

An Analysis of Tourist Spending by International Visitors to the United States during the COVID-19 Pandemic

Eyitayo Olaleye*, Jacob Oluwoye

Center for Urban and Rural Research, Department of Community & Regional Planning, Alabama A & M University, Normal, US
Email: *eolaleye@bulldogs.aamu.edu

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Abstract

The COVID-19 pandemic disproportionately affected sectors that require international travel. One of these is the tourism sector. This study examined the impact of the pandemic on the spending patterns of international tourists in the United States. Using a vector autoregressive (VAR) framework, the study explored the influences of COVID cases and deaths on the number of international visitors in the United States. Exogenous variables in the VAR model are tourists' expenditure, GDP, and the total population of tourists' countries of residence. The lag order selected by Akaike and Schwarz information criteria was 2. The findings revealed that immediate past values of COVID cases and deaths determined their current figures as well as the count of international tourists in the U.S. Furthermore, tourists' expenditure, as well as GDP and population of tourists' countries, influenced the propensities of international tourists to select the U.S. as their destination. However, tourists' spending was not found a significant determinant of COVID cases and deaths, suggesting that coronavirus did not respect the spending abilities of the tourists. The study concluded that the U.S. authorities should be prepared for more inflow of visitors from countries with high GDP and high populations and should be cautious of high spending patterns of visitors as this may add to the existing inflationary pressures in the country.

Keywords

Tourists' Spending, COVID-19, United States, VAR, International Visitors

1. Introduction

The tourism industry is one of the strongholds of economic activity in the world.

In 2019, the travel and tourism sector accounted for more than 10% of the global GDP, but this share decreased to less than 6% in 2020 due to COVID-19 restrictions (World Tourism Organization, 2022). In particular, the United States is one of the top destinations of international tourists in the world. According to the World Travel and Tourism Council (2021), the United States received the third-highest number of international visitors worldwide in both 2019 and 2020 after France and Spain. However, the outbreak of the coronavirus pandemic lowered the number of foreign tourists in the United States from 79.4 million in 2019 to 19.4 million in 2020, and spending by these tourists fell from \$199.4 billion to \$72.8 billion (National Travel and Tourism Office, 2021). These developments pointed to the impact of the pandemic on the tourism industry of the United States. As of June 2022, the University of Oxford (2022) reports that there had been 86.6 million cases of COVID-19 in the United States and 1.01 million deaths, compared to 542 million cases and 6.33 million deaths worldwide.

Nevertheless, findings by Mortazavi (2021) and Han et al. (2020) have hinted that expenditure by tourists has a positive impact on the count of international tourists in the U.S. The rationale provided is that international visitors are always prepared for the spending their visits may require. But the U.S. experiences during the pandemic did not uphold this reasoning. It is against this background that this study intends to examine the spending patterns of international tourists in the United States during the high waves of COVID-19 in 2020. This study brings an innovative approach to the examination of the nexus between travel, tourism, and spending habits. It also attempts to critically examine the pattern and direction of the transfer of not only financial resources among nations but COVID-19 infections between peoples.

This paper proceeds as follows. The next session reviews the relevant literature on the factors determining to spend by international tourists. This is followed by a specification of VAR model and definitions of variables. The estimation results are then presented and discussed. Finally, concluding remarks are highlighted.

2. Spending by International Tourists: Literature Review

The volume and composition of spending by international visitors in the destination country catch the attention of researchers mostly because of the impact of such expenditure on domestic economic activities. This impact is popularly referred to as the tourism-led growth hypothesis (Balaguer & Cantavella-Jorda, 2002). The mechanism by which this relationship manifests is that tourist spending boosts employment, increases tax revenues, and adds to the foreign exchange earnings of the host country (Dogru & Sirakaya-Turk, 2017). In addition, tourism enhances the exchange of social institutions and cultures amongst countries. This can help infuse practices and ideas that accelerate domestic production and enhance business competitiveness (Cohen, 2012). In particular, tourism encourages the transfer of resources, capital, and knowledge to the destination coun-

try, and this develops local production.

Several researchers are therefore interested in testing the relationship between tourist spending and domestic economic activity. [Chiu \(2021\)](#) examines the relationship between tourism expenditure and economic development in the United States. He submits that tourism expansion in the U.S., though driven by economic activity, has no long-run relationship with economic development. This finding had been earlier affirmed by [Tang and Jang \(2009\)](#), suggesting that the elements of economic development are not markedly sensitive to the variations in tourist expenditure in the U.S.

However, the inverse association between economic growth and tourist expenditure is not the conventional knowledge in the literature. [Chiu \(2021\)](#) himself compares his findings on the U.S. with what obtains in China and reports a long-run relationship between spending by international tourists and economic growth in China. Results of a positive relationship have also been obtained by [Dritsakis \(2004\)](#) for Greece, by [Gunduz and Hatemi-J \(2005\)](#) for Turkey, and by [Proença and Soukiazis \(2008\)](#) for southern Europe.

[Sharif et al. \(2021\)](#) are charged with the common conclusion of existing studies on the relationship between tourist expenditure and economic variables in the United States. They, therefore, explore the impact of globalization processes on tourist expenditure before and after the financial crisis in the U.S. They use the quantile-on-quantile regression technique to measure the relationship between three globalization indices (economic, social, and political developments) and tourism development. Their findings demonstrate that all the globalization indices are positively related to tourist expenditure before the financial crisis of 2008. In the post-crisis period, tourism is directly affected by political and social globalization, but there is a negative relationship between economic globalization and tourism. This finding is a candid explanation of the consequences of the financial crisis on tourist expenditure in the U.S.

[Usman et al. \(2020\)](#) investigates the exchange rate pass-through on hotel and restaurant prices in the U.S. and the implication of this on tourism development. They employ a flexible autoregressive distributed lag model as well as multiple cointegration tests. Their findings establish the evidence that exchange rate appreciation reduces restaurant and hotel prices in the U.S., and this attracts international visitors. However, the presence of international tourists drives up energy prices which in turn causes hotel and restaurant prices to rise. The paper concludes that, though the pass-through effect is incomplete, energy prices are the major driver of tourist expenditure in the United States.

[Gavurova et al. \(2021\)](#) assess the infrastructural innovations and tourism spending in 36 countries of the OECD including the United States. Using a robust panel regression and cluster analysis, they show that innovations around information and communication technologies (ICTs) are the dominant determinants of tourism visitors' spending in the sampled countries. The authors recommend advancements in ICT as an effective strategy for attracting beneficial

tourism spending in destination countries. Their results echo those of [Ibanescu et al. \(2018\)](#) and [Amaro et al. \(2016\)](#) who declare that tourists have a higher incentive to spend more days and more money if they meet attractive technology and infrastructure that satisfy their needs.

Using a probit and tobit regression analysis, [Mora-Rivera and García-Mora \(2020\)](#) evaluate the driving force of international remittances on tourist expenditure. Having controlled for endogeneity resulting from remittances, they show that international remittances are a significant determinant of the likelihood and amount spent on domestic tourism in Mexico. They explain the role of remittances in easing liquidity constraints, thereby spurring increased spending on tourism activities.

While remittances can add to robust tourist development, they can limit domestic production, generating a drag on tourism-led growth dynamics. In a meta-analysis of 50 studies, [Adams \(2011\)](#) summarizes that remittances can reduce the labor supply and productivity as the recipients substitute leisure hours for labor hours. In essence, the increased tourist spending coming from international remittances can be dampened by slower growth in productive activities. It follows that the net effect should inform the nature of public policy on tourism and remittances ([Yang, 2011](#)).

Moving away from the macro impact of tourists' spending, [Choi and Joen \(2021\)](#) quantify the economic impact of the spending of tourists at local parks in Mississippi, United States. They focus on the parks operated by the Pat Harrison Waterway District (PHWD). Using both intercept and online surveys, they estimate the total local purchasing in the PHWD areas at approximately \$5.1 million annually. Their results further indicate that the international visitors' spending has the potential to generate over \$4 million of revenue plus certain taxes; about 70 jobs with \$1.4 million of labor income and \$2.9 million value-added in the national output of the district. Choi and Joen have shown that tourism can be a source of economic stimulus albeit regionally. For example, money spent on recreational equipment and groceries constitute a strong boon for the local economy.

To determine the impact of tourists' sentiments on their spending and the decision of prospective tourists, [Wang and Kirilenko \(2021\)](#) analyze the 27,177 TripAdvisor reviews of tourists who have visited top six attractions of the Grand Canyon National Park, Arizona, United States. Their analysis reveals that all reviews tend to be positive, but visitors from Europe and Japan express lesser satisfaction with their visits. The study concludes that the spending of international visitors is linked closely to their experiences. Therefore, national parks and protected areas should work towards meeting the needs of tourists so that they are nudged to spend more during their stay. [Liu et al. \(2019\)](#) have concluded similarly in their analysis of Chinese tourists' sentiments in Australia.

In addition, [Mortazavi \(2021\)](#) examines the role of visitors' satisfaction relative to their prior expectations. His research addresses the degree of spending of

international visitors during the 2015 World Ski Championships held in Falun, Sweden. He finds that visitors whose satisfaction index is greater than their expectations prior to the visit spend significantly more than those who were relatively disappointed of their expectations. It goes that meeting the anticipation of international visitors can incentivize them to spend during their visits.

Existing studies show that income levels of international tourists are a popular driver of their spending in tourist destinations. [Jang et al. \(2004\)](#) studied the spending behavior of Japanese tourists to the United States and finds that spending levels are higher for high-income tourists relative to low-income tourists. In a similar vein, [Dixon et al. \(2012\)](#) investigate expenditure patterns of sports tourists attending a golf tournament in the USA and find heterogeneity in spending patterns and preferences of rich tourists to spend more on the local economy.

Gender has also been described as a determinant of tourists' spending. [Sato et al. \(2014\)](#) study tourists' expenditures at a running event in the U.S. and identifies that male participants spend more money than females. Conversely, [Craggs and Schofield \(2009\)](#) analyze the daily expenditure of international tourists at The Quays in Salford, UK. They report that females are more likely to spend more than males. In addition, [Ibanescu et al. \(2018\)](#) observe mixed spending behavior of male and female tourists in the European Union. This implies there is no conclusive evidence on which gender spends more during international tourism. Nonetheless, length of stay and travel history have been established to have a positive relationship with tourists' spending ([Sato et al., 2014](#); [Thrane, 2016](#)). Those that are staying for a longer time and have had repeated trips are more likely to spend more than first timers with a short stay.

From another perspective, [Nguyen \(2021\)](#) studies the relationship between domestic institutions and tourist spending. His analysis employs a two-step system generalized method of moments and covers a sample of 120 countries from the period 2002 to 2019. Findings from the study show that informal institutions can explain differences in tourism spending across countries but has little power to determine intra-country spending. On the other hand, formal institutions have a positive relationship on tourist spending within and across countries. The study further posits that while formal institutions are drivers of tourism spending in developed countries, strengthening informal institutions, especially on religious and cultural activities are more important in driving tourism spending in developing countries. [Cheng and Zetina \(2021\)](#), in their novel work, examine the impact of COVID-19 on tourist arrivals in Belize and posit that it is the worst disaster for the tourism industry. They conclude that though there is a vaccine in place, it will take some time before traveller confidence is 100% restored.

3. Methodology

Past values of COVID cases and associated deaths influence the present report of cases and deaths. A similar trend is true of foreign visitors to the United States.

As a result, this study employed the vector autoregressive (VAR) model of order 2. The lag was selected based on the Akaike and Schwarz information criteria. Specifically, the model is specified as:

$$Y_t = \beta + A_1 Y_{t-1} + A_2 Y_{t-2} + B X_t + \varepsilon_t \quad (1)$$

where:

Y_t is a 3×1 vector of dependent variables namely COVID cases, COVID deaths and visitors to the US. β is a constant, A_1 and A_2 are parameters of lagged dependent variables, X_t is a 3×1 vector of exogenous variables including visitors' expenditure, GDP of visitors' country and total population of visitors' country. B is a vector of parameters of exogenous variables and ε_t is a vector of error terms.

More explicitly, Equation (1) can be decomposed as:

$$COVCAS_t = \beta_1 + \alpha_{11,p} \sum_{p=1}^2 COVCAS_{t-p} + \alpha_{12,p} \sum_{p=1}^2 COVDEA_{t-p} + \alpha_{13,p} \sum_{p=1}^2 VIS_{t-p} + \pi_k \sum_{k=1}^3 X_{kt} + \varepsilon_{1t} \quad (2)$$

$$COVDEA_t = \beta_2 + \alpha_{21,p} \sum_{p=1}^2 COVCAS_{t-p} + \alpha_{22,p} \sum_{p=1}^2 COVDEA_{t-p} + \alpha_{23,p} \sum_{p=1}^2 VIS_{t-p} + \lambda_k \sum_{k=1}^3 X_{kt} + \varepsilon_{2t} \quad (3)$$

$$VIS_t = \beta_3 + \alpha_{31,p} \sum_{p=1}^2 COVCAS_{t-p} + \alpha_{32,p} \sum_{p=1}^2 COVDEA_{t-p} + \alpha_{33,p} \sum_{p=1}^2 VIS_{t-p} + \mu_k \sum_{k=1}^3 X_{kt} + \varepsilon_{3t} \quad (4)$$

where:

$COVCAS_t$ is COVID cases, $COVDEA$ is COVID deaths, VIS is number of visitors, X_1 is visitors' expenditure, X_2 is GDP of visitors' country and X_3 is total population of visitors' country. The study made use of secondary data obtained from the World Tourism Organization, the World Bank, the World Travel and Tourism Council, and the National Travel and Tourism Office for the years 2019 and 2020.

4. Empirical Results and Discussion

Descriptive analysis

Table 1 contains brief descriptive analysis of the variables. Average COVID

Table 1. Descriptive statistics of the variables.

	<i>Mean</i>	<i>Std. Dev</i>	<i>Max</i>	<i>Min</i>
COVID cases	2,366,763	2,876,780	10,290,000	28,425
COVID deaths	54,873.0	55,618.3	195,072.0	909
Visitors	320,497.0	190,703.1	730,032.0	111,318
Expenditure	2981.2	4100.5	16,151.0	480.0000
GDP	2.652400	3.620802	14.72300	0.253000
Population	2.45E+08	4.70E+08	1.41E+09	17,441,139

Source: Author's computations.

cases in the US in 2020 were about 2.4 million with associated deaths being close to 55,000. This means a death rate of 2.3% which mirrors the mean global death rate of 2.5% reported by [World Health Organization \(2020\)](#). The standard deviations of both COVID cases and deaths are above their mean values, pointing to high degree of volatilities of the pandemic—cases and deaths developed and are reported every day. The large gaps between the maximum and minimum values of cases and deaths further indicate that people who tested positive to COVID-19 and those who died from it were increasing exponentially.

The mean number of visitors to the U.S. in 2020 is approximately 321,000. But the low standard deviation suggests that visitors count has been relatively stable within the year. The maximum value of 730,000 and minimum value of more than 111,000 elucidates the fact that there are no wide dispersions of number of visitors from their mean values. The independent variables (visitors' expenditure, GDP and population) are all high frequency variables as their standard deviations are well above their mean values. Their high range values (excess of maximum values over minimum values) also suggest that these variables are prone to high fluctuations.

Correlation analysis

The correlation coefficients in [Table 2](#) are informative of relationships among the variables. COVID cases and the resulting deaths are very highly correlated (0.92). This lends credibility to the data used in this study—only deaths associated with the pandemic were included. GDP and expenditure are also highly related (0.88). Apparently, the more the size of economic activity, the more the disposable incomes to finance tourism expenditure. Population and expenditure also show close association (0.91). An increase in the size of the population expands demand for goods and services and thus increases expenditure. High relationship between population and GDP (0.70) confirms the theoretical prediction that a higher population increases the labor force which means more resources to produce more output.

However, other coefficients are low and some are negative. Expenditure and COVID deaths are negatively related, suggesting that having high spending pattern

Table 2. Correlation coefficients between the variables.

	COVID cases	COVID deaths	Visitors	Expenditure	GDP	Population
COVID cases	1.00					
COVID deaths	0.92	1.00				
Visitors	0.05	0.04	1.00			
Expenditure	0.11	-0.04	0.29	1.00		
GDP	-0.16	-0.23	0.30	0.88	1.00	
Population	0.43	0.21	0.13	0.91	0.70	1.00

Source: Author's computations.

might prevent one from dying from COVID. There is a positive relationship between expenditure and cases—having enough money to spend does not prevent one from contracting the virus. GDP and both COVID cases and deaths are inversely related. Having a high economic output might point to low spread of COVID and less chance of COVID deaths. Nevertheless, the correlation coefficients are low (−0.16 and −0.23).

What poses a puzzle is the association between number of visitors and COVID cases and deaths. Although the relationships are positive, they are very low (0.05 and 0.04). Is this suggesting that most COVID cases and deaths in the U.S. are domestically sourced? The regression analysis will answer this. On the other hand, the relationship between population and COVID cases and deaths confirms expectations—the pandemic has been notorious in the U.S. due to the sheer number of people living in the U.S. Although the coefficient is low (0.13), the size of the population and number of visitors are positively correlated, implying that people living in countries with a high population have a high propensity to visit the U.S.

Table 3 reveals the results of the VAR estimation. COVID cases and deaths in the previous month significantly influence cases in the current month ($\beta = 0.09$; $\beta = 14$). Cases and deaths in the past two months have a larger, but a not significant, influence on current cases ($\beta = 1.61$; $\beta = 108.37$). Similarly, the number of people who contracted COVID and associated mortalities in the preceding month significantly explain COVID deaths in the current month ($\beta = 0.01$; $\beta = 0.86$), but cases and deaths in the prior two months are with less confidence to influence current COVID deaths. These results point to high volatilities of COVID cases and deaths in the U.S.

Table 3. VAR results.

Independent variables	Dependent variables		
	COVID cases	COVID deaths	Visitors
COVID cases (−1)	0.09	0.01	−0.04
COVID cases (−2)	1.61*	0.04*	−0.04
COVID deaths (−1)	14	0.86	−1.96
COVID deaths (−2)	108.37*	3.2*	2.31
Visitors (−1)	2.71	0.89	0.05
Visitors (−2)	0.19	0.01	0.13
Constant	3,968,554	105,650	196,478
Expenditure	−775.39*	−15.94*	69.46
GDP	−1,268,593	−33,123.2	−43,863.1
Population	0.02	0.01	0.01*
R-squared = 0.87, F-stat = 3.64			

*Indicates that the coefficients are not statistically significant at 5%.

Regression analysis

The results further show that increase in COVID cases and deaths in the previous month decreases the number of visitors ($\beta = -0.04$; $\beta = -1.96$), but a rise in COVID deaths in the prior two months increases the visitors' count in the present month ($\beta = 2.31$). This suggests that visitors consider COVID deaths in the last 60 days too stale to discourage them from visiting the U.S., but the number of COVID cases distracts them from visiting regardless of the time of the report.

The number of visitors in the past months determines the number of COVID cases, deaths, and visitors in the current month. For every one extra visitor in the immediate past month, COVID cases are likely to increase by 2.71 ($\beta = 2.71$) and COVID deaths increase by 0.89 ($\beta = 0.89$). This interprets that most COVID cases and deaths in the U.S. are sourced from visits of foreigners. But visitors in the previous two months have less power to determine COVID cases ($\beta = 0.19$) and deaths ($\beta = 0.01$) in the current month. However, visitors in the past two months have a higher coefficient ($\beta = 0.13$) than visitors in the past month ($\beta = 0.05$) to determine the number of current visitors. This might explain that visitors have adaptive expectations in their decision to visit the U.S.

It is further revealing that as expenditure of visitors increases by \$1 million, COVID cases decrease by about 775 ($\beta = -775.39$) and COVID deaths decrease by 15.94 ($\beta = -15.94$). It follows that as visitors spend more, they are less likely to test positive to COVID 19 because their spending pattern is considerate of the pandemic. This result is, however, not statistically significant. Furthermore, increase in visitors' spending increases the number of visitors to the U.S. by about 69.46 ($\beta = 69.46$). This goes that people are prepared with a robust budget when visiting the U.S.

Increase in GDP by \$1 trillion leads to fall in COVID cases by about 1.3 million, fall in COVID deaths by 33,123, and a decrease in the number of visitors by 43,863. This points out that there are gains to economic expansion. As the economy produces more, people's incomes increase, boosting their affordability to protect themselves from COVID. Also, economic growth implies that people have less incentive to leave their respective countries to visit the U.S.

Finally, as a person is added to the population, the chance that they will contract COVID-19 is 0.02 ($\beta = 0.02$), die of the pandemic is 0.01 ($\beta = 0.01$), and are likely to visit the U.S. is 0.01 ($\beta = 0.01$). The R-squared ($=0.87$) indicates that 87% of the variation in all dependent variables is accounted for by the explanatory variables (lagged dependent variables and independent variables). The F-stat ($=3.64$) also shows the joint significance of all the explanatory variables in the VAR model.

5. Conclusion

The outbreak of COVID-19 affected the tourism sector worldwide. It particularly had profound consequences on the number of foreign visitors in the United States. In this light, this study has explored the tourist spending by international

visitors to the United States during the pandemic. Because cases and associated deaths of COVID have a two-way relationship with the number of visitors, the study adopted the VAR framework to measure the bilateral impact. In addition, tourist expenditure, population, and GDP are exogenous variables included in the model. Secondary data on these variables were collected and analyzed.

The study revealed that past values of COVID cases and deaths determine their current values; they also determine the current values of visitor counts. However, the immediate past values are more important than values with a longer history. It was also observed that while tourist expenditure is a positive function of the number of visitors, it has a negative and insignificant relationship with COVID cases and deaths. Economic activity and population dynamics in the visitors' countries also determine their likelihood of choosing the United States as their tourism destination. While this study looked at the interplay of these variables, it did not look at the challenges of the health care systems of these various countries in managing the pandemic; thus serving as a limitation of this study and an area for further research.

From these findings, the government and authorities in the United States should be prepared for more inflow of visitors from countries with high GDP and high populations, and hence take adequate measures to safeguard public health. They should also be cautious of the high spending patterns of visitors. Much as this injection of direct investment is welcome as it oils the tourism industry, if unmanaged properly it may fuel existing spiral of inflationary pressures in the country.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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