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A COMPARISON OF TWO ECONOMETRIC MODELS (OLS AND SUR) FOR FORECASTING CROATIAN TOURISM ARRIVALS

Summary

Tourism receipts have a large impact on the Croatian economy. The large inflow of foreign exchange during the summer season provides not just income but also a stabilising effect on the local currency, the kuna. The author compares two demand models using OLS and SUR estimation techniques. The model is a system of equations covering five countries, which represent around 72%-78% of total foreign annual arrivals. The model describes arrivals to be a function of the home country's real GDP and the real exchange rate. Based on estimates of forecasting accuracy, it seems that the SUR model yields more precise predictions of foreign arrivals.

JEL: C22; C53

Keywords: tourism demand, forecasting, Croatia

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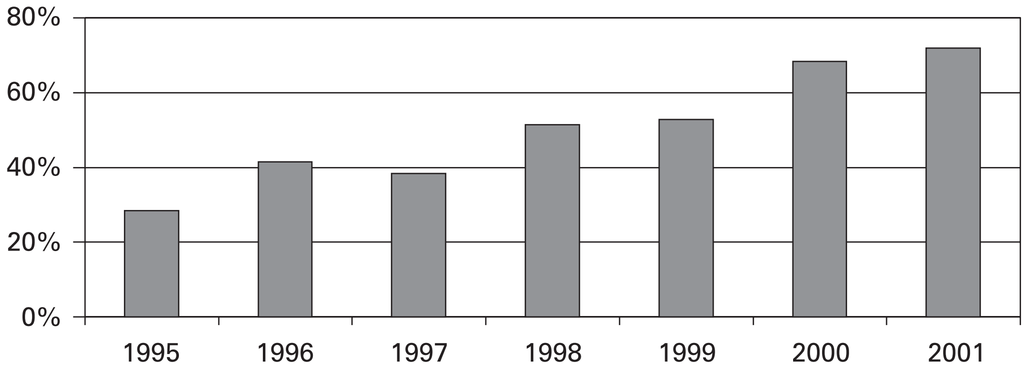
A COMPARISON OF TWO ECONOMETRIC MODELS (OLS AND SUR) FOR FORECASTING CROATIAN TOURISM ARRIVALS

1 Introduction

Tourism receipts have a large impact on the Croatian economy. The large inflow of foreign exchange during the summer season provides not just income but also a stabilising effect on the local currency, the kuna; in addition, it is crucial in easing Croatia's negative external balance, which stems primarily from a large trade deficit. Tourism receipts increased annually on average by 12% from 1993 to 2001, when they reached around 3.2 billion kuna.[1] Net tourism receipts financed around 75% of Croatia's trade deficit in 2001 (Figure 1).

Figure 1 Net tourism receipts as % of trade deficit



Sources: CNB Bulletin No. 67, Table H2 and author's estimates.

The main aim of this article is to develop a model of a physical indicator, such as arrivals, in order to forecast tourism receipts. This demand model should be able to serve as a forecasting tool for the medium term projection of the position of tourism receipts in the balance of payments. One way of forecasting is to multiply the predicted arrivals of certain emitting markets with their estimated per capita expendi-

1 Projection based on actual data for the first three quarters in 2001.

ture. Predicted arrivals could also be used as one of the explanatory variables when explicitly modelling tourism receipts.[2] In addition, the model can be used to approximate the extent to which various events influence tourism, such as the Kosovo crisis. The model therefore focuses on aggregate tourism flows between the countries of origin and destination; it does not deal with estimating structural components, that is, disaggregated tourism flows for business, holidays and visits to friends and relatives.

The model is a system of equations covering the five countries (Germany, Italy, Austria, Slovenia, and the Czech Republic) that provided between 72% and 78% of total annual arrivals during the period 1993-2000. The first step applies an OLS model to seasonally unadjusted data. The second step takes the high seasonality of tourist arrivals into account and compares results. The third step estimates a system of equations using SUR, taking into account the correlation of the error term in the five equations. Using inside sample forecasting, evaluation of the forecasts from both models, the OLS unadjusted and SUR,[3] suggests that SUR estimators are more efficient.

Section 2 gives a brief review of the literature. Section 3 describes the model and the estimation procedure. Section 4 describes the data employed. Section 5 presents and interprets the empirical results of the estimated models. The paper concludes with an evaluation of the forecasting power of the models. According to our data and models, it seems that SUR estimators provide a better basis for forecasting foreign arrivals to Croatia than OLS estimators.

2 Literature Review

The majority of works on modelling tourism flows between the destination and origin country are based on some form of the basic demand function $Q = f(Y,P)$, where Q represents the quantitative measure of foreign tourist consumption of the destination product, Y some income proxy of the origin country and P a proxy for the relative price between the origin and destination country. Some works also include price substitution effects into their model.

The most appropriate variable to be used as the dependent variable is the tourism receipts of the destination country (Tse, 1999, Jensen, 1998). Croatia's tourism receipts are estimated from survey data taken at the main border crossings. However, this data exhibit several series breaks due to changes in methodology, which poses large difficulties for a time series analysis. Alternative proxies are overnights spent by foreign tourists and foreign tourist arrivals, but there are disadvantages to both these variables. The amount of overnights spent is highly susceptible to understatement since they are more subject to the grey economy than arrivals, especially in complementary accommodation (camping and lodgings). Foreign tourist arrivals, on the other hand, do not account for variability in the length of stay. Witt and Martin[4] define arrivals in relative terms, accounting for the population effect. However, we do

2 Difficulties and explicit assumptions when undertaking the estimates are given in Stučka (2000).

3 SUR – Seemingly Unrelated Regression.

4 Witt and Martin (1987a and 1987b).

not take this approach since the set of Croatia's main origin countries includes CEE transition countries whose tourist emission potential[5] is not positively correlated with population size. For example, Poland had a population of 38.7 million in 1997, whereas Austria had a population of 8.1 million; however, according to the number of holiday travels abroad in 1998, the potential of the Austrian emission market was twice the size of the Polish market,[6] a fact that can be explained, among other things, by the difference in living standards.

Income variables are mostly defined as the real GDP of the origin country (Jensen, 1998, Kulendran, Wilson, 2000) or real per capita GDP (Lathiras, Siriopoulos, 1998). While real disposable income in the destination country would be the best measure, appropriate time series of this variable are in most cases not available for transition countries.

Much research has been undertaken in the area of price modelling in tourism demand functions. The tourist consumption basket, especially that of foreign tourists, differs from the CPI consumption basket due to the difference between the basket of goods that foreign tourist consume during the season and the consumption of "native" consumers during the whole year. While Martin and Witt (1987) show that the CPI is a good proxy for the tourist cost of living variable, it represents a brave assumption in Croatian circumstances, taking into account the weight of individual products and services in the CPI basket. Nevertheless, it represents the only measure since there are no alternative proxies for the tourism cost index.

The standard variable entering all equations is the relative price of the origin and destination countries, which is at times adjusted for the exchange rate (Lathiras, Sirioupulis, 1998, Kulendran, Wilson, 2000). In addition, some authors (Turner, Reisinger, Witt, 1998, Loeb, 1982, Lathiras, Sirioupulos, 1998) take into account price developments in competing destination countries as a proxy for the substitution effect. The model presented in this paper does not contain the price substitution effect variable since we are dealing with a short time series and therefore attempt to keep the model rather small.

An additional variable used in some models (Witt, Martin, 1987) is a proxy for the marketing variable. The rationale behind this is that an increase in agents' information about a country contributes to its "recognisabilty" and therefore its "attractiveness". In most models, however, this variable seems to be insignificant in explaining tourism demand.

There is a wide variety of models in the tourism literature for estimating tourism demand and forecasting some measures of tourism consumption in the destination country. Advanced econometric techniques have recently been applied. The problem of non-stationarity was recognised, which led to cointegration analysis and ECM models. In general, econometric tools range from ARIMA and Holt-Winters univariate modelling (Kim, 1999) to 3SLS and 2SLS (Tse, 1999, Kim, Uysal, 1998), and ECM models (Jensen, 1998, Lathiras, Siriopoulos, 1998, Kulendran, Wilson, 2000). Currently the ECM technique is not an issue for Croatia due to the length of the available

5 i.e. tourism departures from origin country as a share of total population.

6 IPK International, 1998, pp. 12 and 15.

time series, which is heavily reduced due to large series breaks in 1990-1993 (war) and 1993 (stabilisation programme bringing four-digit inflation down to single digit inflation).

3 Model Description

A simple demand model is defined in which foreign tourist arrivals represent the quantity demanded for the Croatian tourism product by various emission countries. This quantity is a function of income and prices.

Long-term income is approximated by the country's real GDP. We do not use real disposable income in the equation since such data is unavailable for transition countries, which represent an important share of origin countries. Nor do we apply average wages or earnings as an explanatory variable because public forecasts for this specific variable are not available. The GDP variable, on the other hand, is forecast not only by the local central bank, but also, for example, by various investment banks. The variety of forecasts enables a range of possible projections and simulations.

The price variable is determined by the relative price between two countries corrected for the nominal exchange rate. However, to what extent are foreign tourists aware of the inflation rate in the host country? One could argue that the inflation component enters the model through agents' perceptions of whether the host destination is "expensive" or "cheap".[7] The second determinant for the price component is the nominal exchange rate, which is the most easily accessible information for a relative price comparison between destinations.[8] In other words, the price component of the model is given by the real exchange rate.

First, an OLS model was estimated which attempts to relate arrivals to long-term income and the real exchange rate, as defined in (1):

$$\ln A_{jt} \quad _{j0} \quad _{j1} \ln GDPr_{j,t} \quad _{j2} \ln \frac{Pf_{j,t} FXn_{j,t}}{Pd_t} \quad _t \\ D_{Storm} \quad _2 D_{Kosovo} \quad _3 D_1 \quad _4 D_2 \quad _5 D_3 \quad e_{jt} \tag{1}$$

where A_{jt} represents arrivals from country j in quarter t, $GDPr_{jt}$ denotes real GDP from country j in quarter t, Pf_{jt} and Pd_t stand for the foreign and domestic CPI respectively, D_{Storm} embodies a dummy for the military action "Storm" (Q3/1995) and D_{Kosovo} a dummy for the Kosovo crisis (Q2/1999-Q4/1999), and D_1 to D_3 represent usual seasonal dummies. One would expect a positive relation between income and the quantity demanded. A negative relation would suggest that Croatia, as a host destination, represents an inferior good for certain European markets – as income increases less of "Croatia's coast" will be demanded. The price variable is expected to be negatively related to the demanded quantity of the good, as shown in (2):

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7 For first-time holiday-makers to a destination, the prices for wine, milk, bread, average meal etc. are usually given in touroperator's brochures or result from experiences of family/friends who have visited the country.

8 Detailed explanation regarding the intuition and treatment of these variables in this and other international articles is given in Stučka (2000).

$$\frac{A_t}{GDPr_{j,t}} \quad 0; \frac{A_t}{\left(\frac{Pf_{j,t} FXn_{j,t}}{Pd_t}\right)_t} \quad 0; \qquad (2)$$

Next, the OLS model was estimated using seasonally unadjusted data. The elasticities obtained were then compared to the results when seasonally adjusted data (X11 technique) are employed and no seasonal dummies are used. However, it should be borne in mind that the use of X11 violates certain econometric properties[9] due to the nature of X11 estimation.

Once the OLS coefficients were obtained, an SUR estimation was undertaken. Although it has been shown, using Monte Carlo simulations (Morley, 1997), that OLS estimators seem to be consistent, we compared both techniques for coefficient and forecasting efficiency. Seemingly unrelated regression estimation represents a system of equations, which are related through the cross-equation covariance of the error (Zellner, 1962). The gain in efficiency from using the SUR estimator increases with the correlation between equation errors and decreases with the correlation between equation regressors. Before one turns to empirical results, a brief description of the data is given. The rationale for applying SUR lies in the fact that common factors might exist (weather, marketing spending etc.) that influence all the equations at the same time and induce a correlation between the equations' error terms.

4 Data Description

Quarterly data was used, starting with Q4/1993 and ending with Q2/2000. The reason for starting at the end of 1993 is that a stabilisation programme that tamed inflation was introduced in Croatia in October 1993. Utilising data prior to the programme would lead to heavy distortion, especially in the real exchange rate variable.

The foreign tourist arrival data is from the five main home[10] countries: Germany, Italy, Slovenia, the Czech Republic and Austria. These account for around 72%-79% of total arrivals on an annual basis (see Table 1). The data was taken from the CBS[11] database.

The data for nominal GDP was taken from the IFS series (January 2001, version 1.1.53) in billions of local currency, whilst Slovenian data was taken from the Bank of Slovenia Bulletin. The nominal spot exchange rates (expressed domestic currency per 100 units of foreign currency) were taken from the Croatian National Bank's (CNB) database and represent end of period data. Relative prices were estimated using for-

9 Since X11 seasonally adjusts data by using information from t-1 and t+1. Hence, technical information contained in seasonally adjusted variables at time t are utilised from t-1 and t+1, violating BLUE properties.

10 The home country is the foreign market from which tourists come to Croatia, whereas the host country is the tourism destination, i.e. Croatia.

11 CBS – Central Bureau of Statistics.

Table 1: Arrivals in Croatia from 1993 to 2000, on annual basis, in thousand

	1993	1994	1995	1996	1997	1998	1999	2000
Italy	258.2	357.0	193.8	467.1	688.0	750.8	538.3	886.5
Germany	194.3	355.7	211.0	448.7	640.0	720.6	531.3	919.8
Slovenia	229.7	294.4	299.9	437.6	577.9	637.7	689.9	818.9
Czech Rep.	238.3	435.2	119.1	345.5	579.1	498.5	415.3	697.5
Austria	249.0	362.5	193.1	341.5	447.4	456.9	374.3	511.9
Hungary	90.7	128.8	34.1	84.9	126.7	137.7	141.4	238.8
Slovakia	21.6	59.0	27.1	83.9	153.9	161.7	107.6	183.7
Poland	6.6	17.9	10.3	35.6	97.8	131.0	104.9	275.0
Netherlands	17.0	29.8	25.3	41.7	65.0	88.3	72.6	100.1
Total foreign arrivals	1521.0	2292.8	1324.5	2649.4	3834.2	4111.5	4239.3	5337.6
% of main five markets	76.9	78.7	76.8	77.0	76.5	74.5	78.0	71.8

Source: CBS.

eign and domestic CPI; the data for foreign CPI was taken from the IFS, whereas domestic CPI was taken from the CNB database.

5 Estimation Results

Three types of results are presented in Tables 2-3. Table 2 contains OLS estimation results with the unadjusted dependent variable. Table 3 offers OLS results for seasonally adjusted arrivals in the attempt to evaluate the influence of high seasonality on the estimated coefficients and the robustness of the coefficients. Finally, Table 4 summarises the results from the SUR model with an unadjusted dependent variable.

Table 2: OLS coefficients without seasonally adjusted dependent variables (standard errors in parenthesis)

OLS – unadjusted dependent variable							
AR	**GDPr**	**padj**	**Dstorm**	**DKosovo**	**C**	**R2adjusted**	**F–statistic**
AUSTRIA	**–0.18**	**–3.11**	**–0.63**	**–**	**22.41**	**0.98**	**260.46**
(SE)	*(0.90)*	*(0.97)*	*(0.12)*		*(5.02)*		
CZECH R.	**–1.90**	**2.42**	**–0.98**	**–0.35**	**14.07**	**0.98**	**189.97**
(SE)	*(1.87)*	*(0.91)*	*(0.26)*	*(0.19)*	*(3.14)*		
GERMANY	**1.25**	**–6.37**	**–0.62**	**–**	**44.79**	**0.98**	**281.49**
(SE)	*(1.71)*	*(1.05)*	*(0.13)*		*(9.09)*		
ITALY	**4.94**	**–0.27**	**–0.81**	**–0.39**	**–30.16**	**0.93**	**50.45**
(SE)	*(1.71)*	*(1.35)*	*(0.24)*	*(0.18)*	*(13.7)*		
SLOVENIA	**3.83**	**–2.85**	**–0.07**	**–**	**24.37**	**0.98**	**228.47**
(SE)	*(0.71)*	*(1.37)*	*(0.17)*		*(7.12)*		

Source: Author’s estimates.

Table 3: OLS coefficients with seasonally adjusted dependent variables (standard errors in parenthesis)

AR_SA	GDPr	padj	Dstorm	DKosovo	C	R2adjusted	F–statistic
AUSTRIA	**1.19**	**–2.36**	**–0.62**		**18.49**	**0.74**	**25.14**
(SE)	*(0.50)*	*(0.80)*	*(0.11)*		*(3.63)*		
CZECH R.	**–0.71**	**2.99**	**–0.88**	**–0.33**	**17.12**	**0.55**	**8.98**
(SE)	*(1.16)*	*(0.89)*	*(0.23)*	*(0.18)*	*(2.32)*		
GERMANY	**3.23**	**–5.97**	**–0.57**		**39.59**	**0.84**	**49.0**
(SE)	*(1.70)*	*(1.05)*	*(0.13)*		*(9.03)*		
ITALY	**6.71**	**0.32**	**–0.75**	**–0.33**	**–45.96**	**0.61**	**14.11**
(SE)	*(1.39)*	*(1.05)*	*(0.17)*	*(0.14)*	*(11.17)*		
SLOVENIA	**3.82**	**–2.3**	**–0.17**		**25.05**	**0.71**	**22.48**
(SE)	*(0.58)*	*(1.13)*	*(0.14)*		*(5.62)*		

Source: Author's estimates.

Table 4: SUR coefficients without seasonally adjusted dependent variables (standard errors in parenthesis)

SUR procjena – neusklađena ovisna varijabla						
AR	**GDPr**	**padj**	**Dstorm**	**DKosovo**	**C**	**R2adjusted**
AUSTRIA	**0.93**	**–2.15**	**–0.69**	**–009**	**16.64**	**0.98**
(SE)	*(0.58)*	*(0.60)*	*(0.10)*	*(0.07)*	*(3.16)*	
CZECH R.	**–1.36**	**2.1**	**–1.03**	**–0.33**	**12.9**	**0.98**
(SE)	*(1.06)*	*(0.66)*	*(0.21)*	*(0.15)*	*(1.84)*	
GERMANY	**3.93**	**–4.99**	**–0.7**	**–0.14**	**30.91**	**0.98**
(SE)	*(1.17)*	*(0.67)*	*(0.11)*	*(0.08)*	*(5.94)*	
ITALY	**5.18**	**–1.33**	**–0.87**	**–0.3**	**–28.38**	**0.92**
(SE)	*(1.25)*	*(0.87)*	*(0.19)*	*(0.14)*	*(10.14)*	
SLOVENIA	**3.31**	**–1.41**	**–0.14**	**0.06**	**–22.4**	**0.97**
(SE)	*(0.56)*	*(1.01)*	*(0.15)*	*(0.11)*	*(5.84)*	

Source: Author's estimates.

The coefficients for Germany, Italy, Slovenia and Austria[12] show the expected signs consistently – income is positively related to arrivals and the relative adjusted price is negatively related to arrivals. The estimated coefficients for the Czech Republic show a different but consistent trend: income is negatively related to arrivals in all three estimates, although the coefficients are insignificant. This would indicate that Croatia represents an inferior good for Czech tourists, i.e. the more their long term in-

12 In the unadjusted OLS equation for Austria (Table 2) income elasticity is negative, however insignificant, whilst in the adjusted OLS equation for Italy (Table 3) price elasticity is positive, although insignificant.

come rises, the relatively fewer tourist will come to Croatia. The coefficients in both OLS models seem to be reasonably robust. Similar results relating to inferior goods were obtained by Jensen (1998) for Denmark and the USA, as well as by Lathiras, Siriopoulos (1998) for Greece and Holland.

On average, the highest income elasticity concerns Italy (around 5-6) and Slovenia (around 3-4), whereas Austria's demand seems to be rather inelastic with respect to income (around 1). In other research, income elasticities range from -0.52 to 7.8 (Lathiras, Siriopoulos, 1998) and from -0.6 to 8.98 (Jensen, 1998). German tourists seem to be the most price sensitive (around -5), whilst tourists from Italy seem to have a relatively inelastic demand for the Croatian tourism product. As expected, the military action "Storm" had a significant impact on tourism in Croatia; only the Slovenian market did not show a significant response, mirroring the superior information set they possessed. OLS estimates of the dummy variable that takes account of the Kosovo crisis are reported only for relevant markets[13] – the Czech Republic and Italy. However, in the SUR context, the Kosovo crisis seemed to have significantly affected Croatia's tourism market: only Slovenia and Austria do not seem to have been influenced by the NATO military activity in the region, which is perhaps surprising for the Austrian market. There is also the strong impact of seasonality; once seasonality is removed from the data, the adjusted R^2 decreases by a large amount and reflects a much lower explanatory power of the independent variables.

It is debatable whether there is sufficient variation in the data for the SUR model, for the covariance matrix of the regression parameters demonstrates near-singularity.

For the purpose of forecasting, special attention is placed on standard errors of the coefficients beside the estimated elasticities. Throughout the sample, the standard errors obtained using the SUR results are lower than the standard errors in both OLS estimations. In other words, SUR coefficients seem to be more accurate and should yield better forecasts.

We continue by evaluating the forecasting power of the two models, OLS and SUR, utilising the standard statistics on the forecasting error given in Table 5.

Table 5: Comparison of the forecasting accuracy of OLS and SUR[14]

	Austria		Slovenia		Czech R.		Germany		Italy	
	OLS	SUR	OLS	SUR	OLS	SUR	OLS	SUR	OLS	SUR
Mean	1,379	76	4,648	2,631	1,589	–1,274	2,040	912	7,335	3,985
Median	–140	–121	85	–226	–21	74	90	–611	203	–728
SSE (in million)	5,517	4,607	16,944	15,202	22,834	23,506	15,719	13,436	34,867	28,421
MSE (in thousand)	212	177	652	585	878	904	605	517	1,341	1,093
MAE	9,718	8,792	15,472	15,714	16,390	16,415	14,927	13,458	22,749	22,219
SDE	9,879	8,798	16,871	16,424	16,926	16,996	15,243	13,528	24,719	22,874
Skew	0.629	0.025	1.152	0.246	0.046	–0.787	0.889	0.284	1.402	0.570
MAPE	10.4	10.5	15.5	15.3	21.2	21.4	12.0	12.3	19.8	20.6

13 i.e. with significance at the 10% level.

14 SSE – sum of squared errors, MSE – mean square error, MAE – mean absolute error, SDE – standard deviation of the error, MAPE – mean absolute percentage error.

Figure 2 Inside sample forecast errors for the OLS and SUR model – Slovenia

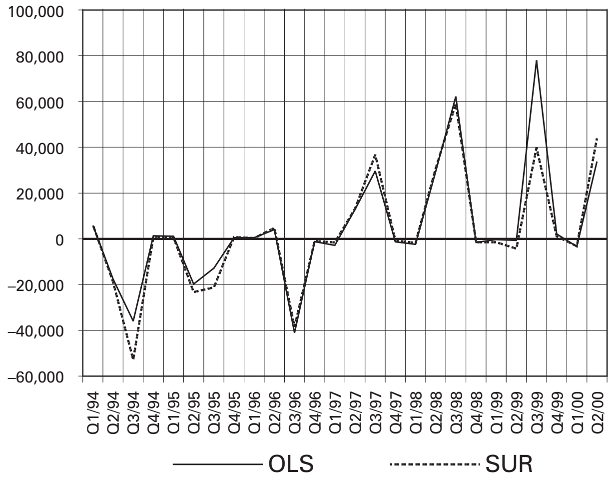


Figure 3 Inside sample forecast errors for the OLS and SUR model – the Czech Republic

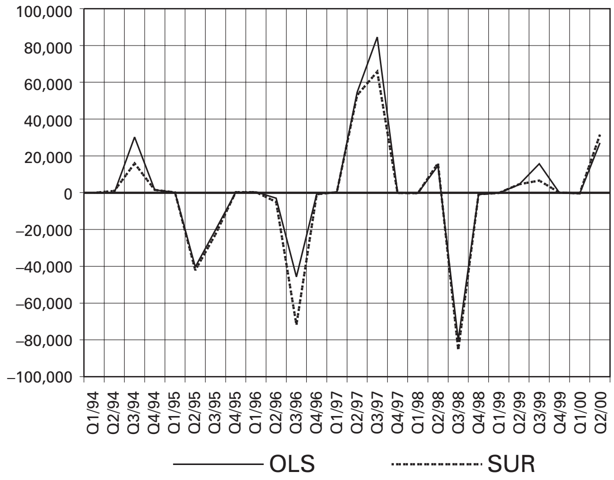


Figure 4 Inside sample forecast errors for the OLS and SUR model – Germany

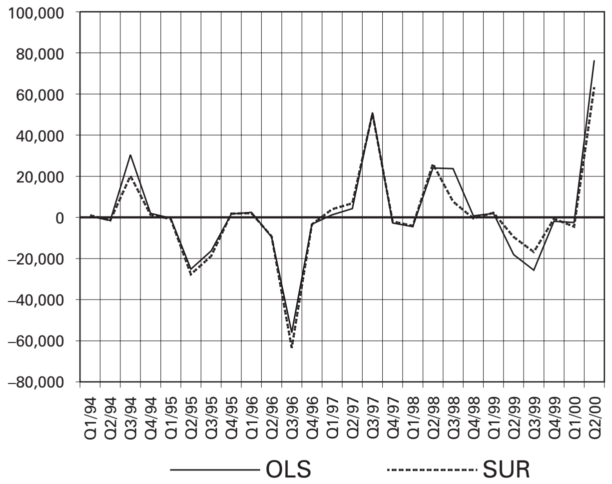


Figure 5 Inside sample forecast errors for the OLS and SUR model – Austria

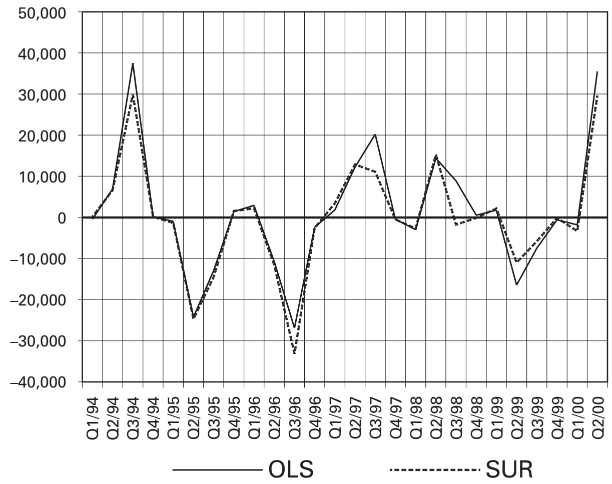
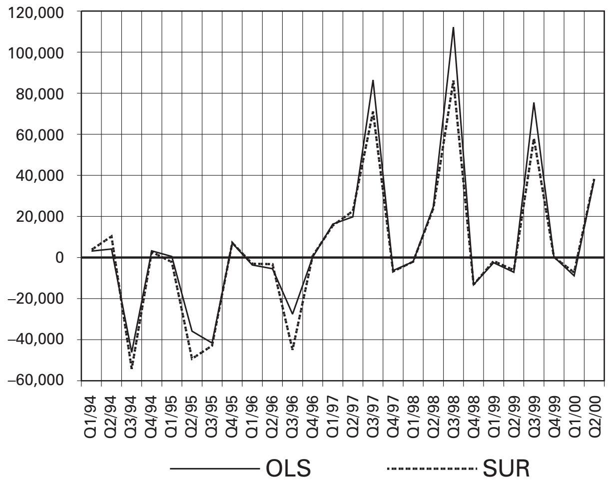


Figure 6 Inside sample forecast errors for the OLS and SUR model – Italy



Various absolute and relative measures of forecasting accuracy are shown in Table 5. It was found that the absolute error mean is much lower in the case of SUR models. Moreover, the standard deviation of the error (SDE) and the sum of squared errors (SSE) of the OLS model are consistently higher than the SUR forecasting errors, except in the case of the Czech Republic. The fact that the OLS model is more biased towards overstating future outcomes is shown by the estimates of the skew. On the other hand, according to the MAPE criterion, the choice of model is not clear-cut, for the differences in forecasting errors are minor. MAPE estimates seem to be inaccurate at the level of 10%-12% for Austria and Germany and at around 20% for Italy and the Czech Republic. In summary, taking into account the various measures of forecasting accuracy, it seems that the SUR model yields better forecasts.

6 Conclusion

This paper presents a demand model for the Croatian tourism product. The quantity demanded is defined as the number of tourist arrivals from the five main home countries, which account for around 72%-78% of total foreign annual arrivals. The model describes arrivals to be a function of the home country's real GDP and the real exchange rate. OLS and SUR estimation techniques were used to evaluate the forecasting power of the model. Based on several measures of forecast accuracy, it seems that the SUR model yields more precise predictions of foreign arrivals. Further research in this field could include a more detailed approach to the seasonal adjustment of the data, which could then be applied to the SUR model. An alternative way of obtaining more accurate estimates is to treat the system of presented data as a panel and allow fixed country effects to capture any heterogeneity. In terms of additional explanatory variables, a substitution variable modelling the influence of competing summer destinations should be included in the model. The influence of the weather could also be taken into account, bearing in mind the proximity of the origin destinations and the high share of foreign camping arrivals in Croatia.

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Appendix

Dependent Variable: LOG(AR_A)
Method: Least Squares
Date: 03/09/01 Time: 15:07
Sample(adjusted): 1994:1 2000:2
Included observations: 26 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPN_A/CPI_A)	–0.180053	0.903799	–0.199218	0.8442
LOG(PADJ_A)	–3.111161	0.973137	–3.197043	0.0047
DOLUJA	–0.630292	0.121625	–5.182255	0.0001
SEZONA1	–0.260651	0.140755	–1.851801	0.0797
SEZONA2	1.721153	0.096895	17.76300	0.0000
SEZONA3	2.407296	0.090872	26.49101	0.0000
C	22.41443	5.026526	4.459229	0.0003
R–squared	0.987988	Mean dependent var	10.84131	
Adjusted R–squared	0.984195	S.D. dependent var	1.147953	
S.E. of regression	0.144317	Akaike info criterion	–0.808812	
Sum squared resid	0.395718	Schwarz criterion	–0.470094	
Log likelihood	17.51455	F–statistic	260.4694	
Durbin–Watson stat	1.637021	Prob(F–statistic)	0.000000	

Dependent Variable: LOG(AR_CZ)
Method: Least Squares
Date: 03/09/01 Time: 15:00
Sample(adjusted): 1994:1 2000:3
Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPN_CZ/CPI_CZ)	–1.388378	1.952021	–0.711251	0.4851
LOG(PADJ_CZ)	1.623789	0.913798	1.776967	0.0908
DOLUJA	–0.999230	0.278742	–3.584786	0.0019
SEZONA1	–0.513489	0.234911	–2.185885	0.0409
SEZONA2	3.391452	0.194682	17.42047	0.0000
SEZONA3	4.882942	0.203142	24.03706	0.0000
C	12.15854	3.124851	3.890919	0.0009
R–squared	0.983511	Mean dependent var	9.879869	
Adjusted R–squared	0.978564	S.D. dependent var	2.313881	
S.E. of regression	0.338775	Akaike info criterion	0.891452	
Sum squared resid	2.295367	Schwarz criterion	1.227409	
Log likelihood	–5.034595	F–statistic	198.8206	
Durbin–Watson stat	1.337545	Prob(F–statistic)	0.000000	

Dependent Variable: LOG(AR_D)
Method: Least Squares
Date: 03/09/01 Time: 15:00
Sample(adjusted): 1994:1 2000:3
Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPN_D/CPI_D)	1.252210	1.715713	0.729848	0.4739
LOG(PADJ_D)	–6.369480	1.058393	–6.018068	0.0000
DOLUJA	–0.620487	0.137416	–4.515385	0.0002
SEZONA1	–0.680254	0.094992	–7.161207	0.0000
SEZONA2	1.546654	0.094505	16.36579	0.0000
SEZONA3	2.507745	0.091724	27.34010	0.0000
C	44.79645	9.091206	4.927448	0.0001
R–squared	0.988297	Mean dependent var	11.08255	
Adjusted R–squared	0.984786	S.D. dependent var	1.334209	
S.E. of regression	0.164566	Akaike info criterion	–0.552594	
Sum squared resid	0.541640	Schwarz criterion	–0.216637	
Log likelihood	14.46003	F–statistic	281.4987	
Durbin–Watson stat	1.838002	Prob(F–statistic)	0.000000	

Dependent Variable: LOG(AR_I)
Method: Least Squares
Date: 03/09/01 Time: 15:01
Sample(adjusted): 1994:1 2000:2
Included observations: 26 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPN_I/CPI_I)	3.892131	1.701636	2.287288	0.0338
LOG(PADJ_I)	–0.827914	1.398168	–0.592142	0.5607
DOLUJA	–0.814465	0.248681	–3.275133	0.0040
SEZONA1	–0.617408	0.181289	–3.405650	0.0030
SEZONA2	1.073061	0.176300	6.086551	0.0000
SEZONA3	2.201666	0.178001	12.36885	0.0000
C	–19.37349	13.10600	–1.478215	0.1557

R–squared	0.942797	Mean dependent var	11.10297
Adjusted R–squared	0.924733	S.D. dependent var	1.121411
S.E. of regression	0.307657	Akaike info criterion	0.705142
Sum squared resid	1.798404	Schwarz criterion	1.043860
Log likelihood	–2.166844	F–statistic	52.19192
Durbin–Watson stat	1.508786	Prob(F–statistic)	0.000000

Dependent Variable: LOG(AR_SLO)
Method: Least Squares
Date: 03/09/01 Time: 15:01
Sample(adjusted): 1994:1 2000:3
Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPR_SLO)	3.830130	0.719778	5.321266	0.0000
LOG(PADJ_SLO)	–2.850993	1.371376	–2.078929	0.0507
DOLUJA	–0.069393	0.179270	–0.387088	0.7028
SEZONA1	0.153001	0.129060	1.185509	0.2497
SEZONA2	2.233883	0.124451	17.94986	0.0000
SEZONA3	3.579903	0.120459	29.71895	0.0000
C	–24.37190	7.124925	–3.420653	0.0027

R–squared	0.985620	Mean dependent var	10.79826
Adjusted R–squared	0.981306	S.D. dependent var	1.572129
S.E. of regression	0.214951	Akaike info criterion	–0.018403
Sum squared resid	0.924076	Schwarz criterion	0.317555
Log likelihood	7.248434	F–statistic	228.4708
Durbin–Watson stat	2.150989	Prob(F–statistic)	0.000000

Dependent Variable: LOG(AR_ASA)
Method: Least Squares
Date: 03/09/01 Time: 15:16
Sample(adjusted): 1994:1 2000:2
Included observations: 26 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPN_A/CPI_A)	1.194324	0.506091	2.359900	0.0276
LOG(PADJ_A)	–2.357843	0.807768	–2.918961	0.0080
DOLUJA	–0.617064	0.115466	–5.344124	0.0000
C	18.48813	3.631380	5.091215	0.0000

R–squared	0.774173	Mean dependent var	11.39050
Adjusted R–squared	0.743378	S.D. dependent var	0.277478
S.E. of regression	0.140564	Akaike info criterion	–0.945663
Sum squared resid	0.434684	Schwarz criterion	–0.752110
Log likelihood	16.29362	F–statistic	25.13985
Durbin–Watson stat	1.468594	Prob(F–statistic)	0.000000

Dependent Variable: LOG(AR_CZSA)
Method: Least Squares
Date: 03/09/01 Time: 16:39
Sample(adjusted): 1994:1 2000:3
Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPN_CZ/CPI_CZ)	–0.404756	1.211565	–0.334077	0.7413
LOG(PADJ_CZ)	2.264099	0.839165	2.698038	0.0128
DOLUJA	–0.900333	0.251009	–3.586861	0.0016
C	15.56947	2.264920	6.874180	0.0000
R–squared	0.563505	Mean dependent var	11.51409	
Adjusted R–squared	0.506571	S.D. dependent var	0.448054	
S.E. of regression	0.314733	Akaike info criterion	0.661772	
Sum squared resid	2.278314	Schwarz criterion	0.853748	
Log likelihood	–4.933922	F–statistic	9.897486	
Durbin–Watson stat	1.225828	Prob(F–statistic)	0.000221	

Dependent Variable: LOG(AR_DSA)
Method: Least Squares
Date: 03/09/01 Time: 15:13
Sample(adjusted): 1994:1 2000:3
Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPN_D/CPI_D)	–9.053729	5.964590	–1.517913	0.1433
LOG(PADJ_D)	–4.614855	1.167757	–3.951898	0.0007
DOLUJA	–0.493229	0.128216	–3.846843	0.0009
C	57.81501	11.97230	4.829065	0.0001
TREND	0.045374	0.021220	2.138251	0.0439
R–squared	0.888012	Mean dependent var	11.69532	
Adjusted R–squared	0.867650	S.D. dependent var	0.424629	
S.E. of regression	0.154480	Akaike info criterion	–0.731933	
Sum squared resid	0.525007	Schwarz criterion	–0.491963	
Log likelihood	14.88110	F–statistic	43.61224	
Durbin–Watson stat	2.205474	Prob(F–statistic)	0.000000	

Dependent Variable: LOG(AR_ISA)
Method: Least Squares
Date: 03/09/01 Time: 16:41
Sample(adjusted): 1994:1 2000:2
Included observations: 26 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPN_I/CPI_I)	5.638423	1.423718	3.960350	0.0007
LOG(PADJ_I)	–0.189260	1.121706	–0.168725	0.8676
DOLUJA	–0.751824	0.195475	–3.846128	0.0009
C	–35.15635	10.93200	–3.215912	0.0040
R–squared	0.657970	Mean dependent var	11.70619	
Adjusted R–squared	0.611329	S.D. dependent var	0.414192	
S.E. of regression	0.258222	Akaike info criterion	0.270642	
Sum squared resid	1.466926	Schwarz criterion	0.464195	
Log likelihood	0.481653	F–statistic	14.10727	
Durbin–Watson stat	1.470751	Prob(F–statistic)	0.000024	

Dependent Variable: LOG(AR_SLOSA) Method: Least Squares Date: 03/09/01 Time: 16:42 Sample(adjusted): 1994:1 2000:3 Included observations: 27 after adjusting endpoints				
Variable	**Coefficient**	**Std. Error**	**t–Statistic**	**Prob.**
LOG(GDPR_SLO)	3.817809	0.581852	6.561476	0.0000
LOG(PADJ_SLO)	–2.303848	1.135187	–2.029488	0.0541
DOLUJA	–0.166327	0.140814	–1.181177	0.2496
C	–25.05454	5.626488	–4.452962	0.0002
R–squared	0.745718	Mean dependent var	11.72192	
Adjusted R–squared	0.712551	S.D. dependent var	0.335437	
S.E. of regression	0.179842	Akaike info criterion	–0.457518	
Sum squared resid	0.743896	Schwarz criterion	–0.265542	
Log likelihood	10.17649	F–statistic	22.48358	
Durbin–Watson stat	2.076566	Prob(F–statistic)	0.000001	

With Kosovo dummy

Dependent Variable: LOG(AR_A) Method: Least Squares Date: 03/13/01 Time: 13:41 Sample(adjusted): 1994:1 2000:2 Included observations: 26 after adjusting endpoints				
Variable	**Coefficient**	**Std. Error**	**t–Statistic**	**Prob.**
LOG(GDPN_A/CPI_A)	0.162599	1.158560	0.140346	0.8899
LOG(PADJ_A)	–2.906220	1.078085	–2.695724	0.0148
DOLUJA	–0.642913	0.126793	–5.070573	0.0001
SEZONA1	–0.220186	0.165804	–1.327991	0.2008
SEZONA2	1.737641	0.104490	16.62979	0.0000
SEZONA3	2.421093	0.096948	24.97315	0.0000
C	20.98558	5.904554	3.554134	0.0023
D_KOS2	–0.049753	0.101778	–0.488843	0.6309
R–squared	0.988146	Mean dependent var	10.84131	
Adjusted R–squared	0.983536	S.D. dependent var	1.147953	
S.E. of regression	0.147297	Akaike info criterion	–0.745077	
Sum squared resid	0.390533	Schwarz criterion	–0.357971	
Log likelihood	17.68601	F–statistic	214.3511	
Durbin–Watson stat	1.714904	Prob(F–statistic)	0.000000	

Dependent Variable: LOG(AR_CZ) Method: Least Squares Date: 03/13/01 Time: 13:42 Sample(adjusted): 1994:1 2000:3 Included observations: 27 after adjusting endpoints				
Variable	**Coefficient**	**Std. Error**	**t–Statistic**	**Prob.**
LOG(GDPN_CZ/CPI_CZ)	–1.900448	1.872776	–1.014776	0.3230
LOG(PADJ_CZ)	2.419592	0.972758	2.487352	0.0223
DOLUJA	–0.982077	0.264496	–3.713019	0.0015
SEZONA1	–0.541734	0.223312	–2.425904	0.0254
SEZONA2	3.391063	0.184612	18.36858	0.0000
SEZONA3	4.888157	0.192656	25.37241	0.0000
C	14.07458	3.148534	4.470201	0.0003
D_KOS2	–0.354848	0.197096	–1.800381	0.0877
R–squared	0.985914	Mean dependent var	9.879869	
Adjusted R–squared	0.980724	S.D. dependent var	2.313881	
S.E. of regression	0.321252	Akaike info criterion	0.808010	
Sum squared resid	1.960849	Schwarz criterion	1.191962	
Log likelihood	–2.908140	F–statistic	189.9792	
Durbin–Watson stat	1.556751	Prob(F–statistic)	0.000000	

Dependent Variable: LOG(AR_D)
Method: Least Squares
Date: 03/13/01 Time: 13:40
Sample(adjusted): 1994:1 2000:3
Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPN_D/CPI_D)	2.130611	2.270284	0.938478	0.3598
LOG(PADJ_D)	–6.027887	1.215164	–4.960556	0.0001
DOLUJA	–0.640628	0.143575	–4.461969	0.0003
SEZONA1	–0.677083	0.096679	–7.003402	0.0000
SEZONA2	1.543684	0.096168	16.05193	0.0000
SEZONA3	2.507964	0.093217	26.90472	0.0000
C	40.88398	11.28270	3.623599	0.0018
D_KOS2	–0.071905	0.119019	–0.604145	0.5529

R–squared	0.988518	Mean dependent var	11.08255
Adjusted R–squared	0.984287	S.D. dependent var	1.334209
S.E. of regression	0.167243	Akaike info criterion	–0.497548
Sum squared resid	0.531431	Schwarz criterion	–0.113597
Log likelihood	14.71690	F–statistic	233.6758
Durbin–Watson stat	1.958542	Prob(F–statistic)	0.000000

Dependent Variable: LOG(AR_I)
Method: Least Squares
Date: 03/13/01 Time: 13:42
Sample(adjusted): 1994:1 2000:2
Included observations: 26 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPN_I/CPI_I)	4.941690	1.712316	2.885969	0.0098
LOG(PADJ_I)	–0.272038	1.358302	–0.200278	0.8435
DOLUJA	–0.813877	0.235248	–3.459653	0.0028
SEZONA1	–0.602708	0.171691	–3.510420	0.0025
SEZONA2	1.067520	0.166805	6.399799	0.0000
SEZONA3	2.202682	0.168386	13.08111	0.0000
C	–30.16210	13.77408	–2.189773	0.0420
D_KOS2	–0.329105	0.183065	–1.797750	0.0890

R–squared	0.951505	Mean dependent var	11.10297
Adjusted R–squared	0.932645	S.D. dependent var	1.121411
S.E. of regression	0.291038	Akaike info criterion	0.616932
Sum squared resid	1.524652	Schwarz criterion	1.004038
Log likelihood	–0.020111	F–statistic	50.45270
Durbin–Watson stat	1.994044	Prob(F–statistic)	0.000000

Dependent Variable: LOG(AR_SLO)
Method: Least Squares
Date: 03/13/01 Time: 13:43
Sample(adjusted): 1994:1 2000:3
Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t–Statistic	Prob.
LOG(GDPR_SLO)	3.777055	0.728217	5.186718	0.0001
LOG(PADJ_SLO)	–3.334136	1.499408	–2.223636	0.0385
DOLUJA	–0.047463	0.182590	–0.259945	0.7977
SEZONA1	0.144258	0.130494	1.105472	0.2828
SEZONA2	2.240898	0.125709	17.82609	0.0000
SEZONA3	3.584249	0.121514	29.49663	0.0000
C	–20.75029	8.399651	–2.470375	0.0231
D_KOS2	0.118637	0.142759	0.831030	0.4163

R–squared	0.986124	Mean dependent var	10.79826
Adjusted R–squared	0.981012	S.D. dependent var	1.572129
S.E. of regression	0.216633	Akaike info criterion	0.019969
Sum squared resid	0.891665	Schwarz criterion	0.403920
Log likelihood	7.730424	F–statistic	192.9013
Durbin–Watson stat	2.135990	Prob(F–statistic)	0.000000

System: UNTITLED
Estimation Method: Seemingly Unrelated Regression
Date: 03/13/01 Time: 14:02
Sample: 1994:1 2000:3
Included observations: 27
Total system (balanced) observations 133

	Coefficient	Std. Error	t–Statistic	Prob.
C(1)	0.932680	0.588751	1.584166	0.1166
C(2)	–2.159025	0.604723	–3.570270	0.0006
C(3)	–0.691310	0.100545	–6.875596	0.0000
C(4)	–0.128729	0.101758	–1.265047	0.2090
C(5)	1.772444	0.077420	22.89382	0.0000
C(6)	2.475367	0.064179	38.56988	0.0000
C(7)	16.64792	3.160957	5.266734	0.0000
C(36)	–0.098316	0.071689	–1.371409	0.1735
C(8)	3.939640	1.176069	3.349838	0.0012
C(9)	–4.999479	0.672815	–7.430684	0.0000
C(10)	–0.702081	0.114145	–6.150796	0.0000
C(11)	–0.669537	0.080612	–8.305654	0.0000
C(12)	1.535535	0.080480	19.07963	0.0000
C(13)	2.534317	0.071204	35.59240	0.0000
C(14)	30.91371	5.943192	5.201534	0.0000
C(37)	–0.140433	0.083693	–1.677956	0.0967
C(15)	5.181613	1.251051	4.141808	0.0001
C(16)	–1.337850	0.878417	–1.523024	0.1311
C(17)	–0.874914	0.193559	–4.520151	0.0000
C(18)	–0.639390	0.141370	–4.522802	0.0000
C(19)	1.060153	0.138719	7.642432	0.0000
C(20)	2.249208	0.135106	16.64774	0.0000
C(21)	–28.38522	10.23686	–2.772844	0.0067
C(38)	–0.302710	0.146292	–2.069212	0.0413
C(22)	–1.360740	1.062772	–1.280369	0.2036
C(23)	2.106980	0.663440	3.175842	0.0020
C(24)	–1.038432	0.216339	–4.800018	0.0000
C(25)	–0.516795	0.170885	–3.024223	0.0032
C(26)	3.381748	0.154651	21.86692	0.0000
C(27)	4.904853	0.149189	32.87668	0.0000
C(28)	12.92908	1.846086	7.003511	0.0000
C(39)	–0.338574	0.156809	–2.159153	0.0334
C(29)	3.176050	0.531749	5.972834	0.0000
C(30)	–1.741580	1.009458	–1.725262	0.0878
C(31)	–0.129764	0.149078	–0.870446	0.3863
C(32)	0.131243	0.108754	1.206793	0.2306
C(33)	2.216830	0.104934	21.12587	0.0000
C(34)	3.582266	0.100184	35.75701	0.0000
C(35)	–22.40417	6.484933	–3.454803	0.0008
C(40)	0.068349	0.115045	0.594104	0.5539
Determinant residual covariance			6.68E–10	

Equation: LOG(AR_A) = C(1)*LOG(GDPN_A/CPI_A) + C(2)
*LOG(PADJ_A) + C(3)*DOLUJA + C(4)*SEZONA1 + C(5)
*SEZONA2 + C(6)*SEZONA3 + C(7) + C(36)*D_KOS2
Observations: 26

R–squared	0.987652	Mean dependent var	10.84131
Adjusted R–squared	0.982850	S.D. dependent var	1.147953
S.E. of regression	0.150331	Sum squared resid	0.406792
Durbin–Watson stat	1.760960		

Equation: LOG(AR_D) = C(8)*LOG(GDPN_D/CPI_D) + C(9)
*LOG(PADJ_D) + C(10)*DOLUJA + C(11)*SEZONA1 + C(12)
*SEZONA2 + C(13)*SEZONA3 + C(14)+C(37)*D_KOS2
Observations: 27

R–squared	0.987951	Mean dependent var	11.08255
Adjusted R–squared	0.983512	S.D. dependent var	1.334209
S.E. of regression	0.171322	Sum squared resid	0.557676
Durbin–Watson stat	2.041652		

Equation: LOG(AR_I) = C(15)*LOG(GDPN_I/CPI_I) + C(16) *LOG(PADJ_I) + C(17)*DOLUJA + C(18)*SEZONA1 + C(19) *SEZONA2 + C(20)*SEZONA3 + C(21) + C(38)*D_KOS2 Observations: 26			
R–squared Adjusted R–squared S.E. of regression Durbin–Watson stat	0.949458 0.929803 0.297115 1.801953	Mean dependent var S.D. dependent var Sum squared resid	11.10297 1.121411 1.588995
Equation: LOG(AR_CZ) = C(22)*LOG(GDPN_CZ/CPI_CZ) + C(23) *LOG(PADJ_CZ) + C(24)*DOLUJA + C(25)*SEZONA1 + C(26) *SEZONA2 + C(27)*SEZONA3 + C(28) + C(39)*D_KOS2 Observations: 27			
R–squared Adjusted R–squared S.E. of regression Durbin–Watson stat	0.985734 0.980478 0.323294 1.576999	Mean dependent var S.D. dependent var Sum squared resid	9.879869 2.313881 1.985864
Equation: LOG(AR_SLO) = C(29)*LOG(GDPR_SLO) + C(30) *LOG(PADJ_SLO) + C(31)*DOLUJA + C(32)*SEZONA1 + C(33) *SEZONA2 + C(34)*SEZONA3 + C(35) + C(40)*D_KOS2 Observations: 27			
R–squared Adjusted R–squared S.E. of regression Durbin–Watson stat	0.985238 0.979799 0.223449 2.049009	Mean dependent var S.D. dependent var Sum squared resid	10.79826 1.572129 0.948658

Data description

frequency: we use quarterly data starting with Q4/1993 and ending with Q4/2000. The reason for starting with the end of 1993 is that the stabilisation programme in Croatia was introduced then and there would be heavy data distortion if previous observations are included.

variables: arrivals from 5 countries which account for around 75% of total arrivals on an annual basis (see Table 1)

	1993	1994	1995	1996	1997	1998	1999	2000	Total
Italy	258,190	356,954	193,827	467,051	688,041	750,809	538,347	886,461	4,139,680
Germany	194,318	355,716	210,968	448,672	640,031	720,569	531,259	919,789	4,021,322
Slovenia	229,660	294,438	299,908	437,604	577,920	637,662	689,851	818,868	3,985,911
Czech R.	238,252	435,168	119,104	345,471	579,061	498,538	415,295	697,521	3,328,410
Austria	248,988	362,458	193,082	341,519	447,437	456,899	374,276	511,896	2,936,555
Hungary	90,730	128,817	34,080	84,903	126,688	137,670	141,413	238,774	983,075
Slovakia	21,573	59,048	27,071	83,933	153,930	161,664	107,629	183,740	798,588
Poland	6,578	17,892	10,277	35,621	97,765	131,049	104,893	274,956	679,031
Netherlands	16,965	29,809	25,341	41,668	64,964	88,286	72,551	100,052	439,636
Total arrivals	1,520,980	2,292,758	1,324,492	2,649,424	3,834,186	4,111,536	4,239,250	5,337,649	25,310,275
% of main five markets	76.9	78.7	76.8	77.0	76.5	74.5	78.0	71.8	72.7

- nominal GDP taken from the IFS series (January 2001, version 1.1.53) in billions, Slovenian data taken from CB bulletin (check), I(1) series
- nominal exchange rates (expressed in the value of domestic currency for 100 units of foreign currency) taken from the Croatian CB bulletin, EOP data, the results should not significantly differ (i.e. are robust) when including quarterly average rates, I(0) series
- population – IFS, in millions, since data for 2000 is not available, we used the estimated population size from previous year as a proxy
- relative price is estimated using foreign and domestic CPI, data for foreign CPI is taken from IFS, January 2001, whereas domestic CPI is taken from Croatian CB database, I(0) series
- data for Croatian tourism receipts are taken from the balance of payments position
- dummies: we use seasonal dummy variables due to the exceptional high seasonality of the arrivals time series, a dummy for the military action "storm", which took place in Q3/1995, a dummy for the Kosovo crisis in 1999

Ayres:

determinants of consumer demand:

price: $dq/dp<0$

income: $dy/dq>0$, $dy/dq<0$ inferir good

substitution/competition: demand is a function of the degree of substitutability and level of competition

tastes and preferences: formation of tastes and preferences outside the model

However, in spite of the complexity of the tourism product and therefore limitations to the descriptive ability of tourism demand models, many of them opt for approximation using two or three aforementioned determinants modelled using proxies.

The following Working Papers have been published since December 1999:

No.	Date	Title	Author(s)
W–1	December 1999	Croatia in the Second Stage of Transition, 1994–1999	Velimir Šonje and Boris Vujčić
W–2	January 2000	Is Unofficial Economy a Source of Corruption?	Michael Faulend and Vedran Šošić
W–3	September 2000	Measuring the Similarities of Economic Developments in Central Europe: A Correlation between the Business Cycles of Germany, Hungary, the Czech Republic and Croatia	Velimir Šonje and Igeta Vrbanc
W–4	September 2000	Exchange Rate and Output in the Aftermath of the Great Depression and During the Transition Period in Central Europe	Velimir Šonje
W–5	September 2000	The Monthly Transaction Money Demand in Croatia	Ante Babić
W–6	August 2001	General Equilibrium Analysis of Croatia's Accession to the World Trade Organization	Jasminka Šohinger, Davor Galinec and Glenn W. Harrison
W–7	February 2002	Efficiency of Banks in Croatia: A DEA Approach	Igor Jemrić and Boris Vujčić

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