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# Asymmetric Risk Impacts of Chinese Tourists to Taiwan.

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## Abstract

Since 2008, when Taiwan's President Ma Ying-Jeou relaxed the Cross-Strait policy, China has become Taiwan's largest source of international tourism. In order to understand the risk persistence of Chinese tourists, the paper investigates the short-run and long-run persistence of shocks to the change rate of Chinese tourists to Taiwan. The daily data used for the empirical analysis is from 1 January 2013 to 28 February 2018. McAleer's (2015) fundamental equation in tourism finance is used to link the change rate of tourist arrivals and the change in tourist revenues. Three widely-used univariate conditional volatility models, namely GARCH(1,1), GJR(1,1) and EGARCH(1,1), are used to measure the short-run and long-run persistence of shocks, as well as symmetric, asymmetric and leverage effects. Three different Heterogeneous AutoRegressive (HAR) models, HAR(1), HAR(1,7), HAR(1,7,28), are considered as alternative mean equations for capturing a variety of long memory effects. The mean equations associated with GARCH(1,1), GJR(1,1) and EGARCH(1,1) are used to analyse the risk persistence of the change in Chinese tourists. The exponential smoothing process is used to adjust the seasonality around the trend in Chinese tourists. The empirical results show asymmetric impacts of positive and negative shocks on the volatility of the change in the number of Group-type and Medical-type tourists, while Individual-type tourists display a symmetric volatility pattern. Somewhat unusually, leverage effects are observed in EGARCH for Medical-type tourists, which shows a negative correlation between shocks in tourist numbers and the subsequent shocks to volatility. For both Group-type and Medical-type tourists, the asymmetric impacts on volatility show that negative shocks have larger effects than do positive shocks. The leverage effect in EGARCH for Medical-type tourists implies that larger shocks would decrease volatility in the change in the numbers of Medical-type tourists. These results suggest that Taiwan tourism authorities should act to prevent the negative shocks for the Group-type and Medical-type Chinese tourists to dampen the shocks that arise from having fewer Chinese tourists to Taiwan.

## Keywords

Asymmetric risk, leverage, risk persistence, tourist revenues, conditional volatility models, Heterogeneous AutoRegressive (HAR) models

## JEL Classification

G32, C22, C58, Z32, Z33.

## Working Paper nº 1813

May, 2018



UNIVERSIDAD  
COMPLUTENSE  
MADRID

ISSN: 2341-2356

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