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Evaluating the Impact of Crime on Tourism in Barbados: A Transfer Function Approach

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Evaluating the Impact of Crime on Tourism in Barbados: A Transfer Function Approach

The impact of crime on tourism to Barbados was examined using a transfer function approach. Results indicate that an increase in the overall crime rate has a negative and significant impact on arrivals to the island, and the fall-off is delayed, starting 6 months after a one-unit increase in the crime rate. The impulse response function shows that a 1% shock to crime reduces arrivals to Barbados, but takes about 20 months for arrivals to return to normalcy. This results in direct income losses of US\$47,000 and indirect losses of US\$108,000. Impacts for murder, assault with intent to rob, rape, and residential burglary rates were also investigated. Qualitatively, the results resemble those for the overall crime rate; however, the magnitudes of the impacts are greater and income losses are generally in the millions. Given the country's dependence on tourism receipts to sustain its current account, shocks to the crime rate can lead to balance of payment problems. Since there is a lag before the impact of increases in crime takes its full toll on arrivals, it is advised that at the first sign of heightened criminal activity policy makers should act to minimize losses.

Keywords: crime; transfer function; Barbados; income losses

1. Introduction

In choosing a destination, most individuals are influenced by their perceptions or knowledge of the destination. As tourism is a discretionary product, the majority of tourists will not go to a destination where their safety and well-being may be in jeopardy (Pizam & Mansfeld, 1996). Crime against tourists, particularly murder, is quickly picked up by regional and international media and can have both an immediate impact in terms of cancellations and the issuance of travel advisories and a long-term impact. It takes both a sufficient passage of time and a significant promotional effort to persuade tourists to return to destinations that are widely seen as unsafe.

Much evidence exists which highly suggests that safety is a necessary condition for a thriving tourism industry. In a survey conducted by Brunt, Mawby & Hambly (2000), 42 percent of respondents noted that they had ruled out travelling to at least one country/area because of dangers such as crime, terrorism or threatening behaviour. Nkosi (2010) found that individuals did not visit facilities in KwaZulu-Natal which had a history of crime. Studies by Shiebler, Crotta & Hollinger (1996) and Brayshaw (1995) indicated that attacks on tourists in Florida in 1992 led to a significant decline in tourism. Similar fallouts were reported for acts of terrorism in Europe (Brady & Widdows, 1988), political instability in China (Gartner & Shen, 1992) and the 9/11 terrorist attacks which led to a worldwide decline in travel.

Faced with a relatively high chance of becoming victims of crime in a particular destination, tourists delay or even completely alter their plans. Indeed, the perception of the crime rate in a destination has a significant influence on international travel (Park & Reisinger, 2008). This poses a challenge for policy makers, particularly those in tourism-dependent states; they must understand how tourists respond to threats, real or perceived, to their safety. If policy makers do not properly include crime-related costs in the tourism cost-benefit calculus, there is a risk of under-investment in suitable infrastructure, programmes and technologies that would ensure the safety of visitors. Unchecked crime against tourists will have adverse effects on the tourist experience and can encourage enclave tourism developments (de Albuquerque & McElroy, 1999).

Barbados is considered a relatively safe destination (World Economic Forum, 2011). The country is politically stable, natural disasters such as earthquakes and tsunamis are extremely rare and the probability of acts of terrorism is miniscule. Nevertheless, there have been reported incidences of crime against tourists. Such incidents have risen in recent years, from an average of 13 incidents per month in 2005 to about 22 incidents per month in 2008, an increase of 69 percent. As a proportion of total crime, incidents against visitors rose from 1.8 percent to 2.9 percent. Travel advisories by the United Kingdom (UK), the United States of America (USA) and Canada—the top three international source markets for Barbados—warn their citizens against walking alone in isolated areas, especially after dark, carrying large amounts of cash or jewellery and to lock and secure hotel rooms and rental home doors and windows.

This study evaluates the response of long-stay tourists to crime in Barbados. Barbados provides an interesting case study, as its economic fortunes are closely tied to its tourism industry. Developments in economic growth generally conform to the trends in international tourism. Tourism satellite accounting by the World Travel and Tourism Council estimates that tourism's total contribution to Barbados' employment and gross domestic product is above 45 percent, identifying Barbados as one of the top 20 most tourism-dependent countries in the world. Like most Small Island Developing States and Territories, (SIDST), Barbados lacks an abundance of natural resources to competitively engage in international goods trade. Thus, tourism has emerged as the main source of foreign exchange, accounting for nearly 50 percent of foreign earnings on

average. Further, current account deficits in Barbados would be unsustainable without the earnings from tourism (Lorde, Lowe, & Francis, 2010).

To meet the objectives of this study, the authors utilise monthly data and a transfer function as in Enders, Sandler & Parise (1992). The main advantage of this approach is that it allows the authors to track the immediate and delayed impacts of crime on tourism. Understanding the relationship between crime and tourism is imperative, as effective management of social problems in general and crime in particular, requires considerable information about the nature of the problem and the range of its effects on the tourism sector.

2. Brief Review of the Literature

Tourism is irrevocably bound up with the concept of safety. Based on the theory of consumer demand by Lancaster (1971), tourists consume certain characteristics of their destination, rather than a single good. Unless the characteristics are unique to the destination, tourists can easily switch to another destination when faced with threats to their safety. Thus, a country can find its tourism industry vulnerable to threats, such as crime, as tourists can easily visit another country with similar characteristics, but which are much safer.

While it is widely recognised that safety is a critical factor in tourists' destination choice process, it is only recently that this issue has gained much scholarly attention. The significant rise in the tourism-safety literature came at the turn of the 21st century due to a multiplicity of international events including: terrorism attacks (for example, USA, 2001; Bali, 2002; Jakarta, 2003; Madrid, 2004; London, 2005; Egypt, 2006); natural disasters such as tsunamis (for example, Indonesia/Sri Lanka/India/Thailand; 2004;¹ Japan, 2011); and health scares (for example, foot and mouth, 2001; bird flu, 2003; SARS, 2003-2004; swine flu, 2009-2010).

As of late, a less researched area in the tourism-safety literature, relates to the impact of crime on tourism. This is noteworthy, since the actual risk of terrorism, health outbreak or natural disaster is low in comparison to the risk of being victimised when on holiday. One possible explanation could be that though rare, crisis events have a fairly immediate and dramatic impact on tourism (see for instance, Dwyer, Forsyth, Spurr, & VanHo, 2006; Eugenio-Martin, Sinclair, & Yeoman, 2006) and in many cases, the event is not limited to the wounded country alone; there are often spillover effects on surrounding destinations (Drakos & Kutun, 2003). As noted by Dimanche & Lepetic (1999), "a crime situation, unlike other crises that break at specific time such as an earthquake, riots or acts of terrorism, pervades the industry by slowly affecting the image of destination and by changing people's perceptions." Moreover, a high crime rate in one country is less likely to impact the image of countries in the neighbouring region.

Despite the relatively small impact of crime on tourism relative to crisis events, it is generally accepted that a high-crime image can be detrimental to a destination. But the extent of the actual impact of crime is generally debated, as this is largely contingent on tourists' knowledge of a destination (Levantis & Gani, 2000). The latter argue that there is an inevitable degree of information asymmetry in terms of destinations' safety levels, as several may not publish accurate and comparable statistics or other information explaining the severity of crime. This suggests that in areas in which criminal activities are well-publicised the relationship between expected tourism and crime may be more profound.

¹ These were the four worst countries affected by the Indian Ocean tsunami of 2004. The others affected were Somalia, Myanmar, Maldives, Malaysia, Tanzania, Seychelles, Bangladesh, South Africa, Yemen, Kenya and Madagascar.

Against this backdrop, it is not surprising that the empirical literature has produced mixed results on the significance of crime on tourism demand. For instance, using annual data, Levantis & Gani (2000) estimate simple country-specific ordinary least squares (OLS) models of the crime-tourism relationship for eight SIDST—the Bahamas, Barbados, Fiji, Jamaica, Papua-New Guinea, Solomon Islands, Trinidad & Tobago and Tonga. It was found that with the exception of the Solomon Islands, increased crime acts a hindrance to demand for tourism in these islands. The authors posit that the finding for Solomon Islands could largely be due to poor feedback to source nations of developments in safety levels in the country.

Another explanation for differing results could be due to the fact that in some destinations, the tourism product may involve more community interactions than others. Some tourist destinations largely consist of all-inclusive hotels, which limit local interactions, and by extension, crime against tourists. Looking specifically at the case of Jamaica, Alleyne & Boxill (2003) discovered that crime has a severe impact on arrivals from the European market. In contrast, visitors from the US seem to be unaffected by criminal activity in Jamaica. As explained by the authors, tourists from Europe tend to gravitate towards smaller, more intimate hotels with greater interaction with the community. Tourists staying in such areas are more likely to be victimised than tourists lodging at all-inclusive hotels.

It is also possible that there is some difference in the response of tourists to different types of crime. For example, Altindag (2009) found that violent crimes such as homicide and assault are negatively associated with the volume of international tourists while crimes such as theft, burglary and property crimes have no impact on tourism in Europe. Pizam (1999) suggests that violent crimes have more of a lasting effect than theft crimes as they are, at times, life altering and can be more devastating to a victim than theft. Moreover, violent incidences such as murder or rape tend to generate more media attention than say theft and thus are likely to have more damaging effects on the perception of the destination.

The available evidence indicates that the extent of crime on tourism depends largely on the publicity given to criminal activities, the amount of interaction with locals and the type of crime in the destination. In what follows, the authors focus exclusively on the impact of crime on arrivals to Barbados.

While the studies reviewed provide some evidence on the relationship between crime and tourism, these approaches, with the exception of Alleyne & Boxill (2003), do not consider the possible dynamic nature of the relationship. By employing a transfer function, this study explicitly considers this possibility. Like previous studies, the response of tourist arrivals to different types of crime and from different source markets is assessed. Unlike previous studies, the time taken for arrivals to return to “normalcy” after a spike (shock) in crime is estimated. The final point of departure is that cumulative losses in tourism receipts after a spike are also quantified.

3. Data and Estimation Technique

The aim of this paper is to provide numerical estimates of the impact of crime on tourism in Barbados. To accomplish this task, the study employs a transfer function as outlined in Enders et al (1992). The function may be written as:

$$Arr_t = \varpi_0 + A(L)Arr_{t-1} + C(L)Z_t + B(L)\varepsilon_t \quad (1)$$

where Arr_t is monthly deseasonalised tourist arrivals to Barbados in period t ; Z_t is the monthly crime rate in period t ; and $A(L)$, $B(L)$, and $C(L)$ are polynomials in the lag operator L . The

polynomial $C(L)$ is called the transfer function in that it shows how a movement in the exogenous variable Z_t affects the time path of the endogenous variable Arr_t . The coefficient c_1 shows the immediate impact of criminal activities on tourist arrivals, while the subsequent coefficients reflect the delayed effects. If the first n lagged values of Z_t are insignificant, there is an n period lag in the effects of crime on tourism.

The procedure for fitting the transfer function consists of various steps and in each stage, the standard Box-Jenkins methodology is used to fit the model and the Schwarz Bayesian and Akaike Information Criteria are used to choose between possible models. The steps can be summarised as follows. First, an autoregressive moving average (ARMA) model of the Z_t sequence is fitted. Second, the Arr_t series is then pre-whitened using the model in the previous step and the cross correlograms between the two series are analysed and used as a guide in identifying the form of $A(L)$ and $C(L)$. Third, the “best” fitting model is used to estimate the preliminary model:

$$[1 - a(L)L]Arr_t = C(L)Z_t + \varepsilon_t \quad (2)$$

where ε_t denotes an error term which may not be white noise. Fourth, the autocorrelation function of the $\{\varepsilon_t\}$ sequence obtained in the previous step is used to find the appropriate form of $B(L)\varepsilon_t$. Finally, steps 3 and 4 are then combined to estimate the full equation. The estimated model should be parsimonious (that is, only significant terms are retained) and the residuals white noise.

From the broad categories reviewed in the previous section, several individual crime rates are selected for analysis, namely, *Murder*, *Rape*, *Assault with Intent to Rob*, and *Residential/Accommodation Burglary*; *Total Crime* is also investigated. It is expected that violent crime will have a greater impact than non-violent crime.

Observations on crime were collected from the statistical unit of the Royal Barbados Police Force with the special permission of the Commissioner of Police, while those for long-stay visitor arrivals were obtained from the Caribbean Tourism Organisation. A caveat is that monthly observations on crime against tourists are only available from 2005-2008, which is much too brief for our empirical purposes. Consequently crime rates in the overall population, that is, for both locals and tourists combined, from 1999M1-2008M12 are employed. This is unlikely to cause significant measurement bias in our view as we believe that tourists’ perceptions and associated response are based on the overall climate of crime in a destination; that is, whether it is a low-versus high-crime destination, or whether there is a spike in overall crime. The obvious exception would be in cases where visitors are targeted disproportionately to locals. At any rate, focussing on reported crime against visitors only would likely understate their true risk of victimisation and consequently estimates of their response.

4. Results

As a preliminary step, the order of integration for all variables must be determined, as estimation of transfer functions requires that the underlying variables be stationary, $I(0)$, to avoid spurious results. This is accomplished using the augmented Dickey-Fuller (Dickey & Fuller 1979; 1981) and the Phillips-Perron (Phillips & Perron, 1988) tests. Results (available on request) indicate that all variables are $I(0)$.

The results from the transfer functions are presented in Table 1 (p -values are given in parentheses). Looking first at the temporal properties, the estimations suggest that all specifications have two autoregressive terms (Arr_{t-1} and Arr_{t-2}) and their coefficients are all positive. We find no evidence that moving average terms should be included. The Q -statistics

indicate that the residuals are white noise and all terms are significant suggesting that the models are well-specified.

We turn now to the impact of crime on arrivals (given by the coefficients of the Z terms). The first column of Table 1 presents the reaction of arrivals to changes in *Total Crime* rate in Barbados. Estimates indicate that an increase in the rate of crime has a negative and significant impact on arrivals. The transfer function also suggests that there is a lag in the tourism-crime relationship.² Specifically, an increase in *Total Crime* rate only starts to affect tourist arrivals after three months (evidenced by the fact that only the Z_{t-3} term was found to be statistically significant). This moderate lag is not unexpected, as it may take some time for tourists to revise their travel plans.

As noted in the literature review, it is quite possible that tourists may react differently to different types of crime. Hence, the authors disaggregate total crime by type and again utilise the transfer function approach, this time to study the impact of the differing types of crime on tourist arrivals to Barbados. This is shown in the remaining columns of Table 1.

It should be noted that there are some interesting features that the estimations have in common. For example, the rates of *Murder*, *Assault with Intent to Rob*, *Rape* and *Residential/Accommodation Burglary* all have a negative and significant impact on tourism (based on the coefficients of the Z terms), but there are some differences. Of particular note, the magnitude of responses and time taken before a response occurs differ. The transfer functions indicate a three-period lag in the response of tourists to *Murder*, a two-period lag for *Residential/Accommodation Burglary* and a one-period lag for *Rape*, while the reaction to *Assault with Intent to Rob* is immediate. The coefficients of the Z terms suggest that there is a fall-off of 735 potential tourists for every one unit increase in the *Assault with Intent to Rob* rate; for the *Murder* rate, approximately 682 tourists; in the case of the *Rape* rate, 397 tourists; and finally, for the *Residential/Accommodation Burglary* rate, about 46 tourists.

We take the analysis a step further and also investigate the dynamic effects of a shock to *Total Crime* on tourism. Hence, the transfer function is modified to produce an impulse-response function, similar to the standard vector autoregression (VAR) analyses. Details of this approach can be found in Enders et al. (1992).

The dynamic effects of crime on tourism are displayed in Figure 1. Looking first at the impact of the *Total Crime* rate, the impulse response shows that a shock to this variable significantly reduces visitors to Barbados. But, since the *Total Crime* rate transfer function has an autoregressive term, the system has memory regarding criminal activity (see Enders et al, 1992). Hence, it takes some time for the effect to dissipate and for arrivals to eventually return to their pre-shock level. Specifically, after a shock to *Total Crime*, it takes about 30 months for arrivals to return to normalcy (see Table 2).

We also estimate the impulse functions for specific types of crime (also shown in Figure 1). The impulse response functions indicate that it takes the longest time for arrivals to return to normalcy after a shock to the *Murder* rate, followed by the *Assault with Intent to Rob*, *Rape* and *Residential/Accommodation Burglary* rates respectively. These results are not very surprising as the former are violent crimes and will generate significant media coverage. Such findings are in line with those of Altindag (2009); that is, the magnitude of the impact of violent crimes on arrivals is greater than that of non-violent crimes. It is noticeable that the drop-offs in arrivals due to the *Murder*, *Assault with Intent to Rob* and *Rape* rates are larger than for the *Total Crime* rate. This

² The most parsimonious model is used for estimation. Hence, only significant terms enter the final equation.

may be due to the fact that the *Total Crime* rate obscures information about more heinous crimes and thus does not engender as large a response from tourists.

As a final step, the direct losses to the tourism economy and indirect losses to the general economy from various shock magnitudes were evaluated. To calculate the direct effect, the drop in arrivals for each month (which were obtained from the impulse functions, shown in Figure 2) was multiplied by the average expenditure (in USD) per tourist in 2004. Estimates suggest that a 1 percent shock to the *Total Crime* rate results in direct losses of over \$47,000. The indirect losses to the general economy tell us for every unit of income generated in the tourism economy, how much income is lost in the general economy and is found by multiplying direct losses by the ratio multiplier of 2.3.³ Estimated indirect losses are \$108,000. Naturally, the direct and indirect income losses associated with tourists' response to each type of crime differ in magnitude as well. Estimates suggest that for a 1 percent shock to the *Murder* rate, the country loses over \$2.8 million directly and \$6.4 million indirectly. Losses from shocks to the *Rape* and *Assault with Intent to Rob* rates are also in the millions. In comparison, losses are \$126,000 directly and \$290,000 indirectly from a shock to the *Residential/Accommodation Burglary* rate.

5. Concluding Remarks

Given the huge potential of the tourist industry and the contribution it is already making to economic growth and development of Barbados, the results presented here highlight the need for a greater consideration of the impact of crime on tourism. For example, it was found that indirect losses are over twice as large as direct losses. Most of the direct income from tourism goes to hotel and restaurant owners, namely local or international elites (Lejarraja & Walkenhorst, 2007). On the other hand, indirect effects trickle down to the lower income strata of the economy. Any shock to crime will thus reduce the livelihood of lower-income producers in a wide array of economic sectors. While it appears that arrivals return to a state of normalcy after a spike in criminal activity within approximately 30-61 months, the on-going viability of the sector is likely to be contingent on taking a multipronged approach to addressing the domestic crime situation.

Devising recovery strategies to increase visitation levels that include aggressive marketing and promotion efforts can help to overcome the decline in arrivals and associated monetary losses, which occur because of heightened criminal activity (Sonmez, Apostolopoulos, & Tarlow, 1999). Wahab (1996) also recommends maintaining good contacts with the international press, and providing comprehensive information to international tour operators and travel agents.

Faced with rising crime levels and rates, authorities often respond by committing additional resources to combat crime whether or not these expenditures are likely to produce deterrence effects. However, a former Police Commissioner of Barbados, Orville Durant, suggested that although deployment of additional security personnel has some short-run benefits, social programmes which include the youth, and greater local community participation in the tourism sector are necessary to capture even greater benefits of tourism (Durant, 1993).

Education is another measure to ensure safety of tourists. Komesar (1973) found that victimisation rates for burglary and assault are inversely related to education. Safety tips prominently displayed in arrivals lounges and in hotel rooms and brochures containing warnings about locking doors and windows of unattended rooms and vehicles should be mandatory (de

³ The ratio multiplier was calculated for Barbados using data from the WTTC. The method for calculating the ratio multiplier is taken from Lejarraja & Walkenhorst (2007).

Albuquerque & McElroy, 1999). Hotel staff can also provide guests with security devices and practices to reduce victimisation (Bach & Pizam, 1996), such as electronic room locks and room safes.

References

- Alleyne, D., & Boxill, I. (2003). The Impact of Crime on Tourist Arrivals in Jamaica. *International Journal of Tourism Research*, 5, 381-391.
- Altindag, D. (2009). Crime and International Tourism. *Louisiana State University Department of Economics Working Paper Series*.
- Bach, S., & Pizam, A. (1996). Crimes in Hotels. *Hospitality Research Journal*, 20(7), 59-76.
- Brady, J., & Widdows, R. (1988). The Impact of World Events on Travel to Europe during the Summer of 1982. *Journal of Travel and Research*, 26, 8-10.
- Brayshaw, D. (1995). Occasional Studies: Negative Publicity about Tourism Destinations. *Travel and Tourism Analyst*, 5, 62-71.
- Brunt, P., Mawby, R., & Hambly, Z. (2000). Tourist Victimisation and the Fear of Crime on Holiday. *Tourism Management*, 21, 417-424.
- de Albuquerque, K., & McElroy, J. (1999). Tourism and Crime in the Carribean. *Annals of Tourism Research*, 26(4), 968-984.
- Dickey, D., & Fuller, W. (1979). Distribution of the Estimators for Autoregressive Time Series With a Unit Root. *Journal of the American Statistical Association*, 74, 427-431.
- Dickey, D., & Fuller, W. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. *Econometrica*, 49, 1057-1071.
- Dimanche, F., & Lepetic, A. (1999, August). New Orleans Tourism and Crime: A Case Study. *Journal of Travel Research*, 38, 19-23.
- Drakos, K., & Kutun, A. (2003). Regional Effects of Terrorism in Three Mediterranean Countries. *Journal of Conflict Resolution*, 47(5), 621-641.
- Durant, O. (1993 йил 28-October). Protecting our Tourists a Must. p. 3.
- Dwyer, L., Forsyth, P., Spurr, R., & VanHo, T. (2006). Economic Effects of the World Crisis Tourism on Australia. *Tourism Economics*, 12, 171-186.
- Enders, W., Sandler, T., & Parise, G. (1992). An Econometric Analysis of the Impact of Terrorism on Tourism. *Kyklos*, 45, 531-554.
- Eugenio-Martin, J., Sinclair, M., & Yeoman, I. (2006). Quantifying the Effects of Tourism Crises: An Application to Scotland. *Journal of Travel and Tourism Marketing*, 19, 21-34.
- Gartner, W., & Shen, J. (1992). The Impact of Tiananmen Square on China's Tourism Image. *Journal of Travel Research*, 40(4), 47-52.
- Gomez, V., & Maravall, A. (2001). Seasonal Adjustment and Signal Extraction in Economic Time Series. In D. Pena, G. C. Tiao, & R. S. Tsay (Eds.), *A Course in Time Series Analysis*. New York: Wiley and Sons.
- Komesar, N. (1973). A Theoretical and Empirical Study of Victims of Crime. *Journal of Legal Studies*, 2, 301-321.
- Lancaster, K. (1971). *Consumer Demand: A New Approach*. New York: Columbia University Press.
- Lejarraja, I., & Walkenhorst, P. (2007). *Diversification by Deepening Linkages with Tourism*. Retrieved 20, 2012, from World Bank:

- http://siteresources.worldbank.org/INTEXP/COMNET/Resources/Lejarraja,_Diversification_by_Deepening_Linkages_with_Tourism.pdf
- Levantis, T., & Gani, A. (2000). Tourism Demand and the Nuisance of Crime. *International Journal of Social Economics*, 959-967.
- Lorde, T., Lowe, S., & Francis, B. (2010). Do Tourism Receipts Contribute to the Sustainability of Current Account Deficits in Barbados? Central Bank of Barbados Working Papers.
- Nkosi, G. (2010). The Impact of Crime on Tourism in the City of uMhlatuze, KwaZulu-Natal. *South Asian Journal of Tourism and Heritage*, 3(2), 76-81.
- Park, K., & Reisinger, Y. (2008). The Influence of Natural Disasters on Travel Risk Perception. *Tourism Analysis*, 13(5-6), 615-627.
- Phillips, P., & Perron, P. (1988). Testing for a Unit Root in Time Series Regression. *Biometrika*, 75, 335-346.
- 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., & Mansfeld, Y. (1996). *Tourism, Crime and International Security Issues*. Chichester, UK: Wiley.
- Shiebler, S., Crotts, J., & Hollinger, R. (1996). Florida Tourists' Vulnerability to Crime. In A. Pizam, & Y. Mansfeld, *Tourism, Crime and International Security Issues* (pp. 37-50). Chichester: Wiley.
- Sonmez, S. F., Apostolopoulos, Y., & Tarlow, P. (1999). Tourism in Crisis: Managing the Effects of Terrorism. *Journal of Travel Research*, 38(1), 13-18.
- United Nations Office on Drugs and Crime. (2002). *Crime trends in the Caribbean and responses*. Vienna: Austria: United Nations Office on Drugs and Crime.
- Wahab, S. (1996). Tourism and Terrorism: A Synthesis of the Problem with Emphasis on Egypt. In A. Pizam, & Y. Mansfeld (Eds.), *Tourism, Crime and International Security Issues* (pp. 175-186). New York: Wiley.
- Witt, S. F., & Moore, S. A. (1992). Promoting Tourism in the Face of Terrorism: The Role of Special Events in Northern Ireland. *Journal of International Consumer Marketing*, 4(3), 63-75.
- World Economic Forum. (2011). *The Travel and Tourism Competitiveness Report 2011*. Geneva, Switzerland: World Economic Forum.

Table 1: Results from Transfer Functions

	Total Crime	Murder	Rape	Assault with Intent to Rob	Accommodation/Residential Burglary
ω_0	24,990.33 (0.000)	14,354.53 (0.000)	16,567.09 (0.000)	15,675.61 (0.000)	23,023.37 (0.000)
a_1	0.314 (0.000)	0.364 (0.000)	0.352 (0.000)	0.364 (0.000)	0.291 (0.001)
a_2	0.245 (0.007)	0.330 (0.000)	0.300 (0.001)	0.300 (0.001)	0.247 (0.006)
c_1	---	---	---	-735.090 (0.075)	---
c_2	---	---	-396.894 (0.099)	---	---
c_3	---	---	---	---	-45.923 (0.002)
c_4	-16.519 (0.005)	-681.602 (0.081)	---	---	---
$Q(1)$	0.130 (0.718)	0.301 (0.583)	0.198 (0.656)	0.037 (0.847)	0.026 (0.872)
$Q(12)$	4.658 (0.968)	6.230 (0.904)	7.739 (0.805)	8.472 (0.747)	4.665 (0.968)
$Q(24)$	14.022 (0.946)	13.576 (0.956)	18.420 (0.782)	18.931 (0.756)	18.824 (0.761)
$Q(36)$	17.589 (0.996)	18.026 (0.995)	22.482 (0.962)	22.614 (0.960)	22.366 (0.963)

Note: Figures in parentheses are p -values. $Q(m)$ are Q -statistics from lags of the residuals.

Table 2: Effects of a One Percent Shock to Various Crime Rates on Tourism

	Periods before Returning to Normalcy (months)	Direct Income Losses (USD)	Indirect Income Losses (USD)
Total Crime	30	47,000	108,000
Murder	61	2,817,000	6,479,000
Rape	48	1,442,000	3,317,000
Assault with Intent to Rob	51	2,767,000	6,364,000
Residential/Accommodation Burglary	30	126,000	290,000

Note: Income losses are in 2004 USD and to the nearest thousand.