

Empowerment of Digital Inclusive Finance and Development of Tourism Industry-Empirical Evidence from Prefecture-Level Cities



Minghui T.¹, Pu Z.²

^{1,2}Shenzhen Tourism College of Jinan University, China

ABSTRACT: Based on the panel data of 297 prefecture-level cities from 2011 to 2018, this paper uses fixed effect model to empirically analyze the relationship between digital inclusive finance and development of tourism industry. The results show that, First, digital inclusive finance has significantly promoted the development of tourism industry, and this promotion effect is more obvious in the inbound tourism market compared to the domestic tourism market. Second, dimensional heterogeneity analysis shows that the coverage and popularization of digital inclusive finance have improved the possibility of vulnerable groups obtaining tourism financial services. The deepening of its use has met the escalating demand of mainstream market for the tourism consumption, and lowered the financing difficulty for micro and small tourism enterprises. Third, the analysis of regional heterogeneity shows that the promotion of digital inclusive finance to tourism industry is only reflected in the eastern and western China. For the domestic tourism market, digital inclusive finance has produced stronger benefits in the east than in the west, while for the inbound tourism market, it shows the opposite conclusion.

KEYWORDS: Digital Inclusive Finance, Tourism Equity, Stratification of Consumption, SYS-GMM, Heterogeneity Analysis

I. INTRODUCTION

China's 14th Five-Year Plan for economic and social development pointed out that it is necessary to speed up the formation of a new pattern of economic development, where the internal circulation is the main body and the internal and external dual circulation promote each other. In order to fulfil the new mission of this era and adapt to the national development strategy, the tourism industry must persist in expanding domestic demand and further realize opening to the outside world (Song, 2021).

In terms of expanding domestic tourism consumption, it is necessary to conform to the consumption upgrading trend of the middle and high-yield classes and tap the consumption potential of the long tail market. The key to meet such demands is to improve the quality of supply. In this context, a feasible way is to promote digital inclusive finance. As early as 2005, the United Nations defined inclusive finance as: providing financial services to all members of society effectively and comprehensively at an affordable cost (Guo & Ding, 2015). At the G20 Summit in 2016, the concept of "digital inclusive finance" was put forward for the first time, "generally refers to all actions to promote inclusive finance through the use of digital financial services". Compared with the conventional finance system, digital inclusive finance enjoys the advantages of high efficiency, low threshold and wide coverage with the blessing of Internet, big data and other technologies, which can effectively reduce financial transaction costs and operational difficulties, promote financial information sharing, help improve the efficiency of financial services and the availability of financial services for vulnerable groups, and finally broaden consumption space. However, there is still few researches on whether the application of digital inclusive finance can promote the development of tourism industry by strengthening tourism financial support. In addition, it is still unknown how mainstream tourists and vulnerable group tourists benefit from this process respectively, whether inbound tourists are benefited, and whether there are differences in the impact of digital inclusive finance on tourism industry in different regions in China.

Therefore, it is very necessary to explore the empowerment of digital inclusive finance to the tourism industry, so as to achieve the mission of boosting the development of the tourism industry in the new era from the perspective of financial support.

II. THEORETICAL BASIS

Digital inclusive finance is the product of the combination of digital technologies such as the Internet and inclusive finance (Wang, Tan, & Zheng, 2020), which refers to the financial service system provided by Internet enterprises, based on digital information

Empowerment of Digital Inclusive Finance and Development of Tourism Industry-Empirical Evidence from Prefecture-Level Cities

technologies such as mobile Internet, cloud computing and big data, for a wide range of social strata and groups with great convenience, lower threshold and wider scope.

Academia has launched many useful explorations on the social effects of digital inclusive finance. Kapoor (2014) simulated the way India's future inclusive finance policy adapts to the changing economic development, pointing out that digital inclusive finance can promote economic development. Radcliffe and Voorhees (2012) found that digital inclusive finance can reduce payment costs, expand financial service channels and enhance accessibility, thus bringing considerable benefits to poor groups. It was also proved that digital inclusive finance can bring many benefits to users, digital finance providers as well as government and economic development (Sutherland & Jarrahi, 2018; Ozili, 2018). Xie, Wang, and Zhao (2020) pointed out that digital inclusive finance can promote rural residents' entrepreneurship by alleviating financial rejection, reducing service costs, improving financing efficiency and realizing financing complementarity. In a word, although the academic circles have demonstrated the great benefits of digital inclusive finance in poverty reduction, entrepreneurship, consumption and industrial upgrading, tourism industry has been rarely involved. At present, only Huang (2020) constructed a fixed effect model based on provincial panel data from 2011 to 2017 to prove the significant positive impact of digital inclusive finance and its coverage and depth of use on China's inbound tourism consumption market. However, the data show that in recent years, the scale of China's domestic tourism market is far ahead of the outbound tourism market and the inbound tourism market, and it is the absolute main body among the three major markets, shouldering the great mission of expanding domestic demand in the post-epidemic era (Song, 2021). Therefore, the domestic tourism market should also be taken into full consideration in the empirical study. According to the above analysis, this paper puts forward Hypothesis 1.

H1: The advantages of digital inclusive finance meet the demands of the mass tourism era and can promote the development of tourism industry, and this benefit can be reflected in both domestic and inbound tourism markets.

From the publisher's synthesis of the indexes of digital inclusive finance, it is found that the range of coverage and depth of use account for most of the weight of the indexes of digital inclusive finance (Guo, Wang, Wang, Kong, Zhang, & Cheng, 2020). Therefore, if the digital inclusive financial system can significantly promote the development of tourism industry, its range of coverage and depth of use will help to deeply analyze the formation mechanism of this causal relationship from multiple perspectives. Based on this, this paper puts forward Hypothesis 2.

H2: The range of coverage and depth of use of digital inclusive finance can promote the development of tourism industry.

At this stage, China's unbalanced and insufficient development is not only reflected in the significant differences in the development level of tourism industry in the eastern, central, western and northeastern regions, but also in the differences in the development level of digital inclusive finance in different regions. Therefore, we should investigate the differences in the impact of digital inclusive finance on tourism industry in different regions, so this paper puts forward Hypothesis 3.

H3: There is regional heterogeneity among the promotion of digital inclusive finance to the development of tourism industry.

III. METHODOLOGY

A. Measurement Model Design and Variable Definition

Combined with the above theory, this paper established a regression model to verify the impact of the development of digital inclusive finance on tourism industry. Since this paper uses panel data of prefecture-level cities, there are generally two estimation methods adopted in the estimation process: fixed effect model or random effect model. Therefore, Hausman test is first carried out in this study before selecting the model type (Hausman & Taylor, 1981). Random effect model has been adopted for the original hypothesis of this test, but the actual result of hypothesis test has significantly rejected the original hypothesis, so the fixed effect model has been selected. Based on the existing research, a panel linear regression model of digital inclusive finance development and development of tourism industry quality is constructed as follows:

$$\text{Tour}_{i,t} = \alpha_0 + \beta_1 \text{IFI}_{i,t} + \beta_2 \text{Control}_{i,t} + \sum \text{Year}_t + \sum \text{Province}_i + \varepsilon_{i,t} \quad (1)$$

Among them, $\text{Tour}_{i,t}$ is the response variable of the model, which represents the quality measurement index of development of tourism industry in the year i of the region t . In this paper, the annual domestic tourism income (tourin_dom), the number of domestic tourists (tournum_dom), the international tourism income (tourin_fore) and the number of inbound tourists (tournum_entry) of each prefecture-level city are used to measure the development quality of tourism industry (Song, 2016).

The core explanatory variable of the model is the digital inclusive finance Index, which is expressed by IFI. In this study, China's Digital Inclusive Finance Index released by the research group from the Institute of Digital Finance at Peking University is used to measure the development level of digital inclusive finance in various prefecture-level cities. And the research group has comprehensively measured the development of digital inclusive finance from the aspects of payment (payment) and credit (credit)

Empowerment of Digital Inclusive Finance and Development of Tourism Industry-Empirical Evidence from Prefecture-Level Cities

which are the subdivided indexes for measuring coverage range of digital inclusive finance (IFI1), and the use depth of digital inclusive finance (IFI2) (Guo et al., 2020). Therefore, this paper further selects these subordinate indexes as explanatory variables to carry out dimensional heterogeneity analysis, in order to comprehensively and deeply explore the impact of the development of digital inclusive finance on the tourism industry.

Control Indicates other control variables that may have impact on the tourism industry. Combined with the existing research, in order to avoid the endogenous issues caused by missing variables as much as possible, the control variables used in this paper include: scientific research fiscal expenditure (sciexp), which is used as an agent index of local science and technology level; road area (road), which is to measure local transportation conditions; size of the registered population (pop), reflecting the size of potential local tourists; number of broadband Internet access (inter), in the era of "Internet + Tourism", the higher the Internet coverage rate, the more perfect the tourism promotion conditions and intelligent tourism infrastructure (Hamid, Albahri, Alwan Jwan, Al-qaysi, Albahri, Zaidan, Alnoor, Alamoodi, & Zaidan, 2021); number of star-rated hotels (hotel), that star-rated hotels can provide comprehensive reception services based on accommodation, and the number is positively correlated with the local tourist reception capacity; government intervention (fisexp), that government intervention in the tourism market has direct and diverse characteristics. This paper uses the amount of fiscal expenditure to measure the degree of government intervention (Wang, 2011); per capita gross domestic product (pgdp), this paper introduces per capita GDP into the model to control the impact of economic development on tourism industry.

Year And Province represent the year effect and province effect of the city, which are also controlled in all models in this paper to eliminate the influence of time and regional factors on the development of digital inclusive finance. In order to eliminate the influence of extreme values of samples, this paper truncates all variables at quantiles of 99% and 1% during regression.

B. Data Sources and Descriptive Statistics

The data sources of this paper are as follows: the core explanatory variables are the prefecture-level city panel data of the digital inclusive finance indexes jointly compiled by the Institute of Digital Finance at Peking University and Ant Financial Services Group, with a time span from 2011 to 2018. The response variables and other control variables in this paper come from CEIC, China Economic Database. When matching the indexes of all prefecture-level cities and supplementing some missing data with interpolation method, this paper obtains the balanced panel data of tourism industry and digital inclusive finance development of 297 prefecture-level cities in China from 2011 to 2018.

In addition, in order to solve the problem of skewed distribution and heteroscedasticity of data and make the results better conform to the model assumptions, this study conducted batch logarithmic processing on all variables; In order to study the regional heterogeneity and reveal the differences in the impact of digital inclusive finance on tourism industry in different regions, 297 samples are categorized into four regions: eastern, central, western and north-eastern.

Table 1 reports descriptive statistics for all variables, including sample observations, mean values, standard deviations, maximum values and minimum values. It can be seen that there is a big gap in the reception of domestic and foreign tourists in the tourism industry, where the domestic market is relatively more prosperous and stable, but inbound reception can bring higher average income.

Table 1: Descriptive Statistics of Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Intourin_dom(Millions of RMB)	1905	9.843	1.147	4.868	13.230
Intournum_dom(Thousands of person-times)	1984	9.934	0.997	5.342	12.740
Intourin_fore(Millions of US dollars)	2018	3.487	2.331	-4.605	8.905
Intournum_entry(Thousands of person-times)	2051	4.342	2.113	-4.605	9.408
ln IFI	2372	4.929	0.519	2.834	5.714
ln IFI 1	2370	4.842	0.598	0.560	5.671
ln IFI 2	2372	4.911	0.526	1.456	5.786

Empowerment of Digital Inclusive Finance and Development of Tourism Industry-Empirical Evidence from Prefecture-Level Cities

Inpayment	2358	4.893	0.650	-3.912	6.077
Incredit	2354	4.620	0.571	-4.605	5.274
Insciexp(Millions of RMB)	2286	5.715	1.342	2.019	10.920
Inroad(Million square metres)	2259	2.465	0.969	-0.446	5.713
Inpop(Thousand person)	2324	8.133	0.878	-1.470	10.440
Ininter(Thousands of households)	2244	6.350	0.910	3.614	9.452
Inhotel(Home)	1814	3.394	0.823	0	6.420
Infisexp(Millions of RMB)	2368	10.180	0.747	7.426	13.630
Inpgdp(RMB)	2344	10.650	0.559	8.802	12.280

Source: Institute of Digital Finance at Peking University and China Economic Database.

IV. EMPIRICAL RESULTS

A. Regression of Reference Model

In this study, Stata16.0 software is used to estimate formula (1) with fixed effect model, and the regression results of reference model are obtained, as shown in Table 2.

Table 2: Regression Results of Reference Model

	Model 1	Model 2	Model 3	Model 4
variables	Intourin_dom	Intournum_dom	Intourin_fore	Intournum_entry
In IFI	0.549*** (0.144)	0.607*** (0.119)	1.093*** (0.375)	1.047*** (0.360)
Insciexp	0.095*** (0.025)	0.078*** (0.020)	0.229*** (0.066)	0.165*** (0.063)
Inroad	0.085*** (0.027)	0.113*** (0.022)	0.154** (0.070)	0.087 (0.067)
Inpop	0.082 (0.051)	0.155*** (0.042)	-0.895*** (0.134)	-0.969*** (0.131)
Ininter	0.215*** (0.045)	0.146*** (0.036)	0.713*** (0.115)	0.706*** (0.109)
Inhotel	0.503*** (0.026)	0.355*** (0.022)	1.153*** (0.068)	1.051*** (0.064)
Infisexp	-0.041 (0.066)	-0.083 (0.054)	0.104 (0.173)	0.296* (0.170)
Inpgdp	0.141*** (0.052)	0.057 (0.043)	-0.415*** (0.141)	-0.416*** (0.133)
Year effect	Yes	Yes	Yes	Yes
Province effect	Yes	Yes	Yes	Yes
Observations	1,398	1,420	1,435	1,455
R ²	0.824	0.844	0.748	0.701

Source: using Stata16 Author's analysis.0.*** p<0.01, ** p<0.05, * p<0.1.

In terms of domestic tourism, Models 1 and 2 show the multiple regression estimation results of digital inclusive finance on the number of domestic tourists and tourism income. It can be found that the estimated coefficient of digital inclusive finance development for domestic tourism income is 0.549, and that for domestic tourism number is 0.607, both of which are significant

Empowerment of Digital Inclusive Finance and Development of Tourism Industry-Empirical Evidence from Prefecture-Level Cities

at the level of 1%. It can be concluded that there is a significant positive correlation between digital inclusive finance and domestic tourist reception in the tourism industry. This estimation result partially verifies Hypothesis 1 proposed in this study. Among other control variables, the impact of per capita GDP on domestic tourism income is significantly positive, indicating that economic development can effectively promote tourism consumption; The bigger registered population, the more tourists; The estimated coefficients of road area, numbers of Internet broadband access and star hotels are also highly significantly positive, indicating that the stronger the accessibility of a city's tourism destination, the more complete the tourism development and reception facilities, and the more prosperous its industrial development. The estimated coefficient of scientific research fiscal expenditure is significantly positive, reflecting the increasing driving role of science and technology in the process of tourism development. Model 3 and Model 4 respectively show the specific effects of the development of digital inclusive finance on outbound tourism revenue and inbound tourist number. Among them, estimation coefficients of inclusive finance for outbound tourism income and inbound tourist number are 1.093 and 1.047 respectively, which are also significant at the level of 1%. This positive promotion effect has significant statistical and economic significance. So far, Hypothesis 1 has been fully verified. At the same time, compared to the impact on the domestic market, the development of digital inclusive finance has played a more significant role in promoting the tourism behavior of inbound tourists. This shows the problems during the Chinese 13th Five-Year Plan period, such as weak growth in inbound tourism, serious and continuously expanding scissors gap in inbound and outbound tourism (Song, 2021), which can be improved by vigorously promoting the development of digital inclusive finance and improving inbound financial support.

B. Impact Analysis of Digital Inclusive Finance Based on Different Dimensions

In this part, this paper takes the four indexes of tourism industry as the response variables, selects the range of coverage, depth of use, as well as payment and credit indexes under the dimension, strength of application, as the core explanatory variables, to conduct regression analysis with fixed effect model.

In terms of the coverage range of digital inclusive finance, the four models in Table 3 report the regression estimation results from such dimension and various indexes of the tourism industry, showing that the coverage of digital inclusive finance has a significant positive role in promoting both the domestic tourism market and the inbound tourism market. The wider the coverage of digital inclusive finance, the more beneficial it is to the development of the tourism industry. This result partially verifies Hypothesis 2 proposed above. It can be seen combining with the measurement method of coverage range that, Because the Internet can transcend the limitations of space, the publisher uses the number of inclusive financial service software accounts owned by every 10,000 people, the proportion of bank card users and the average number of cards tied to each account to specifically measure the coverage range of local inclusive finance (Guo et al., 2020), which shows the way digital inclusive finance reaches users in each city and highlights its popularity advantage over conventional physical financial outlets. And it is this popularity advantage that increases the possibility of vulnerable groups who were originally excluded from tourism financial support accessing financial service channels, so that they have the right to enjoy tourism financial services equally, and can conveniently use functions such as tourism payment, tourism credit and tourism insurance through the Internet, further releasing the tourism consumption potential.

Table 3: Regression Results of Relationship between Coverage Range and Development of Tourism Industry

	Model 1	Model 2	Model 3	Model 4
variables	Intourin_dom	Intournum_dom	Intourin_fore	Intournum_entry
ln IFI 1	0.270*** (0.083)	0.301*** (0.069)	0.543** (0.216)	0.523** (0.207)
Control variables	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
Province effect	Yes	Yes	Yes	Yes
Observations	1,399	1,423	1,436	1,456
R ²	0.824	0.844	0.749	0.701

Source: Author's analysis using Stata16.0. *** p<0.01, ** p<0.05, * p<0.1.

As for the use depth of digital inclusive finance, Table 4 shows that the depth of use has a significant positive effect at the level of 1% on the tourism industry in various indexes, indicating that the range of coverage of digital inclusive finance and the depth of use have strongly promoted the development of the tourism industry, which is completely consistent with Hypothesis 2 proposed

Empowerment of Digital Inclusive Finance and Development of Tourism Industry-Empirical Evidence from Prefecture-Level Cities

in this paper. At the same time, the pulling effect of use depth on inbound tourism market is obviously stronger than that of domestic tourism market, which shows that after nearly ten years of development, the domestic tourism market has deeply enjoyed the convenience dividend brought by digital inclusive finance. However, due to reasons including payment habits, unfamiliar operation, worries about privacy and safety, incompatibility of domestic and foreign financial mechanisms, etc. (Wang, 2019), inbound tourists have not much benefited from domestic financial services, which will lead to richer marginal benefits and more promising consumption growth by providing inclusive financial services for inbound tourists.

Table 4: Regression Results of Relationship between Use Depth and Development of Tourism Industry

	Model 1	Model 2	Model 3	Model 4
variables	<i>Intourin_dom</i>	<i>Intournum_dom</i>	<i>Intourin_fore</i>	<i>Intournum_entry</i>
ln IFI 2	0.485*** (0.113)	0.437*** (0.094)	1.004*** (0.295)	1.107*** (0.283)
Control variables	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
Province effect	Yes	Yes	Yes	Yes
Observations	1,392	1,416	1,429	1,450
R ²	0.827	0.847	0.749	0.703

Source: Author's analysis using Stata16.0. *** p<0.01, ** p<0.05, * p<0.1.

Table 5-6 reports the regression estimation results of payment business and credit business. These subdivided indexes measure the actual use of digital inclusive finance business, and the statistical scope of credit business includes not only personal consumption loans, but also loans of micro and small operators. The estimated results of payment business and credit business are similar to that of the use depth, which significantly promotes the development of tourism industry. From the perspective of tourism consumers, first of all, they can enjoy the advantages of low risks, less restrictions and less value-added services when using Internet financial payment services; Secondly, due to the change of concept, the proportion of tourists using consumer credit is increasing day by day, and inclusive finance services just meet the urgent needs of the mass tourism era (Hu, 2014). For micro and small tourism enterprises, they have to cope with financing difficulties caused by long supply chain and large seasonal fluctuations in their operation process. Factoring services and small loan services provided by Internet platforms can effectively reduce financing costs and relieve the financial pressure of such enterprises, thus improving the comprehensive tourism service capability on the supply side (Sun, Bai, Hua, & Zhang, 2017).

Table 5: Results of Regression Relationship between Payment Business and Development of Tourism Industry

	Model 1	Model 2	Model 3	Model 4
variables	<i>Intourin_dom</i>	<i>Intournum_dom</i>	<i>Intourin_fore</i>	<i>Intournum_entry</i>
<i>lnpayment</i>	0.227*** (0.066)	0.194*** (0.054)	0.307* (0.172)	0.338** (0.165)
Control variables	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
Province effect	Yes	Yes	Yes	Yes
Observations	1,408	1,433	1,449	1,470
R ²	0.827	0.846	0.750	0.703

Source: Author's analysis using Stata16.0. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Regression Results of Relationship between Credit Business and Development of Tourism Industry

	Model 1	Model 2	Model 3	Model 4
variables	<i>Intourin_dom</i>	<i>Intournum_dom</i>	<i>Intourin_fore</i>	<i>Intournum_entry</i>
<i>lncredit</i>	0.067** (0.030)	0.068*** (0.025)	0.138* (0.078)	0.177** (0.075)
Control variables	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
Province effect	Yes	Yes	Yes	Yes

Empowerment of Digital Inclusive Finance and Development of Tourism Industry-Empirical Evidence from Prefecture-Level Cities

Observations	1,408	1,433	1,449	1,470
R ²	0.827	0.846	0.750	0.702

Source: Author's analysis using Stata16.0. *** p<0.01, ** p<0.05, * p<0.1.

C. Discussion on Regional Heterogeneity

In this part, the four measurement indexes of the tourism industry are taken as the response variables, the digital inclusive finance development index is taken as the core explanatory variable, and the control variable of reference model regression is still taken. The fixed effect model is used to analyze the impact of digital inclusive finance on tourism industry in different spatial ranges. The estimation results in the four major economic regions can be seen intuitively from Table 7. Among them, digital inclusive finance continues to play a significant role in promoting the development of tourism industry in the eastern and western regions, but has no significant impact in the central and northeast regions, which is consistent with the regional heterogeneity hypothesis proposed in this paper.

Table 7: Regional Regression Results of the Impact of Digital Inclusive Finance on Tourism

	Eastern			
Dependent variable type	<i>Intourin_dom</i>	<i>Intournum_dom</i>	<i>Intourin_fore</i>	<i>Intournum_entry</i>
<i>ln IFI</i>	0.937*** (0.289)	0.616** (0.241)	1.625*** (0.626)	1.416** (0.589)
	Western			
Dependent variable type	<i>Intourin_dom</i>	<i>Intournum_dom</i>	<i>Intourin_fore</i>	<i>Intournum_entry</i>
<i>ln IFI</i>	0.531** (0.257)	0.670*** (0.212)	2.900*** (0.852)	2.224*** (0.834)
	Central			
Dependent variable type	<i>Intourin_dom</i>	<i>Intournum_dom</i>	<i>Intourin_fore</i>	<i>Intournum_entry</i>
<i>ln IFI</i>	-0.171 (0.263)	0.309 (0.218)	-0.501 (0.690)	-0.221 (0.644)
	Northeast China			
Dependent variable type	<i>Intourin_dom</i>	<i>Intournum_dom</i>	<i>Intourin_fore</i>	<i>Intournum_entry</i>
<i>ln IFI</i>	0.070 (0.617)	0.010 (0.524)	-1.401 (1.384)	0.372 (1.381)

Source: Author's analysis using Stata16.0. *** p<0.01, ** p<0.05, * p<0.1.

In the domestic tourism market, the estimation coefficient in the eastern region is generally higher than that in the western region. The reason may be that the eastern region has complete Internet financial facilities and convenient third-party payment; many tourism enterprises and destinations themselves have the ability to provide a variety of Internet tourism financial services, thus cultivating higher customer stickiness and making local customers have higher acceptance of the use of digital financial services during their travel. However, the conventional financial service system is relatively backward in the western region. Digital inclusive finance just partially makes up for the disadvantage of insufficient availability of financial services for tourists and enhances tourists' willingness to consume, except that the coordination between local tourism destinations and Internet finance is poor and it is difficult to meet the effective demand. Therefore, it has a weak promotion effect on the tourism industry. In terms of inbound tourism market, the estimation coefficients of the eastern and western regions are higher than those of the domestic tourism market in the same region, which is consistent with the previous research conclusions. However, the impact of digital inclusive finance on inbound tourists in the western region is more significant, indicating that inbound tourists show stronger dependence on it with fewer conventional financial outlets. Digital inclusive finance is expected to become one of the driving forces for improving the reception of inbound tourism in the western region.

D. Robustness Test and Endogenousness Treatment

Reverse causality may occur when exploring the impact of digital inclusive finance on tourism industry. In recent years, the integration development trend of finance and tourism is obvious, which is manifested in the fact that besides the one-way support

Empowerment of Digital Inclusive Finance and Development of Tourism Industry-Empirical Evidence from Prefecture-Level Cities

of the former to the latter, the huge demand of tourism industry also plays a positive feedback role on the development of finance (Hu, 2015). For example, more and more Internet tourism enterprises launch various financial service products and carry out financial innovation according to the big data of tourists. In view of this, this paper chooses to build a dynamic panel model and adopt the system GMM estimation method (SYS-GMM) to alleviate the bias caused by reverse causality. This method is widely used because of its advantages in overcoming the weak instrumental variable problem existing in differential GMM (Blundell & Bond, 1998). Specifically, this paper fixes the response variable as domestic tourism income $tourin_dom_{i,t}$, and adds its delayed value to the explanatory variable, and obtains the model as follows:

$$tourin_dom_{i,t} = \alpha_0 + \beta_1 tourin_dom_{i,t-1} + \beta_2 IFI_{i,t} + \beta_3 Control_{i,t} + \sum Year_t + \varepsilon_{i,t} \quad (2)$$

Table 8 reports the system GMM estimation results when the digital inclusive financial indexes and its two subordinate dimensions are used as independent variables respectively (the variables are logarithmic). The results of AR (1) test and AR (2) test show that there is no second-order sequence correlation in the disturbance term of the model. In the Hansen test, P value is between 0.1 and 0.25, accepting the "zero hypothesis of "all instrumental variables are exogenous", and there is no P value expansion, which indicates the test result is fairly good. Therefore, under the condition of reasonable model design, the estimation coefficients of each explanatory variable are significantly positive, which once again confirms the positive role of digital inclusive finance in promoting the development of tourism industry.

Table 8: Robustness Test Results

Variable	System GMM (1)	System GMM (2)	System GMM (3)
	Intourin_dom	Intourin_dom	Intourin_dom
L. Intourin_dom	0.852*** (0.062)	0.859*** (0.057)	0.808*** (0.070)
ln IFI	0.516*** (0.186)		
ln IFI1		0.245** (0.123)	
ln IFI2			0.531*** (0.179)
Control variables	Yes	Yes	Yes
Time effect	Yes	Yes	Yes
AR (1) test	0.000	0.000	0.000
AR (2) test	0.313	0.274	0.414
Hansen test	0.106	0.121	0.186
Observations	1,1'4	1,154	1,154
Number of cities	264	264	264

Source: Author's analysis using Stata16.0. *** p<0.01, ** p<0.05, * p<0.1.

V. CONCLUSIONS

The conclusions of this paper are as follows:

Firstly, digital inclusive finance has significantly promoted the development of tourism industry, which is reflected in its positive impact on the number of domestic and foreign tourists and domestic and foreign tourism income. According to the conclusion of use depth, it is found that the development of digital inclusive finance has a more powerful and positive effect on the tourism behaviour of inbound tourists compared with the domestic tourism market. Secondly, from the perspective of dimensional heterogeneity analysis, the range of coverage and depth of use of digital inclusive finance also have promoting benefits for the development of tourism industry. The extension of coverage range means that the possibility of vulnerable groups obtaining tourism financial services increases, which enhances their confidence in tourism consumption. The deepening of use depth not only better meets the escalating tourism consumption demand of mainstream groups, but also reduces the financing difficulty and capital cost of micro and small tourism enterprises from the supply side. Thirdly, the impact of digital inclusive finance on tourism industry is also heterogeneous in four different economic and geographical regions of China, and the significant positive impact is only reflected in the eastern and western regions. For the domestic tourism market, digital inclusive finance has produced

Empowerment of Digital Inclusive Finance and Development of Tourism Industry-Empirical Evidence from Prefecture-Level Cities

stronger benefits in the east than in the west; On the contrary, for the inbound tourism market, the marginal income brought by digital inclusive finance to the tourism industry in the west, where there are fewer conventional financial outlets, is higher than that in the east, which is expected to become a great boost to the income increase of tourism in the west.

According to the research conclusion of this paper, the following suggestions can be put forward: the first is to further promote the deep integration and development of digital inclusive finance and tourism industry, build a tourism digital inclusive finance system, to achieve the supply side structural reform of tourism finance. The second is to further eliminate the doubts of inbound tourism consumers about using inclusive finance services, and better tap the potential of inbound consumption. Thirdly, in view of the financing difficulties and high capital cost of micro and small tourism enterprises, relevant authorities should introduce corresponding systems to encourage service providers of digital inclusive finance to provide more convenient financing conditions and achieve efficient financing. At last, the leading eastern region should make tourists fully enjoy the convenience of digital inclusive finance and optimize their travel experience; the backward western region can use digital inclusive finance to create more inbound reception benefits when enhancing the availability of financial services, to accelerate the narrowing of regional developmental differences.

FUNDING

This research received funding from Culture, Arts Planning scientifically and Tourism Research Project of Hebei Province (HB20-YB121), Research on the Promotion of Cultural Tourism Brand Construction in Zhangjiakou by hosting the Winter Olympic Games.

REFERENCES

- 1) Blundell R., & Bond S. (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, (1).
- 2) Guo, T., & Ding, X. (2015). International comparative study of inclusive finance-based on the perspective of banking services. *Studies of International Finance*, (02), 55-64. doi:10.16475/j.cnki.1006-1029.2015.02.006.
- 3) Guo, F., Wang, J., Wang, F., Kong, T., Zhang, X., & Cheng, Z. (2020). Measuring the development of digital inclusive finance in China: index compilation and spatial characteristics. *China Economic Quarterly*, 19 (04), 1401-1418.
- 4) Hausman J.A., & Taylor W.E. (1981). Panel data and unobservable individual effects. *North-Holland*, 16(1).
- 5) Hu, F. (2014). Typical model and trend prospect of personal tourism payment. *Ecological Economy*, 30 (03), 163-167.
- 6) Hu, F. (2015). Accelerating the integration of finance and tourism during the 13th Five-Year Plan period. *Tourism Tribune*, 30 (04), 6-8.
- 7) Huang, W. (2020). Analysis of the impact of digital inclusive finance on the growth of inbound tourism consumption. *Journal of Commercial Economics*, (12), 165-168.
- 8) Hamid R.A., Albahri A.S., Alwan J.K., Al-qaysi Z.T., Albahri O.S., Zaidan A.A., Alnoor A., Alamoodi A.H., & Zaidan B.B. (2021). How smart is e-tourism? A systematic review of smart tourism recommendation system applying data management. *Computer Science Review*, 39.
- 9) Kapoor A. (2014). Financial inclusion and the future of the Indian economy. *Futures*, (56), 35-42.
- 10) Ozili, P. (2018). Impact of Digital Finance on Financial Inclusion and Stability. *Borsa Istanbul Review*, 18(12), 329-340.
- 11) Radcliffe, D., & Voorhies, R. (2012). A digital pathway to financial inclusion. *SSRN Electronic Journal*, (11), 1-17.
- 12) Song, C. (2016). Construction of tourism development quality evaluation index system and index compilation method. *Statistics & Decision*, (05), 39-42.
- 13) Sun, Y., Bai, B., Hua, B., & Zhang, S. (2017). Research on the financing ability of tourism enterprises under the background of "Internet plus tourism + finance". *Finance and communications* (20), 11-17+129. doi:10.16144/j.cnki.issn1002-8072.2017.20.003.
- 14) Sutherland, W., & Jarrahi, M.H. (2018). The Sharing Economy and Digital Platforms: A Review and Research Agenda. *International Journal of Information Management*, 43(12), 328-341.
- 15) Song, R. (2021). Thoughts and directions of promoting tourism consumption in the new economic development pattern. *Tourism Tribune*, 36 (01), 3-5.
- 16) Wang, J. (2011). Fiscal policy choices to promote tourism development. *Journal of Central University of Finance & Economics*, (06), 11-16. Doi: CNKI: SUN: ZYCY.0.2011-06-004.
- 17) Wang, J. (2019). International collaboration of Internet Finance in international tourism trade. *Social scientist* (07), 80-85 doi: CNKI: SUN: SHKJ.0.2019-07-012.

Empowerment of Digital Inclusive Finance and Development of Tourism Industry-Empirical Evidence from Prefecture-Level Cities

- 18) Wang, Y., Tan, Z., & Zheng, L. (2020). Research on the impact of digital inclusive finance on social security. *The Journal of Quantitative & Technical Economics*, 37 (07), 92-112.
- 19) Xie, W., Wang, T., & Zhao, X. (2020). Does Digital Inclusive Finance Promote Coastal Rural Entrepreneurship?. *Journal of Coastal Research*, 103(sp1).