



CONFIDENCE INTERVALS FOR TOURISM DEMAND ELASTICITY

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Abstract: Long-run tourism demand elasticities are important policy indicators for tourism product providers. Past tourism demand studies have mainly focused on the point estimates of demand elasticities. Although such estimates have some policymaking value, their information content is limited, as their associated sampling variability is unknown. Moreover, point estimates and their standard errors may be subject to small sample deficiencies, such as estimation biases and non-normality, which renders statistical inference for elasticity problematic. This paper presents a new statistical method called the bias-corrected bootstrap, which has been proved to provide accurate and reliable confidence intervals for demand elasticities. The method is herein employed to analyze the demand for Hong Kong tourism. **Keywords:** tourism demand, elasticity, bias-corrected bootstrap. © 2009 Elsevier Ltd. All rights reserved.

INTRODUCTION

Researchers and practitioners are interested in tourism demand elasticities for two main reasons. First, these elasticities reflect the way in which tourists respond to changes in the influencing factors of tourism demand in terms of direction and magnitude. Second, they provide useful information for tourism policy formulations, as tourism providers can manipulate such determinants as the tourism price and marketing expenditure to increase demand for the tourism product/service under consideration. Tourism demand elasticities provide “unit-free” measures of the sensitivity of an explanatory variable to tourism demand, given a pre-specified functional relationship. Economic theory suggests that, subject to budgetary constraints, tourists choose to purchase particular tourism products/services from among a set of all available such products/services to maximize their utility (Song & Witt, 2000). When the price of a tourism product/service changes, tourists’

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real income also changes. In addition, the price of the product/service in question, relative to the alternatives, also changes. These changes are called income and substitution effects, respectively. Thus, the income and price elasticity values derived from the demand function include both of these effects.

Numerous empirical studies on tourism demand elasticity have been published since the early 1970s, including those carried out by Crouch (1995), Li, Song, and Witt (2005), and Lim (1997). Table 1 presents a list of all those published since 2000. The general findings of these studies indicate that the income elasticities of tourism demand, especially the demand for international tourism, are generally greater than one, thus indicating that tourism is a luxury. The own price elasticity is normally negative, but the magnitudes vary considerably depending on the type of tourism (long or short haul) and the time span of the demand under consideration (long-run versus short-run). However, these studies report point estimates only. Point estimation gives a single value as an estimate of the parameter of interest, but provides no information about the degree of variability associated with it. Hence, such estimates are substantially less informative than confidence intervals. Another drawback is that point estimation provides a biased estimate of true elasticity, as elasticity is often a non-linear function of other model parameters.

In addition, the sampling distribution of a point elasticity estimator is likely to follow a non-normal distribution, which renders conventional statistical inference based on normal approximation problematic. Hence, with point estimates alone, it is difficult to assess whether an elasticity estimate is statistically significant or whether it truly represents elastic demand. Therefore, a confidence interval that is robust to small sample biases and non-normality and that has a prescribed level of confidence is more useful for decision-makers.

The main purpose of this study is to estimate demand elasticity intervals using the bootstrapping method with a view to overcoming the problems associated with point demand elasticity estimates. The empirical analysis of these intervals is based on a dataset relevant to the demand for Hong Kong tourism. More specifically, we estimate the confidence intervals for the long-run elasticities of the demand for inbound tourism to Hong Kong with respect to its main economic determinants: income, own price and substitute price.

We consider nine major inbound markets: Australia, mainland China (China), Japan, Korea, the Philippines, Singapore, Taiwan, the United Kingdom (UK) and the United States (US). Our analysis is based on the autoregressive distributed lag (ARDL) model, which is applied to each market. We employ the ARDL bounds test proposed by Pesaran, Shin, and Smith (2001) to determine the existence of a long-run relationship between tourism demand and its determinants. Once the presence of such a relationship is established, we estimate the long-run elasticities using the ARDL model. For interval estimation, we employ the bias-corrected bootstrap method developed by Kilian (1998), which Li and Maddala (1999) found to be the best means of constructing confidence intervals for long-run elasticities. It is designed to overcome the aforementioned problems of bias and non-normality in relation to elasticity

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