Tourism industry: Role of the real effective exchange rate

Indústria turística: a importância da taxa de câmbio efetiva real

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Abstract

This paper aims to evaluate an econometric model of equilibrium for the Bulgarian foreign tourism industry. The main microeconomic assumptions of the model are the existence of identical consumers, identical composite tourism industry product and perfect market conditions. The real effective exchange rate (REER) is used as a proxy for the composite product price and other proxies are introduced for foreign income and domestic tourism industry capacity. The data is deseasonalised with a geometric mean and the Hodrick-Prescott filter. The TSLS method of estimation is applied to take into account the over-identified model. The estimation results are consistent with core microeconomic theory. The estimated model allows for price equilibrium convergence. Dropping the initial constraints allows for additional conclusions.

The tourism industry can substantially gain from advertising, product diversification and diminished reliance on summer bookings. Given the important macroeconomic role of the tourism industry under the Currency Board regime and the potential for tourism industry vulnerability, the government could play an important role in promoting sustainable development in the tourism sector.

Keywords: Bulgaria, Real effective exchange rate, partial equilibrium, supply and demand curves, tourism sector.

Resumo

Este trabalho tem como objetivo avaliar um modelo econométrico de equilíbrio para a indústria do turismo estrangeiro búlgaro. As principais premissas microeconómicas do modelo são a existência de consumidores idênticos, idêntico produto turismo compósito e condições de mercado perfeitas. A taxa de câmbio efetiva real (TCER) é usada como uma proxy para produto composto preço e outras proxies são introduzidas para a rendimento externo e capacidade doméstica da indústria do turismo. Os dados são corregidos da sazonalidade, com uma média geométrica e o filtro de Hodrick - Prescott. O método TSLS de estimação é aplicado a ter em conta o modelo identificado. Os resultados da estimação são consistentes com a teoria microeconómica. O modelo estimado permite a convergência de equilíbrio de preços. Sem considerar as restrições iniciais, permite tirar conclusões adicionais.

A indústria do turismo pode ganhar substancialmente através da promoção, da diversificação de produtos e da diminuição da dependência das reservas de verão. Dado o papel macroeconómico importante da indústria do turismo sob o regime do Gabinete de Câmbio e do potencial de vulnerabilidade da indústria do turismo, o governo poderia desempenhar um papel importante na promoção do desenvolvimento sustentável no sector do turismo.

Palavras-chave: Bulgária, taxa de câmbio efetiva real, equilíbrio parcial, curvas da oferta e da procura, setor do turismo.

1. REER and the tourism industry in Bulgaria

The tourism industry is certainly one of the most dynamic sectors of the Bulgarian economy. The recent strategy of the Ministry of Economy and Energy of Bulgaria includes tourism, together with the manufacturing industry and the small and medium size enterprises sector, in the group of the most competitive sectors of the Bulgarian economy. Tourism became even more important for the Bulgarian economy after the impact of the global economic crisis of 2008-2009.

The old (2000-2006) and the present (2007-2013) National Development Plan rely on tourism as one of the engines of economic growth.

The tourism sector is important also from a macroeconomic point of view. It is one of the few sectors generating foreign trade surpluses and hence contributing to the external equilibrium of the Bulgarian economy.

The worsening of the current account deficit was one of the biggest weaknesses in the Bulgarian economy (IMF, 2004). Although the Bulgarian current account improved after the outset of the current economic crisis, the role of the tourism sector is still crucial as a source of scarce foreign currency. At the same time, the fixed exchange rate (Currency Board) regime of the Bulgarian lev, makes the position of the tourism sector quite vulnerable, given the well-known price-sensitive nature of the demand for tourism services (Durbarry, 2002). This follows from the fact that the country cannot rely on national currency depreciation in case of rising domestic costs or falling external demand.

It is generally recognised that the exchange rate is especially important for the tourism sector and foreign tourist inflow in particular (Tribe, 2011). Since both the exchange rate and the price level are important for foreign tourist services demand (Tse, 2001), it is natural to use the Real Effective Exchange Rate (REER) as an integrated measure of the tourism sector's export price. The importance of different specifications of the REER for various sectors in international competitiveness is widely accepted (Schmitz, De Clercq, Fodora, Lauro, Pinheiro, 2012).

There are relatively few analytical papers trying to explain the factors behind the strong expansion of the tourism industry in Bulgaria. An exception is Marinov's (2008) paper. As a consequence, it is unclear to which extent the relative macroeconomic stability of the Bulgarian economy is compatible with tourism sector's strong growth and what external factors may affect the industry's performance.

The aim of the present paper is to suggest a simple explanation of the tourism industry's growth especially in the period preceding the economic crisis, based on partial equilibrium analysis. Keeping the analysis as simple as possible, we can still explain what are the main driving forces and possible threats to the tourism sector.

2. A simple partial equilibrium model

The main objective of this paper is to evaluate demand and supply curves for the Bulgarian foreign tourism services market.

For this purpose, we assume that the demand side consists of identical consumers enjoying identical linear utility functions and identical income levels. Furthermore, we conjecture that these consumers buy the same constant basket of goods and services. In brief, we have identical consumers buying the same composite product.

To simplify additionally our task, we presume that foreign tourists' basket coincides with the basket, used by the authorities to compute the Real Effective Exchange Rate (REER). The nominal effective exchange rate is defined as a geometric weighted average of the bilateral exchange rates of the currency of a given country against the currencies of the partner countries of this country. The real effective exchange rate is defined as a geometric weighted average of relative prices (costs) between a given country and its trading partners, expressed in a common currency. It is calculated by deflating the nominal effective exchange rate using appropriate price and cost indexes. The basic feature of the methodology, applied by the BNB and ECB, is the usage of a geometric average in the calculations of the effective exchange rates and of weights, based on manufacturing trade accounting for third countries (BNB2:1-4).

In this paper we used the variant of REER with the consumer price index as deflator in contrast to the unit labor cost alternative. Thus the REER becomes the "price" of one unit of compound tourist' services product per unit of foreign currency, bought and sold on a perfect market. This is a new specification of REER in the context of the tourism industry. Usually the REER is viewed as a macroeconomic variable affecting long term macroeconomic equilibrium (Pineda, Cashin & Sun, 2009).

The REER is calculated by the Bulgarian National Bank (BNB), according to the following formulae:

(1) $$REER = \prod_i \left[\frac{DEFLATOR_{BG}}{DEFLATOR_i * ER_{BGN/currency\_of\_i}} \right]^{w_i},$$

Where $DEFLATOR_{BG}$ is the deflator for Bulgaria (CPI for Bulgaria), $DEFLATOR_i$ is the deflator (CPI) for the respective foreign trade partner country, $ER_{BGN/currency\_of\_i}$ – the exchange rate of the Bulgarian lev (BGN) against the unit currency of the partner country i, i=1,..,n, and w_i – the weight of the partner country i in the basket;

Both the supply and demand of tourism services are supposed to depend on the price, i.e., on the REER. The quantities of tourism services supplied and demanded coincide in our case with real foreign tourist spending and are taken from this item in the balance of payments statistics of Bulgaria.

Consequently we can write two equations:

(2) ST = ST(REER, CT)

(3) DT = DT(REER, YF),

Where ST stands for the supply of tourism services; DT represents foreign demand; CT is the capacity of the domestic tourism industry and YF reflects the foreign income.

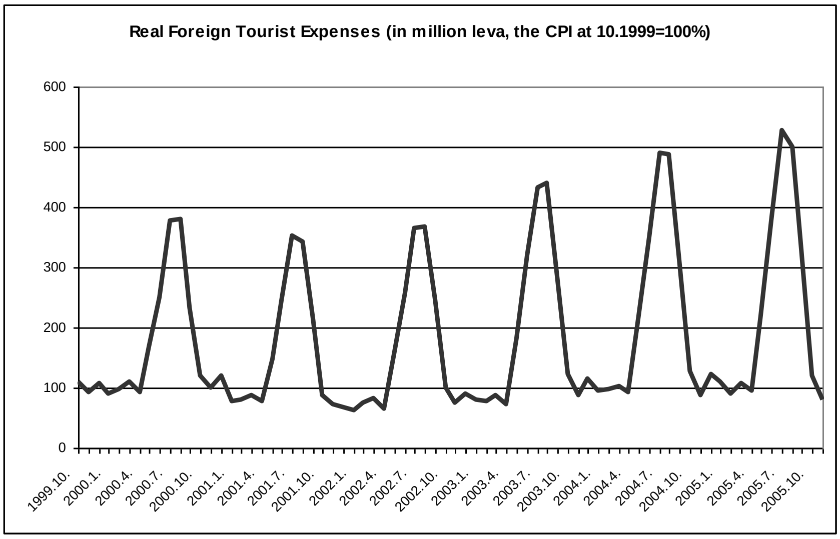
As a result of this formulation, the supply and demand for tourism services are supposed to depend additionally on domestic tourist industry capacity and the foreign income level respectively. The latter two variables can be interpreted as shift parameters, displacing supply and demand curves.

Since in equilibrium the supply equals demand, we have two equations, one dependent and three exogenous variables.

From the point of view of econometric estimation, the two simultaneous structural equations system with three instrumental variables is clearly over identified, so the Ordinary Least Squares (OLS) method is not applicable (Piganiol, 1978). In this case we can apply the two-stage LS method (TSLS).

Another problem is seasonality. This is particularly noticeable in the case of foreign tourism earnings, represented in Figure 1. One can easily observe the summer bookings by foreign tourist spending time in Bulgaria. The seasonal factors seriously worsen the results of econometric estimation of the relationship between dependent and independent variables.

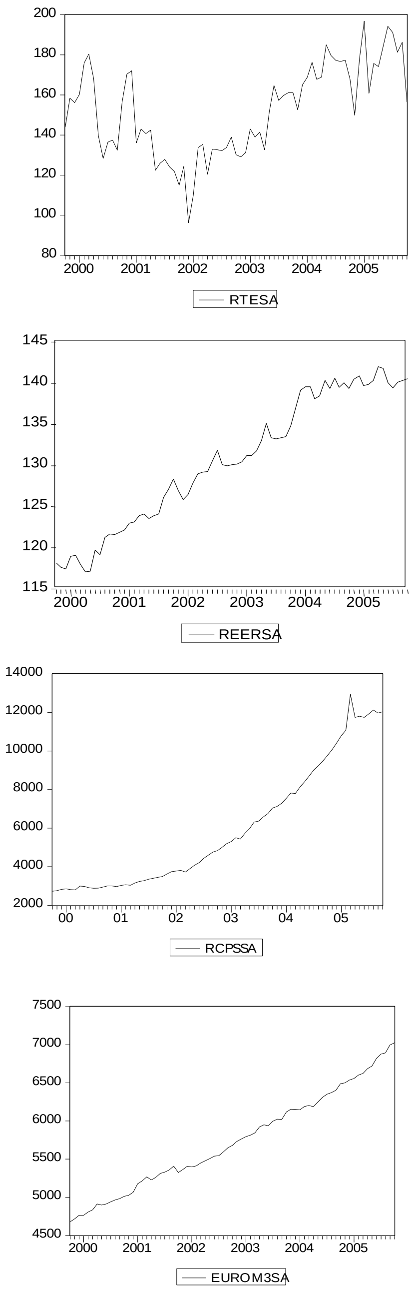
Figure 1 - Real Foreign Tourism Expenses



Sources: The Bulgarian National Bank and The National Statistical Institute, different issues

To resolve this problem, we applied two variants of seasonal adjustment. The first is based on the method of multiplicative moving averages. The calculation involves the technique of geometric mean centred moving average, used by the econometric software package of EViews7. The results of the seasonal smoothing are presented in Figure 2.

Figure 2 - Seasonal Adjustment Calculated by EViews 7



System: SYS01

Estimation Method: Two-Stage Least Squares

Date: 02/09/06 Time: 23:23

Sample: 2000:06 2005:10

Included observations: 65

Total system (balanced) observations 130

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.005118	0.000813	6.294759	0.0000
C(2)	0.942925	0.035525	26.54282	0.0000
C(3)	0.039820	0.008209	4.850923	0.0000
C(4)	-0.557217	0.355911	-1.565609	0.1199

Determinant residual covariance 1802.381

Equation: RTESA = C(1)*RCPSSA(-8) + C(2)*REERSA(-1)

Observations: 65

R-squared	0.625280	Mean dependent var	151.0253
Adjusted R-squared	0.619332	S.D. dependent var	23.43377
S.E. of regression	14.45824	Sum squared resid	13169.56
Durbin-Watson stat	0.776471		

Equation: RTESA = C(3)*EUROM3SA(-8) + C(4)*REERSA(-7)

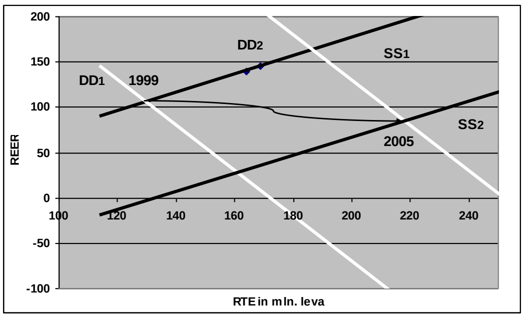
Observations: 65

R-squared	0.554181	Mean dependent var	151.0253
Adjusted R-squared	0.547104	S.D. dependent var	23.43377
S.E. of regression	15.77035	Sum squared resid	15668.35
Durbin-Watson stat	0.662205		

Source: Author

Figure 3 plots supply and demand schedules based on the HP filter smoothing estimation (equations 6 and 7). The SS1 and SS2 lines stand for supply in 1999 and 2005, while the DD1 and DD2 lines replicate demand.

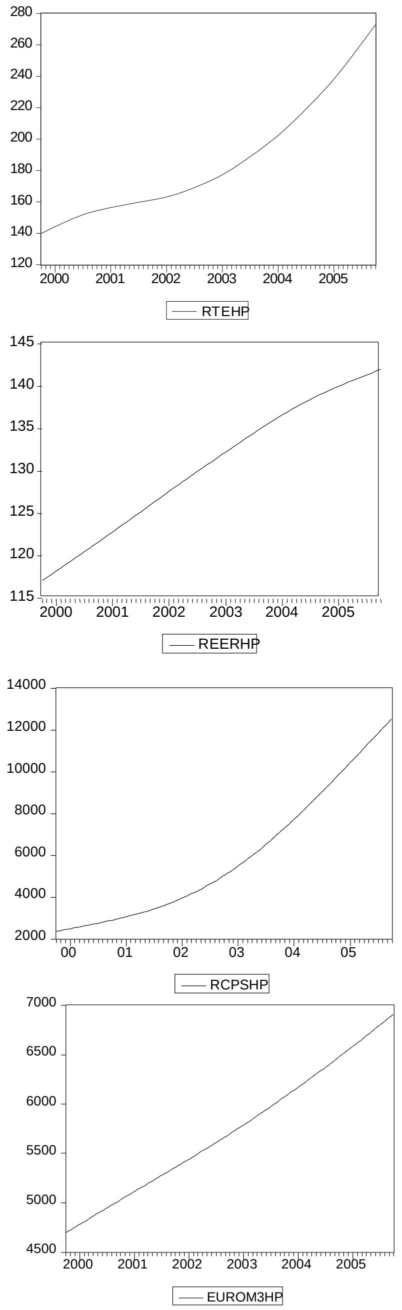
Figure 3 - Supply and Demand Schedules



Source: Author

The second approach exploits the Hodrick-Prescott (HP) filter (Hodrick and Prescott, 1997). The latter is a two-sided linear filter that computes smoothed sequences by minimising the series' variance, subject to penalty constraints. In our case the penalty parameter λ equals 14400, a level appropriate for monthly data. The results are presented in graphic form in the Figure 4.

Figure 4 - Hodrick-Prescott Filter by E-Views &



System: SYS02

Estimation Method: Two-Stage Least Squares

Date: 02/09/06 Time: 23:35

Sample: 2000:04 2005:10

Included observations: 67

Total system (balanced) observations 134

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.011026	0.000216	50.96058	0.0000
C(2)	0.995344	0.009978	99.75842	0.0000
C(3)	0.090415	0.003213	28.13732	0.0000
C(4)	-2.443921	0.138907	-17.59388	0.0000
Determinant residual covariance		101.5096		

Equation: RTEHP = C(1)*RCPSHP(-6) + C(2)*REERHP(-3)

Observations: 67

R-squared	0.986728	Mean dependent var	190.0609
Adjusted R-squared	0.986524	S.D. dependent var	35.80847
S.E. of regression	4.156864	Sum squared resid	1123.169
Durbin-Watson stat	0.014883		

Equation: RTEHP = C(3)*EUROM3HP(-6) + C(4)*REERHP(-2)

Observations: 67

R-squared	0.958411	Mean dependent var	190.0609
Adjusted R-squared	0.957771	S.D. dependent var	35.80847
S.E. of regression	7.358535	Sum squared resid	3519.622
Durbin-Watson stat	0.010610		

Source: Author

The difference between the two methods is in the degree of smoothing. The HP filter allows for much smoother series, suitable for analysing long term relations but implies additional loss of information.

Another problem is the cointegration of series data. For this purpose we applied Augmented Dickey-Fuller Unit-Root test for all series drawn in the analysis (Dickey and Fuller, 1979). All the seasonally adjusted data correspond to an I(1) process, so the series are of the same order of integration and can be estimated as a system without additional transformations.

3. Proxies and estimation results

Some of the variables from the equations (1) and (2) are relatively easy to evaluate. This applies especially to the REER. The data about the real effective exchange rate is regularly published by the BNB. The REER calculated by the BNB is based on the CPI index as of the end of period (BNB1, 2005). The same applies to the data about the real foreign tourist expenses, respectively the variables ST and DT.

In the same time, it is difficult to obtain data about the domestic tourism industry capacity and foreign income, especially on a monthly basis. The natural solution is to look for proxies.

To estimate the domestic tourism industry capacity, we used data about real credit to the private sector as a proxy. Real credit equals the commercial banking sector lending to the private sector, divided by the Consumer Price Index (CPI). Real credit to the private sector (the variable rcps) turns out to be highly correlated with tourism industry performance.

The latter variable is used for the econometric estimation of two variants. The first is rcpssa – reflecting seasonally adjusted data for real credit – and the second, rcpshp – standing in for real credit time series in levels smoothed by the HP filter. This procedure implies, in principle, a lack of seasonality in the data (Mise, Kim & Newbold, 2003). However, this technique was initially conceived for seasonal adjustment (Akaike, 1980). In practice, for relatively short periods without pronounced longer term cycles the HP filter can be applied directly to row data since seasonal movements will behave as short term cycles

The same approach is applied to the proxy dealing with foreign income. The variable used in this case is the M3 money supply in the eurozone. The latter variable is generally correlated with income growth, on the one hand, and reflects demand dynamics in the most important economic region (the EC) for Bulgarian foreign tourist earnings, on the other. The variable is employed in both seasonally adjusted and filter smoothed variants.

The results of the seasonally adjusted econometric estimation are as follows:

(4) RTESA = 0.005*RCPSSA(-8) + 0.993*REERSA(-1)

(5) RTESA = 0.040*EUROM3SA(-8) – 0.557*REERSA(-7)

The numbers in brackets display the time lags. All the coefficients are significant with the exception of the coefficient before REERSA in the equation (5). The absolute ratio between the coefficients, reflecting the impact of price (REER) on the quantities supplied and demanded respectively (0.993/0.557=1.783) is obviously higher than one, implying an equilibrium non-convergence property of the system, according to the elementary rules of partial equilibrium stability dynamics (Ory & Raimbourg, 1995).

This means that the system is not supposed to return to equilibrium if disturbed. However, since the second coefficient is not significant, we may conjecture that disequilibrium dynamics are not highly probable.

The filter smoothed variant of the estimation takes the following parameters:

(6) RTEHP = 0.011*RCPSHP(-6) + 0.995*REERHP(-3)

(7) RTEHP = 0.090*EUROM3HP(-6) – 2.444*REERHP(-2)

In this system all the coefficients are significant. The equilibrium dynamics properties are also different. The absolute level of the price (REER) related coefficients ratio is less than one (0.995/2.444=0.407) thus allowing for equilibrium convergence.

The equilibrium convergence should not be overestimated, because it does not preclude overcapacity. In fact an exogenous decline in demand (provoked by income decline for example) will simply enforce short run market equilibrium without affecting overcapacity and eventual accumulation of excessive debt in the tourism industry.

However, if we drop the simplifying assumption about REER (if the REER does not equal the real tourism services price), then an enhanced price sensitivity of the tourism sector to excess demand in the market could insure short-run equilibrium. To illustrate this, we can visualise the supply and demand interplay.

As we can see from this figure, the real equilibrium level of tourism services, in terms of REER, declines. The main reason for this is the fast increase in supply. Therefore, we can expect that either the effective prices declined or that the tourism industry accepted underutilisation of capacity.

However, we have good reasons to speculate that the industry could have reached a higher efficiency rank with less investment.

4. Some conclusions about Bulgaria as a foreign tourist destination

The above econometric estimation of the partial equilibrium model allows for some additional conclusions about the Bulgarian foreign tourist industry.

The first conclusion is obvious: the price (REER) affects the industry's dynamics. Since, however, (as one can easily see from the smoothed series) the REER has a stable upward trend (this trend is generally not affected by the tourism industry itself), the growth of the sector cannot be explained by the low (compared to the EU and Russia) price level in Bulgaria.

The main driving forces are the tourism industry's building capacity to include increasing leverage on the supply side and regular income growth in countries which consume Bulgaria's tourism services on the demand side. The model suggests that in 2005 the tourism sector suffered probably from excess supply and needed lower prices. The deceleration of tourism industry growth after 2009-2009 may be explained by income growth decline in the EU area.

While the factors affecting the slope of the demand and supply schedules are in principle of a short-run nature, the time lags are relatively long – up to six months. This signifies that price shocks need fairly long periods to be absorbed. The long delay of demand response can be explained by contracting practices in the international tourism market.

The long term (shift) factors (money supply/income and industry capacity/leverage) have more extended impact periods – up to eight months.

The model does not allow for long term (reflecting interrelations between demand, tourism industry capacity and labour supply) equilibrium dynamics research. Nevertheless, we can conjecture that these relationships probably do not overrule the possibility of overcapacity.

The model is based on the idea that consumers of the tourism industry product are identical and the product is not diversified. The removal of this constraint would certainty improve the ability of the tourism industry to adjust to exogenous shocks.

Advertising, product diversification and a diminishing dependence of the tourism industry on summer bookings will certainly improve the prospects for foreign tourists if combined with higher price sensitivity.

On the other hand, taking into account the important macroeconomic role of the tourism under the Currency Board Rule, the government is strongly interested in supporting the tourism industry.

So, as final remark, the tourism sector needs a complex strategy including appropriate pricing, product strategy, strategic financing and constructive government support.

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