Tourism and Crime: Evidence from the Philippines

Rosalina Palanca-Tan,* Len Patrick Dominic M. Garces,*
Angelica Nicole C. Purisima,* and Angelo Christian L. Zaratan*

Using panel data gathered from 16 regions of the Philippines for the period 2009–11, this paper investigates the relationship between tourism and crime. The findings of the study show that the relation between tourism and crime may largely depend on the characteristics of visitors and the types of crime. For all types of crime and their aggregate, no significant correlation between the crime rate (defined as the number of crime cases divided by population) and total tourist arrivals is found. However, a statistically significant positive relation is found between foreign tourism and robbery and theft cases as well as between overseas Filipino tourism and robbery. On the other hand, domestic tourism is not significantly correlated with any of the four types of crimes. These results, together with a strong evidence of the negative relationship between crime and the crime clearance efficiency, present much opportunity for policy intervention in order to minimize the crime externality of the country's tourism-led development strategy.

Keywords: tourism, crime, negative externality, sustainable development

Introduction

The tourism industry in the Philippines has expanded rapidly in recent years due primarily to intensified marketing of the country's rich geographical and biological diversity and of its historical and cultural heritage. In 2000–10, the tourism sector consistently made substantial contribution to the Philippine economy, averaging about 5.8% of gross domestic product (GDP) on an annual basis. In 2011, tourism revenues further increased by 10.2% from 2010, and its share in GDP inched up to 5.9% (National Statistical Coordination Board 2012). In the same year, the tourism sector provided 778,000 employment opportunities nationwide. Most recently, the count of foreign visitor arrivals for January–August 2013 reached 3.2 million, an increase of about 11.3% from 2.9 million visitors recorded in the same period in 2012 (Department of Tourism 2013). The Philippine

* Department of Economics, Ateneo de Manila University, Katipunan Avenue, Quezon City, 1108, Metro Manila, Philippines
  Corresponding author (Palanca-Tan)'s e-mail: rtan@ateneo.edu

tourism industry is expected to continue to expand in the coming years. From 2012 to 2022, travel and tourism contribution to GDP is forecasted to rise at an annual average of 6.5%, and its employment generation by 3.3% (World Travel and Tourism Council 2012).

With its extensive forward and backward linkages—transport, hotel and restaurant, wholesale and retail trade, banking and finance, construction, food processing, agriculture and livestock, manufacturing, etc., the tourism industry promises to have a high income generating potential that can spur growth of local economies and the national economy as a whole. The sector, however, is associated with negative externalities such as environmental degradation and higher incidence of crimes, social costs that are shouldered by residents of tourist destinations in terms of lower quality of life (Pizam 1982). Notwithstanding the significant positive contribution of the tourism industry in the growth of the Philippine economy and as the goal of development planners must be no less than over-all societal welfare with income and quality of life components, there is a need to properly assess the social costs associated with the tourism sector. For a tourism-led development policy to effectively and sustainably raise people's welfare, it must be coupled with measures to address the sector's negative environmental and social consequences, if these exist.

The positive link between tourism and crime is suggested in the Routine Activity Theory on Crime developed by Cohen and Felson (1979). Tourists are "suitable targets," one of three essential elements that are necessary for the success of predatory activities. Fujii and Mak (1980) point to the characteristics of tourists that make them highly desirable targets—they carry money and valuable objects, they are on a holiday mood and hence tend to be less prudent, and they are perceived to be "safer" targets since they rarely report crime to the police. Ryan (1993) points that some tourism activity arises from the demand for illegal goods and services, as in the case of sex tourism (Johnson 2011) and tourism for substance abuse, a phenomenon that is also suspected to prevail in the Philippines. Becker's (1968) quantitative economic model of criminal activity predicts that the incidence of crime increases with higher expected net returns from committing crimes. Expected returns increase with more tourists who commonly possess money and other valuables (expected income from crime) and who are less likely to report crimes (lower probability of detection).

Empirical studies done in both developing and developed countries lend some support to the hypothesized positive relation between tourism and crime. McPheters and Stronge (1974) found that the season of crime coincided with the season of tourism in Miami, USA. Jud (1975) likewise confirmed that growth of tourism-based businesses had a strong positive relationship with crime incidence in his study of 32 states in Mexico.

Pizam's study (1982) using data from 50 states in the United States found significant positive relationship between tourism expenditures and crime incidence in four (namely, crime against property, robbery, rape, and aggravated assault) out of nine categories of crime investigated in the study. A high correlation between tourist arrivals and criminal movements is also found by Wallace (2009) in the case of Tobago. Most recently, Biagi *et al.* (2012) using a panel data of Italian provinces for the years 1985–2003 showed that tourist areas have a significantly higher occurrence of crime than non-tourist areas in the short and long-run.

There are likewise studies that suggest a negative relation between tourism and crime. Grinols *et al.* (2011) present two theoretical considerations for a negative link. One, visitors increase demand for goods and services, which can lead to increase in wages and employment for low-skilled workers. Two, a place that is frequented by tourists is likely to experience and undergo modernization and development programs which can make the area less conducive to criminal activity. Thus, the effect of tourism on crime may be ambiguous, depending on the relative strengths of the positive and negative effects. Grinols *et al.* use these arguments to explain why some tourist types yield no impact on crime in his study of visitors in national parks of counties in the United States.

Empirical literature on Philippine tourism has so far been focused on the performance and contribution of the industry to Philippine economic growth (see, for instance, Lagman 2008; Henderson 2011; and Yu 2012). To the authors' knowledge, there has been no recent paper linking crime in the Philippines to tourism. This paper aims to fill this gap in the literature. Using regression analysis, this paper investigates whether or not crime and tourism in the Philippines are correlated with each other.[1] This is done using panel data gathered from 16 regions of the country for the period 2009–11. Establishing a positive link between tourism activities and incidence of crime would indicate a need to design and institute appropriate measures to sustain tourism-led development.

An Economic Analysis of Crime

This paper adopts the economic framework of Becker (1968) in analyzing the determinants of criminal behavior. An individual i chooses to commit an offense depending on the utility U_i he expects to gain from the criminal act:

---

1) The analysis in this paper is limited to the determination of the existence or non-existence of a relationship/correlation between different types of crimes and different types of tourists. This limitation is imposed by the difficulty of finding an appropriate instrumental variable for tourism that can address the possible reverse causality between crime and tourism.

$$E(U_i) = p_i U_i(y_i - f_i) + (1 - p_i) U_i(y_i)$$

where p_i is the probability of being caught and convicted, y_i is income that can be realized from committing the crime, and f_i is the monetary equivalent of punishment if convicted. The partial derivatives of the expected utility function with respect to each of the three variables are:

$$\frac{\partial E(U_i)}{\partial p_i} = U_i(y_i - f_i) - U_i(y_i) < 0;$$

$$\frac{\partial E(U_i)}{\partial y_i} = p_i U_i'(y_i - f_i) + (1 - p_i) U_i'(y_i) > 0;$$

$$\frac{\partial E(U_i)}{\partial f_i} = -p_i U_i(y_i - f_i) < 0.$$

An increase in the probability of conviction as well as an increase in punishment if convicted reduce the expected utility from criminal activities while an increase in income from criminal activities raises the expected utility.

Becker then specifies the number of offenses committed by an individual O_i as a function of the probability of conviction (p_i), punishment (f_i) and a catch all variable denoted by u_i which may include income from criminal activities (y_i), income from legal activities, among others. Probability of conviction and punishment provides disincentives for an individual to engage in criminal activities, thereby reducing the number of offenses; while income from criminal activities encourages criminal acts and hence, increases the number of offenses. Availability of legal sources of income (a factor that is captured in u_i) may also reduce O_i.

The total number of offenses, O, is the sum of all O_i, and is a function of the (weighted) average values of p_i, f_i, and u_i,

$$O = \sum_{i=1}^{N} O_i = h(p, f, u).$$

The Routine Activity Theory offers a sociological explanation of the determinants of crime. The theory proposes that the level of criminal activity in an area is a function of the dynamics between and among certain groups of people in a particular geographical location. It predicts that crime rate will increase in a community if motivated offenders and suitable targets converge in a particular time and place in the absence of capable guardians (Cohen and Felson 1979). It emphasizes spatial considerations, that is, the

visibility of desirable materials and the ease of access, in the persistence of crime.

The economic and sociological frameworks above both provide a basis to expect a positive link between crime and tourism. Tourism, which involves the influx of people for a holiday, carrying money and valuable objects and with less prudent behavior are suitable targets for criminal activity. In Becker's economic framework, tourism increases the expected gain from criminal activity (tourists have more valuables) and is associated with lower probability of detection (tourist are less likely to report crimes).

This paper investigates the link between crime and tourism through regression analysis for a cross section of 16 regions in the Philippines. A balanced panel data set for the three years, 2009, 2010, and 2011 for all 16 regions is used. The empirical model is specified as

$$Crime_{j,t} = \beta_0 + \beta_1 Tourism_{j,t} + \beta_2 Deterrence_{j,t} + \beta_3 Unemployment_{j,t} + \beta_4 GDP_{j,t}$$
$$+ \beta_5 Growth_{j,t} + \beta_6 DUM2010 + \beta_7 DUM2011 + \varepsilon_{j,t} + \eta_j.$$

The subscripts j and t refer to the region and year, respectively. The βs are the coefficients to be estimated, while $\varepsilon_{j,t}$ and η_j are the error term and the region fixed effect, respectively. The dependent variable *Crime* is per capita crime calculated as the number of crime cases in the region divided by the region's population. Criminal reporting in the Philippines classifies crime into index and non-index crimes. Index crimes are further classified into crimes against persons (which include murder, homicide, physical injury, and rape) and crime against property (further categorized into robbery, theft, car-napping, and cattle rustling). Non-index crimes are all other crimes not falling under any of the above-mentioned categories (eg: smuggling, prostitution, illegal drug trade, and abuse). Separate regression runs are done for total crime and certain crime categories that can possibly target and/or involve tourists, namely, crime against persons, robbery, theft, and non-index crime.

The theoretical model predicts that *Crime* is related positively with *Tourism* ($\beta_1 > 0$) and negatively with *Deterrence*, the probability of being caught and convicted ($\beta_2 < 0$). *Tourism* is defined as the number of tourist arrivals, classified into three types: foreign, domestic, and overseas Filipino. The latter two categories are distinguished from each other on the basis of residency. If a Filipino holds residency in the Philippines, he is considered a domestic tourist. On the other hand, a Filipino who resides (at least temporarily) in another country, say for work or study, is counted as an overseas Filipino tourist. Tourist traffic is calculated by the Department of Tourism from data on hotel check-ins, entry into tourist areas such as parks, and restaurant traffic.

Deterrence or the probability of being caught and convicted is proxied by the crime

clearance rate, a data series generated by the Philippine National Police and reported in the Philippine Statistical Yearbook. The crime clearance rate is calculated as the ratio of the number of crimes for which a case has been filed to the total number of crimes reported. This ratio reflects police and law enforcers' knowledge of the local environment and the efficiency of criminal investigation and hence, can serve as an indicator of the probability of detection and conviction (Marselli and Vannini 1997).

Cantor and Land (1985) provide theoretical arguments for the likely influence of macroeconomic variables on crime rate. The rate of *Unemployment* will be positively related with *Crime* ($\beta_3 > 0$) if criminal activity provides an alternative income source. Brenner (1978) proposes that the inability of an individual to maintain a particular standard of living as a consequence of becoming unemployed may lead to criminal acts. Regional Gross Domestic Product or income (*GDP*) and GDP *Growth* rate can serve as measures of economic prosperity in the region and hence may serve as indicators of the potential for generating income through both legal and illegal means (hence β_4 and β_5 may be > or < 0). Dummy variables for the years 2010 and 2011 are included to capture period effects.

The Variance Inflation Factor (*VIF*) test is used to rule out possible multicollinearity in the regression analyses. The *VIF* of a regressor X_i is calculated as

$$VIF = 1/(1 + R_i^2)$$

where R_i^2 is the coefficient of determination obtained when X_i is regressed against all the other independent variables. A *VIF* of at least 10 is indicative of severe multicollinearity problems in the data, which require correction.

Tourism and Crime: A Preliminary, Descriptive Analysis

Demographic and Economic Profile of the Regions
The Philippines is divided into 17 administrative regions: 8 of which are in Luzon (National Capital Region-NCR, Cordillera Administrative Region-CAR, Ilocos-I, Cagayan Valley-II, Central Luzon-III, CALABARZON-IVA, MIMAROPA-IVB, and Bicol-V), 3 in Visayas (Western Visayas-VI, Central Visayas-VII, and Eastern Visayas-VIII), and 6 in Mindanao (Zamboanga Peninsula-IX, Northern Mindanao-X, Davao-XI, SOCCSKSARGEN-XII, Caraga-XIII, and Autonomous Region in Muslim Mindanao-ARMM[2]). Table 1 presents demographic and economic data on these regions.

---

2) Due to lack of data on crime and tourism, ARMM is not included in the study.

Table 1 Demographic and Economic Profile of the Regions

Region	Land Area		Population (as of 2011)			Average 2009–11				
							GDP		Per Capita GDP (PhP)	Unemployment Rate %
	km²	% Share	thousands	% Share	Density	PhPMillions	% Share	% Growth		
National Capital Region (NCR)	639	0.2	11,990	12.8	18,764	2,012,814	36.0	5.7	167,874	11.9
Cordillera Administrative Region (CAR)	19,294	6.2	1,649	1.8	85	118,219	2.1	9.3	71,691	4.9
I Ilocos Region	13,055	4.2	4,836	5.1	370	177,534	3.2	11.8	36,711	8.4
II Cagayan Valley	31,159	10.1	3,283	3.5	105	101,989	1.8	6.3	31,066	3.1
III Central Luzon	21,543	7.0	10,321	11.0	479	507,284	9.1	13.7	49,151	8.8
IV-A CALABARZON	16,368	5.3	12,859	13.7	786	979,766	17.5	28.2	76,193	9.9
IV-B MIMAROPA	29,621	9.6	2,813	3.0	95	102,990	1.8	–0.9	36,612	4.2
V Bicol Region	18,054	5.8	5,523	5.9	306	113,551	2.0	–1.8	20,560	5.9
VI Western Visayas	20,614	6.7	7,235	7.7	351	228,646	4.1	–7.7	31,603	6.9
VII Central Visayas	15,875	5.1	6,931	7.4	437	335,495	6.0	5.2	48,405	7.3
VIII Eastern Visayas	21,563	7.0	4,183	4.4	194	150,371	2.7	14.2	35,948	5.4
IX Zamboanga Peninsula	16,823	5.4	3,473	3.7	206	116,538	2.1	2.1	33,555	3.5
X Northern Mindanao	20,132	6.5	4,382	4.7	218	210,748	3.8	0.1	48,094	4.8
XI Davao Region	20,244	6.6	4,537	4.8	224	216,158	3.9	2.2	47,643	5.8
XII SOCCSKSARGEN	22,466	7.3	4,194	4.5	187	152,899	2.7	0.9	36,457	4.1
XIII Caraga	21,471	7.0	2,475	2.6	115	64,270	1.1	4.4	25,968	6.1

Source of data: Philippine Statistical Yearbooks 2010, 2011 and 2012 for unemployment data; Bureau of Agricultural Statistics database (countrystat.bas.gov.ph) for all other data series.

NCR or Metropolitan Manila, is the center of culture, economy, and government in the Philippines. The country's population is highly concentrated in this region, accounting for 13% of the nation's population but only 0.2% of its land area. Still posting modest growth, NCR contributes 36% of the country's GDP. Although per capita GDP in the NCR is way above those of the other regions, it has the highest unemployment rate. Second to NCR in terms of population density and economic activity is CALABARZON, the southern neighbor of NCR. In recent years, many of the industries in Metro Manila have moved to this region, making it the fastest growing region in the country economically. Other growth centers in Luzon are Central Luzon, Ilocos, and CAR, all of which are to the north of NCR. In the Visayas, the lead region is Central Visayas which includes Cebu, the second metropolis in the country. In Mindanao, Northern Mindanao and Davao are the lead regions. The poorest region (lowest per capita GDP) in the country is Bicol, which is located in an area that is regularly visited by typhoons. It can be observed from Table 1 that unemployment rate tends to be highest in the most highly urbanized and industrialized regions (NCR, CALABARZON, Central Luzon, and Central Visayas). This is due to in-migration of people from rural areas in search of better economic opportunities.

Crime

Table 2 reveals an over-all concentration of crime in the NCR and Central Luzon. Metro Manila, the foremost metropolis in the Philippines, comprises much of NCR while Central Luzon, immediately to the north of NCR, was the location of the two former US naval bases in the country (Clark, Pampanga and Subic, Zambales). Next in line are the relatively more urbanized regions of CALABARZON, Western and Central Visayas. Only data on crime categories that are most likely to involve tourists, namely, crimes against persons, robbery, and theft, are presented in Table 2. In terms of number of crimes against persons, the top three regions are Central Luzon (14%), NCR (11%) and CALABARZON (10%), which are among the most industrialized and urbanized regions in Luzon. Occurrences of robbery and theft are highest in NCR, followed by Central Visayas, and then, Central Luzon, likewise the regions that are relatively more advanced economically.

With regard to deterrence, proxied by the crime clearance efficiency rate or the ratio of the number of crimes for which a case has been filed to the total number of crimes, the top three ranking regions are NCR (64%), SOCCSKSARGEN (50%), and Ilocos (45%). Remarkably, the latter two regions have relatively lower crime shares in the national total.

Table 2 Crime (number of occurrences) and Crime Clearance Efficiency,* Average for 2009–11

Regions	Total Crimes		Index Crimes Against Persons		Robbery		Theft		Non-index Crimes		Crime Clearance Efficiency
	Number	Share	Number	Share	Number	Share	Number	Share	Number	Share	
National Capital Region (NCR)	148,283	13.3%	31,690	11.1%	28,786	25.8%	34,079	14.8%	48,201	10.4%	64.1
Cordillera Administrative Region (CAR)	33,992	3.0%	11,782	4.1%	2,796	2.5%	7,559	3.3%	11,407	2.5%	22.7
I Ilocos Region	42,268	3.8%	16,036	5.6%	2,118	1.9%	7,125	3.1%	16,040	3.5%	45.4
II Cagayan Valley	36,830	3.3%	11,454	4.0%	2,024	1.8%	4,498	2.0%	18,008	3.9%	23.6
III Central Luzon	148,956	13.3%	39,832	13.9%	12,631	11.3%	25,248	11.0%	67,480	14.6%	20.5
IV-A CALABARZON	109,140	9.8%	28,628	10.0%	11,693	10.5%	17,224	7.5%	48,141	10.4%	28.4
IV-B MIMAROPA	27,859	2.5%	8,587	3.0%	1,399	1.3%	2,796	1.2%	14,751	3.2%	36.1
V Bicol Region	48,271	4.3%	15,233	5.3%	3,425	3.1%	8,749	3.8%	20,148	4.4%	36.3
VI Western Visayas	101,526	9.1%	22,363	7.8%	6,518	5.8%	21,346	9.3%	49,891	10.8%	19.4
VII Central Visayas	95,680	8.6%	19,826	6.9%	13,715	12.3%	31,853	13.9%	28,351	6.1%	28.3
VIII Eastern Visayas	52,852	4.7%	12,248	4.3%	2,215	2.0%	9,240	4.0%	28,716	6.2%	21.2
IX Zamboanga Peninsula	49,074	4.4%	11,514	4.0%	3,074	2.8%	7,300	3.2%	26,094	5.6%	25.8
X Northern Mindanao	75,804	6.8%	19,951	7.0%	8,119	7.3%	21,341	9.3%	23,826	5.1%	13.7
XI Davao Region	72,348	6.5%	17,577	6.2%	7,107	6.4%	18,271	8.0%	28,326	6.1%	19.4
XII SOCCSKSARGEN	47,066	4.2%	11,190	3.9%	3,833	3.4%	7,160	3.1%	23,332	5.0%	50.3
XIII Caraga	26,193	2.3%	7,713	2.7%	1,987	1.8%	5,860	2.6%	10,156	2.2%	29.1
Total	1,116,142	100.0%	285,624	100.0%	111,440	100.0%	229,649	100.0%	462,868	100.0%	

Source of data: *Philippine Statistical Yearbooks* 2010, 2011, and 2012 (National Statistical Coordination Board various years)

Note: * Crime clearance efficiency is the ratio of the number of cases for which a case had been filed with the prosecutor's office or proper court with at least one of the suspects arrested to the total number of crimes reported.

Tourism

In the three years, 2009–11, there were more than 65 million tourist arrivals in the whole country, most of which are domestic tourists (52 million or 79% of the total) and only a fifth (about 13 million) are foreigners. The most popular destinations for domestic tourists are CALABARZON, Bicol, and Western and Central Visayas. Due to its proximity to Metro Manila (only 1–4 hour land travel), CALABARZON is an affordable vacation spot with its natural attractions (waterfalls in Pagsanjan; mountains, lakes, and hotsprings in Laguna, Tagaytay, and Quezon; some beaches in Batangas), historical sites (Cavite and Laguna), and colorful festivals and religious celebrations, among Metro Manila residents for day tours and weekend holidays. Bicol, which is a little farther but still accessible by land travel from Metro Manila, is another favorite destination because of its beautiful beaches and volcanoes, centuries-old stone churches, and the Camsur Watersports Complex. Those who have more resources to spend travel by plane to Western and Central Visayas for the famous beaches of Cebu and Boracay.

Foreign tourists, on the other hand, are concentrated in NCR, Central Visayas, Bicol, and Western Visayas. Metro Manila and Cebu in Central Visayas are the entry points for the foreign tourists. For foreign tourists, the white sand beaches and historical sites in Central Visayas (Cebu and Bohol), Bicol (Camsur), and Western Visayas (Boracay) are the most alluring attractions. Overseas Filipino tourists, like foreign tourists, are mostly attracted to Western Visayas, Bicol, Central Visayas, and NCR.

Table 3 Tourist Arrivals

Region	Total		Foreign		Overseas Filipinos		Domestic	
	Number	Share	Number	Share	Number	Share	Number	Share
National Capital Region (NCR)	6,931,748	10.6%	4,354,387	34.0%	61,473	8.5%	2,515,888	4.8%
Cordillera Administrative Region (CAR)	3,297,801	5.0%	270,607	2.1%	27,850	3.9%	2,999,344	5.8%
I Ilocos Region	1,381,314	2.1%	96,016	0.7%	5,332	0.7%	1,279,966	2.5%
II Cagayan Valley	2,103,199	3.2%	96,487	0.8%	–	0.0%	2,006,712	3.9%
III Central Luzon	2,858,411	4.4%	435,958	3.4%	20,635	2.9%	2,401,818	4.6%
IV-A CALABARZON	12,049,466	18.4%	1,012,145	7.9%	39,821	5.5%	10,997,500	21.1%
IV-B MIMAROPA	1,724,609	2.6%	339,064	2.6%	20,793	2.9%	1,364,752	2.6%
V Bicol Region	8,823,131	13.4%	1,737,219	13.6%	133,594	18.6%	6,952,318	13.3%
VI Western Visayas	6,590,759	10.0%	1,281,828	10.0%	230,009	31.9%	5,078,922	9.7%
VII Central Visayas	7,176,578	10.9%	2,642,256	20.6%	60,687	8.4%	4,473,635	8.6%
VIII Eastern Visayas	652,849	1.0%	48,894	0.4%	3,495	0.5%	600,460	1.2%
IX Zamboanga Peninsula	1,386,547	2.1%	57,517	0.4%	23,440	3.3%	1,305,590	2.5%
X Northern Mindanao	4,199,539	6.4%	162,524	1.3%	55,863	7.8%	3,981,152	7.6%
XI Davao Region	2,766,388	4.2%	175,677	1.4%	20,099	2.8%	2,570,612	4.9%
XII SOCCSKSARGEN	2,015,470	3.1%	12,096	0.1%	10,807	1.5%	1,992,567	3.8%
XIII Caraga	1,683,702	2.6%	95,448	0.7%	6,210	0.9%	1,582,044	3.0%
Total	65,641,511	100.0%	12,818,123	100.0%	720,108	100.0%	52,103,280	100.0%

Source of Data: Department of Tourism (2013)

A cursory look at data presented in Tables 2 and 3 indicates relatively higher crimes in tourist areas. The list of top ranking regions in crime is more or less the same as the list of top ranking regions in tourist arrivals.

Location Quotient

To appraise the incidence of crime and tourist arrivals in each region relative to the national average, location quotients (*LQ*) are calculated using the following formulas (Biagi *et al.* 2012):

$$LQ_{tourism\_i} = \frac{(Tourist\ Arrivals\ in\ Region_i)/(Total\ Arrivals)}{(Area\ of\ Region_i)/(Total\ Area)}$$

$$LQ_{crime\_i} = \frac{(No.\ of\ Crimes\ in\ Region_i)/(Total\ Crime)}{(Population\ of\ Region_i)/(Total\ Population)}$$

where *i* refers to a particular region and *Total* denotes variable values for the whole country. *LQ*s for each region for each of the three years are calculated, resulting in 48 $LQ_{tourism}$ and 48 LQ_{crime}. Plotting points for corresponding $LQ_{tourism}$ and LQ_{crime} and drawing lines through the median values of $LQ_{tourism}$ and LQ_{crime}, the graph is divided into four quadrants: quadrant 1—high $LQ_{tourism}$, high LQ_{crime} combinations; quadrant 2—low $LQ_{tourism}$ and high LQ_{crime}; quadrant 3—low $LQ_{tourism}$, low LQ_{crime}; and quadrant 4—high $LQ_{tourism}$, low LQ_{crime} (Fig. 1). Out of the 48 points ($LQ_{tourism}$ and LQ_{crime} combinations), 30 are in quadrants 1 and 3. The regions of Ilocos (I), Cagayan Valley (II), MIMAROPA (IVB), Eastern Visayas (VIII), and Caraga (XIII) appear to be low-crime, low-tourism regions while CAR,
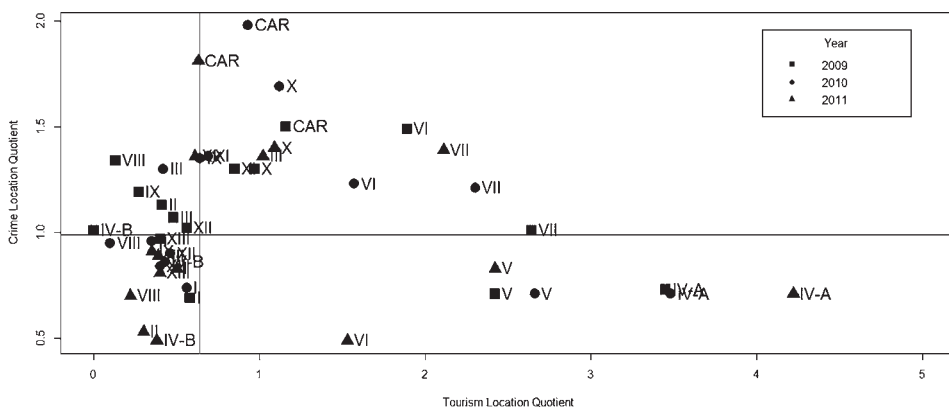

Fig. 1 Location Quotients for Tourism and Crime

Western and Central Visayas (VI and VII), Northern Mindanao (X), and Davao (XI) are the high-tourism, high-crime regions. Central Luzon is consistently a high crime area with relatively less tourism activities. NCR, CALABARZON, and the Bicol region are tourist areas with relatively low incidence of crime. NCR and CALABARZON are the two most highly urbanized and developed regions in the main island of Luzon. Both CALABARZON and Bicol are highly popular for domestic and overseas Filipino tourists. Our LQ analysis is indicative of some degree and forms of direct relationship between crime and tourism which is further investigated in the regression analysis of the next section.

Econometric Analysis

Two regressions runs are done for each of the five dependent crime rate variables, namely, (1) total crime, (2) crime against persons, (3) robbery, (4) theft, and (5) non-index crimes. The two runs differ only in the independent tourism variable/s used. Total tourist arrivals are used in the first run, while the three categories of tourist arrivals (namely, foreign, overseas Filipino, and domestic tourist arrivals) are included as three separate independent variables in the second run. Hence, a total of 10 equations are estimated using the method of ordinary least squares. The results are presented in Table 4.

The last two columns of Table 4 give the VIF of the regressors. All calculated VIFs are much less than the critical value of 10, indicating the absence of multicollinearity. This means that while it is possible that some of the independent variables are correlated with one another, the extent to which they are linearly related is not large enough to render the parameter estimates unreliable as well as necessitate the omission of any of the regressors.

The coefficient of the total number of tourist arrivals is not significant in all five regression runs for aggregate crime and four categories of crime. However, when the number of tourist arrivals is broken down into foreign, overseas Filipino, and domestic, some significant relationships surface. The number of foreign tourist arrivals has a significant positive relationship with robbery and theft cases, as predicted by economic and sociological theories. The estimated value of the coefficient of foreign tourism in the equation for robbery cases implies that an increase in foreign tourists of 1,000 translates into an increase in incidence of robbery cases of 4 per 10,000,000 population. In the case of NCR where population is roughly 12 million, 1,000 more foreign tourists translates into 5 more robbery cases. The magnitude of the coefficient of foreign tourism in the theft equation is about double that in the robbery equation; an increase in foreign tourists

Table 4 Regression Results

Independent Variables	Total Crime		Crime against Persons		Robbery		Theft		Non-index Crime		Variance Inflation Factor (VIF)	
	Run 1	Run 2	Run 1	Run 2	Run 1	Run 2	Run 1	Run 2	Run 1	Run 2	Run 1	Run 2
Constant	0.0081 (0.00071) ***	0.0099 (0.00103) ***	0.0024 (0.00031) ***	0.0028 (0.00050) ***	0.0006 (0.00011) ***	9.50E-04 (0.00014) ***	0.0016 (0.00027) ***	0.0025 (0.00036) ***	0.0035 (0.00042) ***	0.0035 (0.00062) ***	0	0
Unemployment	−0.0001 (0.00011)	−0.00036 (0.00015) **	-3E-05 (0.00005)	-7.81E-05 (0.00007)	-8E-06 (0.00002)	-4.27E-05 (0.00002)	1.8E-05 (0.00005)	-7.26E-05 (0.00005)	-1E-04 (0.00007)	-1.53E-04 (0.00009) *	3.068	4.198
GDP	1.61E-09 (6.1E-10) **	1.99E-09 (7.92E-10) **	2.09E-10 (2.69E-10)	3.13E-10 (3.86E-10)	3.61E-10 (9.37E-11) ***	2.88E-10 (1.07E-10) ***	2.92E-10 (2.35E-10)	2.03E-10 (2.74E-10)	6.59E-10 (3.60E-10) *	1.08E-09 (4.78E-10) **	3.286	5.611
GDP Growth	-2E-05 (0.00001)	−0.000014 (0.00001)	-5E-06 (5E-06)	-4.70E-06 (6.67E-6)	-3E-06 (1.87E-6)	-2.62E-07 (1.85E-6)	-9E-06 (4.68E-6)	-5.25E-06 (4.75E-6)	-3E-06 (7.18E-6)	-3.34E-06 (8.28E-06)	1.103	1.274
Deterrence	-7E-05 (0.00001) ***	−0.000084 (0.00002) ***	-1E-05 (6.38E-6) **	-1.78E-05 (8.11E-6) **	-5E-06 (2.22E-6) **	-9.33E-06 (2.25E-6) ***	-2E-05 (5.57E-6) ***	-2.88E-05 (5.77E-6) ***	-3E-05 (8.53E-6) ***	-2.70E-05 (0.00001) **	1.977	2.223
DUM2010	−0.001 (0.00040) **	−0.00109 (0.00043) **	−0.0007 (0.00018) ***	-7.15E-04 (0.00021) ***	−0.0001 (0.00006) *	-1.75E-04 (0.00006) ***	−0.0004 (0.00015) ***	-4.82E-04 (0.00015) ***	0.00021 (0.00023)	3.20E-04 (0.00026)	1.354	1.462
DUM2011	−0.0021 (0.00049) ***	−0.00218 (0.00051) ***	−0.0009 (0.00022) ***	-8.90E-04 (0.00025) ***	−0.0001 (0.00007) *	-1.35E-04 (0.00007) *	−0.0003 (0.00019) *	-3.62E-04 (0.00017) **	−0.0008 (0.00028) **	-7.52E-04 (0.00031) **	1.998	1.975
Total Tourism	-2.75E-10 (1.856E-10)	–	-7.8E-11 (8.16E-11)	–	-9.7E-12 (2.84E-11)	–	-2.5E-11 (7.13E-11)	–	-1.6E-10 (1.09E-10)	–	1.605	–
Foreign Tourism	–	9.11E-10 (8.37E-10)	–	1.20E-10 (4.07E-10)	–	3.84E-10 (1.31E-10) ***	–	8.46E-10 (2.90E-10) **	–	−4.33E-10 (5.05E-10)	–	4.096
Overseas Filipino Tourism	–	-3.58E-09 (1.03E-8)	–	-3.80E-09 (5.02E-9)	–	-2.72E-09 (1.39E-9) *	–	-5.30E-09 (3.57E-9)	–	8.57E-09 (6.22E-9)	–	1.738
Domestic Tourism	–	-3.29E-10 (2.19E-10)	–	-4.94E-11 (1.07E-10)	–	-3.58E-11 (2.96E-11)	–	-7.28E-11 (7.59E-11)	–	-1.71E-10 (1.32E-10)	–	1.431
Adjusted R2	0.6956	0.7298	0.5500	0.529	0.4720	0.6637	0.4301	0.6187	0.6017	0.6151	–	–

Notes: 1) * = Significant at α=0.10, ** = Significant at α=0.05, *** = Significant at α=0.01
2) Number of observations = 48

of 1,000 translates into an increase in incidence of theft of 8 per 10,000,000 population (10 additional theft cases in the NCR).

The number of overseas Filipino arrivals, on the other hand, is significantly and negatively correlated with robbery. For every 1,000 increase in overseas Filipino tourists, incidence of robbery cases falls by 3 per 1,000,000 population. Again, taking NCR as an example, 1,000 additional overseas Filipino tourists is associated with 36 less robbery cases. It could be that criminals are not particularly attracted to overseas Filipino tourists as they are more cautious and also, more likely to report crimes, relative to foreign tourists. It is also possible that these overseas Filipino tourists, being more familiar with local conditions in different parts of the Philippines, would avoid crime areas. The number of domestic tourists, is not found to be significantly correlated with any type of crime.

The coefficient of *Deterrence* (crime clearance efficiency) is consistently significant

and negative in all 10 regressions. A region with a higher proportion of crimes reported and investigated tends to have a lower rate of criminal cases.[3)] This supports the theoretical proposition that the probability of detection and conviction is indirectly related to crime incidence.

Per capita GDP also turns out to be significantly and positively related with aggregate crime, robbery and non-index crime. Regions with higher per capita GDP have more crimes. This is consistent with the "opportunity effect" argument which asserts that the decision to commit crime depends on the availability of target "goods" and the perceived profitability of illegal activities which increases with income and affluence in the community. The significant negative correlation between GDP growth rate and theft, on the other hand, may be reflecting the potential of the people in the region to generate income through legal means and hence, lower rate of theft. Unexpectedly, regions with higher unemployment turn out to have lower rates of aggregate crime, robbery and non-index crime.[4)]

The significant negative sign of the coefficients of the dummy variable for the year 2010 for all types of crimes except non-index crime indicates that there are less crimes of these categories in 2010 compared to 2009. There is a further significant reduction in all types of crimes (non-index crime included) in 2011. Hence, the crime rates in the different regions are generally higher in 2009 compared to 2010 and 2011 which may be reflective of increased effort and improvements in general peace and order condition nationwide during the Aquino administration.

---

3) The crime clearance rate, calculated as the ratio of the number of crimes for which a case has been filed to the total number of crimes reported, is generated and reported in the Philippine Statistical Yearbook by designated government agencies primarily as an indicator of the efficiency of the criminal prevention system or the probability of crime detection and conviction. However, possible under-reporting of crimes in the Philippines may result in artificially high values for this proxy variable. In such a case, public expenditure on police/military may be a more appropriate variable. Lack of regional data on police/military expenditures prevented the authors from running regressions using this alternative deterrence variable.

4) In an alternative regression run where number of crimes, not per capita crime (number of crimes divided by population), is used as the dependent variable, unemployment has the expected significant and positive relationship with crime. These contrasting findings on the relationship between unemployment and crime warrants a further study, preferably, with longer time period coverage in order to track the long-term dynamics between unemployment and crime. At the outset, it can be supposed that unemployment will not instantly convert an individual into a criminal. But persistent unemployment may eventually lead to people resorting to illegal income generating activities.

Conclusions

The study reveals that only certain types of tourists are correlated with certain types of crimes in the Philippines. Foreign tourism is positively associated with robbery and theft while overseas Filipino tourism is negatively related with robbery.

Regression analysis of the panel data set reveals that regions with more foreign tourist arrivals experience higher rates of robbery and theft. It appears that robbers and thieves distinguish between overseas Filipino and foreign travelers, with foreigners considered to be more "suitable" targets associated with a lower propensity to report a crime and more material possessions. These results may also be reflective of overseas Filipino tourists' knowledge and awareness of the conditions in different areas of the Philippines and their decisions to choose the relatively developed and safe regions. Potential offenders, aware of these traits of overseas Filipino tourists, may be labeling these tourists as "less suitable targets" and are thus, not "motivated" to pursue crimes in areas frequented by this type of tourists.

Overall, the findings of the study show that the extent of the impact of tourism on crime largely depends on the characteristics of the visitors and the type of crime, a conclusion that is similar to Pizam's (1982). This implies that efforts in abating the tourism sector's crime externality must take into consideration the demographics of tourist flows. More resources can be directed towards areas that are frequented by foreign tourists. The study also provides strong statistical evidence of the negative relationship between crime and the deterrence factor, the crime clearance efficiency rate of police forces in the Philippines. This potential deterrent factor must be put to maximum use in areas where they are most essential.

Furthermore, the study provides some empirical support for the hypothesized influence of macroeconomic factors. The significant positive relationship of crime with per capita GDP highlights the better opportunities criminals are faced given the more active circulation of goods and services.

The analysis in this paper is limited to the determination of the existence or non-existence of a correlation between different types of crimes and different types of tourists. It is recommended that a further study on the direction of causality between crime and tourism be undertaken to validate the preliminary findings and recommendations of this paper.

References

Becker, Gary S. 1968. Crime and Punishment: An Economic Approach. *Journal of Political Economy* 76: 169–217.

Biagi, Bianca; Brandano, Maria Giovanna; and Detotto, Claudio 2012. The Effect of Tourism on Crime in Italy: A Dynamic Panel Approach. *Economics: The Open-Access, Open-Assessment E-Journal* 6: 2012–2025, accessed December 2013, http://dx.doi.org/10.5018/economics-ejournal.ja.2012-25.

Brenner, Harvey M. 1978. Economic Crises and Crime. In *Crimes in Society*, edited by Leonard Savitz and Norman Johnston, pp. 555–572. New York: Wiley.

Bureau of Agricultural Statistics. Database, accessed in December 2013, http://countrystat.bas.gov.ph.

Cantor, David; and Land, Kenneth C. 1985. Unemployment and Crime Rates in the Post-World War II United States: A Theoretical and Empirical Analysis. *American Sociological Review* 50: 317–332.

Cohen, Lawrence E.; and Felson, Marcus. 1979. Social Change and Crime Rate Trends: A Routine Activity Approach. *American Sociological Review* 44(4): 588–608, accessed December 2013, http://www.jstor.org/stable/2094589.

Department of Tourism (DOT). 2013. Visitor Arrivals Reached the 3-Million Mark in August 2013. October 17, 2013 DOT Press Release, accessed December 1, 2013, http://www.tourism.gov.ph/Pages/IndustryPerformance.aspx.

Fujii, Edwin T.; and Mak, James. 1980. Tourism and Crime: Implications for Regional Development Policy. *Regional Studies* 14(1): 27–36, accessed December 2013, http://rsa.informaworld.com/srsa/content~db=all~content=a758918960~frm=abslink.

Grinols, Earl L.; Mustard, David B.; and Staha, Melissa. 2011. How Do Visitors Affect Crime? *Journal of Quantitative Criminology* 27: 363–378.

Henderson, Joan C. 2011. Tourism Development and Politics in the Philippines. *Tourismos: An International Multidisciplinary Journal of Tourism* 6(2): 159–173.

Johnson, Afrooz Kaviani. 2011. International Child Sex Tourism: Enhancing the Legal Response in Southeast Asia. *International Journal of Children's Rights* 19(1): 55–79.

Jud, Donald G. 1975. Tourism and Crime in Mexico. *Social Sciences Quarterly* 56(2): 324–330, accessed December 2013, https://www.ncjrs.gov/App/publications/Abstract.aspx?id=31363.

Lagman, Oscar. 2008. *The Philippine Tourism Industry: Adjustments and Upgrading*. De La Salle University Angelo King Institute for Business, Economics, Research and Development Working Paper Series 2008–08. Manila: De La Salle University.

Marselli, Ricardo; and Vannini, Mario. 1997. Estimating a Crime Equation in the Presence of Organized Crime: Evidence from Italy. *International Review of Law and Economics* 17(1): 89–113.

McPheters, Lee R.; and Stronge, William B. 1974. Crime as an Environmental Externality of Tourism: Miami, Florida. *Land Economics* 50(2): 288–292, accessed December 2013, http://www.jstor.org/stable/3145040.

National Statistical Coordination Board (NSCB). 2012. Contribution of Tourism Industry to the Economy Posts 5.9 Percent in 2011. November 26, 2012 NSCB Press Release, accessed November 18, 2013, http://www.nscb.gov.ph/pressreleases/2012/PR-20121126_ES4-01_PTSA.asp#.UoluacRmiSo.

─────. Various years. *Philippine Statistical Yearbook*. Manila: National Statistical Coordination Broad.

Pizam, Abraham. 1982. Tourism and Crime: Is There a Relationship? *Journal of Travel Research* 20(3): 7–10.

Ryan, Chris. 1993. Crime, Violence, Terrorism and Tourism. *Tourism Management* 14(3): 173–183, accessed December 2013, http://www.sciencedirect.com/science/article/pii/026151779390018G.

Wallace, Aurora. 2009. Mapping City Crime and the New Aesthetic of Danger. *Journal of Visual Culture* 8(1): 5–24.

World Travel and Tourism Council. 2012. *Travel & Tourism: Economic Impact 2012 (Philippines)*. London: Sovereign Court.

Yu, Krista Danielle. 2012. An Economic Analysis of the Philippine Tourism Industry. *DLSU Business & Economic Review* 22(1): 119–128.