

Does overtourism and climate risk nexus exist? A cross-country examination

Ghialy Yap ^a 

^a School of Business and Law, Edith Cowan University, Western Australia, Australia

Abstract:

This preliminary study examines the causality between overtourism and climate risk using a cross-country dataset. Using a cross-sectional error correction method, the results reveal that climate risk has a negative long-term adverse effect on overtourism, but not the reverse. This indicates that rising climate risk can reduce overtourism in the long run. Tourists are risk-averse towards climate risk, and they have the tendency to avoid visiting overcrowded tourist destinations that are prone to frequent occurrences of natural disasters.

Keywords: Overtourism, climate risk, climate change, rising temperature

1. INTRODUCTION

The term “overtourism” emphasises the excessive tourism demand for a destination that does not meet the quantity and quality of infrastructure and services to accommodate a large influx of visitors, creating social costs to local residents and putting strains on natural resources (Dodds and Butler, 2019, pp. 11-13; Capocchi et al, 2019). For example, overtourism in Venice has overused and damaged its landscape and coastal spaces (Seraphin et al., 2018). Seraphin et al. (2018, p. 375) were concerned that Venice could be endangered due to its vulnerability to climate change and overtourism.

Despite the critical issues about overtourism and climate change, it is unclear to what extent overtourism can further exacerbate climate risk or vice versa. The main argument for this point is that, on one hand, overtourism generates greenhouse gas emissions through the growing number of low-cost air and sea couriers, unsustainable use of resources such as drinking water, increasing waste and noise pollution and damages to the geographical and natural characteristics of a destination (Seraphin et al., 2018). A large inflow of visitors to such destinations can cause waste pollution and ecological damage (Butler, 2000). On the other hand, rising warm temperatures for countries with coastal islands can be appealing for travellers who want to visit warmer places that offer sun-and-beach activities. Therefore, this research aims to conduct a preliminary investigation into the overtourism and climate risk nexus to determine whether causal relationships exist between them.

2. METHODOLOGY AND RESULTS

This preliminary study examines 60 countries that display annual tourist arrivals exceeding the resident population between 2000 and 2020. A ratio of tourist arrivals to population (ta_pop) is used as a proxy of overtourism for each country. If a country experiences overtourism, the ratio displays a higher proportion of tourist arrivals relative to its domestic resident population. As a proxy for climate risk ($climate_risk$), we employ each country's climate risk score, which is based on the sustainable sovereign risk assessment methodology developed by the London Stock Exchange Group (LSEG). The score implies the degree of vulnerability of a country to climate-related hazards such as sea-level rise, rising temperatures, and food and water scarcity.

We derive economic models to capture the relationships between overtourism and climate risk, as shown in equations [1] and [2].

$$ta_pop_{i,t} = \alpha_0 + \alpha_1 climate_risk_{i,t} + \mu_{1i} + \varepsilon_{1,it} \quad [1]$$

$$climate_risk_{i,t} = \beta_0 + \beta_1 ta_pop_{i,t} + \mu_{2i} + \varepsilon_{2,it} \quad [2]$$

ta_pop = ratio of tourist arrivals to population; $climate_risk$ = climate risk score from LSEG; i = individual country; t = time; α and β are parameters; μ_i = unobservable country-specific effect; ε_{it} = idiosyncratic error term.

The expected sign for α_1 could be either positive or negative. For the positive sign, if the rising climate risk is purely due to more frequent extreme high temperatures, this can encourage a mass influx of tourists in warmer climate destinations, which can cause overtourism. However, for the negative sign, countries with high climate risk scores can be perceived as life-threatening to potential tourists. As the score increases, the proportion of tourist arrivals to population could fall. The expected sign for β could be positive. For countries that encounter increasing

overtourism issues, they can experience an increase in pollution and damage to the natural environment, leading to a surge in climate risk scores.

For the estimation strategy, this research adopts the cross-sectional error correction model (CS-ECM) developed by Blackburne and Frank (2007) and Ditzen (2021). The estimation method can generate cross-sectional specific coefficients for both the short and long run. From equations [1] and [2], the CS-ECM can be written as:

$$\Delta ta_pop_{i,t} = \mu_i - \varphi_{1i}(ta_pop_{i,t-1} - \theta_1 climate_risk_{it}) + \omega_1 \Delta ta_pop_{it} + \omega_2 \Delta climate_risk_{it} + \varepsilon_{1,it} \quad [3]$$

$$\Delta climate_risk_{i,t} = \mu_i - \varphi_{2i}(climate_risk_{i,t-1} - \vartheta_1 ta_pop_{it}) + \gamma_1 \Delta climate_risk_{it} + \gamma_2 \Delta ta_pop_{it} + \varepsilon_{2,it} \quad [4]$$

The study has conducted tests on unit root, cross-sectional dependence, and cointegration. First, ta_pop reveals non-stationary data, while $climate_risk$ is stationary. Second, both ta_pop and $climate_risk$ reject the null hypothesis of weak cross-sectional dependency. Third, long-run cointegration exists for both equations [3] and [4]. The findings can be obtained upon request.

Table 1 below shows the short and long-run coefficients for equations [3] and [4]. It reveals some interesting findings. First, while climate risk does not present any impact on tourism in the short run, it has a significant adverse effect on the international tourism industry in the long run. Second, the findings do not support the argument that overtourism can pose a risk to climate vulnerability in both the short and long run.

Table 1 CS-ECM short- and long-run estimations

Dependent variable: $\Delta ta_pop_{i,t}$	Coefficient (Standard error)	Dependent variable: $\Delta climate_risk_{i,t}$	Coefficient (Standard error)
Short-run estimation:		Short-run estimation:	
ω_2	-0.00194 (0.0319)	γ_2	0.4642 (0.7990)
φ_1	-0.6700*** (0.0466)	φ_2	-0.3331*** (0.0485)
Long-run estimation:		Long-run estimation:	
θ_1	-0.1918** (0.0837)	γ_2	10.6867 (13.6794)

Note: *** and ** denote significance at the 1% and 5% respectively.

3. CONCLUSIONS

Overtourism and climate risk can be viewed as a double-edged sword. On the one hand, overtourism has been blamed for creating risks to environmental and climate vulnerability. On the other hand, the surging risk of climate change, i.e. rising temperatures, can cause massive or uncontrollable inflows of tourists to warmer destinations. This preliminary study investigates whether causal relationships between overtourism and climate risk exist empirically. Using 60 countries between 2000 and 2020, the study found that climate risk can negatively impact overtourism, but not the reverse. Such findings provide us with a holistic view that overtourism is not the leading cause of rising climate risk. However, if a destination has a high climate risk score, this can reduce overtourism in the long run, mainly assuming that tourists are risk-averse to climate-related hazards that could happen to the destination.

ACKNOWLEDGEMENTS

I acknowledge the use of Copilot for searching information and Grammarly for improving sentence structure. All analyses and results discussions are based on the author's own work.

REFERENCES

- Blackburn, E. F. & Frank, M. W. (2007). Estimation of nonstationary heterogenous panels. *Stata Journal*, 7(2), 197-208.
- Butler, R. (2018). Challenges and opportunities. *Worldwide Hospitality and Tourism Themes*, 10(6), 635-641.
- Ditzen, J. (2021). Estimating long-run effects and the exponent of cross-sectional dependence: An update to *xtdcce2*. *Stata Journal*, 21(3), 687-707.
- Dodds, R., & Butler, R. W. (2019). *Overtourism: Issues, Realities and Solutions*. De Gruyter: Berlin.
- Seraphin, H., Sheeran, P., & Pilato, M. (2018). Over-tourism and the fall of Venice as a destination. *Journal of Destination Marketing & Management*, 9, 374-376.