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NEW TOURISM FINANCIAL CONDITION INDEX: EXTENDED WITH TERRORIST ATTACKS*

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Elcin Aykac Alp[1], Mefule Findikci Erdogan[2]
[1]Istanbul Ticaret University, Faculty of Business, Department of Economics, Beyoglu, Istanbul, Turkiye.
ealp@ticaret.edu.tr , ORCID: 0000-0001-9076-2102
[2]Istanbul Ticaret University, DUPA, Beyoglu, Istanbul, Turkiye.
mfindikci@ticaret.edu.tr , ORCID: 0000-0003-0150-0990

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ABSTRACT

Purpose- In this study, a composite indicator that can be followed in the financial markets has been developed. The tourism financial conditions index has been developed in the literature for tourism based on MCI (Monetary Conditions Index) and FCI (Financial Conditions Index). The index is called the Tourism Financial Conditions Index in their studies. This study ensures that the calculation of the tourism index by adding the terror variable to the index can better reflect the expectations.

Methodology- While constructing the composite indicator Z-score is used for standardization. With this standardization terrorist attacks variable is added to the composite indicator. The relationship between New Tourism Financial Composite Indicator and Tourism Stock Market Index Return is analyzed with the Threshold VAR method. This method is used because of the nonlinearity of variables.

Findings: Monthly data for the period 2009:07 – 2017:12 were used in the study. The countries examined are Australia, Denmark, France, Italy, Spain, Türkiye and the UK. It is aimed to examine the relationship between the calculated NTFCI and the Tourism Stock Exchange data of each country. T-VAR results show the relationship between these variables.

Conclusion - In this study, the new version of the TFCI index with terrorist incidents is presented. Chang (2015) developed the TFCI index for the tourism sector. We think that the countries should also consider the effect of terrorism in their economic and financial research in tourism area. Based on this idea, the index was expanded by adding the terror variable to the previously developed TFCI composite indicator and its relationship with the tourism stock market index as a financial indicator was examined. The TVAR model is applied which shows the short-term dynamic relationship. Models for different countries were estimated and similar results were obtained for different countries.

Keywords: Tourism financial conditions index, tourism sector, monetary conditions index, financial conditions index
JEL Codes: E44, E47, G32

1. INTRODUCTION

The literature on studies reveals the importance of the tourism sector in terms of its contribution to economic growth. The tourism sector's unique structure, with high direct and indirect effects, requires the contribution to the economy to be analyzed from different perspectives. The tourism sector provides revenue, creates jobs, and supports the development of related industries, improving the balance of trade and having a positive impact on local economies. Additionally, the growth of the sector can positively affect liquidity and financial markets, leading to an increase in demand for financial products and services, a more attractive financial market, and boosting economic growth. As a matter of fact, when evaluating the contribution of the tourism sector to the economy, it should not only be evaluated in terms of its contribution to the current account deficit but also its importance in terms of financial markets should be emphasized. However, it's also worth noting that the tourism sector is often vulnerable to external factors such as global economic conditions and natural disasters, which can negatively impact financial markets. However, the sector is also vulnerable to external factors such as global economic conditions and natural disasters. Overall, it's clear that the tourism sector has a significant impact on the economy and should

*An earlier version of the article was presented on November 1, 2019, at the Istanbul Finance Congress. Title of this version is "A suggestion for financial condition index for the Turkish tourism sector", includes a technical discussion of the underlying standardization statistics for Turkiye.

be carefully evaluated and managed to ensure sustainable growth. Therefore, it's significant for the sector to monitor the stability/instability position to manage risks to the economy.

On the other hand, terrorist incidents can significantly negatively impact tourism, leading to a decrease in demand for travel to the affected region or country. This can result in a loss of revenue for the tourism industry, which can have broader economic implications for the affected area. The fear of future terrorist attacks can also discourage potential tourists from visiting a destination, even if they have not been directly impacted by an incident. As a result, the threat of terrorism can have a long-lasting impact on tourism demand. However, it is essential to note that the effects of terrorism on tourism are often short-term and localized (Bilgili et. al., 2021). Terrorism can cause a decline in the number of tourists, negatively affect the tourism industry's reputation, and lead to long-term economic damage (Korstanje, 2023). Thus terrorism can create significant vulnerability in the tourism sector, and any study related to tourism should not overlook the impact of terrorist attacks.

This study develops a composite indicator, the Tourism Financial Conditions Index, that can be followed in financial markets. Based on the Monetary Conditions Index and the Financial Conditions Index, the Tourism Financial Conditions Index was developed by Chang, Hsu, and McAleer (2014), and further refined in later studies (Chang, 2015; Chang, Hsu, and McAleer, 2017). This study argues that by adding the terror variable into the index calculation, the tourism index can better reflect expectations.

2. LITERATURE REVIEW

The literature has various methods to measure different aspects of tourism, such as efficiency, sustainability, financial conditions, climate risk, medical tourism attractiveness, and trust in tourism. For instance, Mieczkowski (1985) proposed a tourism climatic index calculation method as a combined measure of tourists' climatic well-being in order to determine the climate-tourism relationship. These proposed indices represent a quantitative assessment of the world's climate for international tourism purposes. De La VIina et al. (1994) used the principal component analysis method to calculate the Tourism Efficiency Index in their studies. They have formed an indicator for the tourism industry. As a result, an index based on factor analysis was created. It was shown that the sector performance was measured correctly. Fernández and Rivero (2009) proposed a method based on factor loadings and a global composite index to measure tourism sustainability. In the creation of this index, both World Travel & Tourism Council (WTTC)'s and Yale University's criteria were used to measure the sustainability of tourism. In the study, they stated that tourism sustainability is a multidimensional concept that depends on many factors. In this new index proposed with the name Sustainable Tourism Index (ST index), they argued that it is more appropriate to determine different factor loads for different factors rather than giving equal weight to all sustainability indicators when measuring.

Göktuğ Kaya, Onifade, and Akpinar, (2022) study also investigate the relation between terrorism and tourism. They applied empirical research with ARDL method for the consequences of terrorist attacks on tourism revenues in Turkey. Examining the existence of the effect of terrorism on tourism is not a new idea. There are many studies made especially for Turkey. however, this study is important in terms of its use in a tourism index.

Chang (2015) created a new daily tourism financial indicator for Taiwan regarding daily financial stock index returns, tourism stock market sub index returns, exchange rate returns, and interest rate differentials. In other words, he proposed the Tourism Financial Conditions Index (TFCI). This index was created by adapting and expanding the TFCI, the widely used Monetary Conditions Index (MCI), and the Financial Conditions Index (FCI) to tourism stock data. However, the method of calculating the daily TFCI differs from the existing methods of constructing the MCI and FCI in terms of calculating the weights. Unlike TFCI calculations in the literature, in this study, the method GARCH, GJR, and EGARCH conditional volatility models are discussed to capture the natural volatility in daily tourism stock index returns. As a result of the study, the findings showed that the new tourism financial conditions index can be estimated by using the conditional average of the tourism stock market index return. In addition, by emphasizing the simplicity of the use and interpretation of the new daily TFCI obtained, it was stated that it would be useful in predicting the current economic and financial environment for tourism stock index returns, especially since it is based on the calculation and interpretation of publicly available information.

Olya and Alipour (2015) propose a mathematical approach to climate risk using extreme precipitation probabilities. In the study, the probability of excessive precipitation was calculated, and the data was then added to the Tourism Climate Index formula for each station on the island. Then, geo-statistical techniques were used and a spatial risk model related to climate was created. Fetscherin and Stephano (2016) aimed to create a Medical Tourism Index, which is a country-based performance measure, to evaluate the attractiveness of a country in terms of health tourism. According to the findings obtained as a result of the study, it was stated that the Medical Tourism Index allows for the measurement of the significant differences between countries. Croce (2016) conducted a study to examine the relationship between trust and tourism. For this purpose, the UNWTO Tourism Confidence Index and the number of international tourists were used for the period 1999-2013, and the crisis and cyclical fluctuations were tried to be estimated with the help of ARIMA models. According to the empirical results of the study, it has been emphasized that the Tourism Confidence Index obtained by the questionnaires

collected by the UNWTO since the second quarter of 2003 is more successful in estimating the crisis and cyclical fluctuations. It is stated that the UNWTO Tourism Confidence Index captures the changes in tourism demand created by external shocks, as well as short-term systematic factors.

Chaivichayachat (2019) used Chang (2015) methodology for constructing an economic indicator "economic condition for tourism (ECT) index". He used this new indicator for Thailand tourism sector. The most important aspect of this study, which is similar to ours, is the use of crime rate in their index. Crime rate is one of the most important economic factors to determine the ECT index and for the forecasting the number of foreign tourists in Chaivichayachat (2019) study.

Again, based on the study of Chang (2015), Malkina, and Ovcharov (2021) examined the relationship between the Tourism Industry Stress Index (TSI) and the Financial Stress Index (FSI) indexes. The countries Finland, Italy, Germany and Spain between 1993 and 2020 is analyzed fort the relationship between TSI and FSI. Both indices are developed in their study and Granger causality is used. The causality relation between FSI-TSI showed that financial turmoil led to increased tourism market stress with an average lag of three months. The contribution of this study is Financial Stress Index and they put forward that FSI can be used as a predictor of the Tourism Industry Stress Index.

3. COMPOSITION OF NTFCI

Chang, Hsu and McAleer (2017) have created an alternative composite indicator for tourism based on the MCI (Monetary Conditions Index) and FCI (Financial Conditions Index) indexes in the TFCI index they developed in their 2014, 2015, 2017 studies. The method used in their study is briefly as follows. In this index, unlike MCI and FCI, the calculation of weights has been changed. When the basis of the index is examined, the FCI is derived from the MCI index. MCI index is short run interest rate and exchange rate linear combination,

$$MCI = Q_1(e_t - e_0) + Q_2(r_1 - r_0) \quad (1)$$

By adding house price and stock price to this linear combination, information about financial markets has become available.

$$FCI = Q_1(e_t - e_0) + Q_2(r_1 - r_0) + Q_3(a_1 - a_0) \quad (2)$$

TFCI is constructed far to summarize current economy and tourism conditions into a single statistical index.

The formation of MCI and FCI indices, the calculation of the parameters here and the literature on the parameters are given in the study of Chang (2015). The point we want to underline the attention to here is the possibility that the use of estimation-based calculations for Q1, Q2, Q3 may change from period to period and from country to country. However, the existing studies in the literature are quite successful in clearly demonstrating that the proxy variables used are important in terms of MCI and FCI.

The TFCI model explained in the studies of Chang (2015) and Chang et al (2017) was created as follows.

$$TFCI = c + Q_1 REE_t + Q_2 DIR_t + Q_3 RTCC_t + u_t \quad (3)$$

The variables used here are REE; real effective exchange, DIR; interest rate and RTCC; composite coincident stock index and i.i.d. error terms are defined as shocks that do not necessarily occur. Q_1, Q_2, Q_3 are coefficients (weights) obtained from OLS regression.

The TFCI index obtained from these calculations was modeled with the Tourism industry stock index (RTS).

$$RTS = TFCI_t + v_t \sim v_t \sim D(0, \sigma_v^2) \quad (4)$$

In equation 4 v_t do not need to be independent or i.i.d. distributed because;

$$RTS = c + Q_1 REE_t + Q_2 DIR_t + Q_3 RTCC_t + u_t + v_t \quad (5)$$

As given in 5th equation $(u_t + v_t)$ shocks construct the new error term as it is given in equation 6.

$$\varepsilon_t = u_t + v_t \sim D(0, \sigma_\varepsilon^2) \quad (6)$$

However, ε_t shocks shown in equation (6) are also i.i.d. It has been shown that the equation (5) can be used after estimation by OLS or ML method.

Chang et. all (2017) study transformed the stochastic structure of the model as follows.

$$RTS = TFCI_t + v_t \sim v_t \sim D(0, \sigma_v^2) \quad (7)$$

In the study, the structure between the related variables was examined by making a factor analysis. The idea in the study of Chang, Hsu, and McAleer (2017) is that the RTS variable is the observable version of the unobservable TFCI composite indicator. Based on this idea, the weights of the variables thought to be related were determined using factor analysis.

In this study, the hypothesis that the method used instead of the stochastic weight determination method is a more useful and accurate weighting method is based on the hypothesis. However, instead of using the analysis of the relationship of the created NTFCI (New TFCI) variable with RTS as an apriori information set, it is evaluated as an observation of a result relationship, that is, as an ex-post information set.

At this point, the study differs from Chang (2015) and the literature developed in 3 subjects. Although ARCH Family models are used in the study, it is thought that there are two limitations. The first is that the Q parameters need to be converted to weights components instead of estimation. Since the Q parameters to be used in the creation of composite indicators will vary according to the period and country in which they are applied, and they contain errors such as u_t, v_t , it is estimated that making linear combinations will give more unbiased results after the relevant variables are selected, making them not to cause scale problems with the necessary normalization method.

The second point is that the error terms are not i.i.d. errors. Using GARCH Family models or Newey-West Hac. standard error estimation is required.

The third issue is the contribution to the content of the index. The rapidly increasing terrorist incidents in the world have a significant impact on the economic relationship of countries based on tourism.

Based on these 3 issues, it was created by standardizing the index and we added the terrorism variable as a variable that should be included in the index.

The index composed from this point of view is given below.

$$TFCI_i = \delta_1 REE_i + \delta_2 CCI_i + \delta_3 CLI_i + \delta_4 CPI_i + +\delta_5 ARV_i + \delta_6 TRR_i \quad (8)$$

It is in the structure of a composite indicator, which is formed in the form of an index. Since the data used in equation 8 are different in structure and contain nominal variables, the effect on the indicator should be standardized while being brought together. The z-score method was used for standardization.

There are many types of data normalization in the literature. Data normalization is particularly useful for modeling practice where data are often at different scales. Although there are many different techniques such as Min-max, Z-score, and Median normalization in the literature, min-max and z-score methods are often preferred (Jain, Nandakumar & Ross, 2005; Jain & Bhandare, 2011; Nayak, Misra & Behera, 2014; Chiaramonte, Croci & Poli, 2015; Svirydzenka, 2016; Mare, Moreira & Rossi, 2017; Jain, Shukla & Wadhvani, 2018). For this reason, the z-score method, which is one of the most frequently used statistical normalization methods, was used in the normalization of the variables in the study.

The most commonly used score normalization technique is the z-score, which is calculated using the arithmetic mean and standard deviation of the given data. In the Z-score method, each observation data is divided by its standard deviation after subtracting from the observation mean in order to eliminate the difference in the measurement unit of the data.

$$z_i = \frac{X_i - \mu}{\sigma} \quad (9)$$

μ is arithmetic mean and σ is standard deviation. Z-score normalization determines a common numerical range for the normalized scores of different structures. In order to calculate TFCI, the different structure between the data was corrected by transforming the variables according to the z-score method. After the variables were normalized, the NTFCI index was calculated.

$$Z\ Skore: TFCI_i = zCCI_i + zCLI_i + zCPI_i + zREE_i + zARV_i + zTRR_i \quad (10)$$

3. DATA AND ECONOMETRIC METHODOLOGY

This section contains information about the data and analysis method.

3.1.Data

Monthly data for the period 2009:07 – 2017:12 was used in the study. The countries examined are Australia, Denmark, France, Italy, Spain, Turkiye and the UK. It is aimed to examine the relationship between the calculated NTFCI and the Tourism Stock Exchange data of each country. The sources of data used in the study are World Bank Database, Global Terrorism Database, and UNWTO Tourism Data.

The definitions of the variables used in this study are given below.

- ✓ CCI; Consumer confidence index (This consumer confidence indicator provides an indication of future developments of households' consumption and saving, based upon answers regarding their expected financial situation, their sentiment about the general economic situation, unemployment, and capability of savings).

- ✓ CLI; Composite leading indicator (The composite leading indicator (CLI) is designed to provide early signals of turning points in business cycles showing fluctuation of the economic activity around its long-term potential level. CLIs show short-term economic movements in qualitative rather than quantitative terms.).
- ✓ CPI: Consumer Price Index (Inflation measured by consumer price index (CPI) is defined as the change in the prices of a basket of goods and services that are typically purchased by specific groups of households).
- ✓ REE; Real Effective Exchange Rate (Real effective exchange rate, is obtained by purifying relative price effects in the nominal effective exchange rate.).
- ✓ ARV; Total Visitor Arrivals.
- ✓ TRR; Number of terrorist attacks in Global Terrorism Database.

3.2. Z Score Calculations

The standardization methods applied to the variables are reported below.

$Consumer\ confidence\ index$: $zCCI_i = \frac{CCI_i - \mu_{CCI}}{\sigma_{CCI}}$ (12)

Composite leading indicator: $zCLI_i = \frac{CLI_i - \mu_{CLI}}{\sigma_{CLI}}$ (13)

Consumer Price Index: $sCPI_i = \frac{CPI_i - \mu_{CPI}}{\sigma_{CPI}}$ (14)

Real Effective Exchange Rate: $sREE_i = \frac{REE_i - \mu_{REE}}{\sigma_{REE}}$ (15)

$Total\ Visitor\ Arrivals$: $sARV_i = \frac{ARV_i - \mu_{ARV}}{\sigma_{ARV}}$ (16)

Number of terrorist attacks: $sTRR_i = \frac{CCI_i - \mu_{CCI}}{\sigma_{CCI}}$ (17)

3.3. Econometric Methodology

For the composite indicator obtained as a result of standardization, firstly, seasonal adjustment was applied. In the second stage, unit root analysis was performed. The unit root tests applied are ADF, Phillips Perron and KPSS unit root tests. In the next step, the relationship between Return and NTFCI variables for each country was estimated using the threshold VAR method. In this section, econometric methodology explanations of the threshold VAR method are written, since ADF, Phillips Perron and KPSS tests are frequently used in the literature, no theoretical explanation is given in this section.

Threshold VAR Methodology - In this paper Balke (2000) TVAR approach is followed and Eviews 9 program is used. The composite indicator and return variables for selected countries are non-linear and with this method this non-linear dynamic relation can be taken into account. T-VAR also report the impulse response functions among these variables.

The TVAR model is introduced with the model given below.

$$Yt = A^1 Y_t + B^1(L)Y_{t-1} + (A^2 Yt + B^2(L)Y_{t-1})I\left[v_{t-d} > \gamma\right] + U_t \quad (18)$$

Y_t is a nx1 vector of endogenous variables and I[ ] is the indicator function which equals 1 when $v_{t-d} > \gamma$ and 0 if $v_{t-d} \leq \gamma$. $B^1(L),\ B^2(L)$ are lag polynomial matrices, U_t are structural disturbances, V_{t-d} is the threshold variable.

In this study nx1 vector of endogenous variables denoted as Z_t and Rt. The indicator function equals 1 when Return variable is higher than the threshold value. The lag value noted as "d". Number of lags selected for each country is different from each other and selected with using lag length criteria. The lag value for Australia, Denmark and Italy is six, for France seven, for Spain eight, for Turkey five and UK is four respectively.

In first step we estimated TVAR model and tested the difference of the regimes. This test procedure is known as Wald test procedure. Three main test types are revealed in Balke (2000) study which are named as; sup-Wald, avg-Wald and exp-Wald tests. Critical values are obtained as using the procedure of Hansen (1996). Nonlinear impulse-response functions estimation is also obtained and interpreted.

4. ECONOMETRIC FINDINGS

The unit root test and non-linearity tests applied in the study were also determinative in the country selection. Thus Australia, Denmark, France, Italy, Spain, Turkey, and the UK are selected for applying the long-run relationship. It has been determined that the tourism index and return data calculated for the above-mentioned countries are stationary.

As is seen in Table 1, the selected countries' Tourism index and Return variables are stationary according to ADF and PP tests. The KPSS test results sigs also stationarity for different significance levels accept Denmark's Return variable. When all test results were evaluated, the analyzes were continued with the assumption that this variable was stationary as well.

Table 1: Unit Root Test Results

Unit Root Test	**ADF**		**Philips-Perron**		**KPSS**	
Country	**Z-Score**	**Return**	**Z-Score**	**Return**	**Z-Score**	**Return**
AUSTURALIA	-3.919262	-12.11078	-3.867946	-12.33404	0.222333	0.125062
DENMARK	-5.235158	-10.67427	-5.215262	-10.64488	0.162476	0.606449**
FRANCE	-4.793902	-10.87698	-4.705331	-10.89989	0.338685	0.082959
ITALY	-3.935316	-10.49419	-3.938032	-10.49600	0.431459	0.166875
SPAIN	-3.912693	-11.41181	-3.327871	-11.57763	0.709181**	0.047779
TURKEY	-3.832844	-8.346489	-3.499046	-8.234617	0.311268	0.280124
UK	-2.927522	-10.93481	-3.209026	-10.93476	0.750358*	0.133773
	ADF Test Critical Values:		PP Test Critical Values:		KPSS Test Critical Values:	
	1% level	-3.493747	1% level	-3.492523	1% level	0.739000
	5% level	-2.889200	5% level	-2.888669	5% level	0.463000
	10% level	-2.581596	10% level	-2.581313	10% level	0.347000

Since all variables are stationary, it is envisaged to establish a VAR model. In order to decide whether the model to be built is linear or non-linear, the linearity test was carried out with the BDS test.

Table 2: BDS Test Results

0,5	**Z-score**	**Return**	**Dim**	
AUSTURALIA	0.04358	0.00039	3	0,05
DENMARK	0.06396	0.00012	3	0,9525
FRANCE	0.05835	0.00485	3	0,05
ITALY	0.03871	0.00440	3	0,05
SPAIN	0.08129	0.01591	2	0,05
TURKEY	0.08117	0.00698	3	0,05
UK	0.06266	0.00360	3	0,05

For %5 percent significance BDS results signs non-linearity accepting Denmark Return variable. For this result, the non-linearity is tested using the Caner Hansen Unit root test, and this test signs non-linearity and stationarity.

Table 3: Threshold VAR threshold and Wald test results

Country	**Estimated Threshold Value**	**Wald Statistics for Structural VAR**		
		Sup-	**Avg-**	**Exp-**
AUSTURALIA	0.0075	61.53	41.07	27.22
		(0.00)	(0.00)	(0.00)
DENMARK	1.3870	69.45	40.53	31.26
		(0.00)	(0.00)	(0.00)
FRANCE	0.0447	113.91	93.18	54.1
		(0.00)	(0.00)	(0.00)
ITALY	0.2343	59.51	39.45	26.62
		(0.00)	(0.00)	(0.00)
SPAIN	0.3800	64.73	48.71	29.92
		(0.00)	(0.00)	(0.00)
TURKEY	-0.1870	53.82	32.52	23.90
		(0.00)	(0.00)	(0.00)
UK	-1.6831	40.48	25.46	17.47
		(0.00)	(0.00)	(0.00)

In Table 3 brief threshold VAR test results are reported. The main equations and impulse-response results are given below.

The first TVAR results are belong to Australia. Z_t defines New Tourism Financial Composite Indicator (NTFCI) with terrorism effect and R_t is used for Australia's Tourism stock exchange market returns. NTFCI is chosen as threshold variable. This

selection helps to analyze the effect of NTFCI to Stock Market Tourism Index returns subject to the level of threshold variable. Estimated threshold value for Australia is 0.007. When the NTFCI is above this threshold value, the first regime realized and this regime is dominated at 64.4% of the period analyzed. If the NTFCI change is below the threshold level the second regime dominates and its realized at 35.6% of the period.

In first TVAR equation Tourism Stock Index Return (R_t) affected from NTFCI negative and positive for different lags but this positive and negative effects changes for different regimes. This implies the effect of threshold variable and value estimation is correct and NTFC has significant effects in different regimes. This effect is also valid for the second part of the T-VAR system. Another implication of second part is the relatively stronger relation between NTFC and R_t respectively.

$$R = 0.199 + 0.039R_{t-1} - 0.094R_{t-2} + 0.040R_{t-3} - 0.220R_{t-4} + 0.072R_{t-5} + 0.092R_{t-6} + 0.0007Z_{t-1} - 0.006Z_{t-2} + 0.02Z_{t-3} - 0.0009Z_{t-4} - 0.002Z_{t-5} + 0.001Z_{t-6} \quad 0.007534 \geq \tau$$
$$(0.008)\ (0.136)\ (0.129)\ (0.135)\ (0.132)\ (0.141)\ (0.136)\ (0.003)\ (0.004)\ (0.004)\ (0.004)\ (0.004)\ (0.003) \qquad (19)$$

$$R = 0.010 - 0.420R_{t-1} - 0.027R_{t-2} - 0.178R_{t-3} - 0.353R_{t-4} - 0.263R_{t-5} - 0.209R_{t-6} - 0.0005Z_{t-1} + 0.002Z_{t-2} - 0.007Z_{t-3} + 0.003Z_{t-4} + 0.003Z_{t-5} - 0.005Z_{t-6} \quad 0.007534 < \tau$$
$$(0.014)\ (0.206)\ (0.238)\ (0.205)\ (0.214)\ (0.211)\ (0.225)\ (0.004)\ (0.006)\ (0.006)\ (0.006)\ (0.006)\ (0.004)$$

$$Z = 0.173 - 2.112R_{t-1} - 9.369R_{t-2} + 8.628R_{t-3} - 3.855R_{t-4} - 2.55R_{t-5} - 2.336R_{t-6} + 0.583Z_{t-1} - 0.03Z_{t-2} + 0.393Z_{t-3} + 0.019Z_{t-4} + 0.063Z_{t-5} - 0.161Z_{t-6} \quad 0.007534 \geq \tau$$
$$(0.365)(6.022)\ (5.722)\ (5.964)\ (5.840)\ (6.251)\ (6.025)\ (0.152)\ (0.199)\ (0.189)\ (0.161)\ (0.166)\ (0.138) \qquad (20)$$

$$Z = -1.493 + 13.985R_{t-1} - 4.538R_{t-2} + 11.813R_{t-3} + 3.331R_{t-4} + 8.95R_{t-5} + 9.88R_{t-6} + 0.446Z_{t-1} - 0.446Z_{t-2} + 0.142Z_{t-3} - 0.079Z_{t-4} - 0.387Z_{t-5} + 0.451Z_{t-6} \quad 0.007534 < \tau$$
$$(0.495)\ (7.310)\ (8.448)\ (7.274)\ (7.590)\ (7.487)\ (7.988)\ (0.156)\ (0.203)\ (0.198)\ (0.196)\ (0.200)\ (0.152)$$

Figure 1: Response of Australia R_t to shock to Australia NTFCI

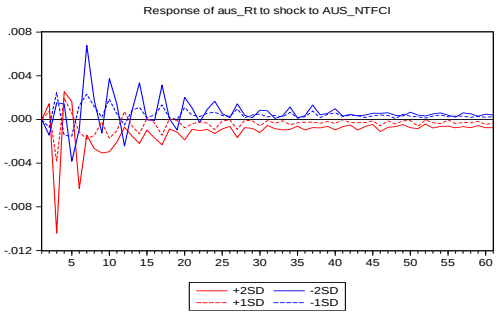

Figure 1 shows the response of the Tourism index return of Australia for positive and negative shocks to the variables in this system. A positive shock to NTFC leads to a temporary positive effect whereas a negative shock leads to a temporary negative effect on R_t. This effect disappears in the first term and is followed by a bigger opposite effect. Also, the opposite effect does not dissipate before the ninth period.

Denmark T-VAR model is given below. The estimated threshold value for Denmark is about 1.39. When the NTFCI is above this threshold value, the first regime is realized, and this regime is dominated at 28.7% of the period analyzed. If the NTFCI change is below the threshold level the second regime dominates and is realized at 71.3% of the period. The relation between those two variables is in the same direction, especially for the first lag. This positive relation changes generally after the third lag. The relatively small effect of terrorism is an expected issue for Denmark.

$$R = -0.048 - 0.026R_{t-1} - 0.239R_{t-2} + 0.565R_{t-3} - 0.032R_{t-4} + 0.256R_{t-5} - 0.16R_{t-6} + 0.007Z_{t-1} + 0.025Z_{t-2} - 0.029Z_{t-3} + 0.012Z_{t-4} - 0.007Z_{t-5} - 0.002Z_{t-6} \quad 1.387090 \geq \tau$$
$$(0.048)\ (0.262)\ (0.320)\ (0.339)\ (0.258)\ (0.208)\ (0.313)\ (0.015)\ (0.021)\ (0.024)\ (0.022)\ (0.008)\ (0.008) \qquad (21)$$

$$R = -0.0007 + 0.089R_{t-1} - 0.018R_{t-2} - 0.003R_{t-3} + 0.101R_{t-4} + 0.021R_{t-5} - 0.094R_{t-6} + 0.0002Z_{t-1} - 0.005Z_{t-2} + 7.918Z_{t-3} - 0.006Z_{t-4} + 0.003Z_{t-5} + 0.004Z_{t-6} \quad 1.387090 < \tau$$
$$(0.007)\ (0.129)\ (0.115)\ (0.114)\ (0.120)\ (0.132)\ (0.113)\ (0.004)\ (0.004)\ (0.004)\ (0.004)\ (0.005)\ (0.004)$$

$$Z = 1.802 - 3.577R_{t-1} - 6.936R_{t-2} + 12.783R_{t-3} + 7.341R_{t-4} - 1.224R_{t-5} + 2.102R_{t-6} + 1.370Z_{t-1} - 1.613Z_{t-2} + 1.013Z_{t-3} - 0.979Z_{t-4} - 0.106Z_{t-5} + 0.665Z_{t-6} \quad 1.387090 \geq \tau$$
$$(1.153)\ (6.285)\ (7.680)\ (8.127)\ (6.182)\ (4.998)\ (7.505)\ (0.370)\ (0.513)\ (0.583)\ (0.531)\ (0.192)\ (0.189) \qquad (22)$$

$$Z = -0.013 - 4.517R_{t-1} + 2.284R_{t-2} + 3.081R_{t-3} + 7.924R_{t-4} - 0.367R_{t-5} + 4.844R_{t-6} + 0.367Z_{t-1} + 0.191Z_{t-2} + 0.106Z_{t-3} + 0.001Z_{t-4} - 0.027Z_{t-5} - 0.121Z_{t-6} \quad 1.387090 < \tau$$
$$(0.204)\ (3.618)\ (3.220)\ (3.179)\ (3.360)\ (3.696)\ (3.162)\ (0.112)\ (0.113)\ (0.107)\ (0.105)\ (0.132)\ (0.124)$$

Figure 2: Response of Denmark R_t to Shock to Denmark NTFCI

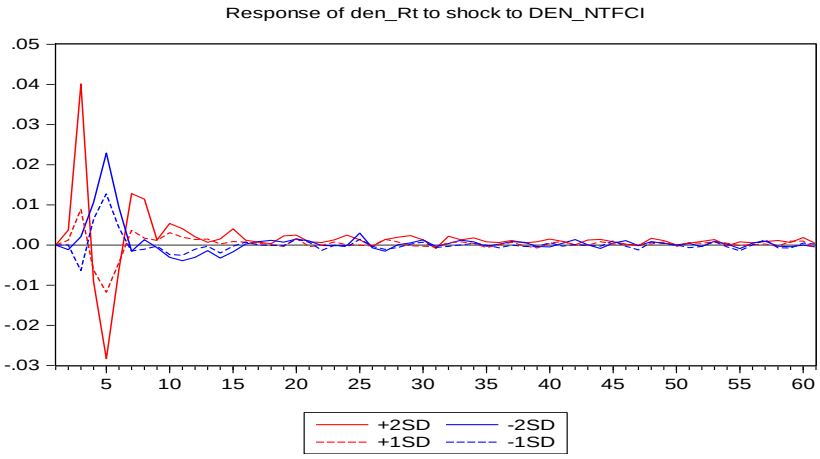

Figure 2 shows the response of the Tourism index return of Denmark for positive and negative shocks to the variables in this system. A positive shock to NTFC leads to a temporary positive effect whereas a negative shock leads to a temporary negative effect on R_t. The relatively high positive effect ends in the third term and fluctuates for several terms. The effect of this shock disappears in the eighteenth term. The negative shock effect also has the same direction effect but after the first term this effect turns into a positive effect and disappears in the fifteenth period.

The first TVAR results below belong to France. Zt defines New Tourism Financial Composite Indicator (NTFCI) with a terrorism effect and R_t is used for France Tourism stock exchange market returns. NTFCI is chosen as the threshold variable. The estimated threshold value for France is 0.0447. When the NTFCI is above this threshold value, the first regime is realized and this regime is dominated at 45.5% of the period analyzed. If the NTFCI change is below the threshold level the second regime dominates and is realized at 54.5% of the period.

$$R = \underset{(0.013)}{0.02} + \underset{(0.179)}{0.098}R_{t-1} - \underset{(0.191)}{0.084}R_{t-2} - \underset{(0.176)}{0.085}R_{t-3} + \underset{(0.177)}{0.049}R_{t-4} + \underset{(0.171)}{0.091}R_{t-5} - \underset{(0.180)}{0.019}R_{t-6} + \underset{(0.174)}{0.169}R_{t-7} - \underset{(0.006)}{0.016}Z_{t-1} + \underset{(0.008)}{0.01}Z_{t-2} - \underset{(0.009)}{0.002}Z_{t-3} - \underset{(0.012)}{0.003}Z_{t-4} + \underset{(0.012)}{0.0003}Z_{t-5} - \underset{(0.006)}{0.002}Z_{t-6} + \underset{(0.006)}{0.003}Z_{t-7} \quad 0.0447 \geq \tau$$

$$R = \underset{(0.009)}{0.02} - \underset{(0.238)}{0.356}R_{t-1} - \underset{(0.206)}{0.018}R_{t-2} + \underset{(0.205)}{0.061}R_{t-3} + \underset{(0.212)}{0.061}R_{t-4} - \underset{(0.208)}{0.071}R_{t-5} - \underset{(0.187)}{0.260}R_{t-6} - \underset{(0.188)}{0.11}R_{t-7} - \underset{(0.007)}{0.005}Z_{t-1} - \underset{(0.008)}{0.0046}Z_{t-2} + \underset{(0.012)}{0.0009}Z_{t-3} + \underset{(0.011)}{0.003}Z_{t-4} + \underset{(0.009)}{0.003}Z_{t-5} - \underset{(0.008)}{0.006}Z_{t-6} + \underset{(0.007)}{0.001}Z_{t-7} \quad 0.0447 < \tau \qquad (23)$$

$$Z = \underset{(0.384)}{-0.858} - \underset{(5.466)}{0.94}R_{t-1} + \underset{(5.839)}{14.771}R_{t-2} + \underset{(5.386)}{13.456}R_{t-3} + \underset{(5.409)}{4.297}R_{t-4} + \underset{(5.217)}{4.597}R_{t-5} + \underset{(5.485)}{5.388}R_{t-6} + \underset{(5.329)}{4.7903}R_{t-7} + \underset{(0.192)}{0.654}Z_{t-1} + \underset{(0.240)}{0.329}Z_{t-2} + \underset{(0.261)}{0.012}Z_{t-3} + \underset{(0.368)}{0.423}Z_{t-4} - \underset{(0.380)}{0.569}Z_{t-5} - \underset{(0.177)}{0.023}Z_{t-6} + \underset{(0.172)}{0.812}Z_{t-7} \quad 0.0447 \geq \tau$$

$$Z = \underset{(0.286)}{0.474} - \underset{(7.401)}{10.253}R_{t-1} - \underset{(6.404)}{14.848}R_{t-2} + \underset{(6.364)}{0.042}R_{t-3} + \underset{(6.581)}{1.18}R_{t-4} + \underset{(6.465)}{5.627}R_{t-5} + \underset{(5.822)}{8.978}R_{t-6} - \underset{(5.845)}{2.845}R_{t-7} + \underset{(0.210)}{0.186}Z_{t-1} + \underset{(0.241)}{0.031}Z_{t-2} - \underset{(0.362)}{0.08}Z_{t-3} + \underset{(0.348)}{0.291}Z_{t-4} + \underset{(0.279)}{0.193}Z_{t-5} + \underset{(0.254)}{0.011}Z_{t-6} - \underset{(0.207)}{0.112}Z_{t-7} \quad 0.0447 \geq \tau \qquad (24)$$

Figure 3: Response of France R_t to Shock to France NTFCI

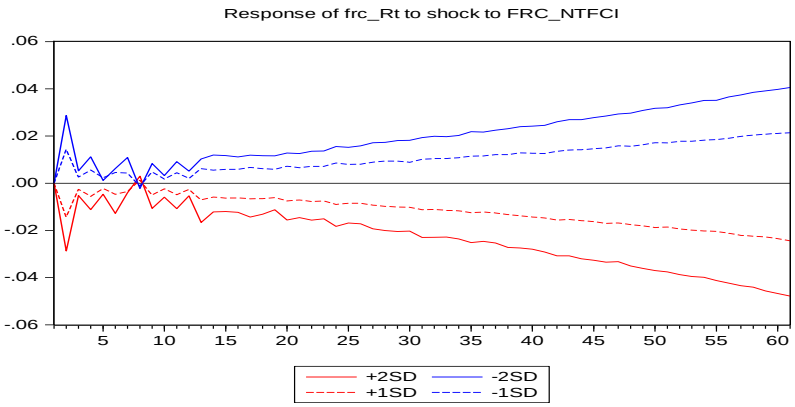

Figure 3 shows the response of the Tourism index return of France for positive and negative shocks to the variables in this system. A positive shock to NTFC leads to a negative effect whereas a negative shock leads positive effect on R_t. The positive

effect has its lowest value in the second period and disappears in the eighth period. This effect is also the same for the negative shock and the positive effect of negative shock also ends in the eighth period.

Italy T-VAR model is given below. The estimated threshold value for Italy is about 0.2343. When the NTFCI is above this threshold value, the first regime is realized, and this regime is dominated at 55.8% of the period analyzed. If the NTFCI change is below the threshold level the second regime dominates and is realized at 44.2% of the period. During the first regime when the NTFCI is above the threshold value return is affected negatively in the first, third, fourth, and fifth lags. This opposite relation turns to positive relation in the second regime except in the third period. A similar effect can be seen for the relation in the second part of the VAR system. The effect of return on NTFCI has a negative effect for various lags in the first regime but positive effects on NTFCI in the second regime.

$$R = \underset{(0.016)}{-0.002} \underset{(0.139)}{-0.074R_{t-1}} \underset{(0.148)}{-0.054R_{t-2}} \underset{(0.154)}{+0.185R_{t-3}} \underset{(0.141)}{+0.064R_{t-4}} \underset{(0.144)}{-0.033R_{t-5}} \underset{(0.159)}{+0.242R_{t-6}} \underset{(0.008)}{-0.015Z_{t-1}} \underset{(0.008)}{+0.018Z_{t-2}} \underset{(0.008)}{-0.001Z_{t-3}} \underset{(0.007)}{-0.002Z_{t-4}} \underset{(0.006)}{-0.007Z_{t-5}} \underset{(0.005)}{+0.004Z_{t-6}} \quad 0.2343 \geq \tau$$

$$R = \underset{(0.023)}{0.025} \underset{(0.260)}{+0.024R_{t-1}} \underset{(0.228)}{-0.318R_{t-2}} \underset{(0.234)}{+0.198R_{t-3}} \underset{(0.227)}{+0.084R_{t-4}} \underset{(0.213)}{+0.321R_{t-5}} \underset{(0.224)}{-0.113R_{t-6}} \underset{(0.006)}{+0.0004Z_{t-1}} \underset{(0.007)}{+0.008Z_{t-2}} \underset{(0.007)}{-0.009Z_{t-3}} \underset{(0.008)}{+0.0001Z_{t-4}} \underset{(0.010)}{+0.0001Z_{t-5}} \underset{(0.007)}{+0.003Z_{t-6}} \quad 0.2343 < \tau \qquad (25)$$

$$Z = \underset{(0.338)}{0.332} \underset{(2.882)}{-5.526R_{t-1}} \underset{(3.084)}{-6.023R_{t-2}} \underset{(3.195)}{-1.199R_{t-3}} \underset{(2.926)}{-2.809R_{t-4}} \underset{(2.988)}{+6.961R_{t-5}} \underset{(3.312)}{-0.167R_{t-6}} \underset{(0.159)}{+0.716Z_{t-1}} \underset{(0.174)}{+0.249Z_{t-2}} \underset{(0.158)}{-0.402Z_{t-3}} \underset{(0.151)}{-0.061Z_{t-4}} \underset{(0.124)}{+0.028Z_{t-5}} \underset{(0.109)}{-0.082Z_{t-6}} \quad 0.2343 \geq \tau$$

$$Z = \underset{(0.728)}{-1.153} \underset{(8.282)}{+13.562R_{t-1}} \underset{(7.285)}{+0.989R_{t-2}} \underset{(7.463)}{+2.428R_{t-3}} \underset{(7.239)}{+6.346R_{t-4}} \underset{(6.778)}{+8.181R_{t-5}} \underset{(7.147)}{+14.692R_{t-6}} \underset{(0.199)}{+0.530Z_{t-1}} \underset{(0.216)}{-0.032Z_{t-2}} \underset{(0.214)}{-0.104Z_{t-3}} \underset{(0.264)}{-0.028Z_{t-4}} \underset{(0.310)}{+0.299Z_{t-5}} \underset{(0.232)}{+0.010Z_{t-6}} \quad 0.2343 < \tau \qquad (26)$$

Figure 4: Response of Italy R_t to shock to Italy NTFCI

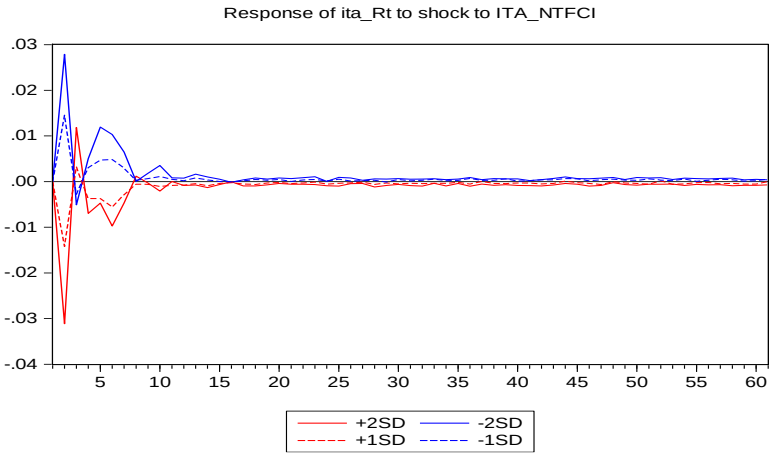

Figure 4 shows the response of the Tourism index return of Italy for positive and negative shocks to the variables in this system. A positive shock to NTFC leads to a negative effect whereas a negative shock leads positive effect on Rt. The positive effect has its lowest value in the second period and disappears in the eighth period. This effect is also the same for the negative shock and the positive effect of negative shock also reaches its end in the eighth period.

Spain T-VAR model is given below. The estimated threshold value for Italy is about 0.2343. When the NTFCI is above this threshold value, the first regime is realized, and this regime is dominated at 55.8% of the period analyzed. If the NTFCI change is below the threshold level the second regime dominates and is realized at 44.2% of the period. During the first regime when the NTFCI is above the threshold value return is affected negatively in the first, third, fourth, and fifth lags. This opposite relation turns to positive relation in the second regime except in the third period. A similar effect can be seen for the relation in the second part of the VAR system. The effect of return on NTFCI has a negative effect for various lags in the first regime but positive effects on NTFCI in the second regime.

$$R = \underset{(0.029)}{-0.004} \underset{(0.147)}{-0.091R_{t-1}} \underset{(0.148)}{+0.216R_{t-2}} \underset{(0.148)}{+0.013R_{t-3}} \underset{(0.138)}{-0.199R_{t-4}} \underset{(0.146)}{+0.221R_{t-5}} \underset{(0.150)}{+0.123R_{t-6}} \underset{(0.140)}{-0.026R_{t-7}} \underset{(0.141)}{-0.089R_{t-8}} \underset{(0.023)}{-0.021Z_{t-1}} \underset{(0.033)}{+0.023Z_{t-2}} \underset{(0.031)}{+0.017Z_{t-3}} \underset{(0.033)}{-0.004Z_{t-4}} \underset{(0.036)}{-0.052Z_{t-5}} \underset{(0.035)}{+0.035Z_{t-6}} \underset{(0.034)}{+0.020Z_{t-7}} \underset{(0.021)}{-0.016Z_{t-8}} \quad 0.3800 \geq \tau \qquad (27)$$

$$R = \underset{(0.035)}{0.069} \underset{(0.200)}{-0.182R_{t-1}} \underset{(0.190)}{-0.235R_{t-2}} \underset{(0.201)}{-0.138R_{t-3}} \underset{(0.207)}{-0.397R_{t-4}} \underset{(0.201)}{-0.260R_{t-5}} \underset{(0.208)}{-0.060R_{t-6}} \underset{(0.225)}{-0.112R_{t-7}} \underset{(0.216)}{+0.125R_{t-8}} \underset{(0.032)}{-0.012Z_{t-1}} \underset{(0.038)}{+0.049Z_{t-2}} \underset{(0.043)}{-0.017Z_{t-3}} \underset{(0.045)}{+0.001Z_{t-4}} \underset{(0.040)}{-0.050Z_{t-5}} \underset{(0.046)}{+0.035Z_{t-6}} \underset{(0.045)}{+0.024Z_{t-7}} \underset{(0.029)}{-0.002Z_{t-8}} \quad 0.3800 < \tau$$

$$Z = 0.437 + 0.063R_{t-1} - 0.516R_{t-2} - 0.216R_{t-3} + 0.512R_{t-4} + 1.484R_{t-5} - 0.510R_{t-6} + 0.598R_{t-7} + 2.385R_{t-8} + 1.107Z_{t-1} - 0.470Z_{t-2} + 0.362Z_{t-3} - 0.150Z_{t-4} - 0.242Z_{t-5} + 0.121Z_{t-6} - 0.289Z_{t-7} + 0.371Z_{t-8} \quad 0.3800 \geq \tau \quad (28)$$
$$(0.161)\ (0.807)\quad (0.811)\quad (0.811)\quad (0.756)\quad (0.800)\quad (0.824)\quad (0.772)\quad (0.774)\quad (0.124)\quad (0.181)\quad (0.172)\quad (0.183)\quad (0.199)\quad (0.194)\quad (0.186)\quad (0.114)$$

$$Z = 0.181 - 0.164R_{t-1} - 1.086R_{t-2} - 0.348R_{t-3} - 1.536R_{t-4} - 1.906R_{t-5} - 0.263R_{t-6} + 0.257R_{t-7} + 0.224R_{t-8} + 1.033Z_{t-1} + 0.357Z_{t-2} - 0.245Z_{t-3} - 0.340Z_{t-4} - 0.077Z_{t-5} - 0.013Z_{t-6} + 0.221Z_{t-7} + 0.018Z_{t-8} \quad 0.3800 < \tau$$
$$(0.244)\ (1.383)\quad (1.311)\quad (1.386)\quad (1.430)\quad (1.392)\quad (1.438)\quad (1.557)\quad (1.491)\quad (0.220)\quad (0.262)\quad (0.299)\quad (0.310)\quad (0.280)\quad (0.317)\quad (0.309)\quad (0.201)$$

Figure 5: Response of Spain R_t to Shock to Spain NTFCI

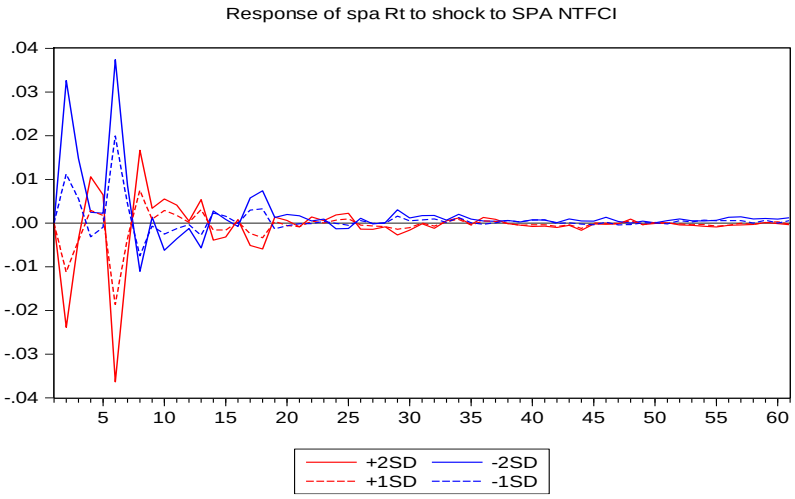

Figure 5 shows the response of the Tourism index return of Spain for positive and negative shocks to the variables in this system. A positive shock to NTFC leads to a negative effect whereas a negative shock leads positive effect on Rt. The positive effect has its lowest value in the sixth period and disappears in the twentieth period. This effect is also the same for the negative shock and the positive effect of negative shock also ends about the twentieth period.

The t-VAR model for Türkiye is given below. The estimated threshold value for the Türkiye model is -0,187. When the NTFCI is above the threshold value, the first regime is realized and the first regime is dominated at 60.8% of the period analyzed. Additionally, if the NTFCI is below the threshold level the second regime dominates and is realized at 39.2% of the period.

In the first TVAR equation R_t was affected by NTFCI negative and positive for different lags but these positive and negative effects changes for different regimes. This effect is also valid for the second part of the T-VAR system. Another implication of the second part is the relatively stronger relation between NTFC and R_t variables.

$$R = 0.010 - 0.001R_{t-1} - 0.266R_{t-2} - 0.080R_{t-3} - 0.059R_{t-4} + 0.270R_{t-5} - 0.009Z_{t-1} - 0.024Z_{t-2} + 0.033Z_{t-3} - 0.029Z_{t-4} + 0.016Z_{t-5} \quad -0.1870 \geq \tau \quad (29)$$
$$(0.017)\ (0.135)\quad (0.149)\quad (0.149)\quad (0.153)\quad (0.154)\quad (0.015)\quad (0.023)\quad (0.023)\quad (0.021)\quad (0.015)$$

$$R = 0.054 + 0.225R_{t-1} - 0.082R_{t-2} + 0.114R_{t-3} - 0.120R_{t-4} - 0.010R_{t-5} - 0.0001Z_{t-1} + 0.003Z_{t-2} - 0.001Z_{t-3} + 0.021Z_{t-4} - 0.008Z_{t-5} \quad -0.1870 < \tau$$
$$(0.023)\ (0.178)\quad (0.163)\quad (0.175)\quad (0.145)\quad (0.144)\quad (0.012)\quad (0.017)\quad (0.018)\quad (0.017)\quad (0.011)$$

$$Z = -0.013 + 0.160R_{t-1} - 3.091R_{t-2} + 3.483R_{t-3} + 0.319R_{t-4} + 1.341R_{t-5} + 1.404Z_{t-1} - 0.132Z_{t-2} - 0.574Z_{t-3} + 0.083Z_{t-4} + 0.163Z_{t-5} \quad -0.1870 \geq \tau \quad (30)$$
$$(0.197)\ (1.539)\quad (1.694)\quad (1.70)\quad (1.739)\quad (1.756)\quad (0.167)\quad (0.262)\quad (0.258)\quad (0.234)\quad (0.171)$$

$$Z = -0.073 + 1.353R_{t-1} + 1.360R_{t-2} + 3.073R_{t-3} + 2.483R_{t-4} - 0.474R_{t-5} + 0.834Z_{t-1} - 0.125Z_{t-2} + 0.105Z_{t-3} - 0.055Z_{t-4} + 0.116Z_{t-5} \quad -0.1870 < \tau$$
$$(0.232)\ (1.774)\quad (1.625)\quad (1.739)\quad (1.449)\quad (1.437)\quad (0.124)\quad (0.171)\quad (0.177)\quad (0.17)\quad (0.111)$$

Figure 6: Response of Türkiye R_t to Shock to Türkiye NTFCI

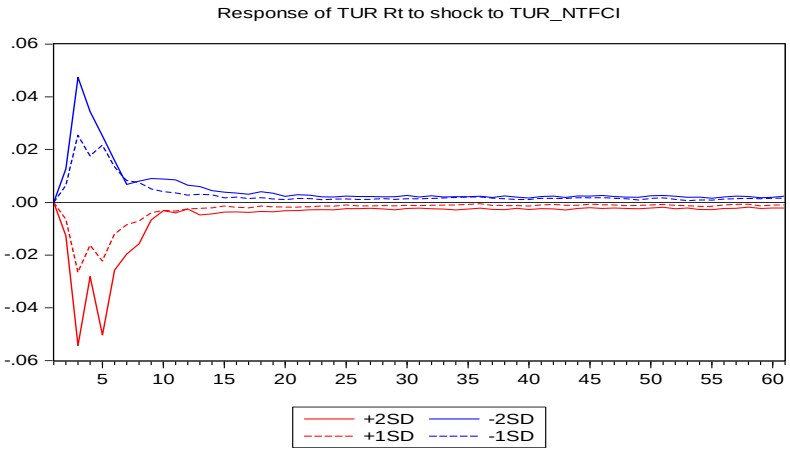

Figure 6 shows the response of the Tourism index return of Türkiye for positive and negative shocks to the variables in this system. A positive shock to NTFC leads to a negative effect whereas a negative shock leads positive effect on Rt. The positive effect has its lowest value in the third period and disappears about the twentieth period. This effect is also the same for the negative shock and the positive effect of negative shock also ends about the twentieth period.

The UK T-VAR model is given below. The estimated threshold value for Italy is about -1.68. When the NTFCI is above this threshold value, the first regime is realized, and this regime is dominated at 68.9% of the period analyzed. If the NTFCI change is below the threshold level the second regime dominates and is realized at 31.1% of the period. During the first regime when the NTFCI is above the threshold value Return variable is affected negatively in the first and second lags. This relation is also a negative relation in the second regime except in the first and fourth periods. In the second part of the VAR system, the effect of return on NTFCI has a negative effect for the first lag in the first regime but positive effects on NTFCI in the second regime except for the third lag.

$$\underset{(0.007)}{R = 0.015} \underset{(0.127)}{-0.223R_{t-1}} \underset{(0.125)}{+0.039R_{t-2}} \underset{(0.119)}{+0.038R_{t-3}} \underset{(0.120)}{-0.135R_{t-4}} \underset{(0.004)}{-0.0004Z_{t-1}} \underset{(0.005)}{-0.007Z_{t-2}} \underset{(0.005)}{+0.0004Z_{t-3}} \underset{(0.004)}{+0.005Z_{t-4}} \quad -1.6831 \geq \tau \tag{31}$$

$$\underset{(0.027)}{R = 0.024} \underset{(0.189)}{+0.049R_{t-1}} \underset{(0.185)}{-0.065R_{t-2}} \underset{(0.177)}{-0.234R_{t-3}} \underset{(0.176)}{+0.327R_{t-4}} \underset{(0.007)}{-0.004Z_{t-1}} \underset{(0.010)}{+0.002Z_{t-2}} \underset{(0.010)}{+0.017Z_{t-3}} \underset{(0.007)}{-0.013Z_{t-4}} \quad -1.6831 < \tau$$

$$\underset{(0.206)}{Z = 0.076} \underset{(3.635)}{-5.868R_{t-1}} \underset{(3.575)}{+2.244R_{t-2}} \underset{(3.402)}{+2.902R_{t-3}} \underset{(3.424)}{+1.646R_{t-4}} \underset{(0.121)}{+0.609Z_{t-1}} \underset{(0.142)}{+0.195Z_{t-2}} \underset{(0.141)}{-0.088Z_{t-3}} \underset{(0.112)}{+0.188Z_{t-4}} \quad -1.6831 \geq \tau \tag{32}$$

$$\underset{(0.683)}{Z = -1.423} \underset{(4.714)}{+0.690R_{t-1}} \underset{(4.626)}{+2.751R_{t-2}} \underset{(4.422)}{-4.669R_{t-3}} \underset{(4.402)}{+4.358R_{t-4}} \underset{(0.175)}{+0.695Z_{t-1}} \underset{(0.258)}{-0.180Z_{t-2}} \underset{(0.256)}{+0.460Z_{t-3}} \underset{(0.175)}{-0.561Z_{t-4}} \quad -1.6831 < \tau$$

Figure 7: Response of UK R_t to Shock to UK NTFCI

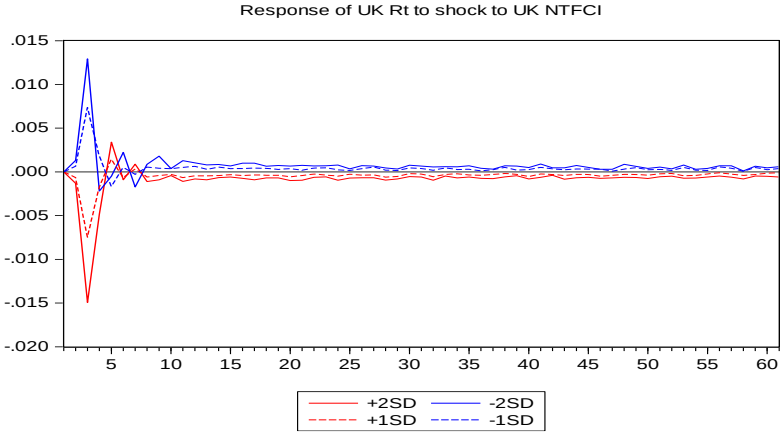

Figure 7 shows the response of the Tourism index return of the UK for positive and negative shocks to the variables in this system. A positive shock to NTFC leads to negative effect whereas a negative shock leads positive effect on Rt. The positive effect has its lowest value in the third period and ends about the seventh period. This effect is also the same for the negative shock and the positive effect of negative shock also disappears about the seventh period.

5. CONCLUSION

In this study, the new version of the TFCI index with terrorist incidents is presented. Chang (2015) developed the Monetary Conditions Index (MCI) and Financial Conditions Index (FCI) as a developed version of the TFCI index adapted to the tourism sector. Adhering to the index methodology developed by Chang (2015), it is thought that the impact of terrorist attacks will affect both the expectations and the economic value of the enterprises existing in the financial market in this field. Today, tourism has become an important economic field not only with the choice of leisure time, but also because it exists in many areas. However, the environment of expectation and trust creates a significant change in preferences. Therefore, countries should also consider the effect of terrorism in their economic and financial research in this area. Based on this idea, the index was expanded by adding the terror variable to the previously developed TFCI composite indicator and its relationship with the tourism stock market index as a financial indicator was examined. With the TVAR model, which shows the short-term dynamic relationship. Models for different countries were edtimated and similar results were obtained for different countries.

REFERENCES

Bilgili, F., Çoban, S., Marangoz, C., Bulut, E., & Kuşkaya, S. (2021). The determinants of demand for tourism in Turkey: Does terror-threat matter? A Markov Regime Switching-VAR approach. Acta Oeconomica, 71(4), 587-607.

Chaivichayachat, B. (2019). Forecasting foreign tourists in Thailand by economic condition for tourism ındex. International Journal of Mechanical Engineering and Technology, 10(3), 144-153.

Chang, C. L. (2015). Modelling a latent daily tourism financial conditions index. International Review of Economics & Finance, 40, 113-126.

Chang, C. L., Hsu, H. K., & McAleer, M. (2017). A tourism financial conditions index for tourism finance. Challenges, 8(2), 1-17.

Chiaramonte, L., Croci, E., & Poli, F. (2015). Should we trust the Z-score? Evidence from the European Banking Industry. Global Finance Journal, 28, 111-131.

Croce, V. (2016). Can tourism confidence index improve tourism demand forecasts? Journal of Tourism Futures, 2(1), 6-21. https://doi.org/10.1108/JTF-12-2014-0026

De La VIina, L. Y., Hollas, D., Merrifield, J., & Ford, J. (1994). A principal components-based tourism activity index. Journal of Travel Research, 32(4), 37-40.

Fernández, J. I. P., & Rivero, M. S. (2009). Measuring tourism sustainability: proposal for a composite index. Tourism Economics, 15(2), 277-296.

Fetscherin, M., & Stephano, R. M. (2016). The medical tourism index: Scale development and validation. Tourism Management, 52, 539-556.

Göktuğ Kaya, M., Onifade, S. T., & Akpinar, A. (2022). Terrorism and tourism: An empirical exemplification of consequences of terrorist attacks on tourism revenues in Turkey. Tourism: An International Interdisciplinary Journal, 70(1), 28-42.

Jain, A., Nandakumar, K., & Ross, A. (2005). Score normalization in multimodal biometric systems. Pattern recognition, 38(12), 2270-2285.

Jain, S., Shukla, S., & Wadhvani, R. (2018). Dynamic selection of normalization techniques using data complexity measures. Expert Systems with Applications, 106, 252-262.

Jain, Y. K., & Bhandare, S. K. (2011). Min max normalization-based data perturbation method for privacy protection. International Journal of Computer & Communication Technology, 2(8), 45-50.

Korstanje, M. E. (2023). The Janus Face of Terrorism and Tourism: Terrorism as a Risk, as a Danger and as a Worry. In Safety and Tourism (pp. 103-115). Emerald Publishing Limited.

Malkina, M., & Ovcharov, A. (2021). Tourism industry stress index and its relationship to the financial stress index. Tourism and Hospitality Management, 27(2), 363-383.

Mare, D. S., Moreira, F., & Rossi, R. (2017). Nonstationary Z-score measures. European Journal of Operational Research, 260(1), 348-358.

Mieczkowski, Z. (1985). The tourism climatic index: a method of evaluating world climates for tourism. Canadian Geographer/Le Géographe Canadien, 29(3), 220-233.

Nayak, S. C., Misra, B. B., & Behera, H. S. (2014). Impact of data normalization on stock index forecasting. Int. J. Comp. Inf. Syst. Ind. Manag. Appl, 6, 357-369.

Olya, H. G., & Alipour, H. (2015). Risk assessment of precipitation and the tourism climate index. Tourism Management, 50, 73-80.

Svirydzenka, K. (2016). Introducing a new broad-based index of financial development. IMF Working Paper 16/05.