

Research on the Development Level and Policy Innovation of Inclusive Finance in Fujian Province

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Abstract

This study takes the statistical data of Fujian Province from 2007 to 2016 as a sample to measure the development level of inclusive finance in Fujian Province, and then builds a model to measure and analyze the development level of inclusive finance. The results show that the development level of inclusive finance in Fujian is good, and overall there is certain synergy effect. However, there are significant differences in the development level of cities and towns. The level of urbanization and financialization rate are significantly positively related to the development of inclusive finance in Fujian Province.

Keywords

Fujian; inclusive finance; financial index, influencing factors; evaluation.

1. Introduction

After the United Nations put forward the concept of inclusive finance in the promotion of the "microfinance year" in 2005, scholars began to pay high attention to inclusive finance. In order to better measure the development level of inclusive finance, the International Monetary Fund (IMF), the World Bank (WB), the Global Partnership for Financial Inclusion (GPFI), and scholars from various countries have built a series of inclusive financial indicator systems. Instead of sticking to traditional research model, they have developed a variety of indicator dimensions to analyze. However, since inclusive finance is a financial concept with more levels and a wider scope than microcredit and microfinance, there is still much room for development. Compared with inclusive finance development status in China, the inclusive financial system at abroad starts earlier, the research is extensive and mature. In contrast, domestic research starts late, and the research of inclusive finance system is not deep enough, and the research focuses more on the connotation and development of inclusive finance. There is no relatively complete measurement system for the measurement methods of inclusive finance, and there are relatively few quantitative studies. Based on this, this paper gives the development data of Fujian inclusive finance from 2007 to 2016, and comprehensively measures and evaluates the financial development indicators of Fujian Province. Through empirical analysis, the author tries to explore the method of scientific evaluation of the development level of inclusive finance in Fujian Province and establish an indicator system to measure the inclusive finance of Fujian Province.

2. Measurement and Evaluation of the Development Level of Inclusive Finance in Fujian Province

2.1. Construction of the Inclusive Financial Index

2.1.1. Dimension Measurement and Indicator Selection

The Alliance of Financial Inclusion (AFI) conducts analysis and research on the selection of inclusive financial indicators based on different countries at the global level, and has produced a set of inclusive financial indicators. the Global Partnership for Financial Inclusion (GPFI)

proposed a new indicator system for measuring the development of digital financial services, including 19 categories and 35 indicators for the three dimensions, which covers the availability of financial services, conditions of use and product quality. After the investigation of the availability of inclusive financial services (FAS), the International Monetary Fund (IMF) evaluates the development of inclusive finance based on the characteristics of countries and regions from the perspective of the suppliers. The indicator system includes three categories, which includes financial service availability, financial services usage and comprehensive indicators, in total there are 242 indicators. After scholar Beck first measures the development level of inclusive finance in eight countries and regions by means of index measurement, scholars from various countries join the team to study the inclusive financial indicator system [1, 2]. For example, the most influential Indian scholar Sarma, who proposes Inclusive Financial Index (IFI) [3]. IFI mainly analyzes and evaluates from the three dimensions of financial service geographic penetration, financial product availability and financial product use efficiency, as well as further optimization and development of Arora and Gupte et al [4-7]. This paper mainly refers to Sarma's research. Under the three dimensions of financial service's geographical penetration, financial service availability and financial service usage, three dimensions and six indicators were constructed to measure and evaluate the development of inclusive finance in Fujian Province and various cities according to the correlation and availability of indicators. As shown in Table 1.

Table 1. Explanation of indicators

Dimension	Description of Indicator	Detailed indicator	Indicator description
Financial services penetration (A_1)	Geographic service penetration	Number of institutional outlets per 10,000 square kilometers	Financial institution outlets / 10,000 square kilometers d_1
	Population service availability	Number of financial institutions per 10,000 people	Financial institution network points / regional resident population d_2
Financial services availability (A_2)	Use of deposit and loan services	Average deposit balance	RMB deposit balance / area resident population d_3
		Average loan balance	RMB loan balance / area resident population d_4
Financial services use (A_3)	Efficient service	Average savings rate	Average deposit amount / regional average GDP d_5
		Per capita loan rate	Per capita loan amount / per capita regional GDP d_6

2.1.2. Calculation Method of Inclusive Financial Development Index

First of all is dimensionless processing. According to Sarma's linear efficacy function method, and combining with the actual socio-economic reality, this paper uses the nonlinear efficacy function to calculate. Here improved poor formula applied as follows:

$$A_i = \frac{x_i - \bar{M}_i}{\text{Max}_i - \text{Min}_i} \quad (1)$$

In this formula, x_i is the actual value of the i-th dimension. \bar{M}_i is the mean value of the i-th dimension. Max_i and Min_i are the maximum and minimum values in the i-th dimension respectively. A_i is the result of linear dimensionless processing of the actual measurement index. The higher the value, the higher the level of inclusive finance development.

Second, the weight is determined. The formula is as follows:

$$IFI = \sum_{i=1}^n w_i A_i \quad (2)$$

w_i represents the weight of the i-th dimension. $w_i \in [0,1]$, the closer w is to 1, the higher the proportion of this dimension in quantifying the degree of inclusive finance.

Finally is the construction of inclusive financial development index. The following method is used to calculate the comprehensive inclusive financial index, and the formula is as follows:

$$IFI = 1 - \frac{\sqrt{(1-A_1)^2 + (1-A_2)^2 + (1-A_3)^2 + \dots + (1-A_n)^2}}{n} \quad (3)$$

When $IFI \in (0,0.3)$, it represents low level of inclusive finance; when $IFI \in (0.3,0.5)$, it represents a medium-level inclusive finance; when $IFI \in (0.5,1)$, it represents the high level of inclusive finance.

2.2. Measurement and Evaluation of the Development Level of Inclusive Finance

According to the principle of the availability of indicator data, the data in this paper are all derived from the Fujian Statistical Yearbook, Fujian Provincial Regional Financial Operation Report, Fujian Provincial Financial Statistics Yearbook, and National Economy and Statistical Bulletin of Social Development of 9 municipal governments of Fujian Province. Fujian inclusive financial development index (as shown in Table 2).

Table 2. Fujian Inclusive Financial Development Index

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Average
Fuzhou	0.1519	0.1711	0.3027	0.3505	0.3557	0.4257	0.4940	0.5541	0.6740	0.7240	0.4204
Xiamen	0.2706	0.2684	0.4006	0.2975	0.3007	0.3491	0.4311	0.5037	0.6494	0.7107	0.4182
Putian	0.1244	0.1350	0.2416	0.3386	0.3735	0.4649	0.5602	0.6271	0.6625	0.6778	0.4206
Sanming	0.1357	0.1595	0.3524	0.3973	0.3884	0.5249	0.5734	0.5253	0.5423	0.5577	0.4157
Quanzhou	0.1212	0.1450	0.2546	0.3212	0.3662	0.4861	0.5731	0.6161	0.6689	0.6666	0.4219
Zhangzhou	0.1332	0.1654	0.2969	0.3649	0.3458	0.4304	0.5366	0.5936	0.6669	0.6778	0.4212
Nanping	0.0895	0.1240	0.3040	0.4341	0.4280	0.4801	0.5461	0.5598	0.6026	0.6283	0.4197
Longyan	0.1442	0.1557	0.2817	0.3213	0.3295	0.4654	0.5672	0.6027	0.6538	0.6751	0.4197
Ningde	0.0779	0.1594	0.3159	0.4202	0.4384	0.4998	0.5340	0.5529	0.5811	0.6013	0.4181
Fujian	0.1354	0.1541	0.2911	0.3493	0.3680	0.4484	0.5279	0.5758	0.6670	0.6995	0.4217

According to the data in Table 2, and from the overall point of view, we may conclude that the trend of Fujian inclusive financial development is constantly rising. Besides, it can be seen from Figure 1 that the development rate of Fujian inclusive finance has been further improved after 2012. The inclusive financial levels of all counties and cities also showed an upward trend,

especially from 2012 to 2015, the growth rate of inclusive financial development in various cities of Fujian Province increased rapidly. Here follows the reasons: First, after the global financial crisis in 2008, the global economy entered a recovery phase. Second, during the "Twelfth Five-Year Plan" period, the state paid attention to the infrastructure construction between urban and rural areas, and the country focused on development of inclusiveness since 2013, which has made the development level of inclusive finance abruptly increase. Among them, the development rate of inclusive finance in Xiamen from 2007 to 2009 was higher than that in other provinces. However, since 2010, the inclusive financial level of other provincial cities has gradually surpassed that of Xiamen, and the development speed has gradually accelerated. Afterwards, the development level of inclusive finance in various provinces and cities has stabilized. It can be seen that the development of inclusive finance in Fujian Province not only focuses on the improvement of development speed, but also pays great attention to regional coordinated development, which is in line with the essential requirements of inclusive finance. From the average value, Quanzhou City has the largest average value of inclusive financial development due to its unique geographical advantages and local government policy support. On the contrast, the territory of Sanming City is dominated by middle and low mountains and hills, which mainly engages in agriculture and forestry, and confronted with serious brain drain, plus the regional GDP is low, although the inclusive financial index has steadily increased with time, the average value is still the lowest; the development trend of inclusive finance in other cities is relatively close, with certain synergistic effects.

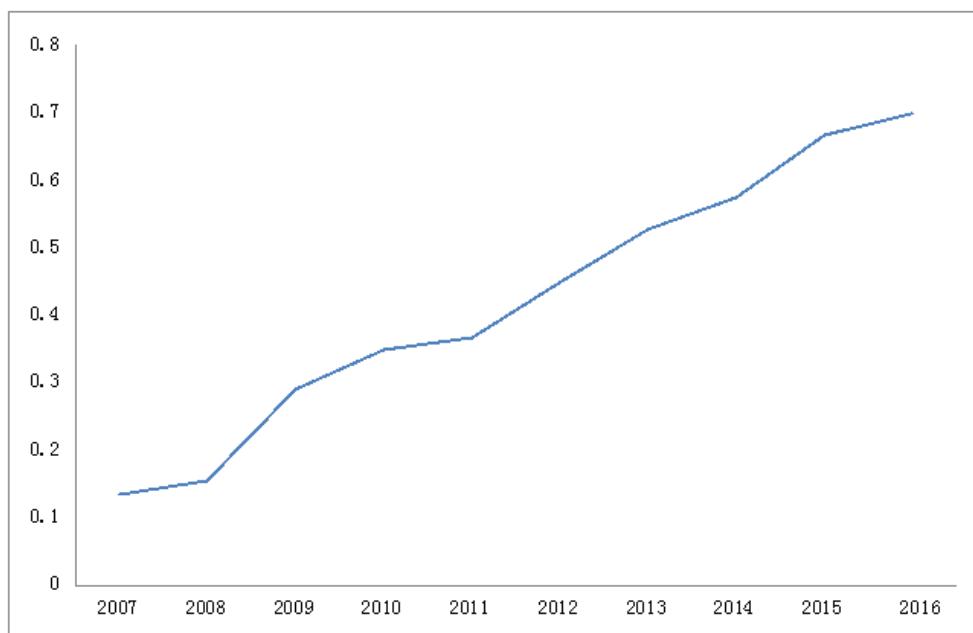


Figure 1. Fujian inclusive financial development level

3. Analysis of the Influencing Factors of the Development Level of Inclusive Finance in Fujian Province

3.1. Variable Selection and Data Source

This section selects one variable being explanatory and six explanatory variables that can best represent the factors affecting the development of Fujian inclusive financial development, in order to measure its impact on the development level of inclusive finance.

3.1.1. Variable Being Explanatory IFI

IFI can intuitively reflect the development level of regional inclusive finance, so the IFI of the nine cities calculated above is taken as variable being explanatory. The closer the value of IFI is to 1, the higher the level of inclusive financial development in the region.

3.1.2. Selection of Explanatory Variables

A. Financial rate (FR). The higher the degree of financialization, the broader the coverage of financial services accepted by the region and the better the quality. The development degree of inclusive finance is inseparable from the development degree of regional financial industry. Therefore, the financial development rate is used to examine the impact of regional financial development level on the development level of inclusive finance, this paper measures the proportion of financial industry's added value to GDP in various cities from 2007 to 2016.

B. Regional average GDP (AGDP). GDP reflects one of the important indicators of social and economic development in a country or region. The average GDP of a region is one of the indicators for measuring the living standards of a country or region. The higher the AGDP of a region, the better the economic level of the region, and the greater the willingness of the financial institution region to place financial resources in the region, the higher the likelihood that people will get financial services, thus promoting the development of local inclusive finance. This paper uses the ratio of GDP of Fujian Province to the total resident population in 2007-2016 to represent AGDP.

C. Urbanization(URB). URB is one of the measures of urban development level. The higher the URB, the better the social and economic development of the region, the more complete the infrastructure, and the better promotion effect on the development of inclusive finance. URB of this paper is expressed by the proportion of the population of the local cities and towns to the total population.

D. Highway mileage (HM). The transportation industry directly affects the speed of local economic development. HM reflects the convenience of transportation in the region, which directly affects the convenience of financial providers in providing services to financial consumers. Therefore, the use of HM represents a major influencing factor of social infrastructure for inclusive finance development, this article uses the mileage of highways.

E. Urban-rural income gap (URI). If the urban and rural income of a region is too large, it indicates that there is obvious financial exclusion in rural areas, which also indicates that the level of inclusive financial development in the region is not high. Therefore, URI affects the development level of inclusive finance. This paper uses the difference between the average disposable income of urban residents and the average net income of rural residents.

F. Government Regulation Policy (GP)

Relevant policies and implementation actions issued by the government have a great impact on the development of inclusive finance. For example, the Third Plenary Session of the 18th Central Committee will include "development of inclusive finance" into the ruling action plan. Since then, various local governments have introduced corresponding inclusive financial policies to develop inclusive finance. Therefore, the government policy is set as a dummy variable. The year value of the policy is set to 1, and the year without the policy value is 0.

The seven indicators of the calculation of the Inclusive Financial Index are derived from Fujian Statistical Yearbook, Fujian Provincial Regional Financial Operation Report, the National Economy and Statistical Bulletin of Social Development of local governments at all levels in Fujian Province, and China Banking Regulatory Commission Financial Permit Announcement, 630 data is included in total.

3.2. Model Construction

This paper uses the Panel Data model to analyze the impact of various factors. The panel model is as follows:

$$IFI_{it} = \beta_0 + \beta_1 FR_{it} + \beta_2 AGDP_{it} + \beta_3 URB_{it} + \beta_4 HM_{it} + \beta_5 URI_{it} + \beta_6 GP_{it} + \mu_{it} \quad (4)$$

In this model, IFI_{it} is independent variable, representing Fujian Province's inclusive financial development index. The subscript i indicates the observed individuals of different cross sections, here representing data of different cities; t represents a time series, ie a period; AGDP represents average GDP; URB represents the urbanization rate; FR represents the financial rate; HM represents Highway mileage; GP represents the government policy factor; URI represents the income gap between urban and rural residents.

3.3. Empirical Analysis

Before performing the empirical analysis, the panel root data is subjected to the unit root test and the Hausman test to avoid the existence of "pseudo-regression". According to the inspection analysis, the adjusted panel model is as follows:

$$IFI_{it} = \beta_0 + \beta_1 FR_{it} + \beta_2 AGDP_{it} + \beta_3 \ln URB_{it} + \beta_4 \ln HM_{it} + \beta_5 \ln URI_{it} + \beta_6 GP_{it} + \mu_{it} \quad (5)$$

In this model, the value of t is 1,2,3,4....10; β_0 represents a constant term; μ_{it} represents the error term; $\ln URB$, $\ln HM$ and $\ln URI$ are for logarithmic values.

The panel data is regressed, and the regression results are shown in Table 3 below. The R-squared value is 0.925, indicating that the adjusted panel model has good goodness of fit, and Prob (F-statistic) = 0 indicates that the fixed effect model is generally significant.

Table 3. Panel regression results

Variable	Coefficient	Standard error	T value	P value
FR	0.0092716*	0.0048504	1.91	0.060
AGDP	0.0308987*	0.0168009	1.84	0.070
lnURB	0.4046375**	0.1731662	2.34	0.022
lnHM	0.8384686***	0.2637644	3.18	0.002
lnURI	0.1339662	0.0822119	1.63	0.107
GP	-0.0016595	0.2355993	-0.06	0.948
_cons	-10.32934***	2.421822	-4.27	0.000
R-squared			0.925	
F-statistic			13.28	
Prob(F-statistic)			0.0000	

Note: ***, **, * indicate significant at the level of 1%, 5%, and 10%, respectively.

According to the regression results, the final regression is:

$$\begin{aligned} IFI_{it} = & -10.3293 + 0.0093 FR_{it} + 0.0309 AGDP_{it} + 0.4046 \ln URB_{it} + 0.8385 \ln HM_{it} \\ & + 0.1340 \ln URI_{it} - 0.0017 GP_{it} \end{aligned}$$

A. The following conclusions can be drawn:

The rate of financialization is significantly positively correlated with the development level of inclusive finance. The higher the degree of financial deepening, the greater the contribution of the financial industry to the gross national product. The more developed the financial services industry in the region, the higher the level of inclusive financial development in the region, and the financial needs of residents are more easily met.

B. AGDP is significantly positively correlated with the development of inclusive finance, which explains that the level of economic development represented by AGDP promotes the development of inclusive finance. From the actual situation, it can be seen that Fuzhou, Xiamen, Quanzhou, etc., which have better economic development, are higher than other cities' inclusive financial indices.

C. The urbanization rate is significantly positively correlated with the inclusive financial development index, which indicates that the higher the urbanization rate, the better the development of inclusive finance. The UR of Xiamen City and Quanzhou City is higher than that of other cities.

Highway mileage plays a key role in promoting the development of inclusive finance and is D. positively correlated. The number of kilometers represents the state of infrastructure construction in a region. To develop inclusive finance, it is necessary to open the "last mile" to give everyone the geographical possibility of obtaining financial services.

E. There is no obvious correlation between the income gap between urban and rural residents and policy factors and the development of inclusive finance. On the one hand, due to data processing reasons, the sample capacity is relatively small, and the regression analysis deviates from the actual situation; On the other hand, because of the changes in the income gap between urban and rural residents and the policy, there is not much impact on the inclusive finance of Fujian Province. The reason why the policy factor is not significant, maybe GP is a dummy variable and cannot be correlated in a short period of time.

4. Conclusions and Suggestions

Through the measurement and analysis of the development level of Fujian inclusive financial development from 2007 to 2016, this paper concludes that although the overall financial level of Fujian Province is improved, there are obvious regional differences. Through the panel model analysis, it is suggested that the economic development factors represented by AGDP, the financial development factors represented by the financialization rate, and the infrastructure factors represented by the urbanization rate and highway mileage are the main factors affecting the development of inclusive finance in Fujian Province. They all play a positive role, especially the positive correlation of infrastructure construction. Therefore, this paper proposes the following suggestions:

A. Strengthening the coordinated development of regional economy and build an inclusive financial system with multiple levels and wide coverage. Strengthening the linkage of regional economy, better optimizing the allocation of financial resources in the regional scope of Fujian Province, as well as eliminating the phenomenon of "financial saturation" and "financial scarcity". Reforming the financial structure of different regions, and continuously optimization of the financial structure can also produce regional economic radiation effects. The regions should be suitable for development according to the local conditions, and regions need to make the development of inclusive finance sustainable. Building a multi-level and wide-covering inclusive financial system on the basis of coordinated regional development. Moreover, mobilizing various banking institutions and other financial institutions, developing characteristic inclusive financial services, and intensifying the innovation of inclusive financial products to meet the needs of residents' financial services.

B. Gradually improve infrastructure construction and improve the financial ecological environment. Strengthening the construction of transportation facilities, and breaking the phenomenon of financial exclusion caused by geographical factors. Increasing investment in financial services and hardware facilities, especially in remote rural areas and areas with serious financial exclusion. Improving relevant laws and regulations, improving financial legal system and supervision system, plus strike the financial crimes. Improving the credit information system and reward and punishment mechanism, and continuously improving the financial environment ecosystem.

C. Developing the "Internet + Finance" model to promote the development of inclusive finance. Using Internet technology to develop corresponding Internet financial products for different service groups. establishing a modern digital financial system suitable for areas with weak Internet development, and carrying out Internet technology financial assistance; rationally building an Internet platform, and deepen urban and rural, online and offline Financial market, building a pluralistic modern inclusive financial system.

D. Breaking the urban-rural dual structure and continuously narrow the gap between urban and rural areas. Increasing farmers' economic income, expanding the source of economic income of farmers' groups; vigorously supporting the development of new rural financial institutions to meet different financial needs; accelerating the adjustment of rural economic structure, optimizing secondary and tertiary industries, and accelerating the development of financial services industry.

E. Continuously improving the education level of residents and strengthen the popularization of inclusive financial knowledge. Through education subsidies, accreditation, and continuing education, to increase the education penetration rate in all areas of Fujian Province; establishing long-term mechanism of publicizing inclusive financial knowledge through a series of activities such as financial knowledge into the countryside, into the community, into the campus, and multi-media methods; strengthening consumer awareness of consumer protection, and improving the financial consumer rights complaints system.

F. Strengthening government policy support and continuously providing positive incentive mechanism for inclusive financial development, including the policy guarantee and positive incentive mechanism of inclusive finance, giving policy inclination and financial resources input to the inferior financial vulnerable groups; monitoring and measuring the inclusive financial level, grasping the province's real-time financial status.

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References

- [1] Ricardo Bebczuk and Arturo Galindo. Financial Crisis and Sectoral Diversification of Argentine Banks, 1999-2004[J]. Applied Financial Economics,2008, (18): 199-211.
- [2] Beck, T. Demirguc-Kunt, A. Martinez Peria, M. S. Reaching Out: Access to and Use of Banking Services Across Countries [J]. Journal of Financial Economics, 2007, 85 (1):234-266.
- [3] Mandira Sarma, M. Index of Financial Inclusion[R]. Indian Council for Research on International Economics Relations, 2008.
- [4] Arora R U. Measuring Financial Access[J]. Griffith University, Discussion Paper in Economics, 2010, (7): 1-21.

- [5] Gupte R , Venkataramani B and Gupta D. Computation of Financial Inclusion index for India [J]. Procedia-Social and Behavioral Sciences, 2012, (37): 133-149.
- [6] Yan Xing. The Utility and Realization of Inclusive Finance: The Review and Enlightenment [J]. International Finance Research, 2015, (11): 24-36.
- [7] Xiaohong Yu, Wengao Lou, Xiurong Yu. Comprehensive Evaluation and Empirical Research on the Development Level of Inclusive Finance in China's Provinces [J]. Finance Forum, 2016, (05): 18-32.