

On the Causal Nexus between Terrorism and Tourism: Empirical Evidence from the South Thailand Insurgency

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Abstract

The causal relationship between terrorism and tourism has long been debated in the literature. Using official monthly statistics on the number of death and casualty from South Thailand insurgency and the number of tourists entering the southern provinces of Thailand from January 2004 to June 2018, the causality between the two variables using the Autoregressive Distributed Lag model (ARDL) and Error Correction Model (ECM) are examined. Estimation results are in accord with other findings in the literature that terrorism has a negative causal impact on tourism in general. The study also finds a very strong evidence of mutual Granger causality that the number of tourists also affects the incidents of insurgency, a striking result that distinguishes this study from many others. In particular, an increase in the number of tourists tends to decrease the incidence of insurgency, and that the estimated adjustment coefficient to the long run equilibrium is unusually high. The result partly uncovers the probable motive of the terrorists in Deep South Thailand that they may seek to create domestic disturbance while minimizing conflict with other countries.

Keywords: Terrorism, Tourism, Insurgency, Southern Thailand, Causality

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ความสัมพันธ์ในเชิงเหตุและผลระหว่างการก่อการร้าย กับการท่องเที่ยว: หลักฐานเชิงประจักษ์จากสถานการณ์ ความไม่สงบในเขตจังหวัดชายแดนภาคใต้

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บทคัดย่อ

บทความเรื่องนี้มีจุดประสงค์เพื่อศึกษาความสัมพันธ์ในเชิงเหตุและผลระหว่างการก่อการร้ายและอุปสงค์การท่องเที่ยวโดยใช้ข้อมูลรายเดือนของจำนวนผู้เสียชีวิตและจำนวนผู้ได้รับบาดเจ็บจากสถานการณ์ความไม่สงบในสามจังหวัดชายแดนภาคใต้ตั้งแต่เดือนมกราคม พ.ศ. 2547 ถึงเดือนมิถุนายน พ.ศ. 2561 จากการทดสอบความสัมพันธ์ในเชิงเหตุและผลระหว่างตัวแปรดังกล่าวโดยใช้ตัวแบบทางอนุกรมเวลาซึ่งได้แก่ ตัวแบบ Autoregressive Distributed Lag (ARDL) และตัวแบบ Error Correction Model (ECM) พบว่า ปัญหาการก่อการร้ายส่งผลกระทบต่อจำนวนนักท่องเที่ยวโดยรวมในเขตจังหวัดภาคใต้อย่างมีนัยสำคัญทางสถิติ แต่ไม่ส่งผลกระทบต่อจำนวนนักท่องเที่ยวจากประเทศเพื่อนบ้าน ซึ่งได้แก่ นักท่องเที่ยวจากประเทศมาเลเซียและสิงคโปร์ นอกจากนี้ยังพบว่า นอกจากการก่อการร้ายจะส่งผลกระทบต่อการท่องเที่ยวแล้ว การท่องเที่ยวยังส่งผลกระทบต่ออัตราการก่อการร้ายอีกด้วย กล่าวคือ มีหลักฐานทางสถิติที่ระดับความเชื่อมั่นที่สูงมากแสดงให้เห็นว่าจำนวนนักท่องเที่ยวที่เพิ่มขึ้นกลับส่งผลให้อัตราการก่อการร้ายลดลง ผลการศึกษาในเชิงประจักษ์ดังกล่าวแสดงให้เห็นถึงความซับซ้อนของแรงจูงใจของกลุ่มผู้ก่อความไม่สงบซึ่งอาจพยายามจำกัดผลกระทบของการก่อการร้ายต่างๆ ให้เกิดขึ้นกับเฉพาะกลุ่มคนไทยเพื่อกดดันรัฐบาลไทยเท่านั้น และป้องกันไม่ให้เกิดผลกระทบโดยตรงกับกลุ่มนักท่องเที่ยวต่างชาติเพื่อหลีกเลี่ยงการก่อปัญหาที่รัฐบาลของชาติอื่นโดยไม่จำเป็น

คำสำคัญ: การก่อการร้าย, การท่องเที่ยว, สถานการณ์ความไม่สงบ, จังหวัดชายแดนภาคใต้, ความสำคัญในเชิงเหตุและผล

1. Introduction (บทนำ)

The South Thailand insurgency is an ongoing unrest led by an ethnic group of separatists in the southern provinces of Pattani, Yala, and Narathiwat of Thailand. While the root of the incidence can be dated back to as early as 1947 (Funston, 2008), it was not until 2004 when the violence escalated to the point that there have been constantly many deadly attacks on civilians in the region that, as classified by the Thai government, constituted an act of terrorism with both political and religious motivation. According to the official statistics collected at the Deep South Watch database, it has been estimated that since 2004, the insurgency has resulted in almost twenty thousand related deaths and injuries, with over three hundred thousand million baht of government budget pouring into numerous public measures to cope with the problem. Concerning the impact of the insurgency on tourism in South Thailand, a topic that constitutes the corpus of this study, there still lacks a quantitative research using data at the national scale that provides any statistical evidence to shed light on this matter. A study based on a survey conducted in Thailand in 2009 by Rittichainuwat and Chakraborty (2009), however, shows that tourists are not deterred by terrorism from travelling, but instead adjust their plan by selecting destinations that are considered safer.

Despite the scarcity of the quantitative studies on the impact of South Thailand insurgency in particular, there exists a vast literature on the impact of terrorism on tourism in general. Findings from selected studies, in chronological order, are summarized as follows. Using monthly data from 1970-1988, Enders and Sandler (1991) find that terrorist events have a statistically significant negative impact on the number of tourists visiting Spain, and that, upon further investigation, the causal link between the two variables is unidirectional such that terrorism affects tourism but not vice versa. Also, Enders et al. (1992), using data from Greece, Italy, and Austria, find that the number of terrorist incidents has a statistically significant impact on the revenue loss from tourism. Drakos and Kutan (1993), using data from Greece, Israel, and Turkey, for the period from January 1991 to December 2000, find that there are significant own and spill over effects of terrorism on market shares of the tourism sector. Concepcion et al. (2003), using data from the Philippines, also suggest that the economic impact of terrorism is through the loss in national income from tourism. In a relatively recent study, Feridun (2011) investigates the causal impact of terrorist incidents on the number of tourists in Turkey using annual data from Turkey from 1986 to 2006 and finds a statistically significant unidirectional impact of terrorism on tourism in Turkey.

The contribution of this study is two-fold. Firstly, the paper seeks to contribute to the literature by adding an evidence-based study on the impact of terrorism on tourism using a rich dataset on the monthly statistics of the number of death and casualty from terrorist incidents in Deep South Thailand and the number of tourists classified by nationality passing through 20 southern immigration ports since 2004. The availability of information on tourists passing through selected port-of-entry rather than the total number of tourists in the whole country is of particular benefit for our research question since it allows us to examine the impact of tourism in the region most likely affected by terrorism, while isolating such impact in the other regions that may seem far-fetched. The information on the nationality of the tourists also makes possible the estimation of group-specific parameters in light of the fact that tourists of different nationalities may have different perceptions towards the severity of risk from terrorism in the region. This paper also provides a contribution in terms of policy initiatives to policymakers and military strategists. Briefly foreshadowing the results of this study, terrorism is found to have a negative causal impact on the total number of tourists in general, although, for the case of Thailand, the impact of the Deep South insurgency on tourists from the neighboring countries such as Malaysia and Singapore is not evident. The study also finds a very strong evidence of mutual Granger causality that the number of tourists also affects the incidents of insurgency, a striking result that distinguishes this study from many others. In particular, I find that an increase in the number of tourists tends to decrease the incidence of insurgency, and that the estimated adjustment coefficient to the long run equilibrium is unusually high. The result partly uncovers the probable motive of the terrorists in Deep South Thailand that they seek to create domestic disturbance while minimizing conflict with other countries.

2. Data (ข้อมูลที่ใช้ศึกษา)

The data used in this study are monthly data from the beginning of South Thailand Insurgency in January 2004 to the period with latest available data released in June 2018. Data on terrorism is the number of combined death and casualty from incidents related with the insurgency, denoted by *DC*, obtained from the Deep South Incidence database. Data on the number of tourists is the number of entering tourists through the southern port-of-entries released by the Bank of Thailand. The number of tourists is further classified into total tourists (*Total*), Malaysian tourists (*Malaysian*), and Singaporean tourists (*Singaporean*). A visual inspection of the variables in Figure 1 reveals that the number of tourists entering Thailand through the southern port-of-entry has an upward trend and a highly seasonal pattern, with annual peaks during the Chinese New Year in February and Songkran (Thailand's Traditional

New Year) festival in April. The number of death and casualty from the insurgency shows a slightly declining trend over the past decade, with an obvious outlier in March 2012, where the total number of death and casualty exceeds 600 incidents. The data on the number of death and casualty from April 2016 and September 2016 is however missing.

This study employs the Autoregressive Distributed Lag (ARDL) bound testing approach to investigate the relationship between terrorism and tourism, for the major advantage that the test yields a valid result regardless of the exact order of integration of each variable, provided that none of the variable is integrated of order 2 or higher (Pesaran, Shin, & Smith, 2001). Before the series are tested for their order of integration, the highly seasonal nature of the number of tourists poses a pedagogic question whether the tests for unit root and the short-run and long-run relationship between the variables of interest should be performed on the original or the deseasonalized data. As summarized in Maddala and Kim (1998), a number of studies such as Ghysels (1990), Ghysels and Perron (1993), and Diebold (1993) argue that in finite samples, statistic such as the Augmented Dickey-Fuller or Phillips-Perron test statistic for unit root using deseasonalized data will be biased towards the null hypothesis that a unit root is present. The analysis thus follows will be based on the use of the original rather than seasonally adjusted data.

3. Methodology (ระเบียบวิธีวิจัย)

The first step to modeling ARDL(p, q) approach à la Pesaran, Shin, and Smith (2001) is to determine the order of integration of all variables to verify that none of the variables is $I(2)$ or above. A conditional error correction model of the following form can then be estimated:

$$\Delta y_t = \delta + \sum_{i=1}^p \beta_i \Delta y_{t-i} + \sum_{i=0}^q \gamma_i \Delta x_{t-i} + \sigma_1 y_{t-1} + \sigma_2 x_{t-1} + \epsilon_t,$$

where y and x are the dependent and explanatory variables of interest, respectively. The optimal lag length (p, q) is typically selected using information criteria such as Akaike or Schwartz-Bayesian Information Criteria. A bound test can then be performed to detect the presence of a long-term relationship between the two variables. The first type of bound test involves an F -test on the joint significance of the impact of level variables on the differenced dependent variable under the null hypothesis $H_0 : \sigma_1 = \sigma_2 = 0$. The second type of bound test is a t -test on the significance of the individual impact of the level variable on the differenced dependent variable under the null hypothesis $H_0 : \sigma_1 = 0$ and $H_0 : \sigma_2 = 0$. The computed test

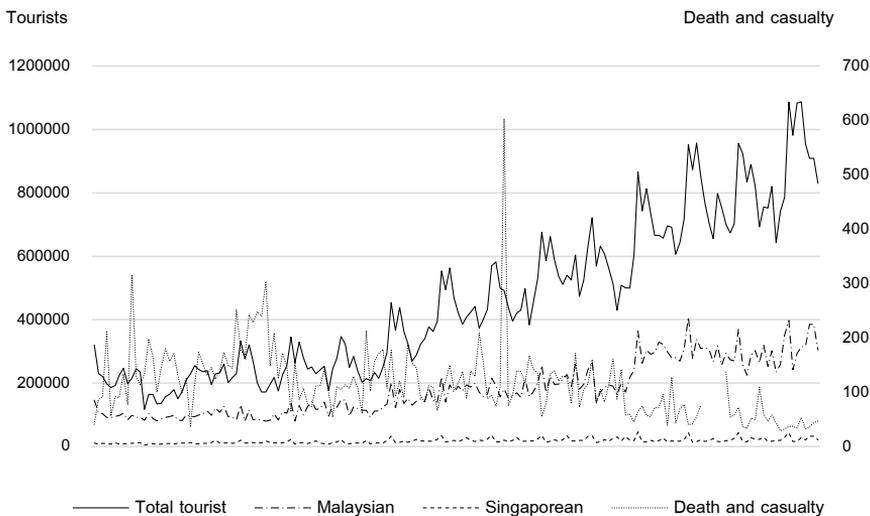
statistics of both tests are compared to a bound as tabulated in Pesaran, Shin, and Smith (2001). If the test statistic is over the upper bound, it is conclusive that there is a long-term relationship between the variables, if the statistic is lower than the lower bound, it is conclusive that there is no long-term relationship between the variables, and if it falls within the bound, the nature of the relationship between the variables is inconclusive.

As noted in Morley (2006), the long-term relationship established using the bound test is only necessary, but not sufficient condition for a causal relationship. To verify the causal direction between the variables, an error correction model (ECM) can then be used to conduct the conventional Granger non-causality test. In particular, a reparameterized ARDL model of the form

$$\Delta y_t = \delta + \sum_{i=1}^p \phi_i \Delta y_{t-i} + \sum_{i=0}^q \psi_i \Delta x_{t-i} - \alpha(y_{t-1} - \theta_0 - \theta_1 x_{t-1}) + \epsilon_t,$$

can be estimated, with the speed-of-adjustment coefficient $\alpha = 1 - \sum_{i=1}^p \beta_i$ and the long-run coefficient $\theta_1 = (\sum_{i=0}^q \gamma_i) / \alpha$.

Figure 1: Number of Tourists and Number of Death and Casualty from South Thailand Insurgency from January 2014 to June 2018. (จำนวนนักท่องเที่ยว และจำนวนผู้เสียชีวิตและบาดเจ็บจากเหตุการณ์ความไม่สงบในจังหวัดชายแดนภาคใต้ ระหว่างเดือน มกราคม 2014 และ มิถุนายน 2018)



Sources: The Bank of Thailand (<http://www.bot.or.th>) and the Deep South Incidence Database (<http://www.deepsouthwatch.org>).

Note: The number of incoming tourists passing through the southern border of Thailand and the number of insurgency-related death and casualty in the deep southern provinces of Pattani, Yala, Narathiwat, and Songkhla during January 2004 and June 2018. The data on the number of death and casualty from April 2016 and September 2016 is missing.

Table 1: Augmented Dickey-Fuller and Phillips-Perron Tests for Unit Root (ผลการทดสอบ Unit root โดย Phillips - Perron Tests)

Tests	DC	Total	Malaysian	Singaporean
Augmented Dickey-Fuller				
τ_T	-11.343***	-5.899***	-9.167***	-12.912***
τ_μ	-9.297***	-1.762**	-3.239***	-8.688***
τ	-3.974***	-0.368	-1.069	-3.011***
First difference				
τ_T	-22.482***	-15.642***	-22.883***	-19.492***
τ_μ	-22.540***	-15.682***	-22.933***	-19.551***
τ	-22.609***	-15.686***	-22.960***	-19.605***
Phillips-Perron				
τ_T	-11.525***	-5.972***	-9.492***	-13.017***
τ_μ	-9.759***	-1.462	-2.356	-8.908***
τ	-3.261***	-0.077	-0.155	-2.060**
First difference				
τ_T	-33.047***	-15.954***	-31.370***	-30.982***
τ_μ	-33.032***	-15.990***	-31.241***	-31.110***
τ	-33.142***	-15.962***	-30.848***	-31.141***

Note: The optimal lag lengths in the test are selected using the Schwarz-Bayesian Information criterion. *, **, and *** denote statistical significance at 90, 95, and 99 per cent, respectively. τ_T , τ_μ , and τ represent the test statistic from a model with drift and trend, a model with a drift without trend, and a model with neither drift nor trend, respectively.

4. Results (ผลการวิจัย)

Results from the unit root test using Augmented Dickey-Fuller and Phillips-Perron tests of all variables are shown in Table 1. While it is uniformly conclusive that *DC* is $I(0)$, there seem to be conflicting results for the order of integration of data on *Total*, *Malaysian*, and *Singaporean*, depending on whether the testing model includes a drift or a trend. The possibly different order of integration between the number of tourists and terrorist incidents, as shown by the unit root test, substantiates the use of ARDL model in testing for a long-term relationship between the two variables. Note that there is strong evidence that all variables become stationary after the first difference, thus indicating that all variables are $I(1)$ or lower which renders the ARDL bound test approach valid.

Six models based on the ARDL bound test approach to test for long-term relationship between variables are estimated and summarized in Table 2. Model 1 estimates the impact of terrorism on the number of tourists entering Thailand through all 20 southern port-of-entries. As tourists of different nationalities may perceive the level of severity of terrorist incidents in the region differently, I perform an additional test for the long-term impact of the number of terrorist incidents on the number of tourists from *Malaysia* and *Singapore* separately in Model 2 and 3, respectively. The possibility of a reverse causality between terrorism and tourism is examined in the last three models. On one hand, there may be a positive causal impact of tourism on terrorism due to that fact that some terrorists may disguise themselves as tourists or that some terrorists may employ a strategy that specifically targets tourist destinations to provoke turmoil. On the other hand, a negative causal impact of tourism on terrorism is also possible if the terrorists aim to avoid international conflict by diverting from tourist destinations.

To prove this conjecture, the last three models revert the dependent and explanatory variables in the prior models, with the number of death and casualty from terrorist incidents as the dependent variable in all models, and the total number of tourists, the total number of Malaysian tourists, and the number of Singaporean tourists as the explanatory variable in Model 4, 5, and 6, respectively. All models are estimated under various model specifications either with an unrestricted constant with no trend, an unrestricted constant with restricted trend, or an unrestricted constant with unrestricted trend. The optimal lag (p,q) of each model and the preferred model specification are selected based on the minimum Schwartz-Bayesian criteria among the models that render serially-uncorrelated error terms. Despite the fact that the preferred specification of each of six models may differ, depending on the chosen type of information criterion, the conclusion drawn on the nature of long-term relationship between terrorism and tourism in all models is remarkably uniform. As shown in Table 2, results from the bound test suggest that there exists a long-term relationship between the number of death and casualty from terrorist incidents and the total number of tourists as well as the total number of Singaporean tourists. There is no statistical evidence suggesting that the number of Malaysian tourists, which comprises the majority of tourists visiting Thailand through the port-of-entry in the south, are affected by the South Thailand Insurgency. This finding may in part be justified by the fact that many Malaysians are locals with relatively better knowledge of safer tourist destinations in the area who are likely less alarmed than tourists from other distant countries. A somewhat surprising result is that there is a strong evidence suggesting that the number of Malaysian, Singaporean, and total tourists in general have a causal impact

on the number of terrorist incidents. This finding points out to the possibility that tourists may be a factor that plays an important role in shaping the strategy of the separatists in South Thailand.

Estimation results from the ECM model to establish a sufficient condition for the long-term relationship between terrorism and tourism are provided in Table 3. All models, except for Model 2 where the bound test suggests that there is no long-term impact of the number of terrorist incidents on the number of Malaysian tourists, are reestimated in ECM form using the preferred model specification from the previous result in Table 2. The estimated adjustment coefficients that are statistically significant, negative, and less than one, suggest that all models, except Model 3, are dynamically stable. The adjustment coefficient to the long-term impact of terrorist incidents on total number of tourists of 0.334 indicates a fairly slow responsiveness of the change in number of tourists to the change in the number of terrorist attacks, a probably unsurprising result considering the fact that the diversion of travel plan often involves cancellation fee or that tourists may receive incomplete or delayed information about the terrorist incidents. The estimated long-run coefficient suggests that in the long run, an increase in the number of death or casualty from terrorist attack occurring in South Thailand Insurgency is likely to reduce the number of tourists visiting the southern provinces of Thailand by as many as 865 persons per one incident. Given that the number of death and casualty resulted from South Thailand insurgency since its inception in 2004 has almost totaled twenty thousand incidences, the revenue loss from tourism alone may thus be as high as sixty billion baht, based on the estimated average spending of 20,000 baht per one tourist per trip in Thailand in 2015 (Ministry of Tourism and Sports, 2015)

The results that the number of total tourists, and Malaysian and Singaporean tourists all have statistically significant negative long-term impact on the terrorist incidents provide an interesting finding to the literature on terrorism and tourism. The evidence points out to the probable motive of the separatists in Deep South Thailand that they may seek to create domestic disturbance while minimizing conflict with other countries. This conjecture is highly consistent with the fact that many of the insurgent group leaders have strong foreign contacts and receive considerable financial support from foreign sources (Cline, 2007). The extremely high rate of adjustment of the change in the number of total and Malaysian tourists to the number of terrorist incidents also indicates the possibility that the number of incoming tourists plays an important role in shaping the strategy of terrorists when planning their attacks.

Table 2: ARDL Bounds Test (ผลการประมาณการจาก ARDL Bounds Test)

Model	Restrictions		
	Unrestricted constant with no	Unrestricted constant with	Unrestricted constant with
<i>(1) Total DC</i>			
<i>F</i>	2.213	12.146***	18.217***
<i>t</i>	-1.960	-5.927***	-5.927***
AIC	4056.235	4036.055†	4036.055†
BIC	4068.561	4051.462†	4051.462†
LM	3.840×10^{-5}	0.672	0.672
<i>(2) Malaysian DC</i>			
<i>F</i>	2.741	5.689	7.917
<i>t</i>	-1.454	-3.671	-3.671
AIC	3814.198	3804.803†	3804.803†
BIC	3835.768	3829.454†	3829.454†
LM	0.548	0.293	0.293
<i>(3) Singaporean DC</i>			
<i>F</i>	9.311***	26.125***	39.065***
<i>t</i>	-4.308***	-8.839***	-8.839***
AIC	3296.655	3251.636†	3251.636†
BIC	3312.062	3273.206†	3273.206†
LM	0.118	0.157	0.157
<i>(4) DC Total</i>			
<i>F</i>	64.699***	43.055***	64.581***
<i>t</i>	-11.367***	-11.323***	-11.323***
AIC	1770.018†	1771.688	1771.688
BIC	1779.262†	1784.013	1784.013
LM	0.064	0.038	0.038
<i>(5) DC Malaysian</i>			
<i>F</i>	65.728***	43.550***	65.322***
<i>t</i>	-11.464***	-11.425***	-11.425***
AIC	1766.985†	1768.968	1768.968
BIC	1779.310†	1784.375	1784.375
LM	0.013	0.016	0.016
<i>(6) DC Singaporean</i>			
<i>F</i>	9.168***	41.333***	61.998***
<i>t</i>	-4.029***	-11.129***	-11.129***
AIC	1773.240†	1774.620	1774.620
BIC	1794.810	1786.946†	1786.946†
LM	0.051	0.013	0.013

Note: *, **, and *** denote statistical significance at 90, 95, and 99 per cent, respectively. † indicates the preferred model based

Table 3: Estimate Long-Run Equilibrium Relationship from Preferred Model Specification
(ผลการประมาณการความสัมพันธ์ระยะยาว)

Model	Adjustment Coefficient(α)	Long-run Coefficient(θ_1)
(1) <i>Total DC</i>	-0.334*** (0.056)	-865.484*** (359.809)
(2) <i>Malaysian DC</i>	- -	- -
(3) <i>Singaporean DC</i>	-1.494*** (0.170)	5.687 (5.220)
(4) <i>DC Total</i>	-0.916*** (0.081)	-1.326×10^{-4} *** (2.080×10^{-5})
(5) <i>DC Malaysian</i>	-0.921*** (0.080)	-4.243×10^{-4} *** (6.250×10^{-5})
(6) <i>DC Singaporean</i>	-0.436*** (0.108)	-4.943×10^{-3} *** (1.735×10^{-3})

Note:*, **, and *** denote statistical significance at 90, 95, and 99 per cent, respectively.

5. Conclusion (สรุปผลการวิจัย)

Question on the causes and consequences of terrorism has always been central to the economics of defense. A better knowledge of this issue not only helps the policymakers mitigate the impact of terrorism, but also unravels the motive of the terrorists. This paper aims to contribute to the literature on the causal nexus between terrorism and tourism by estimating an Autoregressive Distributed Lag model (ARDL) and an Error Correction Model (ECM) to determine the nature of relationship between the number of death and casualty from South Thailand insurgency and the number of tourists entering the southern ports of Thailand during January 2004 and June 2018. A bound test approach à la Pesaran, Shin, and Smith (2001) after the estimation of ARDL is employed to test for the long-term relationship between the number of death and casualty and the number of tourists as the two variables of interest may have different order of integration. The estimation result on the impact of terrorism on tourism in this paper is in coherence with other findings that the number of death and casualty from terrorist attacks in South Thailand insurgency has a statistically significant negative impact on the number of total tourists entering the southern port of Thailand, although such impact on the number of tourists from the neighboring countries such as Malaysia and Singapore is not evident. In particular, an increase in the number of death or casualty from terrorist attacks is

estimated to reduce the total number of tourists visiting the southern provinces of Thailand by as many as 865 persons per one incident. Given that the number of death and casualty resulted from South Thailand insurgency since its inception in 2004 has almost totaled twenty thousand incidences, the revenue loss from tourism alone may thus be as high as sixty billion baht based on the information on average spending per tourist per trip in 2015 by the Ministry of Tourism and Sports of Thailand. Another interesting finding is the reverse Granger causality on the impact of tourism on terrorism. The result that the number of Malaysian and Singaporean tourists both have a negative impact on the number of terrorist incidents with very high rate of adjustment partly helps unravel the strategic pattern of the terrorists that they tend to avert from tourist destinations, probably to avoid any unnecessary conflicts with other nations.

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