



## Investigating the Impact of COVID-19 on Singapore's Tourism Industry and Economy

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This study aims to find economic effects of COVID-19 on tourism in Singapore. Tourism receipts were used as the variable representing tourism, whilst employment (by sector) statistics and GDP were used to represent Singapore's economy. The results indicated Singapore's tourism industry did suffer for the duration of the crisis, as evidenced by the negative YoY change. Second, the result of regression analysis indicates that the tourism industry does contribute to employment opportunities, but the same cannot be said for its relationship with GDP. The negative correlation between tourism receipts and GDP needs to be further investigated and validated.

**Keywords:** Singapore, Tourism industry, GDP, COVID-19, Employment

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## INTRODUCTION

Singapore has always integrated tourism into its national economic development plans. Since beginning in 1963, the tourism industry has developed to contribute an estimated 4 percent to Singapore's GDP (STB, 2023). However, tourism, as an industry vulnerable to external shocks, has been affected by various crises in Singapore before. Some examples include the 1997 Asian Financial Crisis (Cave, 1999) and the 2002 SARS outbreak in Singapore (APEC, 2004). The former financial crisis saw a negative 11.8 percent growth of tourist arrivals a year after the event whereas the latter health crisis caused Singapore's tourist arrivals to shrink in the following month by 61.6 percent after the onset of the event (Cave, 1999: 53; Henderson, 2004: 69). These events, however, pale in comparison to the impact that the COVID-19 global pandemic had not just in Singapore but on the world as it grounded all international travel to a stop. As such, the impact of the pandemic was catastrophic for the international tourism industry. This is evidenced by a -72 percent annual change (vs 2019) in international tourist arrivals and a loss of USD 1.8 trillion in terms of direct GDP generated from tourism (UNWTO, 2023). Beyond tourism, the pandemic caused the world's economy to shrink by 4.3 percent in 2020 (UN, 2021). Depending on this economic situation, this study arise the research question.

1. What is the effect of COVID-19 on the tourism industry in Singapore?
2. How has the performance of the tourism industry affected Singapore's economy during the pandemic?

With the reentry of COVID-19 and world travel resuming in 2022, this study seeks to update existing literature about the tourism and economic effects of COVID-19, with Singapore as a case study. According to this research purpose, this article is structured as follows. The remaining sections of this paper will present a short review of existing literature affecting Singapore's tourism industry, followed by methodology. Findings will then be presented and discussed before offering a conclusion.

## LITERATURE REVIEW

Extant literature pertaining to Singapore can be divided into two broad categories – general economic analyses of tourism and the impact of crisis events on tourism. An early piece by Heng and Low (1990) assessed the economic impact of the tourism industry in Singapore using the input-output methodology. Their analysis demonstrated that the economic value of tourism had more impact on the economy, owing to the multiplier effect, than from export or manufacturing (Heng & Low, 1990: 263). Another study by Lean et al. (2014) focused on the tourism-economic growth nexus. This study demonstrated the cointegration of tourism expansion and economic growth, as well as real effective exchange rate and international trade (Lean et al., 2014: 154). In summary, both studies showcased the economic effects of tourism.

The second category deals with the impact of crises on tourism in Singapore and the resulting economic effect. These studies have assessed crisis events such as the 1997 Asian Financial Crisis, 2008 Global Financial Crisis, 2003 SARS Outbreak, and 2020 COVID-19 Pandemic (APEC, 2004; Cave, 1999; Erh, 2021; Henderson, 2004; Meng et al., 2010; Purwomarwanto & Ramachandran, 2015). Together, these studies emphasize the vulnerability of the tourism industry to external shocks. Health crises, however, have been shown to have a more devastating impact. For example, the 1997 Asian Financial Crisis led to a -11.8 percent decrease in Singapore's tourist arrivals in 1998 (Cave, 1999: 53), while the 2008 Global Financial Crisis caused Singapore's tourism industry to contract by 13.5 percent in the first 6 months of 2009 compared to the same period in 2008 (Meng et al., 2010: 46). In both events, the effects of the financial crises were only observable in the following year. Comparatively, when the 2003 SARS Outbreak was first declared in Singapore in mid-March, tourist arrivals had fallen by 61.6 percent in April and by May, it further contracted by 70.7 percent (Henderson, 2004: 69). Besides the immediacy of the effects of the health crisis, that is, Singapore's tourism industry felt the effects much faster than the financial crises; the extent of the effects was also vastly different. The impact of the financial crises on tourist arrivals was much smaller as compared to the 2003 SARS outbreak because pandemics more adversely affect travel patterns and behaviors (Henderson, 2004).

Focusing on the COVID-19 study by Erh (2021), the findings showcased the extent of economic damage inflicted within the first year of the pandemic. Statistical analysis demonstrated that the value-added coefficient for the tourism industry, from the usual hover of \$722.8, fell to \$621.2 in Q2'20 and then recovered slightly to \$669.1 in Q3'20 in Singapore (Erh, 2021: 8). Erh (2021) also attempted to forecast the impact of travel bubbles, which led to the conclusion that as long as the pandemic was still ongoing and travel restrictions were in place, it would be unlikely for the tourism industry to recover to former levels of GDP contribution. Although useful, this study was conducted while the world was still amid the pandemic (2020). Now, in a post-pandemic world, there is a gap in the literature in assessing the effects of COVID-19 in totality on the tourism industry. As such, this study aims to contribute to the literature in this regard.

## METHODOLOGY

Statistical analysis in the form of Pearson correlation was conducted. This is because Pearson is more suited for interval scales, whereas Spearman correlation is more suited for ordinal scales. In this instance, the data set for this study are intervals. Regression analysis refers to a statistical analysis method that assumes a mathematical model and estimates this model from measured data in order to identify the functional relationship between independent and dependent variables (Sen & Srivastava, 1997).

In this study, the regression analysis used gross domestic product as the dependent variable. And it was used as a control variable in the regression analysis to control the impact on economic growth such as domestic consumption and government spending. The analysis to determine the effect of international tourism on Singapore's economic growth is as follows.

$$Y = \beta_0 + \beta_1 X + \varepsilon_i$$

Here,  $X$  is the  $i$ -th independent variable and  $\varepsilon$  is the error generated when measuring  $Y$ , and it is assumed.  $\varepsilon_i$  is for all  $i$ ,  $E(\varepsilon_i) = 0$ ,  $V(\varepsilon_i) = \sigma^2$ , independent of each other and normally distributed.

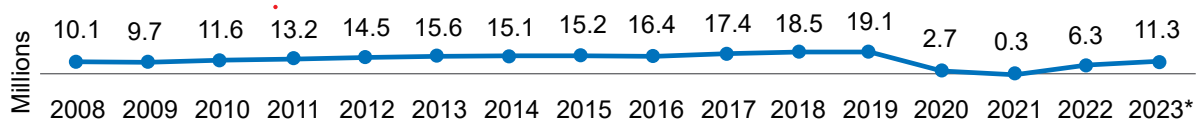
In estimating the coefficients of regression analysis, a fixed effects model was used to take into account the heterogeneity of panel data due to spatial and temporal differences, thereby reducing bias due to omitted variables (Allison & Christakis, 2006). In estimating the coefficients of regression analysis, a fixed effects model was used to take into account the heterogeneity of panel data due to spatial and temporal differences, thereby reducing bias due to omitted variables (Allison & Christakis, 2006). The Hausman test, which is performed to determine the use of the fixed effect model and the random effect model in panel data analysis, uses the fixed effect model if the difference in coefficients is significant ( $p < 0.05$ ) (Frondel & Vance, 2010).

## ANALYSIS

We analysed visitors to Singapore before and after COVID-19. Figure 1 shows the trend of visitors to Singapore from 2008 to 2023. Due to the COVID-19 quarantine measures, the number of visitors decreased further in 2021 compared to 2020, when the coronavirus epidemic broke out in earnest (Figure 1).

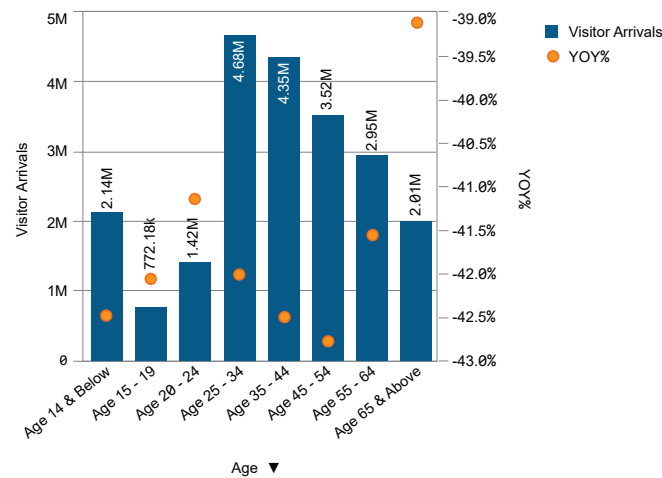
Figure 2 shows the analysis of tourists who visited Singapore between 2019 and 2020 by age. By age, people in their 30s and 40s account for the largest proportion. This trend is similar to the previous trend, but due to quarantine measures, only visitors with a clear purpose of travel were able to visit, so it can be assumed that it was mainly visited by people of working age.

Statistics were retrieved from Singapore's Department of Statistics (DOS). Tourism receipts were used as the variable representing tourism, whilst employment (by sector) statistics and GDP were used to represent Singapore's economy (see Table 1). Time-series data was used, ranging from 2018-2022, which captures pre-COVID, COVID, and post-COVID periods.



**Fig. 1.** International Arrivals to Singapore

Source: Department of Singapore Statistics \*Jan-Oct 2023



**Fig. 2.** Visitor arrivals trends by demography  
Source: Singapore Tourism Board (2024)

**Table 1.** Tourism and Economic Variables in Absolute Numbers

| Variable                                       | 2022      | 2021      | 2020      | 2019    | 2018      |
|------------------------------------------------|-----------|-----------|-----------|---------|-----------|
| Tourism Receipts (million dollars)             | 29,252    | 4,337     | 17,482    | 68,004  | 67,883    |
| GDP At Current Market Prices (million dollars) | 643,545.8 | 569,364.2 | 480,691.2 | 514,066 | 508,337.4 |
| Total Employment (thousand)                    | 3,893.6   | 3,643.5   | 3,603.3   | 3,784.3 | 3,714.8   |

Source: DOS, 2023

## FINDINGS

First, year-on-year (YoY) changes in all three variables were analysed (see Table 2 below). The results indicated Singapore's tourism industry did suffer for the duration of the crisis, as evidenced by the negative YoY change. However, when pandemic measures were lifted in 2022, YoY change jumped nearly 600 times, reaching +575.5

**Table 2.** Tourism and Economic Variables YoY Change

| Variable                     | 2022    | 2021   | 2020   | 2019  | 2018  |
|------------------------------|---------|--------|--------|-------|-------|
| Tourism Receipts             | +574.5% | -75.2% | -74.3% | +0.2% | +0.9% |
| GDP At Current Market Prices | +13.0%  | +18.4% | -6.5%  | +1.1% | +7.2% |
| Total Employment             | +6.9%   | +1.1%  | -4.8%  | +1.9% | +1.2% |

(Author's calculations based on data retrieved)

**Table 3.** Tourism Receipts and GDP Pearson Correlation

| Parameter                           | Value        |
|-------------------------------------|--------------|
| Pearson correlation coefficient (r) | -0.3162      |
| P-value                             | 0.6043       |
| Covariance                          | -597991944.4 |
| Sample size (n)                     | 5            |
| Significance Testing                | -0.5772      |

percent. As for GDP and employment, 2020 recorded negative YoY changes but bounced back quickly in 2021 and proceeded to record greater positive growths in 2022. This emphasizes the unexpectedness of COVID-19 in 2020, but the economy was resilient by turning around the nosedive a year in. The positive growth in GDP and employment compared with the negative growth in tourism in 2021 indicates that other sectors played an important part in resuscitating the economy since the tourism industry was crippled by the pandemic.

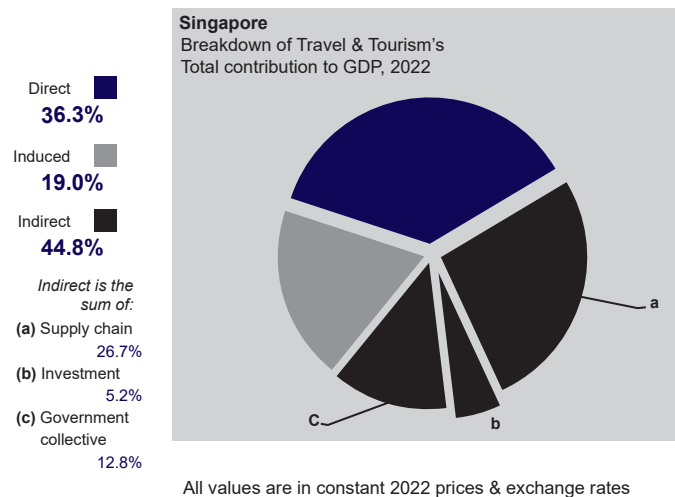
Second, Pearson correlation was run between (1) tourism receipts and GDP, and (2) tourism receipts and total employment. The results presented below indicate that (1) there is a non-significant medium negative relationship between tourism receipts and GDP, ( $r=.316, p=.604$ ) (see Table 3), and (2) there is a non-significant medium positive relationship between tourism receipts and total employment, ( $r=.388, p=.519$ ) (see Table 4). This indicates that the tourism industry does contribute to employment opportunities, but the same cannot be said for its relationship with GDP.

The results shown by this regression analysis are similar to the actual situation in Singapore. Industry observer James Walton of Deloitte Singapore noted that the post-COVID-19 travel rebound globally was slower than expected due to a s higher inflation, and conflicts in Ukraine and the Middle East fuelling a global economic slowdown; as well as the increased cost of living and flight prices remaining high (Raguraman, 2024). This is because there are various factors that affect economic growth. Although tourism accounts for a large portion of Singapore’s economy, linear regression analysis is difficult to remove other external factors in Singapore’s domestic growth. This is also because, as James analysed, there were other external factors besides the economic slowdown due to the COVID-19 that had a negative impact on economic growth.

According to WTTC (2023), the indirect effect of tourism on economic growth is greater than the direct effect

**Table 4.** Tourism Receipts and Employment Pearson Correlation

| Parameter                           | Value       |
|-------------------------------------|-------------|
| Pearson correlation coefficient (r) | 0.3881      |
| P-value                             | 0.5186      |
| Covariance                          | 1312228.675 |
| Sample size (n)                     | 5           |
| Significance Testing                | 0.7293      |



**Fig. 3.** Contribution of Tourism in Singapore to GDP  
Source: WTTC (2023)

of tourism. The economic effect is divided into direct effect and indirect effect, and the employment effect is an indirect effect. Therefore, this study shows that indirect effects are more significant than direct economic effects as investment in the tourism industry decreases in 2020 and 2021.

## CONCLUSION

Addressing the first research question, findings have shown that COVID-19 did impact Singapore's tourism industry negatively. The years in which COVID-19 was in full swing (2020 – 2021) also saw annual changes in tourism receipts fall by 74 percent and 75 percent respectively. This corresponds with previous studies investigating crises events in Singapore where it was shown that the tourism industry suffered during crises (APEC, 2004; Cave, 1999; Erh, 2021; Henderson, 2004; Meng et al., 2010; Purwomarwanto & Ramachandran, 2015). Although the findings reported in this study are at a superficial level (i.e., only reporting YoY change), it still shows a fuller picture of the performance of the tourism industry pre-, during, and post-COVID periods and the damage inflicted. However, this in itself is a limitation of the method used. Perhaps it would have been to calculate the value-added coefficient which would make this study complementary to Erh (2021).

It was interesting that tourism receipts turned out to have a moderate negative relationship with GDP. Based on past studies where tourism was shown to contribute to GDP (Comerio & Strozzi, 2019), one would expect a positive relationship. Studies in Singapore also demonstrated the positive effects of tourism on economic growth (Heng & Low, 1990; Lean et al., 2014) but it seems to be contradicted by this finding. Perhaps an explanation could be that a simple Pearson correlation was not the ideal tool to determine the relationship between tourism receipts and GDP. Instead, testing for co-integration would have been the better option as previously done by other studies (Lean et al., 2014; Pérez-Rodríguez et al., 2015; Rasool et al., 2021).

The second correlation test between tourism receipts and employment found that there is a moderate positive relationship between the two, albeit insignificant. This still means that tourism contributes to employment creation. However, because tourism is not the main industry Singapore relies on for its national economy, other sectors also play a hand in employment. This is evident in negative YoY changes for tourism for both 2020 (-74.3 percent) and 2021 (-75.2 percent), but employment only saw negative YoY change for 2020 (-4.8 percent) and then gained slightly in 2021 (+1.1 percent). To answer the second research question, the performance of tourism affects employment opportunities positively to a moderate degree, but not GDP.

Previous studies have demonstrated the employment effect but only within the tourism or hospitality industry (Aynalem et al., 2016; Bunghez, 2016). Going beyond that realm, Gómez López and Barrón Arreola (2019) investigated the employment effects of tourism *and* economic growth, both of which contributed positively. In this regard, the positive correlation between tourism receipts and employment found in this study concurs with Gómez López and Barrón Arreola (2019). Looking within the Singapore literature focusing on crises, only Erh (2021) investigated the impact of tourism on employment, however, she focused on employee compensation. As such, this finding newly contributes to Singapore literature and reinforces the importance of tourism and job creation opportunities.

The findings from this study are rudimentary; however, it still worked to contribute to the literature. This is especially so as this study was able to present a more complete picture of the effects of COVID-19 on Singapore's tourism industry and the positive correlation between tourism receipts and employment which emphasizes the importance of tourism. The negative correlation between tourism receipts and GDP needs to be further investigated and validated. As such, because of the simple correlation tests conducted, findings need to be read with caution. More studies are encouraged to investigate the impact of COVID-19 more thoroughly with stronger statistical analytics.

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# COVID-19가 싱가포르 관광산업 및 경제에 미치는 영향 연구

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본 연구는 COVID-19가 싱가포르 관광산업에 미치는 경제적 영향을 살펴보는 것을 목표로 하였다. 이를 위하여 관광 수입은 관광을 대표하는 종속변수로, 산업부문별 고용통계와 GDP는 싱가포르 경제를 대표하는 경제변수로 독립변수로 하여 분석하였다. 분석결과, 전년 대비 마이너스 변화에서 알 수 있듯이 싱가포르의 관광 산업은 COVID-19 기간 동안 어려움을 겪은 것으로 나타났으며, 싱가포르 관광 산업이 고용 기회에 기여하는 것은 사실이지만, GDP와의 유의미한 관계가 없는 것으로 나타났다. 본 연구결과를 통해 향후 관광 수입과 GDP 간의 음의 상관관계에 대한 추가적인 연구가 필요하다는 결론을 도출하였다.

**주제어:** 싱가포르, 관광산업, GDP, COVID-19, 고용

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대외경제정책연구원에서 동남아시아경제를 연구하였다. 국립말라야대학교 동아시아학과에서 박사를 취득한 후, 현재는 한국외국어대학교 국제지역대학원 강사로 제직하고 있으며 주요 연구분야는 아세안정치경제이다(02ymkim@gmail.com).