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# FORECASTING TOURIST ARRIVALS IN GREECE AND THE IMPACT OF MACROECONOMIC SHOCKS FROM THE COUNTRIES OF TOURISTS' ORIGIN

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**Abstract:** This paper generates short-term forecasts on tourist arrivals in Greece and performs impulse response analysis to measure the impact of macroeconomic shocks from the origin country on future tourism demand. We find the ARIMA (1, 1, 1) model outperforms exponential smoothing models in forecasting the direction of one year *out of sample* forecasts. However, this does not translate into point forecasting accuracy. Impulse response analysis on the impact of unemployment and tourists' cost of living shocks shows that the source of downside risk to future tourism numbers is limited in scope, magnitude, and duration. Shocks to consumer confidence from the origin countries have no impact on future tourism demand. Our results offer important insights and implications for policymakers and tourist operators.
**Keywords:** tourist arrivals, macroeconomic shocks, ARIMA, Holt's exponential model with trend, double exponential smoothing, impulse response function. 

## INTRODUCTION

The tourism industry is, for some countries, one of the most crucial sectors of their economy, as it accounts for a large part of their Growth Domestic Product (GDP) and employment figures. Tourism is characterized by large variations in numbers on a yearly basis and, as a result, predicting future arrivals is a very difficult task. Forecasts of tourist arrivals are essential for planning, policy making and budgeting purposes by tourism operators (Uysal & O'Leary, 1986).

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In response to this, a growing body of literature has focused on tourism demand and arrivals' forecasts in several countries (for instance, Law (2000) for Taiwan and Hong Kong, Burger et al. (2001) for South Africa, Chu (2008) for nine major tourist destinations in the Asian-Pacific region, Dharmaratne (1995) and Dalrymple and Greenidge (1999) for Barbados, González and Moral (1996) for Spain, Chu (2004), 2009), Song and Witt (2006) for Asian-Pacific countries, Lim and McAleer (2001), Athanasopoulos and Hyndman (2008) for Australia, Smeral and Weber (2000) and Papatheodorou and Song (2005) for international tourism trends and Shen, Li, and Song (2010) for the United Kingdom outbound tourism demand) under the research framework that the tourism industry is a key sector in the economic development strategy of many developing countries.

A second strand of literature that has emerged in recent years is the use of macroeconomic factors to explain tourism demand using structural time series models. For instance, Metzgen-Quemarez (1990) used real GDP figures from the United States, amongst other factors; Var, Golam, and Icoz (1990) and Icoz, Kozak, and Var (1998) considered Turkish Consumer Price Index (CPI) figures and the Turkish Lira currency exchange rate against the currency units from the tourists' country of origin, respectively; Greenidge (2001) used real GDP and CPI of the country of origin as well as the price index of tourism in Barbados and finally, Song, Li, Witt, and Athanasopoulos (2010) employed GDP data of the country of origin and CPI in Hong Kong relative to the country of origin adjusted by the exchange rate.

This paper seeks to break new ground by analyzing, for first time in the literature, the impact of macroeconomic shocks from the country of origin on future short term tourism demand to Greece. We examine the effect of tourists' cost of living, unemployment and consumer confidence in the country of origin as the source of macroeconomic shocks. Particularly, the two latter variables have not been considered in the prior related literature. Tourists' cost of living is used as a measure of price competitiveness of the destination and, as such, has a major impact on tourism demand. Unemployment and the consumer confidence indicator serve as useful proxies for the state of the economy in the origin country, which implies an impact to future demand for tourism. The intuition behind unemployment lies in two avenues of research which have focused on the wage curve hypothesis and the psychological impact on the level of happiness. Both explanations imply a negative impact on future tourism numbers in periods of high unemployment. The consumer confidence indicator reflects the level of economic uncertainty and/or expectations on future income and the level of precautionary savings. The build up of precautionary savings feeds into falling levels in tourism demand as consumers postpone or cancel vacations.

Additionally, no study to our knowledge has attempted to forecast future arrivals in Greece, which is one of the most popular tourist destinations worldwide. According to the National Statistical Service of Greece, in 2002 the country welcomed 14.9 million international tourists placing Greece the 12$^{th}$ place most visited destination