Path Analysis Of Climate And Tourism To The Economic Growth In The Philippines

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Abstract

This study is an empirical validation of the economic and environmental parameters of tourism in the Philippines. The determined tourism factors to be affected by tropical depressions are: tourist arrivals, tourism employment rate and travel price. These factors had varied impacts on economic growth in terms of annual gross domestic product through: exchange rate, inflation rate, consumer price index, and employment rate. The researcher utilized a path analysis to determine which among the tourism factors had a robust effect by the tropical depression. This study also concludes the effects (both direct and indirect) of predictors to GDP. A model was established from the predictors (x) to its response (y). To demonstrate the paths from the origin to the end, a computed path coefficients were generated. The summation of value effects was determined and an effect model was established. Findings revealed that travel price factor was a prevalent element that influenced the volatility of GDP and not more on the tourist arrivals and tourism employment rate. Tourists, regardless of nationality, prefer to spend more their money, enjoy and mesmerize the natural beauty of Philippines even with the occurrence of natural disturbances. Hence, this study implies on strengthening the policy of fixed prices on travels and all in-country cost, developing more the outdoor and indoor tourism industry, the Philippines infrastructure to sustain and enhance tourism services.

Keywords: tourism influx, path analysis, GDP, Economic growth, Philippines

1.0 Introduction

"Tourism is defined by Virola, et.al (2001) as a compromise activity of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited. This means that tourists and visitors regardless of purpose of travel and origin, contributes to the economic behavior of the country. World Travel and Tourism Council stated that tourism industry has been proven to be a major contributor in the economic development in the Philippines. The bounteous tourist destinations of the country include its diverse culture and heritage, rich traditions, beautiful architectures and mesmerizing scenery, landscapes and water forms.

Tourism alone subjugates the third largest item in the world trade (Harrison, 1994) which is also responsible for seven percent of global exports and monetary values (Roberts, 2008). As reported in 2011 by the Department of Tourism (DOT), tourism

industry contributes about 9.5% to the annual gross domestic product. In 2014, a total of Php 157.73 billion was generated from inbound tourists for the first nine months in 2014 by the Tourism Research and Statistics Division (TRSD). Tourism statistics revealed that the top five visitor markets in terms of expenditure are Korea, (Php45.08 billion), the United States (Php 30.86 billion), Australia (Php 9.99 billion), Japan (Php 8.27 billion), and China (Php 7.08 billion). Substantial contributions to visitor receipts were likewise provided by Canada (Php 5.83 billion), United Kingdom (Php 5.78 billion), Germany (Php 3.34 billion), Singapore (Php 3.00 billion) and Saudi Arabia (Php 2.84 billion).

According to the Asian Development Bank of the Philippines (2013), major contributors to the economic growth include inflation, gross domestic product, employment rate, US Dollar exchange rate, relative consumer price index, and frequency of seasonal challenges. Moreover, the growth of international tourism during the past 30 years was due on employment caused by the tourism industry, foreign exchange earnings, balance of payments and the global economy in general (Mchone, 2000). As of 1998, *The Economist* concluded that over four in ten jobs in the Philippines were supported by the tourism industry with a rapid share in the country's economy.

Additionally, between 1994 and 1998, employment generated by tourism increased from 20 percent to 22 percent of the total employment rate for the whole economy. Also, tourist arrival for many countries is a significant and growing source of foreign exchange earnings. In India, about 5.92% of the country's GDP comes from tourism and it provides employment to over 9.24% of the country's workforce (Stynes, 2009). Similarly, a study conducted in Malaysia by Tang (2011) explained the causal relationship of inflation, employment, tourist arrivals to the economic standing of Malaysia within South East Asian Nations.

Consistently, one of the many concerns of tourists coming to the country aside from the entertainment or leisure, and natural attractions, are the prices of the commodities and services. Price factors are relevant when weighing travel options. According to Brakke (20014) tourists consider two (2) components in a travel namely: (1) transport costs or the cost of traveling to a destination country by land, air, or sea. Theoretically, by location and distance, price of air fares vary wildly. (2) in-country costs- in general, country costs represent the expenditures of visitors in a country for a short-term (Sinclair, 1998). This includes accommodation, food, drinks, tour services, souvenirs, entertainment and among many others. Travelers' activity is primarily subjected to prices of many different markets.

In similar term, occurrences of natural phenomenon like typhoons, earthquakes, floods or strong winds inflicted considerable loss in the rise of economic stability in Guandong province (Smeral, 2003). This implies that climate is one of the determinants for a certain country's economic development.

Utilizing the concepts and ideas being presented from varied credible sources, the tourism variables to be measured are in terms of: (1) tourist arrivals; (2) tourism employment; and (3) travel price factor. These factors had direct and indirect effects also on the following factors namely: (1) exchange rate; (2) employment rate, (3) inflation rate, (4) consumer price index; and finally to (7) gross domestic product.

The purposes of this study are to: (1) determine which among the factors in tourism sector is highly affected by tropical depressions, (2) identify which

among the tourism factors largely contribute to the fluctuations of gross domestic product, (3) predict the percentage impacts and prevalent effect of tropical depression and tourism factors (tourist arrivals, tourism employment and travel price factor) to the volatility of gross domestic product.

2.0 Designs and Methods

This study made use of the path analysis to trace the fit of the relationship matrix of the causal models (Padua, et.al, 2014). Path analysis model will determine and trace the causes of high economic growth from climate and the tourism factors in the Philippines. The model made use of single-headed arrow to signify causality.

Furthermore, to determine the path weight of each variable, regression analysis was utilized. This is to show both the direct and indirect effect of the variables (independent and dependent).

1. Tourists Influx (TI) refers to the massive coming or arrival of visitors or people in a country. A number of tourists' arrivals in the Philippines was noted from several records from 2004-2010 (Department of Tourism, 2011). This implies that there was a massive headcount of tourist in the country per year.

2. Exchange rate (ExR) is the price for which the currency of a country can be exchanged for another country's currency. Factors that influence exchange rate include (1) interest rates, (2) inflation rate, (3) trade balance, (4) political stability, (5) internal harmony, (6) high degree of transparency in the conduct of leaders and administrators, (7) general state of

economy, and (8) quality of governance.

3. Inflation Rate (IR) is defined as a sustained increase in the general level of prices for goods and services. It is measured as an annual percentage increase of commodities. Also, it is the increase of prices in accordance to a given price index (Commey, 2002). As inflation rises, every dollar a tourist own buys a smaller percentage of a good or service in a certain country.

4. Consumer Price Index (CPI) is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food and medical care. The CPI is calculated by taking price changes for each item in the predetermined basket of goods and averaging them; the goods are weighted according to their importance. Changes in CPI are used to assess price changes associated with the cost of living.

5. Employment Rate (EmR) is the rate measured by the number of citizens employed in ratio to a given population.

6. Tropical Depression Frequency (TDF) refers to the number of weather disturbances in a country. Tropical depression has direct and immediate implication of tourism influx as it appropriately response to its arrivals (Crandall, 2004).

7. Gross Domestic Product (GDP) is the gross national market value of all officially recognized products in the country in a given period of time. It is the totality of final expenditures of goods and services less the amount of imports of goods and services. It

is measured through the government consumption and spending, investment, and net export (Organization for Economic Cooperation and Development, 2001).

The statement stated about GDP, implies that higher GDP indicates positive economic growth.
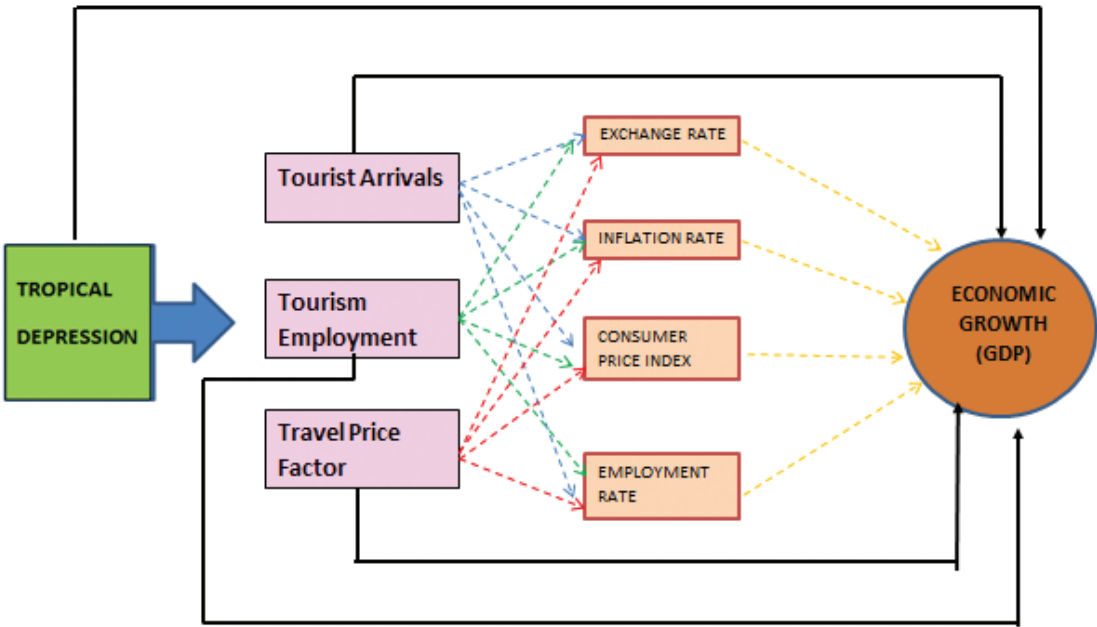

Figure 2. Path Coefficient Results on Tourist Arrivals

Using linear regression, the direct *(bold and black arrows)* and indirect *(colored and broken arrows)* effects of path from tropical depression to tourist arrivals to GDP were considered. The predictor value of weather disturbances to tourist arrivals is -0.116 which explains about 1.3% of variances in the tourist counts in the country. Also, it has been depicted that tropical depression causes a direct 5.4% of variances in the GDP. This value (-0.2320) is constant among the three factors of tourism as a direct effect to the response variable of this study.

The indirect effect of the identified predictors was summarized in Tables 1. There are seven (7) different indirect paths from TD to GDP. The sum of its path coefficients marked the effect value from TD to GDP.

Table 1. Summary of Path Weights caused by TD, TA to GDP

Origin	Direct Effect	Indirect Effect	Path Coefficients	Effect
Tropical Depression	**-0.2320**	TA-GDP	-0.11066	*(direct effect + indirect effect)*
		TA-ExR-GDP	0.006995	
		TA-Inflation-GDP	-0.00658	
		TA-Inflation- ExR-GDP	0.000579	
		TA-Inflation-CPI-GDP	-0.00437	
		TA- CPI-GDP	0.09818	**-0.201563**
		TA-EmR-GDP	0.046201	
		TOTAL	**0.030337**	

Table 1 manifests the effect of tropical depressions in terms of tourist arrivals to the economic growth in the Philippines. The indirect effects from tropical depression to tourist arrivals and to GDP were enumerated. The product of its path coefficient, for example TD TAà GDP= -0.116 * 0.954 = 0.110664. The process of computation was repeated in the same manner following the different paths. Among the indirect effects, the predictor with the highest indirect effect to GDP is TDàTAàCPIà GDP (0.0981795). This means

that tourist arrivals highly affect the behavior of consumer price index of the commodities in the destination country. And the sum of direct and indirect effect of TD, TA to GDP = -0.201563 only.

Moreover, the effect of tropical depression occurrences in a destination country to the tourism employment rate was considered. The diagram below shows the path effect of tropical depression to tourism employment and to GDP in terms of direct and indirect effect.
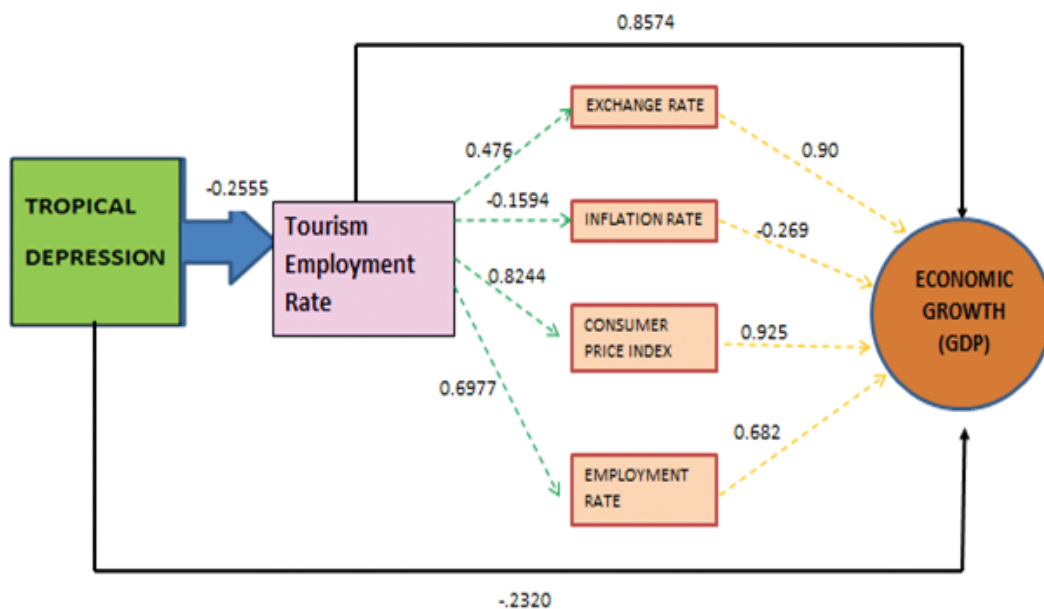

Figure 3. Path Coefficient on Tourism Employment Rate

Based on the figure, the path coefficient of all possible paths to GDP were determined. The indirect effect from TD, TA to GDP is the product of its path coefficients to the response variable. For example, the indirect effect of tropical depression passing to tourism employment rate (TEmR) to consumer price index (CPI) to GDP = -0.2555*0.8244*0.925= -0.194836635. Thus, the results of all indirect paths were computed using linear regression of the standard coefficients of all the predictor variables. This manner was utilized repeatedly in all possible paths to regulate the path coefficients. The results were shown in table 2 below.

Table 2. Summary of Path Weights on Tourism Employment Rate (TEmR)

Origin	Direct Effect	Indirect Effect	Path Coefficients	Effect
Tropical Depression	**-0.2320**	TEmR-GDP	-0.2190657	*(direct effect + indirect effect)*
		TEmR-ExR-GDP	-0.0109456	
		TEmR-Inflation-GDP	-0.0109555	
		TEmR-Inflation- ExR-GDP	0.00964001	**-0.529515094**
		TEmR-Inflation-CPI-GDP	0.00707341	
		TEmR- CPI-GDP	-0.1948366	
		TEmR-EmR-GDP	0.12157492	
		TOTAL	**-0.297515094**	

Table 2 reveals the effect of tropical depression with the tourism employment to annual gross domestic product. The summation of direct and indirect path coefficients is **-0.529515094** which implies that occurrence of tropical depression has no effect to the tourism employment rate and to GDP as its end determinants. In similar term, the occurrence of tropical disturbances does not hire or fire any worker in the tourism industry. Workers remain in their field even typhoons hit in certain tourism destination. This leads to a constant tourism employment rate. Moreover, tourism employment rate holds the highest indirect effect to GDP through employment rate with the value of 0.12157492.
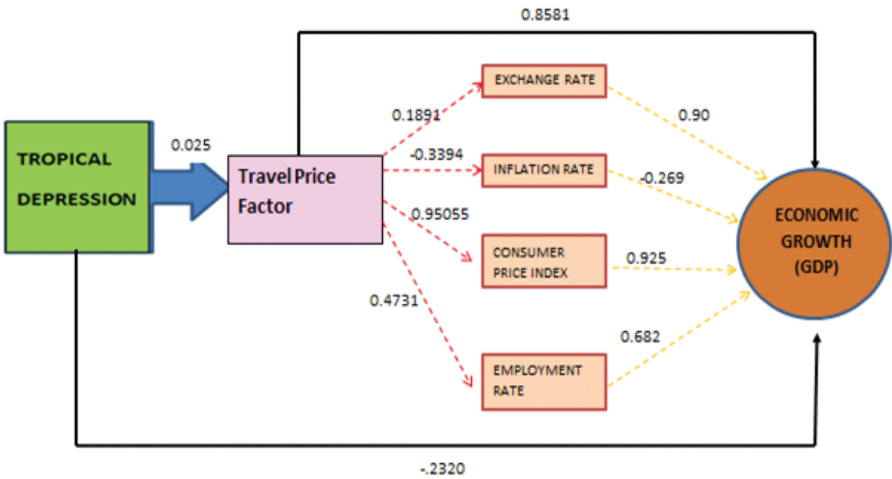

Figure 4. Path Coefficient Results on Travel Price Factor

Lastly, the third factor of tourism identified in this study was the travel price factor. Figure 4 demonstrates all the path effects from TP, TPF to GDP. In same manner, the path coefficients are the product of each linear regression coefficient from the predictor variable up to the response variable. The origin of the path is the tropical depression and its end is the GDP. The results of the indirect effects of travel price factor were all shown in table 3.

Table 3. Summary of Path Weights on Travel Price Factor (TPF)

Origin	Direct Effect	Indirect Effect	Path Coefficients	Effect
Tropical Depression	**-0.2320**	TPF-GDP	0.0214525	*(direct effect + indirect effect)*
		TPF-ExR-GDP	-0.00042548	
		TPF-Inflation-GDP	0.002282465	
		TPF-Inflation- ExR-GDP	-0.0020084	
		TPF-Inflation-CPI-GDP	0.001514785	**0.297515094**
		TPF- CPI-GDP	0.021981468	
		TPF-EmR-GDP	0.008066355	
		TOTAL	**0.052863698**	

The indirect effects of tropical depression (TD) through the travel price index were considered. The sum of direct and indirect effect from TDàTPFà GDP= 0.297515094 which means that tropical depression through travel price factor has an impact to the annual behavior of GDP. Among the indirect effects, travel price factor through consumer price index attains the highest indirect effect (0.021981468) to GDP.

The researchers then proceeded to compare the effects of tropical depression to tourism factors and the effects of these to GDP. The total results were shown in the table below.

Table 4. Effects of Tropical Depression to Tourism Factors and GDP

Tourism Factors	Effects of Tropical Depression (%)	Total Effects to GDP
Tourist Arrivals	1.3	-0.201663
Tourism Employment	0.1	-0.529515094
Travel Price Factor	6.5	0.297515094

Upon considering the three factors of tourism, (tourist arrivals, tourism employment rate, and travel price factor) tropical depression affects these factors by 1.3%, 0.1% and 6.5% respectively. It is highly evident that decisions on transport costs and in-country costs are affected by weather turbulence. Based on the percentage, the cost of travel and tourism commodities fluctuate when typhoons are coming. Consistently, travel price factor has a robust effect to GDP. 80.1% of variance in GDP was explained by this factor. It has the highest effect of 0.297515094. This factor is followed by tourist arrival with a value of -0.201563

and lastly, the tourism employment rate having an effect value of -0.529515094. These findings mean that among the tourism factors included in the study, the two aspects has lesser effects to the fluctuations of GDP per year compared to the first factor mentioned.

4.0 Conclusion

Tourism's role to the economic growth is quite many and complex. Climate makes tourism industry resilient. Tourism industry is one of the great contributing determinants to the annual gross domestic product of the Philippines even though a number of weather conditions have been forecasted to hit the country which are irrepressible. Among the identified tourism factors, travel price had been affected by these natural weather disturbances. These prices accordingly had a high positive effect on GDP among other factors as a whole in terms of tourist utilization of goods, tourist accommodation, food and drinks, passenger transport, travel agents, tour operators and tourism guides and souvenirs, recreation, entertainment and cultural services.

On the process of targeting large GDP per year, Philippines has to make significant investments on infrastructure to improve airports, roads, accommodations, tourism activities and public services to facilitate the needs of incoming tourists. Also, with the recorded natural incident of typhoons in the Philippines, it does not lead tourists to postpone their travel schedules nor travel cost increases. However, the nation has to work on unified and standard prices of travel goods and services regardless of locations since tourists are not stressed out on unfavorable weather conditions. Hence, travel safety measures and indoor tourism in the country must be

strengthened to accommodate these tourists who are willing to take the risk of travelling and contribute more to the tourist revenues for an increase of GDP.

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