

The Effect of COVID-19 on Tourism: A Comparative Statistical Study

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ABSTRACT

The Tourism industry is one of major contributors to national development. It plays a major role in nation's economic development by bringing needed foreign exchange and creating jobs. There are many countries who have made have been put on the world made just because of tourism. The key when it comes to tourism is the ability of a nation to effectively put in place policies and structures that allow it to tap into its huge potential. Many people who have studied the field of tourism are in agreement that it has a huge role to play in ensuring sustainable and balanced national development. With the Coronavirus pandemic however, the tourism industry has tremendously been affected resulting in adverse outcomes to tourists, employers, developing and developed nations around the globe. The disease is caused by a virus and affects the respiratory system. Code named SARS-CoV-2, it has brought the world to a standstill since the later part of 2019. It has had its effects on all aspects of life as we know it and many nations are still battling to keep its deadly effects under control. The advent of this disease has affected the tourism sector to a very large extent most especially due to closure of national borders and the enforcement of lockdowns. This paper took a look at the situation in Ghana's tourism sector. The research work showed that Ghana is at a high risk of losing huge numbers of international visitors. It provides a model for putting actual numbers to the potential effect of the COVID-19 pandemic on the nation's tourism industry.

Keywords: Tourism; COVID-19; Development; Impact; Nation

INTRODUCTION

Economic theory places tourism in the third Service Sector. This is so because the various components of the tourism industry seek to provide services to people. These include leisure activities, travelling, accommodation and visiting sites. Those who play an active role in the above are providing a service to tourists and enthusiasts of the tourism sector. States that people who patronize tourism services are placed in the category of utilizers since the business of tourism cannot be stored or enumerated. Therefore, when a tourist visits a place or tours a monumental site in any part of the world, he or she is utilizing the commodity of tourism by spending time and money in that particular locality. It logically right to note that the absence of visitors adversely affects the ability of tourist establishments to sell their goods or put their services to effective use. When there are no visitors, there are no sales. The absence of a need for

tourism will inadvertently lead to the demise and bankruptcy of all businesses that are linked to the industry [1].

Such a situation is called a crisis and has the potential of killing an entire industry at best and rendering it obsolete. The global village phenomenon brings into play greater effects. This is because the closure of the restaurant at a tourist site will mean a loss of a contract for its suppliers and a huge disruption of the supply chain that is related to the work of the restaurant. Thus, the food sector is affected including farmers, those who process the food, those who sell the processed food and those who cook it. There will be in a snowball effect loss of jobs and human livelihood. This will ultimately increase the number of employed in a nation and the economic and society are affected [2].

Looking at things from a natural point of view, the ramifications discussed above might not be as huge but on a smaller scale there is a probability that the supply chain in a situation as the one described above is very possible. Even such a small effect is

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negative and unwholesome. This calls for studies to be made in order to understand the real cost of a crises on a particular sector. The use of numbers, data and models give a clearer idea as to the sources of such crises, its effects and how decision makers can respond should crises arise. These studies would serve as a basis for predictions and preparations that can be put in place to forestall the effects of such a crisis. States very clearly that our world has become a very complex place. Taking in Maslow's theory of needs into consideration in the advent of crisis, a world that is constantly under the barrage of countless crisis will see the priorities of consumers of the delights of tourism shifting from tourism centered desires to the need to survive, gives a very interesting insight into the above by opining that the advent of crisis causes a change in the attitude of patrons of the tourism industry. Such people would rather carryout internal visits and indigenous tourism than to move from one nation to another in order to satisfy their need for sigh seeing and relaxation as well as saving costs of travel and foreign expenditure [3].

LITERATURE REVIEW

The world has been hit in a very serious way by the surge of the COVID-19 pandemic. It is a crisis of an unprecedented nature that has affected the world from the December 2019 till now. It comes after the global financial crisis in 2008 which caused complications in all spheres of human endeavour including the vacation and travel sector. One of the very first issues for consideration in such a time is that of the health and safety of tourists [4].

Opines the lack of research work on the impact of crises on the tourism industry and how that research has affected the decisions of governments and nations. Most of the research done so far with respect to the effects of crisis on the tourism sector has mostly been on the reactions of costumers to crisis or the management and control of the negative impacts of crisis on the sector. Others have focused the way providers in the sector have reacted to crises. Looking at the supply-side of the industry in a crisis is typically a solitary in any municipality, state or territory [5].

In the case of tourism, the use of models has usually been restricted to demand models more than supply modelling. In fact states that the former is more relevant to forecasting when it comes to tourism research than the later. Supply forecasting is a tool for people who make policies, manage organizations. However, the application of econometric principles to tourism is absent in the literature reviewed with the study by being an exception. In as much as discussions abound on the effect of the COVID-19 pandemic abound, this a scarcity of research work in the field. This study aims at filling that gap. This paper uses the work from existing studies on other disease-related pandemics as a basis for a hypothesis on the effect of COVID-19 on the tourism industry and market [6].

METHODOLOGY

In the past few years many techniques have been adapted as a means of understanding the economic effects of infectious

diseases. Some of these techniques that have been put forth in literature follow two main approaches. These are the microeconomic and macroeconomic approaches. The former of these methods is an evaluation based on the individual or households. The approach measures the national effects of a disease using an aggregation of the same effects on individuals and households in the nation. The defect in this approach is quite clear because such a study might not be a true measure of such effects because they do not take into consideration macroeconomic and external factors [7].

The macroeconomic technique takes on a larger scale and looks at the effects of diseases on the national scale. They express variables that determine economic outcomes in a nation as a function of changes in the health repressors that affect a population, opines that the drawback of this approach is the endogeneity problem that arises from negative economic outcomes and the incidence of infectious diseases. This means that economic status is a determinant of one's health and at the same time, the health status of a person influences their income levels. Both the micro and macroeconomic approaches do not have a means of forecasting future costs and benefits. In short, they do not provide a means of planning with the future in mind [8].

In time series models are proposed as a good means when evaluating the effects of diseases of epidemic proportions which are transitory. Also the combination of an autoregressive moving average model with an exogenous variable can be used in cases that involve a disease like the COVID-19 pandemic [9].

In the above mentioned a approach, the occurrence of the said illness is included in the model using a dummy variables at the times where the illness occurs. In cases where the variability of the said disease does not change significantly over a period of years, the time series model is not a suitable tool.

However, it has been used for many other exercises because it is a good fit and can be used in studies concerning international trade. The importance of this model lies in the fact that tourism is a form of trade thus gravity equations have been applied in the understanding the quantum of tourism flows in many different settings. The use of the gravity equation method has undergirded international trade theory over the years and has recently gained transaction in the tourism industry based on the use of the consumer theory [10].

The dependent variable (Tour) represents the total number of tourists that arrive in a country to another country during a particular year. The other variables include Gdppc is the per capita real gross domestic product of the nation to which one is travelling; Ppl the total number of people in the destination country. Dt represents how far the country being visited is from the country of origin. The following variables take into consideration the commonality of a border based on geography Bo, language spoken (Lg), colonial background Col, colonizer Cmnl Scntry is factored into the equation if the visit is in the same country. If none of these are not applicable in a particular setting, they default to zero. Defines as an index that measures similarity of religion in both nations. If both nations are signatories to the same regional agreement the (Rag)

dummy variable is used. The Rlw variable is used a proxy for the effectiveness of institutions in the country being visited. The state of security and stability of the nation being visited is catered or by the TER variable. It is determined by the number of people who are affected by the attacks of terrorism for every 10, 000 inhabitants. The term Hersite is used to accommodate the number of World Heritage Sites in the nation that is being visited. The annual average temperature in the country being visited is catered for by the Tp variable while LfEx caters for the life expectancy on average at birth in the destination. Last but not least represents the well-behaved disturbance term.

The Tour, Dt, Gdp, Ppl, Tp and LfEx variables are taken in natural logs (ln). This is done to lessen the circumstance in which the variability of the above variables are unequal across the range of values of a second variable that predicts it. These variables can be described as elasticities.

The variable DRi is very key because it takes into account a list of diseases that are related to travel. These are communicable diseases like Yellow Fever, Ebola, Malaria and COVID-19. The variable defaults to 1 if there is the risk of contracting the disease in the destination country but is zero otherwise.

This research makes the assumption that the existence of a particular disease in a nation has a direct impact on the tourism industry there. The work doesn't look at the prevalence ratio of the disease year on year. This research work thus considers that tourists will not visit a country once they have information that there is moderate to high risk of contracting a disease such as those stated above in a destination country. Also this work was carried out based on the assumption that travel warnings about the risk of contracting a particular disease was constant between 2019 and 2020. The existence of the disease in a nation puts it at risk even if there are no present cases.

The variable is destination-specific. It is also does not change with time thus panel estimation techniques cannot be applied. Time-varying fixed effect variables are used to cater for factors from the originating country such as population or gross domestic product per capita. Therefore, an extensive set of destination and country-pair controls are included in the regression. The main equation stated above is estimated by selecting different values for each of the variables in the host country in a particular year. Also, standard errors are added to the source country pairs (Table 1).

| | Obs | Average | Standard Deviantion | Minimum | Maximum |
|-----------------------|---------|---------|---------------------|---------|---------|
| InTour _{jt} | 142 415 | 6.918 | 3.277 | 0 | 18.18 |
| InGdppc _{jt} | 142 415 | 8.488 | 1.447 | 4.91 | 11.36 |
| InPpl _{jt} | 142 415 | 16.052 | 2.04 | 9.86 | 21.06 |
| InDt _{ij} | 142 415 | 8.492 | 0.954 | 2.35 | 9.9 |
| Bo _{ij} | 142 415 | 0.038 | 0.191 | 0 | 1 |
| Lg _{ij} | 142 415 | 0.19 | 0.392 | 0 | 1 |
| Col _{ij} | 142 415 | 0.02 | 0.14 | 0 | 1 |
| Cmncl _{ij} | 142 415 | 0.106 | 0.308 | 0 | 1 |

| | | | | | |
|-----------------------|---------|-------|-------|-------|------|
| Scntry _{ij} | 142 415 | 0.018 | 0.133 | 0 | 1 |
| RelSm _{ij} | 142 415 | 0.19 | 0.235 | 0 | 0.99 |
| Ragi _{jt} | 142 415 | 0.191 | 0.393 | 0 | 1 |
| Rlw _{jt} | 142 415 | 0.108 | 0.93 | -1.95 | 2 |
| TER _{jt} | 142 415 | 0.008 | 0.05 | 0 | 2.14 |
| Hersite _{jt} | 142 415 | 7.063 | 9.622 | 0 | 53 |
| InTp _{jt} | 142 415 | 2.768 | 0.565 | 0.41 | 3.34 |
| InLfEx _{jt} | 142 415 | 4.262 | 0.127 | 3.71 | 4.43 |
| Mal _{jt} | 142 415 | 0.147 | | 0 | 1 |
| YllFev _{jt} | 142 415 | 0.146 | | 0 | 1 |
| Eb _{jt} | 142 415 | 0.325 | | 0 | 1 |
| Cvd-19 _{jt} | 142 415 | 0.006 | | 0 | 1 |
| TrdRan _{jt} | 142 415 | 0.388 | | 0 | 1 |

Table 1: Descriptive statistics.

The effect of infectious diseases on the arrival of tourists

Opines that the evaluation of tourism demand with respect to time makes it possible to evaluate both the dynamic evolution of the industry and the structural nature of its determinants. However, since the issuance of travel warnings about the risk involved in contracting a disease remains a constant, this work compares the tourist arrivals to countries with and without the risk of contracting a particular disease. The impact of the existence of travel related disease on the choice of a tourist is the focus of this study as opposed to the short-run effect of its eradication. This implies that a tourist might not visit a country if he or she is convinced that they might contract a disease related to their travel. Such a tourist will choose another destination with low or no risk at all. In such a case the variable DRi assumes a negative value.

The table below shows the estimated values of the above described coefficients and different regression-based statistics for the equations stated. This is done for each of the following travel related diseases namely Yellow Fever, Ebola, Malaria and COVID-19. The separate evaluation of each of the diseases stems from the fact that the policies and measures involved in medically eradicating each of these diseases is different. However, from the view of econometrics, the use of a joint estimation causes a high correlation between countries affected by different diseases. This gives unexpected or insignificant results for some of the diseases.

The main equation stated above is estimated by selecting different values for each of the variables in the host country in a particular year while including effects that are fixed. A variance of 77% in tourist arrivals from overseas is seen from the R-square values in the table below. The values in the table also reveal a trend that is corroborated in literature, the signs and sizes yielded by the parameters are just as expected. This shows that the model is aptly suited to be used in the study. The parameters used in the estimation are quite similar in the four regressions for each of the illnesses that pose a risk to international travel (Table 2).

| | (A) | (B) | (C) | (D) | (E) |
|-----------------------|-----------|-----------|-----------|-----------|-----------|
| InGdppc _{jt} | 0.405*** | 0.491*** | 0.452*** | 0.463*** | 0.404*** |
| | -0.0191 | -0.0186 | -0.0183 | -0.0183 | -0.0184 |
| LnPpl _{jt} | 0.673*** | 0.664*** | 0.656*** | 0.658*** | 0.650*** |
| | -0.0101 | -0.00998 | -0.01 | -0.00996 | -0.0099 |
| LnDt _{ij} | -1.316*** | -1.290*** | -1.295*** | -1.300*** | -1.282*** |
| | -0.0234 | -0.0235 | -0.0235 | -0.0233 | -0.0235 |
| Bo _{ij} | 1.221*** | 1.269*** | 1.243*** | 1.244*** | 1.263*** |
| | -0.12 | -0.121 | -0.122 | -0.122 | -0.121 |
| Lg _{ij} | 0.875*** | 0.886*** | 0.875*** | 0.872*** | 0.900*** |
| | -0.0442 | -0.0443 | -0.0445 | -0.0444 | -0.0441 |
| Col _{ij} | 0.785*** | 0.774*** | 0.783 | 0.789*** | 0.766*** |
| | -0.113 | -0.114 | -0.115 | -0.114 | -0.115 |
| Cmncl _{ij} | 0.474*** | 0.419*** | 0.454*** | 0.453*** | 0.468*** |
| | -0.063 | -0.0634 | -0.0631 | -0.0633 | -0.0627 |
| Sctnry _{ij} | 0.0918 | 0.135 | 0.091 | 0.0863 | 0.134 |
| | -0.142 | -0.143 | -0.144 | -0.144 | -0.143 |
| RelSim _{ij} | 1.080*** | 1.122*** | 1.102*** | 1.092*** | 1.134*** |
| | -0.0659 | -0.0663 | -0.0663 | -0.0663 | -0.0658 |
| Ragi _{jt} | 0.747*** | 0.769*** | 0.777*** | 0.773*** | 0.777*** |
| | -0.0439 | -0.044 | -0.0441 | -0.0439 | -0.44 |
| Rlw _{jt} | 0.539*** | 0.414*** | 0.466*** | 0.467*** | 0.472 |
| | -0.0255 | -0.0261 | -0.0249 | -0.0249 | -0.0248 |
| TER _{jt} | -2.059*** | -2.260*** | -2.225*** | -2.146 | -2.378*** |
| | -0.237 | -0.238 | -0.239 | -0.239 | -0.239 |
| Hersite _{jt} | 0.0202*** | 0.0178*** | 0.0192*** | 0.0189*** | 0.0197*** |
| | -0.00195 | -0.00201 | -0.00199 | -0.002 | -0.00197 |
| InTp _{jt} | 0.735*** | 0.711*** | 0.709*** | 0.662*** | 0.854*** |
| | -0.0294 | -0.0296 | -0.0325 | -0.029 | -0.0336 |
| InLfEx _{jt} | -0.781*** | -0.302** | 0.185 | 0.127 | 0.0208 |
| | -0.162 | -0.152 | -0.154 | -0.155 | -0.152 |
| Mal _{jt} | -0.629*** | | | | |
| | -0.0531 | | | | |

| | | | | | |
|-----------------------|-----------|---------|---------|---------|---------|
| YllwFev _{jt} | -0.445*** | | | | |
| | -0.0406 | | | | |
| Eb _{jt} | -0.124*** | | | | |
| | -0.0343 | | | | |
| Cvd-19 _{jt} | -0.324* | | | | |
| | -0.187 | | | | |
| TrdRan _{jt} | -0.464*** | | | | |
| | -0.0373 | | | | |
| Observations | 142 415 | 142 415 | 142 415 | 142 415 | 142 415 |
| R-squared | 0.77 | 0.77 | 0.768 | 0.768 | 0.766 |

***p<0.001, **p<0.05, *p<0.1

Table 2: Effect of the risk of contracting a disease on international travel.

The Gross Domestic Product and the population values are high. This means that tourists prefer to visit countries that are richer and highly populated. The variable that represents the distance between the country of origin and the destination country; which describes the expense associated with a tourist trip is negative and significant. This value is buttressed by the fact that the dummy variable that represents the proximity of the borders between the originating country and the destination country is positive. This implies that tourists prefer to visit nations that are closer to them than those that are further away. Factors such as the commonality of language, colonial links and religion show positive coefficients from the estimates. This means that a cultural gap is a relevant factor which can be used to explain international tourism demand. From the above, it is seen that nations with a coast can expect a high number of tourist arrivals. Other factors that yield a positive effect are the presence of regional trade agreements. This variable serves as a proxy to determine the intensity of economic activities that occur between the original country and the destination country.

All parameters relating to the Travel Related Diseases (TRD) are show negative signs. It confirms that there is a negative relationship between the presence of a disease in a nation and the number of tourists that visit it. This is an expected turn out. As a result of this, countries that are at risk of a travel related disease will receive fewer international visitors. In the case of malaria, an endemic nation will receive 47% less visitors. For yellow fever the value is 36% less. Countries with a risk of contracting COVID-19 will receive 12% less visitors whereas those with an endemic Ebola situation will receive 28% less visitors. The observation of this parameter clearly proves that the risk of contracting a disease on visiting is a barrier for the growth of the tourism industry. It is also seen that malaria poses

a greater risk than other diseases. It is quite obvious that travelers from highly developed countries might be more averse to visiting countries where these diseases are endemic than those from less developed nations. This implies that the risk associated with a travel related disease has a close association with the level of development of a nation. In order to cater for this the subsamples relating to countries of origin are disaggregated based on levels of development using the Human Development Index (HDI) in order to make the model robust. Using this index, 114 countries are developed while 94 are developing countries. Such countries have medium or low HDI. The former set of countries have high HDI.

CONCLUSION

The effect of the COVID-19 pandemic is unprecedented. The impact of this disease on all sectors of industries and individual lives has been devastating. The financial losses have been significant and has caused significant uncertainties. Possible scenarios show that there will be 60% to 80% decline in the arrival of international tourists for a year. This is dependent however on how fast the pandemic can be contained and how long borders will be closed due to travel restrictions and the closure of borders. This will ultimately affect the statistical data for tourism in 2020. These effects will in no doubt be seen in Ghana. Models must be developed to take into consideration the Ghanaian situation in order to gauge the nominal real-time. Such a study will help the government to develop strategies to

alleviate future possibilities of such a crises while looking at how best to deal with the current effects of the pandemic.

REFERENCES

1. Richardson B. Crisis Management and Management Strategy–Time to “Loop the Loop”? *Disaster Prevention and Management*. 1994;3(3): 59-80.
2. Paraskevas A, Altinay L, McLean J, Cooper C. Crisis knowledge in tourism: types, flows and governance. *Annals of Tourism Res*. 2013;41:130-152
3. Smeral E. International tourism demand and the business cycle. *Annals of Tourism Res*. 2012;39(1):379-400.
4. Kozak M, Crotts J, Law R. The impact of the perception of risk on international travellers. *Int J Tourism Res*. 2007;9(4):233-242.
5. Faulkner B. Towards and framework for tourism disaster management. *Tourism Mgmt*. 2001;22(2):135-147.
6. Song H, Li G. Tourism demand modeling and forecasting—a review of recent research. *Tourism Management*. 2008;29(2):203-220.
7. Basili M, Belloc F. How to measure the economic impact of vector-borne diseases at country level. *J Economic Sur*. 2015;29(5):896-916.
8. Sachs J, Malaney P. The economic and social burden of Malaria. *Nature*. 2002;415(6872):680-685.
9. Kuo H-I, Chen C-C, Tseng W-C. Assessing impacts of SARS and Avian Flu on international tourism demand to Asia. *Tourism Management*. 2008;29(5):917-928.
10. Wang YS. The impact of crisis events and macroeconomic activity on Taiwan’s international inbound tourism demand. *Tourism Mgmt*. 2009;30(1):75-82.