DEPENDENCY OF TURKISH EXCHANGE RATE UNDER ACCESSION CONDITIONS TO EUROPEAN UNION

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Abstract

Relationships of Turkish exchange rate with the European Union countries, non-member European Union countries and two world financial leader countries' exchange rates are investigated under accession period conditions by using univariate and multivariate co-integration and vector error correction model. Our result indicates that; a- Turkish currency has more significant relationship with emerging European countries, b- dependency of Turkish currency with its counterparts grows over accession period especially after candidate status given, c- influence of accession period on dependency of Turkish currency is clear, d- degree of linkage relationships with emerging EU member countries fade away after they join to EU, e- co-movement of Turkish currency with two world leading countries are limited.

Key Words: *Turkish exchange rate, Accession period, EU, Co-integration, CGARCH*

JEL Classification: C22, E44, F15, G15

Introduction

The lira was introduced as a gold coin in 1844. After world war II, in 1946 lira was pegged to US Dollar as 2.8 Turkish Lira equal to 1 US Dollar and maintained until 1960, when the currency was first devalued and 1 dollar became equal to 9 lira. Starting from 1970, a series of hard, then soft pegs to the dollar operated as the value of the lira began to fall. Due to the chronic inflation problem experienced in Turkey from the 1970s to the 1990s, the lira experienced severe depreciation in value and high inflation rates. From an average of 9 lira per US dollar in the early 1970s, it decreased to 1.6 million lira per U.S. dollar in late 2001 accompanied an average inflation of more than 40% per year. The Guinness

Book of Records ranked the lira as the world least valuable currency in 1995 and 1996, and again in 1999 through 2004.

After a very strong devaluation in 2001, the TL has been left to float freely except a few minor interventions and, has become overvalued against the other currencies by some 49%, according to the exchange rate index at the end of 2006. However, despite numerous outcries from the business community the government insisted on freely floating the TL. In its last few years, the lira stabilized and even rose against the U.S. dollar and the euro. In order to create a psychological impact and to facilitate financial accounting, the present government introduced the New Turkish Lira (first YTL then once again returning to TL since the beginning of 2007) by getting rid of six zeros off the currency. This policy gave a boost to the positive expectations of Turkey's economy.

While developing with emerging financial markets, Turkey stock market faces high degree of volatility and fragility, mostly resulting from political instability and liberalization attempts. The idea behind the market liberalization in Turkey is to develop the financial markets and reach the level of developed countries. To do so, Turkish people believe that the best and efficient way in order to reach developed countries level is to liberalize and globalize Turkish financial market through becoming a member of EU.

Literature review

Countries which deal with the interest rates of other countries are supposed to face effects in their external exchange rate unless governments fix exchange rate. Export, import and FDI in particular makes the exchange rates of countries influence each other. Almost all studies detect an exchange rate relationship which is strong or weak between countries, such as; Swanson (2003), AuYong et al. (2004), Barkoulas et al. (2004), Nikkinen et al. (2006) Huang, and Yang (2003) McAleer and Wei Nam (2005) Bowman (2005) Tai (2007)

Among the studies which examine the Turkish exchange rate Abu Hassan and Ergun (2009) showed that the degree of linkages of global currencies with the Euro is getting stronger. They indicate that the direction of global linkages of exchange rates is, overtime, moving from US Dollar towards the Euro. Ogawa and Shimizu (2004) find linkages between the Turkish lira and both the EURO and the US dollar since the 4th quarter of 2003. Brada and Kutan (2001) express that the Turkish lira had linkages to both the EURO and the US dollar before the 4th

quarter of 2000. However, the Turkish lira had linkages only to the US dollar in the 2nd quarter of 2001 although the adjusted R-squared decreased to very low levels. The Turkish lira had linkages to both the euro and the US dollar in the 4th quarter of 2003. Turkish monetary authorities have again started to peg to a currency basket of both the euro and the US dollar while it was pegged to the basket of three major currencies only in the 2nd quarter of 2004. It seems that the exchange rate policy in Turkey has not yet stabilised. Among the very limited studies, we can conclude that significant co-integration is detected between the Turkish Lira, the US Dollar and EURO.

Data and Methodology

The data set includes the daily observations of the exchange rates and obtained from DataStream. Focus was centred on the data for Turkey, twenty-seven EU member countries (Belgium, France, Italy, Luxembourg, The Netherlands, Germany, Denmark, Ireland, the UK, Greece, Portugal, Spain, Austria, Finland, Sweden, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia, Bulgaria and Romania), five non-EU member European countries (Norway, Ukraine, Croatia, Iceland, Albania), the US and Japan.

The sample period has been divided into sub-periods to perform sub-period analysis and to analyse the impact of breakthrough points on the linkges as follows; the first sub-period; 4 January 1988 - 1 January 1996 (Custom union entered into force at the Luxembourg summit). The second sub-period: 1 January 1996 -1 December 1999 (EU leaders decided to grant Turkey candidate country status at Helsinki).The third sub-period: 1 December 1999 - 3 October 2005 (Official entry talks were launched). The fourth sub-period: 3 October 2005 – 1 June 2008.

First, Stationary tests which are Augmented Dickey–Fuller (ADF) (Dickey & Fuller, 1981), and Phillips-Perron (PP) (Phillips & Perron, 1988) are applied to determine the order of integration.Second, the Engle-Granger (1987) Co-integration regression is estimated by the ordinary least square and then the unit root test is applied to the residual obtained from their regressions. The value of optimal lag length k is selected by the Akaike Information Criterian (AIC). The test statistics obtained is then compared against the table generated by MacKinnon (1991). Third, the Johansen's multivariate co-integration test (Johansen; 1988, 1991, 1994) applied. The test utilizes two likelihood ratios (LR) and test statistics

for the number of co-integrating vectors. Critical values for both the maximum eigenvalue and trace tests are tabulated in Osterwald-Lenum (1992). Fourth, the vector error correction model (VECM) is based on the Engle-Granger (1987) error correction representation theorem likelihood ratio tests for linear restriction employed.

Empirical Results

Stationarity (Unit Root) test results indicate that all series are nonstationary in levels but stationary in first differences. The estimations are performed using ADF and PP, which include an intercept. Lag selection is based on Akaike Information Criterion. Bivariate co-integration results are presented in Table 1. The result indicates that there is no bivariate co-integration relationship between the Turkish Exchange Rate (TER) and the exchange rates of sample countries except for selected non-member and late member countries in the first and second sub-periods. After the EU leaders decided to grant Turkey candidate country status at Helsinki, co-integration relationships appeared between the TER and the exchange rates of all sample countries. Throughout the whole period the Turkish Lira has relations with Cyprus (1%), Estonia (10%), Latvia (10%), Lithuania (10%), Bulgaria (5%), Romania (5%), Albania (5%), Croatia (10%) and Iceland (1%).

Table 2 represents the Johansen co-integration results over all sub-periods and the EU membership process. The TER has a highly significant relationship with the US dollar and Japanese yen in all sub-periods except the whole period. But, surprisingly strong co-integration relationships are captured between the TER and the exchange rates of non-member countries in all sample periods after the Custom Union Agreement was signed on the 1st of January 1996. The overall results indicate that the TER enjoys a significant long-term relationship with the US dollar and Japanese yen but not EU member countries. The VECM results reveal that the TER enjoyed a dynamic relationship with EU member countries in the second and third period. However, these relationships disappear in the following periods. The results also show that the TER has short-term linkages with the US in the second and third period. The overall results show that the dynamic relationships of the TER fade away over the course of the Turkey – EU relationship. This is possibly due to the precautions taken by the Turkish Government to control the consumer price index and inflation during the sample period which there has been severe political instability, lack of serious monetary policies against chronic financial problems.

Conclusion

In this study we explore the external relationships of Turkish exchange rate with the countries which are member of EU, non–member EU but European, the US & Japan using the co-integration and CGARCH econometric methods. The bivariate co-integration analysis results show that; a- TER has strong causality relationship with EU member countries and the US & Japan in whole period. b- The multivariate co-integration analysis indicates one co-integrating vector and significant linkages between the TER and the US and Japan in all sub–periods, and with non EU member European countries after the custom union agreement in 1996, including the whole period as summarised in figure below. c- The dynamic relationships enjoyed by the TER with developed EU countries increased over the course of Turkey – EU relations, especially in the fourth period which is after the official entry talks were launched. This is possibly due to the precautions taken by the Turkish Government to control the consumer price index and inflation in the previous periods. The relationship of the TER with developed EU member countries strengthens over time, but with developing EU member countries it weakens and fades away. d-The effect of the Turkey – EU relations on the linkages of the Turkish exchange rate is positive and increases over the course of negotiations and breakthrough points. e- The US Dollar is the dominant exchange rate in the long–term and short–term dynamic linkages of the Turkish exchange rate.

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TABLE 1 Engle –Granger Co-integration Results Summary

	Sub Periods				Overall
Countries	**1**	**2**	**3**	**4**	
The US	1.647	1.541	-2.345**	-1.786***	-0.727
Japan	-0.436	4.339	-1.752***	-1.979**	-0.520
Belgium	-0.031	-0.744	-2.186**	-1.674***	-0.398
France	-0.056	-0.842	-2.185**	-1.674***	-0.383
Italy	-0.494	-1.329	-2.185**	-1.674***	-0.685
Luxembourg	-1.787	-0.790	-2.170**	-1.673***	-0.950
The Netherlands	-0.078	-0.710	-2.273**	-1.674***	-0.446
Germany	-0.021	-0.755	-2.186**	-1.674***	-0.435
Denmark	0.172	-0.875	-2.192**	-1.673***	-0.377
Ireland	2.973	-1.961**	-2.186**	-1.674***	-0.494
The UK	1.647	0.545	-2.252**	-1.673***	-0.618
Greece	0.944	-1.441	-2.115**	-1.674***	-0.662
Portugal	2.091	-0.935	-2.248**	-1.674***	-0.617
Spain	2.075	-0.762	-2.185**	-1.674***	-0.802
Austria	0.064	-0.728	-2.186**	-1.674***	-0.436
Finland	2.756	-1.130	-2.186**	-1.674***	-0.603
Sweden	1.103	-1.154	-2.163**	-1.695***	-0.836
Cyprus			-3.444***	-1.682***	-3.982*
Czech Rep.	-0.697	-0.589	-2.097**	-1.671***	-0.993
Estonia		-0.632	-2.170**	-1.673***	-.824***
Hungary	-1.918	-0.230	-2.307**	-2.402**	-0.610
Latvia		1.246	-2.140**	-1.674***	-905***
Lithuania		0.155	-1.829***	-1.673***	-640***
Malta	2.361	-1.250	-2.134**	-1.673***	-0.387
Poland	-0.414	-1.459	-2.081**	-1.671***	-0.380
Slovakia	-1.481	-2.114**	-2.146**	-1.719***	-0.544
Slovenia		-1.413	-2.166**	-1.673***	-1.118
Bulgaria		-1.221	-2.170**	-1.673***	-.443**
Romania		-1.764	-2.767*	-1.684***	-.066**
Albania		-0.591	-2.091**	-1.672***	-.023**
Croatia		-1.848***	-2.164**	-1.674***	-787***
Norway	2.793	-1.727***	-2.273**	-1.661***	-0.403
Iceland			-3.606*	-3.187*	-4.173*
continue…					
Ukraine		-2.358**	-2.611*	-1.785***	-1.199
EURO		-1.053	-2.184**	-1.674***	-2.405**
Japan	0.277	4.339	-1.752***	-1.979**	-0.520
Russia	-0.962	1.506	-1.671***	-1.651***	-748***

Note: t-statistics are reported in the table. *, ** and *** denotes the significance level at 1%,5% and 10**%** respectively. Insufficient sample size caused missed values in the table.

TABLE 2 Johansen Co-integration Results

Variables	**Null hypothesis**	**Trace**	**λ_{max}**
First Sub-Period			
With members before 96	r = 0	486.25*	99.86*
	r≤1	386.38*	90.11*
	r≤2	296.27*	59.69
With members after 04	r = 0	No Coint.	No Coint.
With non-members	r = 0	No Coint.	No Coint.
With US and Japan	r = 0	44.96*	33.76*
Second Sub-Period			
With members before 96	r = 0	No Coint.	No Coint.
With members after 04	r = 0	469.46*	132.11*
	r≤1	337.35*	93.38*
	r≤2	243.96*	74.17*
	r≤3	169.79*	51.16
With non-members	r = 0	139.31*	59.78*
With US and Japan	r = 0	49.63*	41.99*
Third sub-period			
With members before 96	r = 0	No Coint.	No Coint.
With members after 04	r = 0	327.14*	78.85*
	r≤1	248.29*	57.04
With non-members	r = 0	176.59*	59.50*
With US and Japan	r = 0	30.09*	19.02
continue…			
Fourth sub- period			
With members before 96	r = 0	No Coint.	No Coint.
With members after 04	r = 0	No Coint.	No Coint.
With non-members	r = 0	173.13*	67.87*
With US and Japan	r = 0	32.37*	25.88*
Whole period			
With members before 96	r = 0	5 Coint. Eq.	4 Coint.eq.
With members after 04	r = 0	4 Coint. Eq.	4 Coint.eq
With non-members	r = 0	179.05*	54.78*
With US and Japan	r = 0	No Coint.	No Coint.

Note: The Johansen test results reported in the table. * indicates a co-integration equation. Different lags are allowed in generating the above results while critical values are obtained from Osterwald-Lenum (1992).