Tourism and economic growth: a time-varying parameter approach

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Tourism and economic growth: a time-varying parameter approach

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The main goal of this study is to investigate the effect of tourism on the economic growth in Turkey over the period of 1970–2011 using the time-varying parameter and the Kalman filter approaches. The results show that tourists have a positive impact on the economic growth of Turkey. We have found that a 1% increase in the spending of tourists leads to a 0.03% increase in the gross domestic product per capita. In addition, physical and human capital and government consumption expenditure have positive effects on economic growth, while real effective exchange rate has a negative effect on Turkey’s economic growth. Finally, this study shows that the product elasticities are inelastic in Turkey during the period of 1970–2011.

Keywords: economic growth; time-varying parameter; Kalman filter; Turkey

Introduction

Recently, researchers have been interested in the relationship between tourism and economic growth. A general consensus has emerged that it increases foreign exchange income, creates employment opportunities, stimulates the growth of the tourism industry, and therefore triggers overall economic growth. As such, tourism development has become a common awareness in political authorities worldwide (Kasimati, 2011). Like other countries Turkey gives special emphasis to international tourism due to its contributions to the economy. International tourism generates both macro- and micro-economic effects. Among the latter, international tourism improves the quality of labour employed in the industry, uses sources efficiently under high competition, benefits from scale economies, and develops new facilities adapted to international standards and demand and supply in the tourism sector. The macroeconomic effects of international tourism are a weightier consideration: these include foreign export demand for domestic goods and services, generating foreign currency earnings, new employment opportunities within the country, contributing to the repayment of foreign debt, improving the country’s international standing as well as its people’s living standards, increasing national income, generating new economic sources, accumulating investment, and thus increasing domestic output, and so on.

The main purpose of the study is to estimate the relationship between tourism revenues and economic growth in Turkey. Though numerous studies in the past attempted to estimate tourism effect on economic growth for Turkey, the application of the time-varying parameter (TVP) approach for the set of Turkey data covering 1970–2011 is rather new. The paper is organized in five sections: after the introduction, the second

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section reviews the literature and theoretical basics, the third section presents empirical studies, and the fourth section outlines the research methodology, where the TVP approach is explained, the model is presented, and the data requirement of the selected model is discussed. The fifth section presents research findings and analysis. The last section draws conclusions and suggests policy implications.

**Literature review**

Recorded global evidences demonstrate that whenever the economic growth status of the world, and especially the economic status of major tourist countries of origin have not been in an appropriate condition (oil shock period, etc.), international tourism has been faced with stagnation in all countries. Due to improvements in the status of the global economic growth and enhancing future perspectives of the economy, especially in these major tourist countries, the level of demand for foreign trips has increased. Global economic growth leads to an increased investment in all economic sectors and increased trade volume among the countries and this will lead to an enhanced international tourism demand. In other words, when income per capita status and the economy of Turkey’s neighbouring countries is improved, increasing foreign currency incomes obtained from international tourism for the country is much higher than when improvement of economic status occurs in countries further away. National economic growth and increasing income per capita level in the first step, along with increasing the levels of internal tourism demand and investment in this sector, enhances internal tourism levels within a country. In the next step, increased internal tourism level results in the increasing of international tourism levels according to the Linder theory.

Thus, tourism should have an impact on the frequently used quantitative measure of the economic development gross domestic product (GDP). As a result, a specialized literature has developed a method to measure the impact of tourism upon GDP to deal with measuring how tourism contributes to economic growth (Ivanov & Webster, 2006).

As such, tourism-generated proceeds have come to represent a significant revenue source, increasing employment, household income, and government income in countries worldwide.

According to the estimates of the World Tourism Organization, the number of international people’s movements around the world will rise to 1602 million by 2020, while tourism receipts will reach some US$200 billion (United Nations World Tourism Organization [UNWTO], 2011). Furthermore, the World Tourism Travel Council expects that the scale of the world tourism industry, which made up roughly 10.4% of the world’s GDP in 2004, will increase to 10.9% in 2014. When all components of the tourism industry were taken into account, i.e. tourism consumption, investment, government spending, and exports, the industry grew 5.9% in 2004 alone, reaching US$5.5 trillion. The 10-year growth forecast is for US$9.5 trillion in 2014. For these very reasons, thoroughly investigating all aspects of tourism development and economic growth is extremely important for governments (Leea & Chang, 2008, p. 180).

It has been more than a decade since tourism has been converted into the biggest industry in the world, and it has constantly been developed since then. Today, this industry is a great income resource for many countries, and most governments support the tourism industry actively. On the other side, half of the world employment will be allocated to tourism industry by 2020, based on statistics from the World Trade Organization (WTO). According to the WTO, the number of tourists in the world exceeded 800 million persons in 2007, with an income of more than 800 billion dollars. It places the tourism industry in
third rank of world trades, after the oil and automotive industries. This industry is one of
the most important and highest income industries of the world in the twenty-first century,
thus encouraging policy-makers to pay more attention to this industry as an economic,
cultural, and political and security development strategy, and its positive economic and
cultural impacts are considered seriously by governments and nations (Lashkarizadeh,

In the case of Turkey, the main transformation concerning the tourism sector started
during the mid-1980s. Before 1980, the share of tourism in total fixed investments was
under 1%, and its share in GDP was 0.8% with only about 60,000 bed spaces. In 1985, in
line with the newly implemented program the sector was included among promoted
sectors; thus largely contributing to economic growth with increasing investments in the
sector. The share of tourism in GDP increased from 0.8% in 1980 to 7% in 2007. While the
tourism income was US$326 million and the number of foreign tourists were 1,288,000 in
1980, the figures increased to 23,500,000 tourists with a tourism income of US$13,390
million. Table 1 demonstrates the development of Turkish tourism by gathering a
summary of the total number of tourist arrivals and tourism income of Turkey in 4-year

As noted, tourism plays an important role in Turkey’s gross national product (GNP),
export, and in meeting foreign trade deficits. The share of GNP tourism receipts relative to
exports has significantly increased since 1980. To illustrate, in 1980, the share of tourism
receipts of Turkey in GNP was 0.06% and its share of exports was about 11%. The share of
tourism receipts (GNP) increased to about 0.6% and exports increased to about 29% in
2001, also 3.6 and 20.8% in 2011. Table 2 shows the share of tourism receipts in GNP and
the share of tourism receipts in exports over the period of 1970–2011.

According to the WTO’s projections (World Trade Organization [WTO], 1996),
Turkish tourism will grow 5.5% each year until 2020. International tourist arrivals in
Turkey are expected to be 27 million by 2020 with tourism receipts of US$19.8 billion by
2020. In so doing, tourism will play a pivotal role in strengthening the relationships
between Turkey and the rest of Europe.

Recently, there have been efforts to test empirically whether international tourism
leads to economic growth. Balaguer and Cantavella-Jordà (2002) examined the role of
tourism in Spain’s long-run economic development. They found evidence to support the
tourism-led economic growth hypothesis for the data sample from the last three decades.
This finding implies an appropriate policy choice, which has led to positive tourism

Table 1. Development of Turkish tourism by years.

<table>
<thead>
<tr>
<th>Years</th>
<th>Incoming tourists (× 1000)</th>
<th>Tourism income (million US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970–1973</td>
<td>4025</td>
<td>387</td>
</tr>
<tr>
<td>1974–1977</td>
<td>5986</td>
<td>777</td>
</tr>
<tr>
<td>1978–1981</td>
<td>5860</td>
<td>1217</td>
</tr>
<tr>
<td>1982–1985</td>
<td>7747</td>
<td>3103</td>
</tr>
<tr>
<td>1986–1989</td>
<td>13,877</td>
<td>7847</td>
</tr>
<tr>
<td>1990–1993</td>
<td>24,482</td>
<td>12,957</td>
</tr>
<tr>
<td>1994–1997</td>
<td>32,699</td>
<td>21,936</td>
</tr>
<tr>
<td>1998–2001</td>
<td>39,197</td>
<td>28,096</td>
</tr>
<tr>
<td>2002–2005</td>
<td>65,918</td>
<td>44,212</td>
</tr>
<tr>
<td>2006–2009</td>
<td>96,575</td>
<td>59,158</td>
</tr>
<tr>
<td>2010–2011</td>
<td>59,473</td>
<td>32,843</td>
</tr>
</tbody>
</table>

income multiplier effect in Spain. In a similar study, Dritsakis (2004) found strong causality between international tourism earnings and economic growth for the economy of Greece for the period of 1960–2000. In brief, these studies imply that policies designed to attract tourists and that parallel international demand for tourism in these countries creates net positive income effects.

As another Mediterranean country with significant sun-sand-sea attractions along long coastlines as well as numerous historical, cultural, geographical, and environmental attractions and facilities, Turkey’s tourism development and tourism policies have contributed to Turkey’s economic growth, especially since 1980. At the same time, Turkey has followed export-led industrialization and outward-looking development policies since 1980, similar to South Korea. In the context of this similarity, one may consider the effects of international tourism on South Korea’s economic growth. Oh (2005) rejects the tourism-led economic growth hypothesis in favour of the economy-driven tourism growth hypothesis for South Korea: export-driven economic growth in the South Korean economy may be a strong causal component of tourism growth. In fact, Oh argues that the tourism-led growth occurs in economies where tourism demonstrates a spillover effect. Oh’s finding implies that the share of tourism earnings in the GDP must be high in order to validate the tourism-led economic growth hypothesis. The proportion of tourism receipts in relation to manufacturing in the Korean GDP is too low, arguably, to accept the tourism-led economic growth hypothesis. One may consider that South Korean government policies might not be as rational as those in Spain and Greece, to match international tourism demand for goods and services, thereby leading to spillover effects. Table 3 has summarized some major recent works on tourism development and economic growth.

**Table 2. The share of tourism receipts in GNP and export (%) in Turkey.**

<table>
<thead>
<tr>
<th>Years</th>
<th>The share of tourism receipts in GDP</th>
<th>The share of tourism receipts in exports</th>
<th>The share of tourism receipts in GDP</th>
<th>The share of tourism receipts in exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>0.3</td>
<td>8.8</td>
<td>1991</td>
<td>1.8</td>
</tr>
<tr>
<td>1971</td>
<td>0.4</td>
<td>9.3</td>
<td>1992</td>
<td>2.3</td>
</tr>
<tr>
<td>1972</td>
<td>0.5</td>
<td>12.4</td>
<td>1993</td>
<td>2.2</td>
</tr>
<tr>
<td>1973</td>
<td>0.7</td>
<td>13.0</td>
<td>1994</td>
<td>3.3</td>
</tr>
<tr>
<td>1974</td>
<td>0.5</td>
<td>12.6</td>
<td>1995</td>
<td>2.9</td>
</tr>
<tr>
<td>1975</td>
<td>0.5</td>
<td>14.3</td>
<td>1996</td>
<td>3.3</td>
</tr>
<tr>
<td>1976</td>
<td>0.4</td>
<td>9.2</td>
<td>1997</td>
<td>4.3</td>
</tr>
<tr>
<td>1977</td>
<td>0.3</td>
<td>11.7</td>
<td>1998</td>
<td>2.9</td>
</tr>
<tr>
<td>1978</td>
<td>0.4</td>
<td>10.1</td>
<td>1999</td>
<td>2.1</td>
</tr>
<tr>
<td>1979</td>
<td>0.3</td>
<td>12.4</td>
<td>2000</td>
<td>2.9</td>
</tr>
<tr>
<td>1980</td>
<td>0.5</td>
<td>11.2</td>
<td>2001</td>
<td>5.3</td>
</tr>
<tr>
<td>1981</td>
<td>0.5</td>
<td>8.1</td>
<td>2002</td>
<td>5.3</td>
</tr>
<tr>
<td>1982</td>
<td>0.6</td>
<td>6.4</td>
<td>2003</td>
<td>4.6</td>
</tr>
<tr>
<td>1983</td>
<td>0.7</td>
<td>7.2</td>
<td>2004</td>
<td>4.4</td>
</tr>
<tr>
<td>1984</td>
<td>1.4</td>
<td>11.8</td>
<td>2005</td>
<td>4.2</td>
</tr>
<tr>
<td>1985</td>
<td>2.2</td>
<td>18.6</td>
<td>2006</td>
<td>3.5</td>
</tr>
<tr>
<td>1986</td>
<td>1.6</td>
<td>16.3</td>
<td>2007</td>
<td>3.2</td>
</tr>
<tr>
<td>1987</td>
<td>2.0</td>
<td>16.9</td>
<td>2008</td>
<td>3.5</td>
</tr>
<tr>
<td>1988</td>
<td>2.6</td>
<td>20.2</td>
<td>2009</td>
<td>4.1</td>
</tr>
<tr>
<td>1989</td>
<td>2.4</td>
<td>22.0</td>
<td>2010</td>
<td>3.4</td>
</tr>
<tr>
<td>1990</td>
<td>2.1</td>
<td>24.9</td>
<td>2011</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Source: Ministry of Tourism, Turkey (2012).
Table 3. Tourism development and economic growth in the literature.

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Used technique</th>
<th>Result(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arslanturk, Balcilar, and Abidin Ozdemir (2011)</td>
<td>Time-varying causality; time-varying coefficient model; VECM</td>
<td>No Granger causality between the series. GDP has no predictive power for tourism receipts; however, tourism receipts have a positive predictive content for GDP following early 1980s.</td>
</tr>
<tr>
<td>Odhiambo (2012)</td>
<td>ARDL (bounds testing)</td>
<td>There is a unidirectional causal flow from labour force participation to economic growth – and from tourism development to labour force participation.</td>
</tr>
<tr>
<td>Amaghionyeodiwe (2012)</td>
<td>Multivariate co-integration, error-correction</td>
<td>There is a long-run positive relationship between economic growth and tourism. An increase in tourism receipts tends to have a positive impact on GDP.</td>
</tr>
<tr>
<td>Srinivasan, Santhosh Kumar, and Ganesh (2012)</td>
<td>ARDL-UECM</td>
<td>Tourism has a positive impact on economic growth in Sri Lanka both in the short and long run.</td>
</tr>
<tr>
<td>Ekanayake and Long (2012)</td>
<td>Panel co-integration, Granger causality</td>
<td>The results suggest that governments of developing countries should focus on economic policies to promote tourism as a potential source of economic growth.</td>
</tr>
<tr>
<td>Narayan, Sharma, and Bannigidadmath (2013)</td>
<td>Panel data</td>
<td>Visitor arrivals consistently predict exports and money supply, and to a lesser extent, exchange rates and GDP.</td>
</tr>
<tr>
<td>Surugiu and Surugiu (2013)</td>
<td>Co-integration method and Granger causality (VECM)</td>
<td>There are Granger causality relationships running from tourism expansion to economic growth, which sustains the tourism-led growth hypothesis.</td>
</tr>
<tr>
<td>Brida, Pereyra, Pulina, and Such (2013)</td>
<td>Co-integration, Granger type causality</td>
<td>There is strong empirical evidence in favour of the hypothesis of tourism as a generator of long-term economic growth.</td>
</tr>
<tr>
<td>Ridderstaat, Croes, and Nijkamp (2013)</td>
<td>Co-integration, VECM, Granger causality</td>
<td>The long-run relation indicates that a 1% change in tourism revenues would lead to a 0.49% increase in real GDP in the long run.</td>
</tr>
<tr>
<td>Aslan (2013)</td>
<td>Newly developed panel Granger causality tests</td>
<td>The study finds evidence to support the tourism-led growth hypothesis for a group of panel in Mediterranean countries.</td>
</tr>
</tbody>
</table>

Notes: VECM, vector error correction model; ARDL, autoregressive distributed lag model; UECM, unrestricted error correction model.
The share of international tourism revenues in Turkey’s GDP has been increasing since 1980. Whether international tourism contributes to Turkey’s economic growth was recently tested by Gunduz and Hatemi-J (2005). They found evidence that international tourism does contribute to the long-term economic growth of Turkey, thereby supporting the earlier research conducted by Kasman and Kirbas (2004), who had also found a positive long-term co-integrated relationship between international tourism revenues and economic growth in Turkey; more specifically: higher numbers of international tourists coming in leads to a higher per capita income in Turkey. These findings not only imply the presence of spillover effect of international tourism in the economy, they also imply that economic agents have thus far followed rational policies to match international tourism demand for goods and services.

The tourism sector in Turkey is backward and forward linked to the 38 sectors (Kasman & Kirbas, 2004), which implies higher multiplier effect – close to 3.5 compared with many other sectors. The long-run growth elasticity, with respect to international tourism revenues equals 0.326, representing a 0.326% growth in GDP as a result of an average of 1% increase in international tourism revenues.

The primary purpose of this article is to examine the relationship between tourism and the economic growth of Turkey. It attempts to determine the relationship between earnings from tourism and GDP for the period of 1970–2011 using Space State models. TVP and Kalman filter (KF) algorithm are used to try to assess whether a relationship exists between tourism receipt and economic growth or not.

**Methodology**

This study uses a TVP approach for estimating tourism effects on Turkey’s economic growth during the period of 1970–2011. The TVP approach is an advanced technique in econometric forecasting. This model relaxes the constancy restriction on the parameters to be estimated in a traditional fixed-parameter econometric model to take account of the possibility of parameter changes over time (Li, Wong, Song, & Witt, 2006). According to Song and Witt (2000), the TVP approach can simulate different types of external shocks to the tourism demand system, and such shocks could include policy and regime shifts, economic reforms, and political uncertainties. This could be particularly applicable to countries that have suffered from extreme changes in prices (e.g. from petroleum supply disruptions), from war in their region, or when their major generating markets are encountering limits such as leisure time available or changing their politico-economic systems (e.g. transition from communist to market economies). In particular, the TVP serves well in capturing the influence of external shocks that are gradual and diffused in nature, such as consumer taste evolution and other social and psychological changes of the consumers (Song & Wong, 2003). The TVP approach has been successfully used in modelling and forecasting other economic activities (Brown, Song, & McGillivray, 1997; Riddington, 1993; Song, Liu, & Romilly, 1996, 1997; Song, Romilly, & Liu, 1998; Stock & Watson, 1996). However, the application of the TVP method to tourism has been rare. The TVP model allows such parameters to change over time, and therefore is more adaptable in dealing with structural changes in econometric models (Engle & Watson, 1987). Brown et al. (1997), Kim (1993), Park and Hahn (1999), Park and Zhao (2010) and Song and Wong (2003) are important articles that used TVP approach.

TVP models are normally specified in a state space form (SSF), and estimated by the KF algorithm (Kalman, 1960). A wide range of time series models, including the classical linear regression model and ARIMA models, can be written and estimated as special cases
of a state space specification. State space models have been applied in the econometrics literature to model unobserved variables: (rational) expectations, measurement errors, missing observations, permanent income, unobserved components (cycles and trends), and the non-accelerating rate of unemployment. Extensive surveys of applications of state space models in econometrics can be found in Hamilton (1994a, 1994b) and Harvey (1989).

There are two main benefits in representing a dynamic system in SSF. First, the state space allows unobserved variables (known as the state variables) to be incorporated into, and estimated along with, the observable model. Second, state space models can be analysed using a powerful recursive algorithm known as the Kalman (Bucy) filter. The KF algorithm has been used, among other things, to compute exact, finite sample forecasts for Gaussian ARMA models, multivariate (vector) ARMA models, multiple indicators and multiple causes, and time-varying (random) coefficient models.

A linear state space representation of the dynamics of the $n \times 1$ vector $y_t$ is given by the system of equations:

$$y_t = c_t + Z_t \alpha_t + \varepsilon_t,$$

$$\alpha_{t+1} = d_t + T_t \alpha_t + \vartheta_t,$$

where $\alpha_t$ is an $m \times 1$ vector of possibly unobserved state variables, where $c_t$, $Z_t$, $d_t$, and $T_t$ are conformable vectors and matrices, and where $\varepsilon_t$ and $\vartheta_t$ are vectors of mean zero, Gaussian disturbances. Note that the unobserved state vector is assumed to move over time as a first-order vector autoregression.

We will refer to the first set of equations as the “signal” or “observation” equations and the second set as the “state” or “transition” equations. The disturbance vectors $\varepsilon_t$ and $\vartheta_t$ are assumed to be serially independent, with contemporaneous variance structure:

$$\Omega_t = \text{var} \left( \begin{pmatrix} \varepsilon_t \\ \vartheta_t \end{pmatrix} \right) = \begin{pmatrix} H_t G_t \\ G_t' Q_t G_t \end{pmatrix},$$

where $H_t$ is an $n \times n$ symmetric variance matrix, $Q_t$ is an $m \times m$ symmetric variance matrix, and $G_t$ is an $n \times m$ matrix of covariances. Note that the updating equation for the states is for the states in period $t \times 1$, given the errors specified in period $t$.

Here, we present a very brief discussion of the specification of a linear state space model. Those desiring greater detail are directed to Hamilton (1994a, 1994b), Harvey (1989), and especially the excellent treatment of Koopman, Shephard, and Doornik (1999). Over the past decade, the co-integration, error correction, and vector autoregressive (VAR) models have been widely used, sometimes even overused, in the areas of modelling and forecasting virtually all macroeconomic and financial activities. Although these modelling methods are different in the ways in which the models are constructed, they are all derivatives of traditional ordinary least squares (OLS). According to Bomhoff (1994), if time series are stationary, their first and second moments are well defined, and there is no conceptual problem in computing the unconditional means, variances, and covariances based on the observations over the same period. However, when time series are non-stationary, as with most economic time series, OLS is invalid since the properties of the time series depend on the length of the sample period. Therefore, unconditional means, variances, and covariances cannot be calculated using OLS. To overcome this problem, the data need to be differenced. This often results in the
loss of the long-run characteristics of the model. The TVP approach, however, estimates
the parameters of the model sequentially using the forward KF and backward Kalman
smoother and produces conditional distributions for means and variances. It is, therefore,
more useful in analysing non-stationary series. Moreover, the TVP approach does not
require the data to be stationary before model estimation, and so the procedure of model
specification and estimation is drastically simplified since one does not have to worry
about unit root testing and data differencing (Song & Wong, 2003).

Model and data
The model used in this study derived from Aslan (2008), Fayissa, Nsiah, and Tadesse
(2007) and Sequeira and Campos (2005) models. In the economic growth literature,
researchers have been interested in the rate at which countries close the gap between their
current positions and their desired long-run growth path.

To determine the responsiveness of income growth rate to tourism and the traditional
sources of economic growth such as investment in physical and human capital, a measure of
an institutional factor represented by the economic freedom index, government consumption
expenditures, and a proxy variable of external competitively, real effective exchange rate, we
first specify a simple double log-linear Cobb–Douglass production function as:

\[ \text{LNGDPP}_t = \beta_{1t} + \beta_{2t} \text{LNPHCA}_t + \beta_{3t} \text{LNSSCEN}_t + \beta_{4t} \text{LNTOUR}_t \\
+ \beta_{5t} \text{LNGCONEXP}_t + \beta_{6t} \text{LNEXR}_t + \varepsilon_t, \]  

(4)

\[ \beta_{jt} = \phi_j \beta_{j-1} + \varepsilon_{jt}, \quad \text{where } j = 1, 2, \ldots, 6 \text{ and } t = 1970, \ldots, 2011. \]  

(5)

Equation (4) is called the measurement or system equation, while Equation (5) is
known as the transition or state equation. There are two additional assumptions related to
Equations (4) and (5). If the components of the matrix \( \phi_j \) in Equation (5) equal unity, the
transition equation becomes a random walk (RW) process:

\[ \beta_{jt} = \beta_{j-1} + \varepsilon_{jt}. \]  

(6)

If the transition equation can be written as an RW, the parameter vector \( \beta_t \) is said to be
non-stationary. The error term \( \varepsilon_{jt} \) in Equation (6) is an external shock to the state equation
\( j \), and this shock may be due to a change in economic policy or a shift of the economic
regime at time \( t \).

LNGDPP is the natural log of real GDP per capita (World Bank, 2013), LNPHCA is
the log of gross fixed capital formation as a percent of real GDP used as a proxy for
investment in physical capital (World Bank, 2013), LNSSCEN is log of secondary and
tertiary school enrolment used as measure of investment in human capital (World Bank,
2013), LNTOUR is log of tourist receipts per capita in US$ (UNWTO, 2011),
LNGCONEXP is log of government consumption expenditure (World Bank, 2013),
LNEXR is log of real effective exchange rate (Penn World Table version 7.0), and \( \varepsilon \) is the
error terms with the conventional statistical properties.

Results
The TVP approach is tested based on the effect of tourism on the economic growth for
Turkey. In this study, the selected model is estimated after examining various models with
autoregressions and moving averages of varying degrees and using the KF algorithm. This model with minimum Akaike and Schwarz criteria moreover fits with the theoretical foundations. The estimation sample period is from 1970 to 2011. The results of the estimation are presented in Table 4. Since the transition equations all follow a RW process, they are omitted from the table. The results of model reveal the expected relationship between the GDP per capita income and the explanatory variables. The variables representing the sources of growth have the expected signs. As we estimated a double-logarithmic model, all the coefficients represent elasticities. The values of the product elasticities reported in Table 4 are for the end of period demand elasticities (i.e. they are the estimated elasticities for 2011).

The results indicate that tourism (TOUR) has a positive and statistically significant effect on the GDP per capita (at $p < 0.05$) of Turkey. Accordingly, we find that a 10% increase in the tourism receipts of Turkey’s economy would result in a 0.03% increase in the average per capita income. Similarly, a 10% increase in investment in physical capital (PHCA) as measured by the gross fixed capital formation as a percent of GDP will increase GDP per capita by 0.07%. We also find that investment in human capital (SSCEN) through increases in secondary and tertiary levels of school enrolment and government consumption expenditures (GCONEXP) have a positive and statistically significant impact on the real GDP of Turkish economy, i.e. a 10% increase in human capital and government consumption expenditures will typically lead to a 0.5 and 0.09% increase in the GDP per capita of the Turkish economy, respectively. Only LNEXR elasticity ($-0.01$) is negative which shows an opposite effect on economic growth. It is noteworthy that this table shows the impact of last year.

In order for tourism and other variables during the course of investigation and analysis, a transfer equation (Equation (5)) using KFs are estimated. The results are shown graphically in Figure 1. Although the product elasticities in the recent period are important, researchers and practitioners may also wish to examine the evolution of the product elasticities over the time. As by looking at the changing patterns of the product elasticities, we can find out how economic growth has responded to the policy and regime changes at certain periods. This enables us to provide useful suggestions for further policy formulations.

The results show that the product elasticities are inelastic in Turkey, as the absolute value of the product elasticity with respect to explanatory variables, especially tourism receipts, is less than 1. The tourism receipts have had a positive effect on economic growth during the time period, but the trend has been declining, especially from 1970 to 2011 the

<table>
<thead>
<tr>
<th>Variables</th>
<th>Final state</th>
<th>Root MSE</th>
<th>z-Statistic</th>
<th>Prob.</th>
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<tr>
<td>Intercept</td>
<td>5.243061</td>
<td>0.530644</td>
<td>9.880557</td>
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<td>LNPHCA</td>
<td>0.073577</td>
<td>0.014381</td>
<td>5.116265</td>
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<td>LNSSCEN</td>
<td>0.511833</td>
<td>0.145613</td>
<td>3.515031</td>
<td>0.0004</td>
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<td>LNTOUR</td>
<td>0.030020</td>
<td>0.012789</td>
<td>2.347348</td>
<td>0.0213</td>
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<tr>
<td>LGCONEXP</td>
<td>0.090663</td>
<td>0.063824</td>
<td>1.420529</td>
<td>0.1555</td>
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<td>LNEXR</td>
<td>0.011393</td>
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<td>0.0251</td>
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<td>Log likelihood</td>
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<td>Schwarz criterion</td>
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<td>Diffuse priors</td>
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<td></td>
<td>Hannan–Quinn criterion</td>
<td>-0.402476</td>
</tr>
</tbody>
</table>

Source: Authors calculation.
The trend has more declining slope. It can also be observed that LNPHCA, LNSSCEN, and LNGCONEXP have had positive effects on economic growth during the time period. All these three variables have considerable downward or upward trends from 1970 to 2011. Probably the major event which has occurred in Turkey during this period was that every four main variables of the economy have led to a strong reaction. LNEXR effect on economic growth during this period was generally negative.

**Conclusion and implications**

Using TVP and KFs new approaches, the main goal of this study is to investigate the effect of tourism on the economic growth in Turkey over the period of 1970–2011. The results show that the expenditure of tourists positively impacts the economic growth of Turkey. We have found that a 1% increase in the spending of tourists leads to a 0.03% increase in the GDP per capita income. According to the WTO, Turkey offers considerable potential, not only for seaside tourism, but also for environmental and ecotourism, cultural tourism, and sports tourism. Turkey is recognized as a symbol of tourism in the region today.

Based on Figure 1, the product elasticities are inelastic in Turkey, as although tourism has always increased, Turkey’s GDP, is still less than 1. Therefore, the government should make policies to mitigate the effects of basic changing, including, social, economic, and...
natural shocks. Also, the results show that physical and human capital and furthermore, government consumption expenditures, have increased effects on economy. On the contrary, real effective exchange rate has a reductive effect on GDP.

A policy implication which may be drawn from this study is that Turkey’s economy can improve its economic growth performance, not only by investing on the traditional sources of growth such as investment in physical and human capital and government expenditure, but also by strategically harnessing the contribution of the tourism industry and improving their governance performance.

These findings are important for policy-makers, because they can now argue in favour of allocating more financial resources to the tourism industry (for more tourism supply and promotion) aimed at obtaining higher levels of economic growth in the future. Turkey can increase its labour productivity by employing new management and operation strategies, importing advanced technologies and new inputs in the tourism industry, and thereby increase economic growth further. Furthermore, the endogenous nature of tourism requires policy-makers to take care of buildings and maintain adequate conditions (e.g. leadership, creativity, innovation, and entrepreneurship) to guarantee a long-term growth potential of tourism and, ultimately, the economy.

Notes
1. Email: mamipours@gmail.com
2. Email: kaveh.nazari@gmail.com
3. Grossman and Helpman (1991, p. 517) consider the spillover effects of scientific and technological knowledge on foreign trade and economic growth. This is also possible in the tourism industry.

References


