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Research paper

Does tourism promote economic growth in Chinese ethnic minority areas? A nonlinear perspective

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ABSTRACT

Although the importance of tourism in the economic development of ethnic minority areas has been emphasized in previous research, little is known about its exact economic effects on these areas. Using panel data of 75 Chinese ethnic autonomous counties from 2007 to 2016, this paper empirically examines and quantifies the impact of tourism development on economic growth based on a threshold model. The empirical results indicate that tourism has a significant nonlinear effect on the economic growth in Chinese ethnic minority areas. Furthermore, tourism's contribution to economic growth tends to decrease along with increasing tourism specialization. In addition, the practical implications of this work are provided.

1. Introduction

Most countries in the world are multiethnic states (Doyle, 1998), where ethnic issues are either serious or intractable (Onwuzuruigbo, 2010). Ethnic conflicts could greatly threaten domestic stability (Bertrand, 2008; Roychoudhury, 2015). In addition to religious and cultural factors, economic factors are mostly responsible for ethnic conflicts (Onwuzuruigbo, 2010; Steinberg & Saideman, 2008). Politicians and scholars should therefore attach great importance to economic growth in ethnic minority areas for the sake of social stability and unity.

China is a united multiethnic country, with 56 ethnic groups, and the Han ethnic group is the largest of the 56 ethnic groups. According to the latest Chinese population census in 2010, the Han ethnic group composes approximately 91.51% of the national population; the remaining groups hence combined constitute approximately 8.49% of the Chinese people. In terms of the population size, the other 55 ethnic groups are therefore customarily identified as 'ethnic minorities'. National minorities are scattered across two-thirds of China, but they are mainly concentrated in the border and remote areas in northwestern and southwestern China, which are of strategic importance to national unity. There are major differences between the locations where the majority and minority populations have inhabited for a long time. Most Han people live on the plains of eastern and central China, while only one-fifth of minorities dwell at an altitude comparable to that of the plain (Gustafsson & Shi, 2003). Instead, the border areas where a great amount of the minority population is concentrated are mostly mountainous. Owing to the remoteness of these areas and the mountainous environment, the ethnic minority areas have low levels of transportation infrastructure and industrial development (Yang, Wall, & Smith, 2008). Their economies mainly depend on farming and stock-breeding, which generally have low benefits and create little added value. Although China has experienced rapid economic development for decades, the levels of the economic development in areas across the country still exhibit large differences. The statistics reported by the National Ethnic Affairs Commission of the People's Republic of China (NEAC) reveal that the average GDP per capita in ethnic minority areas was much lower than the national average in 2018, as it was only two-thirds of the national figure. Due to the unbalanced economic development between Han majority areas and ethnic minority regions, it is difficult for the central government to build a harmonious community of shared futures for all ethnic people in the modern world, and ethnic tensions, conflicts and even wars between the majority and the minority are more likely to occur. Promoting the economic growth of ethnic minority areas is a fundamental way to resolve the issues related to the ethnic minorities (Steinberg & Saideman, 2008).

The Chinese government has implemented a series of preferential policies for ethnic minorities and adopted a great variety of measures to achieve economic prosperity and unity among ethnic groups. Among these measures, tourism has been utilized in many ethnic minority areas as a tool for economic and social development since China's reform and opening up. The main reason is that tourism is considered to be well adapted for ethnic minority areas because it makes full use of the

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conditions that make these minorities impoverished. Ethnic minority-inhabited areas possess cultural characteristics (Latip, Rasoolimanesh, Jaafar, Marzuki, & Umar, 2018) and an authentic natural environment (Phommavong & Sörensson, 2014) that seem to fascinate most tourists (Carr, Ruhanen, & Whitford, 2016; Sun, Wang, & Ma, 2018). For instance, in the case of the Kanas scenic site located in the Xinjiang autonomous region, Yang, Ryan, and Zhang (2013) argued that Tuva and their Kazakh neighbors make the scenic resort more attractive to Han tourists by contributing to building an aesthetic and exotic tourism atmosphere. The particular cultural capital in ethnic minority regions can be transformed into economic profit in the tourism context (Trupp, 2014). Moreover, as an environmentally friendly and labor-intensive industry, tourism has the advantages of low environmental impact (Hall & Lew, 2009), high industrial correlation (Zhang, 2018) and great employment promotion (Croes & Vanegas, 2008), which has been suggested to be an important driving force of modern economic growth (Cárdenas-Garcia, Sanchez-Rivero, & Pulido-Fernandez, 2015). The government therefore plans to develop tourism in ethnic minority areas into a strategic pillar industry to quicken the pace of economic growth to match relatively more developed regions and thereby narrow the gap between them.

The voluminous empirical literature has investigated the impact of tourism on economic development using various econometric methods such as time series models (Balaguer & Cantavella-Jordá, 2002), panel models (Caglayan, Sak, & Karymshakov, 2012), and cross-sectional models (Po & Huang, 2008). Most of these works support the tourism-led growth hypothesis (TLGH) based on the country (Tugcu, 2014) or provincial level (Li, Goh, Zhang Qiu, & Meng, 2015). In China, however, the circumstance (e.g. the policy environment) of tourism development and the economic growth mechanism between ethnic minority areas and nonethnic minority areas differ greatly (Zhu & He, 2019). The system of autonomy of ethnic regions, which is supported by the Constitution of the People's Republic of China, enables ethnic minorities to have extensive autonomous power in governing the local affairs of their ethnic groups and to fully employ their regional advantages. Consequently, this policy stimulates the socioeconomic development in ethnic minority areas. Some scholars have nevertheless argued that the autonomy and minority rights granted to minorities may create 'reverse discrimination' against the Han (Wu & He, 2018). These rights could hence impact tourism's development in ethnic minority areas since the host attitudes toward tourists, who are mainly from the Han nationality, are vital to tourism expansion. In addition, if the regional autonomy system is not implemented properly, ethnic minorities may focus exclusively on the interests of their own people: the minority areas will then experience a high degree of local protectionism. This pattern is contrary to the development of a market economy with the characteristics of openness and competitiveness. Once the local protectionism in ethnic minority areas is overly developed, people from nonethnic Chinese areas will encounter trade barriers when trying to trade with minorities. The result would be a prohibitively higher interregional transaction cost and damage to trade volumes for ethnic minority areas (Gao & Long, 2014). The potential negative impact of the ethnic autonomy system could be a serious hindrance to tourism development in minority areas where most of the production factors have to be imported due to the backward economy. It must therefore be asked whether tourism promotes economic growth in Chinese ethnic minority areas. This question remains to be fully examined. As suggested by Lin, Yang, and Li (2019), future efforts should probe the possible nonlinear features that may exist in the tourism-economic nexus. To the best of the authors' knowledge, the effect of tourism on the economic growth in Chinese ethnic minority areas has not yet been empirically examined in the current research. The lack of studies on the exact assessment of the economic impact of tourism on these areas does not help the policy-makers achieve high-quality development of the tourism industry in such regions.

To quantify the impact of tourism on the economic growth in Chinese ethnic minority areas, the research presented here selects the ethnic autonomous counties as this empirical study samples and employs a nonlinear perspective to explore the relationship between tourism and economic growth. One of the reasons for sampling at county level is that the county is the most basic administrative unit in China and all the counties in the sample are from the same economic, political system within a single country, so that the influence of tourism on economic growth in Chinese ethnic minority areas can be analyzed more effectively. In addition, as reported by the National Ethnic Affairs Commission, the combined minority population of all 120 Chinese ethnic autonomous counties accounts for 70% of the total population in the autonomous areas inhabited by ethnic groups. Hence, using samples consisting of county-level ethnic autonomous regions will produce very representative results. Furthermore, a nonlinear impact on economic growth caused by tourism development could represent the reality of ethnic minority areas.

The rest of this paper is structured in the following way. Section 2 conducts a review of the topics of both the tourism-economic growth nexus and the economic influence of tourism in ethnic areas. Section 3 presents the research methodology, and Section 4 reports the empirical results and develops a discussion. The final part of the research offers some conclusions and implications.

2. Literature review

In the literature review section, this study thoroughly reviews the literature about the tourism-economic growth nexus. Then, the research on the economic influence of tourism with respect to ethnic areas is discussed.

2.1. Tourism-economic growth nexus

Because of the potential of the tourism industry to generate employment opportunities, increase the foreign exchange income, create tax revenue, and stimulate consumption (Balaguer & Cantavella-Jordá, 2002; Croes & Vanegas, 2008; Dogru & Bulut, 2018; Dogru, Sirakaya-Turk, & Crouch, 2017; Karimi, 2018; Paramati, Alam, & Chen., 2017; Smeral, 2015; Sokhanvar, Çiftçioğlu, & Javid, 2018), tourism has long been regarded as a pathway to boosting economic growth (Shih & Do, 2016). Hence, there has been a thorough discussion of the tourism and economic growth nexus; in particular, empirical tests using cointegration techniques and causality analysis are widely employed to examine whether tourism can positively contribute to economic growth (Brida, Punzo, & Risso, 2011; Croes & Vanegas, 2008; Durbarry, 2004; Fahimi, Akadiri, Seraj, & Akadiri, 2018; Lee & Brahmasrene, 2013; Shahbaz, Kumar, Ivanov, & Loganathan, 2017; Tang & Tan, 2015). Based on the abundant existing literature, the TLGH proposed by Balaguer and Cantavella-Jordá (2002) has been empirically supported in many cases. This hypothesis implies that the development of tourism can positively stimulate economic growth, and it has been verified in extensive empirical research areas either at the country or provincial level: for instance, followers of Balaguer and Cantavella-Jordá (2002), such as Akinboade and Braimoh (2010), Chen and Chiuo-Wei (2009), Durbarry (2004), Hye and Khan (2013), Kreishan (2011), Lee (2008), Matahir and Tang (2017), Sokhanvar et al. (2018) and Tang and Tan (2015), have supported the validity of the TLGH by using a single economy's time series data. Furthermore, through cross-country data, Chiu and Yeh (2017), Figini and Vici (2010), Parrilla, Font, and Nadal (2007), and Po and Huang (2008) also present strong evidence for the TLGH. Bilen, Yilanci, and Eryüzlü (2017), Caglayan et al. (2012), Chingarande and Saayman (2018), Dogru and Bulut (2018), Lee and Chang (2008), Tugcu (2014), and Zaman, Shahbaz, Loganathan, and Raza (2016) obtained results showing that tourism can strengthen economic growth with country panel data.

Similar conclusions have been reached using provincial data (Deng, Ma, & Shao, 2014; Li et al., 2015; Trang, Duc, & Dung, 2014). For

example, Li et al. (2015) selected 19 provinces of inland China and 12 provinces of coastal China to empirically examine the impact of tourism development on regional economic growth, and their results reveal that tourism exerts a stronger influence on economic growth in inland China than in coastal China. Although the extensive literature pertaining to the TLGH exists at the country or provincial level, the county-level examinations have been limited. This limitation has been especially strong in the context of Chinese ethnic minority areas, though tourism plays an important role in the economic development of these areas. Additionally, whereas the positive effect of tourism on economic growth is widely recognized in the short term, the dynamic interactions between tourism development and economic growth have not been fully addressed in the long term, which has led to a disregard of the economic law of returns. Whether economies specializing in tourism can sustain long-term growth thus remains an issue requiring further study.

With the thorough investigation of the nexus between tourism and economic growth, some negative consequences of tourism development, such as the Dutch disease (Chen, Lai, & Chu, 2016; Forsyth, Dwyer, & Spurr, 2014; Inchausti-Sintes, 2015; Pham, Jago, Spurr, & Marshall, 2015) and the resource curse (Deng et al., 2014; Ghalia & Fidrmuc, 2018), have also caused great damage to the economy. Recently scholars have therefore reached a consensus that one size does not fit all: in other words, the economic effect of tourism will change under different circumstances (Chiu & Yeh, 2017; Zuo & Huang, 2018). Following this train of thought, scholars have begun to explore the nonlinear effect of tourism on economic growth. By employing tourism specialization (measured by the ratio of the international tourism receipts to the GDP) as the threshold variable, Po and Huang (2008) have pioneered investigations of the nonlinear relationship between tourism and economic growth. These authors found that while tourism has a significantly positive impact on economic growth in the case of a tourism specialization degree below 4.0488% or above 4.7337%, this positive relationship is not significant when the tourism specialization degree is in the range between 4.0488% and 4.7337%. Using IV estimation of a panel threshold model, Chang, Khamkaew, and Mcaleer (2012) confirmed the positive impact of international tourism on economic growth, but the impact is higher when the tourism specialization is in the low regime. Wu, Liu, Hsiao, and Huang (2016) also checked the TLGH by employing the real interest rate as a threshold variable. Chiu and Yeh (2017) applied three different metrics of tourism specialization as threshold variables, namely, the tourism receipts ratio, tourist ratio, and travel services ratio, to illuminate the role of tourism in 84 countries' economic growth from a nonlinear perspective. The results indicate that regardless of which threshold variable is used, a notable positive relativity between tourism and economic development only exists in Regime 2 (when the degree of tourism specialization surpasses the threshold value). Otherwise, the relationship is not significant or is negative. Using the SYS-GMM (system generalized method of moments) method, Zuo and Huang (2018) found that an inverted-U-shaped or N-shaped relationship exists between the tourism specialization and economic growth in mainland China. As outlined above, tourism development has a varying effect on economic growth, which is in line with the basic economic law of returns.

2.2. The economic impact of tourism in ethnic areas

Tourism is employed to facilitate the economic development of many ethnic areas where development options are limited (Yang, 2013) because of the geographic characteristics, historical factors, cultural factors and so on (Xie, 2010; Zhu & He, 2019). As the tourism market has become increasingly mature in the postmodern tourism era, tourism operators have striven to diversify their commodities while responding to the needs of some customers for authentic experiences of minority cultures and traditions (Loukaitou-Sideris & Soureli, 2012). Tourism appears to be a good option for economic development in ethnic areas from both the demand and supply sides. However, the view of the economic impact of tourism in ethnic areas has not yet reached a consensus among academics; this view can be roughly examined by splitting the impact into two parts: the positive part and the negative part. For the positive impact, most researchers state that the ethnicity and authenticity are important factors in attracting tourists (Chen, 2000; Xie, 2010; Zhuang, Taylor, Beirman, & Darcy, 2017) who are in pursuit of exotic experiences (Loukaitou-Sideris & Soureli, 2012). These factors can bolster the spending by tourists through their eating in ethnic restaurants, lodging in family inns or hotels, purchasing locally made souvenirs or handicrafts, enjoying ethnic dance shows, or other such activities (Ishii, 2012; Kunasekaran et al., 2017; Xie, 2010; Yang, 2013). All of these activities can help to generate employment opportunities for local residents (Carr et al., 2016) and improve their family income and living standards (Yang & Wall, 2009). Motivated by the economic benefits, the ethnic communities that have developed tourism may promote the 'relocalization' of ethnic cultures through ethnic arts, religious ceremonies, traditional festivals, and craft production (Adams, 2003; Markwick, 2001; Theerapappisit, 2009), thereby assisting in the protection of threatened minority heritage and ethnic culture (Henderson, 2003). As the cultural exoticism is the primary attraction for most of the tourists, the revitalization of minority cultures can contribute to the continued economic profit induced by tourism (Yang, 2013). Additionally, the ethnic identity may be strengthened among the local people through pride in their local culture (Henderson, 2003; Swain, 1990). In this case, more people would like to be involved in local tourism development and utilize their ethnicity to generate income and foreign exchanges.

The negative economic impact induced by tourism in ethnic areas has also, however, been observed in studies. Using the methods of interviews, surveys, and informal discussions in the Xishuangbanna Dai autonomous prefecture of Yunnan province in China, Yang and Wall (2009) suggested that a small number of minority people recognize tourism may increase the prices of local goods. Latip et al. (2018) found that in addition to the positive economic impact, tourism development may also cause an increased living cost, higher property prices and rising property taxes, which adversely affect the economic development in the indigenous community. Adopting the generalized least squares estimate method, Zhu and He (2019) tested the effect of tourism on human capital in ethnic areas and found that tourism expansion has a negative impact on the human capital of these areas. As Coria and Calfucura (2012) argued, the weakness of human capital often places community members in a poverty trap, which in turn hampers the sustainable development of the local economy. Apart from these considerations, the challenges of utilizing cultural assets as the main tourism attractions to develop the economies of ethnic areas should not be neglected. In the context of modernization, tourism can lead to cultural commodification. As Cohen (1988) pointed out, because the commodification process involves the erosion of ethnicity and authenticity of cultures, it results in 'delocalization'. Sun et al. (2018) claimed that whether the impact of tourism causes 'delocalization' or 'relocalization' depends on the extent of tourism development in ethnic areas. If the tourism developmental level is relatively low, tourism plays an important role in 'relocalization', thus, it can generate sufficient revenues for local communities. Otherwise, 'delocalization' sets in and the reconstructed authenticity dubbed by Robinson (1999) emerges to lead tourists' consumption. This pattern would nevertheless be contrary to the desire of some tourists for authentic or genuine experiences; thus, the economic impact of tourism is limited. In addition, with the expansion of tourism and cultural commodification, foreign capital flows into the ethnic tourism market, which leads to the showcasing of marginalized cultures in a way that is mainly beneficial to outsiders rather than to host communities (Robinson, 1999).

In summary, there are still some gaps that have been identified in the literature. Although current research has intensively investigated the tourism-economic growth nexus from a linear perspective, articles that analyze the nonlinear nexus are scarce, though the latter phenomenon is

more accordant with economic laws. The economic impacts of tourism in ethnic areas are mainly examined by using qualitative methods include fieldwork, interviews, informal conversations, and observations. Several studies use quantitative methods such as questionnaire investigations. These methodologies sometimes rely on the subjective view of researchers and respondents, who are unable to scientifically evaluate the overall economic impact of tourism with respect to ethnic areas. To the best of the authors' knowledge, only one empirical study has tested the validity of the TLGH in the case of ethnic areas (Zhu & He, 2019). However, this study has limits in that it examines the relationship between tourism and economic growth by applying human capital as a dependent variable to reflect the economic development, which has a great likelihood of leading to a bias of the estimation. Accordingly, county-level panel data is employed to empirically examine the effect of tourism development on the economic growth in Chinese ethnic areas from a nonlinear perspective. Furthermore, how this effect varies with the level of tourism specialization is explored.

3. Hypothesis development

Many ethnic minority areas of China are rich in history, traditional festivals, folk arts, religions, and natural sceneries, all of which are considered to be tourist draws. In the process of the commodification of cultural and natural assets through tourism development, the tourist draws are essential to promoting economic growth in Chinese ethnic minority areas. The reason is that as people's disposable income grows, the demand for tourism goods and services is expected to show persistent growth because more individuals can afford the consumption of the goods or services (Adamou & Clerides, 2010). Chinese ethnic minority areas endowed with abundant authentic tourist resources have benefited from the expansion of the tourism demand market, which can generate increased foreign currency for their economies. In an early tourism development stage, tourism-related goods and services are mostly labor intensive (Zhu & He, 2019), and they also require low levels of technology (Sequeira & Maças, 2008), which leads to the generation of many jobs, especially for low-skilled locals (Monterrubio, Osorio, & Benítez, 2018). Because the job generation activity is the main channel of increasing income for local people, it achieves economic growth in Chinese ethnic minority areas. In addition, more social capital is involved in the construction of tourism projects that are driven by the expansion of the tourism industry (Moscardo, Konovalov, Murphy, McGehee, & Schurmann, 2017). Consequently, there is investment in the fundamental and supporting infrastructures of tourism and quickening of the local urbanization process (Zhao & Dong, 2017). These changes effectively spur economic growth in ethnic minority areas of China. In short, it is assumed that tourism has a positive influence on the economic growth of Chinese ethnic minority areas. Hence, Hypothesis 1 can be expressed as follows:

H1. Tourism has a positive effect on the economic growth of Chinese ethnic minority areas.

Progressive development in the tourism industry may not, however, sustain the economic growth in the long term since the industry is likely to experience lower efficiency in the production of goods and services, as it remains labor intensive and lacks high-technological components (Deng et al., 2014). Furthermore, to satisfy the increasing demand for labor factors, the tourism sectors have to compete with other industries for laborers, driving the overall salaries higher (Adamou & Clerides, 2010). Other traditional sectors in Chinese ethnic minority areas, e.g. agriculture or manufacturing industries, therefore have substantial difficulty retaining workers. As a result, these industries usually experience a decline or even bankruptcy, which may cause a deindustrialization process in Chinese ethnic minority areas and hamper their long-term economic growth.

With the vigorous development of tourism, massive numbers of tourists flow into the host destination. The price levels of certain goods or services can be inflated by considerable tourism demand (Sheng & Tsui, 2009). However, the tourists are not the only consumers of the goods or services, and the impacted local population will have to pay higher prices for them (Sheng & Tsui, 2009). Part of the locals' income will thus be offset by the increasing expenses. Similarly, the influx of mass investments in the construction of the tourism infrastructure can increase the land values and thereby stimulate local property prices (Latip et al., 2018; Yang & Wall, 2009). These rising prices might raise the property costs for locals and local businesses. Consequently, the marginal effect of tourism on economic growth may be diminishing along with the tourism's development. Furthermore, owing to the generally backward economies in Chinese ethnic minority areas, most of the factors of production (such as capital and certain goods) need to be imported, which results in considerable economic leakage (Zhang & Tu, 2020). On these grounds, it is assumed that progressive tourism development does not guarantee sustainable economic growth in Chinese ethnic minority areas. The corresponding Hypotheses 2 and 3 are as follows:

H2. Tourism has a nonlinear effect on the economic growth of Chinese ethnic minority areas.

H3. The marginal effect of tourism on economic growth shows a decreasing trend in Chinese ethnic minority areas.

4. Methodology

4.1. Empirical model

Based on the above literature review and theoretical analysis, this paper empirically examines the nonlinear effect of tourism development on economic growth. As suggested by Hansen (1999), a more general multiple threshold regression model is developed as follows:

$$\begin{aligned} PGDP_{it} = {} & \mu_i + \beta_1 TS_{it} I(TS_{it} \le \gamma_1) + \beta_2 TS_{it} I(\gamma_1 < TS_{it} \le \gamma_2) \\ & + \cdots + \beta_n TS_{it} I(\gamma_{n-1} < TS_{it} \le \gamma_n) + \beta_{n+1} TS_{it} I(TS_{it} > \gamma_n) + \delta X_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

where $PGDP_{it}$ is the dependent variable of the economic growth for county i in year t measured by the per capita GDP. In addition, TS_{it} is measured by the ratio of the total tourism revenue to the GDP, and it represents the tourism specialization, which is taken to be both a core independent variable and a threshold variable. Furthermore, γ refers to the estimated threshold value; $I(\cdot)$ is an indicator function such that if the relation in $(\cdot)$ is true, then $I(\cdot)$ equals one, and otherwise $I(\cdot)$ is zero; lastly, X_{it} is a vector of control variables including the urbanization rate (UR_{it}), fixed assets investment level (FAI_{it}), financial development level (FIN_{it}), government size (GOV_{it}), transport accessibility (TA_{it}), industrial structure (INS_{it}) and social consumption level (SCL_{it}). Moreover, μ_i denotes the unobservable individual effects of the county, and ε_{it} indicates the random standard error.

4.2. Definitions of the variables

4.2.1. Definition of the dependent variable

Economic growth is the dependent variable in this empirical study. GDP and per capita GDP are commonly used as indicators of economic growth. Given that the regional GDP is closely related to the regional population size, it cannot objectively and accurately reflect the equilibrium degree of social economic development. Because the per capita GDP can eliminate the impact of the population size on economic growth, it can make up for the deficiency of the GDP in measuring economic development to some extent. Therefore, this paper employs the per capita GDP to characterize economic growth.

4.2.2. Definitions of the core independent variable and the threshold variable

The present study focuses on the nonlinear relationship between the tourism development and economic growth in ethnic areas, and it tests the threshold effect of different levels of tourism development on the economic growth in ethnic areas. In this paper, therefore, both the core independent variable and the threshold variable are tourism development. In line with Vita and Kyaw (2016), the tourism specialization is used to represent the tourism development, and it is measured by the ratio of the total tourism revenue to the GDP. In addition, the ratio of the total tourist numbers to the total population size (TP) at the county level is used as a proxy variable of the tourism specialization in a robustness test (Kim, Chen, & Jang, 2006; Zhao & Xia, 2020). Following Po and Huang (2008), the tourism specialization is also employed as the threshold variable.

4.2.3. Definitions of the other control variables

To minimize the endogenous problem caused by omitted variables, a set of control variables that affect both the tourism development and the economic growth in ethnic areas is introduced according to the earlier literature.

The urbanization rate is used, as the process of urbanization can promote the concentration of capital, technology, human resources and other factors of production into cities (Turok & Mcgranahan, 2013). Then, urbanization can improve the level of industrial development and technological innovation ability and promote industrial upgrades and production efficiency, which will achieve economic growth. An increased urbanization rate often means better infrastructure and more advanced educational conditions (Bettencourt, Lobo, Helbing, Kühnert, & West, 2007), which can enhance the tourism reception capacity and cultivate tourism talents and thereby induce tourism development. The proportion of the urban population is used to the total regional population size to measure the urbanization rate.

The fixed assets investment level is measured by the ratio of fixed assets investment to the regional GDP. In line with the backward economic situation in ethnic areas, the regional infrastructure construction is limited and the industrial development is slow. There are thus a lack of facilities and industrial environments for the good performance of the regional economy and tourism industry. It is therefore expected that the improvement of the fixed assets investment level will significantly promote economic growth in ethnic areas.

The financial development level is vital, as a large number of empirical studies have confirmed that financial development has an important impact on economic growth (Ang & Mckibbin, 2007; Kar, Nazlioglu, & Agir, 2011; Rioja & Valev, 2004; Samargandi, Fidrmuc, & Ghosh, 2015). Accordingly, the variable FIN, which is measured by the ratio of the deposits and loans to the regional GDP, is introduced into the model to control its effect on economic development.

The transportation accessibility is a dummy variable that takes the value of one for the year the county opened to highways and the same value for the subsequent years. Otherwise, the value of this variable is zero.

The industrial structure is represented by the proportion of the added value of the primary and secondary industries to the regional GDP.

The social consumption level is measured by the ratio of the total retail sales to the regional population size.

4.3. Data

Due to the data availability and consistency, panel data covering 75 ethnic autonomous counties for the period of 2007–2016 is used. The tourism revenue and tourist number data were manually collected from both the Statistics Bulletin of the National Economic and Social Development and the Government Work Report of each county. All of the other variable data were collected from the Easy Professional Superior (EPS) Data Platform (http://olap.epsnet.com.cn/index.html). Considering that there are still some missing values, the data are interpolated using a linear interpolation algorithm to establish a balanced panel data set.

Table 1 presents the result of the descriptive statistics of each variable. More specifically, the result shows that the logarithmic value of the per capita GDP in the autonomous counties of the sample ranges from 7.7003 (Jishishan Baoan Dongxiang Sala autonomous county) to 12.5718 (Subei Mongolian autonomous county). For the 75 sample counties, the average value of the tourism specialization is 0.1807. Zhenning Buyi and Miao autonomous county, which is located in Guizhou province, has the largest tourism specialization value (2.7231) in this study. Furthermore, Table 2 reports the Pearson's correlation coefficients among the variables, and it shows that there is a significantly positive correlation between the tourism specialization and the economic growth. Moreover, the urbanization rate, fixed assets investment level, transportation accessibility, industrial structure and social consumption level are significantly and positively associated with economic growth, while the financial development level is negatively correlated with economic growth in Chinese ethnic areas.

5. Empirical results and discussion

5.1. Threshold effect tests

According to Hansen's research, the threshold effect of the model is tested. F statistics are introduced as a test against the null hypotheses, which are a single threshold, a double threshold and a triple threshold. Furthermore, p-values are obtained using a bootstrap technique. As Table 3 reported, a single threshold F_1 and double threshold F_2 are significant with a bootstrap p-value of 0.003 and 0.000, but the test for a triple threshold F_3 is insignificant with a bootstrap p-value of 0.270. Thus, it can be concluded that there are double threshold effects of tourism development on economic growth in Chinese ethnic minority areas, and the double threshold values are 0.385 and 0.829, as reported in Table 3.

5.2. Threshold estimation results

For the comparison of the results estimated from different models, three other models are also introduced to examine the effect of tourism specialization on economic growth in the case of Chinese minority areas. These models are a pooled OLS (ordinary least squares) model, an FE (fixed effects) model involving a linear term of tourism specialization, and an FE model involving both linear and quadratic terms of tourism specialization. Table 4 presents the estimation results of four different types of models. The F-test of Model 3 strongly rejects the null hypothesis, which indicates that Model 3 is more suitable than Model 2 for estimating the panel regression. The Hausman test concludes that the null hypothesis of no difference between the FE model and the RE model is rejected and suggests that the FE model is preferred. Hence, it is demonstrated that the empirical results drawn from the FE specification are reliable. The estimations of Model 4 indicate that whereas the linear

Table 1
Descriptive statistics from 2007 to 2016.

Variable	Observations	Mean	Standard Deviation	Maximum	Minimum
(log) PGDP	750	9.6269	0.7226	12.5718	7.7003
TS	750	0.1807	0.2312	2.7231	0.0007
UR	750	0.2216	0.1435	0.7778	0.0129
FAI	750	0.9658	0.6312	5.8375	0.1499
FIN	750	1.2080	0.4428	3.1782	0.1244
TA	750	0.2813	0.4499	1	0
INS	750	0.6291	0.0896	0.9925	0.2853
(log) SCL	750	8.1872	0.7037	10.0091	6.2311

Table 2
Pearson's correlation among the variables.

	(log) PGDP	TS	UR	FAI	FIN	TA	INS	(log) SCL
(log) PGDP	1							
TS	0.175***	1						
UR	0.541***	0.102***	1					
FAI	0.241***	−0.013	0.201***	1				
FIN	−0.167***	0.251***	−0.094**	0.221***	1			
TA	0.268***	0.164***	0.096***	−0.067*	0.104***	1		
INS	0.177***	−0.233***	−0.029	0.028	−0.330***	−0.098***	1	
(log) SCL	0.807***	0.224***	0.388***	0.128***	0.078**	0.375***	−0.011	1

Notes: (log) PGDP: logarithm of the per capita GDP; (log) SCL: logarithm of SCL.
*p < 0.1, **p < 0.05, ***p < 0.01.

Table 3
Tests of the threshold effect.

	Threshold value	*F* statistics	Bootstrap *p*-value	Critical value of *F* (1%, 5%, 10%)
Single threshold effect test	0.541***	LR = 25.348***	0.003	(16.051, 8.424, 6.655)
Double threshold effect test	0.385***, 0.829***	LR = 23.176***	0.000	(3.901, 0.847, −3.574)
Triple threshold effect test	0.015, 0.385, 0.829	LR = 2.549	0.270	(14.327, 7.476, 5.737)

Notes: The F statistics and p-values result from repeating the bootstrap procedure 300 times for each of the three bootstrap tests.
***Significant at the 1% level.

Table 4
The estimation results.

Variables	Threshold model	Pooled OLS	Fixed-effect model	
	(1)	(2)	(3)	(4)
TS		0.254*** (0.044)	0.093 (0.075)	0.354 (0.235)
TS^2				−0.129* (0.119)
TS ≤ 0.385	0.819*** (0.120)			
0.385 < TS ≤ 0.829	0.427*** (0.079)			
TS > 0.829	0.150*** (0.047)			
UR	0.430*** (0.103)	1.076*** (0.122)	0.474*** (0.139)	0.413*** (0.134)
FAI	0.087*** (0.017)	0.177*** (0.028)	0.086* (0.045)	0.095** (0.047)
FIN	−0.180*** (0.029)	−0.348*** (0.037)	−0.190*** (0.054)	−0.199*** (0.052)
TA	0.043* (0.026)	0.031 (0.028)	0.054 (0.042)	0.054 (0.041)
IND	0.751*** (0.134)	1.108*** (0.175)	0.758*** (0.283)	0.783*** (0.283)
SCL	0.852*** (0.021)	0.715*** (0.024)	0.904*** (0.057)	0.882*** (0.066)
Cons	2.095*** (0.178)	3.028*** (0.204)	1.756*** (0.428)	1.904*** (0.487)
R^2	0.880	0.794	0.872	0.873
F-test			187.68***	182.84***
Hausman test			36.95***	36.31***

Notes:
*p < 0.1, **p < 0.05, ***p < 0.01.
Standard errors of the estimated coefficients are reported in brackets.

coefficient of tourism development is insignificantly positive, the quadratic coefficient is significantly negative, which suggests that there exists a nonlinear relationship between tourism and economic growth and further confirms that the threshold model applied in this study is reasonable. In addition, Model 1 has the largest adjusted R^2, suggesting that the tourism development variable with double thresholds has the strongest explanatory power for economic growth. Hereafter, Model 1 is used as the main specification.

According to the estimation results of Model 1, there are three regimes divided by the existing double threshold effect of tourism on economic growth. Specially, in the first regime with the level of tourism development below 0.385, the estimate of the coefficient of tourism on economic growth is 0.819 with a 1% level of significance, which indicates that one unit increase in tourism specialization could result in an 81.9% expansion in economic growth. In the second regime, where the level of tourism development fluctuates between 0.385 and 0.829, the estimate of the effect of tourism on economic growth is significant and equals 0.427, suggesting that one unit increase in tourism specialization stimulates economic growth with a 42.7% increase, which is nearly half of the 81.9% increase in the first regime. In the third regime in which the level of tourism development is above 0.829, the coefficient of tourism on economic growth has a significant value equaling 0.150, which indicates that the impact of tourism specialization on economic growth is sharply reduced by 15% when tourism specialization increases by one unit.

These results reveal a complex phenomenon: tourism has a continuous positive effect on economic growth, that is, the TLGH is valid in Chinese ethnic minority areas. Therefore, Hypothesis 1 is supported. The magnitude of tourism's marginal effect is, however, diminishing along with the improvement of the regime of tourism specialization. This result further indicates a nonlinear relationship between tourism development and economic growth in ethnic minority areas, which strongly supports Hypotheses 2 and 3. A policy implication emerges that counties with a lower tourism specialization level can execute aggressive policies to foster the tourism industry with the aim of stimulating their economic growth, such as exploiting advantageous resource endowments to create attractive tourism products and adopting effect strategies to promote demand for tourism. When the counties have a tourism specialization level exceeding the optimal threshold value, however, the economic cost grows more quickly than the benefits, and thus, the marginal effect of tourism on economic growth declines. In such a case, developing tourism will not help sustain the economic growth of counties.

For further analyses, according to the average tourism specialization level of each county in Chinese ethnic minority areas during 2007–2016, all 75 counties are classified into three groups by regimes (Table 5). In Group 1, 65 of the 75 counties have a lower ratio of tourism revenue to GDP, but compared to another two groups, the marginal effect of the tourism development on the economic growth is the highest, suggesting tourism contributes greatly to the economic growth of Group 1 counties. Counties in this group should thus expand the tourism industry strategically to gain more economic growth. The tourism policy examples

Table 5
Summary of counties classified into three groups by threshold regimes during the years 2007–2016.

Group	Regime	Autonomous counties in Chinese ethnic minority areas
1	TS ≤ 0.385	Ledong, Ruyuan, Huzhu, Wufeng, Baoting, Yuanjiang, Lanping, Guanling, Wuchuan, Nanjian, Yinjiang, Shuangjiang, Chengbu, Tashkurgan, Mojiang, Tianzhu, Menglian, Ning'er, Ninglang, Chabuchar, Xundian, Pingbian, Xiuyan, Eshan, Weishan, Balikun, Pengshui, Xinping, Xinhuang, Changjiang, Jingdong, Jinggu, Muli, Songtao, Huanren, Minhe, Jianghua, Cangyuan, Yanhe, Yangbi, Lancang, Yuping, Shilin, Shizhu, Luquan, Xiushan, Jishishan, Weixi, Gengma, Subei, Zhijiang, Ximeng, Liannan, Tongdao, Youyang, Jinping, Jinxiu, Zhenyuan, Changbai, Changyang, Fuxin, Aksai, Lingshui, Jingzhou, Mayang
2	0.385 < TS ≤ 0.829	Beichuan, Kuandian, Bama, Jingning, Benxi, Hekou, Qingyuan, Ziyun, Zhenning, Longsheng
3	TS > 0.829	–

Notes: TS is the average tourism specialization level of each county in Chinese ethnic minority areas during 2007–2016.

include taking full advantage of local authentic cultures and traditions to attract tourists and enhancing the quality and differentiation of tourism products and services.

In Group 2, each of the 10 counties in 75 county samples has a value of tourism specialization that exceeds the first turning point but is below the second turning point. The counties in this group also gain a positive economic impact from tourism, but the marginal impact is much lower than the counties in Group 1. The negative impacts of tourism expansion, such as overcommercialization of ethnic cultural assets, lower efficiency in the tourism industry, higher labor and property costs for businesses, increased goods prices for the local communities, crowding out effects on other sectors, and economic leakage, hence affect the economic performance of the Group 2 counties. Unless the destination counties take reasonable measures to mitigate the negative influences, the decline of the marginal effect is unavoidable.

Group 3 represents those counties in which the value of tourism specialization exceeds the second turning point. Although the destinations reached in this regime have a certain potential in attracting tourists that facilitates economic growth to some extent, the negative externalities induced by tourism development may cause great economic losses. As a result, the expansion of these counties' tourism industries needs to be strictly controlled. Very few counties nevertheless seem to be able to reach this specialization regime. In light of the future development of Chinese ethnic minority areas, counties reaching a high level of tourism specialization should change from expanding the tourist market to improving the tourism efficiency and endeavoring to allocate resources to other supportive industries.

Overall, the emergence of tourism, the transformation of ethnic cultural capital, and the exploitation of natural tourism resources greatly contribute to the economic growth in less-developed ethnic areas. Due to the law of diminishing returns, however, the influence of tourism on economic growth gradually weakens along with the maintenance of tourism development and ultimately fades away. In other words, additional tourism investment or high tourism specialization will not support economic growth at a correspondingly high level, but will create uneconomical effects of little benefit to the development of ethnic areas. Overall, the strong contributions of the rising tourism specialization to economic growth may be largely offset by the inefficiency losses caused by the price inflation stemming from tourism expansion (Yang & Wall, 2009), the inflationary effects of tourism (Wu et al., 2016), the crowding out of other sectors by the tourism industry (Zhang, Tu, Zhou, & Yu, 2020), and crime and violence (Tyrrell & Johnston, 2009).

As reported in Table 4, the estimated coefficients of the control variables have the expected signs. The urbanization rate is significantly and positively related to the economic growth of ethnic areas, as for each increase of one unit of the urbanization rate, the per capita GDP increases by 43.0%. Every additional unit of fixed capital investment will increase the per capita GDP by 8.7%. Financial development is significantly and negatively correlated with economic growth. Transportation accessibility plays a significant role in promoting economic development, as every additional unit of transportation accessibility induces an approximately 4.3% increase in the per capita GDP. The industrial structure is positively correlated with economic growth, indicating that primary and secondary industries are still the main power industries to promote economic growth in ethnic areas. A 1% increase in the social consumption level leads to a 0.85% increase in the per capita GDP.

5.3. Robustness checks

For a robustness test, TP is employed as a proxy of the tourism specialization in the threshold model. Table 6 reveals that the effect of TP on the economic growth in ethnic areas also has obvious double threshold characteristics, and the corresponding threshold values are 7.225 and 14.590. The estimated coefficients of the TP are 0.039, 0.022 and 0.005 for Groups 1, 2, and 3, respectively. The conclusion can thus be drawn that with the continuous improvement of the tourism specialization, the marginal contribution of tourism to economic growth in ethnic areas shows a nonlinear decreasing trend, which supports the main findings in Table 4. In addition, the estimated results of the control variables are basically consistent with the corresponding results of Model 1 in Table 4. A double threshold effect hence exists in the relationship between tourism development and economic growth in ethnic areas.

6. Conclusions and implications

This research applied county-level panel data to revisit the tourism-growth nexus and to examine whether the effect of tourism development on economic growth would vary according to different degrees of tourism specialization in the ethnic minority areas of China. The study started by empirically testing whether the TLGH is correct given the circumstances of Chinese ethnic minority areas. The results suggest tourism has been a significant impetus in stimulating the economic development in ethnic areas. In contrast with the previous literature, by taking the tourism specialization as the threshold variable, a nonlinear relationship was uncovered between tourism and economic growth. The empirical results imply that there exists a double threshold effect with two threshold values of 0.385 and 0.829 in the relationship between tourism and economic growth. To be specific, the significantly positive effect of a tourism specialization on economic growth below the first threshold level turns into a significantly positive but relatively low effect with a 39.2% decline when the threshold level ranges from the first threshold value of 0.385 to the second threshold value of 0.829. Furthermore, the marginal contribution of tourism to economic growth continues to decline by 27.7% when it is above the threshold value of 0.829. The development of the tourism industry in ethnic minority areas

Table 6
Robustness check results.

Variables	Estimated coefficients	Variables	Estimated coefficients
TP ≤ 7.225	0.039*** (0.006)	TA	0.053** (0.026)
7.225 < TP ≤ 14.590	0.022*** (0.003)	IND	0.651*** (0.132)
TP > 14.590	0.005** (0.002)	SCL	0.836*** (0.023)
UR	0.428*** (0.102)	cons	2.245*** (0.190)
FAI	0.084*** (0.016)	R^2	0.884
FIN	−0.158*** (0.028)	*N*	750

Notes:
**p < 0.05, ***p < 0.01.
Robust standard errors of the estimated coefficients are reported in brackets.

may therefore strongly foster economic growth to a certain level, but those increasing investments in the tourism industry that are indicated by rising tourism specialization may not achieve the desired goal.

The findings of the panel threshold regression model provide further insights into the economic impact of tourism on ethnic minority areas, and some practical implications emerge. First, for most of the counties in Chinese ethnic minority areas with higher economic returns of tourism, tourism helps to greatly enhance their economic growth, which reflects the strong value of developing tourism programs in these areas. Under this condition, minority rights should be fully protected in ethnic areas on the assumption that the rights given to minorities could help greatly in achieving national unity (Wu & He, 2018), hence providing a stable political environment for tourism development. Additionally, under a regional autonomy regime, the minorities should uphold their self-determination rights by making full use of the local advantages to develop competitive tourism industries and by firmly opposing local protectionism, which would promote economic growth in Chinese ethnic minority areas. Indeed, preferential policies for tourism expansion should be given to the counties in general and the especially impoverished ones in particular to lift their economies out of poverty. These policies may include a reduced tourism enterprise income tax, subsidized loans to enterprises or individuals, and improvements to local fundamental facilities. Second, the results of this study highlight the existence of three-regime nonlinear effects of tourism on the economic growth in ethnic minority areas, and the effect in one regime was found to have a decreasing trend in the process of the continuous improvement of tourism specialization. To strengthen the effect of tourism on the economic growth of specific counties with relatively higher tourism specialization, therefore, targeted investments should be made in tourism-related employment training, infrastructure, and research and development to help improve labor skills and facilitate product innovation. These investments would also promote the operational efficiency of the tourism industry and sustain the long-term economic growth in Chinese ethnic minority areas. Third, the growing goods and real estate prices that occur as the tourism industry expands may somewhat account for the decreasing returns of tourism development. The policy makers of ethnic areas should therefore attach great importance to maintaining the overall price stability for the sake of avoiding the possible consequences of the increase of living expenses and operating costs to the host communities and businesses with the ongoing development of the tourism industry, which would enable these areas to effectively realize the full economic potential of their tourism industries. Finally, in addition to the points mentioned above, the economic leakage may be another reason for the diminishing marginal effect of tourism development on the economic growth in ethnic areas. In order to handle this problem effectively, efforts should be made to establish local supply chains and offer more community-oriented goods to mitigate the high economic leakage of tourism and thereby maximize the effect of tourism on the economic growth of ethnic areas.

The results presented here are not free from limitations, which give suggestions for future studies. First, due to data unavailability, it was not possible to incorporate other factors that may influence the validity of the TLGH in Chinese ethnic minority areas, such as tourism resource endowments (Zhu & He, 2019), ethnic cultural characteristics (Coria & Calfucura, 2012), and community support (Zhuang et al., 2017). In order to avoid both omitted-variable and small-sample biases, it is recommended that researchers consider more control variables and use full samples consisting of all ethnic autonomous counties in the future. Second, the study focused on examining the nonlinear relationship between tourism and economic growth in this study, and future efforts should apply advanced econometric techniques to explore the possibly dynamic relationship between them. Third, the study focused on Chinese ethnic minority regions, and the results might not be suitable to other ethnic areas across the world. Hence, it is recommended that future empirical analyses on the regional data of other countries.

Author statement

Dr. Dapeng Zhang has curated the research idea and designed the research, he composed the Introduction, Literature review, Hypothesis development, Methodology, and contributed to the acquisition of financial support for data collection and the verification of data analysis. Miss Jinghua Tu contributed to the data collection, quantitative analysis and the discussion and conclusions of the research.

Declaration of competing interest

None.

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