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THE BULGARIAN FOREIGN TOURIST MARKET: PARTIAL EQUILIBRIUM ANALYSIS WITH REER

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Abstract: The main objective of the paper "The Bulgarian Foreign Tourist Market: Partial Equilibrium Analysis With REER" is to evaluate an econometric equilibrium model for the Bulgarian foreign tourist industry. The main microeconomic assumptions of the model are the existence of identical consumers, identical composite tourist industry product and perfect market conditions. The REER is used as proxy for the composite product price and other proxies are introduced for foreign income and domestic tourist industry capacity. The data is deseasonalised on the basis of geometric mean approach and Hodrick-Prescott filter. The TSLS method of estimation is applied given the overindentified nature of the model. The estimation results are consistent with the core microeconomic theory. The estimated model allows for price equilibrium convergence. The dropping of the initial constraints allows for additional conclusions. The tourist industry can substantially gain from advertising, product diversification and lessened reliance on the summer income picks. The government, given the important macroeconomic role of the tourist industry under the CB regime and the potential tourist industry vulnerability, is strongly interested in implementing strategic measures guaranteeing sustainable tourist sector development.
Key words: Bulgarian tourist industry; Real Effective Exchange Rate; Partial Equilibrium; Econometric analysis

1. The Tourist Industry in Bulgaria

The tourist industry is one of the most dynamic sectors in the Bulgarian economy. The recent strategy of the Ministry of Economy and Energy of Bulgaria includes the tourism, together with the manufacturing industry and the Small and Medium Size sector, in the group of the most competitive sectors of the Bulgarian economy. The present (200-2006) and the new (2007-2013) National Development plan also rely on tourism as one of the engines of economic growth.

The tourist sector is important also from macroeconomic point of view. It's one of the few sectors generating positive foreign trade results and contributing to the external equilibrium of the Bulgarian economy.

On the other hand, the worsening of the current account deficit is one of the biggest flaws of the Bulgarian economy. On the other, the role of the tourist sector becomes crucial as a source of foreign currency. The fixed exchange rate regime of the Bulgarian lev makes the position of the tourist sector even more vital for the national economy.

Nevertheless, there are relatively few analytical papers trying to explain the factors behind the strong expansion of the tourist industry. As a consequence, it is not known to which extent the present macroeconomic stability is compatible with tourist sector strong growth and what external factors may affect the industry performance.

The aim of the present paper is to suggest a simple explanation of the tourist industry growth, based on the partial equilibrium analysis. Keeping the analysis as simple as possible, we can still explain what are the main driving forces and the possible threats to the tourist sector.

2. A Simple Partial Equilibrium Model

The main objective of the paper is to evaluate the demand and supply curves for the Bulgarian foreign tourist services marker.

For this purpose, we assume that the demand side consists of n 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). Thus the REER becomes the "price" of one unit of compound tourist' services product, bought and sold on a perfect market.

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

Consequently we can write two equations:

(1) ST = ST(REER, CT)
(2) DT = DT(REER, YF)

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

As a result of this formulation, the supply and demand for tourist services are supposed to depend additionally on domestic tourist industry capacity and 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 B.:1978: 94). In this case we can apply the two-stage LS method (TSLS).

Another problem is the seasonality. This is especially true in the case of foreign tourism earnings, represented at Figure N1. On can easily observe the summer picks of foreign tourist spending in Bulgaria. The seasonal factors seriously worsen the results of econometric estimation of the relations between dependent and independent variables.

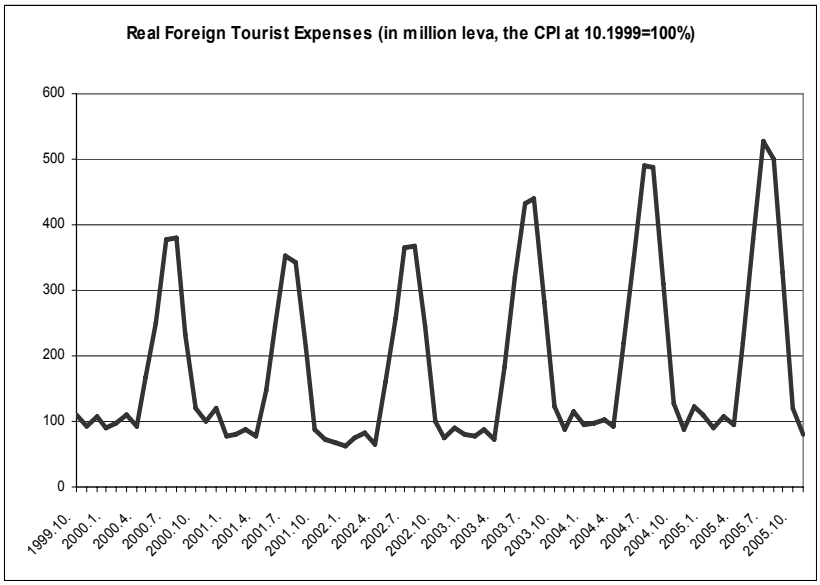
To resolve this problem, we applied two variants of seasonal adjustment. The first is based on the multiplicative moving average method. The calculation involves the geometric mean centered moving average technique, used by the econometric package Eviews. The results of the seasonal smoothing are presented in the Appendix I.

The second approach exploits the Hodrick-Prescott filter (Hodrick, R.J. and E.C. Prescott: 1997**:** 1–16). The latter is a two-sided linear filter that computes smoothed sequences by minimizing the series' variance, subject to penalty constraints. In our case the penalty parameter λ equals 14400, level appropriate for monthly data. The results are presented in graphical form in the Appendix II.

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

Another problem is the cointegration of data series. For this purpose we applied Augmented Dickey-Fuller Unit-Root test for all series drawn in the analysis. All the seasonally adjusted data correspond to an I(1) process (the unit-root hypothesis cannot be rejected for the first differences), so the series are integrated of the same order and can be estimated as a system without additional transformations.

Figure N1
Real Foreign Tourist Expenses in Bulgaria



Sources: The Bulgarian National Bank and The National Statistical Institute, different Issues.

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 National bank of Bulgaria (BNB). The same applies to the data about the real foreign tourist expenses, respectively the variables ST and DT.

On the other hand, it is difficult to obtain data about the domestic tourist industry capacity and foreign income, especially on monthly basis. The natural solution is look for proxies.

In the case of domestic tourist industry capacity we used the data about the real credit to the private sector as a proxy. The real credit equals the commercial banking sector lending to the private sector, divided by the CPI. The real credit to the private sector (the variable rcps) turns out to be highly correlated with tourist industry performance.

The variable is used for the econometric estimation in two variants. First, as rcpssa, reflecting the seasonally adjusted data for the real credit and secondly, as rcpshp, staying for the real credit time series smoothed by a Hodrick-Prescott filter.

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

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

(3) RTESA = 0,005*RCPSSA(-8) + 0,993*REERSA(-1)

(4) 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 coefficient before REERSA in the equation (4). 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 then one, implying equilibrium non-convergence property of the system, according to the elementary rules of the partial equilibrium stability dynamics (Ory J-N and Raimbourg Ph.: 1995: 57).

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

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

(5) RTEHP = 0,011*RCPSHP(-6) + 0,995*REERHP(-3)

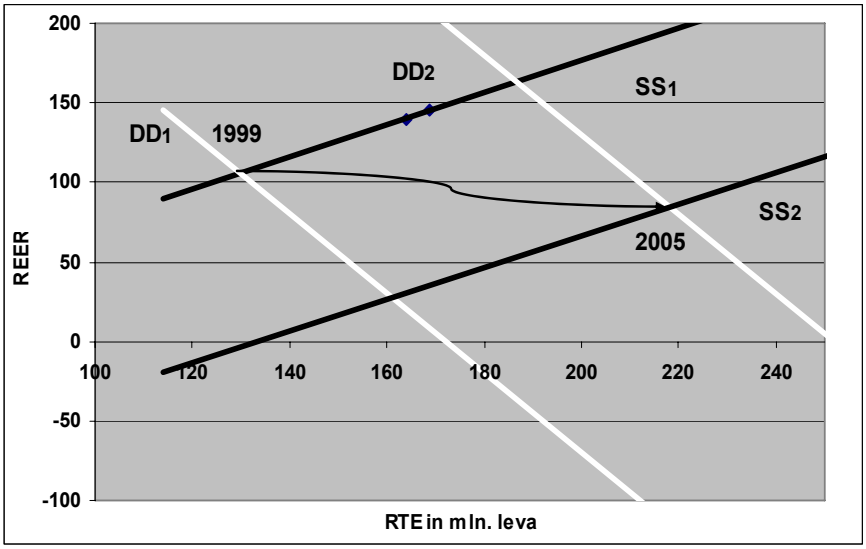
(6) RTEHP = 0,090*EUROM3HP(-6) – 2,444*REERHP(-2)

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 the overcapacity and the eventual overindebtness of the tourist industry.

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

Figure N2
Supply and Demand Curves of the Bulgarian Foreign Tourist Market



The Figure N2 plots the supply and demand schedules based on the HP filter smoothing estimation (equations 5 and 6). The SS1 and SS2 lines stand for the supply in 1999 and 2005, while the DD1 and DD2 lines replicate demand.

As we can see from the figure, the real equilibrium level of tourist 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 had declined or that the tourist industry had accepted capacity underutilization.

Yet we have serious reasons to speculate that the industry could have obtained higher efficiency with less investment.

4. Some Conclusions about Bulgaria as Foreign Tourist Destination

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

The first conclusion is obvious and it means that the price (REER) affects the industry 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 tourist 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 tourist industry capacity building, including the increasing leverage, on the supply side, and the regular income growth in the countries, consuming Bulgaria's tourist services, on the demand. The model suggests that in 2005 the tourist sector suffers probably from excess supply and would need to lower prices.

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 the contracting practices at the international tourist 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 and tourist industry capacity and labor supply) equilibrium dynamics investigation. Nevertheless we can conjecture that these relations probably do not overrule the possibility of overcapacity.

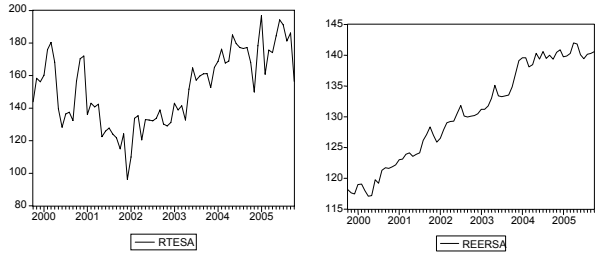
The model is based on the idea that the consumers of the tourist industry product are identical and the product is not diversified. The abolition of this constraint would certainty improve the ability of the tourist industry to adjust to the exogenous shocks.

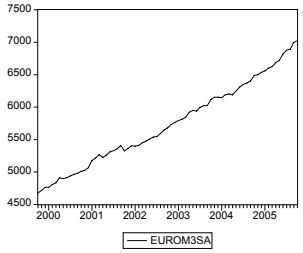
The advertising, product diversification and the diminishing of the tourist industry dependence on the summer picks, will certainly improve the foreign tourism prospects if combined with higher price sensitivity.

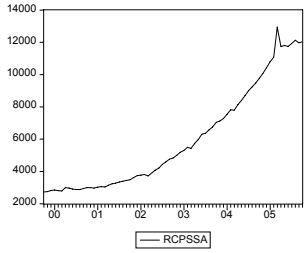
On the other hand, taking into account the important macroeconomic role the tourist industry is playing under the Currency Board Rule, the government is strongly interested in supporting the tourist industry.

So the tourist sector needs complex strategy, including appropriate pricing, product strategy, financing and government support.

APPENDIX I
Seasonal Adjustment







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		

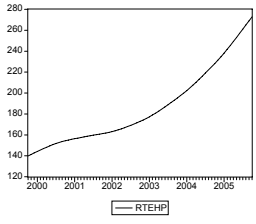
Equation: RTESA = C(1)*RCPSSA(-8) + C(2)*REERSA(-1)
Observations: 65

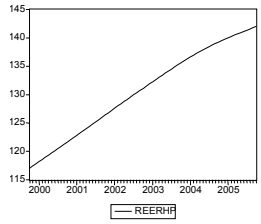
R-squared	0.625280	Mean dependent var	151.0253
Adjusted R-squared	0.619332	S.D. dependent var	23.43377
S.E. of regression	14.45824	Sum squared resid	13169.56
Durbin-Watson stat	0.776471		

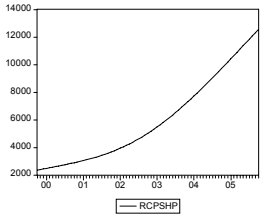
Equation: RTESA = C(3)*EUROM3SA(-8) + C(4)*REERSA(-7)
Observations: 65

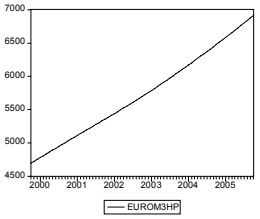
R-squared	0.554181	Mean dependent var	151.0253
Adjusted R-squared	0.547104	S.D. dependent var	23.43377
S.E. of regression	15.77035	Sum squared resid	15668.35
Durbin-Watson stat	0.662205		

APPENDIX II
Hodrick-Prescott Filter









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			

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