Empirical Research Article

Political Upheavals, Tourism Flight, and Spillovers: The Case of the Arab Spring

Journal of Travel Research
2022, Vol. 61(4) 921–939

DOI: 10.1177/00472875211002652
journals.sagepub.com/home/jtr
SAGE

José L. Groizard[1], Mohanad Ismael[2], and María Santana-Gallego[1]

Abstract

This article exploits the Arab Spring, which occurred in 2011, as a natural experiment to study the effect of political upheavals on international travel. We find that foreign tourists' demand to travel to countries experiencing Arab Spring episodes was sharply reduced and persisted after two years. We also find evidence of two different spillover effects: a tourism diversion to rest of the world, and a regional contagion to geographically nearby countries (other Arab countries that did not experience Arab Spring episodes and the Mediterranean region, although with heterogenous effects across individual countries). To disentangle how spillovers are channeled, we test whether geographical and cultural (Islamic) affinity play any role. We find that diversion is explained by the attitudes of Western tourists but not of those whose origin is Arabic. Furthermore, we find that the contagion caused by the Arab Spring is stronger for the nearest Muslim countries.

JEL codes: F14, F51, H12, O11

Keywords

political stability, international tourism, gravity model, spillovers, terrorism

Introduction

Understanding disruptive events, such as political uprisings, terrorism, and war, and their consequences represents a topic of interest for academics and policy makers in the tourism field since the early 1980s. The tourism sector is highly sensitive to episodes of political instability as the threat of violence intimidate potential tourists (Sönmez 1998). Safety and peace are public goods consumed inherently at the tourist destination by travelers, and their provision is considered a prerequisite for tourism development. Fear of random terrorism is not new, but 9/11 New York terrorist attacks, and the war against Al-Qaeda terrorist network raised new global security concerns that severely impacted the tourism industry, especially in the Arab world.

In 2011, some Arab countries from the Middle East and North Africa (MENA) region became involved in episodes of political turmoil after experiencing a revolutionary wave of spontaneous demonstrations followed by widespread violent and nonviolent protests. This was the end of a long period of political stability in the region. Interestingly, the power of social media and modern information and communication technologies not only helped to spread the so-called Arab Spring revolutions to other countries, but also to make them visible to the rest of the world (Khondker 2011; Rane and Salem 2012).

The goal of this article was to analyze the short-term impact of the Arab Spring, as a sudden unexpected political turmoil, common to various MENA countries, on international travel. There is a large body of evidence that indicates that different forms of violence influence tourists' choice of destination, and that there are factors that mediate in this relationship. The conceptual framework on political stability and tourism was provided by Hall (1994) and followed by other works, such as Pizam and Mansfeld (1996), Pizam (1999), and Sönmez (1998), that established the connections between three types of political violence (i.e., terrorism, political turmoil and war) with tourism. It is generally assumed that tourists are risk-averse consumers who balance utility and cost associated with the increased likelihood of being involved in a violent episode at a destination. Therefore, the perception of risk associated with violence in one destination results in substitution with a safer destination, which might even imply to remain at home.

We make three contributions to the existing literature. First, in contrast with the dominant analysis in the literature that takes the time series approach, we provide *causal*

[1]Departament d'Economia Aplicada, Universitat de les Illes Balears, Palma de Mallorca, Spain
[2]Department of Economics, Birzeit University, Birzeit, Palestine

Corresponding Author:
José L. Groizard, Departament d'Economia Aplicada, Universitat de les Illes Balears, Ctra. de Valldemossa km 7,5, Palma de Mallorca, 07122, Spain.
Email: joseluis.groizard@uib.es

inference evidence of the effects of the Arab Spring events on international tourism demand by using a structural gravity model of bilateral tourism flows. Our strategy is to identify the Arab Spring effect by using a difference-in-differences technique (DiD), where the treatment variable corresponds to countries that have experienced Arab Spring episodes from 2011 onwards. We interpret our results as *causal* effects since our estimates reflect relative changes over time in Arab Spring countries compared to the control groups before and after the political upheavals, and we simultaneously control for other possible shocks that affect tourism demand either at the destination, the origin country, or a particular destination-origin pair.

A second contribution is that our paper also focuses on the international spillover effects of the Arab Spring episodes in other countries and around the geographic boundaries of the Mediterranean and MENA region. The distinction between perceived risk and actual risk is of crucial relevance in the consumer's choice theory (Kahneman and Tversky 1979) as eventually explain that tourists substitute destination countries with low actual risk by others with lower perceived risk giving rise to the so called spillover effect. We distinguish two types of spillover effects: contagion and substitution. In the first one, often referred as a generalization effect (e.g., Pizam and Mansfeld 1996), we presume that the Arab Spring events will affect other countries that did not experience episodes of political instability. The substitution effect occurs when competitor countries absorb the tourism flows displaced from the Arab countries due to the Arab Spring. We propose a model that captures the interdependence among tourism destinations where economic fundamentals of the exchange including multilateral resistance are controlled for. This is a relevant contribution of our research since this methodology has not been previously used and allows us to test for different hypotheses.

Third, although there are papers testing the role of physical and cultural distance on tourism demand (e.g., Yang, Liu, and Li 2019), no studies have empirically examined how these channels also contribute to diffuse the effects of political uprisings into other countries. We fill this gap, shedding light on the underlying mechanisms that drive contagion or substitution based on the premises that consumers are risk averse and might face heterogenous information search costs. These assumptions are consistent with empirical evidence where both tourists and investors respond quickly to political disturbances in the face of increased risk (Lee and Chen 2020). Because we are able to disentangle whether geographical and cultural distance are channeling international spillovers, we contribute to the crisis management literature by pinning down recovery marketing policy targets.

The article is organized as follows. In the second section, we summarize the existing literature. In the third section, we describe the Arab Spring episodes and the structure of tourism inflows in the Arab countries affected by the Arab Spring events as well as the structure in other countries of interest before and after the uprisings. In the fourth section, we present an analysis of political instability on tourism, and in the fifth section, we extend our analysis to study international spillovers. Finally, in the sixth section, we conclude.

Literature Review

To summarize recent research, we focus on studies related to politically motivated violence, which normally include terrorism as an extreme form of violence manifestation but also social unrest that might produce regime changes. In this section, we classify recent studies based on the methodology employed to infer conclusions. The literature on the influence of terrorism on tourist destination choice has been dominated by time series analysis. However, we will also review the growing literature that uses demand models to study the influence of different types of violence on tourism, as well as the applications of the most recent gravity models.

Time Series Studies

The first empirical studies were initiated by Enders and Sandler (1991) using monthly data to study the Granger causality between terrorist episodes and the response of tourism in Spain. The results indicated that a typical terrorist attack was accompanied by large a drop of visitors that was not observed until about three months after the attack. The influence of that study has been enormous, in such a way that its methodology has been extended to many other countries, obtaining similar results. In another study, Enders, Sandler, and Parise (1992) infer terrorism risk to neighboring European countries not directly affected by the attacks. They call it the "generalization effect" under which the perceived threat in a country ends up putting the entire region at risk. Subsequent work, for both individual case studies and small groups of countries, have confirmed initial findings that tourism demand falls shortly after terrorist attacks, that there is a contagion effect as terrorism in any country deterred tourists from the continent overall, and that there is market substitution between countries (e.g., Drakos and Kutan 2003; Fletcher and Morakabati 2008; Feridun 2011; Seabra, Reis, and Abrantes 2020). See Krajnák (2020) for an extensive review of the recent literature.

Another question addressed in the literature has been the direction of causality in the relationship between terrorism and tourism, provided that tourists and foreign nationals have been the target of terrorist groups. Their concern is also attributable to the idea that political instability instigates the action of terrorism and, therefore, that political stability might be considered a prerequisite for tourism development. For example, Samitas et al. (2018) examined whether the relationship between terrorism and tourism in Greece is bidirectional and found that causality runs from terrorism to tourism and not viceversa. In another recent study, Bayar and Yener (2019) applied cointegration techniques for a group of

countries in the Mediterranean region. Their findings indicate a positive relationship between political stability and tourism growth and a two-way causality.

Other articles have employed novel time series approaches to study indirect effects of terrorism and political conflicts. For example, Afonso-Rodriguez and Santana-Gallego (2018) used cointegration methods and found evidence of a transitory tourism diversion from the MENA region to Spain related to the rise of terrorism and political instability attributed to the Arab Spring. Common unobserved factors and simultaneity of political events and tourism changes should, therefore, be convincingly addressed when evaluating causality of a single episode of political disruption. With this regard, Perles-Ribes et al. (2018) study the Arab Spring effect on different tourism destinations in the Mediterranean coastline using a method that combines Bayesian structural time-series with a regression model to construct a synthetic control based on a combination of markets that are not treated. A key assumption in this method is that the countries belonging to the control group should not be affected by the Arab uprisings, otherwise counterfactual predictions would not be netted out of the shock of interest. However, this untested assumption is of crucial relevance, especially if it is suspected that there may be international spillover effects. With this regard, the DiD method we propose, allows us to separate the treated and the control groups when detecting the presence of spillovers that contaminate the results.

Demand Studies

Another strand of the literature has taken the demand approach employing cross-sectional data or panel data to address the issue of the effects of political instability and/or terrorism on international tourism. Ahlfeldt, Franke, and Maennig (2015) analyze how German tourists react to the 9/11 terrorist attacks as well as to several episodes of terrorism in Islamic countries by using a DiD strategy. The findings indicate that terrorist attacks impacted especially on Islamic countries, and that tourism into Islamic countries was temporarily substituted by tourism to south European countries. This study is the first on this topic that uses a quasi-experimental approach, although it is only limited to the German tourism and does not cover other types of political violence.

Araña and León (2008) estimated a travel choice model before and after the September 11 attacks using microlevel data and concluded that terrorism caused a significant decrease in consumer's utility, affecting both the decision to travel and one's preferences for the attribute of the tourism product. Neumayer (2004) tested different types of political violence on tourism based on fixed effects panel estimator and a dynamic generalized method of moments. Both methods showed clear evidence that human rights violations, conflict, and other politically motivated violent events negatively influence tourist arrivals. He also provides evidence that terrorism produces negative intraregional spillovers on tourism inflows and substitution among regions. However, given the limitation of the data set, the author was not able to test the hypothesis of spillovers linked to revolutions. Another influential study by Saha and Yap (2014) showed that political instability and terrorism reduce tourism development, although the effect of the former is stronger than the latter. Methodologically, these last two studies employ broad measures of political variables in a cross-country panel analysis and neither uses DiD techniques.

Recently Liu and Pratt (2017) combined time series with cross-sectional data to quantify the relationship between terrorism and tourism in 95 countries. After controlling for income, the findings indicated that there is no long-term effect of terrorism on international tourism demand and that its short-term effect is quite limited.

Gravity Models of Tourism Demand

A rising number of studies take advantage of the availability of bilateral tourism data to estimate an international tourism demand. For example, Llorca-Vivero (2008) estimated a cross-sectional gravity equation for tourism from the G-7 countries to a large number of destinations worldwide and found that both domestic victims and international attacks are relevant factors when foreign tourists make their destination choice.

Neumayer and Plumper (2016) investigated the hypothesis that transnational terrorist attacks in Islamic countries on citizens from Western countries, according to the strategic intention of the terrorist groups, should produce a different type of spatial spillover effects on international tourism. They found that terrorist attacks not only reduce tourism from the country whose citizens have been attacked but also from other similar countries of origin, directed not only to the destination where the attack occurred but also to other similar destinations.

Mitra, Pham, and Bandyopadhyay (2018) estimated a structural gravity model to capture the effects of terrorism on air passenger traffic. This article made an important contribution bringing gravity theory to the data, separating terror incidents on tourism infrastructure or travelers from other targets and dealing with endogeneity. Regarding endogeneity, this article raised the concern that countries that are important tourism destinations have a greater incentive to increase their counterterrorism effort, and that ignoring this would result in an upward bias of the estimated effect of terrorism. Results indicate that bilateral air passenger flow is very sensitive to terrorism, since even a small-scale incident reduces travel by around 1% for closer countries. Recently, Fourie, Rosselló-Nadal, and Santana-Gallego (2020) estimated a gravity model to investigate the effects of security threats, namely, terrorism, crime, and corruption, on international tourist flows, showing that tourists prefer traveling to countries with similar levels of safety and security as exist in their origin country.

Table 1. Political Instability in Arab Countries.

	Before Arab Spring	After Arab Spring	Difference Before–After	Difference 2010–2011	Difference 2010–2012	Difference 2010–2013
A. Arab Spring countries						
Egypt	0.68	1.52	0.83	0.54	0.57	0.71
Syria	0.54	2.46	1.93	1.20	1.88	1.87
Tunisia	−0.05	0.67	0.72	0.33	0.69	0.87
Yemen	2.25	2.40	0.15	0.00	0.01	−0.07
B. Arab competitor countries						
Algeria	1.19	1.29	0.10	0.10	0.08	−0.09
Iraq	2.31	1.92	−0.39	−0.41	−0.32	−0.27
Jordan	0.34	0.55	0.21	0.21	0.21	0.31
Kuwait	−0.41	−0.21	0.21	0.14	0.26	0.30
Lebanon	1.70	1.63	−0.07	−0.07	0.02	0.06
Morocco	0.46	0.45	−0.01	0.01	0.08	0.12
Saudi Arabia	0.37	0.44	0.07	0.23	0.23	0.18

Notes: Political instability index (PI) is constructed from Worldwide Governance Indicators from the World Bank. The index ranges from −2.5 (more stable) to 2.5 (less stable). The Before Arab Spring period is from 2008 to 2010, and it shows the average PI. The After Arab Spring period similarly refers to the mean PI from 2011 to 2013. Differences are calculated as unitary chage in the PI index.

Overall, the use of gravity models applied to study international tourism is becoming a new tool that overcomes many of the disadvantages of the traditional demand approaches. In the reviewed literature on political violence and tourism, however, there are concerns that require further attention, such as the difficulties to infer causality, the interference of political upheavals on terrorism and vice versa, the omission of relevant macroeconomic shocks, and last but not the least, the linkages that explain which factors drive spillovers between countries.

The Arab Spring

As with most episodes involving political instability, the Arab Spring outbreak in 2011 had immediate consequences for economic activities in the affected countries. In this section, we provide a summary of what happened in the four countries most severely affected by the Arab Spring: Egypt, Syria, Tunisia, and Yemen. We detail how international tourism flows were affected by these episodes, describing the changes in tourism arrivals to these countries and the roles played by the largest tourist-source markets.

Basic Facts

On December 18, 2010, Mohamed Bouazizi, a young street vendor, set himself on fire in protest against police abuse in Tunisia. This isolated event triggered a wave of popular upheavals that led to the fall of the government and the subsequent resignation of the Tunisian president on January 14, 2011, after having ruled the country for 23 years. The Tunisian revolution inspired further popular upheavals in the Arab world throughout 2011, which gave rise to the phenomenon known as the Arab Spring. Demands for civil liberties and more political freedom were made by young demonstrators in countries like Egypt, Libya, Syria, and Yemen.

Table 1 summarizes changes in the Political Instability index produced by the World Bank in the region (World Governance Indicators [WGI]; World Bank 2017b). Perceptions of the likelihood that the government being destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism, increased significantly in the AS countries and to a lesser extent in Jordan, Kuwait, and Algeria.

Tourism Data and Sample

Tourism data are taken from the United Nations World Tourism Organization (UNWTO) and covers international tourist arrivals to 160 destination countries from 183 origin countries from 2008 to 2013. The UNWTO defines a tourist as an "overnight traveler taking a trip to a main destination outside of his/her usual environment, for less than a year, for any main purpose (business, leisure, or other personal purpose) other than to be employed by a resident entity in the country or place visited." Therefore, one-day visitors are not included in the tourism variable.

We limited the sample period to cover the three years before and after the Arab Spring. Enlarging the period would pick up some other political developments that had occurred in each country that have affected the tourism industry, such as the Civil war in Yemen in 2014. While they are follow-ups of the Arab Spring uprisings, the longer the period, the greater is the noise behind this relationship. Moreover, the UNWTO is not reporting data for Syria and Yemen after

2011 and 2015, respectively. Therefore, a strong argument for the consideration of this sample period is based on the aims of the current research to quantify the short-term impact of the political event in the involved economies and on the limits of the data and method as further explained in the fourth section.

Destination countries are classified into four groups: (1) Arab Spring countries (AS), as those that experienced civil protests in the region with high levels of political violence, demanding that the rulers leave and that led to regime changes in some (Egypt, Syria, Tunisia, and Yemen); (2) Arab countries without major Arab Spring events (ANS), namely, those Arab countries located in the MENA region but did not experience similar levels of political violence (Algeria, Iraq, Jordan, Kuwait, Lebanon, Morocco, and Saudi Arabia); (3) Mediterranean countries (MED), including European countries located in the Mediterranean coastline (Albania, Bosnia and Herzegovina, Croatia, Cyprus, France, Greece, Italy, Malta, Portugal, Slovenia, Spain, and Turkey); and (4) the rest of the countries, which include the remaining 137 countries in the sample. This last group is the excluded category in our analysis. See section A-1.1 in the Supplementary Material for a detailed explanation.

Description of International Tourism Inflows

Since the 1970s, many Arab countries in the Mediterranean region have focused their economic development on the tourism sector using their natural and cultural amenities as a source of attraction, which due to political violence are in danger (Groizard and Santana-Gallego 2018). The development of the tourism industry in the region was a success; it captured significant market share from European seaside tourism and contributed to the socioeconomic development of vast coastal regions. Indeed, many Arab countries, including the ones that experienced Arab Spring episodes—Egypt, Yemen, Syria, and Tunisia—recorded sizable growth rates in the 2000s. However, this trend was abruptly halted in early 2011 with the Arab Spring upheavals while other alternative destinations in the region kept growing, as can be observed in Figure 1.

Figure 2 presents the decreases in tourism in AS countries since 2011. It can be observed that during the first year, tourist arrivals dropped significantly in all the countries and remained below 2010 levels over the sample period.

Panel A of Table 2 compares the number of tourist arrivals for the period just before (2008–2010) and after (2011–2013) the Arab Spring outbreaks for different affected destinations. Clearly, the average number of tourists has fallen in all AS countries. As showed in Figure 2, the decline was most severe in Egypt and Syria, which each experienced a reduction of about 22% and 24%, respectively, compared to the pre–Arab Spring period.

When we look at the Arab alternative destinations (panel B of Table 2), we can see that the Arab Spring has not had

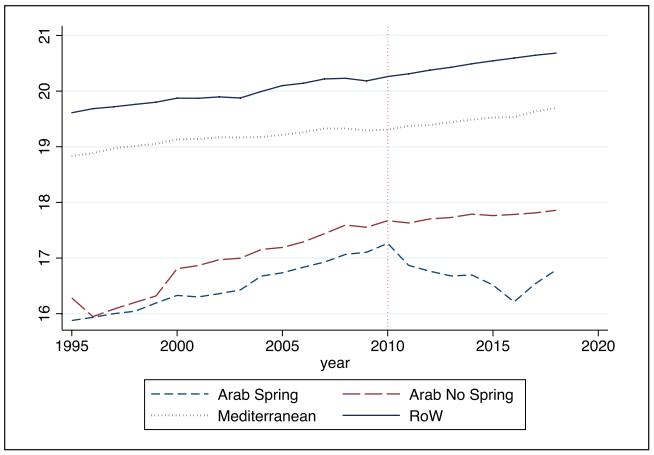

Figure 1. Tourism trends based on (log of) international tourist arrivals.

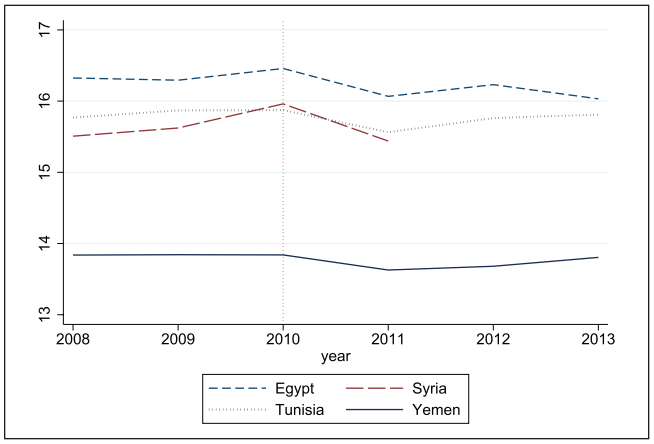

Figure 2. Decreases in (log of) tourist arrivals in Arab Spring countries.

the same influence on other countries in the region. Tourist arrivals decreased in Iraq and Lebanon after the Arab Spring, while tourist arrivals increased for the rest of the ANS countries. Apparently, the effect of the Arab Spring on other Arab countries depends on their geographic location. For instance, inbound tourism was reduced in Iraq and Lebanon after the Arab Spring, while in Jordan, tourist arrivals increased by only 3%. These three countries share a border with Syria. On the other side, Algeria, which shares a border with Tunisia, experienced a large increase in inbound tourism.

Despite the reduction of tourism figures in some Arab countries, all the Mediterranean countries described in panel C of Table 2 show an increase in average tourist arrivals after the Arab Spring. For instance, small countries such as Albania, Bosnia and Herzegovina, Croatia, and Slovenia experienced large percentage increases in tourist arrivals after the Arab Spring. At the same time, larger countries such as Spain, Italy, and France also presented increases in their

Table 2. Tourist Arrivals (Millions and % Change).

Country Name	Before Arab Spring	After Arab Spring	% Change Before–After	% Change 2010–2011	% Change 2010–2012	% Change 2010–2013
A. Arab Spring countries						
Egypt	12.75	9.96	−21.9	−32.4	−20.3	−34.7
Syria	6.69	5.07	−24.2	−40.7	–	–
Tunisia	7.56	6.70	−11.4	−26.6	−10.6	−6.1
Yemen	1.03	0.90	−12.5	−19.1	−14.7	−3.4
B. Arab competitor countries						
Algeria	1.92	2.59	34.9	15.7	27.2	32.0
Iraq	1.21	1.17	−3.6	−0.5	−26.8	−41.2
Jordan	3.91	4.02	2.9	−5.9	−1.1	−6.2
Kuwait	5.01	5.84	16.6	7.0	10.0	19.4
Lebanon	1.78	1.43	−19.6	−23.7	−37.0	−41.2
Morocco	8.50	9.59	12.8	0.6	0.9	8.2
Saudi Arabia	12.17	15.43	26.8	30.7	50.5	45.4
C. Mediterranean competitor countries						
Albania	1.72	2.83	64.7	12.7	44.0	30.4
Bosnia and Herzegovina	0.33	0.45	36.3	7.4	20.3	44.9
Croatia	8.82	10.41	18.0	9.0	13.8	20.2
Cyprus	2.24	2.42	8.1	10.1	13.4	10.7
France	77.54	82.04	5.8	5.0	7.0	9.1
Greece	15.29	16.62	8.7	9.5	3.4	19.4
Italy	43.20	46.73	8.2	5.7	6.3	9.3
Malta	1.27	1.48	16.5	5.7	7.8	18.1
Portugal	6.72	7.62	18.8	7.5	11.1	35.8
Slovenia	1.88	2.15	22.0	9.1	16.0	22.1
Spain	54.02	58.11	7.6	6.6	9.1	15.2
Turkey	30.45	36.05	18.4	10.5	13.8	20.5
D. Rest of the countries						
Rest of the World	639.27	741.93	16.1	4.5	12.3	18.5

Note: The Before Arab Spring period is from 2008 to 2010, and it shows the average tourist arrivals (in million). The After Arab Spring period refers to the years from 2011 to 2013, with the exception of Syria where it only refers to 2011, as explained in the main text. Differences are calculated as percentage changes of tourist arrivals.

tourism inflows after the Arab Spring, though not as great as the aforementioned smaller countries. Turkey, which has a large economy, has been the MENA country that has benefited the most from the Arab Spring.

With regard to tourism composition, we show the five largest tourism-source markets for each AS country in Table 3. The main markets in Egypt are the European markets (panel A of Table 3). Syria, on the other hand, bases its tourism industry on markets of regional origin (panel B of Table 3). Panel C of Table 3 shows that the largest part of all tourists in Tunisia are Libyan, followed by French and Algerian tourists. Yemen (panel D of Table 3) bases its tourism in regional markets. As the bottom line, the collapse of inbound tourism to AS countries was highlighted by differing levels of decreased travel from the largest tourist-origin markets, either European or from within the MENA region, likely reflecting not only the effects of the Arab Spring episodes but also other shocks that must be considered.

Political Instability and Tourism Flight in the Arab World

Model and Estimation

Our approach for estimating the effect of the Arab Spring on international tourism inflows follows the DiD analysis.The DiD analysis takes advantage of the fact that the treatment variable (i.e., that the Arab Spring occurred in 2011) was unexpected for tourists and, therefore, it can be considered as an exogenous shock.[1] That is, we assume that the treatment variable is exogenous as long as political instability is the result of unexpected and random events that affect consumer decisions.

Our analysis differs from a before–after comparison, as in (Mansfeld and Winckler 2015), because we compare not just the differences in the treatment group before and after the political episodes, but also the differences across the treatment and the control groups. Moreover, an important

Table 3. Tourist Arrivals to Arab Spring Countries by Origin (Thousands).

	Before Arab Spring	Share (%)	After Arab Spring	Share (%)	Growth Rate (%)
A. Egypt					
Russian Federation	2,233	18.5	2,233	24.9	0.0
United Kingdom	1,333	11.0	985	11.0	−26.1
Germany	1,233	10.2	908	10.1	−26.4
Italy	1,067	8.8	593	6.6	−44.4
France	579	4.8	285	3.2	−50.8
B. Syria					
Lebanon	1,900	26.6	1,300	24.2	−31.6
Jordan	1,333	18.7	560	10.4	−58.0
Turkey	932	13.0	1,300	24.2	39.5
Iraq	928	13.0	1,000	18.6	7.8
Saudi Arabia	455	6.4	134	2.5	−70.5
C. Tunisia					
Libya	1,870	27.5	1,900	34.5	1.6
France	1,370	20.1	854	15.5	−37.7
Algeria	1,010	14.8	850	15.5	−15.8
Germany	488	7.2	369	6.7	−24.4
Italy	394	5.8	190	3.5	−51.8
D. Yemen					
Saudi Arabia	192	45.4	218	51.7	13.4
Oman	49	11.5	48	11.3	−1.6
United Arab Emirates	22	5.1	15	3.6	−29.4
India	20	4.7	17	3.9	−17.0
United States of America	18	4.3	20	4.8	10.7

Note: The Before Arab Spring period is from 2008 to 2010, and it shows the average tourist arrivals (in million). The After Arab Spring period refers to the years from 2011 to 2013, with the exception of Syria where it only refers to 2011, as explained in the main text. Differences are calculated as percentage changes of tourist arrivals.

advantage of the DiD approach is that, given that we benefit from having panel data, we are able to control for unobserved characteristics in both origin and destination countries as well as other macroeconomic shocks that might determine tourist inflows to the cross-section of countries.

Without a proper method, the simple time-series break would capture some other effects beyond the Arab Spring. This problem can be overcome if the Arab Spring only affects a specific group of countries (i.e., the treated group) at a specific point in time and the rest of countries can be used as a control group. Note that when comparing groups, changes in observed shocks can be controlled for, and differences in the treatment group due to unobserved shocks will also be removed when applying differences to the control group. This is how the DiD procedure removes the potential effects of confounding shocks.

We employ a standard gravity equation for tourism flows between two countries: *i*, the origin, and *j*, the destination. The gravity model has solid theoretical foundations Arkolakis, Costinot, and Rodriguez-Clare 2012; Allen, Arkolakis, and Takahashi 2020) and represents a general equilibrium environment with great flexibility (Larch and Yotov 2016). The gravity model has been used extensively to explain trade (e.g., Anderson and van Wincoop 2003; McCallum 1995; Rose 2000), migration (e.g., Gallardo-Sejas et al. 2006; Karemera, Oguledo, and Davis 2000), and foreign direct investment (e.g., Bergstrand 1985; Head and Ries 2008) between countries. This model is based on the notion that any bilateral exchange between a given pair of countries (i, j) is related to the relative size (i.e., population, surface, and GDP) and frictions (i.e., distance, common language, and common borders) of the countries. Furthermore, these types of specifications are increasingly used in tourism research (Eilat and Einav 2004; Khadaroo and Seetanah 2008; Neumayer 2010; Vita and Kyaw 2013; Fourie, Rosselló, and Santana-Gallego 2015). Morley, Rosselló, and Santana-Gallego (2014) have shown that gravity models can be derived from consumer choice theory to explain bilateral tourism.

Our initial model simply captures the frictions generated by the Arab revolution in bilateral tourism through a DiD specification as follows:

$$y_{ijt} = \alpha AS_j + \beta POST_t + \delta(AS_j \times POST_t) + \upsilon_{ijt}. \quad (1)$$

In this equation, the dependent variable is the number of tourist arrivals from origin i to destination country j in year t. Our sample comprises international tourist arrivals to

160 destination countries from 183 origin countries for the period 2008–2013 collected from UNWTO (2017).

The DiD procedure, in its canonical format, requires at least two time periods and two groups: in the first period no one is treated, and in the second period some units are treated (the treated group) while others are not (the comparison group). So, we need to introduce some periods before the event to observe parallel trends assumption and after the event to observe the short-term effect of the Arab Spring outbreak on tourist arrivals. As it can be observed from Figure 1, tourism trends in Arab countries, both for AS and ANS, were similar before 2010. After the Arab Spring outbreak, tourism figures in the treatment group (AS) clearly decline while in the control groups they continue to grow. Consequently, we consider the three years before the shock, where the parallel trend assumption was observed, and the three years after the event, due to data availability and to exclude other events not attributable to the Arab Spring.

The treatment qualifier is the AS_j variable that takes a value of 1 for the four destination countries that experienced the Arab Spring and zero otherwise. Therefore, the control group is defined, at the moment, as the rest of the countries in the world that did not experience the Arab Spring uprisings. The coefficient α captures the different tourism demand levels in AS countries during the whole period of analysis with respect to the rest of the countries. The variable $POST_t$ is the treatment indicator that takes a value of 1 at the moment for the years 2011 and later, and zero otherwise. In Ahlfeldt, Franke, and Maennig (2015), the treatment indicator takes a value of 1 for each year that a terrorist episode is observed and zero otherwise, because of the widely accepted assumption that tourism levels recover within the year (Pizam and Fleischer 2002). Since we do not have this prior, we leave the treatment indicator at 1 during the two years after the onset of the revolutions. Therefore, the coefficient β will measure the change of tourism demand that the whole sample of countries experienced after the Arab upheavals. The coefficient δ will capture the differentiated response of the treated group of countries after the Arab Spring, with respect to the control group. It is relevant to note that a negative δ coefficient would not indicate a loss of tourism in the country with respect to the previous period, but rather a loss with respect to the group of countries in the control group after the Arab Spring.

An advantage of the DiD method is that we can introduce additional covariates to avoid omitted variables bias. For instance, in gravity estimates is often argued that omitting multilateral resistances or third country effects could be problematic and that they should be controlled for by adding dyadic and country-year fixed effects (Baldwin and Taglioni 2006; Head and Mayer 2014). Therefore, bilateral tourism might take the following form:

$$y_{ijt} = \delta(AS_j \times POST_t) + \gamma' X'_{jt} + \lambda' Controls_{jt} + \psi_{it} + \psi_{ij} + \psi_j \times year_t + e_{ijt}, \quad (2)$$

where country-pair (ψ_{ij}) and origin-year (ψ_{it}) fixed effects are included. We consider the possibility that unobserved shocks that are specific to every pair of origin and destination countries exist. The reason to include this dyadic type of fixed effect is to capture some other possible heterogeneous shocks that are potentially relevant to a given country pair and that go beyond the standard country fixed effect (e.g., news is likely be transmitted more intensely between two countries rather than with third parties due to historical or cultural reasons, which are difficult to measure). Moreover, the most relevant unobserved country-specific shocks (e.g., freedom of press, cultural and political rules) are constant in both origin and destination countries, country pair fixed effects would absorb them. Furthermore, we control for the existence of idiosyncratic shocks at origin countries. This is consistent with the idea that every origin market for tourists has been exposed to a different degree of information regarding the news of the Arab Spring. Here, it is important to note that coefficients α and β presented in equation (1) are not estimated since they are absorbed by the set of fixed effects included in equation (2). Finally, in order to control for common trends at the destination level, destination-specific trends ($\psi_j \times year_t$) are added. Notice from Figure 1 that the preexisting trend was stronger in the AS countries than in the rest. Omitting such difference would in any case underestimate the effect of the Arab uprisings on tourism inflows.

It is noticeable that our variable of interest ($AS_j \times POST_t$) is time-variant and destination-specific, meaning that destination-year fixed effects (ψ_{jt}) cannot be added to the equation. In order to control for further destination-specific time-variant shocks, a set of time-variant characteristics at the destination country are considered (X'_{jt}).[2] This vector includes real GDP per capita and the population of the destination country. Both variables are obtained from the World Development Indicators database (World Bank 2017a). In a robustness check, we add to our baseline specification two controls ($Controls_{jt}$) for political instability in the host country. First, a proxy for political instability is added: the inverse of the political stability variable taken from the World Governance Indicators database (World Bank 2017b). The WGI defines political stability (and the absence of violence) as perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. Second, we include a measure of terrorism in the models. Since terrorism is another likely consequence of political instability that has confounding effects on tourism, we deal with it by adding a variable to our original analysis that captures the intensity of terrorism in each tourism destination country. A proxy for terrorism—the number of people killed in terrorist attacks per year (in thousands)—is included in the model. This variable is obtained from the Global Terrorism Database (START 2017). Equation (2) is estimated with and without those controls in order to check if the effect of the Arab Spring on tourist arrivals is robust to the inclusion of these variables.[3]

The model is estimated using a Poisson regression model. As discussed by Santos-Silva and Tenreyro (2006, 2010), log-linearized equations cannot be consistently estimated unless very restrictive assumptions on the error term are made. The authors discuss that a conventional ordinary least squares estimation of the gravity equation is biased because of the likely existence of heteroskedastic residuals and the prevalence of zero bilateral trade flows. So, they suggest a nonlinear Poisson estimator (pseudo-maximum likelihood estimation [PPML]). Thus, a PPML regression model with two high-dimensional fixed effects estimators is used (PPML-FE) to provide consistent and unbiased estimates in the presence of heteroskedasticity by applying the iterative algorithm developed by Guimaraes (2014). To deal with the large number of high-dimensional fixed effects, the estimator implemented by Correia (2016) is applied. Note that both estimates include country-pair (ψ_{ij}) and origin-year fixed effects (ψ_{it}) as well as a set of time-variant destination characteristics (X'_{jt}). These sets of fixed effects prevent country fixed and time-variant origin-specific variables from being estimated, but not the time-varying regressors such as the δ coefficient. That is, we are ensuring that the δ coefficient is robust to different sources of individual and country-pair unobserved heterogeneity.

Initially, we assume that the effect of the treatment on the treated is homogeneous across treated countries and post-treatment years. However, we will break these assumptions in a second step to allow coefficient δ to differ by year or by country to gain flexibility, and to obtain more detailed causal patterns. For this purpose, we will first define the treatment variable separately for each period, while maintaining the definition of the treatment group. Second, we will define the variable that qualifies for treatment at the country level while maintaining the definition of the treatment variable. This will yield different δ coefficients for countries or time periods.

Main Results

We proceed with the estimation in five stages, and at each stage we consider different assumptions regarding the Arab Spring effect. In the first stage, we run a benchmark model capturing the conditional average effect of the Arab Spring event on tourism inflows assuming that the effect is homogenous for the four countries considered and the three post-crisis years. In the second stage, we split the Arab Spring effect by destination group, namely Arab Spring (AS), other Arab countries (ANS), and Mediterranean (MED) countries to get an idea about potential spillover effects. In the third stage, we split the Arab Spring effect over the years 2011, 2012, and 2013 to ascertain the time adjustment pattern. In the fourth stage we consider different groups for the origin countries, that is, tourists traveling from other Arab countries (ArabL), a Western point of origin (Western), or from the rest of the world (Other).[4] And in the fifth stage, we split the Arab Spring effect by country to show the severity pattern that the Arab Spring had on each country's tourism. In this analysis, the control group is all of the non–Arab Spring countries.

Table 4 shows the main results of the impact of the Arab Spring on tourism inflows. We only display the coefficient of interest (δ) for each column.[5] Our gravity model estimated by PPML-FE provides a consistent and unbiased estimate, and coefficients barely change after the inclusion of $Controls'_{jt}$ for political instability and terrorism at the destination level. This result implies that the effect of the Arab Spring on international tourism goes beyond the increase of the political instability and terrorism. In column 1 of Table 4 we present the overall effect of the Arab Spring and observe a strong effect (−0.56) on tourism inflows. So, the Arab Spring implies a decrease of tourist arrivals of 42.8% ($e^{\delta}-1$) when compared to tourism figures from countries that did not experience Arab Spring episodes.

When splitting up the effect by destination group, as presented in column 3 or Table 4, results show that the Arab Spring has reduced tourist arrivals to affected countries by 40.8%, while increasing inbound tourism flows to alternative destinations. The effect of the Arab Spring on the Arab alternative destinations implies an increase of tourism by a 15.6%, while the effect on the Mediterranean countries is an increase of 4.2%. F-tests for the equality of coefficients show that coefficients are statistically different. This result provides evidence of tourism deviation, and in the next subsection, we explore regional effects in detail. When we split the effect by year, as presented in column 5 of Table 4, we observe that there have been strong repercussions in all three years with an apparent reduction in intensity during 2012, and a maximum in 2013. This indicates that the Arab Spring had long-term effects and/or the political unrest still persisted in the regions, thereby discouraging tourists from visiting the country. As mentioned by Neumayer (2004), events of instability and violence damage the image that a tourist has about the destination country, and this negative perception might last long after the event has passed and stability has been restored. This idea also applies to foreign investors. Tourists and investors will only travel or invest at before-violence levels if the negative image of the country is eradicated. Depending on the duration and intensity of the violent events and how negative the media coverage has been, this might take years.

We are also interested in analyzing the effect of the Arab Spring according to the country of origin. We first distinguish from tourism originating from any Arab League country that was not affected by the Arab Spring (i.e., other Arab countries) and find that the Arab Spring reduced inflows from other Arab origin countries by 49% as shown in column 7 of Table 4. Second, tourism originating in the Western region dropped by 45.4%, while inflows from other origin countries was reduced by 38%. These results suggest that the effect of the Arab Spring on tourist arrivals is relatively homogeneous across origin groups, and was confirmed by the *F* test. Finally, when the Arab Spring effect is considered

Table 4. Main Results.

	Overall Effect		By Destination Group		By Year		By Origin Group		By Destination Country	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
AS	−0.558***	−0.559***	−0.523***	−0.524***						
	(0.0577)	(0.0580)	(0.0523)	(0.0525)						
ANS			0.145**	0.138**						
			(0.0595)	(0.0597)						
MED			0.0411***	0.0416***						
			(0.0124)	(0.0125)						
AS × 2011					−0.625***	−0.627***				
					(0.0596)	(0.0599)				
AS × 2012					−0.509***	−0.510***				
					(0.0686)	(0.0686)				
AS × 2013					−0.741***	−0.738***				
					(0.0851)	(0.0847)				
AS × *ArabL*							−0.676***	−0.676***		
							(0.179)	(0.179)		
AS × *Western*							−0.606***	−0.608***		
							(0.0653)	(0.0650)		
AS × *Other*							−0.476***	−0.476***		
							(0.0613)	(0.0632)		
AS × *Egypt*									−0.478***	−0.487***
									(0.0568)	(0.0583)
AS × *Syria*									−0.869***	−0.865***
									(0.199)	(0.202)
AS × *Tunisia*									−0.501***	0.507***
									(0.0625)	(0.0626)
AS × *Yemen*									−0.304**	−0.275**
									(0.129)	(0.130)
Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
F test			83.24	114.61	77.88	77.5	3.55	3.62	6.47	7.03
			0.000	0.000	0.000	0.000	0.1699	0.1634	0.091	0.071
Observations	70,240	69,963	70,240	69,963	70,240	69,963	70,240	69,963	70,240	69,963

Note: Table displays δ coefficients from model specifications. Robust standard errors (in parentheses) clustered by country pair. The coefficients are statistically significant at the *10%, **5%, or ***1% level. Dyadic and origin-year fixed effects as well as destination trends and time-variant destination specific determinants (GDPpc and Population) are included in all models. Destination-specific controls are terrorism and political instability.

by destination country, column 9 of Table 4, the estimated coefficients show that tourist arrivals in Syria decreased by 58%, while in Egypt and Tunisia it decreased by around 39% and in Yemen by 24%. According to the *F* test, differences between estimated coefficients for each country are only significant at the 10% level.

As an additional robustness check, in order to control for the different intensities of the political instability suffered in the AS countries, an augmented version of equation (2) is estimated by adding an interaction term between the variable of interest ($AS_j \times POST_t$) and the political instability at the destination country (*Instab*). In our DiD analysis, when we use a dummy to measure the posttreatment effect, we are imposing the restriction of an equal effect of the Arab Spring across countries and time. However, when the posttreatment variable is interacted with the instability proxy, we are controlling for the different intensities of the Arab upheavals. The results presented in Table A2 in the Supplementary Material show that the sign and significance of the coefficients are similar to the ones in the baseline model, but the magnitude of the Arab Spring effect is reduced when the variable of interest is interacted with political instability. For instance, the overall effect of the Arab Spring, when interacted with the instability proxy, is a reduction of tourist arrivals by 31%. Interestingly, in this case, the magnitude of the effects on alternative destinations (Arab and Mediterranean) is not significant, nor is it for the effect of the Arab Spring in Tunisia. In contrast, we obtain similar conclusions as the one derived from Table 4 for the effect by year or by origin group.

Regional Effects

We have seen that the Arab Spring had a severe and persistent effect on tourist inflows in Syria, Egypt, Tunisia, and Yemen, and that the Arab Spring affected the countries that directly suffered it, but there is a contemporaneous positive effect in the Mediterranean region and other Arab countries. This heterogenous response given by tourists suggests that there are regional effects that are likely important and require further inspection. We, therefore, estimate the simultaneous

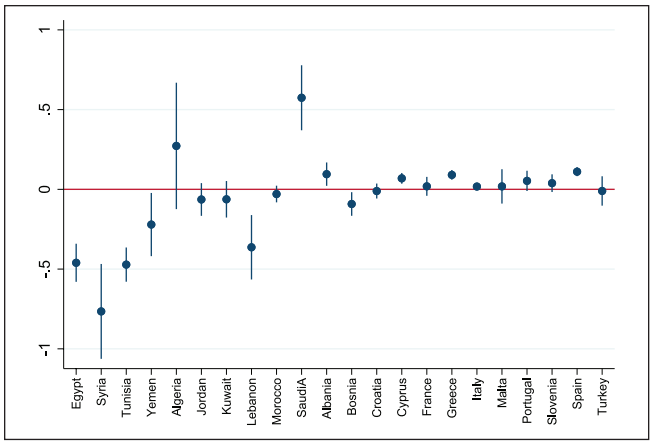

Figure 3. Country-level effects of the Arab Spring (95% confidence intervals).

response of tourism demand in other Arab and Non-Arab countries in the MENA and Mediterranean region. When estimating a similar model for other countries, we are going to capture the destination-country unobserved effect on arrivals. Since these shocks are contemporaneous to the Arab Spring, it is likely that our estimates reflect the Arab Spring shock transmitted with more intensity to other neighboring economies.

To this end, we focus on two groups of destination countries in the Mediterranean and MENA region according to two criteria: (1) cultural perception (e.g., the Arab countries that did not have Arab Spring events, which we included in a category [ANS] separate from the AS countries) and (2) specialization similarity (e.g., Mediterranean countries [MED] that are close substitutes in terms of the type of tourism specialization). In this case, the rest of the countries are taken as the reference group. Therefore, we divide the posttreatment variables of the event into AS_j, ANS_j, and MED_j by destination country.

Figure 3 presents the estimated parameters and the confidence intervals. Clearly, the largest negative effects of the Arab Spring on tourist arrivals are for the AS countries, and these results are similar to the ones presented in column 10 of Table 4. Regarding the impact on alternative destinations, we found heterogeneous results. Focusing on the ANS, there is a significantly positive effect of the Arab Spring on Saudi Arabia (78%) while the effect is significantly negative for Lebanon (−30%). For the other countries in the group, the effect of the Arab Spring is not significantly different from that for the rest of the world. The poignant contagion effects found for Lebanon can be explained by the fact that the country shares a land border with Syria, which has been involved in a fierce civil war since 2011, suggesting that geography might be channeling those effects. Interestingly, Saudi Arabia presents a large positive effect on the ANS coefficient, which indicates that there was some sort of tourism deviation among countries within the region and suggests a cultural driver of indirect effects.[6]

Regarding the group of MED countries, the changes in tourism figures after the Arab Spring was also diverse but lower than for the ANS countries. Specifically, a significantly negative effect of the Arab Spring is estimated for Bosnia and Herzegovina (−8.8%), while there is not a significantly different effect of the Arab Spring on Mediterranean countries such as Croatia, France, Malta, Portugal, Slovenia, and Turkey. Finally, there is a group of countries that seem to be absorbing part of the deviated tourism, namely, Albania (10%), Cyprus (7.5%), Greece (9.1%), Italy (1%), and Spain (11.7%). However, it is important to mention that we cannot distinguish the spillover effects owing to the Arab Spring from other concurrent destination country-specific effects. For example, Greece had a great recession during this period, and some northern European leaders put pressure on the country to leave the European Union. This situation generated widespread political, social, and economic uncertainty that drove away tourists. The conclusion of our regional analysis is that while tourists fled the countries directly affected by popular uprisings in the AS, some countries in the same region or the surrounding areas saw a reduction or increase in the influx of tourists from the outside. Although these changes may be due to other contemporary shocks in the countries analyzed, it is likely that a good part of them may be attributed to the special circumstances that expelled tourists from the AS countries.

International Tourism Spillovers of the Arab Spring

Previous results suggest that other countries, apart from those directly affected by the political upheavals, are also experiencing significant changes in international tourism after the Arab Spring. One important question is whether tourists move from countries that experience political instability to other countries. That is, to what extent are tourism changes observed in third countries *caused* by the Arab Spring? Specifically, we are interested in understanding if these flows of tourists would have changed their destination anyway, without taking into account the shock of the Arab Spring.

A potential concern in our previous identification strategy is the violation of the stable unit treatment value assumption (i.e., SUTVA). SUTVA requires that the treatment applied to one country (e.g., an AS country) does not affect the tourism inflows of another country. This assumption does not hold if there is some kind of international spillover. Hence, as shown in the previous section, where evidence of regional effects were obtained, the interpretation of results requires disentangling the potential existence of spillover effects.

Tourists might decide to travel to safer places if they perceive that the risk of traveling to a troubled country is too high compared with the welfare obtained in alternative destinations. A potential spillover effect occurs due to information transmission that alters people's perception of risk and safety. If a country has a negative image or it is perceived to

be unsafe to visit, it is likely that these perceptions will also apply to other similar countries and not just those that are unsafe. The spillover effect is possible when consumers are risk averse and have imperfect information on what is going on in each tourism destination. If the media labeled Arab countries experiencing episodes of political and social protest as AS potentials, less informed tourists could end up confusing them with those countries that actually suffered from conflict. Therefore, asymmetric information across consumers and via media labeling could be extending the negative effects of the Arab Spring to other Arab countries that did not directly experience such significant political turmoil. So, a negative spillover effect is expected in the Arab countries although they did not experience the Arab Spring. We refer to this negative spillover as a "contagion effect."

On the other hand, there is another possible spillover that takes place when tourists, rather than not traveling at all, substitute a destination country because they perceive it to be risky or unsafe, with another one with similar features but which is perceived to be risk-free. In this case, tourism would shift from unstable countries (e.g., Arab countries) to safer destinations (e.g., European Mediterranean countries). Mediterranean countries can be seen as natural substitute destinations for the Arab countries since they offer similar weather conditions (sun, sea, and sand) and cultural heritage sites, but they are politically stable destinations. So, tourists who might have opted for destinations such as Egypt or Tunisia, may now consider alternative choices such as Spain, Greece, or Turkey. We refer to this positive spillover as a "substitution effect."

Another violation of the SUTVA is a general equilibrium effect because of the relative price adjustment induced by the Arab Spring in other countries' competitiveness. The Arab Spring could make other tourism destinations more competitive in the short term, but this effect is likely to be reversed in the long run, leading to changes in relative demand. Moreover, the Arab Spring timing coincides with the end of the Great Recession, and this great shock made some well-known tourism destinations in Southern Europe more competitive (i.e., Spain, Portugal, and Greece). As a consequence, tourism demand in those countries has likely been increasing since 2011 owing to improvements in relative prices and not to the Arab Spring. In order to control for all of these effects, the specification used to estimate the spillover effects also includes time-variant destination-specific fixed effects.

Modeling Interdependence

The question of interest is whether and to what extent tourism between a pair of countries $\{i, j\}$ depends on tourism between a different pair of countries $\{-i, -j\}$. In our particular case, we are interested in measuring how tourism flight to the AS countries indirectly affected other countries. This relationship is commonly identified using so-called spatial econometric models that exploit cross-sectional interdependence, which assumes that the growth rate of a particular observation is influenced by the growth rate of other observations (LeSage and Fischer 2008). These models require that the channel of interdependence be assumed explicitly, normally with regard to geographic or spatial variables (e.g., distance or adjacency) since the strength of a relationship is expected to decline with distance and increase with adjacency. However, our data set presents two types of advantage: first, our dependent variable is not defined at a country level but at a country-pair level, and second, time variation is useful in measuring a structural change in the bilateral interdependence relationship. In fact, the literature interprets a significant interdependent relationship as a spillover effect.

Hence, our approach differs from the standard spatial econometric analysis in three dimensions. First, we include as a regressor an index of bilateral interdependence measured as the total tourism flows from any origin to the four AS destinations. Unlike foreign exchange crises that originate in one country and are transmitted through commercial and financial links to other countries, Arab revolutions are common political crises to a group of countries of a similar intensity, so they can be analyzed as a great common symmetric shock transmissible to other countries. Second, we do not impose any weighting scheme in the cross-section; instead, we test for different hypotheses regarding the transmission mechanism underlying the international spillover, including spatial effects. And third, we simultaneously control for any type of observed or unobserved time-varying idiosyncratic shocks at destination markets, such as specific trends or multilateral resistance effects, that are commonly understood as market determinants of bilateral exchange. Moreover, origin-specific fixed effects are added to control for idiosyncratic characteristics at the origin level.[7] By doing this, we are separating what is a response of tourism to an external shock (i.e., spillover) from other market-driven mechanisms that occur simultaneously, including general equilibrium effects. For this reason, we call the estimated effect a pure spillover effect.

To address these questions, we estimate a model that captures changes in the interdependent relationship between two destination tourism markets. In order to control for changes to tourism flows, we estimate the model in first differences, as follows:

$$\Delta Y_{ijt} = \alpha \Delta Y_{it}^{AS} + \delta(\Delta Y_{it}^{AS} \times POST_t) + \gamma_i + \gamma_{jt} + \varepsilon_{ijt}, \quad (3)$$

where ΔY_{ijt} is first difference of the log transformation of the tourism flows from origin i to destination country j in year t, and Y_{it}^{AS} is defined as $\Sigma_{j \in AS\_i} Y_{ijt}$ comprising aggregate tourism flows from each origin i to the whole Arab Spring destinations, excluding those arriving to their own country $j \neq i$ in the case of any of the four AS destinations. As an example, the model explains the tourism flows from Germany to Spain using, as a regressor, the aggregate flow of German

tourists that travel to the AS countries. The parameter of interest (δ) is aimed at capturing the structural change in the interdependent relationship after the Arab Spring political upheavals, with $POST_t$ being a dummy variable that takes a value of 1 after the political shocks.

It is worth mentioning that with this specification, the parameter α captures a pure spillover effect emerging from a set of country pair–related interdependence between Arab destinations and the rest of countries that are orthogonal to other types of shock. With the parameter δ, the model also captures the change in the degree of complementarity or substitutability between Arab destinations and the rest of destinations after the Arab Spring, once we condition for a wide array of shocks that capture origin-country fixed effects, destination-country fixed effects, origin–destination fixed effects, and importantly, destination-time varying fixed effects. The country-year fixed effects will capture not only general equilibrium effects but also other confounding effects that occur simultaneously. For instance, following our previous example, German tourists would rather travel more to Spain or Greece after 2011 because the Great Recession spurred Spanish and Greek competitiveness and not just because the Arab Spring lead to tourism deviation. Following the terminology used by Neumayer and Plumper (2010), we model spatial dependence in dyadic data by using the specific target contagion specification.

As a first step, we only consider the spillover effect that the Arab Spring could have created around the world. A negative spillover (δ) means that AS countries would be losing tourism to other destinations while the opposite sign would imply a contagion. As a second step, we explore the spillover effects among neighboring countries. For example, a contagion hypothesis (positive δ) indicates that potential tourists could be stigmatizing Arab destinations. In this case, a decrease in the number of visitors to Arab countries in conflict, from any source, should also reduce visits to Arab countries without conflict from those same origins. Conversely, a tourist could identify the Mediterranean region as substitute offering safer destinations, and they may thus receive a higher number of international visitors. Therefore, a substitution (negative δ) would indicate that the Arab Spring produced tourism flight to similar, but safer countries. Thirdly, we test whether tourism flight is more intense from Western countries than from Arab countries, and finally, we put together the two last hypotheses. Equation (3) is estimated by PPML with two high-dimensional fixed effects (destination-year γ_{jt} and origin γ_i fixed effects).

Table 5 shows the estimates from equation (3). The first line of column 1 to column 3 presents an estimation of the parameter α, which is the coefficient obtained from the regression of bilateral tourism against the arrivals of tourism of the same origin to the set of AS countries. The null or a significantly positive α parameter indicates that AS destination markets are not rivals (i.e., substitutes) of the rest of destinations, although the parameter is only marginally

Table 5. International Tourism Spillovers.

	Arab Spring	Origin Group	Destination Group
ΔY_{it}^{AS}	0.121	0.118	0.159*
	(0.0832)	(0.0827)	(0.0839)
$\Delta Y_{it}^{AS} \times post$	−0.114	−0.119	−0.209*
	(0.123)	(0.138)	(0.108)
$\Delta Y_{it}^{AS} \times ArabL \times post$		0.101	
		(0.132)	
$\Delta Y_{it}^{AS} \times Western \times post$		−0.168*	
		(0.102)	
$\Delta Y_{it}^{AS} \times ANS$			−0.478
			(0.338)
$\Delta Y_{it}^{AS} \times ANS \times post$			0.742*
			(0.391)
$\Delta Y_{it}^{AS} \times MED$			−0.167*
			−0.088
$\Delta Y_{it}^{AS} \times MED \times post$			0.204**
			(0.103)
Observations	49,792	49,792	49,792

Note: Table displays α and δ coefficients from model specifications. All specifications include origin and destination-year fixed effects. Robust standard errors (in parentheses) are clustered by country pair. The coefficients are statistically significant at the *10%, **5%, or ***1% level.

significant in column 3 when we control for the destination group of tourists. In that case, a 1% decrease in the annual growth in tourism from any origin to the AS countries is associated with a decrease of 0.16% of bilateral tourism to any other destination with the same origin. For the interpretation of the results, it is important to note that variables are in first differences and that the omitted category is the rest of the world when regional dummies are used as interactions.

In the next step, we consider to what extent the Arab Spring has changed the complementary relationship of the AS destinations with the other destinations. To answer this, we show the δ coefficient ($\Delta Y_{it}^{AS} \times POST_t$) in the second row. First, column 1 presents the baseline model, and the estimated coefficient is not significant, indicating that there is not any change in interdependence after 2011. This result should not surprise us because in an interconnected world, the decreased number of tourists in certain destinations should be compensated by increases in tourists in other destinations so that the average effect of the Arab Spring is diluted over all countries. Therefore, we have to go a step further to disentangle the existence of spillovers.

As a second step, we test the hypothesis that the deviation of tourism from the AS countries to alternate destinations after 2011 depends on the origin of the tourists. As previously emphasized, the perception of risk and safety is likely to differ depending on the country of origin, which provide some common cultural features. So, the variable of interest $\Delta Y_{it}^{AS} \times POST_t$ is interacted with the three possible origin groups of countries, that is, Arab League countries, Western

countries, and other destinations (omitted category). The results are presented in column 2 of Table 5. We find that the only significant, and negative, interdependence link is seen for the Western origins (-0.168%). Quantitatively, the effect of Arab revolutions is very large and indicates that for every 1% growth reduction of tourism flows to the AS countries from Western countries, there is a deviation of 0.17% to other destinations after the political upheavals. Here, the results show that cultural affinity and information asymmetries are likely playing a role in explaining the spillover effects. This result is in line with the one obtained by Neumayer and Plumper (2016) who estimates spatial spillover effects in the form of reducing tourism from the West to Islamic destinations (even if none of the countries have been directly affected by a terrorist attack). Their main argument for explaining the contagion effect is that tourists update their expectations after a terrorist attack, expecting a greater chance of becoming victimized in other Islamic countries given the transnational character of Islamist terror groups and the limited capacity of governments in Islamic countries to prevent such attacks.

Moreover, spillovers are not restricted to the AS countries; they are likely affecting alternative destinations such as other Arab countries within the MENA and the Mediterranean region as suggested by the estimates presented in Figure 3. To evaluate these possible spillover effects, we interact the variable ($\Delta Y_{it}^{AS} \times POST_t$) with the dummy variables for the other Arab countries (ANS) and the Mediterranean region (MED). These new interaction terms represent how the spatial interdependent relationship changed after the Arab Spring in the (non-AS) Arab and Mediterranean regions and indicates whether tourism contagion or substitution to that group of countries exists. The results presented in column 3 show that the δ parameter for the variable $\Delta Y_{it}^{AS} \times POST_t$ now becomes significant and negative for the other destinations (omitted category).

The total effect is computed as the sum of the α and δ parameters and indicates that a reduction of 1% of bilateral tourism inflows to the AS countries increases tourism deviation to the rest of the world by 0.05% (0.159-0.209).[8] For the interaction with the ANS countries, the spatial interdependent relationship changed after 2011, with a significant spillover effect (0.742) indicating a contagion of the Arab Spring to the rest of the Arab countries. That is, after 2011, a 1% decrease in the growth rate of tourist arrivals from any origin to the AS countries also reduces the growth of tourist arrivals from any origin to the Arab countries by 0.74%. For the interaction with the MED dummy variables, results show that the overall spillover effect also indicates some sort of contagion after 2011, meaning that overall, a 1% decrease in the growth rate of tourist arrivals to AS countries also reduces tourist arrivals from any origin to the Mediterranean region by a 0.037% ($0.037 = -0.167 + 0.204$). Therefore, we find that before the political upheavals occurred in the Arab world, Arab and Mediterranean destinations were substitutes of the AS countries, but after the Arab Spring, the contagion turned these regions into complements.

The Role of Geography and Religion in Contagion

The previous results indicate that the incidence of contagion is mainly regional; that is, international visitors decide to travel less to countries within the limits of the region and, to a lesser extent, to neighboring regions. To examine the links through which contagion happens regionally we need to further discriminate between two possible hypothesis. One would be the geographical border effect that would arise in a context where the likelihood of an outbreak rises in the surrounding countries. There are several reasons for this to happen, for instance, the potential traveler visualizes in the news that border countries receive refugees expelled from the countries in conflict including citizens and activists with some capacity to transfer political instability or social unrest. If the news emphasizes these aspects, it is very possible the tourist also refuses to travel to these border destinations. Moreover, the conflict in neighboring countries can also hinder or impede people's mobility through traditional transport routes and as a result reduce access to the tourism market. For example, De Sousa, Mirza, and Verdier (2018) show that neighboring countries adjacent to terror face negative trade spillovers because of enhanced security measures that increase trade costs. Similarly, more restrictive security measures might imply tighter checks at borders and reductions on visa allowances. However, a competing explanation of contagion is based on another channel. International traveler simply refuses to travel to Arab destinations interchangeably because he has stigmatized them. For instance, Al-Hamarneh and Steiner (2004) describe how the rise of global Islamic terrorism after the September 11 attacks created a cultural divide between Islam and the Western world with a great impact on the tourism development in the Arab world. Separating both effects is crucial to understanding the mechanisms driving the propagation of political crisis specially when both are clustered geographically.

To test the two hypotheses, we run a regression race based on the baseline model and including interactions of the variable that captures the border effect and the variable that captures the element of religious similarity. In the first column of Table 6, we estimate a specification of the model presented in the Table 5 with a dummy when the destination country is a border country of any of the four AS countries. In the second column, we add to the border variable the interaction with the religious affinity, identifying Muslim border countries from the rest. In particular, we define a dummy variable ($Muslim$) that takes the value of 1 if the percentage of the population declared to be Muslim at the destination country is greater than 40%, and zero otherwise. In the third column, we drop the border variable but keep the Muslim variable to identify the effect of religion, disregarding the border status. Finally, in the fourth column, we extend the previous column

Table 6. Spillovers Channels: Religion and Geography.

	AS Border	AS Border, Muslim Religion	Muslim Religion	Muslim Religion by Destination Group
ΔY_{it}^{AS}	0.142*	0.162**	0.163**	0.163**
	(0.0814)	(0.0783)	(0.0778)	(0.0783)
Interactions with ΔY_{it}^{AS}:				
×*borderAS*	−0.380			
	(0.342)			
×*Muslim*		−0.145	−0.245*	
		(0.112)	(0.138)	
×*Muslim* × *borderAS*		−0.408		
		(0.497)		
×*Muslim* × *MED*				−0.279**
				(0.119)
×*Muslim* × *ANS*				−0.482
				(0.337)
×*Muslim* × *Rest*				−0.0922
				(0.120)
×*post*	−0.190*	−0.225**	−0.226**	−0.226**
	(0.104)	(0.106)	(0.105)	(0.106)
×*post* × *borderAS*	0.658			
	(0.445)			
×*Muslim* × *post*		0.223	0.445*	
		(0.146)	(0.233)	
×*Muslim* × *post* × *borderAS*		0.640		
		(0.524)		
×*Muslim* × *MED* × *post*				0.332**
				(0.130)
×*Muslim* × *ANS* × *post*				0.760*
				(0.396)
×*Muslim* × *Rest* × *post*				0.176
				(0.161)
Observations	49,792	49,792	49,792	49,792

Note: Table displays α and δ coefficients from model specification. *Muslim* is a dummy variable that takes the value of 1 if the percentage of the population declared to be Muslim at the destination countries is greater than 40%, and zero otherwise. All specifications include origin and destination-year fixed effects. Robust standard errors (in parentheses) are clustered by country pair. The coefficients are statistically significant at the *10%, **5%, or ***1% level.

to test a broader geographical scope of the religious based-contagion by adding three groups of Muslim destinations; the ones located in the MENA region (indeed, all the ANS countries are Muslim); the ones located in the Mediterranean region (Turkey and Bosnia and Herzegovina); and the rest of Muslim countries in the sample.

Therefore, results displayed in Table 6 replicate the estimates presented in the first and third column of Table 5 but with the *border* and *religious* interactions. The first result we learn from column 1 is that border countries are not significantly different from the nonborder economies, neither before the Arab uprisings nor after them. This discards the existence of spillovers related with the immediate geographical proximity. The second result we obtain from the next column (column 2) is that Muslim border countries do not behave differently from the nonborder Muslim countries, since none of the coefficients are significantly different from zero. In the third column, we exclude the border dimension from the Muslim interaction and find that the effect of interdependence of the Muslim destinations is negative and significant (−0.082=0.163–0.245) but experiences an abrupt change after the Arab Spring, becoming positive (0.137=0.163–0.245–0.226+0.445) and significant. This indicates that a 1% reduction in tourism toward the AS countries generates an increase of 0.082% toward the rest of Muslim countries in the period before the Arab Spring, but a decrease of 0.137% to other Muslim destinations after the political upheavals of 2011. This result indicates that Muslim destinations were competitors before the Arab Spring but evidence of contagion is found after 2011. Consequently, this evidence indicates that Arab revolutions have an effect expelling international tourism from Muslim countries.

Finally, in column 4, we explore the religion-based contagion along the geographical distance. With this purpose, we

interact the *Muslim* dummy with the region of destination, where closer destinations to the AS countries are those of other Arab destinations within the MENA, the Mediterranean Arab countries, and the rest of the Arab destinations in the world. Interestingly, now the effect of interdependence across Muslim destinations before the revolutions is negative and significant for the Mediterranean Muslim countries. That is, Turkey and Bosnia and Herzegovina are important competitors of the AS countries. This result is in line with the one presented in Figure 3 where a negative effect of the Arab Spring was estimated for Turkey and Bosnia and Herzegovina, although the effect was only significant for the latter.

Results confirm that contagion was transmitted to other Muslim countries within the region, with a very high coefficient for the ANS countries (0.760) and to the other Muslim countries at the Mediterranean region, with a significant coefficient although of a lower size (0.332). Results also indicate that contagion through religion is limited geographically to the neighbor regions but not globally. These results provide evidence that also geographical distance plays a role in explaining the interdependence. Precisely, the overall spillover effect for the Mediterranean Muslim countries, although negative, is very low ($-0.01 = 0.163 - 0.279 - 0.226 + 0.332$). For the ANS destinations, this negative spillover (evidence of contagion) is positive and larger ($0.697 = 0.163 - 0.226 + 0.76$). This indicates that a 1% reduction of tourism from any origin country toward the AS countries causes a decrease of 0.697% in the ANS countries. This is a noticeable contagion effect in the MENA region only, and is very similar to the one presented in column 3 in Table 5 for this group of destination countries.

To sum up, the incidence of contagion was higher among Muslim countries, suggesting that information asymmetries of cultural origin are channeling the international spread of Arab Spring revolutions.

Conclusion

This article explores the causal impact of the Arab Spring on international travel both in countries directly involved in the political crisis and in third countries that have been indirectly affected. We find that the conditional effect of the Arab Spring on tourism inflows is highly persistent over time, meaning that tourism losses are of a similar magnitude two years after the beginning of the episodes of political instability. Although no hostile acts were registered against tourists after the revolutions, the Arab Spring seriously damaged the perception that tourists have about the countries' risk profiles, producing tourism flight. This was likely magnified by the use of social media and a lack of trust in official press. Moreover, we find that Western countries reduced bilateral tourism to the AS countries with much more intensity than other countries, including other Arab source countries. This indicates that the perception of risk among tourists was stronger for culturally distant countries (i.e., Western countries vs. other Arab countries).

The revolutions have led to the flight of tourists not only in the countries involved in the revolts but also in other Arab countries in the region that are politically stable and without attempted revolutions, such as Lebanon and Bosnia and Herzegovina. At the same time, other non-Arab countries in the region experienced increases in tourist arrivals after the revolutions, including major destinations such as Spain, Portugal, and Greece. These results are maintained even when terrorism is taken into account. This leads us to assert that the quantitatively estimated effects mainly represent the effects of the Arab revolution.

We also identify international spillover effects of the Arab Spring, and test whether these branch out spatially and culturally. Our estimates show that Western tourists replace Arab spring destinations with other destinations in the world; however, tourists of Arab origins do not. We also identify a post–Arab Spring contagion to other Arab countries that did not experience revolts and, to a lesser extent, to Mediterranean destinations. Contagion to border countries is nonexistent, but is important to other similar religious countries within the MENA region and at a lower scale to other Muslim countries in the Mediterranean.

We find, at odds with the evidence of prolonged conflicts such as civil wars, that border countries are not significantly affected by the Arab Spring and that contagion caused by the Arab Spring was greater among Muslim neighbor destinations. These results suggest that there is a pattern of contagion similar to that of financial crises in which information asymmetries play a relevant role and travel agents and travelers assign similar levels of risk to nonconflict countries that share common cultural characteristics and try to find safe travel alternatives in neighboring regions. Interestingly, the results confirm the hypothesis that there are information barriers that distort the perception of risk in tourist destinations, and that such information asymmetries generate different responses from travelers and travel operators depending on their cultural background.

From a policy perspective, governments must compensate for the effects of their own and others' uprisings with highly targeted marketing policies. On the one hand, it is important to differentiate the safe destination to avoid stigmatization among less informed consumers with traditional advertising. For example, in a situation where the destination Arab country and the source market are quite culturally distant, marketing materials need to be designed to mitigate negative perceptions due to animosity or ethnocentric attitudes. However, short-term policies will have a limited effect if stakeholders do not understand how politics drive consumers' attitudes toward Arab countries in culturally distant Islamic countries. On the other hand, marketing efforts should be made in those markets where a greater decline is expected. In this sense, our work indicates that these countries are the most culturally distant Western countries.

Our research is subject to certain limitations and provide some avenues for future research. We are assuming that the Arab Spring shock is a common shock since we are unable to

capture a refined measure of the intensity of the shock at country level. This is not a problem per se, given that we are also assuming that the shock might originate different responses from tourists from different origin markets or destinations. However, further research should be made to disentangle how tourists with different cultural backgrounds form its travel expectations when they might have different behavioral biases when processing information related with the Arab world. Similarly, because the treatment variable is common to all AS countries and does not reflect the intensity of the political uprisings, as time passes the treatment variable is likely capturing other developments at the country level that make interpretation more complex. Hence, our method is best suited for capturing the short-term effect of the Arab Spring on international tourism. The long-term consequences of political instability should be addressed as well by taking into consideration that wars, terrorism, and political turmoil might cause irreversible damage to World Heritage cultural assets.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Groizard and Santana acknowledge support from grants RTI2018-101696-B-100-R (MCI/AEI/FEDER, UE) and PID2019-106738GB-100 (MCI/AEI/FEDER, UE), respectively.

ORCID iDs

José L. Groizard https://orcid.org/0000-0002-0772-1156
María Santana-Gallego https://orcid.org/0000-0001-5977-7875

Supplemental Material

Supplemental material for this article is available online.

Notes

1. Our identifying assumption rules out that there may be an inverse causal relationship (i.e., between tourism and the Arab revolutions). Recent cross-country evidence suggests that institutional change is not related to the interactions that arise from international travel (Arif and Hall 2019).
2. These variables are viewed as a source of omitted country-specific trends.
3. Terrorism is defined as the threatened or actual use of illegal force and violence by a nonstate actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation.
4. Table A-1 in the Appendix presents the countries included in Arab and Western origin groups.
5. The full range of estimated coefficients are omitted for space constraints. In general, the sign and significance of explanatory variables are as expected. The F test refers to the coefficients of the variables of interest presented in the table.
6. The striking effect we observe in Saudi Arabia may be due to the religious appeal that the pilgrimage to Mecca has in Islamic culture.
7. Since the variable of interest Y_{it}^{AS} is time-varying and origin-specific, origin-year fixed effects cannot be included in the regression.
8. To compute the total spillover effects, we just take into account the significant parameters.

References

Afonso-Rodriguez, J. A., and M. Santana-Gallego. 2018. "Is Spain Benefiting from the Arab Spring? On the Impact of Terrorism on a Tourist Competitor Country." *Quality & Quantity: International Journal of Methodology* 52 (3): 1371–408.

Ahlfeldt, G. M., B. Franke, and W. Maennig. 2015. "Terrorism and International Tourism: The Case of Germany." *Journal of Economics and Statistics* 235 (1): 3–21.

Al-Hamarneh, A., and C. Steiner. 2004. "Islamic Tourism: Rethinking the Strategies of Tourism Development in the Arab World after September 11, 2001." *Comparative Studies of South Asia Africa and the Middle East* 24 (1): 173–82.

Allen, T., C. Arkolakis, and Y. Takahashi. 2020. "Universal Gravity." *Journal of Political Economy* 128 (2): 393–433.

Anderson, J. E., and E. van Wincoop. 2003. "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review* 93 (1): 170–92.

Araña, J. E., and C. J. León. 2008. "The Impact of Terrorism on Tourism Demand." *Annals of Tourism Research* 35 (2): 299–315.

Arif, I., and J. C. Hall. 2019. "International Flows of People and Institutional Change." *European Journal of Political Economy* 58:276–88.

Arkolakis, C., A. Costinot, and A. Rodriguez-Clare. 2012. "New Trade Models, Same Old Gains?" *American Economic Review* 102 (1): 94–130.

Baldwin, R., and D. Taglioni. 2006. "Gravity for Dummies and Dummies for Gravity Equations." NBER Working Paper No. 121516.

Bayar, Y., and B. Yener. 2019. "Political Stability and Tourism Sector Development in Mediterranean Countries: A Panel Cointegration and Causality Analysis." *European Journal of Tourism Research* 21:23–32.

Bergstrand, J. H. 1985. "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence." *Review of Economics and Statistics* 67 (3): 474–81.

Correia, S. 2016. "Linear Models with High-Dimensional Fixed Effects: An Efficient and Feasible Estimator." Tech. rep., working Paper.

De Sousa, J., D. Mirza, and T. Verdier. 2018. "Terror Networks and Trade: Does the Neighbor Hurt?" *European Economic Review* 107:27–56.

Drakos, K., and A. M. Kutan. 2003. "Regional Effects of Terrorism on Tourism in Three Mediterranean Countries." *Journal of Conflict Resolution* 47 (5): 621–41.

Eilat, Y., and L. Einav. 2004. "Determinants of International Tourism: A Three-Dimensional Panel Data Analysis." *Applied Economics* 36 (12): 1315–27.

Enders, W., and T. Sandler. 1991. "Causality between Transnational Terrorism and Tourism: The Case of Spain." *Terrorism* 14 (1): 49–58.

Enders, W., T. Sandler, and G. F. Parise. 1992. "An Econometric Analysis of the Impact of Terrorism on Tourism." *Kyklos* 45 (4): 531–54.

Feridun, M. 2011. "Impact of Terrorism on Tourism in Turkey: Empirical Evidence from Turkey." *Applied Economics* 43 (24): 3349–54.

Fletcher, J., and Y. Morakabati. 2008. "Tourism Activity, Terrorism and Political Instability within the Commonwealth: The Cases of Fiji and Kenya." *International Journal of Tourism Research* 10 (6): 537–56.

Fourie, J., Rosselló, J., and M. Santana-Gallego. 2015. "Religion, Religious Diversity and Tourism." *Kyklos* 68 (1): 51–64.

Fourie, J., J. Rosselló-Nadal, and M. Santana-Gallego. 2020. "Fatal Attraction: How Security Threats Hurt Tourism." *Journal of Travel Research* 59 (2): 209–19.

Gallardo-Sejas, H., S.-G. Pareja, R. Llorca-Vivero, and J. Martinez-Serrano. 2006. "Determinants of European Immigration: A Cross-country Analysis." *Applied Economics Letters* 13 (12): 769–73.

Groizard, J. L., and M. Santana-Gallego. 2018. "The Destruction of Cultural Heritage and International Tourism: The Case of the Arab Countries." *Journal of Cultural Heritage* 33:285–92.

Guimaraes, P. 2014. "POI2HDFE: Stata Module to Estimate a Poisson Regression with Two High-Dimensional Fixed Effects." Statistical Software Components, Boston College Department of Economics.

Hall, C. M. 1994. *Tourism and Politics: Policy, Power and Place*. Chichester, UK: Wiley.

Head, K., and T. Mayer. 2014. "Gravity Equations: Workhorse, Toolkit, and Cookbook." In *Handbook of International Economics, Handbook of International Economics*, vol. 4, edited by G. Gopinath, E. Helpman, and K. Rogoff, 131–95. Philadelphia, PA: Elsevier.

Head, K., and J. Ries. 2008. "FDI as an Outcome of the Market for Corporate Control: Theory and Evidence." *Journal of International Economics* 74 (1): 2–20.

Kahneman, D., and A. Tversky. 1979. "Prospect Theory: An Analysis of Decision under Risk." *Econometrica* 47 (2): 263–91.

Karemera, D., V. I. Oguledo, and B. Davis. 2000. "A Gravity Model Analysis of International Migration to North America." *Applied Economics* 32 (13): 1745–55.

Khadaroo, J., and B. Seetanah. 2008. "The Role of Transport Infrastructure in International Tourism Development: A Gravity Model Approach." *Tourism Management* 29 (5): 831–40.

Khondker, H. H. 2011. "Role of the New Media in the Arab Spring." *Globalizations* 8 (5): 675–79.

Krajnák, T. 2020. "The Effects of Terrorism on Tourism Demand: A Systematic Review." *Tourism Economics* 20 (10): 1–23.

Larch, M., and Y. V. Yotov. 2016. "General Equilibrium Trade Policy Analysis with Structural Gravity." WTO Staff Working Papers ERSD-2016-08, World Trade Organization (WTO), Economic Research and Statistics Division.

Lee, C.-C., and M.-P. Chen. 2020. "Do Country Risks Matter for Tourism Development? International Evidence." *Journal of Travel Research*. Published online September 25.

LeSage, J., and M. Fischer. 2008. "Spatial Growth Regressions: Model Specification, Estimation and Interpretation." *Spatial Economic Analysis* 3 (3): 275–304.

Liu, A., and S. Pratt. 2017. "Tourism's Vulnerability and Resilience to Terrorism." *Tourism Management* 60:404–17.

Llorca-Vivero, R. 2008. "Terrorism and International Tourism: New Evidence." *Defence and Peace Economics* 19 (2): 169–88.

Mansfeld, Y., and O. Winckler. 2015. "Can This Be Spring? Assessing the Impact of the 'Arab Spring' on the Arab Tourism Industry." *Tourism* 63 (2): 205–23.

McCallum, J. 1995. "National Borders Matter: Canada-U.S. Regional Trade Patterns." *American Economic Review* 85 (3): 615–23.

Mitra, D., C. S. Pham, and S. Bandyopadhyay. 2018. "Terrorism and International Air Travel: A Gravity Approach." *World Economy* 41 (11): 2852–82.

Morley, C., J. Rosselló, and M. Santana-Gallego. 2014. "Gravity Models for Tourism Demand: Theory and Use." *Annals of Tourism Research* 48 (C): 1–10.

Neumayer, E. 2004. "The Impact of Political Violence on Tourism." *Journal of Conflict Resolution* 48 (2): 259–81.

Neumayer, E. 2010. "Visa Restrictions and Bilateral Travel." *Professional Geographer* 62 (2): 1–11.

Neumayer, E., and T. Plumper. 2010. "Spatial Effects in Dyadic Data." *International Organization* 64 (1): 145–66.

Neumayer, E., and T. Plumper. 2016. "Spatial Spill-overs from Terrorism on Tourism: Western Victims in Islamic Destination Countries." *Public Choice* 169 (3/4): 195–206.

Perles-Ribes, J. F., A. B. Raman-Rodriguez, L. Moreno-Izquierdo, and M. T. T. Marti. 2018. "Winners and Losers in the Arab Uprisings: A Mediterranean Tourism Perspective." *Current Issues in Tourism* 21 (16): 1810–29.

Pizam, A. 1999. "A Comprehensive Approach to Classifying Acts of Crime and Violence at Tourism Destinations." *Journal of Travel Research* 38 (1): 5–12.

Pizam, A., and A. Fleischer. 2002. "Severity versus Frequency of Acts of Terrorism: Which Has a Larger Impact on Tourism Demand?" *Journal of Travel Research* 40 (3): 337–39.

Pizam, A., and Y. Mansfeld. 1996. *Tourism, Crime, and International Security Issues*. New York: John Wiley.

Rane, H., and S. Salem. 2012. "Social Media, Social Movements and the Diffusion of Ideas in the Arab Uprisings." *Journal of International Communication* 18 (1): 97–111.

Rose, A. K. 2000. "One Money, One Market: The Effect of Common Currencies on Trade." *Economic Policy* 15 (30): 7–46.

Saha, S., and G. Yap. 2014. "The Moderation Effects of Political Instability and Terrorism on Tourism Development: A Cross-Country Panel Analysis." *Journal of Travel Research* 53 (4): 509–21.

Samitas, A., D. Asteriou, S. Polyzos, and D. Kenourgios. 2018. "Terrorist Incidents and Tourism Demand: Evidence from Greece." *Tourism Management Perspectives* 25:23–28.

Santos Silva, J. M., and S. Tenreyro. 2006. "The Log of Gravity." *Review of Economics and Statistics* 88 (4): 641–58.

Santos Silva, J. M. C., and S. Tenreyro. 2010. "On the Existence of the Maximum Likelihood Estimates in Poisson Regression." *Economics Letters* 107 (2): 310–12.

Seabra, C., P. Reis, and J. L. Abrantes. 2020. "The Influence of Terrorism in Tourism Arrivals: A Longitudinal Approach in a Mediterranean Country." *Annals of Tourism Research* 80:102811.

Sönmez, S. F. 1998. "Tourism, Terrorism, and Political Instability." *Annals of Tourism Research* 25 (2): 416–56.

START (National Consortium for the Study of Terrorism and Responses to Terrorism). 2017. "Global Terrorism Database." National Consortium for the Study of Terrorism and Responses to Terrorism (START), University of Maryland. https://www.start.umd.edu/gtd/.

UNWTO (United Nations World Tourism Organization). 2017. "Compendium of Tourism Statistics." https://www.unwto.org/.

Vita, G. d., and K. S. Kyaw. 2013. "Role of the Exchange Rate in Tourism Demand." *Annals of Tourism Research* 43:624–27.

World Bank. 2017a. "World Development Indicators." https://data.worldbank.org/data-catalog/world-development-indicators.

World Bank. 2017b. "Worldwide Governance Indicators." http://info.worldbank.org/governance/wgi/.

Yang, Y., H. Liu, and X. R. Li. 2019. "The World Is Flatter? Examining the Relationship between Cultural Distance and International Tourist Flows." *Journal of Travel Research* 58 (2): 224–40.

Author Biographies

José L. Groizard is Associate Professor of International Economics at the University of the Balearic Islands, Spain. His research interests include firm-level technology adoption, organizational aspects of production (e.g., FDI, offshoring), both at micro and macro-levels; tourism development and political conflict; international shocks and local development; small-scale events as tourism promotion policies; trade frictions and migration linkages; and political economy of globalization. His researches have appeared in *European Economic Review*, *Economic Inquiry*, *Journal of Development Studies*, *Tourism Management*, *Journal of Cultural Heritage*, among other journals.

Mohanad Ismael is an Assistant Professor of macroeconomics at the University of Birzeit where he has been teaching at the department of economics since 2012. Currently, he is the head of economics department and the director of economic master program. Mohanad completed his Ph.D at the University of Evry Val D'Essonne in 2011. Mohanad received his Master degree in applied macroeconomics and B.A. in Mathematical Applied to Economics. His research interest is about applied macroeconomics, environment and tourism. He is a research associate in MAS Institute and collaborating projects with researchers in both business and CGE modeling. He has several publications in international academic journals.

María Santana-Gallego is Associate Professor at the Applied Economic department at the University of the Balearic Islands, Spain. She is a researcher specialized in issues related to the International Economy (international trade, tourism economy and exchange rates). She has published in various national and international journals such as *Journal of Travel Research*, *Tourism Management*, *the World Economy*, *Empirical Economics*, *Economic Modeling or Annals of Tourism Research*.