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The Relationships between Financial Policy, Fiscal Policy, Visitor Exports and the Tourism Economy of Thailand

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Abstract:

This objective of this research is to apply the Vector Autoregressive (VARs) model to study the relationships between the macroeconomic variables in the tourism sector by using Gross Domestic Product in the tourism sector of Thailand with interbank rates, individual government expenditures on tourism and visitor exports (foreign spending). Quarterly data from 1995 to 2016 with a total of 88 data sets are employed in the study. The results show that the interbank rate had the greatest impact on the gross national product of the tourism sector in Thailand at 9.17%. On the other hand, individual government expenditures on tourism had an impact of only 2.77%. Consequently, monetary policy will affect the economy of the tourism sector in Thailand more efficiently than fiscal policy. Therefore, the Thai government should implement fiscal policy together with monetary policy to boost the tourism economy and to increase competitiveness.

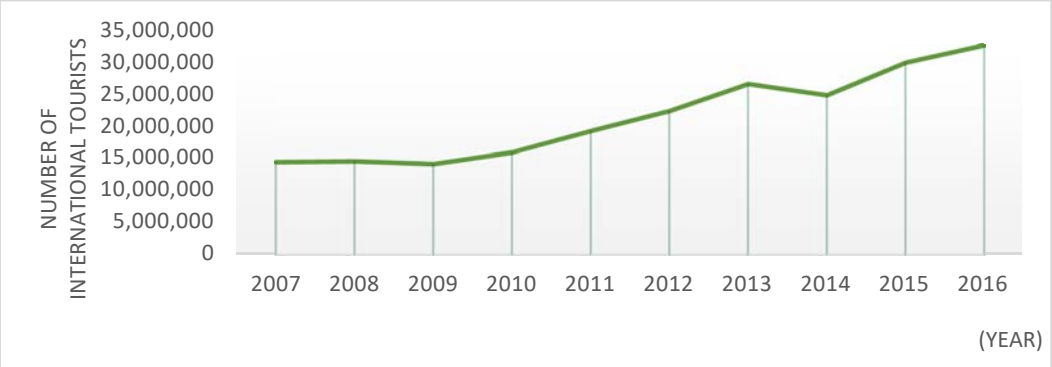
Keywords: monetary policy; fiscal policy; tourism economy; Thai tourism

JEL Classification: E22; E26; Z30.

Introduction

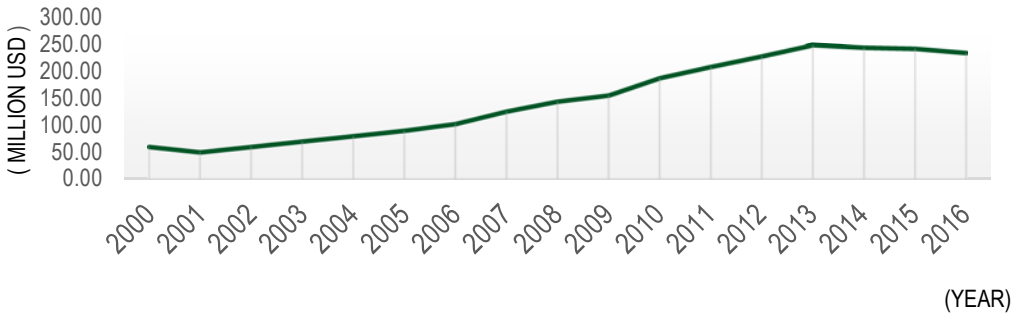
Tourism is a very important industry in the overall economic development of many countries around the world including Thailand. Thailand's tourism industry has continuously grown as can be seen in Figure 1, which demonstrates that from 2007 to 2016, the number of international tourists has unceasingly increased from 14.46 million people in 2007 to 32.58 million people in 2016. It is apparent that the increased rate has significantly expanded and this is a major source of national revenue (Chitchumnong 2004). In consequence, the government understands the significance of the tourism industry and invests in tourism more as there is an urgent policy to recover the confidence to invest and to support Thailand's tourism in order to promote tourism to achieve the greatest potential, which will benefit the country in terms of revenue from foreign currency and will support national economic strength and economic stimulation.

Figure 1. Number of International tourists visiting Thailand during 2007 - 2016 (Department of Tourism 2017)



As shown in Figure 2, government spending over 17 years in Thailand's tourism sector according to the WTTC has increased from 60 million dollars in 2000 to 234.73 million dollars in 2016. This indicates that the government gives priority to tourism and that state spending significantly affects economic growth due to the economic stimulation of Thailand that results from fiscal policy (Borvonphongsakul and Jantarakolica 2011). Furthermore, Ohlan (2017) discovered that the financial sector is related to the tourism sector in India. As a result, it is possible that the monetary and fiscal policies of the government may affect the tourism economy.

Figure 2. Thai government spending increases from 2000 to 2016 (World Travel and Tourism Council 2017)



Despite the continuous expansion of the Thai tourism sector, the study of the macroeconomic impacts of government spending in the Thai tourism sector has not been conducted in recent years. This research aims to propose guidelines for the promotion of tourism growth to develop the tourism industry's potential in Thailand, and to suggest policy to increase the number of foreign visitors to the country in the future.

1. Literature Review

According to the literature review, it was found that economic growth will be one of the main targets of the country and government policy to stimulate the economy through monetary and fiscal policy. From the study of Thammawong (2009), the increase in broad money (M_2) is closely related to national income. Pensupar *et al.* (2011) also found that monetary policy is related to Thailand's exports and results in economic growth. On the other hand, monetary policy impacts the gross domestic product (GDP) and is more efficient than fiscal policy (Yimsiriwattana 2003, Polpakdee 2012)

Another important policy for national development is fiscal policy. Government spending policy is significant in the building of economic foundations. This is one of the most important policies to stimulate economic growth. Rongkad (2014), revealed that the operation of fiscal policy results in the stimulation of economic expansion, affecting GDP. Nasakornkriengdej (2005) found that fiscal policy has a two-way relationship in the shortrun and the long run with GDP. Yimsiriwattana (2003) and Ratanasri, (2013), found that policy with the greatest efficiency should combine monetary policy and fiscal policy as it will affect both consumption expenses and GDP. Kanluan (2006) discovered that the income from foreign tourists traveling in Thailand is regarded as highly important to the Thai economy.

As previously mentioned in regard to he operation of the monetary policy and the fiscal policy, the two policies significantly influence the macroeconomy. Furthermore, Nonthapot (2014) and Nonthapot (2016) stated that the tourism sector brings income and foreign visitors to Thailand. However, the operation of monetary and

fiscal policy still has limitations in terms of the study, particularly the operating result of the two policies towards the tourism sector economy of Thailand at the macroeconomic level. Therefore, the research will focus on this topic.

2. Scope of the Research

2.1. VARs Model in the study

Because the relationship between macroeconomic variables at the present time tend to be interdependent and dynamic, the Structural Form Model that has been frequently used is less appropriate. Vector Autoregressive (VARs) is the model that was developed to describe the relationships between macroeconomic variables, which has the following reduced form:

$$\begin{bmatrix} y_{1,t} \\ y_{2,t} \\ \vdots \\ y_{n,t} \end{bmatrix} = \begin{bmatrix} a_{10} \\ a_{20} \\ \vdots \\ a_{n0} \end{bmatrix} + \begin{bmatrix} a_{11}(L) & a_{21}(L) & \cdots & a_{n1}(L) \\ a_{12}(L) & a_{22}(L) & \cdots & a_{n2}(L) \\ \vdots & \vdots & \ddots & \vdots \\ a_{1n}(L) & a_{2n}(L) & \cdots & a_{nn}(L) \end{bmatrix} \begin{bmatrix} y_{1,t-i} \\ y_{2,t-i} \\ \vdots \\ y_{n,t-i} \end{bmatrix} + \begin{bmatrix} e_{1,t} \\ e_{2,t} \\ \vdots \\ e_{n,t} \end{bmatrix} \quad (1)$$

In the VARs model, according to the above equation, each variable in the model relationship is vertical but there are (1) lags in the variable (2) lags in the other variables in the system and (3) noise that has a white noise quality.

where: y_{it} is the variable in the system;

a_{it} is the coefficient that requires estimation;

e_{it} is the noise that has a white noise quality.

2.2. Methods

The study method using VARs can be concluded as follows:

- set the variable in the VARs model;
- a stationary test of all variables in the VARs model by Unit Root Test;
- indicate the appropriate Lags of VARs by using Information Criteria;
- stability test of the entire VARs system;
- test the interdependence relation by Granger Causality Test with the method of Engle & Granger (1987);
- estimate the variables' relations in the system with Impulse Response Function Analysis and Forecast Error Variance Decomposition Analysis

2.2.1. Data and Declaration of Variables

The data of this research is quarterly data from 1995 to 2016 with a total of 88 data sets. For the declaration of variables in this study, the variables can be divided into 2 groups as follows:

1. Target Macroeconomic Variables

Income variables use the Total contribution to GDP of the statistics reports of the World Travel & Tourism Council (WTTC) which summarizes results into US dollars as at the current price (World Travel & Tourism Council 2017a).

Income variables are quarterly visitor exports and collected visitor exports (Foreign spending) from the statistics reports of the World Travel and Tourism Council (WTTC) (World Travel & Tourism Council 2017b).

2. Policy Variables

Financial policy variables use the Interbank Rate (IN) collected the data of the Interbank Rate from the statistics reports of the Bank of Thailand (Bank of Thailand 2017).

The fiscal policy variables use Government Individual Expenditure on tourism from the statistics reports of the World Travel and Tourism Council (WTTC) which summarizes results into US dollars as at the current price (World Travel & Tourism Council 2017c).

VARs in this study can be written in the following equitation:

$$Y_t = A_0 + \sum_{i=1}^{p} A_i Y_{t-i} + \varepsilon_t \quad (2)$$

where: a $Y_t = \begin{bmatrix} y_{1,t} \\ y_{2,t} \\ \vdots \\ y_{4,t} \end{bmatrix}, A_0 = \begin{bmatrix} a_{10} \\ a_{20} \\ \vdots \\ a_{40} \end{bmatrix}, A_i = \begin{bmatrix} a_{t11}(L) & a_{t21}(L) & \cdots & a_{i41}(L) \\ a_{t12}(L) & a_{t22}(L) & \cdots & a_{i42}(L) \\ \vdots & \vdots & \ddots & \vdots \\ a_{t14}(L) & a_{t24}(L) & \cdots & a_{i44}(L) \end{bmatrix}, \varepsilon_t = \begin{bmatrix} e_{1,t} \\ e_{2,t} \\ \vdots \\ e_{4,t} \end{bmatrix};$

$y_{1,t}$ is Quarterly Gross Tourism Product;

$y_{2,t}$ is Quarter Visitor Exports;

$y_{3,t}$ is Quarter Interbank Rate;

$y_{4,t}$ is Quarter Individual Government Expenditure on tourism

2.2.2. Stationary Testing of all Variables in the VARs model using Unit Root Test

The next step is to use all of the variables in the model to conduct the unit root test in order to guarantee that the analysis of the Impulse Response Function can be properly operated; therefore, there must be an hypothesis for every variable that has a stationary qualification.

2.2.3. Specifications of appropriate Lags of VARs by Information Criteria

In order to make the equation of the model accurate, the specification of appropriate Lags is to select a number of Lags for the VARs model by selecting the model that has Lags causing the lowest index of information criteria. In this study, the selected index of information criteria is as follows:

Swartz Information Criteria; $$SIC(p) = \log\left(\det\left(\hat{A}_p\right)\right) + \log(n)\frac{pm^2}{n} \quad (3)$$

where: $\hat{A}_p$ is the matrix coefficient of VARs;

n is the total number of data;
p is the number of Lags;
m is the number variables in the system.

2.2.4. Stability Testing of the system

Stability testing of the system is operated by testing whether $\hat{A}_p$ has Eigen Value less than 1 or not.

2.2.5. Interdependence Testing by Granger Exogeneity Test

The Granger Exogeneity Test tests the Matrix $\hat{A}_p$

$$A_t = \begin{bmatrix} a_{t11}(L) & a_{t21}(L) & \cdots & a_{i41}(L) \\ a_{t12}(L) & a_{t22}(L) & \cdots & a_{i42}(L) \\ \vdots & \vdots & \ddots & \vdots \\ a_{t14}(L) & a_{t24}(L) & \cdots & a_{i44}(L) \end{bmatrix} \text{ check if } a_{ijk}(L) = 0 \text{ or not while } j \neq k \quad (4)$$

2.2.6. Estimation of Variable Relations in the system with Impulse Response Function Analysis and Forecast Error Variance Decomposition Analysis

To confirm the variable relations in VARs as to whether the relationships turn to the right direction in the scope of the theoretical ideas, it requires Impulse Response Function Analysis and Forecast Error Variance Decomposition Analysis to estimate the effect of variables in the model as to whether the direction of the relationship is appropriate or not. The analyses were adjusted to follow Stability Property, as follows:

$$\begin{bmatrix} y_{1,t} \\ y_{2,t} \\ \vdots \\ y_{4,t} \end{bmatrix} = \begin{bmatrix} a_{10} \\ a_{20} \\ \vdots \\ a_{40} \end{bmatrix} + \begin{bmatrix} a_{t11}(L) & a_{t21}(L) & \cdots & a_{i41}(L) \\ a_{t12}(L) & a_{t22}(L) & \cdots & a_{i42}(L) \\ \vdots & \vdots & \ddots & \vdots \\ a_{t14}(L) & a_{t24}(L) & \cdots & a_{i44}(L) \end{bmatrix} \begin{bmatrix} y_{1,t-i} \\ y_{2,t-i} \\ \vdots \\ y_{4,t-i} \end{bmatrix} + \begin{bmatrix} e_{1,t} \\ e_{2,t} \\ \vdots \\ e_{4,t} \end{bmatrix} \quad (5)$$

Set the model to have Stability Property and the equation is as follows:

$$\begin{bmatrix} y_{1,t} \\ y_{2,t} \\ \vdots \\ y_{4,t} \end{bmatrix} = \begin{bmatrix} \bar{y}_1 \\ \bar{y}_2 \\ \vdots \\ \bar{y}_4 \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} a_{t11}(L) & a_{t21}(L) & \cdots & a_{i41}(L) \\ a_{t12}(L) & a_{t22}(L) & \cdots & a_{i42}(L) \\ \vdots & \vdots & \ddots & \vdots \\ a_{t14}(L) & a_{t24}(L) & \cdots & a_{i44}(L) \end{bmatrix}^{i} \begin{bmatrix} e_{1,t} \\ e_{2,t} \\ \vdots \\ e_{4,t} \end{bmatrix} \quad (6)$$

The long-term period shall be as follows:

$$\begin{bmatrix} y_{1,t} \\ y_{2,t} \\ \vdots \\ y_{4,t} \end{bmatrix} = \begin{bmatrix} \bar{y}_1 \\ \bar{y}_2 \\ \vdots \\ \bar{y}_4 \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} \phi_{11}(L) & \phi_{21}(L) & \cdots & \phi_{41}(L) \\ \phi_{12}(L) & \phi_{22}(L) & \cdots & \phi_{42}(L) \\ \vdots & \vdots & \ddots & \vdots \\ \phi_{14}(L) & \phi_{24}(L) & \cdots & \phi_{44}(L) \end{bmatrix} \begin{bmatrix} e_{1,t} \\ e_{2,t} \\ \vdots \\ e_{4,t} \end{bmatrix} \quad (7)$$

where: $\phi_{ij}(L)$ is Impulse Response Function Analysis to test the effect of the policy variables towards the target tourism economy variables.

3. Empirical Research

According to the study, the studying steps are as follows:

3.1. Stationary Testing of all Variables in the VARs model using Unit Root Test

It was found that the data of all 4 variables tested by Augmented Dickey-Fuller (ADF test) and Philips-Perron (PP test) intersect and are inclined. According to Mackinnon (1996), Gross Domestic Tourism Product (lnTY), Interbank Rate (lnIN), Government Individual Expenditure on tourism (lnGT), and Visitor Exports (lnEX) are stationary at the level I(0), due to the acceptance of the main hypothesis that every variable is stationary leading to the analysis of VARs and Granger Causality.

Table 1. Data Stationary Result (Unit Root)

Variables	ADF test		PP test	
	Level	Difference	Level	Difference
lnTY	-5.081*** [1]	-4.605***[6]	-2.489 [5]	-3.786** [2]
lnGT	-4.620*** [1]	-5.384***[3]	-2.356 [2]	-5.126*** [2]
lnEX	-5.332*** [1]	-8.143***[0]	-4.737*** [2]	-8.595*** [6]
lnIN	-4.904*** [1]	-9.711***[1]	-4.986*** [5]	-13.015***[1]

Source: Calculation

Notes: ** Reliability at the 95%

*** Reliability at the 99%

[ ] reveal optimal Lag Length

3.2. Specifications of appropriate Lags of VARs by Information Criteria

The testing of Optimal Lag Length Criteria by considering Akaike information criterion (AIC) and Schwarz information criterion (SC) demonstrates that the number of appropriate lags is equal to 2. Therefore, the selection of Lag Length will be used in the estimation and interdependence relationships later.

Table 2. Result of the appropriate Lags

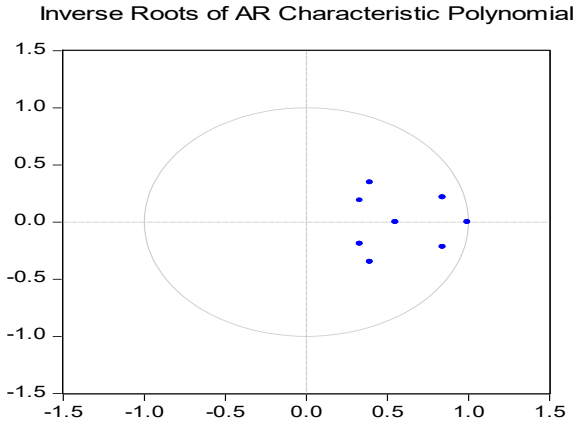
Lag	AIC	SC
0	-3.956	-3.839
1	-14.416	-13.834
2	-15.595*	-14.546*
3	-15.514	-13.999
4	-15.477	-13.495

Note: * indicates lag order selected by the criterion

3.3. Stability Testing of the System

According to the study as shown in Figure 3, the estimated model VARs has a stable qualification due to the entire Eigen Values of the model being stable in Unit Circle, which indicates that VARs has a stable qualification and can be developed later.

Figure 3. Characteristic Root Test of the Model



3.4. Estimation

For the estimation result of VARs as shown in Table 3, VARs estimates that it has an Optimal Lag equal to 2. The result is presented in accordance with VARs Model- Substituted Coefficients of the Equation 8.

$$TY = \beta_1 TY(-1) + \beta_2 TY(-2) + \beta_3 IN(-1) + \beta_4 IN(-2) + \beta_5 GT(-1) + \beta_6 GT(-2) + \beta_7 EX(-1) + \beta_8 EX(-2) + \alpha_0 \quad (8)$$

3.5. Causality Testing by Granger Causality Test

According to the Granger causality test, the Interbank Rate is the cause affecting Gross Tourism Domestic Product in the same direction at 95% reliability. Individual Government Expenditure on tourism is the cause affecting Gross Tourism Domestic Product in the same direction at 99% reliability. At the same time, Visitor Exports has bi - directional causality with Gross Tourism Domestic Product.

Table 3. Estimation Result of VARs

	TY	IN	GT	EX
TY(-1)	1.843	-1.421	-0.039	0.275
	(0.080)	(1.777)	(0.095)	(0.216)
	[22.916]	[-0.799]	[-0.413]	[1.271]
TY(-2)	-0.895	1.140	0.055	-0.357
	(0.080)	(1.786)	(0.095)	(0.218)
	[-11.080]	[0.638]	[0.585]	[-1.639]
IN(-1)	0.009	0.578	0.002	0.008
	(0.005)	(0.117)	(0.006)	(0.014)
	[1.788]	[4.920]	[0.358	[0.605]
IN(-2)	0.004	-0.112	-0.001	0.003

	TY	IN	GT	EX
	(0.005)	(0.116)	(0.006)	(0.014)
	[0.781]	[-0.966]	[-0.273]	[0.277]
GT(-1)	0.015	-0.684	1.540	0.103
	(0.080)	(1.784)	(0.095)	(0.217)
	[0.195]	[-0.383]	[16.121]	[0.475]
GT(-2)	0.027	0.848	-0.557	-0.024
	(0.081)	(1.790)	(0.095)	(0.218)
	[0.342]	[0.473]	[-5.812]	[-0.110]
EX(-1)	0.015	1.277	-0.005	0.711
	(0.047)	(1.047)	(0.056)	(0.127)
	[0.336]	[1.218]	[-0.097]	[5.565]
EX(-2)	-0.115	-0.806	0.045	-0.325
	(0.039)	(0.874)	(0.046)	(0.106)
	[-2.919]	[-0.922]	[0.977]	[-3.053]
C	-0.007	0.298	0.024	-0.067
	(0.018)	(0.407)	(0.021)	(0.049)
	[-0.418]	[0.732]	[1.104]	[-1.348]
R-squared	0.998	0.352	0.998	0.558
Adj. R-squared	0.998	0.284	0.998	0.512
S.E. equation	0.012	0.266	0.014	0.032
F-statistic	6942.990	5.172	8047.613	12.036
Log likelihood	259.604	-3.501	245.282	175.263
Akaike AIC	-5.896	0.294	-5.559	-3.912
Schwarz SC	-5.637	0.552	-5.300	-3.653
Mean dependent	3.858	0.005	4.920	0.021
S.D. dependent	0.310	0.315	0.395	0.046

Note: Standard errors in ( ) & t-statistics in [ ]

Table 4. Causality Testing Result of VARs

Dependent	Independent Chi- square statistics			
	lnTY	lnIN	lnGT	lnEX
lnTY	-	7.390** [2]	13.096*** [2]	9.927*** [2]
lnIN	1.244 [2]	-	-	-
lnGT	1.061 [2]	-	-	-
lnEX	5.891** [2]	-	-	-

Note: ** Reliability at the 95%
***Reliability at the 99%

3.6. Analyses on Impulse Response towards the Financial Policy, the Fiscal Policy, and Visitor Exports Affecting the Tourism Economy.

3.6.1. Impulse Response Function Analysis

The analysis result of Impulse Response considers the response of Gross Tourism Domestic Product and the variables of monetary policy, fiscal policy, and Visitor Exports when there is a change in Standard Deviation or Sock at 1 S.D. Shock can be seen in Figure 4 as follows:

Regarding the response of Interbank Rate towards Gross Tourism Domestic Product, if the Interbank Rate increases 1 S.D., Gross Tourism Domestic Product will significantly increase at once and then gradually decrease. The peak period of increase is in quarter 6 and tends to decrease in quarter 10.

Regarding the response of Government Individual Expenditure on tourism towards Gross Tourism Domestic Product, if Individual Government Expenditure on tourism increases 1 S.D., Gross Tourism Domestic Product will not change quicklyy but gradually increases in quarter 4 and continues to increase to peak in quarter 10.

Regarding the response of Visitor Exports towards Gross Tourism Domestic Product, if Visitor Exports increases 1 S.D., Gross Tourism Domestic Product will not change quickly and then gradually decreases. In quarter 4, it will decrease to the lowest level and increase to the peak in quarter 10.

3.6.2. Variance Decomposition Analysis

This is the analysis to decompose the effects from variances in which macroeconomic factors gain the highest percentage which will affect the Gross Tourism Domestic Product the most. In other words, it means that Gross Tourism Domestic Product is the value of the variable that is needed to be studied the most.

Table 5 shows that the Interbank Rate affects Gross Tourism Domestic Product the most at 9.17%, the next biggest factor is Visitor Exports at 3.66%, and Individual Government Expenditure on tourism at 2.27%.

However, if we compare the effect of monetary policy and fiscal policy on Thailand's Gross Tourism Product to consider the policies that most affect Gross Tourism Domestic Product, the study revealed that the Interbank Rate affects Gross Tourism Domestic Product the most at 9.17% while Individual Government Expenditure on tourism is at 2.27%. This indicates that the operation of monetary policy impacts the tourism economy of Thailand and is more effective than fiscal policy.

Response to Cholesky One S.D. Innovations $\pm$ 2 S.E

Figure 4. Relationships of Monetary Policy, Fiscal Policy, and Visitor Exports affecting the Tourism Economy

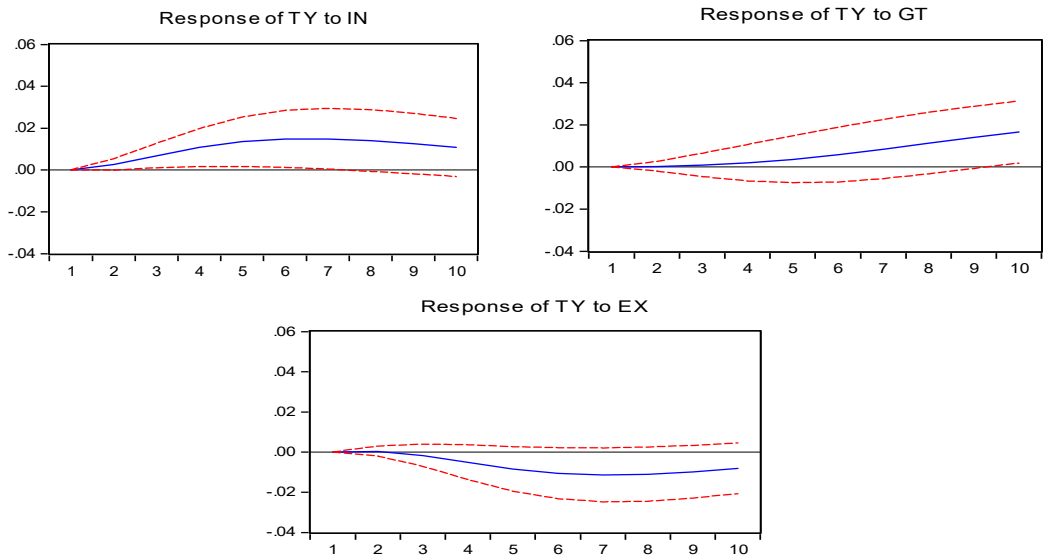


Table 5. Effects on Gross Tourism Domestic Product Divided into Major Economic Factors

Period	S.E.	TY	IN	GT	EX
1	0.012	100.000	0.000	0.000	0.000
2	0.026	98.891	1.070	0.011	0.027
3	0.039	96.229	3.525	0.058	0.188
4	0.051	92.219	6.483	0.186	1.111
5	0.061	87.568	9.304	0.483	2.645
6	0.069	82.908	11.673	1.075	4.343
7	0.077	78.552	13.495	2.113	5.839
8	0.081	74.549	14.767	3.739	6.945
9	0.086	70.821	15.524	6.046	7.609
10	0.089	67.271	15.823	9.038	7.868

Note: *Cholesky Ordering: TY IN GT EX

Conclusion, Discussion and Suggestions

Conclusion

The Interbank Rate and Individual Government Expenditure on tourism affect Gross Tourism Domestic Product in the same direction. At the same time, Visitor Exports has bi - directional causality with Gross Tourism Domestic Product.

The Interbank Rate affects Gross Tourism Domestic Product the most at 9.17%; the next is Visitor Exports at 3.66%, and Individual Government Expenditure on tourism at 2.27%. To compare the effects of monetary policy and fiscal policy on Thailand's Gross Tourism Product, the study revealed that the Interbank Rate affects Gross Tourism Domestic Product the most at 9.17% while Individual Government Expenditure on tourism is at 2.27%. This indicates that the operation of monetary policy impacts the tourism economy of Thailand and is more effective than fiscal policy.

Discussion

1. As the Interbank Rate affects Gross Tourism Domestic Product, it is apparent that the Interbank Rate which is a monetary policy variable, affects Thailand's economy in tourism. The Interbank Rate is the short-term loan interest rate between commercial banks used to facilitate financial flow. A better financial flow (liquidity) is related to Gross Tourism Domestic Product. Similar to the study of Borvonphongsakul and Jantarakolica (2016), it was found that the Interbank Rate affects Gross Tourism Domestic Product, and is a monetary policy variable affecting Thailand's economy in tourism

2. To consider the effect of Individual Government Expenditure on tourism on Gross Tourism Domestic Product, it was found that Individual Government Expenditure on tourism is a variable that is related to fiscal policy and affects the overall Gross Tourism Domestic Product, which indicates that Individual Government Expenditure on tourism leads to the growth of Thailand's economy in tourism.

3. Visitor Exports (Foreign spending) affects Gross Tourism Domestic Product, which indicates that Visitor Exports is a tourism income variable. When tourists visit Thailand, the expense rate is high and it increases Thailand's tourism economy. In common with Kanluan (2006), income from the travel of foreign tourists who visit Thailand is regarded as highly important to the Thai economic system. It demonstrates that Visitor Exports affects Thailand's tourism economy.

Suggestion

1. According to the study, the operation of moentary policy affects Thailand's tourism economy more than fiscal policy. Therefore, the Thai government should combine fiscal policy with monetary policy in order to drive the economy in the tourism sector to grow and to increase its competitive capacity.

2. The governmental sector and the private sector should have tourism strategies and to plan monetary policy and fiscal policy to promote the tourism service. They should set targets for tourists and tourism types accordingly. In addition, there should be tourism information that clear in the country's tourism spots.

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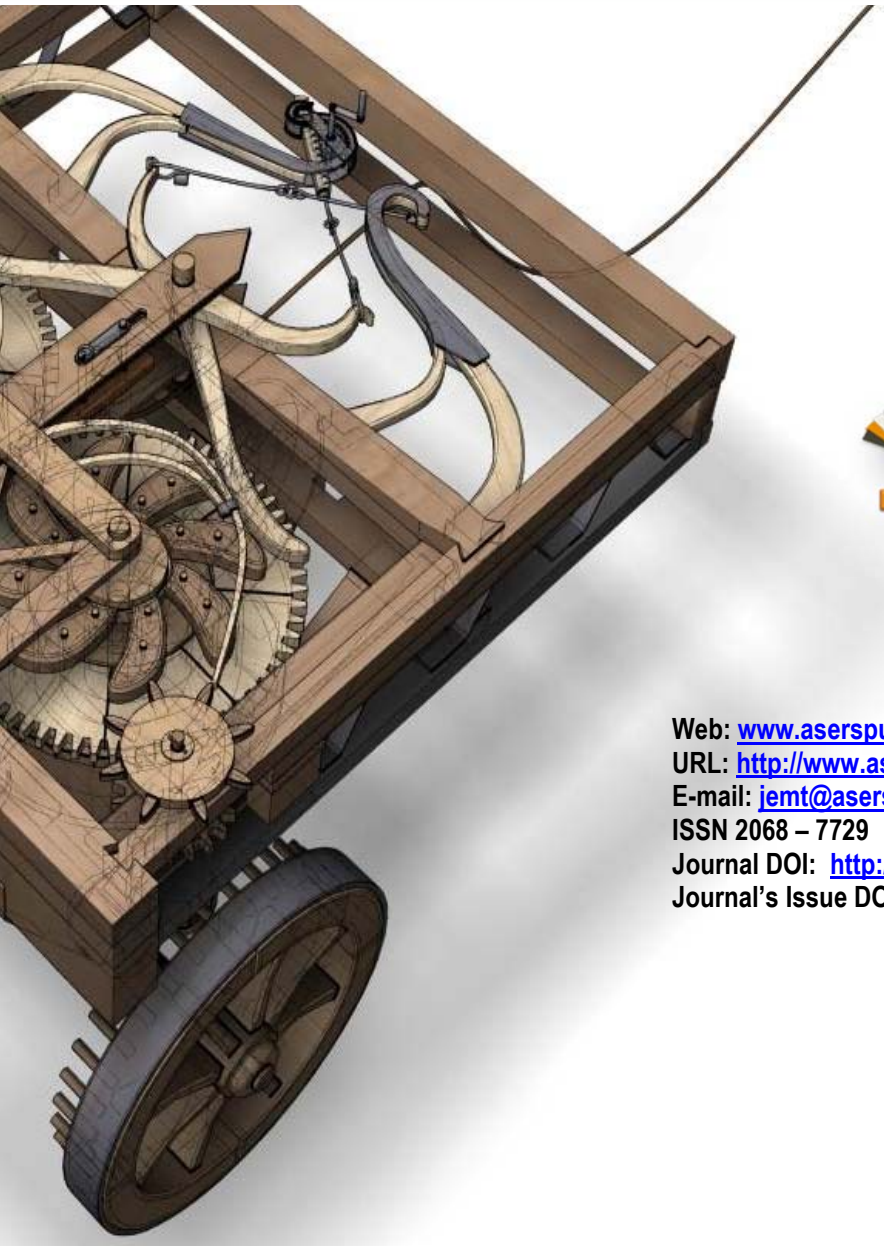

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