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The impact of border control policy on tourists’ behaviors in Taiwan during the COVID-19 pandemic

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ABSTRACT

In response to the global pandemic of the COVID-19 outbreak, Taiwan barred foreign nationals from entering into Taiwan starting from March 19th, 2020. This study aims to explore the impact of lockdown policy on the length of stay, tourism expenditure, tourist satisfaction and revisit intention based on a sample of 3987 inbound visitors collected from the 2020 Annual Survey Report on Visitor Expenditures and Trends, published by the Taiwan Tourism Bureau. The empirical results indicate that: (1) the border control policy increases the length of stay of around 33.4719 nights; (2) a drop of the total expenditure, F&B expenditure, transportation expenditure, entertainment expenditure, and shopping expenditure but an increase of accommodation expenditure is found; (3) the border control policy seems to reduce the level of tourist satisfaction but does not affect revisit intention.

1. Introduction

In response to the continued spread of COVID-19, the strict border control was implemented on March 19th, 2020 to bar foreign nationals from entering into Taiwan. Only those who applied for approval could be released, and all entrants were required to undergo home quarantine for 14 days after entry. The border control policy has caused a major fall in Taiwan’s tourism activities, so there was only 9.38% of inbound tourists’ arrival in 2020 from April to December. According to the data from the Taiwan Tourism Bureau, most inbound visitors came to Taiwan with the purpose of leisure before the border control while the main purposes of inbound visitors were visiting friends or relatives (VFR) and business after the border control policy. Therefore, the structural characteristics of visitors to Taiwan after the border control have changed drastically from the first quarter of 2020 (before the border control). It is interesting to understand how the border control policy influences inbound tourist behaviors such as the length of stay, tourism expenditure, tourist satisfaction and revisit intention.

Theoretically, various travel purposes are associated with different tourism needs and travel motivations and consequently lead to different amounts of expenditure and satisfaction (Serra et al., 2015). Existing empirical studies have proved an association between tourism expenditure and travel purpose. Laesser and Crouch (2006) examine markets segmented by tourism patterns and conclude that those who attend conferences tend to spend more than other reasons of travel. On the other hand, the purpose of VFR has a negative impact on tourism expenditure. Similar empirical patterns are found in other studies (Jang et al., 2003; Park et al., 2020). Recently, Ahn et al. (2020) apply the almost ideal demand system approach and find a significant correlation between the travel expenditure allocation of different tourist types and various travel purposes. Some studies further point out that the travel purpose-tourism expenditure depends on the categories in the tourism budget. For example, Lehto et al. (2004) claim that leisure travelers have the higher shopping expenditure than VFR and business travelers. Relatively little attention has been paid to the relationship between travel purpose and tourist satisfaction. López-Guzmán et al. (2018) investigate the motivation and satisfaction of tourists visiting the city of Córdoba, Spain, a World Heritage Site. Their results indicate that tourists with great cultural motivation are more likely to have higher satisfaction level.

This study examines how the government’s border control policy influence inbound tourists’ length of stay, tourism expenditure, tourist satisfaction and revisit intention. The government’s lockdown policy may affect the tourists’ length of stay as they do not have the chance to stay abroad longer than they otherwise would without any travel restrictions or quarantine measures. This change in tourists’ length of stay...
in turn can have an impact on the amount of money they spend at the tourist destination. The change in tourist expenditure can also arise due to the changed composition of tourists and the level of crowdedness at the tourism destination. This effect could become even greater as international mobility is restricted and foreign tourists are absent. The tourism destination. This effect could become even greater as in
terne mobility is restricted and foreign tourists are absent.

Definitions and descriptive statistics of variables (n = 3987).

| Variable | Definition | Mean | S.D. |
|----------|------------|------|------|
| Lockdown | Lockdown = 1 if an observation is recorded in or after March 2020 as Taiwan barred foreign nationals from entering into Taiwan starting from March 19th, 2020. Lockdown = 0 otherwise | 0.4650 | 0.4988 |
| First | First visit (1 = yes, 0 = no) | 0.3012 | 0.4588 |
| Age | Age | 41.9536 | 13.5922 |
| College | At least a college degree (1 = yes, 0 = no) | 0.8509 | 0.3562 |
| INC | Yearly income (U.S. dollar) | 32604.5080 | 34316.9216 |
| Work | Individual in labor force (1 = yes, 0 = no) | 0.7505 | 0.4328 |
| Male | Male (1 = yes, 0 = no) | 0.5250 | 0.4988 |
| Stay | length of stay (unit: day) | 25.8651 | 23.6448 |
| Exp | Daily tourism expenditure (unit: US dollar) | 1959.8349 | 2871.4713 |
| ACC | Daily Accommodation expenditure (unit: US dollar) | 591.8470 | 1469.8410 |
| F&B | Daily food and beverage expenditure (unit: US dollar) | 499.4619 | 596.9147 |
| Tran | Daily Local transportation expenditure (unit: US dollar) | 178.4529 | 236.3070 |
| ENT | Daily Entertainment expenditure (unit: US dollar) | 59.0096 | 162.2418 |
| SHP | Daily Shopping expenditure (unit: US dollar) | 447.8073 | 1629.9818 |
| Satisfaction | Rate satisfaction with the trip to Taiwan using a scale of 1 (poor)-5 (excellent) | 4.4382 | 0.5576 |
| Revisit | Visit Taiwan again (1 = yes, 0 = no) | 0.9932 | 0.0820 |

Table 1

The first that simultaneously examines the effect of the government lockdown policy during the COVID-19 pandemic on inbound tourists’ length of stay, tourism expenditure, tourist satisfaction and revisit intention.

2. Methodology

This study obtains data from the 2020 Annual Survey Report on Visitor Expenditure and Trends, conducted and released by the Taiwan Tourism Bureau. Through the method of “Quota Sampling” and carefully designed questionnaire interviews, a total of 3987 inbound tourists in the year 2020 were completed to report their tourism behaviors in Taiwan. Due to the strict border control measures on the epidemic, the suspension of survey occurs from May to June. As a result, the effective sample size from January to March 2020 is 2133 (before the strict border control measures on the epidemic). Srivastava and Kumar (2021) indicate that customer satisfaction derived from hotel attributes may change due to the prevailing COVID-19 pandemic.

Finally, tourists’ level of satisfaction can affect tourists’ revisit intention in the future (Humagain & Singleton, 2021). As far as we are aware, this study is the first that simultaneously examines the effect of the government lockdown policy during the COVID-19 pandemic on inbound tourists’ length of stay, tourism expenditure, tourist satisfaction and revisit intention.

3. Results

Table 2 illustrates tourist satisfactions and revisit intention estimates in the ordered Probit model and univariate Probit model. The main results indicate that the border control policy reduce the level of travel satisfaction to Taiwan but does not significantly impact revisit intention.

Note: **significant at 1% level; *significant at 5% level; ± significant at 10% level.

hygiene or social-distancing measures. Using data collected from the WeChat online survey, Hong et al. (2020) confirms changing tourist satisfaction with the bed and breakfast (B&B) in Zhejiang, China, due to the COVID-19 pandemic. Srivastava and Kumar (2021) indicate that customer satisfaction derived from hotel attributes may change due to the prevailing COVID-19 pandemic.

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Tourist satisfaction is measured using a 5-point Likert scale ranging from 1 (poor) to 5 (excellent), so the ordinary least squares (OLS) model is not applicable. Instead, an ordered Probit model is employed in the current study for the estimation of tourist satisfaction. Furthermore, due to the data nature of a binary dependent variable, the univariate Probit model is applied to estimate the determinants of revisit intention. Finally, the length of stay and tourism expenditure is estimated by using the OLS model. While the OLS estimation provides the mean marginal effects of border policy on inbound tourists’ length of stay, tourism expenditure, tourist satisfaction and revisit intention.

Table 2

The estimates of tourist satisfaction and revisit intention.

| Variable | Coefficient | t statistics | Coefficient | t statistics |
|----------|-------------|-------------|-------------|-------------|
| Lockdown | −0.3383*** | −8.03 | 0.0804 | 0.48 |
| First | −0.0657 | −0.13 | −0.513*** | −3.2 |
| Age | −0.0124*** | −7.97 | −0.015** | −2.49 |
| College | 0.0501 | 0.90 | −0.7445** | −2.13 |
| INC | 0.000005*** | 7.07 | 0.000005 | 1.62 |
| Work | −0.1024* | −1.90 | −0.0872 | −0.45 |
| Male | −0.075* | −1.88 | 0.1487 | 0.98 |
| Cut1 | −3.6963*** | −22.02 | − | − |
| Cut2 | −2.5531*** | −24.14 | − | − |
| Cut3 | −0.5156*** | −5.33 | − | − |
| Constant | − | − | 3.8466*** | 7.65 |
| Log likelihood | −3104.2428 | −149.4127 | − | − |

Note: **significant at 1% level; *significant at 5% level; ± significant at 10% level.
Table 3
The estimates of the length of stay and tourism expenditure from the OLS.

| Variable | Stay | Exp | ACC | F&B | Tran | ENT | SHP |
|----------|------|-----|-----|-----|-----|-----|-----|
| Lockdown | 33.4719*** | -53.5667*** | 22.6438*** | -27.0252*** | -10.5769*** | -4.8059*** | -36.0491*** |
| (59.07) | (12.71) | (15.77) | (21.65) | (18.7) | (10.19) | (13.57) | (14.8) |
| First | -3.2033*** | 10.0347*** | 9.7984*** | -1.123 | 0.3248 | -0.359 | 3.9193 |
| (5.34) | (2.25) | (4.45) | (0.85) | (0.54) | (0.72) | (1.4) | (1.8) |
| Age | -0.0061 | 0.81109*** | 0.1157** | 0.1148*** | 0.0453** | -0.0107 | 0.4064*** |
| (2.25) | (2.19) | (2.5) | (2.18) | (0.61) | (4.15) | (3.15) | (4.15) |
| College | -0.3368 | 4.8285 | 1.9068 | 2.0323 | 0.7163 | -0.608 | -0.9307 |
| (0.45) | (0.86) | (1.00) | (1.23) | (0.95) | (0.97) | (0.26) | (0.26) |
| INC | -0.00002 | 0.0002*** | -0.0007*** | 0.0001*** | 0.00003*** | 0.0001*** | 0.0001*** |
| (2.65)** | (2.85) | (3.13) | (5.85)** | (2.95) | (3.96) | (2.65) | (2.65) |
| Work | -3.0064 | 18.9593*** | 14.4276*** | -0.969 | 1.7216** | 0.3482 | 6.9031** |
| (4.12)** | (3.49) | (7.8) | (0.6) | (2.36) | (0.57) | (2.02) | (2.02) |
| Male | 0.8509 | -3.6325 | 11.3192*** | -1.06483 | -0.2462 | 0.2097 | -11.1059*** |
| (1.58) | (-0.91) | (8.31) | (-0.9) | (-0.46) | (0.47) | (-4.41) | (-4.41) |
| Constant | 14.4067*** | 72.2112*** | -14.7576*** | 35.5932*** | 12.1226*** | 6.2258*** | 31.2181*** |
| (11.08) | (7.47) | (-4.48) | (12.07) | (9.34) | (5.75) | (5.21) | (5.21) |
| R-squared | 0.5328 | 0.0559 | 0.1072 | 0.1206 | 0.0972 | 0.0348 | 0.0599 |

* t statistics in parentheses, Note: ***significant at 1% level; **significant at 5% level; * significant at 10% level.
In terms of tourist characteristics, first-time, elder and well-educated visitors are less likely to visit Taiwan again. High-income visitors tend to be satisfied with their travel experience in Taiwan while Age, Work and Male are negatively associated with the level of tourist satisfaction.

Table 3 lists the estimated value of the length of stay and travel expenditure for inbound visitors in Taiwan. Column 1 (labeled as Stay) reports that the coefficient of Lockdown is positive and statistically significant at the 1% level (i.e., 33.4719). The finding suggests that the border control policy increases the length of stay of around 33.4719 nights. The variables First, INC and Work have negative and significant impacts on the length of stay in Taiwan.

Columns 2–7 in Table 3 summaries the estimates of total daily travel expenditure and daily expenditure for the five travel-related goods and services. The main findings show that the border control policy decreases total daily travel expenditure and almost all categories of travel expenditure except for accommodation expenditure.

The estimated effects of the border control policy on travel expenditure from the OLS and quantile regression are visually summarized in Figs. 1–6. The solid line in the middle of the shaded area traces the coefficient estimates of Lockdown based on the 0.05–0.95 quantile regression models. The shaded area is the 95% confidence region of the coefficient estimates. The OLS estimates are represented by the three horizontal dashed-lines. All figures except Fig. 2 show that the confidence region is below the zero horizontal line, indicating that the border control policy decreases total travel expenditures, F&B expenditure, local transportation expenditure, entertainment expenditure and shopping expenditure. On the other hand, Fig. 2 shows that the border control policy stimulates daily accommodation expenditure.

4. Conclusion and research limitation

The empirical evidence indicates that the border control policy affects the length of stay, tourist satisfaction and travel expenditure. There are two possibilities why the border control policy impacts tourism expenditure. The first possibility is that the main purpose of inbound tourists to Taiwan is VFR and business (after the border control policy) rather than leisure (before the border control policy). Inbound visitors with different travel purposes are expected to have different needs and travel motivations. The second possibility is that many tourism activities may be treated as health risky behaviors during the COVID-19 pandemic (e.g., going out shopping, going out for a drinking, visiting museums and using public transportation). As we can see from Table 3, inbound tourists’ food and beverage expenditure, local transportation expenditure, entertainment expenditure, and shopping expenditure have all decreased due to the government lockdown policy. In contrast, the effect of the border control policy on accommodation expenditure is positive, indicating that tourists spend more on accommodation during the COVID-19 pandemic. Thus, tourists’ risk perceptions due to the COVID-19 pandemic are associated with their behaviors. This is consistent with the findings of Bratić et al. (2021) that tourists’ risk perceptions due to the COVID-19 virus can induce changes in their vacation behavior. As can be seen from Table 3, tourists chose to engage less in risky behaviors but more in relatively safe activities (staying in hotels) when their risk perception is high. The results of this study are also consistent with Lin and Chen (2021) that high-priced accommodation facilities tend to attract more customers by putting emphasis on different quarantine and hygiene measures during the COVID-19 pandemic. The contributions of this study are twofold. First, this study explicitly examines how the government’s lockdown policy impacted inbound tourists in different dimensions (length of stay, tourism expenditure, tourist satisfaction and revisit intention), which have not been much studied in the past related studies. Second, this study finds that inbound tourists’ behaviors are highly sensitive to their risk perceptions, which is consistent with past studies (Bratić et al., 2021).

However, some research limitation applies and the results of this study have to be interpreted with caution. During the pandemic period, people have experienced difficulties both mentally and economically. Those difficulties encountered may reshape people’s behaviors. For example, people’s psychological conditions, their friends’ or relatives’ health conditions can affect their behaviors. Internal mobility may have also turned into an abnormal situation due to trade restrictions. In other words, there may be different external factors that affect tourists’ behaviors. Unfortunately, these external factors were not included in this study due to data availability. Future studies could try to incorporate these different external factors into the analysis in order to improve the precision of the estimated coefficients. The second limitation is that this study uses only data from the Taiwan tourism market. Given that the COVID-19 pandemic has affected tourists globally, it would be of interest for future studies to perform a larger scale analysis such as a cross-country comparison using data from different countries.

Despite the above limitations, the findings of this study provide useful inspirations for tourism managers and authorities in making policies during the COVID-19 pandemic. Among different measures adopted by the tourism managers and authorities aimed to boost the
tourism industry post the COVID-19 pandemic era, reducing the tourists’ perceived risks associated with the destination is of high priority to regain confidence from the tourists.

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Declaration of competing interest

There is no conflict of interest involved.

References

Ahn, Y. J., Lee, S. K., & Lee, S. K. (2020). Do some travel purposes lead to more tourist expenditure patterns than others? Evidence from an almost ideal demand system (AIDS) analysis. Asia Pacific Journal of Tourism Research, 25(8), 902–913.

Bratic, M., Radivojevic, A., Stojiljkovic, N., Sinovci, O., Juvac, E., Lejnak, M., & Podovsovik, E. (2021). Should I stay or should I go? Tourists’ COVID-19 risk perception and vacation behavior shift. Sustainability, 13(6), 3573.

Donaire, J. A., Galli, N., & Camprubi, R. (2021). Empty summer: International tourist behavior in Spain during COVID-19. Sustainability, 13(8), 4356. https://doi.org/10.3390/su13084356.

Hall, M. C., Prayag, G., Fieger, P., & Dyason, D. (2020). Beyond panic buying: Consumption displacement and COVID-19. Journal of Service Management, 32(1), 113–128.

Hong, Y., Cai, G., Mo, Z., Gao, W., Xu, L., Jiang, Y., & Jiang, J. (2020). The impact of COVID-19 on tourist satisfaction with B&B in Zhejiang, China: An importance-performance analysis. International Journal of Environmental Research and Public Health, 17(10), 3747.

Humagain, P., & Singleton, P. A. (2021). Examining relationships between COVID-19 destination practices, value, satisfaction and behavioral intentions for tourists’ outdoor recreation trips. Journal of Destination Marketing & Management, 22, Article 100665.

Jang, S., Yu, L., & Pearson, T. (2003). Chinese travellers to the United States: A comparison of business travel and visiting friends and relatives. Tourism Geographies, 5(1), 87–108.

Kuo, C. W. (2021). Can we return to our normal life when the pandemic is under control? A preliminary study on the influence of COVID-19 on the tourism characteristics of Taiwan. Sustainability, 13, 9589.

Laesser, C., & Crouch, G. I. (2006). Segmenting markets by travel expenditure patterns: The case of international visitors to Australia. Journal of Travel Research, 44(4), 397–406.

Lehto, Y. Y., Cai, L. A., O’Leary, J. T., & Huan, T. C. (2004). Tourist shopping preferences and expenditure behaviours: The case of the Taiwanese outbound market. Journal of Vacation Marketing, 10(4), 320–332.

Lin, Y. C., & Chen, C. M. (2021). How do hotel characteristics moderate the impact of COVID-19 on hotel performance? Evidence from Taiwan. Current Issues in Tourism. https://doi.org/10.1080/13683500.2021.1910213.

López-Guzmán, T., Galvez, J. C. P., & Muñoz-Fernández, G. A. (2018). Satisfaction, motivation, loyalty and segmentation of tourists in World Heritage cities. PASOS, 16(1), 73–86.

Park, S., Woo, M., & Nicolau, J. L. (2020). Determinant factors of tourist expenses. Journal of Travel Research, 59(2), 267–280.

Sentelho, D. L., & Hon, A. (2020). The impacts of social and economic crisis on tourist behavior and expenditure: An evolutionary approach. Current Issues in Tourism, 23(6), 740–755.

Serra, J., Correia, A., & Rodrigues, P. M. (2015). Tourist spending dynamics in the algarve: A cross-sectional analysis. Tourism Economics, 21(3), 475–500.

Srivastava, A., & Kumar, V. (2021). Hotel attributes and overall customer satisfaction: What did COVID-19 change? Tourism Management Perspectives, 40, Article 100867.

Stannard, T., Steven, G., & McDonald, C. (2020). Economic impacts of COVID-19 containment measures. Analytical Notes Series, AN 2020/04, Reserve Bank of New Zealand.