

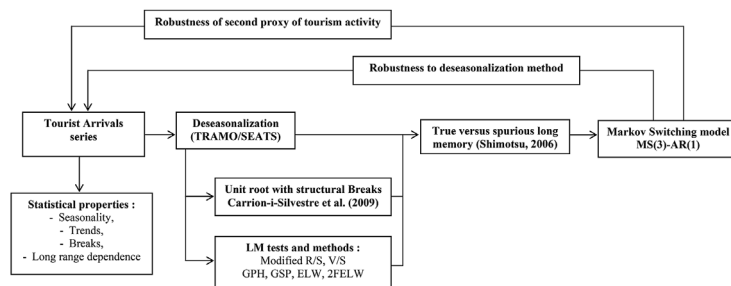
# Tourism, terrorism and political violence in Tunisia: Evidence from Markov-switching models



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## GRAPHICAL ABSTRACT



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## ABSTRACT

This study investigates the impact of terrorist attacks and political violence on the number of tourist arrivals and overnight stays in Tunisia. The dataset employed consists of monthly data that covers the period from January 2000 to September 2016, which includes several political and terrorist attacks in Tunisia and the region. Empirically, we investigate the true data generating process (DGP) of these two proxies of tourism activity by accounting for four statistical properties that characterize these series: (1) seasonality, (2) unit roots, (3) breaks, and (4) long memory behavior.

Our empirical findings show strong evidence of stationarity, five breaks in the tourist arrival time series and spurious long memory behavior. By estimating a 3-state Markov switching model consisting of the mean, trend, and variance, we find that the Tunisian Jasmine revolution and two recent terrorist attacks, one at the Bardo National Museum on March 18, 2015 and the other at the tourist resort at Port El Kantaoui, Sousse on June 26, 2015, played an important role in influencing the tourism activity of the country. Our empirical findings show also that local shocks have a more important impact than international shocks in influencing tourism activity. Interestingly, we find that the effects of terrorist shocks have a long duration compared to political violence shocks. Several security, marketing, and economic policies have been proposed and discussed in the paper.

## 1. Introduction

Throughout the world, tourism has become one of the industries most exposed to political unrest and terrorist attacks (Arana & Leon, 2008; Causevic & Lynch, 2013; Peter et al., 2014; Wolff & Larsen, 2014;

and; Avraham, 2016). In particular, since the beginning of the century, many democracies from developed countries have exhibited high levels of terrorist episodes. Starting with the September 11 Twin Towers attack in New York City in 2001, followed by the bombing events in Madrid in 2004 and London in 2005, and ending with the terrorist

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attacks in Brussels, Paris, and Berlin in 2016, terrorist incidents have created deep economic concern for the tourism industry. Recently, following the Arab Spring, an unprecedented wave of political violence and terrorist events have occurred in several MENA tourism-dependent economies, keeping tourists away from Egypt, Tunisia, and Turkey.

An important issue when proposing economic policies or designing a complete tourism strategy to restore tourism activity following political violence or terrorist attacks is the exact determination of the path time of these shocks. Indeed, the tourism industry is a sensitive sector and closely connected to other sectors (transport, trade, information and communications technology), so the social cost of such shocks can be damaging in terms of job losses and social exclusion if the recovery takes time. Therefore, the necessity to measure the time length of each shock is pertinent for policymakers and managers in the tourism industry. Furthermore, studies show that recovery is likely to be slow, as repeated incidents of violence tend to have long-lasting effects on tourist arrivals (IMF, 2017). To this end, it is important to determine whether these shocks have a transitory, persistent, or permanent impact. Estrada and Koutronas (2016) argue that “such severe shocks, concentrated in time, can cause major disruption on specific sectors of the economy.” Based on these reports, it is important to focus on these shocks and study if political violence or terrorist attacks are transitory or persistent shocks, which will help to determine which type of policies should be recommended and implemented to recover from their negative effects.

Our choice of Tunisia as a case study of the impact of political violence and terrorist attacks on tourism activity is motivated by the growing place and important role that the tourism sector has in the Tunisian economy. Tunisia is a tourism-dependent economy, and the industry is considered one of the main drivers of the country's economic growth. For many years, the tourism sector has contributed to more than 7% of Tunisia's real GDP. In addition, this sector is one of the main sources of its foreign exchange. Furthermore, the tourism industry represents an important source of job creation, creating more than 400,000 jobs. Despite the importance of the tourism industry in the Tunisian economy, few studies have researched tourism in Tunisia. (see for instance Ouerfelli, 2008; Gasmi & Sassi, 2015; Jlassi, Fliti, & Chaibi, 2015; and Ben Aissa and Goaid, 2016).

The present study adds to the international tourism demand literature by examining and determining the true nature of the data-generating process (DGP) of two tourism activity proxies for the case of Tunisia (the number of tourist arrivals and the number of overnight stays). To this end, this paper explores several possible DGPs to model these two series. These alternatives include short memory models with breaks, processes characterized by unit roots, and models characterized by long-range dependence. Moreover, given the importance of the effective timing of tourism action, which can be drawn from modeling and determining the true DGP of the monthly time series, we investigate the short-run impact and the duration effects of two particular shocks in Tunisia: terrorist attacks and political violence shocks. To the best of our knowledge, this is the first study that attempts to examine the effects of those types of shocks on tourism activity using Tunisian data, recent econometric developments based on long-range dependence, and Markov switching models, as well as how to differentiate between these two processes.

The rest of this paper is organized as follows. Section 2 presents an overview of the literature review on terrorism and international tourism demand. Section 3 outlines the tourism sector in Tunisia and the different shocks that affect the series of the monthly number of tourist arrivals and nights. Section 4 presents the empirical methodology followed throughout the paper. Section 5 investigates the true DGP of the series of the number of tourist arrivals using several models. Section 6 uses Markov switching models with changes in the intercept, trend, and variance to model tourist arrivals and assess the robustness of our results to a second proxy of the tourism activity and a second technique of deseasonalization. Section 7 concludes the paper and

highlights the main policy implications.

## 2. Literature review

Terrorism and political violence have grown into a primary consideration for the tourism industry because these incidents seem to affect tourism activity more severely than all other types of shocks, such as natural catastrophes, financial crises, or health crises (Sonmez, 1998). Neumayear (2004) and Reisenger and Mavondo (2005) highlight the handicap effect of terrorism and political turmoil on the development of new destinations because consumer decisions show a preference for regions with more political stability and characterized by a peaceful social environment. Arana and Leon (2008) underlined the precarity of tourism following turbulences; both demand and supply can be sensitive to extreme events, such as terrorism or political violence. The empirical literature focusing on the impact of events (political violence, terrorist attacks, etc.) on international tourism demand can be classified into two groups.

### 2.1. Transitory or permanent shock on tourism demand

The first strand is based on determining whether the impact of such shocks on the tourism demand is transitory or permanent. Barros, Gil-Alana, and Wanke (2016) highlight that “a shock is known to have a temporary or short term effect if after a few number of periods the series return backs to its original performance level.” For example, the impact of political violence and/or a terrorist attack shocks on the number of tourist arrivals vanishes quickly (after a few observations) and the demand recovers its primary realization. In contrast, there is evidence of a persistent or long-term impact, if the short-run effect of shocks converges toward a new trend in the achievement of demand.

Researchers have explored this possibility by applying unit root tests to tourism activity proxies (see Narayan, 2005, 2008; Lean & Smyth, 2009 among many others). For instance, using several unit root tests with structural breaks, Narayan (2005) shows that the 1987 political coups in Fiji had only transitory effects on tourist arrivals and tourist expenditures. Narayan (2008) investigates, in the context of panel data, the effect of shocks to international tourist arrivals in the case of Australia and shows these shocks have only a transitory impact. Lean and Smyth (2009) investigated the impact of shocks to international visitor arrivals from Malaysia's 10 major source markets. Using Lagrange Multiplier (LM) unit root tests with one and two structural breaks, the authors found evidence for stationarity of the tourist arrival time series and that the effects of shocks are transitory. These results are interpreted as evidence for long-term sustainability in Malaysia's tourist sector.

Recently, Raza and Jawaid (2013) investigated the impact of terrorism on the tourism sector in Pakistan during the period of 1980–2010. The authors show using the Johansen and Juselius and ARDL (autoregressive distributed lag) bound testing cointegration approaches that terrorist attacks have a significant negative impact on tourism in both the long and short runs. More recently, Liu and Pratt (2017) measured the relationship between terrorism and tourism based on international demand models using panel data for 95 countries. Their findings indicate that globally, tourism is resilient to terrorism, with a limited impact in the short run. Interestingly, most of the literature on the terrorism–tourism nexus is based on annual time series or panel data. Agiomirgianakis, Serenis, and Tsounis (2017) argue that government actions and policies on tourism activities require being prepared for a quite short-term objective. Indeed, he stresses that political instability and terrorist upheavals, among other short internal or external factors, are often unpredictable for terms longer than 6–9 months. Furthermore, this timing dependence of policy decision makers (governmental and private) in the tourism industry is a problem the literature often fails to address. Our objective is to fill this gap fairly.

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