

Research Assessment Exercise 2020

Impact Case Study

University: The Hong Kong Polytechnic University |

Unit of Assessment (UoA): 23 hotel management & tourism |

Title of case study: Supporting Destination Development through Accurate Tourism Demand Forecasting |

(1) Summary of the impact

Research carried out at The Hong Kong Polytechnic University (PolyU) since 2008 has helped national tourism organisations and private businesses to formulate their operational strategies in the Asia Pacific region. This is especially significant because tourism-related ventures rely heavily on accurate forecasts of tourism demand to reduce the risk of investments and operations. This research has also provided tourism destinations within the region with useful information on demand elasticity analyses, which can inform pricing and marketing policies. In particular, the team used forecast exercises to estimate source-market-specific price and income elasticities for destinations within the region. |

(2) Underpinning research

The research on tourism demand forecasting was initiated in 2004, when Professor Haiyan Song joined the School of Hotel and Tourism Management at PolyU. Since then, PolyU has been awarded a number of research grants from the Hong Kong Research Grants Council (RGC), which have allowed the research team to work continuously on advancing the tourism demand modelling and forecasting methodologies, with a particular focus on the methodologies that enable accurate forecasts of large tourism demand forecasting systems (3.1). This has led to the establishment of the first Web-based tourism demand forecasting system, which can predict the demand for Hong Kong tourism from a number of source markets. The system also generates forecasts of tourist receipts and demand for hotel rooms in Hong Kong. Based on the research underpinning this forecasting system, the research team further improved its forecasting accuracy through interval forecasting (3.2), bootstrapping (3.3), forecast combination (3.4) and judgmental forecasting (3.6). These innovations were first introduced to tourism demand modelling and forecasting by the research team. In a large scale tourism demand forecasting system involving the estimation of hundreds of forecasting models, it is important to identify the best performing models through a forecasting competition between a large number of alternative models under different situations, such as different destination-origin pairs and high frequency versus low frequency data, and to test both pure time series models and econometric models. The research team carried out a major forecasting competition (3.5) to identify the best forecasting models. The results allowed the research team to develop appropriate tourism demand forecasting models. |

(3) References to the research

- 3.1 Song, H., S. F. Witt and X. Y. Zhang (2008). Developing a Web-based Tourism Demand Forecasting System. *Tourism Economics*, 14 (3), 445-468.
- 3.2 Song, H., J. Kim and S. Yang (2010). Confidence Intervals for Tourism Demand Elasticities. *Annals of Tourism Research*, 37 (2), 377-396.
- 3.3 Kim, J. H., Song, H. and Wong, K. K. (2010), Bias-corrected Bootstrap Prediction Intervals for Autoregressive Model: New Alternatives with Applications to Tourism Forecasting. *Journal of Forecasting*, 29: 655-672.

- 3.4 Shen, S., G. Li and H. Song (2011). Combination Forecasts of International Tourism Demand. *Annals of Tourism Research*, 38(1), 72-89.
- 3.5 Athanasopoulos, G., R. Hyndman, H. Song and C. Wu (2011). The Tourism Forecasting Competition. *International Journal of Forecasting*, 27(3), 822-844.
- 3.6 Song, H., Z. Gao, and S. Lin (2013). Combining Statistical and Judgmental Forecasts via a Web-based Tourism Demand Forecasting System. *International Journal of Forecasting*, 29, 295-310. |

(4) Details of the impact

Accurate tourism forecasts provide a scientific foundation for tourism policies (e.g. planning investment in infrastructure, marketing resource allocation and tourist taxation) and business strategies (e.g. operation management and new product development). As a result, organisations can benefit from more effective strategic planning and reduced risk of decision failures.

The success of the Web-based forecasting system attracted the attention of the Pacific Asia Travel Association (PATA), an internationally acclaimed, not-for profit organisation that promotes the responsible development of travel and tourism to, from and within the Asia Pacific region. The Association provides advocacy, insightful research and innovative events to its member organisations, which comprise government, state and city tourism bodies, international airlines and airports, hospitality organisations, educational institutions and travel industry companies in Asia Pacific and beyond. In 2012, PATA engaged the PolyU team in collaboration with scholars from the University of Surrey in the UK to establish a forecasting system that generates quarterly and annual forecasts of visitor arrivals to more than 40 destinations within the Asia Pacific region. The objective is to generate accurate forecasts of visitor arrivals and receipts for PATA, which can inform the policy and strategy formulations of its members in the public and private sectors. Accurate forecasts are vital for the success of the project. The first PATA report was produced in 2013. So far, the forecasting team has produced six forecasting reports (5.2; other sample reports are available online). Beginning in 2019, PATA further engaged the team to produce more than 40 individual reports (one for each destination).

The developed models represent the most advanced econometric methods for tourism demand modelling and forecasting in the present literature. Most of the research publications listed above were supported by the Hong Kong Research Grants Council General Research Fund.

Based on the developed methodologies, the PolyU team has been producing annual PATA Visitor Forecasts since 2013. The forecasting reports are made available to all PATA members, including nearly 100 governments, 25 airlines and airports, and hundreds of travel companies around the world. To date, more than 800 non-government agencies from 40 countries/regions have subscribed to the system. The research team members have been invited to give over 50 presentations at international conferences and workshops, and attended media releases for the commissioned projects. The forecasts have been used by such businesses as Air China, Bangkok Airways, Nauru Airlines, Malaysia Airports, Changi Airport, Boeing, Resorts World Sentosa, Hong Kong International Theme Parks Limited and Viator (5.3). They have been widely reported and shared via online news portals and social media (5.4, 5.5).

Below are two examples of the impacts of the PATA Visitor Forecasts:

- a) PATA Visitor Forecasts are important sources of information for government policy formulation in the Asia Pacific region. Based on the PATA Visitor Arrival Forecasts, China Tourism Academy and National Tourism Data Center, the think tank of the China Tourism Administration (CNTA) (now the Ministry of Culture and Tourism (MCT)),

has used our forecasts of tourism demand in the Belt and Road region to formulate government policy. Specifically, the PATA Visitor Forecasts identified long term growth in tourist flows between China, Russia, Mongolia and Pakistan. Subsequently, promotional policies tailored to these countries were designed. In addition, since 2014 through CNTA/MCT, the Chinese government has signed 70 bilateral agreements on culture and tourism cooperation with the Silk Road Economic Belt countries covered in the PATA Visitor Forecasts (5.6).

- b) Business strategies, especially expansion strategies, require accurate forecasts of demand for products and services. The PATA Visitor Forecasts provide useful information for business decision-making at the micro level. As industry members of PATA, airlines, hotels, travel agencies and cruise liners rely on our destination–origin forecasts to inform their business investment decisions. For example, Dusit Hotel & Resort International, with more than 270 properties under 6 brands operating in 13 countries, has used PATA Visitor Forecasts to formulate medium- to long-term development strategies. Based on our forecasts for 2015-2018, Dusit Hotels and Resorts made considerable investment in hotel expansion within the Asia Pacific region. As a result, their hotel rooms increased from 2,782 in 2013 to 5,113 in 2019. In addition, more than 50 Dusit Thani hotels are in the pipeline in countries/regions where the PATA Visitor Forecast Reports identified higher growth potential (5.7).]

(5) Sources to corroborate the impact

- 5.1 [Web-based forecasting system:
<http://www.tourismforecasting.net/hktdfs/home/project/teams.jsp>
- 5.2 Asia Pacific Visitor Forecasts Reports 2013-2017, 2015-2019
- 5.3 Testimonial letter available from Dr Mario Hardy, CEO, Pacific Asia Travel Association (PATA). This confirms the value of forecasts for different stakeholders in understanding the changing market dynamics of tourism in the Asia Pacific region.
- 5.4 Forecast clippings from different countries (2017-2019)
- 5.5 Forecast updates in social media (2017-2019)
- 5.6 Testimonial letter available from Mr Zhongguang Li, Vice President of China Tourism Academy of China Tourism Administration (CNTA). This confirms the use of forecasts related to the demand for tourism has influenced the government policy formulation.
- 5.7 Testimonial letter available from Chairman of Dusit Hotels & Resorts. This confirms the use of the forecasts in shaping the short- and mid-term business decisions and guiding the investment decision on expansion of the network of hotels in Thailand and the Asia Pacific region.]