Remodeling international tourism demand: Old theory and new evidence

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HIGHLIGHTS

- Inclusion of price and exchange rate as mutually exclusive components is flawed.
- Independent use of price and exchange rate variables should be abolished.
- Combined use of substitute and relative prices is not practical in policy-making.
- IPI is not a good proxy for income in predicting tourism demand.
- Country-specific heterogeneity must be taken into account in panel data.

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ABSTRACT

The purpose of this study is to advance the tourism demand theory by excluding simultaneous effects of exchange rates and prices in empirical models, formulating an alternative pricing modus operandi consistent with recent research in the area, and demonstrating the efficacy of the use of an industrial production index (IPI) as a proxy for income. A panel fully modified ordinary least squares (FMOLS) method is employed to estimate the inbound tourism demand for Turkey. Study findings suggest that the inclusion of exchange rates and prices, as mutually exclusive components, can be misleading; the IPI is not a good proxy for income; and country-specific coefficients need to be analyzed to accurately explain determinants of tourism demand for countries in the panel.

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1. Introduction

Since the inception of tourism studies as an academic field, economists have studied tourism demand extensively to estimate the determinants of demand as well as to forecast future tourism demand by applying a variety of empirical techniques. While early tourism demand studies focused on measurement issues as they relate to the proper identification of independent variables (e.g., Witt & Martin, 1987b), conceptualization of variables (e.g., Martin & Witt, 1988; Uysal & Crompton, 1985), and proxies acceptable for these variables (e.g., Morley, 1994), current studies tend to focus more on modeling and forecasting techniques (e.g., Wong, Song, Witt, & Wu, 2007) and data levels to be used (Song, Li, Witt, & Fei, 2010). However, a consensus has yet to be reached on common factors affecting tourism demand and most effective modeling and forecasting techniques (Peng, Song, Crouch, & Witt, 2014). While acceptable proxies for dependent variables are generally straightforward, it is unclear how explanatory variables should be constructed and which variables should be included in tourism demand models. In particular, the estimation of purchasing power parity effects on tourism demand models is still controversial (De Vita & Kyaw, 2013; Oh & Ditton, 2005).

There are typically two components of price in tourism demand models: 1) prices at a destination (cost of living) relative to the prices at tourists' originating country, which are known as relative prices (RP), and 2) prices at the destination relative to the prices in competing destinations, which are known as substitute prices (SP) (Song & Li, 2008). Accordingly, both RP and SP have an effect on tourism demand. While most tourism demand studies include at

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least one of these variables, different methods are used in constructing prices. One issue concerns the appropriate measurement of prices and the availability of such data. Often, for example, relative consumer price indices are used (see e.g., Uysal & Crompton, 1984), but some studies have occasionally employed indices more attuned to the measurement of tourist service prices (Martin & Witt, 1987). A further major modeling problem arises from the role and inclusion of exchange rates in demand models. Martin and Witt (1988) argue that exchange rate alone is not an acceptable proxy for prices and suggest including exchange rates separately along with RP and SP standardized by the relevant exchange rate. Where the effect of exchange rates is modeled independently, the argument often centers on the view that tourism consumers may have a different awareness of, and reaction to, exchange rates compared to local prices. Tourists often have some knowledge of exchange rates before they travel to their destination, but may not be as aware of local currency prices until after they have arrived at their destination (Martin & Witt, 1988). While some studies use exchange rates *only* to standardize the RP and SP (see e.g., Song, Witt, & Li, 2003), most studies have included exchange rates separately along with the RP and/or SP standardized by a relevant exchange rate (see e.g., Martin & Witt, 1988). Oh and Ditton (2005) argue that separate exchange rates along with the RP variable should be used as proxies for prices. Recently, De Vita and Kyaw (2013) showed, however, that the exchange rate alone is not a significant determinant of tourism demand, while RP standardized by exchange rate is, and they argued that exchange rates, on their own, should not be included in tourism demand models. However, the authors failed to provide an analytical explanation and empirical evidence about why tourism demand models should exclude a separate exchange rate along with prices standardized by relevant exchange rates.

IPI has been used, albeit rarely, in tourism demand studies as a proxy for income (e.g., González & Moral, 1995; Seo, Park, & Yu, 2009) in the presence of monthly level data because income proxies, such as GDP or GNP, are not available on a monthly basis. However, the extent to which IPI is a suitable proxy for income is not clear. Thus, we further analyze the efficacy of IPI as a proxy for income relative to GDP, which is the most commonly used income proxy in tourism demand studies.

Most non-stationary panel data analyses are conducted based on the assumption that the panel members are homogeneous and provide a pooled long-run coefficient estimate for the entire panel (Pedroni, 2001). In our study, while "the term panel data refers to the pooling of observations on a cross-section of countries over several time periods" (Baltagi, 2005, p. 1), the term non-stationary simply refers to the nature of data's variance and covariance change over time making it challenging for an analyst to model demand accurately. However, members of the panel may have different characteristics; thus, they are likely to produce different coefficient estimates. Accordingly, using the fully modified ordinary least squares (FMOLS) estimator, one can compare the pooled coefficient estimates (which assume the panel members are homogeneous), with country-specific coefficient estimates (which assume the panel members are heterogeneous). The FMOLS estimator models the long-run relationship for panels of cointegrated variables. However, the long-run coefficients are analogous to short-run coefficients. The FMOLS estimator applies modifications to the OLS estimator to correct for serial correlation and endogeneity problems (Pedroni, 2001). Correcting serial correlation and endogeneity (or biased estimation) problems allow the associated t-statistics to follow the standard normal distribution. Hence, the FMOLS estimator produces asymptotically unbiased and normally distributed coefficient estimates.

Accordingly, the purpose of this study is to rectify the methodological inaccuracies made when modeling tourism demand and constructing the variables used in extant tourism demand studies. Although we do not proclaim to address all misconceptualizations of proxy variables used in tourism demand studies, we do suggest new conceptualizations of demand constructs to avoid further model misspecification problems. More specifically, we first reconceptualize the use of exchange rates and prices in tourism demand models to readdress and correct the methodological errors made while constructing the price variable. Second, we test the efficacy of IPI as a proxy for income relative to the GDP. Finally, we investigate the differences between pooled and country-specific coefficient estimates produced when using panel data analysis in order to provide evidence that different strategies may be required across tourist generating countries. For these purposes, we model international tourism demand for Turkey from nine major tourist generating countries, *Germany, France, Netherlands, United Kingdom, Italy, United States, Russian Federation, Belgium, and Sweden,* for the period of 2003–2012 to empirically test the proposed postulations using the FMOLS estimator.

The results show that the coefficients of exchange rates and prices are insignificant when they are simultaneously included in the demand model. However, the relative and substitute prices become significant when they are adjusted by relevant exchange rates. The income effect on tourism demand is only statistically significant when using GDP as a proxy for income, yet it is not significant when IPI is used. Country-specific coefficient estimates vary greatly relative to estimates from the pooled panel data analysis.

Accordingly, we advance the following postulations: 1) We theorize that inclusion of price and exchange rate variables as mutually exclusive components can be misleading and hence independent use of these variables should be abolished. 2) Prices standardized by exchange rate seem to be better proxies for cost of living in destinations relative to an [or "the"] originating home country. 3) We empirically show that GDP is a better proxy for income relative to IPI in predicting tourism demand. 4) Country-specific coefficients need to be estimated using appropriate empirical methods because countries in a panel may not be homogeneous and hence determinants of demand may be different for each country in the panel.

1.1. Literature review

Estimating and forecasting tourism demand are important for marketing strategies and policy developments. Perhaps, the growing number of review and meta-analytical papers published in academic journals on tourism demand in recent decades illustrates the importance of demand studies in tourism (for a detailed review of tourism demand literature please see Crouch, 1994b; Lim, 1997; Peng, Song, & Crouch, 2014; Peng, Song, Crouch, Witt, 2014; Song & Li, 2008; Witt & Witt, 1995). However, tourism demand models vary widely in terms of dependent and independent variables, periods and levels of the data, empirical methodologies, and country of origin and destination pairs.

While tourist arrivals, tourism expenditures, and tourism receipts are mainly used as tourism demand proxies (e.g., Akal, 2004; Chu, 2011), a few studies used the length of stay (e.g., Gokovali, Bahar, & Kozak, 2007) and tourist nights spent (e.g., Gouveia & Rodrigues, 2005). Although the use of these variables as proxies are theoretically sound, analyses may yield different results based on the proxies used. More recently, Song, Li, Witt, and Fei (2010) showed that tourist expenditures variable is a better proxy for demand than tourist arrivals. They maintain however that the use of a particular dependent variable would depend entirely on the aim of the analysis and whether destinations want to see an