MEASURING THE SENSITIVITY OF TURKISH AND ROMANIAN STOCK MARKETS TO EUROPEAN STOCK MARKETS: A COMPARATIVE ANALYSIS

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Since the process of globalization accelerates all over the world, trade and economic relations among countries become very intensive and the stock markets in these countries started to integrate to each other quickly. As a result of this, world wide stock markets become more sensitive to developments in any countries so, the stock markets are affected easily from the other markets' transactions. How are the stock markets in Turkey and Romania, which have close economic relations with European Union, sensitive to European stock markets? The aim of this article is to measure the magnitude and direction of the sensitivities of Turkish and Romanian stock markets to changes in European Union stock markets in last decade. In this study, the results of the analysis have indicated that these two countries are sensitive to European Union Stock Markets and that their sensitivities become more remarkable in the last ten years.

INTRODUCTION

The impact of the globalization was spread over the countries and theirs stock markets easily. So the price changes in worldwide stock markets are been affected by each other.

Turkey and Romania developed their economic and commercial relations with each other in last decade by the winds of globalization. They started to become strategic partners. They both have strong economic and commercial relations with EU countries with in the framework of European Union. The influence of the political and economic activities between these two countries and other European Countries spread over their stock markets. Accordingly, the stock markets of these two countries should be sensitive to other European Stock markets.

The aim of this article is to measure the magnitude and direction of the sensitivities of Turkish and Romanian stock markets to changes in European stock markets in last decade.

To this end, general information about Turkish and Romanian stock markets will be given first, then the current conditions and change of the sensitivities of this two countries' stock markets to European's will be stated.

1. THE DATABASE AND THE METHODOLOGY OF THE STUDY

The stock market in Turkey is called Istanbul Stock Exchange (ISE) and that in Romania is called Bucharest Stock Exchange (BSE). In general, ISE100 Index is indicator of the ISE and BET10 Index is indicator of the BSE . The data of these two countries' main indexes are used in this article.

There are lots of stock markets around Europe. Analyzing the sensitivities of Turkish and Romanian stock markets to each single European country is needed a very large study and, it was impossible to do in the scale of this study. In this study, because of the number of the European countries are not a few, the FTS Eurofirst 300 Index is used to represent all European countries. The data of the study is derivate from related official web sites.

Both the impact of rapid changes in globalization process and since Turkey and Romania continuously developed their economic relations with European countries, it can be expected that their stock markets are sensitive to other European Countries'.

Consequently, the hypothesis that is examined in this article is "Turkish and Romanian stock markets sensitive to European stock markets". To examine the hypothesis, ISE100 Index (basic indicator of the ISE), BET10 Index (basic indicator of the BSE) and FTS Eurofirst 300 Index are used. The period of the study is 1999-2008 (120 months). Monthly return rates are calculated by using dollar base closing prices. The ten year return rates are divided in to five parts in twos. Beta coefficients are calculated for the sensitivity of the ISE100 Index and BET10 to European stock markets for each part as an indicator of the sensitivity. Then, ten year return rates divided in to two parts in fives and Beta coefficients of the two countries' stock markets are calculated. When calculating the Beta coefficients, FTS Eurofirst 300 Index (indicator of the European Stock Market) is considered as the market index. In conclusion the hypothesis of the study has been examined with the findings of this study.

2. ISTANBUL STOCK EXCHANGE (ISE), BUCHAREST STOCK EXCHANGE (BSE) and FTS EUROFIRST 300 INDEX

Proceeding principals and laws of ISE put into force in 1984 and 1985. Stocks of ISE was started to be transacted in 1986 first (SPK Temel Bilgiler Kılavuzu, 2006: 8). The number of the company that transacted in ISE was 41 at the beginning and it has increased up to date. Nowadays, over 300 companies are being transacted in ISE (SPK Temel Bilgiler Kılavuzu, 2006: 240; (http1). Market index of the ISE is ISE100 Index. The ISE index contains the stocks of one hundred companies of which the market values and volumes of the transaction are biggest. The index can be considered as the main indicator of the ISE (SPK Temel Bilgiler Kılavuzu, 2006: 350-351).

The BSE established in the process of transition from socialism to free market economy in 1995. The BSE that was a governmental institution at first becomes a joint stock company in 2005 (Çikot, 2008: 10). The number of the company that transact in BSE was 9 in 1995 and it has increased up to date (http2). Market index of the BSE is BET 10 Index. The BET 10 index contains the stocks of ten companies of which volumes of the transaction are biggest. The index can be considered as the main indicator of the BSE (http3).

FTS Eurofirst 300 index contains the stocks of the biggest 300 companies from 16 countries of Europe. The index approximately has a parallel movement with other important European stock markets. That's why it is considered as an indicator of European stock markets (http4).

3. BETA COEFFICIENT as an INDICATOR of the MARKET SENSITIVITY

Beta coefficient is an important measurement which indicates the relations between the changes in returns of market index and depending changes in stock returns (Demir and Kaderli, 2008: 97; Korkmaz and Ceylan, 2006: 536). In other words, it is a coefficient which measures the sensitivity of any stocks to its changes in market index (Kaderli and Akça, 2009: 64; Bekçioğlu, Öztürk and Kaderli; 2003: 34). As seen, Beta coefficient shows how the systematic risk affect a stock's return (Ross et al., 2005: 30). Beta coefficient of any financial assets is calculated by dividing covariance of market portfolio of that financial assets with to variance of which market portfolio return. It can be formulated like that (Copeland et al., 2005: 151; Fama and French, 2004: 5):

$$\beta_i = \frac{Cov_{i,p}}{\delta_p^2}$$

Here, β_i = i Beta coefficient of securities, $Cov_{i,p}$ = covariance of return rate of the securities with market return rate, δ_p^2 = symbolize the variance of the market return rate.

The Capital Assets Pricing Model (CAPM) which developed by Sharpe (1964) is generally depending on one variable. In this model the independent variable is market portfolio and, returns of securities in the market are compared with returns of market index. Beta coefficient can be calculated with the Capital Assets Pricing Model too, because it shows the relations between a securities' return and its market index's return (Demir and Kaderli, 2007: 186-187; Campbell et al., 1997: 182).

$$E(R_i) = R_f + \beta_i(R_m - R_f)$$

Here, $E(R_i)$ = expected return of the securities, R_f = risk free interest rate, β_i = i Beta coefficient of the securities, R_m = symbolizes the expected return of the market index.

In calculation Beta coefficient of securities with formula above, generally past return rates of that securities are used (Foster, 1978: 265).

If the coefficient which calculated with this formula is bigger than 1, it means that 1% change in market index creates bigger than 1% change in returns of the securities. If the coefficient smaller than 1, it means, that 1% change in market index creates smaller than 1% change in returns of the securities. If the coefficient equal 1, it means that the change in market index return and change in returns of the securities are the same. If the Beta coefficient is negative it means that, the relations above occurs visa versa (Hirt and Block, 2006: 170; Levy, 2006: 343; Civelek and Durukan, 1998: 110-111; Tiniç and West, 1979: 174-175). As long as beta coefficients increase, the sensitivity of a securities return to market return increases.

4. MEASURING the SENSITIVITY of TURKISH and ROMANIAN STOCK MARKETS to EUROPEAN STOCK MARKETS

The ten year monthly (1999-2008) data has provided from ISE100 Index and BET10 Index as sample of ISE, and BSE and return rates are calculated by using ten years monthly closing price. There are many stock markets in Europe. Instead examining every single stock market in Europe, FTS Eurofirst 300 Index is used as sample of European stock market for the same period and, return rates are calculated by using ten years monthly closing price.

Parallel movement of European stock markets with Turkish and Romanian stock markets can be expected because Turkey and Romania have close economic relations with European Union and each other. Accordingly, when it is considered all European stock markets as one market, Turkish and Romanians stock markets can be accepted as parts of this market.

In this study, ten year time period (1999-2008) is divided in to five parts in twos. Correlation matrixes which show the levels of relations among ISE 100 Index, BET 10 Index and FTS Eurofirst 300 Index are set by using 24 month period dollar base returns data which calculated before for each two year period. FTS Eurofirst 300 Index can be considered as market index because it contains the stocks of the important European companies. That is why it is used as market index in this study.

When the table 1 is reviewed, it can be seen that these three indexes in 1999-2004 have relations with each other but the level of the relation is not strong. In addition, Romanian stock market has a weak negative relation with Turkish and European stock markets. But, it can be seen from the same table that the relations among these three Indexes are getting better.

The relations among these Indexes are investigated with correlation matrixes and then Beta coefficients of ISE 100 and BET 10 Indexes are calculated for each two year periods and they are shown in Table 2.

The trends of Beta coefficients of ISE 100 and BET 10 indexes are shown in Figure 1.

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When Table 2 and Figure 1 are reviewed together it can be seen that ISE 100 Index is more sensitive to European stock markets than BET 10 index and it has a rapid and offensive response to European stock market. On the other hand, BET 10 Index is negative sensitive to European stock market from 1999 to 2002. In other words, BET 10 Index is defensive to European stock market for this period. Since 2004, ISE 100 and BET 10 indexes are becoming more sensitive to European stock market and each other.

At the next step of this study, the period from 1999-2008 is divided in to two parts of fives to increase the number of observations. Correlation matrixes which show the levels of relations among ISE 100 Index, BET 10 Index and FTS Eurofirst 300 Index are set by using 60 month period dollar base returns data which calculated before for each five year period. They are shown in table 3.

Table 1: Correlation Matrix Which Shows the Levels of Relations among ISE 100 Index, BET 10 Index And FTS Eurofirst 300 Index for Each Two Years

Period	Indexes	FTS Eurofirst300	ISE100	BET10
1999-2000	FTS Eurofirst300	1	0,366*	-0,327*
	ISE100	0,366*	1	-0,275
	BET10	-0,327*	-0,275	1
2001-2002	FTS Eurofirst300	1	0,677***	-0,036
	ISE100	0,677***	1	0,051
	BET10	-0,036	0,051	1
2003-2004	FTS Eurofirst300	1	0,452**	0,27
	ISE100	0,452**	1	0,234
	BET10	0,27	0,234	1
2005-2006	FTS Eurofirst300	1	0,496**	0,399**
	ISE100	0,496**	1	0,672***
	BET10	0,399**	0,672***	1
2007-2008	FTS Eurofirst300	1	0,774***	0,759***
	ISE100	0,774***	1	0,67***
	BET10	0,759***	0,67***	1

*1 % level of significance, **5 % level of significance, *** 1 % level of significance.

Table 2: Beta Coefficients of ISE 100 and BET 10 Indexes for Each Two Year Periods

Endeksler	Period				
	1999-2000	2001-2002	2003-2004	2005-2006	2007-2008
ISE100	1,936*	2,003***	1,19**	1,681**	1,517***
BET10	-1,01*	-0,054	0,442	1,473**	1,497***

* 10 % level of significance ** 5 % level of significance. *** 1 % level of significance.

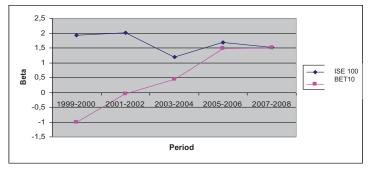**Figure 1:** The Trends of Beta coefficients of ISE 100 and BET 10 indexes

Table 3: Correlation Matrixes which Show the Levels of Relations among FTS Eurofirst 300, ISE 100 Index and, BET 10 Index for each Five Year Period

Period	Indexes	FTS Eurofirst300	ISE100	BET10
1999-2003	FTS Eurofirst300	1	0,536***	-0,136
	ISE100	0,536***	1	-0,141
	BET10	-0,136	-0,141	1
2004-2008	FTS Eurofirst300	1	0,628***	0,656***
	ISE100	0,628***	1	0,643***
	BET10	0,656***	0,643***	1

*** 1 % level of significance

As seen on table 3, although the relations among these indexes are considered in wider scale, the results didn't change either. The relations between ISE 100 Index and European stock market in 1999-2003 have parallel direction and they are at the mid level. The relations between BET 10 Index and European stock market for same period have opposite direction and the level is lower. But, it can be seen from the same table that the relations among these three Indexes are getting stronger since 2004. They all have parallel movements.

The relations among these Indexes are investigated with correlation matrixes and then Beta coefficients of ISE 100 and BET 10 indexes are calculated for each five year periods and they are shown in Table 4.

Table 4: Beta Coefficients of ISE 100 and BET 10 Indexes for Each Five Year Periods (The sensitivity to FTS Eurofirst Index)

Period	Indexes	Beta Coefficient
1999-2003	ISE100	1,89***
	BET10	-0,259
2004-2008	ISE100	1,382***
	BET10	1,574***

*** 1 % level of significance

When the table 4 is reviewed, ISE 100 Index is much more sensitive to European stock market than BET 10 Index and it is also offensive. At the same period BET 10 Index has a super defensive response to European stock market. Both BET 10 and ISE 100 Indexes have the same level of sensitivities to European stock market in 2004-2008. Naturally, it is observed that the sensitivity of these two countries to each other increased at the same period.

In conclusions, the results for two year and five year periods are supporting each other. That is to say that Turkish stock market is always sensitive to European stock market for the period of this study. BSE lower and negative sensitive to European stock market at first but, it become very sensitive to European stock market in time. This situation is proofing the hypothesis of the study.

CONCLUSION

The rapid developments of globalization processes have affected all the countries of the world and removed almost economic and commercial borders. As a result, international capital flows and countries' stock markets are being affected from this process. In other words, countries' stock markets became sensitive to each other.

Turkey and Romania are geographically close countries. They have many common commercial and economic interests. The relations between these two countries are continuously developing up to date. They also developed economic relations with other European countries because Romania is full member of EU and Turkey is a candidate member to EU. Consequently, it can be expected that stock markets of these countries are sensitive to each other and other EU countries. This study aims at investigating whether such integration exists or not.

In this study the hypothesis which argues that these two countries' stock markets are sensitive to European stock market has been examined. As a result of this examination an existence of the

sensitivity has been found. Findings also show that Turkish Stock Market is less sensitive to European and Romanian stock market at the beginning of the period. But level of the sensitivity is increased through this period. Romanian stock market becomes more sensitive to European and ISE especially in last four years. Romanian full membership to the European Union and the increase in its stock market sensitivity happens at the same time. One explanation of rapid increase in sensitivity can be explained by the full membership of Romania to the EU.

In conclusions, both ISE and BSE are highly sensitive to European stock markets. Because of this sensitivity, if investors take in to consideration the changes in European stock markets they can make a proper decision when they decide to invest in these two countries' stock market.

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