THE IMPACT OF EXCHANGE RATE VOLATILITY ON TOURISM SECTOR: A CASE STUDY, TURKEY

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ÖZ

Dış ticaret dengesinin sürekli açık verdiği ülkemizde turizm sektörü cari işlemler dengesinin sağlanmasında çok önemli bir görev üstlenmektedir. Bu özelliğinin yanında turizm sektörü yarattığı istihdam olanakları ile ekonomiye dinamizm katmakta ve ekonomik gelişime önemli katkılar sağlamaktadır. Turizm sektörünün en önemli başarısı kaliteli hizmet sunmak ve olabildiğince çok turisti ülkemize çekmektir. Bu bağlamda döviz kurlarının oynaklığı sektörü oldukça fazla etkilemektedir. Bu çalışma bu durumdan yola çıkarak döviz kurlarındaki dalgalanmaların Türkiye'ye gelen turist sayısı üzerindeki etkisini analiz etmeye çalışmaktadır.

Anahtar Kelimeler: Turizm, Döviz Kuru, Hata Düzetme Modeli (ECM), EGARCH

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ABSTRACT

Tourism sector makes a significant contribution to maintaining balance of payments on current account in Turkey. Moreover, tourism sector creates the facilities of employment, promotes economic expansion, and plays a central role in representing quality services and attracting as many tourists as possible. In this case, exchange rate volatility has a markedly effect on tourism sector. In this paper, the question of whether currency fluctuations have an impact on the number of tourists coming to Turkey will be analysed.

Key Words: Tourism, Exchange Rates, Error Correction Mechanism (ECM), EGARCH

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INTRODUCTION

The process of tourism sector started together with the law of incentive of tourism, numbered 2364 and introduced in 1982. This process considerably spurted after 1983, and the number of tourism firms increased and the number of beds rose from 60.000 to 300.000. Furthermore, the figure of tourists, coming to Turkey, increased from 1 million to 8 million, and Turkey has been one of the most catching and pleasure cruising countries for particularly the European Union countries. As a result of this, tourism has contributed to the national economy in Turkey, and become an important part of employment. When

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compared to the previous periods, the Turkish tourism has changed in terms of environmental issues and governance of investment after 1988 (TÇG, 2004).

While the number of tourists was 1.2 million in 1980, that of 2006 rose to 8 million. Although tourism incomes in 1980 were 326 million $, in 2006 it was 16.9 billion $, including 12.5 billion $ international ones. While the rate of tourism in GDP (gross domestic product) was at 0.5%, it was at 3% in 2006. Whereas the percentage of exports in GDP was at 12.2% in 1980, it increased to 14.7% in 2006. Turkey is the 12 th in the rate of increase in the number of tourists and 8 th in terms of hard-currency income in the world. To date, there has been 7 development plans, and except for 2 plans, in the remaining 5 years' development plans, it would not be wrong to say that the number of tourists has dropped behind the aims at plans. In the first 5 years' and 5 th 5 years' plans, the number of tourists has been higher than as expected. These are 121% and 134%, respectively. With regard to tourism income, it has been higher than as expected in 3 rd (1973-77) and 5 th (1985-89) 5 years' development plans. These are 275% and 142%, respectively (TÇG, 2004).

On account of the fact that 5 years' plans introduced give a general idea of diversified subjects, it does not enable us to have concrete results. Some measures envisaged have not reached success whereas others have partially been carried out. It is reasonable to say that plans have not been successful in governing legal, executive regulations and incentive economic measures which should be in parallel with each other (TÇG, 2004).

We can say that the security of tourists, interactions resulting from global economy and foreign exchange rates are referred to as the most important factors to determine the figure of tourists arriving at the country.

In the period of fixed exchange rate system implemented in the world, when compared to flexible exchange rate system, because of the fact that the rate of international trade has been higher, the supporters of fixed exchange rate system suggest that flexible exchange rate system reduces the speed of international trade. For this reason, they believe that fixed exchange rate system is more efficient for international trade (Çağlar, 2003).

However, in today's world, it can be said that particularly developing countries tend towards flexible exchange rate system. It is impossible to implement fixed exchange rate system owing to runaway inflation and trade liberalization in developing countries. In flexible exchange rate system, due to the fact that changes in exchange rates often increase the uncertainty, solutions should be found to avoid the uncertainty of risk in particular tourism sector by applying to financial methods such as, forward exchange and option markets (Çağlar, 2003).

In this paper, changes in real exchange rates and whether the uncertainty of exchange rates has an impact on the number of tourists will be analysed. In Section 1, the relevant literature has been reviewed. In Section 2, the method we used in this paper was stated. In Section 3, the findings obtained were shown. Section 4 offers some concluding remarks.

1. THE STUDIES ON EXCHANGE RATE AND TOURISM

According to Toh and Khan (1997), in Singapore the changes in exchange rates and tourism incomes account for the changes in the number of tourists at 94% (Weber,

2001). In this study, with 3 month-data, the relationship between tourism in Australia and exchange rates was studied from 1983 to 1997. Besides, Johansen and Engel Granger tests were applied. It has been suggested that the changes in exchange rates account for the changes of tourism demand at 50% (Dritsaki, 2004). Granger causality between tourism incomes (3 month-data) and real exchange rates has been founded from 1960 to 2000. These results are consistent with another study on Greece carried out by Patsoaritis et al. (2005) and support the findings of this study by applying to regression analysis.

Eugenio-Martin and Morales (2004), who found the relationship between economic growth and tourism incomes by studying panel data in Latin America from 1985 to 1998, concluded that the correlation between tourism incomes, exchange rates and purchasing power parity has been very weak. Furthermore, Meryar and Payne (2007) suggest that exchange rates have a very poor impulse on tourism demand in Croatia between 1994 and 2004. In reviewing the literature, it is worth highlighting that Narayan (2004) found that there has been inverse granger causality between the increase in wages resulting from improvement in tourism and appreciation.

2. MATERIAL AND METHOD

According to Arize (1997), the relationship between the number of tourists, the change in exchange rates, and the uncertainty of exchange rates can be shown in a basic form as follows:

$$X=\varphi_0 + \varphi_1 RER_t + \varphi_2 \sigma_t + v_t \quad (1)$$

In this formula, all variables are thought of as a logarithmic form and with the method of Tramo/Seeds, the effect of seasonality is excluded in the model, where X is the number of tourists; RER is the change in real exchange rates; σ_t is the uncertainty of exchange rates and v_t is error term.

Table 1 Statistics (1994-2006)

Index	Mean	Standard Deviation	Skewness	Kurtosis	Jargue-Bera	Prob
Y_{USA}	11.0583	0.28509	0.92534	3.57526	8.13789	0.01709*
$Y_{GERMANY}$	13.2296	0.47140	-0.64265	2.71535	3.75492	0.152997
G_{FRANCE}	11.3533	0.37966	-0.06009	1.72247	3.56743	0.16801
G_{UK}	11.9527	0.37756	0.59526	2.23829	4.32798	0.11486
$REER_{USA}$	-4.00844	0.20020	-0.07250	2.46869	0.65718	0.71993
$REER_{EU}$	-3.76174	0.18636	0.37177	2.48175	1.77979	0,41069
$REER_{UK}$	-3.40624	0.12403	-0.22472	2.69878	0.63425	0.72824

NOTE: Jargue-Bera shows the test results of normal distribution, and null hypothesis depicts that series is normally distributed. The symbol * illustrates that series is not normally distributed.

2.1. MATERİAL

In this study, in an attempt to eliminate the effects of price differences in exchange rates between countries, 3 month-data was studied, including 1994:1-2006:4. The data in exchange rates was obtained from Central Bank of the Republic of Turkey, IMF's data set, and the number of tourists was noted from Turkish Statistical Institute. RER can be seen for each selected country as follows:

$$RER=NER\ (CPI_f / CPI_d) \quad (2)$$

In this formula, CPI_f is foreign country's consumer price index; CPI_d is Turkey's consumer price index, NER is nominal exchange rate.

2.1.1 EGARCH Model

In recent years, there has been an increasing interest in regression residuals assumed to have constant conditional variance, homoscedastic residuals. So far, however, there has been little discussion about the variation of the residual variance (Gökçe, 2001). Hence, it is useful to mention the autoregressive conditional heteroscedastic model (ARCH) proposed by Engle (1982), and generalised form of ARCH is GARCH model proposed by Bollerslev (1986). GARCH models facilitate the calculation of variance through financial time series. However, the problem with this approach is that it takes symmetric conditional variance into consideration. However, Nelson (1990), Christie (1982), and Schwert (1989) assert that this approach of GARCH has not been successful owing to the fact that volatility allows for asymmetric responses of the conditional variance.

In the literature, another model is the exponential GARCH (EGARCH) developed by Pagan and Schwert (1990) and Nelson (1991). When compared to GARCH models, this model guarantees positivity in conditional variance and allows whether the variance response is asymmetric or not. In this study, EGARCH model was applied and conditional variances obtained from EGARCH were used, rather than the uncertainty. The series of real exchange rates is as follows:

$$R_t = \alpha_0 + \sum_{i=1}^{r} \alpha_i R_{t-i} + \varepsilon_t \tag{3}$$

$$\varepsilon_t \left| \Omega_{t-1} \approx N\left(0, \sigma_t^2\right) \right. \tag{4}$$

$$\log\left(\sigma_t^2\right) = \exp\left[\alpha_0 + \sum_{i=1}^{q} \alpha_i g\left(z_{t-1}\right) + \sum_{i=1}^{p} b_i \log\left(\sigma_{t-1}^2\right) \right] \tag{5}$$

$$g\left(z_t\right) = \theta z_t + \left[\left| z_t \right| - E\left| z_t \right| \right]$$

In the equation above, R_t is returns stochastic; ε_t is error term; Ω_{t-1} is data set in the period t-1; σ^2_t is conditional variance; z_t is standardised error term; (ε_t/σ_t) is zero mean and variance σ^2_t is normally distributed. The equation 3, conditional mean equation, the r th order autoregressive process AR(r). For model specification and estimation, Schwarz Information Criterion (SIC) is applied and as can be seen from Table 2, a lag order r=1 is selected for USA, France, and Germany. For the UK, the lag is not used. After model is estimated, ARCH-LM test is applied to check whether dependence between error terms is or not. The results of this study indicate that there is no dependence between error terms.

The equation 4, conditional variance equation, represents EGARCH (p,q). According to EGARCH, variance is conditional based on the lag of variance itself and

standardised error term ($\varepsilon t/\sigma_t$).Volatility persistence is observed with the equation $\sum_{i=1}^{p} b_i$. If this sum in absolute value is very small, then we say that there is no persistence a lot. In the equation 5, the second part $\left[|z_t| - E|z_t|\right]$ indicates the effect of ARCH. The parameter θ allows the effect of ARCH to be asymmetric and the value of θ which is statistically important illustrates that there is an asymmetric effect.

As can be seen from Table 2, EGARCH 1 (β) is statistically at the level of significance. For countries stated, there is fairly volatility persistence. The parameter θ estimated for Europe and the UK indicates an asymmetric volatility. In other words, positive shocks affect volatility more than negative shocks do.

Table 2. EGARCH Model Estimation Results, 3 Month-Data (1994-2006)

Parameters	$REER_{USA}$	$REER_{EU}$	$REER_{UK}$
Intersection	-9.12959* (-23.33016)	-0.837434 (-1.257888)	-3.091022* (-3.686200)
A	0.756952* (2.581321)	0.974118* (3.226368)	-0.017806 (-0.807414)
B	-0.748194* (-8.752442)	0.958771* (10.81910)	0.407823* (2.732320)
Θ	0.775219* (2.705974)	-0.631325* (-3.552787)	-0.144003* (-2.614719)
SIC (lags)	(1) -1.898541	(1) -2.807954	(0) -1.996792
ARCH-LM	(3) 0.151139 (0.928410)	(4) 0.688041 (0.604299)	(4) 0.158238 (0.958195)

Note: *,** indicate the 1% and %10 levels of significance, respectively, the values in the parenthesis show the values of z. ARCH-LM test checks whether or not there is any dependence between error terms. Null hypothesis is that there is no dependence between error terms.

2.2. METHOD

2.2.1. Unit Root Tests

We now turn the issue of formal tests of whether an observed data series is generated by a stationary or non-stationary process, such as, ADF. In this study, the Augmented Dickey Fuller (ADF) (Dickey and Fuller, 1979) test was applied.

The findings of the unit root tests can be found from Table 3. The series in Table 3 are checked based on intercept and trend, and the results vary according to the implications of these characteristics for the choice of intercept and trend in the unit root test regression. All series is not stationary, but for the model of the first difference, the series is stationary.

Table 3. Unit Root Tests

	ADF TEST LEVEL	
SERIES	Intercept	Intercept and Trend
LA_SA_{USA}	-1.274877	-2.269175
$LA\_SA_{GERMANY}$	-2.526975	-3.347096*
LA_SA_{FRANCE}	-1.739129	-4.734932***
LA_SA_{UK}	-1.057548	-3.173212
$REER_{USA}$ _SA	-1.050626	-2.443273
$REER_{EU}$ _SA	-0.821044	-3.417576*
$REER_{UK}$ _SA	-2.884968*	-3.540000*
	ADF TEST FIRST DIFFERENCES	
ΔLA_SA_{USA}	-9.167629***	-9.304851***
$\Delta LA\_SA_{GERMANY}$	-8.242463***	-8.263646***
ΔLA_SA_{FRANCE}	-8.674475***	-8.582359***
ΔLA_SA_{UK}	-8.909488***	-6.548420***
$\Delta REER_{USA}$ _SA	-7.815595***	-6.273495***
$\Delta REER_{EU}$ _SA	-11.53907***	-11.49143***
$\Delta REER_{UK}$ _SA	-5.573958***	-5.511983***

Note: ***, ** and * indicate the 1%, 5% and 10% levels of significance, respectively; the null hypothesis is rejected and the alternative hypothesis, saying that series is stationary is not rejected. The lag order for ADF test is selected.

2.2.2. Cointegration

From the above it can be concluded that the series is not stationary, that is, the series is I (1). The next stage of the process is to apply cointegration analysis to check long-run equilibrium relationships between the number of tourists and exchange rates. For this reason, in this study, Johansen test was applied. Johansen and Juselius (1990) proposed maximum likelihood estimation and likelihood ratio tests to check the existence of cointegration. The Error Correction Model (ECM) for the first difference is as follows (Demirel and Erdem; 2004):

$$\mathbf{\Delta X_1 = \Gamma_t \Delta X_{t-1} + \ldots + \Gamma_{k+1} \Delta X_{t-k} + \Pi X_{t-k} + \mu + \varepsilon_t \text{ ve } \varepsilon_t \sim N(0, \Lambda)\ t = 1 \ldots T.} \quad (6)$$

Here Π is nxn matrix; $\Gamma_t, \ldots, \Gamma_{k+1}$ is the matrix of the parameters ; X_t (nxn) is 1 th order unit root vector ; μ (nX1) is vector constant value; ε_t is error term and Λ (nXn) shows covariance matrix. In the equation, on account of the fact that ΔX_1 is stationary, the right-hand side is stationary if and only if ΠX_{t-k} is stationary.

In cointegration analysis, Johansen approach depends on likelihood ratio test and an alternative hypothesis, indicating n-r-1 unit root, is tested against the null hypothesis, saying n-r unit root. Johansen developed two test statistics. These are trace statistic and maximal eigenvalue statistic.

$$\mathbf{\Lambda_{max} = -T \Sigma_{i=r+1} \ln (1- \Lambda_i),\ r = 0, \ldots, n-1.}$$

Here Λ_i is the maximum eigenvalue and maximal eigenvalue statistic is as follows:

$$\mathbf{\Lambda_{max} = -T \ln (1- \Lambda_i)}$$

As shown in Table 4 below, the results obtained from both trace and the maximal eigenvalue tests show that there is no cointegrating relationship between the variables for group USA. On the other hand, it is possible to say that there is one cointegrating relationship for group Germany, the UK and France. Because of the fact that the variables are cointegrated, there is an error correction model. In this study, the error correction model is applied for all groups, except for group USA.

Table 4. Johansen Cointegration Results

Null Hypothesis	Trace Test	Null Hypothesis	Maximal Eigenvalue Test
Group USA		Group USA	
$r \leq 0$	12.14124	$r = 0$	12.10723
$r \leq 1$	0.034016	$r = 1$	0.034016
Group Germany		Group Germany	
$r \leq 0$	26.44823*	$r = 0$	22.53599*
$r \leq 1$	3.912238	$r = 1$	3.912238
Group France		Group France	
$r \leq 0$	26.51224*	$r = 0$	18.92406
$r \leq 1$	7.588185	$r = 1$	7.588185
Group UK		Group UK	
$r \leq 0$	15.80905*	$r = 0$	15.62192*
$r \leq 1$	0.187127	$r = 1$	0.187127

Note : r is the number of the cointegrating vectors; * indicates that at 5% level of significance, the null hypothesis, saying that there is no cointegration relationship between variables is not accepted. Critical values vary based on trend, intercept. A lag of r=2 for VAR was selected before Johansen test.

2.2.3. Granger Causality Test

Cointegration analysis gives an account of whether there is a long-run relationship or not; however, it does not explain the direction of the relationship. Granger causality developed by Engle and Granger (1987), based on error correction model, enables us to explain the direction of the relationship. The model can be described as follows:

$$\Delta X_t = \psi + \sum_{j=1}^{m} \alpha \, \Delta X_{t-i} + \sum_{i=1}^{k} \beta_{\,1} \, RER_{t-i} + \gamma \sigma_t + \delta \mu_{t-1} + \varepsilon_t \qquad (7)$$

In this equation, all variables are logarithmic. X_t - independent variable - is the lag values for the number of tourists arriving, RER_t is the lag values for real exhange rates, σ_t obtained from the equations (3), (4), and (5) is the uncertainty of exchange rates, μ_t obtained from the equation (1) is the lag value for error term and ε_t is error term.

3. FINDINGS

Table 5 shows the results for the series of real exchange rates and the number of tourists.

Table5. Regression Analysis for countries, 3 month-data, 1994-2006

Variables	USA	Germany	France	UK
Intersection	1.414003	1.787981*	2.096314**	-0.086477
	(0.1216)	(0.064)	(0.0459)	(0.9158)
X_{t-1}	0.746077***	0.772915***	0.542717***	0.827841***
	(0.000)	(0.000)	(0.0032)	(0.0000)
X_{t-2}	-	-	-	-
RER_t	-	-0.314882	-0.804949**	-0.695509**
		(0.2372)	(0.0169)	(0.04250)
RER_{t-1}	-	-	-	-
RER_{t-2}	-0.355252**	-	-	-
	(0.0180)			
μ_{t-1}	-	-0.131936	-0.059355	-0.202141
		(0.4955)	(0.7973)	(0.2274)
σ	-0.110570	1.073995	1.541519*	-2.808826
	(0.6899)	(0.2682)	(0.0860)	(0.6787)
D-W	2.336208	2.038866	1.978777	1.963029
Prop (F-Stat.)	0.0000	0.0000	0.0000	0.0000
R-squared	0.744	0.809	0.804	0.883

Note: The values in the parenthesis - Pr > I t I - illustrate the probabilities. *, ** and *** indicate the 10%, 5% and 1% levels of significance, respectively;

For USA, a lag of r=1 of the number of tourists is at the level of significance, while a lag of r=2 of real exchange rates is at the 5% level of significance. On account the fact that the variables are not cointegrated for USA, an error correction model is not applied, and the effect of volatility is not statistically at the level of significance.

Regarding Germany, a lag of r=1 of the figure of tourists is at the 1% level of significance, but real exchange rates are not at the level of significance. The findings obtained from error correction model are not statistically at the level of significance.

μ_{t-1} is the error correction parameter which helps to maintain at the equilibrium and the variables tend towards long-run equilibrium because of this parameter. In practice, this parameter is expected to be negative and statistically at the level of significance. Short-run deviations from the equilibrium are corrected according to the extent of error correction parameter. If the parameter is not statistically at the level of significance, then we say that long-run deviations of the variables from the equilibrium cannot reach the equilibrium again. For Germany, the effect of volatility is not at the statistical level of significance.

When it comes to France, a lag of r=1 for the number of tourists is at the 1% level of significance. The nominal value of real exchange rates is at the 5% level of significance.

Besides, the term μ_{t-1} is not at the statistical level of significance, and volatility is at the 10% level of significance which concludes that the uncertainty of exchange rates has an impact on the number of tourists, arriving from France.

With regard to the UK, a lag of r=1 for the number of tourists is at the 1% level of significance. Likewise France, the nominal value of real exchange rates is at the 5 % level of significance for the UK. The parameter μ_{t-1} and volatility are not at the level of significance.

CONCLUSION AND SUGGESTIONS

In this study, the question of whether or not the changes in real exchange rates and the uncertainty have an impact on the number of tourists, arriving in Turkey from USA, Germany, France, and the UK was discussed. The findings suggest that a lag of r=1 for the number of tourists has a significant effect on the number of tourists arriving at the country. It is likely therefore that the quality of services and tourist satisfaction has a positive effect on tourists.

When observing the changes in real exchange rates, a lag of r=2 for USA is at the level of significance. Regarding Germany, the change in exchange rates does not have any effect on the number of tourists. For the UK and France, there is an effect on nominal exchange rates. Real exchange rates have an adverse effect on the number of tourists as expected. This indicates that except for USA, nominal exchange rates are an important factor for the figure of tourists arriving from the UK and France. For German tourists, customer satisfaction is more important than other factors.

With respect to the uncertainty in real exchange rates, the uncertainty does not have any effects on the number of tourists, except for France. A possible explanation for this, it might be that tourists do not concern about the change in real exchange rates and the uncertainty.

As a result, it can therefore be assumed that the improvements in the quality of the current services and customer satisfaction and keeping customers satisfied markedly contribute to the figure of tourists. For this reason, tourism firms should ensure whether customers are entirely satisfactory or not.

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