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DETERMINANTS OF ARGENTINEAN TOURISM DEMAND IN URUGUAY

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Determinantes de la demanda argentina de turistas en Uruguay

Gabriela Mordecki*

Resumen

En Uruguay el total de turistas anuales representan alrededor del 90% de la población total, e históricamente más del 60% provienen de Argentina. Las actividades turísticas tienen un gran impacto en la economía uruguaya. Representan aproximadamente el 4% del PIB uruguayo y generan cerca de 6% del empleo total y 14% de las exportaciones totales. Por esta razón, es importante analizar los factores determinantes detrás de la demanda turística. En este trabajo se estudia la relación entre el número de turistas argentinos que ingresan a Uruguay, su gasto real, el PIB argentino y el tipo de cambio real (TCR) entre Uruguay y Argentina tratando de encontrar relaciones de largo plazo entre las variables, siguiendo la metodología de Johansen. Se encontraron dos relaciones de cointegración, a través de dos modelos de vectores de corrección de error (VECM). En el primero se incluye el gasto turístico real, el PIB argentino y el TCR entre Argentina y Uruguay. En el segundo, tratamos de estimar el número de turistas argentinos, utilizando datos mensuales de turistas, un indicador mensual de la actividad argentina y el TCR entre Uruguay y Argentina. El pronóstico del modelo indica una leve disminución del gasto turístico argentino en 2014 y una recuperación para el 2015.

Palabras clave: demanda turística, cointegración, tipo de cambio real.

Código JEL: C32, F14, F41

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Determinants of Argentinean tourism demand in Uruguay

Gabriela Mordecki

Abstract

In Uruguay total yearly tourists represent about 90% of its population of which historically 60% or more have come from Argentina. Tourist activities have a great impact on Uruguayan economy. They represent about 4% of Uruguayan GDP and generate near 6% of total employment and 14% of total exports. For this reason it is important to analyze the determinants behind tourism demand. In this paper we study the relationship between the number of Argentinean tourists in Uruguay, their real expenditure, Argentinean GDP and the real exchange rate (RER) between Uruguay and Argentina trying to find long-run relationships between variables, following Johansen methodology. We found two cointegration relationships, through Vector error correction models (VECM). In the first one we include real tourism expenditure, Argentinean GDP and the RER between Argentina and Uruguay. In the second one, we try to estimate the number of Argentinean tourists, using monthly dada of tourists, a monthly indicator of Argentinean activity and the RER between Uruguay and Argentina. The model's forecast indicates a slight decrease of Argentinean tourism expenditure in 2014 and a recovering for 2015.

Key words: tourism demand, cointegration, real exchange rate

JEL: C32, F14, F41.

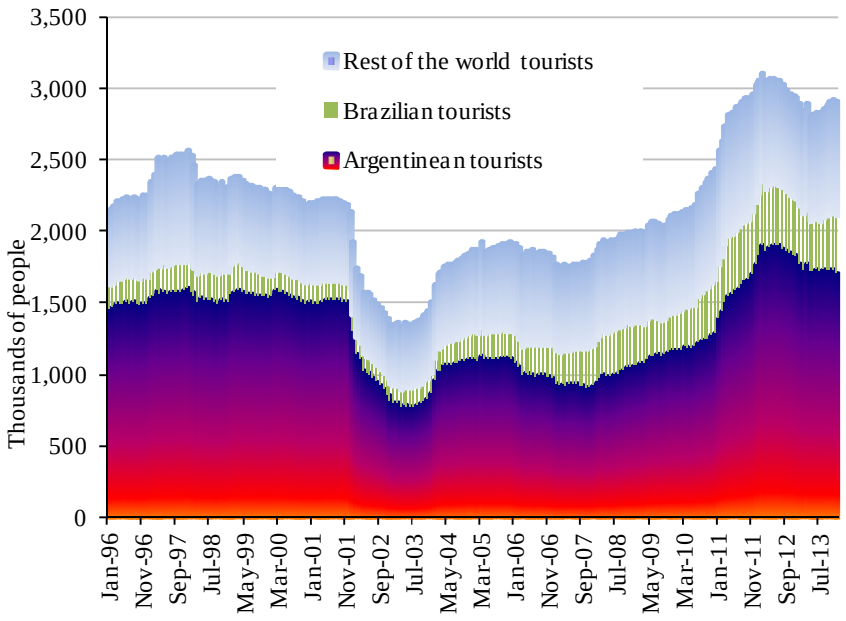
1. Introdution

Alexis Papathanassis (2011) asserts that over the last years the tourism sector has grown substantially in a number of ways, and at a global level, tourism appears to be crisis-resistant. The World Tourism Organization (2013) annual report affirms, "In spite of persisting global economic challenges and geopolitical shifts, tourism continues to grow and even exceed long-term forecasts and expectations". After reaching in 2012 one billion people traveling around the world annually, tourism maintained the trend with a 5% growth in 2013. However, each region has different characteristics making relevant to study the particular cases. This paper refers to a small country, Uruguay, located in the south of South America, between two big neighbors: Argentina and Brazil, and with a very peculiar geographic and political structure that was defined by its history and afterwards development.

Uruguay has 3.3 million inhabitants, with 700 km of beaches over the Rio de la Plata, with a temperate climate. Argentinean tourists have historically been our main visitors. Our main touristic resort, Punta del Este is about 360 km from Buenos Aires, Argentinean capital city. Then Argentinean tourists came to our country for its annual holidays, long week-ends, winter holidays, and also many of them have their own houses in Uruguay, family relationships, and many times investments and commercial interests.

Total yearly tourists represent about 90% of Uruguayan population. Argentinean tourists represent nearly 60% of this total, a share that has maintained over time. Tourist activities have a great impact on Uruguayan economy. They represent about 4% of Uruguayan GDP and generate about 6% of total employment and 14% of total exports.

Figure 1. Annual tourists' arrivals to Uruguay by nationality

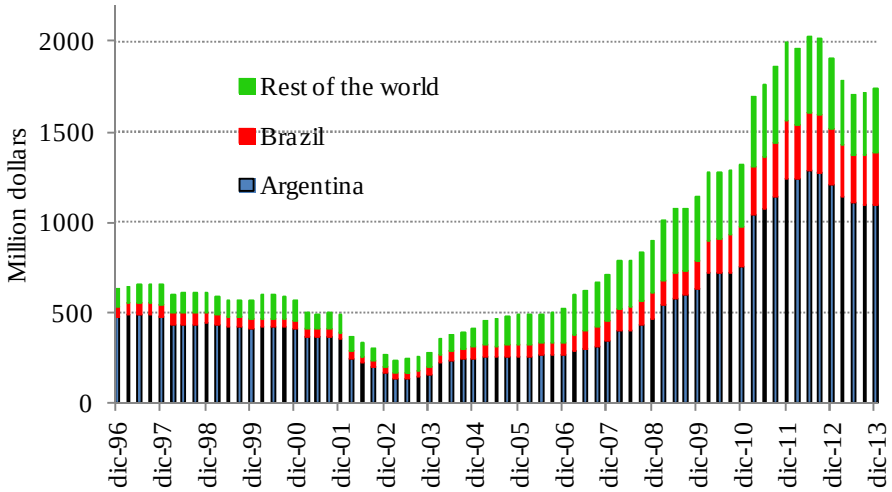


SOURCE: Ministry of Tourism, Uruguay

Figure 1 shows the evolution of tourism in Uruguay during the period of analysis (Jan-1996 to Dec-2013). Argentinean tourists have increased substantially during the last decade, after the 2001-2002 crises, but they have stagnated and even diminished in recent years, due to internal problems of Argentinean economy and overvaluation of our local currency. Brazilian tourists, the second tourists by nationality, have increased in the last years, but they only represent about 14% of total tourists.

In Figure 2 we have data of annual international tourism receipts, considered by nationality. The evolution is similar to the number of tourists, and although the increase has accelerated in the last decade, the participation rates of the principal nationalities remain similar.

Figure 2. Annual international tourism receipts in Uruguay by nationality



SOURCE: Ministry of Tourism, Uruguay

To explain this difference it is important to know the determinants of tourists demand. Altmark et al. (2013) estimate the Argentinean and Brazilian tourism demand, for the period ended in the second quarter of 2011. Since then, Argentina have gone through Balance of Payment problems, and consequently devaluating its currency and imposing strict controls to the acquisition of foreign currency for tourists going abroad. Therefore, the main objective of this work is to estimate Argentinean tourist demand (tourists arrivals and their expenditure), considering data from January 1996 up to December 2013, and using this models to make projections for 2014 and 2015. This is an example of a small economy impacted by devaluation and currency control policies in the main source of tourism.

In this paper we study the relationship between the number of Argentinean tourists in Uruguay, its real spending, Argentinean GDP and the real exchange rate between Uruguay and Argentina trying to find long-run relationships between variables, following the cointegration methodology developed by Johansen (1988).

The present paper is organized as follows. The second section describes the analysis framework and background; in section three we estimate the models; in the fourth section we make some projections and finally, the fifth section draws some conclusions.

2. Analysis framework and background

Paraskervopoulos (1977), Loeb (1982), Stronge and Redman (1982), Truett and Truett, (1987), Witt and Witt (1995), Mudambi and Baum (1997), are examples of some important works about estimation of the determinants of a tourist demand. Crouch (1994) found 80 empirical studies on the demand function for tourism. Song and Li (2008) review the published studies on tourism demand modeling and forecasting since 2000. Most of these works focused on income of source countries, and the relative price of the exported tourist services as the main determinants of tourism demand.

Works focused on Uruguayan tourism study the relevance of tourism activities on GDP growth, as Brida et al. (2010), but mainly they try to estimate the determinants of the tourism demand, like Robano (2000), Altmark et al. (2012), or Serviansky (2011). In these works the authors, with different emphasis, try to find a relationship between real tourism spending with real income of the source tourists.

Lim (1997) presents a review of more than 100 published studies of empirical international tourism demand models. Tourist arrivals/departures and expenditures/receipts have been the most frequently used dependent variables. The most popular explanatory variables used have been income, relative tourism prices, and transportation costs. Song and Li (2008) found that the methods used in analyzing and forecasting the demand for tourism have been more diverse than those identified by other review articles, and in addition to the most popular time-series and econometric models, a number of new techniques have emerged in the literature.

3. Model

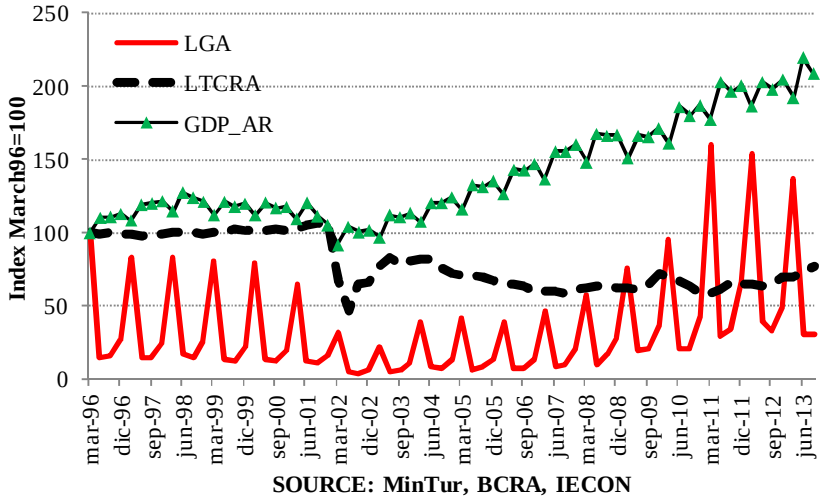
3.1 Data and methodology

In this paper we consider two alternative measures for tourist demand: number of tourists entering the country and real tourists spending. We will try to find a long-run relationship of these variables with the country source income and relative prices, measured by the real exchange rate between both countries (Argentina and Uruguay).

To carry out this investigation, we estimated two vector error correction models (VECM), following Enders (1995), and considered data from January 1996 to December 2013.

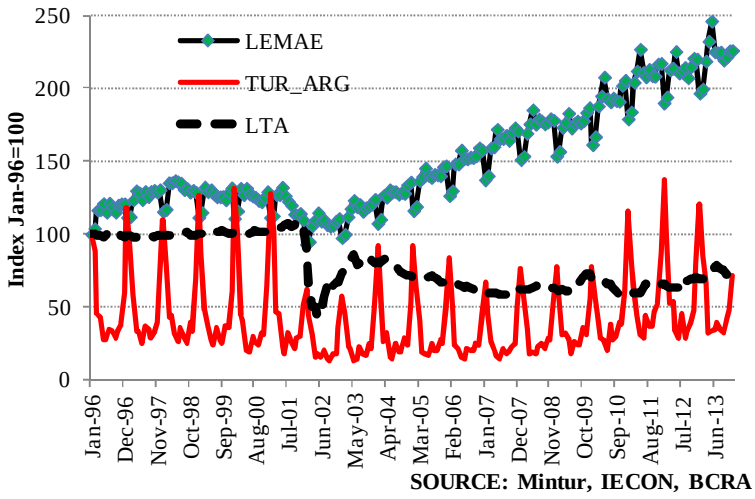
The first model considers quarterly data of Argentinean real tourism expenditure (LGA), Argentinean GDP (GDP_AR) and the real exchange rate between Argentina and Uruguay (LTCRA), all in logarithms (see Figure 3).

Figure 3. Income from Argentinean tourism, GDP and real exchange rate (quarterly data)



The second model uses monthly data and the variables considered are: the number of Argentinean tourists entering Uruguay (TUR_ARG), a monthly indicator of Argentinean activity (LEMAE) and the real exchange rate between Argentina and Uruguay (LTA), all considered in logarithms (Figure 4).

Figure 4. Argentinean tourists, activity indicator and real exchange rate (monthly data)



The Argentinean GPD with quarterly data, the monthly activity indicator (EMAE), the number of tourists and the tourism expenditure has high seasonality, and then some significant seasonal dummies were introduced in both models. Before that we performed the Augmented Dickey-Fuller (ADF) test to test the integration degree, which results are shown in Table 1.

All the cases were non-stationary series with a unit root, i.e., I (1). According to the theory, this is a result generally expected for economic series, opening the possibility to analyze whether there is a cointegration vector between the series, showing a long-term relationship between variables.

Table 1. Unit root tests

Augmented Dickey-Fuller H_O = there is an unit root				
	Statistic value of the series in levels	Rejection H0 up to 95%	Statistic value of the series in first differences	Rejection H0 up to 95%
LGA	0.398289	No	-2.452891	Yes
	(no constant, 8 lags)		(no constant, 10 lags)	
GDP_AR	1.494793	No	-2.611534	Yes
	(no constant, 5 lags)		(no constant, 4 lags)	
LTCRA	-0.785982	No	-6.099693	Yes
	(no constant, 4 lags)		(no constant, 3 lags)	
TUR_ARG	-0.002279	No	-4.297616	Yes
	(no constant, 13 lags)		(no constant, 12 lags)	
LEMAE	0.866585	No	-2.508460	Yes
	(no constant, 13 lags)		(no constant, 14 lags)	
LTA	-0.715271	No	-6.178068	Yes
	(no constant, 11 lags)		(no constant, 10 lags)	
Lags are calculated due to Akaike criteria				

To test the existence of long term equilibrium relationships among the variables we applied the Johansen (1988) methodology. From this verification, we estimated a vector error correction model VECM (Engle and Granger, 1987 and Johansen, 1992).

3.2 Johansen cointegration method

Following Enders (1995), cointegration analysis is based on an autoregressive vector with Vector Error Correction Model specification for an endogenous variable vector.

$$\Delta X_{it}=A_1 \Delta X_{(it-1)}+\cdots+A_k \Delta X_{(it-k+1)}+\prod X_{(it-k)}+\mu+\Gamma D_t+\xi_{(t)} \qquad t=1, \ldots, T$$

Where $\xi_{(t)} \sim N(0,\sigma^2)$

μ is a vector of constants and Dt contains a set of dummies (seasonal and interventions).

Information about long-term relationships is included in the $\prod \square = \alpha\beta^{'}$ matrix, where β is the coefficient's vector for the existing equilibrium relationships, and α is the vector for short-term adjustment mechanism coefficients. The identification of the matrix $\prod$ range determines the total cointegration relationships existing among the variables.

Once examined the long-term relationship, we proceed to the short-term analysis, which shows different adjustment mechanisms of the variables to the long-run equilibrium.

The cointegration is analyzed with Johansen test, from the Trace and the Eigenvalue of matrix Π (Tables 2 and 3). The existence of a cointegrating vector is not rejected, and the signs of the variables were as expected. Moreover, in the resulting pattern exclusion tests for β and weak exogeneity test for α all were significant. Furthermore, residuals were well behaved (see Annex).

Table 2. Cointegration test for first model with quarterly data

Sample (adjusted): 1996Q3 2013Q3
Included observations: 69 after adjustments
Trend assumption: No deterministic trend (restricted constant)
Series: LGA LTCRA GDP_AR
Exogenous series: D(S1) D(S2) D(S4) D(E021) D(I022) D(I121) D(I094) D(I083) D(E092) D(E043) D(E031)
Warning: Critical values assume no exogenous series
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.366442	39.70656	35.19275	0.0152
At most 1	0.089384	8.214658	20.26184	0.8065
At most 2	0.025099	1.753918	9.164546	0.8260

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.366442	31.49191	22.29962	0.0020
At most 1	0.089384	6.460740	15.89210	0.7347
At most 2	0.025099	1.753918	9.164546	0.8260

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 3. Cointegration test for second model with monthly data

Sample (adjusted): 1996M08 2013M12
Included observations: 209 after adjustments
Trend assumption: Linear deterministic trend
Series: TUR_ARG LTA LEMAE
Exogenous series: D(I0202) D(E0202) D(I0210) D(S1) D(S2) D(S3) D(S4) D(S5) D(S6) D(S7) D(S8) D(S9) D(S10) D(S11) D(E0201) D(I0205) D(I0301)
Warning: Critical values assume no exogenous series
Lags interval (in first differences): 1 to 6

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.130030	37.03493	29.79707	0.0062
At most 1	0.037173	7.921986	15.49471	0.4738
At most 2	2.30E-05	0.004803	3.841466	0.9438

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.130030	29.11295	21.13162	0.0031
At most 1	0.037173	7.917182	14.26460	0.3872
At most 2	2.30E-05	0.004803	3.841466	0.9438

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Thus, the vectors found are:

For the first model

$$LGA_t = 2.697\,\mathrm{LTCRA}_t + 3.347 GDP\_AR_t - 36.036$$
$$(7.444) \qquad (9.966)$$

As variables were considered in logarithms, the coefficients can be read as elasticities. Therefore, with the increase of one percentage point (pp) in real exchange rate considered through LTCRA, the tourists spending (LGA) grows 2.697%. On the other hand, with the increase of one pp in activity, the number of tourists increases 3.347%. This confirms that tourism is a luxury activity, because its income-elasticity results greater than 1.

For the second model the coefficients are smaller than the ones that result of the quarterly model, but the implications are the same.

$$TUR\_ARG_t = 1.925\,\mathrm{LTA}_t + 1.687\mathrm{LEMAE}_t - 5.20$$
$$(9.398) \qquad (9.275)$$

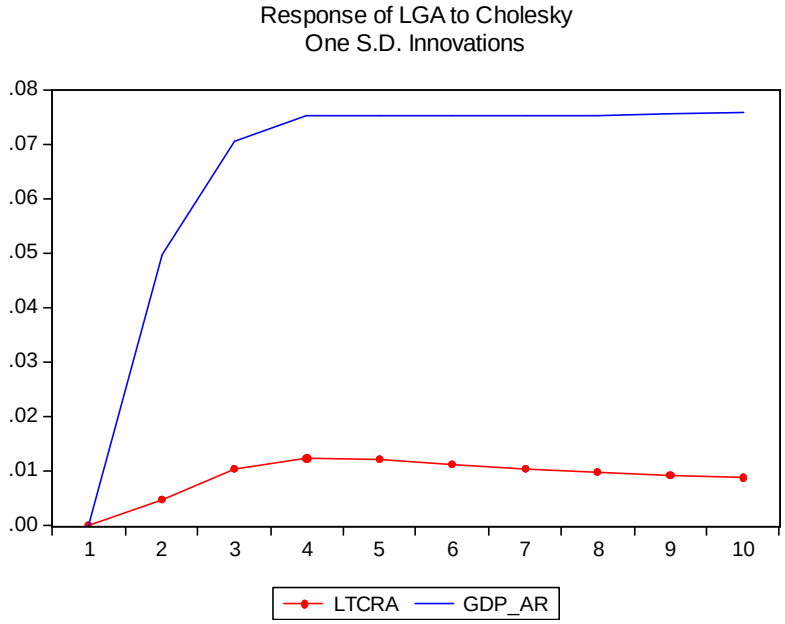
In this case, with the increase of one pp in real exchange rate considered through LTA, the number of tourists (TUR_ARG) grows 1.925%. On the other hand, with the increase of one pp in activity, the number of tourists increases 1.687%. This again confirms that tourism is a luxury activity, with the income-elasticity greater than 1.

Expenditure is more elastic to changes in relative prices and income than the number of tourist.

3.3 Impulse-response functions

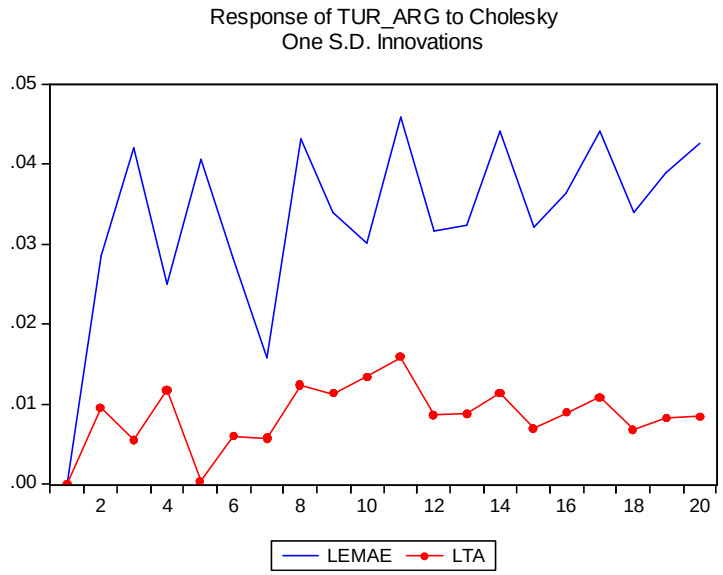
The impulse response functions show the reaction of the different variables to external changes in the other ones. In this first case, a shock is simulated in real exchange rate and real income. Depending on the case they have an impact on tourists' arrivals or tourists spending. Figures 5 and 6 show the response of tourists arrivals and spending to a positive shock on Argentineans income and real exchange rate.

Figure 5. Tourists' spending impulse-response function



After 4 quarters GDP fits around 7.5% to a positive shock on Argentinean income and the effect of real exchange rate appears positive near 1%.

Figure 6. Number of tourists impulse-response function



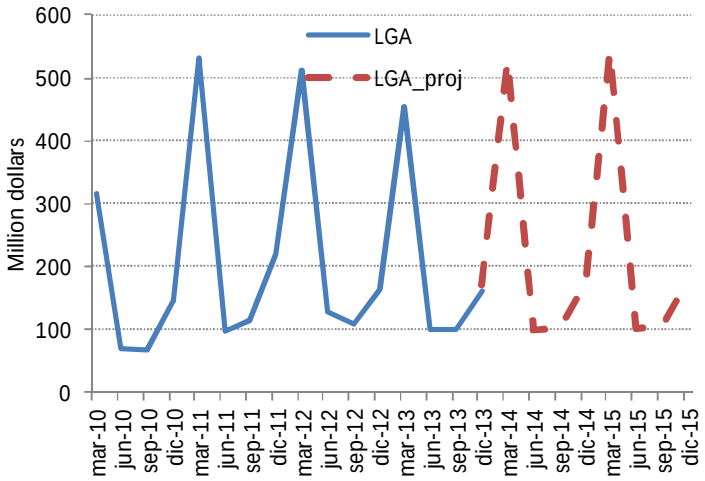
Considering monthly data and number of tourists' arrivals, the effects seem to be less extreme. After 12 months, the overall impact over the number of tourists to a positive shock on Argentinean income is around 4%, while is 1% to an increase on the bilateral real exchange rate.

4. Projections

To complete this analysis of tourism demand, it is important to consider the possible future trajectory of tourists and their spending.

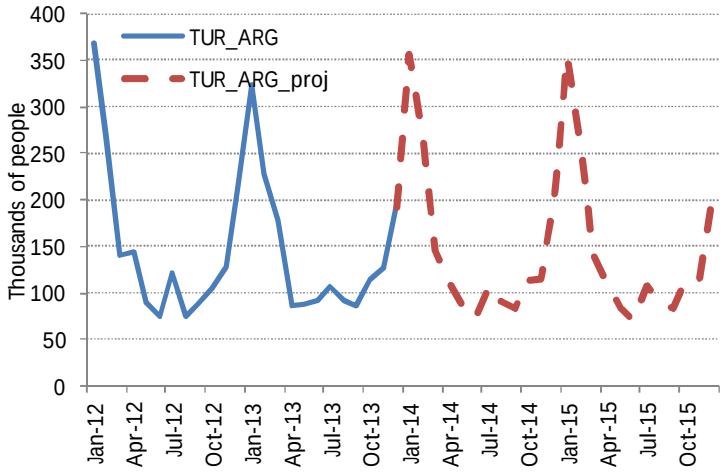
According to the first model, Argentinean tourists' spending will increase 10% during 2014, and it will grow 3% in 2015.

Figure 7. Argentinean tourists' spending projections



In the second model projections indicate that the number of tourists will recover during 2014 (2%), but decrease again during 2015 (1.5%). Nevertheless, considering the confidence interval these results are not significantly different from zero.

Figure 8. Argentinean tourists' arrivals projections



5. Concluding remarks

The main objective of this paper was to estimate a demand function for Argentinean tourism demand in Uruguay. This is an example of a small economy impacted by devaluation and control currency policies applied in the main source of tourism. This objective was instrumented through the estimation of two models, one considering the Argentinean tourists' spending in Uruguay (using quarterly data) and a second one using the number of tourists entering Uruguay (monthly data). For both models we applied Johansen methodology and we found two long-run relationships, one for each model. The other variables considered were Argentinean income and real exchange rate between Uruguay and Argentina. Both resulted significant in both models.

The two models show income-elasticities larger than one, what shows the characteristic of "luxury" good that applies to tourism. That is, as income grows, this kind of consumption grows more than proportionally.

The impulse-response functions show a greater impact of income changes over relative prices changes, and this difference is more important for spending than for the number of tourists.

Finally we projected the estimated series and the model forecast an increase in expenditure, but tourists' arrivals seem to increase only slightly or stay equal to the year before. The results suggest that changes in relative prices and Argentinean income have more impact in real expenditure than in the number of tourists.

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