

## Article

# Fiscal Decentralization, Urban-Rural Income Gap, and Tourism

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**Abstract:** The reform of China's tax-sharing system in 1994 has not only had a profound heterogeneous impact on the control level of fiscal resources by local government but also might exert a negative effect on the sustainable development of tourism. Based on this hypothesis, this paper uses 1993–2018 data from 31 Chinese provinces to examine the dynamic relationship between China's fiscal decentralization, income gap, urbanization, and tourism growth using a panel co-integration model. Our results show that there is a stable co-integration relationship between fiscal decentralization, income gap, and tourism growth. In general, the impact of fiscal decentralization and income gap on tourism development varies across regions. However, in most provinces, urbanization helps the development of tourism. Urbanization and fiscal decentralization also help reduce the income gap. This shows that the inter-regional government competition promotes not only the growth of tourism but also income equality. To achieve the sustainable development of tourism, China should not only take the advantage of local governments' incentives for economic growth but also handle the income gap problem considering local conditions.

**Keywords:** fiscal decentralization; urban-rural income gap; tourism

## 1. Introduction

China's 1994 fiscal decentralization reform has led to a fiscal challenge faced by the local government: more public goods to provide with fewer revenue sources. To solve the problem, local governments in China tend to expand the tax base and promote employment through the development of the local economy [1], which has a considerable impact on the income gap. On the one hand, China's fiscal decentralization reform has promoted the local economy and increased the rural population's incomes. On the other hand, as local governments provide credit, land, and policy support to local enterprises, the urban population would benefit more from the growth of local enterprises than the rural population. Considering the two impacts of competition between local governments on the urban-rural income gap, which one dominates?

The urban-rural income gap is directly related to the process of urbanization. Since the reform of China's economic system, China's urbanization rate has steadily increased from 17.9% in 1978 to 60.3% in 2019. However, China's income gap is not rising monotonically. On the one hand, urbanization promotes the transfer of rural surplus labor in large amounts to cities and towns, and migrant labor

has significantly improved labor productivity and rural residents' income levels; on the other hand, urbanization has caused economic resources to concentrate in cities where productivity is higher. Urban residents have a higher level of education, better job opportunities, more abundant public goods, and higher levels of asset wealth, all of which will lead to an expansion of the urban-rural income gap. If an economic policy that prioritizes efficiency is implemented for a long time, it will undoubtedly lead to the continuous expansion of the urban-rural income gap.

The development of China's tourism industry depends on the income level of the whole population. However, the urban-rural income gap affects the development of the tourism industry as well. According to data from the "Chinese Culture and Tourism Statistical Yearbook 2019", the per capita travel expenditure for urban residents is 1034 yuan per trip, while that for rural residents is only 612 yuan per trip. In addition, the travel rate of urban residents is 2.3 times that of rural residents. In 2019, the total population of rural residents in China is as high as 560 million. With urbanization promoting the percentage of urban residents in the Chinese population, the higher marginal travel tendency of urban residents will inevitably boost the demand for tourism. The development of tourism also helps to stimulate the consumption demand of the Chinese economy and promote employment. In addition, government transfer payments to low-income groups and vocational training will also help reduce income gaps and increase the demand for tourism in the whole society.

The endowment of tourism resources varies greatly across different regions in China. Therefore, the development of tourism in various places needs to adapt to local conditions. Chinese provinces are significantly different in the level of urbanization, and the ability to mobilize local financial resources. As a result, the income gap between urban and rural areas displays substantial cross-region disparity. These will directly affect the development strategy and potential of tourism development in various regions. So, what is the trend of China's urban-rural income gap? What is the heterogeneity in the effect of fiscal decentralization on this gap? How does urbanization affect the development of the income gap? What is the relationship between fiscal decentralization, urban-rural income gap, and tourism growth? What is the mechanism and effect of its interaction? Some scholars have discussed this. However, in general, most existing studies used cross-sectional data or time-series data for regression analysis, and the use of panel data to investigate the interaction between the three factors, in the long run, is still rare in the existing literature. As these questions are of great significance to China in reducing the urban-rural gap and promoting the sustainable development of the tourism industry, this paper uses the panel data from 1993–2018 to conduct quantitative analysis on the dynamic relationship between the three factors.

## 2. Literature Review

A large amount of existing literature explores the relationship between fiscal decentralization and income inequality, but the conclusion varies significantly. Some studies believe that fiscal decentralization reduces income inequality. Tselios et al. [2] explored the relationship between fiscal decentralization and income inequality in Western Europe and argued that greater fiscal decentralization is related to a reduction in interpersonal income inequality. Ezcurra and Pascual [3] also confirmed that decentralization is negatively related to the level of cross-regional inequality within the sample European Union countries. Cavusoglu and Dincer [4] also believe that fiscal decentralization does reduce income inequality, but this effect is only limited to the rich states of the United States. Siburian [5] pointed out that fiscal decentralization gives local governments autonomy. This helps local governments design development plans that better adapt to the regional conditions and provide public products and services more effectively, thereby resulting in a reduction in regional income inequality. Other studies believe that fiscal decentralization would further increase income inequality. Sacchi and Salotti [6] conducted an empirical analysis of the relationship between fiscal decentralization and income inequality in a sample of 23 OECD countries from 1971 to 2000 and showed that the level of tax decentralization in a country is positively associated with the level of income inequality. Liu et al. [7] believe that although China's sub-provincial fiscal decentralization has led to

greater inequality within the province, the fiscal equalization efforts by the provincial government tend to reduce the negative impact of fiscal decentralization on sub-province regional inequality.

Some studies find that the impact of fiscal decentralization on income inequality depends on multiple factors such as the level of economic development, government size, and governance level, and hence it tends to be quite complicated. Lessmann [8] pointed out that the impact of fiscal decentralization on regional inequality depends on the level of economic development. Although in rich countries, decentralization helps to achieve a more equitable regional income distribution. But in developing and emerging economies, decentralization may lead to increased regional inequality. Sepulveda and Martinez-Vazquez [9] argue that the impact of fiscal decentralization on income inequality depends on the size of the government. When the overall size of the government is relatively small in the economy, a higher level of decentralization will lead to deterioration in income distribution. However, as the overall government budget accounts for about 20% or more of GDP, fiscal decentralization can help improve income distribution. However, Kyriacou et al. [10] believe that the effect of fiscal decentralization on reducing income inequality between regions depends on the quality of governance. Fiscal decentralization would lead to regional income convergence under a high level of government governance, but regional income divergence among countries with poor government governance.

The existing research on the relationship between urbanization and income inequality has not reached a consistent conclusion. Most studies believe that urbanization can help reduce income inequality. Chen et al. [11] used 1978–2014 data to investigate the potential causality between urbanization and income inequality in China. The results show that urbanization has a direct mitigation effect on income inequality. The analysis by Lu and Chen [12] on China's 1987–2001 provincial panel data shows that urbanization has greatly reduced urban-rural inequality. However, economic reform policies that favor urban residents have increased urban-rural inequality. The study of Ha et al. [13] in Vietnam shows that in the long run, urbanization has an impact on reducing income inequality. The study confirmed the hypothesis that there is an inverted U-shaped relationship between urbanization and income inequality. Oyvat [14] believes that over-urbanization has exacerbated income inequality. Adams and Klobodu [15] used PMG and CCEMG to study the impact of urbanization on inequality in 21 sub-Saharan African countries from 1984 to 2014. The research conclusion does not support the Kuznets hypothesis. Urbanization has no strong influence on income inequality, but the improvement of system quality can alleviate the influence of urbanization on income inequality. Some studies believe that there is no simple linear relationship between urbanization and income inequality. Wu and Rao's [16] empirical analysis based on OLS, fixed effects, and random effects models shows a robust inverted U-shaped relationship between inequality and urbanization. The threshold of urbanization rate is 0.53, which means that income inequality would decline in the provinces with urbanization levels higher than the threshold. However, Liddle [17] believes that the level of urbanization is either independent of the urban-rural gap or has a nonlinear effect. Initially, the increase in urbanization will lead to an improvement in the income inequality in these areas. In the case of a high level of urbanization, the increase in the level of urbanization will exacerbate the urban-rural income inequality. Kanbur and Zhuang [18]'s research on four Asian countries shows that the impact of urbanization on income inequality varies greatly. In the Philippines, urbanization contributes about 30% of inequality across the country, over 50% in Indonesia, and slightly less than 15% in India. By contrast, in China, it has reduced income inequality.

Some scholars have examined the impact of tourism on income inequality. Fang et al. [19] used the annual data of 71 developing countries and 31 advanced economies for 1995–2014 to examine the impact of tourism indicators on income inequality and found that tourism has a negative impact on the income inequality of developing economies, while its impact on advanced economies is negligible. Alam and Paramati [20] using the balanced panel data of 49 developing economies around the world from 1991 to 2012 confirm the existence of the Kuznets curve hypothesis between tourism and income inequality. Shi et al. [21] used the spatial Dubin model to analyze the impact of inbound tourism in

31 provinces of China on the urban-rural income gap from 2003 to 2017. Research shows that at the national level, local inbound tourism has significantly reduced the local urban-rural income inequality, while inbound tourism in neighboring areas has significantly increased the local urban-rural income inequality. However, the literature on the analysis of the impact of income disparity on tourism is still relatively rare.

Ezcurra and Pascual [3,22] believe that the decentralization from the central government to local governments is a complex and multidimensional process. The practice of most literature is to estimate the level of fiscal decentralization by using the proportion of the local government's share in central government revenue (expenditure). As for income inequality, Siburian [5,23] used Per worker GDP, Gini coefficient, and population-weighted GDP coefficient of variation to measure this indicator. Mah [4,24,25] used cross-sectional data, panel data, dynamic OLS cointegration test, Fully Modified Ordinary Least Squares, and other methods to estimate the effect of fiscal decentralization on income distribution. Abdillah and Mursinto [26] used panel regression to examine the effects of fiscal decentralization, income inequality on the poverty rate in Indonesia. Different from the existing literature, this paper adopts an autonomous method to calculate the fiscal decentralization index, instead of using the revenue (expenditure) method to measure this index. The autonomous method can better reflect the degree of financial autonomy of local governments. Different from the Gini coefficient used in most literature, this paper uses the Theil index to measure income inequality. Because the Theil index is more sensitive to changes in high- and low-income groups, this helps to truly reflect the changes in the income gap between China's urban and rural areas. Based on existing research methods, we refer to the Full Modified Estimator (FMOLS) of the Estimation Consistency Panel Cointegration Equation proposed by Pedroni [27] to estimate fiscal decentralization, income disparity, and its impact on tourism.

Based on the existing studies, most studies examine the impact of fiscal decentralization or urbanization on income disparity and economic growth at the national level. Very few studies provide analysis at the regional level. Different regions in China have different levels of urbanization and are in development stages, and their urban-rural income gap and the role of local governments are also very different. In addition, tourism has its own uniqueness. Local governments are more inclined to the development of heavy industries, and the development of tourism tends to be not included for priority. Therefore, the existing results reached at the national level and in the field of economic growth might not be applicable to sub-national level regions and the tourism industry. This paper will use the fiscal decentralization index, the Theil index, and other indicators to establish a panel co-integration model of fiscal decentralization, urbanization and its impact on urban-rural income gap and tourism, and perform co-integration tests and estimates to reveal the interaction between these variables.

### 3. Variable Selection and Data Description

This paper uses panel data from 31 Chinese provinces from 1993 to 2018 as the research sample. The level of urbanization is measured by the proportion of the urban population in the total population (URB), and the data comes from the CEIC database. To measure the urban-rural income gap, some scholars use the ratio of urban per capita disposable income to rural per capita net income. Some scholars also use the Gini coefficient to measure the income distribution gap. In choosing our measure of the urban-rural income gap, we think that the Gini coefficient is more sensitive to changes in the income of the middle class and by contrast, the Theil index is more sensitive to changes in the high- and low-income groups, which can more accurately reflect the changes at both ends of China's urban-rural income gap. Therefore, this paper selects the Theil Index (TL) to measure China's urban-rural income gap.

$$TL_{it} = \sum_{j=1}^2 \left[ \frac{p_{ijt}}{p_{it}} \right] \ln \left[ \frac{p_{ijt}}{p_{it}} / \frac{z_{ijt}}{z_{it}} \right] \quad (1)$$

In formula (1),  $j = 1, 2$  denotes urban and rural areas respectively.  $z_{ijt}$  represents the population of urban ( $j = 1$ ) or rural ( $j = 2$ ) in region  $i$ .  $p_{ijt}$  represents the per capita disposable income of the urban ( $j = 1$ ) or the per capita net income of the rural ( $j = 2$ ) in the  $i$  area.

This paper measures the level of inter-regional government competition using autonomous fiscal decentralization indicators. The larger the fiscal decentralization index, the more abundant financial resources and the higher level of fiscal autonomy local governments have in the competition with other local governments.

$$\text{Fiscal decentralization}_{it} = \frac{\text{Local fiscal net revenue}_{it}}{\text{Local fiscal net revenue}_{it} + \text{Central government transfer payment}_{it}} \quad (2)$$

In the fiscal decentralization data, the 1993–2008 local fiscal net revenue and central government transfer payments are from the “Compilation of Statistical Data for Sixty Years of New China”, and the 2009–2018 data are from the “China Statistical Yearbook”. There are two main outlets for local fiscal expenditures. One is to develop the local economy, including tourism, and the other is to provide public products to reduce the income gap between the rich and the poor to promote social justice.

The tourism indicators are expressed in terms of the operating revenue of the tourism industry in Chinese provinces over the sample years, and the data comes from the China Tourism Statistical Yearbook over the years. This variable is represented by REVENUE. The sample interval of this paper is 1993–2018, unless otherwise specified, most of the original data come from CEIC.

The statistical description of the data is shown in Table 1. The maximum income from tourism is 107.25 billion yuan, which was obtained in Shanghai. The fiscal decentralization value is between 0.0067 and 0.9028, with the maximum value obtained in Shanghai. Shanghai has the highest urbanization rate, with a value of 0.896. The Theil index is between 0.0129 and 0.344. In Table 1, there are 806 observations in 31 provinces  $\times$  26 years.

**Table 1.** The statistical description of main variables.

|                | REVENUE (Unit: Thousand Yuan) | DEC   | URB   | TL    |
|----------------|-------------------------------|-------|-------|-------|
| Mean           | 11,985,630                    | 0.505 | 0.465 | 0.119 |
| Median         | 503,3373                      | 0.491 | 0.461 | 0.111 |
| Maximum        | 107,250,230                   | 0.903 | 0.896 | 0.344 |
| Minimum        | 41,776                        | 0.007 | 0.152 | 0.013 |
| Observations   | 806                           | 806   | 806   | 806   |
| Cross sections | 31                            | 31    | 31    | 31    |

Note: REVENUE, DEC, URB, TL represent tourism revenue, fiscal decentralization, urbanization, and the Theil index that reflects the income gap between urban and rural areas.

In terms of different regions, East China has the highest fiscal decentralization index. This is related to more developed local economies and a higher level of fiscal autonomy in eastern provinces such as Jiangsu, Zhejiang, and Shanghai. The northwestern region has the lowest fiscal decentralization index. These provinces are all underdeveloped regions, and their fiscal revenue and autonomy are lower. The Theil index in most regions has experienced rising first and then falling, which means that with the development of the economy, most regions of China have experienced a process of an initial increase in the rural-urban gap followed by a decline. This is consistent with the results of most theoretical studies, that is, as urbanization and income levels increase, the urban-rural income gap will experience a process of rising first and then falling. From 2013 to 2018, the smallest urban-rural income gap is found in East China, while the largest was found in Northwest and Southwest. In terms of the level of urbanization, the highest is currently in North China, and the lowest is in Southwest. The highest tourism revenue is in East China, and the lowest is Northwest China.

In Table 2, North China includes Beijing, Tianjin, Hebei, Shanxi, and Inner Mongolia; Northeast China includes Liaoning, Jilin, and Heilongjiang; East China includes Shandong, Jiangsu, Anhui, Zhejiang, Fujian, and Shanghai; South China includes Guangdong, Guangxi, and Hainan; Central China



includes Hubei, Hunan, Henan, and Jiangxi; Northwest includes Ningxia, Xinjiang, Qinghai, Shaanxi, and Gansu; Southwest includes Sichuan, Yunnan, Guizhou, Tibet, and Chongqing.

**Table 2.** Trends of main indicators by region.

| <b>Decentralization</b> | <b>1993–1997</b> | <b>1998–2002</b> | <b>2003–2007</b> | <b>2008–2012</b> | <b>2013–2018</b> |
|-------------------------|------------------|------------------|------------------|------------------|------------------|
| North China             | 0.531            | 0.557            | 0.576            | 0.618            | 0.645            |
| Northeast China         | 0.539            | 0.474            | 0.427            | 0.449            | 0.429            |
| East China              | 0.589            | 0.657            | 0.685            | 0.703            | 0.74             |
| South China             | 0.643            | 0.63             | 0.55             | 0.546            | 0.587            |
| Central China           | 0.563            | 0.5              | 0.437            | 0.412            | 0.483            |
| Northwest China         | 0.414            | 0.348            | 0.302            | 0.3              | 0.333            |
| Southwest China         | 0.428            | 0.372            | 0.35             | 0.347            | 0.383            |
| <b>Theil Index</b>      | <b>1993–1997</b> | <b>1998–2002</b> | <b>2003–2007</b> | <b>2008–2012</b> | <b>2013–2018</b> |
| North China             | 0.075            | 0.078            | 0.100            | 0.093            | 0.068            |
| Northeast China         | 0.041            | 0.065            | 0.097            | 0.080            | 0.067            |
| East China              | 0.067            | 0.074            | 0.099            | 0.092            | 0.064            |
| South China             | 0.119            | 0.098            | 0.152            | 0.140            | 0.093            |
| Central China           | 0.105            | 0.103            | 0.140            | 0.124            | 0.088            |
| Northwest China         | 0.162            | 0.172            | 0.202            | 0.180            | 0.133            |
| Southwest China         | 0.191            | 0.221            | 0.228            | 0.191            | 0.133            |
| <b>Urbanization</b>     | <b>1993–1997</b> | <b>1998–2002</b> | <b>2003–2007</b> | <b>2008–2012</b> | <b>2013–2018</b> |
| North China             | 0.449            | 0.471            | 0.549            | 0.62             | 0.675            |
| Northeast China         | 0.481            | 0.49             | 0.531            | 0.573            | 0.606            |
| East China              | 0.367            | 0.406            | 0.497            | 0.586            | 0.657            |
| South China             | 0.465            | 0.522            | 0.451            | 0.515            | 0.575            |
| Central China           | 0.239            | 0.297            | 0.37             | 0.442            | 0.524            |
| Northwest China         | 0.317            | 0.329            | 0.371            | 0.431            | 0.507            |
| Southwest China         | 0.279            | 0.299            | 0.33             | 0.371            | 0.451            |
| <b>Revenue</b>          | <b>1993–1997</b> | <b>1998–2002</b> | <b>2003–2007</b> | <b>2008–012</b>  | <b>2013–2018</b> |
| North China             | 445,833.2        | 713,912.3        | 1,209,969        | 1,854,141        | 2,571,159        |
| Northeast China         | 125,006.9        | 306,458.8        | 586,575.8        | 776,598.7        | 906,539.5        |
| East China              | 398,561.7        | 942,676.5        | 1,758,539        | 3,115,424        | 4,610,650        |
| South China             | 989,946.9        | 2,004,953        | 2,091,030        | 2,687,276        | 3,849,792        |
| Central China           | 96,053.4         | 218,600.7        | 705,157.8        | 1,287,185        | 1,553,934        |
| Northwest China         | 49,648.29        | 98,996.42        | 233,324.6        | 433,627.4        | 560,714.6        |
| Southwest China         | 86,466.51        | 201,298.8        | 607,767.8        | 919,630.5        | 1,190,499        |

To better understand the trend of China's urban-rural income gap, we used the calculated Theil index to make a plot that shows China's urban-rural income gap from 1993 to 2018. Figure 1 shows that China's urban-rural income gap has experienced phased volatility. Overall, from 1993 to 2018, the urban-rural income gap in China has shown an inverted U-shaped. From 1993 to 2003, the income gap has shown an upward trend as a whole and has been declining afterward. 2018 is the lowest point of the entire period of 0.08. This trend is also consistent with the data released by the National Bureau of Statistics of China and UNICEF (2017). The National Integrated Urban-Rural Household Survey conducted by the National Bureau of Statistics of China also shows that the ratio of disposable income in China's urban and rural areas shows an inverted U-shaped trend.

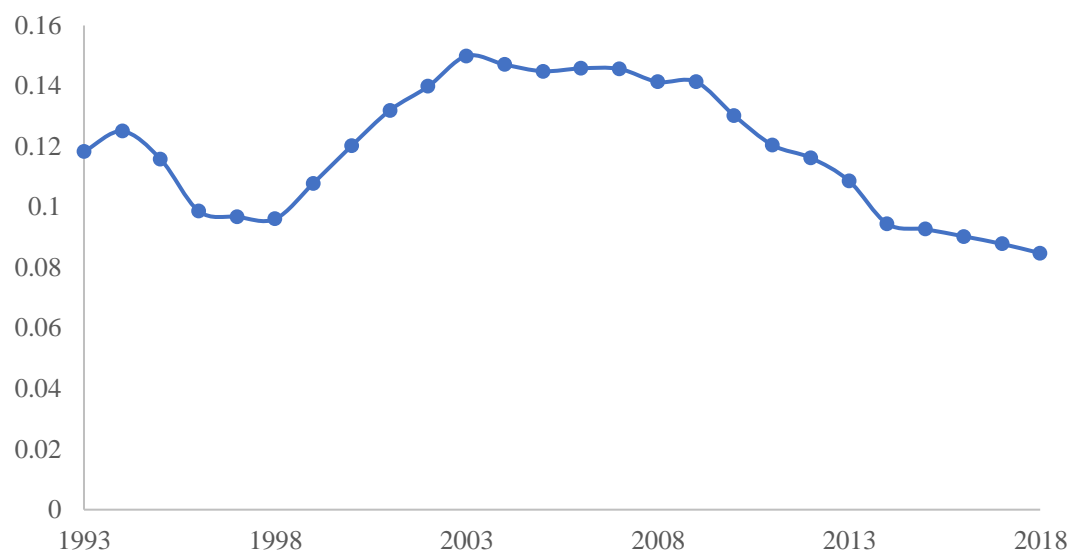


Figure 1. The trend of China Theil Index from 1993 to 2018.

#### 4. Hypothesis, Methodology, and Empirical Analysis

Based on the introduction and literature review sections, we propose the following main research hypotheses.

**Hypothesis 1.** *Fiscal decentralization does not help the development of tourism. To jump-start the local economy, local governments usually choose manufacturing industries as the “engine” of growth rather than tourism as manufacturing industries tend to deliver economic outcomes faster and create more job opportunities.*

**Hypothesis 2.** *The widening of the income gap is not conducive to the long-term development of tourism. Excessive income disparity usually results in a large number of low-income people lacking sufficient funds to support tourism.*

**Hypothesis 3.** *Urbanization is conducive to reducing the income gap and promoting the development of tourism. Because urbanization is conducive to employment, thereby increasing residents’ income and spending on tourism.*

We first use the unit root test to examine the stationarity of the panel data to avoid spurious regression problems. Then, we conduct a co-integration test on the panel data to analyze whether there is a long-term stable relationship between fiscal decentralization, urbanization, urban-rural income gap, and tourism. Finally, this paper uses fully modified least squares (FMOLS) to estimate the panel data cointegration model to reveal the dynamic effects of fiscal decentralization and urbanization on the urban-rural income gap and tourism.

##### 4.1. Unit Root Test

To avoid the spurious regression problem caused by non-stationary time series, we use panel unit root to test the stationarity of the data. To ensure the robustness of the test results, we use three commonly used test forms, namely LLC, ADF, and PP. The logarithmic values of tourism revenue, fiscal decentralization, urbanization, and income gap are represented by LNREVENUE, LNDEC, LNURB, and LNTL, respectively. The results are shown in Table 3. We take the logarithm of these variables because the difference in the logarithm of a variable is equivalent to the rate of change for the variable, and the rate of change of the variable is usually a stationary series. On the other hand, it also reflects the long-term elastic relationship between tourism and fiscal decentralization, urbanization, and the urban-rural income gap.

**Table 3.** Unit root test.

| Test Method | LNREVENUE        |                             | LNDEC            |                             | LNURB            |                             | LNTL             |                             |
|-------------|------------------|-----------------------------|------------------|-----------------------------|------------------|-----------------------------|------------------|-----------------------------|
|             | Level Value Test | First-Order Difference Test | Level Value Test | First-Order Difference Test | Level Value Test | First-Order Difference Test | Level Value Test | First-Order Difference Test |
| LLC         | 4.279 (1.000)    | −19.548 (0.000)             | 1.656 (0.951)    | −19.727 (0.000)             | 14.055 (1.000)   | −9.058 (0.000)              | 2.064 (0.981)    | −18.479 (0.000)             |
| ADF         | 47.943 (0.905)   | 469.556 (0.000)             | 49.785 (0.868)   | 454.863 (0.000)             | 4.003 (1.000)    | 347.608 (0.000)             | 21.526 (1.000)   | 410.195 (0.000)             |
| PP          | 45.090 (0.947)   | 651.286 (0.000)             | 58.823 (0.591)   | 495.614 (0.000)             | 3.187 (1.000)    | 382.736 (0.000)             | 18.217 (1.000)   | 465.591 (0.000)             |

Note: LNREVENUE, LNDEC, LNURB, LNTL represent the natural logarithm of tourism revenue, fiscal decentralization, urbanization, and Theil index respectively. LLC, ADF, and PP, respectively represent the calculation results of three different test methods.

Since the null hypothesis is that there is a unit root and the variables LNREVENUE, LNDEC, LNURB and LNTL cannot reject the null hypothesis at a significant level of 1%, this shows that the four variables are not stable (see Table 3). Then we take the difference between the above variables. The unit root results on the first-order difference show that all three statistics reject the null hypothesis that there is a unit-roots for the first-order difference. This shows that the variables LNREVENUE, LNDEC, LNURB, and LNTL all follow the first-order single integer I(1) sequence. This shows that we can perform co-integration tests on the above four variables without the spurious regression problem.

#### 4.2. Cointegration Relationship Test of Panel Data

Because both the explained variable and the explanatory variables follow the first-order single integral, the necessary condition of equation cointegration is satisfied. We use the method proposed by Pedroni [27] for the panel cointegration test. To check the stationarity of the residuals, this method uses a total of 7 statistics including 4 statistics within groups and 3 statistics between groups. Pedroni [28] pointed out that panel ADF-statistic and Group ADF-statistic are more effective in small sample testing. Meanwhile, Panel v-statistic and Group rho-statistic turn out to be not quite effective. When the test results are inconsistent, the ones from panel ADF-statistics and group ADF-statistics shall prevail. Cointegration test was performed on 4 groups of variables, namely lnREVENUE, lnDEC, lnTL, lnURB; lnTL, lnDEC, lnURB; lnTL, lnDEC; lnTL, lnURB. From the test results in Table 4, except for the Group rho-statistic in the cointegration Equation (1) which failed the 10% significance test, all equations reject the non-existence of integration at the 1% significance level. This shows that there is a long-term cointegration relationship between the variables lnREVENUE, lnDEC, lnTL, and lnURB.



**Table 4.** Cointegration test results.

|                     | Cointegration<br>Equation (1) | Prob. | Cointegration<br>Equation (2) | Prob. | Cointegration<br>Equation (3) | Prob. | Cointegration<br>Equation (4) | Prob. |
|---------------------|-------------------------------|-------|-------------------------------|-------|-------------------------------|-------|-------------------------------|-------|
| Panel v-Statistic   | 2.659                         | 0.004 | 4.652                         | 0.000 | 7.661                         | 0.000 | 9.104                         | 0.000 |
| Panel rho-Statistic | −1.456                        | 0.073 | −11.288                       | 0.000 | −22.231                       | 0.000 | −19.175                       | 0.000 |
| Panel PP-Statistic  | −9.517                        | 0.000 | −13.032                       | 0.000 | −16.051                       | 0.000 | −13.917                       | 0.000 |
| Panel ADF-Statistic | −3.472                        | 0.000 | −10.729                       | 0.000 | −14.790                       | 0.000 | −11.570                       | 0.000 |
| Group rho-Statistic | 0.558                         | 0.711 | −10.702                       | 0.000 | −16.163                       | 0.000 | −13.762                       | 0.000 |
| Group PP-Statistic  | −9.275                        | 0.000 | −17.198                       | 0.000 | −18.566                       | 0.000 | −16.531                       | 0.000 |
| Group ADF-Statistic | −2.847                        | 0.002 | −11.897                       | 0.000 | −14.248                       | 0.000 | −12.242                       | 0.000 |

#### 4.3. Estimation of the Panel Cointegration Equation

To examine the impact of the urban-rural income gap on tourism, and the impact of fiscal decentralization and urbanization on the urban-rural income gap, we examine the following two-panel cointegration equations:

$$\ln REVENUE_{it} = \alpha_{it} + \beta_{it} \ln DEC_{it} + \gamma_{it} \ln URB_{it} + \delta_{it} \ln TL_{it} + \mu_{it} \quad (3)$$

$$\ln TL_{it} = \alpha_{it} + \beta_{it} \ln DEC_{it} + \gamma_{it} \ln URB_{it} + \mu_{it} \quad (4)$$

In Equation (3),  $\beta_{it}$ ,  $\gamma_{it}$  and  $\delta_{it}$  represent the changes in tourism revenue caused by fiscal decentralization, urbanization, and income gap. In Equation (4),  $\beta_{it}$  and  $\gamma_{it}$  represent the changes in the urban-rural income gap caused by fiscal decentralization and urbanization rate, respectively.

Whether fiscal decentralization or urbanization will directly affect the income of residents, thereby affecting the demand for tourism. The reform of fiscal decentralization gives local governments not only the incentive to develop the local economy but also the responsibility of maintaining equality through transfer payments. The urbanization is more through market-oriented means to affect residents' income. No matter which of the above approach leads to changes in the urban-rural income gap, it will directly affect the tourism industry through the consumption demand of residents. Therefore, fiscal decentralization and urbanization not only directly affect the urban-rural income gap, but are also closely related to the development of tourism.

Following the approach to the estimation of the cointegration equation proposed by Pedroni [28], we use the full modified estimator (FMOLS) to estimate the coefficients in Equations (3) and (4). The results are shown in Table 4. For the impact of urbanization on tourism, there is a positive correlation between them for all provinces except for three provinces (Guangxi, Yunnan, and Xinjiang). This shows that in most provinces in China, urbanization has increased the overall income level of residents. In addition, the marginal propensity to spend on tourism of urban residents is also higher than that of rural residents. Therefore, in most provinces, urbanization can help promote the development of tourism (see column 4 of Table 5).

For the impact of inter-regional government competition on tourism, we found significant heterogeneity. The positive correlation between the two variables is found for economically developed regions with higher fiscal autonomy. For example, Beijing, Shanghai, Shandong, Guangdong, Chongqing, and Hebei are all provinces with higher fiscal autonomy (see column 3 of Table 5). These provinces have more financial resources to develop tourism and promote environmental improvement. In other words, in these regions, fiscal expenditures are mostly used to promote economic development, particularly tourism development. By contrast, for most of the economically underdeveloped regions, inter-regional government competition is not positively associated with the development of tourism, for example, Tianjin, Anhui, Henan, Hubei, Guangxi, Tibet, Shaanxi, Gansu, Xinjiang. Most of the fiscal expenditures in these regions are used for heavy industry investment with high pollution, high energy consumption, and instant results. Tourism development usually does not have priority in these regions. In addition, transfer payments to maintain social stability and reduce income inequality usually account for a large proportion of fiscal expenditures. This reduces the financial expenditure on tourism development. In these areas, the higher the fiscal decentralization index, the less conducive to tourism growth. In other words, in these areas, fiscal expenditure tends to serve the need for social stability.

The impact of the income gap on tourism is mainly manifested in two characteristics. In areas with rapid urbanization, high-income rural people choose to migrate to the cities. It will undoubtedly lead to a decline in the average income of rural residents, thereby widening the urban-rural income gap. And due to improvement in urban public services and household income, this rural-to-urban migrant group has a high marginal propensity to consume for tourism which helps promote the development of tourism. In other words, in the short term, rapid urbanization has led to a widening of the income gap between urban and rural areas and an increase in tourism revenue. See the areas where the coefficient

is positive in the second column of Table 5. For example Shanghai, Zhejiang, etc. By contrast, in the long run, as the income gap between urban and rural areas continues to widen, migrants' propensity to consume tourism tends to be low relative to traditional urban residents. These areas with negative coefficients in the second column of Table 5 include, for example, Tianjin, Jiangsu, etc.

Table 5. Estimation results of panel cointegration equation.

|           | Equation (1) |            |            | Equation (2) |             |
|-----------|--------------|------------|------------|--------------|-------------|
|           | TL           | DEC        | URB        | DEC          | URB         |
| Beijing   | −0.070       | 1.109 *    | 8.724 ***  | 0.742        | −3.810 **   |
| Tianjin   | −0.835 ***   | −0.949 *** | 1.079 *    | −2.088 ***   | −1.252 ***  |
| Hebei     | 3.143 **     | 10.309 *   | 3.586 ***  | −4.424 ***   | −0.379 **   |
| Shanxi    | 0.882 *      | 1.420      | 4.742 ***  | −1.493 **    | 0.214       |
| Inner     | 1.630 ***    | 1.521 ***  | 5.336 ***  | −1.141 ***   | 0.873 ***   |
| Liaoning  | 2.031 ***    | −1.151     | 2.826 ***  | −1.298       | 0.648       |
| Jilin     | −0.201       | −1.295     | 8.213 ***  | −4.483 ***   | 2.806 ***   |
| Shanghai  | 0.753 **     | 3.451 ***  | 2.661 ***  | 1.485 ***    | −2.228 ***  |
| Jiangsu   | −0.278 *     | 1.159      | 2.405 ***  | 4.127 *      | −1.521      |
| Zhejiang  | 0.881 **     | 0.966      | 4.757 ***  | 3.232 ***    | −3.582 ***  |
| Anhui     | −0.527       | −2.199 **  | 2.366 ***  | −1.835 ***   | −0.557 ***  |
| Fujian    | 0.048        | 0.808 *    | 4.979 ***  | −1.029 ***   | 1.323 ***   |
| Shandong  | 0.389        | 4.475 ***  | 1.984 ***  | −0.659       | −0.001      |
| Henan     | 3.196 ***    | −6.818 *** | 4.914 ***  | −3.349 ***   | −0.856 ***  |
| Hubei     | −1.454 ***   | −3.445 *** | 2.913 ***  | −1.782 ***   | −0.662 ***  |
| Hunan     | −1.057       | −2.129     | 3.045 ***  | −1.617 ***   | −0.758 ***  |
| Guangdong | −0.002       | 3.038 ***  | 2.306 ***  | −0.542       | −1.920 **   |
| Guangxi   | −1.332 **    | −4.499 *** | −1.640 **  | 0.253        | −1.480 ***  |
| Hainan    | −0.897 **    | −0.506     | 1.578 ***  | −1.454 ***   | −0.730 ***  |
| Chongqing | 0.096        | 0.792 *    | 3.884 ***  | −1.414 ***   | −0.588 ***  |
| Sichuan   | 1.858 ***    | 0.239      | 3.297 ***  | −1.153 ***   | −0.699 ***  |
| Guizhou   | 3.547        | −1.520     | 4.515**    | −0.971***    | −0.763***   |
| Yunnan    | −2.666 *     | −2.314     | −3.158 **  | 0.730 **     | −0.836 ***  |
| Tibet     | −3.188 ***   | −1.248 **  | 2.286 ***  | −1.047 ***   | 0.845 ***   |
| Shaanxi   | 0.503 ***    | −0.749 **  | 3.530 ***  | −1.837 ***   | −0.427 ***  |
| Gansu     | −1.181 **    | −4.040 *** | 0.689      | −1.555 ***   | −1.025 ***  |
| Qinghai   | 5.280 ***    | 2.584      | 11.590 *** | −0.855 ***   | −1.355 ***  |
| Ningxia   | 1.402        | 2.177      | 4.787 ***  | −1.480 ***   | −0.286 **   |
| Xinjiang  | −4.440 ***   | −5.012 *** | −3.214 *** | 1.137 ***    | −1.3247 *** |

Note: \*, \*\*, \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.

For the impact of urbanization on the income gap, except for Inner Mongolia, Jilin, Fujian, and Tibet, urbanization helps narrow the income gap in all regions that have passed the significance test (see column 6 of Table 5). For the impact of fiscal decentralization on the income gap, except Shanghai, Jiangsu, Zhejiang, and Yunnan, an increase in the fiscal decentralization index will lead to a decline in the income gap for all provinces. In other words, in most provinces, fiscal expenditures play a role in social stability (see column 5 of Table 5).

For a better investigation on the impact of fiscal decentralization and urbanization on income gap and tourism. We perform FMOLS estimation on the panel data of Chinese provinces, and the estimation results are shown in Table 6. From Table 6, urbanization is beneficial to the development of tourism in almost all regions (see column 4 of Table 6). In North China and East China, fiscal decentralization is conducive to the development of tourism. This is because these regions have sufficient financial resources to develop tourism in addition to spending to reduce income inequality. In the remaining regions, fiscal expenditures play more of a role in stabilizing society. In these regions, fiscal resources are used for the development of employment-promoting heavy industries with little available for the development of tourism (see the third column of Table 6). Except for South China, the widening of the income gap in other regions will promote the development of tourism (see the second column of

Table 6). This is closely related to the rapid urbanization process in China. Even if the income does not increase at an overall level, the migration of high-income rural people into cities will cause the income gap to widen. And urban residents have a higher marginal propensity for tourism consumption than rural residents, which will lead to an increase in tourism revenue. From the sixth column of Table 6, in almost all provinces, urbanization helps reduce the income gap. Fiscal decentralization also helps narrow the income gap.

**Table 6.** Estimation results of panel cointegration equations by region.

|          | Equation (1) |            |           | Equation (2) |            |
|----------|--------------|------------|-----------|--------------|------------|
|          | TL           | DEC        | URB       | DEC          | URB        |
| Dongbei  | 0.801 ***    | −0.614     | 5.043 *** | −5.061 ***   | −1.979 **  |
| Huabei   | 0.961 ***    | 3.247 ***  | 3.962 *** | −1.845 **    | 0.253      |
| Huadong  | 0.216        | 3.542 ***  | 2.631 *** | 0.263        | −0.122     |
| Huanan   | −1.327 **    | −6.082 *** | 1.56 *    | −2.071 ***   | −1.585 *** |
| Huazhong | −0.180       | −2.622 *   | 3.112 *** | −2.249 ***   | −0.570 *** |
| Xibei    | 0.919        | −1.603 *   | 4.850 *** | −1.205 ***   | −0.951 *** |
| Xinan    | 3.10 ***     | 1.443      | 6.465 *** | −1.511 ***   | −0.597 *** |

Note: \*, \*\*, \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.

#### 4.4. Discussion

Urbanization is an important driving force for the development of tourism. However, in terms of the percentage of the urban population, China is still low relative to developed countries. Therefore, with further urbanization in China, the growth potential for China's tourism would be considerable. The effect of fiscal decentralization on the development of tourism has great regional heterogeneity. In North and East China, fiscal expenditure has played a role in promoting the development of tourism. In other regions, fiscal expenditure mainly plays a role in promoting income equality. Therefore, the decision on tourism-promoting measures should be based on local conditions. In the short term, the widening of the urban-rural income gap will help promote the development of tourism. However, in the long run, the opposite is true. In addition, urbanization and fiscal decentralization can help reduce the income gap between regions. This shows that incentives for local governments to promote the local economy and urbanization will help improve local-condition based policies for economic growth and social justice.

In addition, improving the liquidity of rural residents' housing assets is also conducive to increasing their consumption of tourism. At present, the housing assets of rural residents are difficult to be released into asset markets, and the price is too low. These make it difficult for rural residents to obtain considerable asset liquidity and also limit their ability to consume tourism products. Market-oriented reform on rural residential properties will not only promote the process of urbanization and reduce the urban-rural income gap but also greatly increase rural residents' ability to consume tourism. The equal access to social public services for urban and rural residents, such as education, medical care, and elderly care services, will help reduce rural residents' marginal propensity to make buffer stock savings. The increase in the marginal propensity for tourism consumption will help promote the development of China's tourism.

#### 5. Conclusions and Policy Suggestions

Through quantitative research on fiscal decentralization, urbanization, and its impact on the income gap and tourism, we have obtained the following main conclusions. First of all, China's urban-rural income gap has generally experienced a trend of first rising and then falling. Secondly, tourism revenue, fiscal decentralization, urbanization, and urban-rural income gap are all subject to a first-order single integration, that is, there is a long-term co-integration relationship between these variables. Third, the promotion of urbanization is shown to help promote the development of tourism in all provinces except Guangxi, Yunnan, and Xinjiang. The impact of fiscal decentralization on the tourism

industry has significant heterogeneity. In regions with higher fiscal autonomy, fiscal expenditure tends to be used to promote the development of tourism. However, in provinces with low fiscal autonomy, fiscal decentralization plays a significant role in promoting social justice rather than the development of tourism. This verifies hypothesis 1. In the short term, rapid urbanization will lead to a widening of the urban-rural income gap, but it will also promote tourism growth. But in the long run, the narrowed income gap is conducive to the long-term sustainable development of the tourism industry. This indicates hypothesis 2. Fourth, except for Inner Mongolia, Jilin, Fujian, and Tibet, urbanization is conducive to narrowing the income gap in all provinces. In addition, except Shanghai, Jiangsu, Zhejiang, and Yunnan, fiscal decentralization will lead to a decline in the income gap, that is, fiscal expenditure plays an important role in inequality. Sub-regional studies have further confirmed the above research conclusions. In general, urbanization can help reduce the income gap. But only in provinces with low fiscal autonomy, fiscal decentralization can reduce it. In the long run, the narrowing of the income gap will help the sustainable development of tourism. This proves hypothesis 3 mentioned above.

Based on the above research conclusions, our main policy recommendations are as follows. First, urbanization should be further promoted. Urbanization turns out to help reduce the urban-rural income gap. Meanwhile, an increase in residents' income and the marginal propensity to consume tourism product is also conducive to promoting the development of the tourism industry. Second, the reform of the fiscal system needs to be further promoted. More fiscal autonomy should be given to local governments to reduce their incentive to expand local tax-base by supporting high-polluting, high-energy-consuming heavy industries, thereby benefiting the development of more sustainable service industries such as tourism. Local governments should have the discretion to take into account the dual roles of economic development and social stability in accordance with local conditions. In addition, vigorously promoting market-oriented reform should be conducted to promote the mobility of rural residential property assets, and to help rural residents achieve the same access to public service as an urban resident. In future research, we will continue to track China's fiscal decentralization reform and the process of urbanization to thoroughly examine the effects of these factors on economic development.

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