Journal of Namibian Studies, 35 (2023): 1307-1329 ISSN: 2197-5523 (online)

Tourism Specialization On The Economy In The 20 Highest Ttci Countries With The Tourism-Led-Growth Hypothesis Linear-Nonlinear Economic Model

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Abstract

The excellence of the tourism sector is allegedly a source of new economic drivers, which is included in the category of comparative special advantages if it has the existence of resources to be managed in the long term. Tourism does not constantly improve the economy, this is based on the conditional state of tourism which is not a basic sector of the economy. The Tourism-Led-Growth Hypothesis states that tourism contains non-linear variables because the state of tourism output affects various thresholds of the economy not constantly. This study analyzes 20 countries with the highest TTCI index in 1991-2021. Time series data, using the threshold effect statistical method by building a model of tourism on the economy. The research will also prove the relevance of the Tourism-Led-Growth Hypothesis, which states tourism must be comparative and have a threshold value to affect the economy. The results confirm that Threshold Effects of the Tourism-Led Growth is very relevant and accurate in knowing how influential the variable components of tourism affect the economy through non-linear relationships. Non-linear relationships must be formed because it characterized tourism variables as not always constant, but sometimes tourism affects the economy minimally and optimally. From the results of the 20 countries with the highest TTCI Index values, the countries that have significant tourism variables and affect the economy both at the minimum and optimum limits are 13 countries. The tourism sector in these 13 countries is specialized and has a comparative advantage, so it can affect the economy at the minimum and optimal threshold values. In the results of 7 countries proven that tourism is not specialized and does not affect the economy either at the minimum or optimal threshold, 7 countries do not have a comparative advantage and are not specialized in tourism.

Keywords: Tourism, Economy, Treshold Effect, TLGH

I. Introduction

World tourism is increasingly experiencing progress and development, many countries in the world are developing the tourism sector to provide additional sectoral contributions to the economy. According to the World Tourism Organization, the tourism industry is one of the drivers of world trade and prosperity today (Joun & Kim, 2020). The World Travel and Tourism Council report shows that in 2019 the tourism sector contributed 10.3% (US$ 8.9 trillion). global Gross Domestic Product (GDP) and 330 million jobs, which is about 10% of all global jobs (WTTC, 2020). I expect this figure to increase as more countries adopt tourism industry-oriented policies (Po & Huang, 2008). The increase in tourism demand in the present time caused one of them. Tourism has become a secondary need, everyone needs to travel to relieve boredom or work routines (Sessoms, 1984).

Ekanakaye & Long (2012), & Vanegas (2014) argue that the tourism industry is one of the main sources of positive externalities in the economy. The relevance of tourism is seen in infrastructure development and opening up employment opportunities. More and more developing countries are strategically making international tourism an engine of economic growth to drive the development of other industries and the country's overall economy besides the direct function of tourism in generating foreign exchange and creating jobs (Zuo & Huang, 2018). The economic structure in some developing countries is shifting from traditional sectors such as agriculture and manufacturing to more modern sectors such as tourism that provide a greater share in developing countries (Garidzirai & Pasara, 2020). Zuo & Huang (2018) argue that tourism development is not only a process with increasing numbers of tourist arrivals but also a driving force that causes major structural transformations in a country's economy. Measurement of the quality of tourism in a country can be seen through the value of the Tourism Competitiveness Index (TTCI) issued by the World Economic Forum as one of the organizations that officially assesses tourism in a tourist destination country. The criteria for tourism development through TTCI consists of 5 pillars and 17 components as follows:

Figure 1. Travel & Tourism Development Index Framework

The value of the Tourism & Tourism Competitiveness Index (TTCI) is measured in 117 countries where the assessment criteria consist of five pillars. First, the Enabling Enviroment looks at how the business environment, safety and security, health and hygiene, human capital and labor markets and infrastructure and digital services. Second Travel and Tourism Policy and Enabling Conditions includes travel and tourism priorities, international openness and price competitiveness. Third infrastructure includes air transportation infrastructure, land and port infrastructure and tourist service infrastructure. Fourth Travel and Tourism Demand Drivers include natural resources, culture and non-convenience resources. Fifth Travel and Tourism Sustainability includes environmental resilience, resilience and socio-economic conditions, travel and tourism demand pressures and impacts (World Economic Forum, TTCI Index, 2022). From the results of the TTCI value, there is a range of indexes/value ranges from 1.0 (worst) to 7.0 (best). The different characteristics and comparative characteristics of various countries in terms of tourism provide differences in competitiveness for the tourism sector in each country. The following is an overview of TTCI data on countries that have medium to high tourism competitiveness:

Table 1. Average Travel & Tourism Competitiveness Index (TTCI) of 20 Countries 2017-2021

No	Countries	Value TTCI	No	Countries	Value TTCI
1	Japan	5,30	16	Portugal	4,82
2	US	5,21	17	Denmark	4,55
3	Spain	5,37	18	Finland	4,50
4	France	5,31	19	Hongkong	4,70
5	Germany	5,29	20	Sweden	4,58
6	Switzerland	4,98			
7	Australia	5,08			
8	United Kingdom	5,16			
9	Singapore	4,86			
10	Italy	5,02			
11	Austria	5,02			
12	China	4,83			
13	Canada	5,01			
14	Netherlands	4,76			
15	Korea rep	4,71			

Description:		
	=	Asia Pasific
	=	America
	=	Europe

Sumber : World Economic Forum, Travel & Tourism Development Index, 2021

The table above presents data on 20 countries with the highest TTCI where the index range is in the 4.58-5.37 category. Of the 20 countries that are thought to be superior and have a high competitive value of tourism, the country is thought to have an advantage in the field of tourism, but these advantages must be able to be proven by the Tourism Led Growth Hypothesis / TLGH. TLGH forms the concept of tourism excellence in each country must be based on the comparative side or tourism must be able to specialize in order to be able to provide a minimum and optimal threshold value impact on the economy. Tourism output will not constantly give a real increase to the economy, tourism output has a fluctuating impact. The tourism growth hypothesis drives the economy indicating the influence between tourism and economic growth (Tourism Led Growth Hypothesis/TLGH) where tourism creates demand, both consumption and investment which in turn will lead to the supply of goods and services production activities (Vanegas, 2014). Tourism is considered a strategic asset in encouraging the development of certain countries/regions that have tourism potential and can create a country's comparative advantage (Fafurida et al., 2020).

The development of tourism comparative advantage of a country and between regions can also be seen in the data of tourism sector indicators that are often used in previous studies (Brida, Cortes & Pulina, 2016), namely the Average GDP Per Capita Value, International Tourist Tourism Receipts, Ratio of Tourism Receipts to GDP Per Capita, Number of Arrivals, Number of Departures, Tourism Travel Services Exports, Tourism Travel Services Imports and Export/Import Ratio. According to Song & Wu (2022); Chiu & Yeh (2016) countries with comparative advantages in tourism can have a significant impact on economic activity. According to the World Travel and Tourism Council (WTTC) international travel and tourism costs are the largest sector in the world on almost all economic measures including gross output, capital investment, increasing employment and others (Aslan et al., 2009). The development of the average component of tourism indicators in 20 countries with high and medium tourism competitiveness index (TTCI) values is expected to affect the amount of GDP per capita value of a country due to high tourism supply and demand activities, seen from various important components presented below:

Table 2. Average Value of GDP Per Capita (Y), International Tourist Tourism Receipts (q), Number of Arrivals (NA), Number of Departures (ND), Tourism Travel Service Exports (ts), in 20 Countries in Four Regions during 1991-2021.

No	Countries	Y	q	NA	ND	ts
1	Japan	$37.730	$31.721	9.150.166	15.576.986	9,61%
2	United States	$52.476	$27.631	121.291.102	10.699.157	27,65%
3	Spain	$35.236	$39.077	8.195.732	16.377.849	54,60%
4	France	$40.184	$51.587	159.593.006	50.320.677	18,65%

No	Countries	Y	q	NA	ND	ts
5	Germany	$45.737	$42.526	22.864.194	85.244.548	15,33%
6	Switzerland	$62.818	$35.962	8.467.000	23.201.484	14,78%
7	Australia	$41.631	$30.376	5.212.484	5.545.710	61,14%
8	UK	$40.544	$40.825	28.068.032	59.997.484	14,24%
9	Singapore	$69.383	$46.138	11.787.823	6.992.290	9,30%
10	Italy	$41.482	$40.706	67.856.987	48.105.955	34,94%
11	Austria	$48.504	$21.007	20.899.806	9.776.516	31,74%
12	China	$75.020	$21.283	99.355.323	48.994.097	15,45%
13	Canada	$42.326	$22.572	36.170.581	59.799.271	23,54%
14	Netherlands	$48.632	$26.501	10.612.613	19.928.992	6,15%
15	Korea_rep	$29.410	$49.752	7.496.258	10.832.387	17,58%
16	Portugal	$30.060	$39.371	2.219.123	2.354.806	39,05%
17	Denmark	$49.723	$52.480	3.742.742	6.153.452	8,66%
18	Finland	$41.769	$36.263	2.658.323	6.548.710	14,22%
19	Hongkong	$45.464	$50.237	28.162.355	70.013.129	21,79%
20	Sweden	$44.033	$37.804	5.080.645	39.208.516	15,98%

Source: World Bank, world tourism and economics data, 1991-2021

In the economic structure of 20 countries with high TTCI GDP per capita has the lowest range of $29,410 and the highest of $75,020, while the tourism revenue side conditions the lowest range of $21,007 and the highest of $52,480. On the tourism side, 20 countries have the highest tourist arrivals of 159,593,006 million and the lowest arrivals of 2,219,123 million with the highest tourist departure rate of 85,244,548 million and the lowest of 2,354,806 million. The movement of tourism export and import services in the 20 highest TTCI countries is in the range of 6.15% - 61.14%. In general, these conditions indicate that the components of the revenue side, tourism and high tourism exports and imports do not necessarily affect the economy directly and continue to move constantly to improve the economy, in line with Chiu & Weh (2016) in their research found evidence that not necessarily countries that have high tourism indicator values, for example the United Kingdom (UK) has a high number of international tourist arrivals into the UK but the number of tourist departures (UK citizens) out of the UK is much higher. So the Tourism Led Growth Hyphothesis may not apply in the UK, even though the UK has a relatively high Travel & Tourism Competitiveness Index (TTCI) value.

Brau, Lanza & Pigliaru 2007); Du, Lew & Ng (2014) found that Tourism Led Growth Hypothesis (TLGH) is not always supported under the same tourism and economic conditions. The relationship between economic growth and tourism may be linear or non-linear, resulting in biased results and information because it is possible to use imprecise estimates. Most studies concentrate on analyzing the relationship between growth and tourism, under heterogeneous circumstances with various time variations. This is one of the reasons that lead to different results in the relationship between economic growth and tourism (Wu et al., 2016). Brida, Cortes-Jimenez & Pulina (2016) reviewed several previous studies related to Tourism Led Growth Hypothesis (TLGH) in several countries. The study results prove that TLGH is biased and cannot reflect economic growth directly. In the econometric model developed, TLGH variables such as the number of visits and the number of tourist receipts are assumed to be inputs of production factors where the scope of determinants shaping economic growth is very different, capital, labor, and technological progress are economic variables, but tourism variables are sectoral variables that only cover part of the economy, especially in tourist destinations where tourism is not a pillar industry.

This research is designed using an explanatory research approach that explains existing phenomena and hypothesis testing that explains causal relationships, the time dimension of research involves a lot of specific time and with many samples (pooled data) so that the depth of research is less in-depth, but with high generalization (statistical studies). It is hoped that this research will serve as a new blueprint in the addition of a country's economic model, by considering tourism specialization variables as a new economic driver model that must be considered. Tourism is included in the international interaction of exports and imports of tourism specialization between countries, specialization in tourism is an important point for the progress of the regional economy and between countries. This study uses an empirical model along with the definition of each variable with the unit of analysis is 20 world tourism countries according to the highest ranking of the Travel & Tourism Competitiveness Index (TTCI) issued by the World Economic Forum.

II. Literature Review

Tourism is the whole series and business of selling goods and services needed by tourists, as long as they travel until they return to their place of origin. The tourism industry in another sense, is an industry in the form of all tourism activities as a whole. Therefore, the tourism industry has specific characteristics, namely as follows: Tourism products cannot be moved, production and consumption occur at the same time, tourism products have a variety of forms, buyers can not taste and can not even test the product, tourism products are businesses that contain great risk, Spillane (2004).

Tourism demand is usually considered as a measure of the use of goods or services by tourists (Frechtling, 2001). Tourism demand is a special form of demand because tourism products are a collection of complementary goods and services (Morley, 1992). Consumers instead of goods and services are transported, and tourism consumption occurs simultaneously with tourism production (Schulmeister, 1979). The concept of tourism demand stems from the classic definition of demand in economics, which is the desire to own commodities or utilize services, combined with the ability to buy them. The level of significance and impact of tourism demand provides a strong assessment for a better understanding of the nature of the tourist decision-making process (Stabler & Sinclair, 2010).

In statistical calculations various opinions differ on how tourism variables in influencing the economy, some opinions that tourism variables are considered not always constant increase the economy. The inconstancy brings various hypotheses, one of which was developed by Chiu & Yeh (2016) Tourism Led Economic Growth can be asserted to affect the economic growth of a country if tourism receipts in the country are greater than outgoing tourism expenditures. For example, a country's international tourism arrivals exceed international tourism departures and tourism service exports exceed tourism service imports, it can be said that tourism is a comparative advantage of a country (Export Led Growth). So it is important to first identify the condition of a country's economic structure in this case whether the country is specialized in tourism or not, so as not to cause bias in concluding the results of the Tourism Led Growth Hypothesis (TLGH) (Po & Huang, 2008). The results of the Threshold panel regression model also show the threshold effect of tourism development on economic growth, implying that countries with different tourism specialization and industrial structure conditions experience different impacts on the tourism growth relationship. In particular, the estimated coefficient of tourism on economic growth decreases with the level of tourism specialization and industrial structure exceeding the threshold value, (Zuo & Huang (2017).

The results of the panel Threshold regression model also show the threshold effect of tourism development on economic growth, implying that countries with different tourism specialization and industrial structure conditions experience different impacts on the tourism growth relationship. In particular, the estimated coefficient of tourism on economic growth decreases with the level of tourism specialization and industrial structure exceeding the threshold value. The results confirm the application of TLGH was found to positively affect economic growth at the 1% statistical level. Second, the non-linear results obtained from the panel threshold regression model illustrate that there is a non-linear relationship between tourism development and economic growth under the threshold variables of TA, TR and IS. This suggests that counties with different tourism specialization conditions and industrial structures experience various impacts on tourism-led growth linkages, (Zhang & Cheng (2019).

The results showed a positive relationship between tourist arrivals and GDP, and showed a unidirectional TLGH between tourism and economic growth, these findings illustrate that the level of output associated with economic well-being and level of development is very important in attracting tourists. The major impact of the expansion of tourism in the N-11 economies justifies the need for government intervention expected to encourage and increase tourism demand by providing tourism services to the N-11 countries. A one percent increase in tourist arrivals can increase GDP by 0.06 percent (Hakan, Aslan & Gungor (2015).

The structure of the tourism flow component is included in how the interaction of goods and services internationally, it can be said that there is an international trade relationship. International Trade David Ricardo in Faurani (2015) revealed that the theory of comparative advantage is the basis for the creation of international trade. In this theory, if a country produces two commodities but is less efficient (has an absolute disadvantage) than other countries, there is still a basis for gaining trade benefits. The first country should specialize in producing and exporting commodities with smaller absolute losses (comparative advantage commodities) and importing commodities with larger absolute losses (comparative disadvantage commodities).

III.Research Methodology

Data Type and Data Source

This type of research is quantitative descriptive research and the data source used is secondary data, namely data in the form of information in the form of numbers, has counting units and its value can change or is variable. The data used in this study is panel data which is a combination of time-series data for the period 1991-2021 for 30 years and cross-section data, namely 20 countries from Asia Pacific, America, Africa, the Middle East and Europe which are included in the Travel and Tourism Competitiveness Index (TTCI) category with an average total scale of 17 pillar indicators of 4.1-7.0 in the best category. The 20 countries observed include, Japan United states, Spain, France, Germany, Switzerland, Australia, United Kingdom, Singapore, Italy, Austria, China, Canada, Netherlands, Korea_rep, Portugal, Denmark, Finland, Hongkong and Sweden Data sources in the study were obtained from the official website of the world bank open data tourism, the website https://data.worldbank.org/, Travel & tourism development index rebuilding for a sustainable and resilient future book and various sources of literature related to world tourism data needs.

Research Variables and Operational Definition of Variables

Creswell (2014) explains that variable refers to the characteristics or attributes of an individual or an organization that can be measured or observed. The independent variables are the variables that (may) cause, influence, or have an effect on the outcome, while the independent variables used in this research are tourism development and control variables. This study consists of dependent variables (dependent variables) and independent variables (independent variables) which will be described as follows:

1. The first model dependent variable in this study is the per

capita income value (Y) of gross domestic product converted to international dollars using the purchasing power parity rate divided by the mid-year population. International dollars have the same purchasing power over Gross Domestic Product (GDP) as US dollars have in the United States. Gross Domestic Product at buyer's prices is the sum of the gross value added by all resident producers in the Country plus product taxes and minus subsidies not included in the value of the product It is calculated without making deductions for the depreciation of artificial assets or for the depletion and degradation of natural resources divided by the amount population. Data in international dollars 2017.

2. The first model independent variable in this study is Consumption (C) final expenditure (total consumption) is the sum of final household consumption expenditure (private consumption) and general government final consumption expenditure (general government consumption).
3. The first model independent variable in this study is Direct investment (I) refers to direct investment equity flows in the reporting economy such as the amount of equity capital, income reinvestment, and other capital. Direct investment is a category of cross-border investment in which residents of the same economy have control or a significant degree of influence over the company's management. Ownership of 10 percent or more of the common stock of voting stock is a criterion for determining the existence of a direct investment relationship.
4. The first model independent variable in this study is general government spending (G) includes all current government expenditures for purchasing goods and services (including employee compensation). It also includes a large proportion of spending on national defense and security, but excludes government military spending which is part of the government's capital formation.
5. The first model independent variable in this study is the Threshold variable/threshold limit of per capita GDP to tourist tourism acceptance (Q) is the value of GDP converted to international dollars using the purchasing power parity level divided by the mid-year population then divided again by international tourist tourism receipts derived from spending by international visitors, including payments to national operators for international transport as a whole/aggregate.
6. The first model independent variable in this study is the Threshold variable/threshold limit for the number of foreign tourist arrivals to tourist departures (N). Where the number of departures is the tourism activity carried out by people from their country of residence to other countries for any

purpose other than activities paid for in the country visited divided by the number of departures made by people from their country of residence to other countries for purposes other than activities paid in the visited country.

7. The first model independent variable in this study is the Threshold variable/threshold limit for the amount of exports to imports of tourism services (TS) is travel services (% of commercial service exports) includes goods and services obtained from an economy by the travelers in that economy for their own use during a visit of less than one year for business or personal purposes divided by travel services (% of imports of commercial services) includes goods and services procured from an economy by travelers in that economy for their own use during a visit of less than one year for business or personal use.

Tourism Specialization Categorization Modeling Threshold Effects of the Tourism-Led Growth

This study refers to several previous studies regarding the concept of The Threshold Effects by Tong (1978); Tong and Lim (1980); Hansen (2000) in Po & Huang (2008); Chiu & Yeh (2016) to investigate the differences in the correlation between tourism development, economic growth, and other macroeconomic variables using certain threshold variables. This is done because the linear growth model is often used in the previous literature as an example below:

$$Y_i = \alpha_1 + \beta_1 C_i + \beta_2 I_i + \beta_3 G_i + \beta_4 k_i + \varepsilon_i \dots\dots..(1)$$

where Y is GDP per capita, C is consumption, I is investment, G is government spending and q is international tourism receipts. The above model can produce biased results because an increase in total (C) consumption can lead to economic growth based on Keynesian consumption theory, but it can also reduce economic growth because some economists argue that saving is the main factor of economic growth. An increase in productive government spending (G) can stimulate economic growth, while an increase in government spending for consumption is detrimental to economic growth, indicating that the expected coefficient sign is uncertain, where each country has different degrees and conditions of tourism that can affect the economy (Chiu & Yeh, 2016). The extent to which tourism can affect the economy is also biased (Song & Wu, 2022). Because tourism is not a pillar industry in many countries, it needs to get special treatment if tourism is to be a determinant that can drive the economy. In other words, the development of tourism does not always result in economic growth. It is possible that an increase in tourism may or may not increase economic growth (Po & Huang, 2008).

The threshold regression model comes from the autoregressive threshold model in the time series model developed by Tong & Lim (1978) in Po & Huang (2008). In this case three tourism specialization indices are used as threshold variables (degree of tourism specialization). By declaring the threshold variable as k_i for representation and optimal threshold value as 〖c〗 _1^*. This modeling will test the threshold regression for each country with a 30-year time series from 1991-2021 (time series) to identify countries with tourism specialization and countries without tourism specialization. The first model of the non-linear equations formed is as follows:

$$LY_i = (\alpha_1 + \beta_1 C_i + \beta_2 I_i + \beta_3 G_i) * f(k_i \leq c_1^*) + (\alpha_2 + \beta_4 C_i + \beta_5 I_i + \beta_6 G_i) * f(k_i > c_1^*) + \varepsilon_i \dots \dots \dots \dots \dots (2)$$

Description:

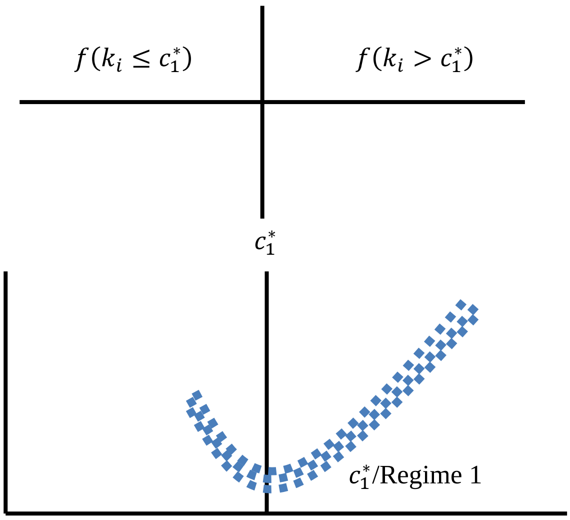
Y	=	Per Capita GDP
C	=	Total Consumption
I	=	Investment
G	=	Government Spending
α_1, α_2	=	Constant Coefficient
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$	=	Regression coefficient of each variable C, I and G
k_i	=	Threshold values Q, N and TS
Q	=	Threshold Effects GDP per capita of tourism tourism receipts
N	=	Threshold Effects the number of arrivals from departures of tourists
TS	=	Threshold Effects Total exports from imports of travel services
c_1^*	=	Minimum Threshold value
c_2^*	=	Optimal Threshold value
ε_i	=	term error

In the above model, change the linear function to non-linear with Y being the natural logarithm in order to get stationary data and enter the tourism variable proxy into the model using the threshold f(k_i 〖≤c〗 _1^*). Then test the macroeconomic variables C, I, G together with the tourism threshold variables Q, N, and TS to obtain the significance value of the tourism threshold variable to GDP per capita (Y) by looking at the residual equations of Q, N, and TS and standard F results threshold. Where ε_i is assumed to be independent and identically distributed (i.i.d) and to follow the white noise process. f (.) is an indicator function. If the relationship in (.) exists, then f (.) is 1, otherwise f (.) is 0. Equation (2) is a simple two-regime model described by the value of the threshold variable. This shows that the relationship between explanatory variables and economic growth is represented by β1 = (α_1,β_1,β_2,β_3) when k_i (threshold variable) is less than or equal to the threshold value c_1^* (regime 1), but with β2 = (α_2,β_4,β_5,β_6) when k_i is greater than the threshold value c_1^* (regime 2). Equation (2) can be estimated only after rejecting the null hypothesis of the linear model. Threshold contains data characteristic functions and threshold values as follows:

1. Characteristic functions of variables that have a middle threshold value or value entered into Regime 1 : $f(k_i \leq c_1^*) = \{\frac{Value\ 1\ when\ k_i \leq c_1^*}{Value\ 0\ when\ k_i > c_1^*}$
2. Characteristic functions of variables that have a middle threshold value or value entered into Regime 2 : $f(k_i > c_2^*) = \{\frac{Value\ 1\ when\ k_i > c_2^*}{Value\ 0\ when\ k_i < c_2^*}$

This characteristic function divides the data into a range of regimes, those data which are marked c_1^* and c_2^* are flexible and can be at the threshold of the minimum point value, the middle threshold point and the optimal point, illustrated as follows:

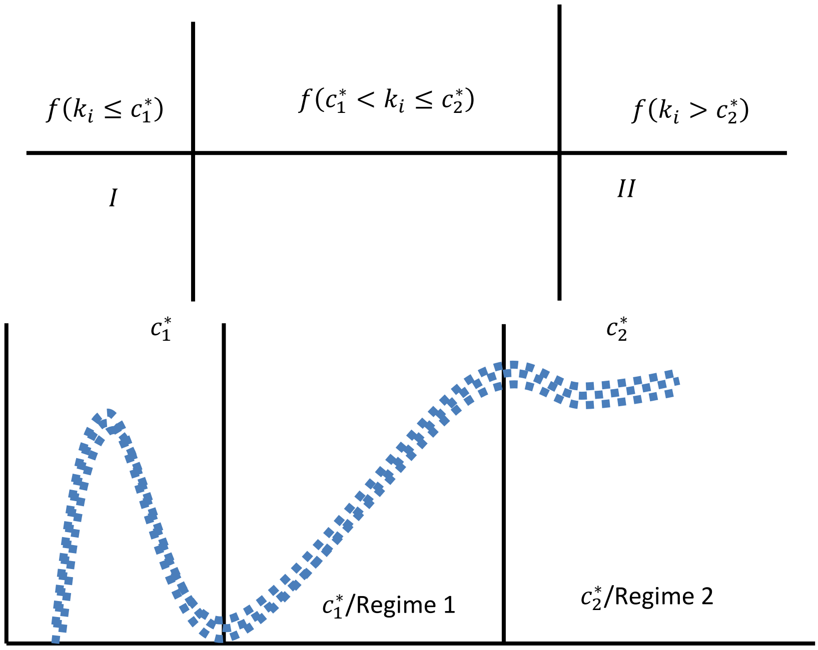
1. Illustration of the minimum threshold value:



Source: Rue s.tsay and rong chen, 2019, pp 44-49

The first illustration shows how the regime is divided, when the data has a minimum threshold point/c_1^* then the data tends to show minimum values at the threshold variable that affects the dependent variable. In one scope the data entered in regime 1 shows the minimum value obtained by the threshold variable significantly affects the dependent variable, so this produces a value of c_1^*.

2. Illustration of the threshold value of the middle threshold:



Source: Rue s.tsay and rong chen, 2019, pp 44-49

The second illustration shows how the regime is divided again because it gets the middle threshold value and the optimal value. when the data has an optimal point/c_2^* then the data tends to form a middle threshold and shows optimal values at the threshold variable that affects the dependent variable. In one scope the data entered in regime 2 shows that the optimal value that forms the middle threshold is obtained by the threshold variable significantly affecting the dependent variable, so this produces a value of c_2^*, and the middle threshold value is obtained.

Threshold testing is continued by looking at the significance F which shows, regime 1 and regime 2 must meet the significant F requirements, so Equation (2) can be estimated only after rejecting the null hypothesis of the linear model. Because the threshold value (c) is unknown, the traditional F-test is not suitable for testing the null hypothesis. Therefore, Tong & Hansen (1978) in Chiu & Yeh, (2016) suggest using a test with near-optimal power to alternative distances from the null hypothesis, which takes the form of a standard Threshold F statistic as below:

$$F = n\left(\frac{\tilde{\sigma}_n^2 - \sigma_n^2}{\hat{\sigma}_n^2}\right) \qquad (3)$$

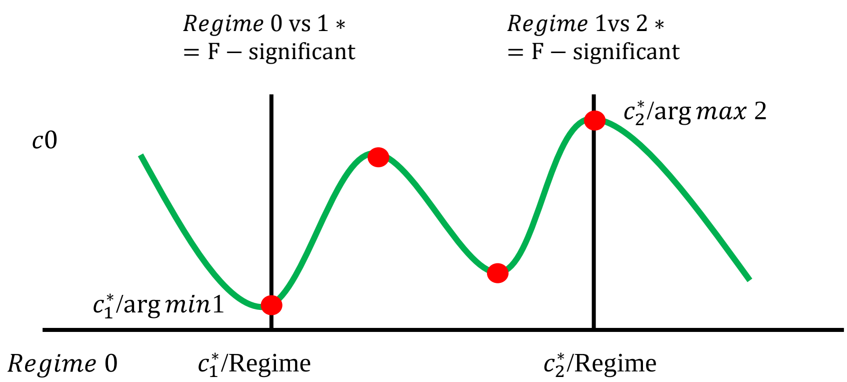
This test looks at the value of the F distribution and looks at the residuals of each model variable Q, N and TS on the effect of GDP per capita (Y) in each equation model. The above formula with the following classification σ̃_n^2 residual variance of the linear model and σ̂_n^2 residual variance of the equation to estimate the equation, it is necessary to arrange the data in ascending order in k, and after considering the degree of freedom problem, discarding the smallest 15% of observations and biggest. Then the residual linear model obtained from the variables Q, N and TS will be divided by the f statistic to make the equation non-linear, with the remaining 70% sample space limited by the threshold value [c,c] divided into n. the result of the equation will get (σ()̂c_i) for each c, the optimal threshold value c_1^* can be determined by choosing the smallest σ̂_n^2 (c_i) with the following equation:

$$c_1^* = \arg min\ \hat{\sigma}^2(c_i), i = 1, \dots . n,$$

$$c_1^* \ \epsilon \ [\underline{c}, \overline{c}] \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots . (4)$$

where σ̂_n^2 (c_i) is the residual variance of the equation with the optimal threshold value c_2^*.

F-statistics as a whole is characterized by the results of significance, significance is formed in each regime. F statistical significance is indicated by 0 vs 1* = indicating that Regime 1 is significant and has a minimum threshold value c_1^*=significant, 1 vs 2* = indicating Regime 2 is significant and has an optimal threshold value and forms a middle threshold value c_2^*=significant, illustrated by the following graph:



Source: Rue s.tsay and rong chen, 2019, pp 44-49

The illustration above illustrates the F-statistics illustration, arg min 1 and arg min 2 must meet the requirements for significance F between regimes. Regime 0 is a model without a regime or a regime threshold with no insignificant data, when the data moves from point 0 to regime 1, the threshold starts to be significant and is formed, so F is concluded 0 vs 1*= c_1^* significant. The minimum significant threshold data then moves from the regime 1 point to the regime 2 point, the threshold starts to be significant and is formed, then F is concluded as 1 vs 2*= c_2^* significant. This also concludes that both the threshold variables in regime 1 and 2 are statistically significant.

The threshold model is formed slowly from a linear to non-linear basis with a mathematical reduction process. The threshold equation starts from the linear basic equation, then it is reduced to a non-linear minimum and optimal threshold equation model, so in the next derivative equation we get the middle threshold value by finding the minimum and optimal threshold values. The final equation that is formed as a whole becomes as follows:

$$LY_i = (\alpha_1 + \beta_1 C_i + \beta_2 I_i + \beta_3 G_i) * f(k_i \leq c_1^*) + (\alpha_2 + \beta_4 C_i + \beta_5 I_i + \beta_6 G_i) * f(c_1^* < k_i \leq c_2^*) + (\alpha_3 + \beta_7 C_i + \beta_8 I_i + \beta_9 G_i) + * f(k_i > c_2^*) + \varepsilon_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(5)$$

Description:

Y	=	Per Capita GDP
C	=	Total Consumption
I	=	Investment
G	=	Government Spending
$\alpha_1, \alpha_2, \alpha_3$	=	Constant Coefficient
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9$	=	Regression coefficient of each variable C, I and G
k_i	=	Threshold values Q, N and TS
Q	=	Threshold Effects GDP per capita of tourism tourism receipts
N	=	Threshold Effects the number of arrivals from departures of tourists
TS	=	Threshold Effects Total exports from imports of travel services
c_1^*	=	Minimum Threshold value
c_2^*	=	Optimal threshold Threshold value
$c_1^* < k_i \leq c_2^*$	=	Middle threshold Threshold value
ε_i	=	term error

To test the existence of three regimes versus two regimes, the null hypothesis is set as Ho : two regimes versus three regimes. The statistical test is the same as the F-Statistics in Eq (3) with the exception that σ̃_n^2 is the residual variance of Eq (1) and σ̂_n^2 is the residual variance of Eq (5). Since the threshold level is unknown and the asymptotic F-statistic cannot be derived from the χ2 distribution, a bootstrap procedure is required to test the hypothesis. As a country concentrates more on tourism, its economy will depend more on revenue from tourism. Therefore it is expected that if the degree of tourism specialization is higher than a certain threshold, there will be a significant relationship between tourism growth and economic growth.

IV. Results and Discussion

The threshold regression model was analyzed to test the Tourism Led Economic hypothesis postulating that tourism is the main determinant of a country's long-term economic growth (Po & Huang, 2008). Revenue and receipts from the tourism sector can be used to finance imports of capital goods which in turn have an impact on producing goods and services so that they can lead to economic growth (Brida et. al, 2014 in Hakan et. al, 2015). The Treshold Effect Tourism Led Economic regression test was carried out throughout 1991-2021 in 20 countries with three tourism threshold variables namely Q, N and TS and three macroeconomic variables namely C, I and G as control variables (Chiu & Weh, 2016). Regression Threshold Effect Tourism Led Economic 20 Countries with high and upper middle class competitiveness index:

Table 3. Statistical Results of Minimum and Optimal Threshold Effects of Q, N and TS Against Y in 20 Countries with a High TTCI Index in 1991-2021

1	Jepang	Threshold Value	Regime 2	
Q	f ($k_i \le c^*_1$)	Q < 0.0078579019 -- 8 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.007857901 <= Q < 0.02479158 -- 13 obs	0 vs. 1 *	7.3768
	f ($k_i > c^*_2$)	0.02479158 <= Q -- 10 obs	1 vs. 2 *	8.4103
N	f ($k_i \le c^*_1$)	N < 0.2597747 -- 7 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.2597747 <= N < 0.3646842 -- 5 obs	0 vs. 1 *	5.7995
	f ($k_i > c^*_2$)	0.3646842 <= N -- 19 obs	1 vs. 2 *	6.6556
TS	f ($k_i \le c^*_1$)	TS < 0.1177236 – 5 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.1177236 <= TS < 0.152196 – 5 obs	0 vs. 1 *	12.395
	f ($k_i > c^*_2$)	TS < =0.152196 – 21 obs	1 vs. 2 *	10.770
2	US	Threshold Value	Regime 2	
Q	f ($k_i \le c^*_1$)	Q < 0.2597747 -- 7 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.2597747 <= Q < 0.7935277 -- 16 obs	0 vs. 1 *	11.756
	f ($k_i > c^*_2$)	0.7935277 <= Q -- 8 obs	1 vs. 2 *	7.5947
N	f ($k_i \le c^*_1$)	N < 0.1178234 -- 6 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.1178234 <= N < 0.2987001 -- 10 obs	0 vs. 1 *	11.756
	f ($k_i > c^*_2$)	N < 0.2987001 -- 8 obs	1 vs. 2 *	7.0252
TS	f ($k_i \le c^*_1$)	TS < 0.02534004 -- 5 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.02534004 <= TS < 0.03718035 -- 14 obs	0 vs. 1 *	7.6957
	f ($k_i > c^*_2$)	0.03718035 <= TS -- 12 obs	1 vs. 2 *	8.9338
3	Spain	Threshold Value	Regime 2	
Q	f ($k_i \le c^*_1$)	Q < 0.0097563089 -- 15 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.0097563089 <= Q < 0.01036648 -- 4 obs	0 vs. 1 *	7.3677
	f ($k_i > c^*_2$)	0.01036648 <= Q -- 4 obs	1 vs. 2 *	7.6445
N	f ($k_i \le c^*_1$)	N < 0.3948512 -- 8 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.3948512 <= N < 0.410306 -- 5 obs	0 vs. 1 *	20.054
	f ($k_i > c^*_2$)	0.410306 <= N -- 18 obs	1 vs. 2 *	10.257

TS	f ($k_i \le c^*_1$)	TS < 0.2669622 -- 8 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.2669622 <= TS < 0.3646842 -- 4 obs	0 vs. 1 *	20.0548
	f ($k_i > c^*_2$)	0.3646842 <= TS -- 19 obs	1 vs. 2 *	10.2573
4	Singapore	Threshold Value	Regime 2	
Q	f ($k_i \le c^*_1$)	Q < 0.162562 -- 8 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.162562 <= Q < 0.3721687 -- 11 obs	0 vs. 1 *	11.92942
	f ($k_i > c^*_2$)	0.3721687 <= Q -- 12 obs	1 vs. 2 *	9.893033
N	f ($k_i \le c^*_1$)	N < 0.0081614959 -- 7 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.0081614959 <= N < 0.0440257 -- 11 obs	0 vs. 1 *	17.96843
	f ($k_i > c^*_2$)	0.04402573 <= N -- 13 obs	1 vs. 2 *	8.921707
TS	f ($k_i \le c^*_1$)	TS < 0.6389409 -- 5 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.6389409 <= TS < 0.8676028 -- 13 obs	0 vs. 1 *	16.14468
	f ($k_i > c^*_2$)	0.8676028 <= TS -- 13 obs	1 vs. 2 *	8.391324
5	France	Threshold Value	Regime 2	
Q	f ($k_i \le c^*_1$)	Q1 < 0.2387826 -- 12 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.2387826 <= Q1 < 0.410279 -- 9 obs	0 vs. 1 *	14.19049
	f ($k_i > c^*_2$)	0.410279 <= Q1 -- 10 obs	1 vs. 2 *	10.32739
N	f ($k_i \le c^*_1$)	N < 2.181395 -- 6 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	2.181395 <= N < 3.352371 -- 10 obs	0 vs. 1 *	14.01464
	f ($k_i > c^*_2$)	3.352371 <= N -- 15 obs	1 vs. 2 *	7.893595
TS	f ($k_i \le c^*_1$)	TS < 1.230235 -- 7 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	1.230235 <= TS < 1.305577 -- 12 obs	0 vs. 1 *	10.88346
	f ($k_i > c^*_2$)	1.305577 <= TS -- 12 obs	1 vs. 2 *	5.635763
6	Austria	Threshold Value	Regime 2	
Q	f ($k_i \le c^*_1$)	Q < 0.02581925 -- 16 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.02581925 <= Q < 0.034327219 -- 9 obs	0 vs. 1 *	41.09612
	f ($k_i > c^*_2$)	0.034327219 <= Q -- 6 obs	1 vs. 2 *	5.506416
N	f ($k_i \le c^*_1$)	N < 1.85423 -- 6 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	1.85423 <= N < 2.431391 -- 17 obs	0 vs. 1 *	8.712598
	f ($k_i > c^*_2$)	2.431391 <= N -- 8 obs	1 vs. 2 *	8.393181
TS	f ($k_i \le c^*_1$)	TS < 0.8867014 -- 9 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.8867014 <= TS < 1.172373 -- 10 obs	0 vs. 1 *	9.420136
	f ($k_i > c^*_2$)	1.172373 <= TS -- 12 obs	1 vs. 2 *	9.736965
7	China	Threshold Value	Regime 2	
Q	f ($k_i \le c^*_1$)	Q < 0.0020941129 -- 8 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	0.002094112 <= Q < 0.002271091 -- 4 obs	0 vs. 1 *	14.63802
	f ($k_i > c^*_2$)	0.0022710919 <= Q -- 11 obs	1 vs. 2 *	7.786682
N	f ($k_i \le c^*_1$)	N < 2.330916 -- 11 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	2.330916 <= N < 9.973045 -- 14 obs	0 vs. 1 *	14.34059
	f ($k_i > c^*_2$)	9.973045 <= N -- 6 obs	1 vs. 2 *	27.31621
TS	f ($k_i \le c^*_1$)	TS < 1.319754 -- 9 obs	Threshold Test	F-statistic
	f($c^*_1 < k_i \le c^*_2$)	1.319754 <= TS < 1.540895 -- 15 obs	0 vs. 1 *	26.95187
	f ($k_i > c^*_2$)	1.540895 <= TS -- 7 obs	1 vs. 2 *	11.48338

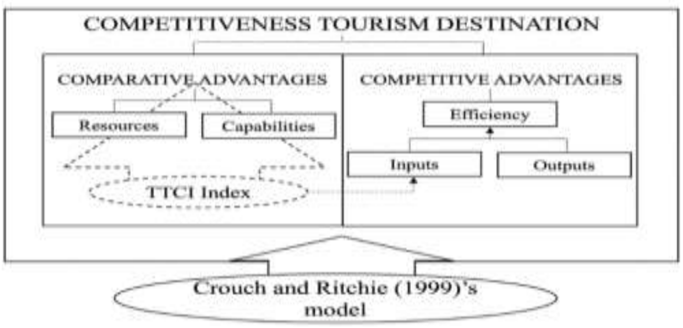
8	Canada	Threshold Value	Regime 2	
Q	$f(k_i \le c^*_1)$	Q < 0.01929129 -- 12 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.01929129 <= Q < 0.02887638 -- 10 obs	0 vs. 1 *	9.771383
	$f(k_i > c^*_2)$	0.02887638 <= Q -- 9 obs	1 vs. 2 *	6.495432
N	$f(k_i \le c^*_1)$	N < 0.5290217 -- 10 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.5290217 <= N < 0.6816223 -- 7 obs	0 vs. 1 *	13.24340
	$f(k_i > c^*_2)$	0.6816223 <= N -- 10 obs	1 vs. 2 *	8.117696
TS	$f(k_i \le c^*_1)$	TS < 0.3889149 -- 4 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.3889149 <= TS < 0.6245613 -- 12 obs	0 vs. 1 *	12.83547
	$f(k_i > c^*_2)$	0.6245613 <= TS -- 11 obs	1 vs. 2 *	9.726121
9	Netherlands	Threshold Value	Regime 2	
Q	$f(k_i \le c^*_1)$	Q < 0.01768527 -- 4 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.01768527 <= Q < 0.03793655 -- 22 obs	0 vs. 1 *	14.65211
	$f(k_i > c^*_2)$	0.03793655 <= Q -- 5 obs	1 vs. 2 *	11.90663
N	$f(k_i \le c^*_1)$	N < 0.3005419 -- 4 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.3005419 <= N < 0.5409487 -- 4 obs	0 vs. 1 *	10.64553
	$f(k_i > c^*_2)$	0.5409487 <= N -- 23 obs	1 vs. 2 *	6.478604
TS	$f(k_i \le c^*_1)$	TS < 0.7713981 -- 7 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.7713981 <= TS < 0.8168516 -- 8 obs	0 vs. 1 *	5.729433
	$f(k_i > c^*_2)$	0.8168516 <= TS -- 7 obs	1 vs. 2 *	6.357404
10	Portugal	Threshold Value	Regime 2	
Q	$f(k_i \le c^*_1)$	Q < 0.01397058 -- 15 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.01397058 <= Q < 0.02530501 -- 12 obs	0 vs. 1 *	15.61865
	$f(k_i > c^*_2)$	0.02530501 <= Q -- 4 obs	1 vs. 2 *	8.100697
N	$f(k_i \le c^*_1)$	N < 0.5812994 -- 10 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.5812994 <= N < 0.6988681 -- 13 obs	0 vs. 1 *	9.870205
	$f(k_i > c^*_2)$	0.6988681 <= N -- 8 obs	1 vs. 2 *	6.788086
TS	$f(k_i \le c^*_1)$	TS < 1.343635 -- 6 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	1.343635 <= TS < 3.6798 -- 10 obs	0 vs. 1 *	16.52660
	$f(k_i > c^*_2)$	3.6798 <= TS -- 15 obs	1 vs. 2 *	5.672052
11	Sweden	Threshold Value	Regime 2	
Q	$f(k_i \le c^*_1)$	Q < 0.0074616959 -- 6 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.0074616959 <= Q < 0.0318768 -- 16 obs	0 vs. 1 *	17.40880
	$f(k_i > c^*_2)$	0.03187682 <= Q -- 9 obs	1 vs. 2 *	11.41770
N	$f(k_i \le c^*_1)$	N < 0.2133349 -- 18 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.2133349 <= N < 0.373138 -- 6 obs	0 vs. 1 *	27.27116
	$f(k_i > c^*_2)$	0.373138 <= N -- 7 obs	1 vs. 2 *	13.99556
TS	$f(k_i \le c^*_1)$	TS < 0.577352 -- 7 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.577352 <= TS < 1.776933 -- 18 obs	0 vs. 1 *	9.670627
	$f(k_i > c^*_2)$	1.776933 <= TS -- 6 obs	1 vs. 2 *	11.43290
12	Switzerland	Threshold Value	Regime 2	
Q	$f(k_i \le c^*_1)$	Q < 0.1816171 -- 9 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \le c^*_2)$	0.1816171 <= Q < 0.52461 -- 18 obs	0 vs. 1 *	8.747917

	$f(k_i > c^*_2)$	0.52461 <= Q -- 4 obs	1 vs. 2 *	12.42217
N	$f(k_i \leq c^*_1)$	N < 0.010872079 -- 13 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \leq c^*_2)$	0.010872079 <= N < 0.04402573 -- 5 obs	0 vs. 1 *	8.196176
	$f(k_i > c^*_2)$	0.04402573 <= N -- 13 obs	1 vs. 2 *	5.684683
TS	$f(k_i \leq c^*_1)$	TS < 0.6961064 -- 8 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \leq c^*_2)$	0.6961064 <= TS < 0.8349904 -- 8 obs	0 vs. 1 *	7.508557
	$f(k_i > c^*_2)$	0.8349904 <= TS -- 15 obs	1 vs. 2 *	10.70806
13	Hongkong	Threshold Value	Regime 2	
Q	$f(k_i \leq c^*_1)$	Q < 0.0044298899 -- 4 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \leq c^*_2)$	0.004429889 <= Q < 0.00463433 -- 4 obs	0 vs. 1 *	12.83290
	$f(k_i > c^*_2)$	0.0046343369 <= Q -- 5 obs	1 vs. 2 *	7.626929
N	$f(k_i \leq c^*_1)$	N < 0.2143127 -- 6 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \leq c^*_2)$	0.2143127 <= N < 0.3165464 -- 8 obs	0 vs. 1 *	20.77836
	$f(k_i > c^*_2)$	0.3165464 <= N -- 17 obs	1 vs. 2 *	10.13632
TS	$f(k_i \leq c^*_1)$	TS < 0.8483412 -- 6 obs	Threshold Test	F-statistic
	$f(c^*_1 < k_i \leq c^*_2)$	0.8483412 <= TS < 1.006712 - - 6 obs	0 vs. 1 *	9.305202
	$f(k_i > c^*_2)$	1.006712 <= TS -- 19 obs	1 vs. 2 *	8.795141
14	Germany	Not Significant Threshold Variables Q, N And TS		Regime 1
15	Australia	Not Significant Threshold Variables Q, N And TS		Regime 1
16	UK	Not Significant Threshold Variables Q, N And TS		Regime 1
17	Italia	Not Significant Threshold Variables Q, N And TS		Regime 1
18	Kore Rep	Not Significant Threshold Variables Q, N And TS		Regime 1
19	Denmark	Not Significant Threshold Variables Q, N And TS		Regime 1
20	Finland	Not Significant Threshold Variables Q, N And TS		Regime 1

Source: Data Processed by Eviews Regression Threshold Software.

The results above are the statistical results of the minimum and optimal threshold values Threshold Effect Q, N and TS where the significance of the threshold value is obtained when a variable has a threshold value f (ki ≤ c*1), f(c*1 < ki ≤ c*2) and f (ki > c*2) , then the values of Q, N and TS have minimum and optimum limit values and these variables are specialized. The Q, N and TS values that do not have a minimum and optimum threshold value for these variables are not significant as threshold variables that affect the economy of a country. Threshold Effect Q, N and TS regression see direct significance to the economy between countries where a significant Threshold effect variable will get an optimal threshold value and this variable affects (Y) GDP per capita of each country. Countries that have tourism variables that are significant and affect the economy both with minimum and optimum limits are 13 countries namely Japan, United States, Spain, Singapore, France, Austria, China, Canada, Netherlands, Portugal, Sweden, Switzerland and Hong Kong. Statistically, the results show that F regime 0 vs 1 and F regime 1 v 2 are significant, while obs is the length of year, the variables Q, N and TS affect the minimum and optimum. In the results of 7 countries namely Germany, Australia, UK, Italy, Kore Rep, Denmark and Finland it is proven that tourism is not specialized and does not affect the economy either at a minimum or optimal threshold. The Threshold Effects of the Tourism-Led Growth are proven in the results of the non-linear model, the tourism variable cannot be said to increase the economy constantly in 20 countries with a high TTCI index. The results of the 1991-2021 research on the tourism sector through the non-linear TLGH results show that tourism has a minimal and optimal influence in several years and the threshold value of the variable contribution of tourism to the economy of each country. The results of the research statistically show that there are 13 countries that have optimal or significant threshold values and are in regime two or regimes where the Q, N and TS variables have significant values affecting Y/GDP per capita of each country. 13 Countries have a comparative advantage and specialization in the formation of the tourism sector so that tourism plays a role in improving the economy. There are 7 countries that have threshold values, some of the variables are not optimal or some of the variables do not have a direct significance to the per capita Y/GDP of each country, which are in the first regime group. In the 7 insignificant countries it can be concluded that tourism does not have comparative and competitive advantages, so it is not specialized so that tourism does not play a significant role in improving the economy.

This is in line with the theory of comparative advantage in the tourism sector which refers to specialization, because comparative advantage is dynamic and claims that specialization is a source of trade growth that can increase productivity and consumption patterns (Schumacher, 2013). Two conditions must exist for endogenous comparative advantage to trigger a welfare-enhancing effect, namely the production process and expanding demand for goods (demand elasticity) through increased competitiveness. According to Crouch & Ritchie (1999) competitiveness is about the necessary conditions in terms of resources and managerial capabilities for a country to develop tourism successfully. Tourism is a labor-intensive industry, which has a significant contribution to employment (WTTC, 2012). The following is a Competitiveness Tourism Destination (CTD) diagram:



Source: Crouch and Ritchie's CTD Model (1999)

Figure 2. Research Model of Tourism Destination Competitiveness

In the figure above, two dimensions of competitiveness can be seen, namely comparative advantage and competitive advantage. As a sector that includes a variety of interrelated industries, tourism has the ability to drive trade and economic growth. Especially putting more emphasis on the characteristics of tourism, the beauty of the natural environment and cultural heritage is a comparative advantage for countries specializing in tourism (UNWTO, 2013). So that in the 13 countries that specialize in tourism, these countries will benefit greatly if they increase tourism excellence as a factor affecting economic growth. In 7 countries that are not specialized in tourism, they have not been able to contribute to the economy, and do not have the advantage to drive the economy. This also concludes that it is not certain that countries that have a high tourism competitiveness index can benefit economically.

V. Conclusion

The results confirm Threshold Effects of the Tourism-Led Growth is very relevant and accurate in knowing how influential the variable components of tourism affect the economy through non-linear relationships. Non-linear relationships must be formed because it characterized tourism variables as not always constant, but sometimes tourism affects the economy minimally and optimally. From the results of 20 countries with the highest TTCI Index values, it is evident that countries that have significant tourism variables and affect the economy both at the minimum and optimum limits are 13 countries, namely Japan, United States, Spain, Singapore, France, Austria, China, Canada, Netherlands, Portugal, Sweden, Switzerland and Hong Kong. The results statistically show that F regime 0 vs 1 and F regime 1 v 2 are significant, while obs is the length of the year the variables Q, N and TS affect the minimum and optimum. The tourism sector in 13 significant countries proves that tourism in these countries is specialized and has a comparative advantage, so it can affect the economy at the minimum and optimal threshold values.

In the results of 7 countries, namely Germany, Australia, UK, Italy, Korea Rep, Denmark and Finland, it is proven that tourism is not specialized and does not affect the economy either at the minimum or optimal threshold. Threshold Effects of the Tourism-Led Growth is evidenced in the results of the non-linear model, the tourism variable cannot be said to increase the economy constantly in 20 countries with a high TTCI index. In the 1991-2021 research results, the tourism sector through the non-linear TLGH results showed that tourism had a minimal and optimal effect on several years and the threshold value of the contribution of tourism variables to the economy of each country.

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