direct promotion effect, the indirect promotion and promotion of urbanization process.

First, digital inclusive finance directly promotes the development of rural economy. Second, developing the rural economy can promote the new urbanization process. Third, digital inclusive finance indirectly promotes the development of rural economy, forming digital inclusive finance to promote the process of new urbanization and so on. In view of the above points, this paper puts forward research hypothesis H2: digital inclusive finance mainly promotes the development of new urbanization in Guangxi by promoting rural economic growth.

### **4. Measurement of new urbanization level in Guangxi Zhuang Autonomous Region**

#### ***4.1. The construction of new urbanization index system in Guangxi Zhuang Autonomous Region***

Based on the actual development of the new urbanization in Guangxi and the difficulty of obtaining the indicators of 14 prefecture-level cities in Guangxi, this paper selects a total of 18 indicators from five dimensions of economic urbanization, social urbanization, ecological urbanization, population urbanization and urban-rural integration to describe the development level of the new urbanization in Guangxi. The data are from Guangxi Statistical Yearbook and Guangxi Financial Yearbook.

#### ***4.2. The calculation of the new urbanization level in Guangxi Zhuang Autonomous Region***

##### ***4.2.1. The measurement results of the new urbanization level***

The entropy method is used to calculate the final score of the new urbanization level of 14 prefecture-level cities in Guangxi from 2011 to 2019. The results show that the new urbanization index of 14 prefecture-level cities in Guangxi from 2011 to 2019 is calculated by the entropy method. The results show that the new urbanization level of Nanning is the highest, followed by Guilin. The new urbanization

level of Guangxi shows a steady upward trend, but its overall level is not high, so it still needs to be strengthened.

## 5. Empirical study of digital inclusive finance on the development of new urbanization in Guangxi

### 5.1. Data source

This paper mainly selects the macro data of 14 prefecture-level cities in Guangxi from 2011 to 2019. The original data are selected from the Guangxi Statistical Yearbook and the statistical yearbooks of each city. The data of digital inclusive finance index are from the Research Center of Digital Finance of Peking University. The measurement software used for the empirical analysis in this paper is Stata16.

### 5.2. Variable description

#### 5.2.1. Explained variable

New urbanization (URB) is taken as the explained variable, and the data are calculated by entropy method. Based on the research of Chen Shulin (2022), this paper selects 18 indicators from five dimensions, including economic urbanization, social urbanization, ecological urbanization, population urbanization and urban-rural integration, and constructs an evaluation index system<sup>[16]</sup> for the development level of new urbanization in Guangxi.

#### 5.2.2. Core explanatory variables

This paper uses the digital inclusive Financial Index (DIF) to measure the financial development level, and uses the index to describe the development level of digital inclusive financial in Guangxi from 2011 to 2019. This paper uses the index to measure the index of digital inclusive finance, and the specific index construction and measurement method refer to the research<sup>[17]</sup> of Guo et al. (2020).

#### 5.2.3. Control variables

In order to eliminate the influence of omitted variables as much as possible, this paper draws on the research of Zhou Yu (2022) and selects five factors as the control variables<sup>[18]</sup> of the model. This paper uses per capita regional gross product (GDP) to measure the level of macroeconomic development, uses the ratio of the tertiary industry's added value to GDP (IND) to measure the industrial development, and uses the proportion of the insured number of urban basic medical insurance (INS) to the total population of the region to measure the level of social security. The total investment of foreign invested enterprises (TFI) is used to measure the level of foreign investment, and the urban ROAD area per capita (ROAD) is used to measure the level of infrastructure.

#### 5.2.4. Mediating variables

This paper uses rural economic growth as the mediating variable. Based on the study of Yin Zhaohui (2022), this paper selects rural economic growth as the mediating variable.<sup>[19]</sup>

### 5.3. Model design

In order to explore the actual impact of the development of digital inclusive finance on the new urbanization in Guangxi, the following model is constructed based on H1:

$$URB_{it} = \alpha_0 + \alpha_1 DIF_{it} + \alpha_2 GDP_{it} + \alpha_3 IND_{it} + \alpha_4 INS_{it} + \alpha_5 TFI_{it} + \alpha_6 ROAD_{it} + \varepsilon_{it} \quad (1)$$

### 5.4. Empirical research

#### 5.4.1. Analysis of regression results

After using Stata16 software to conduct empirical analysis on the annual panel data of 14 cities in Guangxi from 2011 to 2019, the regression results shown in Table 1 are obtained.

Table 1: Regression results of panel data model

	(1)	(2)
	No control variables are added	Control variable added
LnDFI	0.5149*** (5.5892)	0.5036*** (5.7713)
LnGDP		0.2940*** (3.4117)
LnIND		0.0485 (0.4825)
LnINS		0.0467* (1.8673)
LnTIF		0.0013 (0.1576)
LnROAD		0.1886*** (5.0124)
Intercept term	3.6912 (10.4523)	5.2068 (8.6520)
Area effect	Yes	Yes
Time effect	Yes	Yes
Sample size	126	126
Adjusting R	0.917	0.946

Note: \*\*\*, \*\* and \* represent significance at the levels of 1%, 5% and 10%, respectively; Values in parentheses are t-values.

To allow for the possibility that the data could be subject to heteroscedasticity, the data were taken in logarithms. According to the regression results in the above table, when no control variables are added, we can see that the coefficient of digital inclusive finance index is 0.5149, which is significant at the significance level of 1%, indicating that the development of digital inclusive finance has a promoting effect on the level of new urbanization in Guangxi.

After adding control variables, we can see that the impact of digital inclusive finance development on the new urbanization construction in Guangxi is still significantly positive, and the effect coefficient is 0.5036, indicating that for every 1 percentage point increase in the level of digital inclusive finance, the level of new urbanization construction will increase by 0.5036 percentage points.

In terms of control variables, the effect coefficient of macroeconomic development level (GDP) is 0.2940, which is significant at the level of 1%, indicating that the level of macroeconomic development has a significant role in promoting the new urbanization in Guangxi. One of the reasons for capital and population aggregation is the development of macroeconomy, which can promote economic urbanization and population urbanization. The development of macro economy can promote the development of new urbanization. The effect coefficient of social security level (INS) is 0.0467, which is significant at the level of 10%, indicating that the social security level has a significant role in promoting the development of new urbanization in Guangxi, because the equalization of public services will promote the development of social urbanization, thus promoting the development of new urbanization; The effect coefficient of infrastructure level (ROAD) is 0.1886, which is significant at the level of 1%, and it has a promoting effect on the new urbanization level of Guangxi. The effect coefficients of industrial development (IND) and foreign investment (TFI) are not significant, indicating that the two variables do not have a great impact on the level of new urbanization in Guangxi.

In summary, it is concluded that the development of digital inclusive finance can promote the construction of new urbanization in Guangxi.

### 5.5. Robustness analysis

This paper adopts the lagged explanatory variable method to test its robustness. The effect of digital inclusive finance on new urbanization in Guangxi may have a certain lag effect. In order to avoid the possibility of reverse causality in the data, the core explanatory variables are tested by lagged one and lagged two. The results are shown in Table 2. The regression coefficients of the core explanatory variables lagged one period and lagged two periods are significantly positive at the significance level of

1% and 5% respectively, which means the regression results are valid.

Table 2: Regression results of robustness test

	(1)	(2)
	LnURB	LnURB
LnGDP	0.356 ***	0.322 ***
	(0.055)	(0.085)
LnIND	0.247 ***	0.255 ***
	(0.067)	(0.086)
LnINS	0.025	0.029 *
	(0.017)	(0.016)
LnTFI	0.003	0.003
	(0.008)	(0.009)
LnROAD	0.232 ***	0.255 ***
	(0.038)	(0.038)
L.DIF	0.114 ***	
L.DIF	(0.027)	
L2.DIF		0.081 **
		(0.040)
cons	3.520 ***	3.345 ***
	(0.299)	(0.296)
Sample size	112	98
Adjusting R	0.922	0.913

Note: \*\*\*, \*\* and \* represent significance at the levels of 1%, 5% and 10%, respectively

### 5.6. Mediating effect analysis

In order to explore the mediating effect of rural economic growth, based on research hypothesis H2, rural economic growth is taken as the mediating variable, according to the mediating effect test method<sup>[20]</sup> proposed by Wen and Ye (2014). The following model is constructed:

$$URB_{it} = \alpha_0 + \alpha_1 DIF_{it} + \alpha_2 GDP_{it} + \alpha_3 IND_{it} + \alpha_4 INS_{it} + \alpha_5 TFI_{it} + \alpha_6 ROAD_{it} + \epsilon_{it} \quad (2)$$

$$RECO_{it} = \beta_0 + \beta_1 DIF_{it} + \beta_2 GDP_{it} + \beta_3 IND_{it} + \beta_4 INS_{it} + \beta_5 TFI_{it} + \beta_6 ROAD_{it} + \epsilon_{it} \quad (3)$$

$$URB_{it} = \gamma_0 + \gamma_1 DIF_{it} + \gamma_2 RECO_{it} + \gamma_3 GDP_{it} + \gamma_4 IND_{it} + \gamma_5 INS_{it} + \gamma_6 TFI_{it} + \gamma_7 ROAD_{it} + \epsilon_{it} \quad (4)$$

Where  $\alpha_0, \beta_0, \gamma_0$  is the intercept term, is the coefficient, and rural economic growth (RECO) is the mediating variable, which is measured by the added value of the primary industry.  $\alpha_1, \beta_1, \gamma_1$  Where, in Equation (2) is the total effect of digital inclusive finance development on new urbanization in Guangxi;  $\alpha_1$  In Equation (3) is the impact of digital inclusive finance development on rural economic growth;  $\beta_1$  In Equation (4), is the effect of rural economic growth on Guangxi's new urbanization, and is the direct effect of digital inclusive finance development on Guangxi's new urbanization.  $\gamma_2 \gamma_1$

This part refers to Wen et al. (2014) to test the mediating effect<sup>[20]</sup> of digital inclusive finance development on the new-type urbanization construction in Guangxi, and the results are shown in Table 3. First of all, according to the regression results of Column (1) in Table 3, the total effect of digital inclusive finance development on Guangxi's new urbanization is 0.180, which is significant at the significance level of 1%. Column (2) and column (3) show that the influence coefficients of digital inclusive finance on rural economic growth and rural economic growth on new urbanization are 0.081 and 0.201, respectively, which are significant at the significance level of 1% and 5%, respectively.  $\beta_1, \gamma_2$  The direct effect of the development of digital inclusive finance on the new urbanization in Guangxi is 0.164, which is significant at the significance level of 1%.  $\beta_1, \gamma_2$  Among them, the direct effect of rural economic growth is 0.164, the indirect effect is 0.016, and the mediating effect accounts for 8.89% of the total effect. The above empirical results further show that the development of digital inclusive finance can indeed support the construction of new urbanization in Guangxi by promoting rural economic growth.

Table 3: Test results of mediating effect

	(1)	(2)	(3)
	URB	RECO	URB
DIF	0.180 *** (0.024)	0.081 *** (0.024)	0.164 *** (0.025)
GDP	0.308 *** (0.048)	0.313 *** (0.049)	0.245 *** (0.056)
IND	0.252 *** (0.063)	0.281 *** (0.064)	0.195 *** (0.068)
INS	0.005 (0.016)	0.022 (0.017)	0.000 (0.016)
TFI	0.004 (0.009)	0.020 ** (0.009)	0.008 (0.009)
ROAD	0.236 *** (0.040)	0.057 (0.040)	0.225 *** (0.039)
RECO			0.201 ** (0.094)
Intercept term	4.085 *** (0.299)	12.421 *** (0.303)	6.586 *** (1.206)
Sample size	126	126	126
R2	0.941	0.873	0.943

Note: \*\*\*, \*\* and \* represent significance at the levels of 1%, 5% and 10%, respectively

## 6. Research conclusions and suggestions

### 6.1. Research conclusion

First of all, based on the data of 14 cities in Guangxi from 2011 to 2019, this chapter empirically tests the direct impact of digital inclusive finance development on new urbanization in Guangxi after controlling the influence of variables such as macroeconomic development level, industrial development status, social security level, foreign investment level and infrastructure level. Firstly, the development of digital inclusive finance plays a significant role in promoting the construction process of new urbanization in Guangxi. Secondly, digital inclusive finance can support the construction of new urbanization in Guangxi by promoting rural economic growth.

### 6.2. Countermeasures and suggestions

Based on the above research conclusions, this paper puts forward the following policy suggestions on how to promote the development of new urbanization in Guangxi through digital inclusive finance:

First, we should strengthen the development of digital inclusive finance and support the development of new urbanization in Guangxi. Second, we will optimize the service model of digital inclusive finance to improve service quality and efficiency. Third, strengthen the integration of digital inclusive finance and rural economy to promote the development of rural economy. Fourth, we will strengthen the improvement of social security and infrastructure construction to improve the level of urbanization.

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