



Economic Effect Evaluation of Linyi Red Tourism

Gong Ling^{1,2}

¹Linyi University, Linyi, China

²Philippine Christian University, Manila, Philippine

Email: gonglingzai2004@163.com

Abstract: Linyi is rich in red tourism resources, with high quality, strong attraction, and great development potential. Using econometric analysis models, using the Linyi red tourism development (measured by domestic income of red tourism) and regional economic growth (measured by GDP) as endogenous variables, a VAR model is constructed to empirically analyze the impact of red tourism development on regional economic growth. Through research, it has been found that a positive impact on the domestic and international income growth rates of Linyi's red tourism has a positive impact on the GDP growth rate, and from a trend perspective, the duration is relatively long; This indicates that the domestic and international income of Linyi's red tourism has a significant promoting effect on Linyi's economic growth. From the results of variance decomposition, there has been a significant growth trend since the second period. Based on the analysis of the economic effects of red tourism, considering the overall nature of Linyi's red culture, proximity to geographical location, convenient transportation, and government support, this paper analyzes the specific path for the coordinated development of Linyi's red tourism. Construct a top-level design for the coordinated development of red tourism resources from the perspectives of goal coordination, organization and interest coordination, and institutional coordination.

Keywords: red tourism, VAR model, Pulse response function, Variance decomposition

1. Introduction

As a "red holy land" in Shandong Province, Linyi City has rich red cultural resources and profound cultural heritage^[1]. In terms of functional significance, red cultural resources have political functions, social effects, and economic effects. The economic effects of red cultural resources are not inherent in themselves, but rather a value form mainly reflected in the economic benefits created by the red tourism industry, which is an effect derived from the market system.^[2] Therefore, Linyi City takes red tourism as a starting point to accelerate its revitalization and poverty alleviation. On November 6, 2017, the Linyi Municipal Party Committee and Government issued the "Opinions on Accelerating the Development of Red Tourism" (referred to as the "Opinions"), which proposed that by 2020, Linyi City would be built into a red cultural holy land with the Yimeng spirit as its cultural connotation, the family Yimeng as its regional characteristics, and the red tourism as its product support, and call it the "Family Yimeng, Red Linyi" image brand, Build a national red tourism highland and a red tourism destination with certain international influence. In recent years, domestic scholars have formed a large number of literature on early research on red tourism based on different disciplinary backgrounds and perspectives, such as Gan Na and Chen Honghong (2020), Li Dongna (2019), Fu Tao (2019), Zhou Meijing and Xu Chunxiao (2019), Jin Bingxiong (2017), Zhao Zhifeng (2016), Zhao Wei et al. (2014), Liu Limei and Lv Jun (2010), Yu Fenglong and Lu Lin et al. (2005). Throughout the previous research, from the perspective of research content, most of it highlighted the political function and social effects of red tourism, with less involvement in economic effects^[3]. Moreover, there were few empirical analyses of the impact of red tourism on regional economic growth from the perspective of econometrics by constructing econometric models. Therefore, taking the development of red tourism in Linyi City from 2000 to 2019 (characterized by domestic and international income of red tourism) and regional economic growth (measured by regional GDP) as endogenous variables, a vector autoregressive model (VAR) is constructed to empirically analyze the impact of the development of red tourism in Linyi on regional economic growth. This is beneficial for the new era, The socio-economic development and poverty alleviation in Linyi City have important theoretical and practical significance.

2. Literature review

Through the analysis of the above literature, it was found that most of the literature is about the analysis of political functions and social effects, with less involvement in economic effect analysis. Quantitative analysis is even less commonly used for economic effect analysis.

The existing research is guided by the synergy theory and takes a regional red tourism as the research object to analyze the conditions and implementation of regional red tourism collaborative development^[3]. There are few researches on the coordinated development of red tourism in Linyi.

The research of this paper is divided into the following: (1) Based on the analysis of the value of Linyi red tourism resources, the use of econometric model to analyze the contribution rate of Linyi red tourism to economic growth. (2) Based on the integrity of Linyi red culture, the proximity of geographical location, the convenience of transportation,



government support and other realistic basic conditions, from the macro and micro levels to build the implementation path of Linyi red tourism collaborative development.

3. Description of the Study Area

This article constructs an econometric model using Linyi's red tourism development (measured by domestic income of red tourism) and regional economic growth (measured by GDP) from 2000 to 2019 as endogenous variables, and constructs a VAR model to empirically analyze the impact of red tourism development on regional economic growth.

Variables	Unit	Data source
Domestic tourism revenue	100 million yuan	Linyi Statistical Yearbook
International tourism revenue	100 million yuan	Linyi Statistical Yearbook
GDP	100 million yuan	Linyi Statistical Yearbook

Table 1 Variable description

Development of red tourism. The development of red tourism is measured by red tourism revenue. Through data analysis from 2000 to 2019, it was found that the domestic revenue of Linyi's red tourism accounts for over 95% of the total revenue, while the international revenue of red tourism accounts for a relatively low proportion.

Regional economic growth. The economic development of Linyi City is measured by GDP, which is the annual data of regional GDP from 2000 to 2019.

4. Econometric Model Specification

Because the current research is on the complex system of red tourism development and regional economic growth, the development of red tourism in Linyi City (described by the domestic and international income of red tourism) and regional economic growth (measured by the regional gross domestic product (GDP)) are endogenous variables. Therefore, VAR model is selected to depict the dynamic impact effect of red tourism development on regional economic growth.^[4]

5. Model construction and Productivity-research relationship

The mathematical expression of the model is (1).

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_t - p + \epsilon_t, t = 1, 2, \dots, T \quad (1)$$

Among them, y_t represents K-dimensional endogenous variable; X_t represents D-dimensional exogenous variable vector; p represents the order of lag; T is the number of samples; $k \times k$ dimensional matrix A_1, A_2, \dots, A_p and $k \times D$ -dimensional matrix B represent the matrix of coefficients to be estimated; ϵ_t represents K-dimensional perturbation vectors that can be correlated with each other at the same time, but not with their lag periods and the variables on the right side of the equation.

6. Estimation

The revenue from domestic red tourism in Linyi from 2000 to 2019 came from Linyi Tourism Administration Network and Linyi Statistical Yearbook. The GDP data of Linyi from 2000 to 2019 was sourced from Linyi Statistical Yearbook. To weaken or eliminate heteroscedasticity, statistical analysis is conducted using the growth rates of GDP, domestic red tourism revenue in Linyi, and international red tourism revenue in Linyi (represented by Y, X_1 and X_2 respectively).

6.1 Stationary Testing of VAR Models^[5]

Perform a stationarity test on the model, taking into account the endogeneity between variables, using AR root test. If the AR root test is passed, all eigenvalues of the VAR model are less than 1 and fall within the unit circle, indicating that the model has passed the stationarity test. Through inspection, it was found that all eigenvalues fell within the unit circle, indicating that the model is stable.

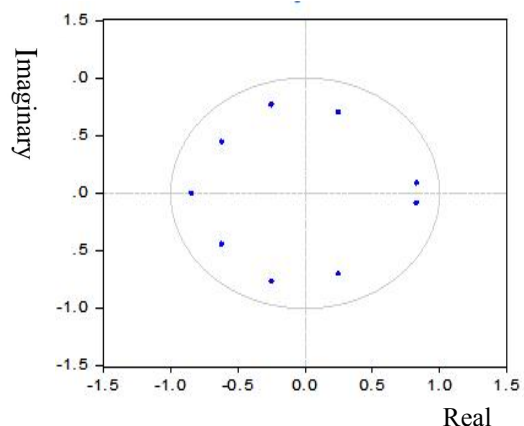


Figure 1 AR Root Test

6.2 Selection of Lag Order for VAR Model

After the stationarity test of the VAR model, the selection of the lag order of the VAR model needs to be determined. Based on the optimal lag order of AIC and SC, standard AIC and SC were selected. Considering the sample size, lagged 2nd and 3rd orders were selected, with AIC of 13.53476 and SC of 14.56402 for lagged 2nd order, 11.356 and SC of 12.80461 for lagged 3rd order. Based on this result, the overall lag period of the model was selected as 3rd order.

6.3 Impulse response function

The impulse response function describes the impact of an endogenous variable's impact on other endogenous variables in the VAR model, and requires that the disturbance terms are non orthogonal. In order to solve the problem of non orthogonalization of the VAR model pulse response function, Cholesky decomposed the pulse response function. This article establishes a 3-variable VAR model and uses the pulse method to obtain a pulse response function graph of GDP growth rate. The horizontal axis represents the number of lag periods of the impact effect, the vertical axis represents the degree of response of GDP growth rate, the solid line represents the pulse response function, representing the response of GDP growth rate to the impact of Linyi Red Tourism domestic and international income, and the dashed line represents the positive and negative double standard deviation band.

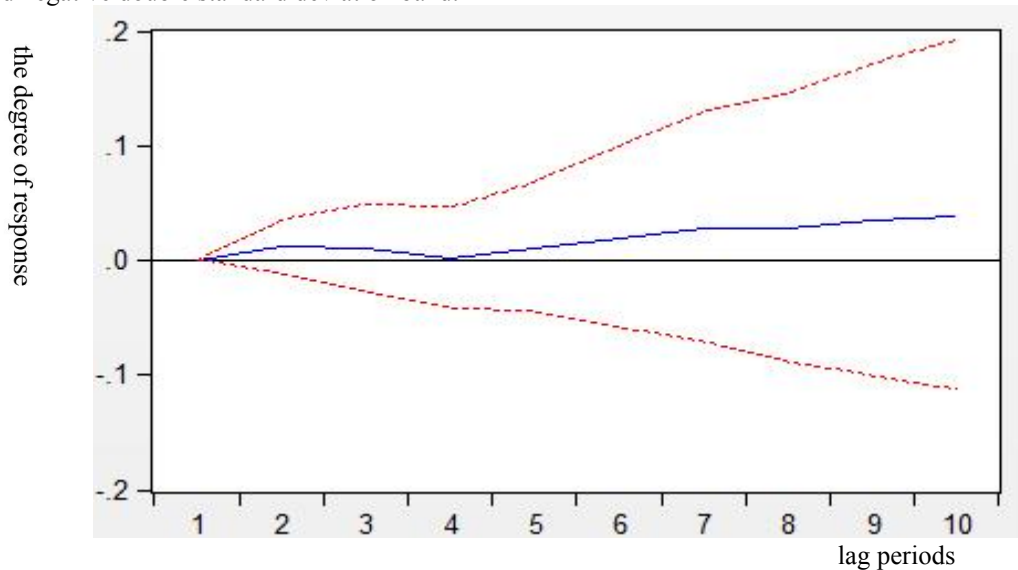


Figure 2 Response Function of GDP Caused by Domestic Income Impact of Linyi Red Tourism

From the above figure, it can be seen that a positive impact on the domestic income growth rate of Linyi's red tourism has a positive impact on the GDP growth rate, and from a trend perspective, the duration is relatively long. This indicates that the domestic income of Linyi's red tourism has a significant promoting effect on Linyi's economic growth (GDP).

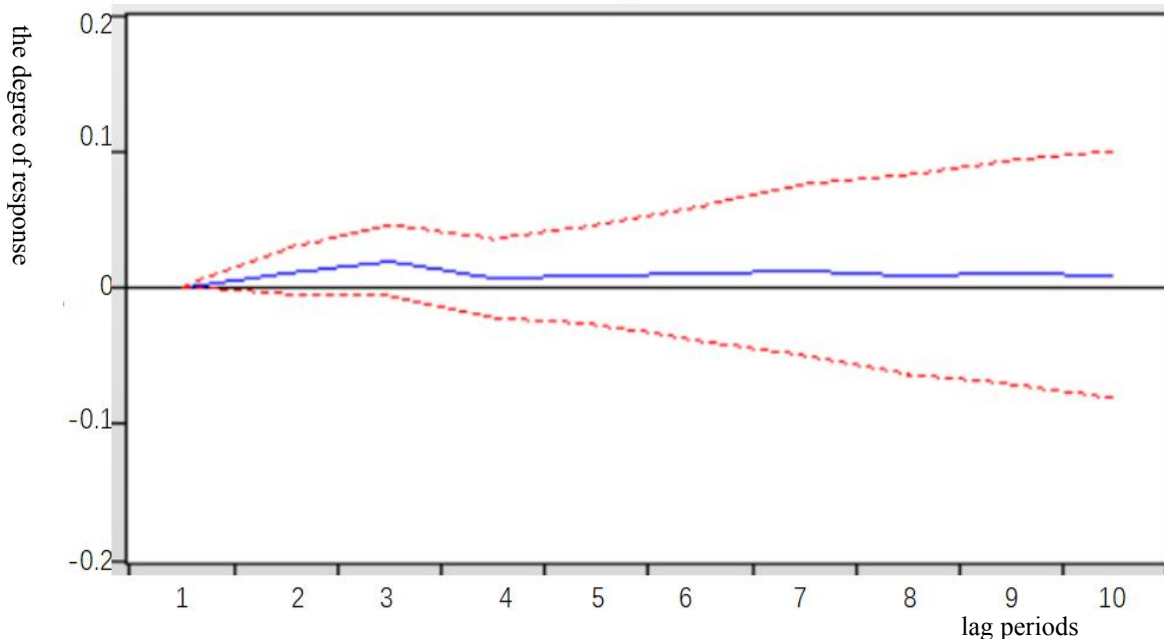


Figure 3 Response Function of GDP Caused by International Income Impact of Linyi Red Tourism

From the above figure, it can be seen that a positive impact on the international income growth rate of Linyi's red tourism has a positive impact on the GDP growth rate, and from a trend perspective, the duration is relatively long. This indicates that the international revenue of Linyi's red tourism has a significant promoting effect on Linyi's economic growth.

6.4 Variance decomposition

Variance decomposition is the analysis of the contribution of each structural shock in a VAR model to the changes in endogenous variables, in order to evaluate the importance of different structural shocks. Therefore, variance decomposition provides information on the relative importance of each random disturbance that affects the variables in the VAR model. Ten periods are now selected as the lag period for variance decomposition. Based on the constructed VAR model, variance decomposition is performed on regional economic growth, as shown in Figure 4.

From the results of variance decomposition, it can be seen that the contribution rates of domestic and international income from Linyi's red tourism to Linyi's economic growth are not significant at first, without considering the contribution rate of Linyi's economic growth itself. However, there has been a significant growth trend since the second period. The impact of domestic red tourism revenue on Linyi's economic growth (GDP growth rate) peaked at 8.18% in the seventh period, and hovered between 6.53% and 7.93% in other periods. The impact of Linyi International Red Tourism revenue on Linyi's economic growth (GDP growth rate) has reached over 10% in the third and fourth periods, 10.28% in the third and fourth periods, 10.88% in the fourth period, and hovering between 5.61% and 8.57% in other periods. Overall, 82.05% -86.59% of the standard deviation of Linyi's economic growth is carried by itself, 6.53% -8.18% is carried by Linyi's domestic red tourism, and 5.61% -10.88% is carried by Linyi's international red tourism.

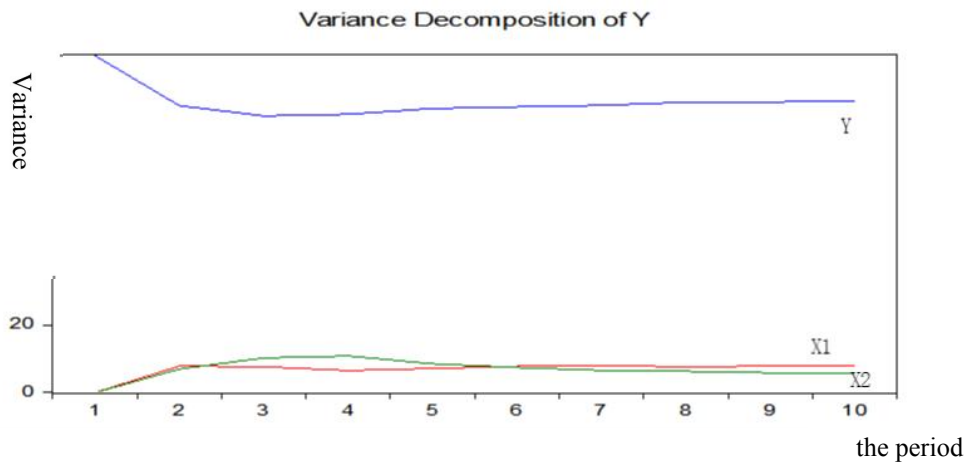


Figure 4 Variance decomposition

7. Results and Discussion

7.1 Results

First, in terms of the long-term situation, there is a long-term stable equilibrium relationship between the domestic income and international income of red tourism in Linyi City and the regional economic growth. Second, Granger causality test results show that in the long-term change, both the domestic and international income of red tourism in Linyi City are Granger causes of regional economic growth. Therefore, the economic growth of Linyi region is obviously dependent on its red tourism income. The increase of red tourism income in Linyi region promotes the regional economic growth. Thirdly, the impulse response function analysis results of VAR model show that, on the whole, both domestic and international income of Linyi red tourism have a positive impact on regional economic growth, and the force gradually weakens in the later period. The variance decomposition results show that the domestic revenue of red tourism has a higher explanatory power and contribution to regional economic growth in Linyi City, while the international revenue of red tourism has a lower explanatory power and contribution to regional economic development, and there is still a large room for improvement.

7.2 Discussion

Tourism, as a driving force and an industry with strong correlation, provides a driving force for the transformation and development of regional economy. Linyi red tourism resources are rich, the value of tourism resources is high, and the influence of resources is large. Red tourism has played its own value in the economic development of Linyi. However, the development of red tourism in each administrative division of Linyi has some problems, such as fighting for itself and disunity of goals, which has some adverse effects on its development. Through the guidance of the government to reach the cooperation of various administrative divisions, formulate the coordinated development plan of red cultural tourism.^[6]

(1) Target collaboration. To promote the coordinated development of Linyi's red tourism, it is first necessary to clarify the overall goal of coordinated development. Firstly, conduct a thorough investigation of the red tourism resources, understand the characteristics of red tourism resources in each district and county, classify red tourism resources when planning for regional coordinated development, analyze commonalities, and highlight characteristics; Secondly, evaluate the market environment of red tourism, understand the external environment and advantages of red tourism development, and analyze the necessity of coordinated development of red tourism in Linyi; Thirdly, in order to fully understand the distribution of red tourism resources and the limitations of the current fragmented development, the overall goal of coordinated development of red tourism in Linyi should be formulated. The entire Yimeng mountainous area is developed

and constructed as a large red tourism area, establishing the overall image and brand of Linyi red tourism, improving the level of Linyi red tourism development, and putting Linyi red tourism on the path of coordinated development.^[7]

(2)Coordination of organization and interests.Promote the coordinated development of red tourism in Linyi, and all districts and counties in Linyi will jointly participate in coordination and cooperation. In order to ensure the protection of the interests of all districts and counties, it is necessary to establish an institution where all districts and counties participate, jointly negotiate and coordinate development issues, and meet the interests and needs of each district and county. The coordinated development of red tourism needs to be gradually promoted, and in the process of development, there will inevitably be conflicts between key development and overall development. Interest synergy is a key issue in the coordinated development of regional red tourism, and it should be achieved through corresponding institutional mechanisms to achieve interest synergy among all parties involved^[7].

(3)Institutional coordination.To ensure the effective implementation of various collaborative plans and enable each collaborative development entity to fulfill their responsibilities, it is necessary to establish corresponding supervision, assessment, and constraint mechanisms to ensure the implementation effect of the overall plan for collaborative development. Firstly, establish a supervision system for the coordinated development of Linyi red tourism, to supervise the implementation of overall planning and various tasks; Secondly, establish an evaluation and assessment system for the coordinated development of Linyi's red tourism, evaluate the effectiveness of planning and task implementation, and assess them based on the evaluation results; Any issues discovered during the assessment process should be promptly resolved. Thirdly, establish a punishment system for the coordinated development of Linyi red tourism, and punish practitioners who do not comply with the system during the coordinated development process to ensure the effectiveness of the coordinated development.

On the whole, the output results of research and analysis are still not up to the demand level, and the ultimate purpose of conducting research is to form theoretical knowledge. Therefore, in the future research in this field, enough empirical research that can form a paradigm is still needed as research support. In the future, it is still necessary to continuously strengthen the use of research methods such as econometric models, broaden research fields and horizons, extensively learn from domestic and foreign cutting-edge research results, pay attention to interdisciplinary combined research and innovative research methods, in particular, make full use of new technology applications such as big data, and promote research progress on issues such as red tourism flow, tourist space-time behavior research, and smart tourism construction^[8].

Acknowledgments: We appreciate the support of our colleagues at Linyi University and their valuable opinions and insights on improving the paper. We also thank the anonymous reviewers for their valuable feedback.

References

- [1]Overview of the Development of Red Tourism in Linyi. China Tourism News, November 15, 2018
- [2] Suggestions for the 14th Five Year Plan for National Economic and Social Development and the Long Range Goals for 2035 in Linyi City. January 19, 2021
- [3] Li Dongna The Development Path of Red Tourism Based on Core Values Shaping [J]. Social Scientist, 2019 (2): 75-81+93
- [4] Xu Yueyue, Zhang Yingjie. Research on the Economic Effects of Red Tourism: A Case Study of Linyi City, Shandong Province [J]. Tourism Market Research, 2020 (10): 152-154
- [5] Gaotie Mei. Econometric Analysis Methods and Modeling [M]. Tsinghua University Press, 2020
- [6] Ye Guangyu, Han Guangfu. The phased characteristics and evolution of the development of national red tourism policies [J]. Social Scientist, 2020 (8): 70-74
- [7] Chen Ailan. Exploring the Collaborative Development Path of Red Tourism in Northwest Fujian [J]. Strait Science, 2020 (11): 81-85
- [8] Wang Haobin, Sun Wenfu. Research on the Integrated Development and Quality Improvement Strategy of Linyi Red Tourism Products from the Perspective of Rural Revitalization [J]. Tourism Overview (Second Half Month), 2019 (6): 92-94