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EXCHANGE RATES' EFFECT ON SPOT AND FUTURES EQUITY INDEX MARKETS: A STUDY ON BORSA ISTANBUL[1]

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Abstract:

This paper examines the linkages between the foreign exchange rates, spot equity index and equity index futures. The study aims to investigate whether there is difference between the spot and futures markets in the scope of relation with the foreign exchange rates' returns and which leads the other. The relationships are examined by using the vector autoregression (VAR) model, impulse-response functions, variance decomposition and Granger Causality tests. The sample of the study consists of US dollar to Turkish Lira rate (USD/TRY), Euro to Turkish Lira rate (EUR/TRY), BIST 30 Index and BIST 30 Index Futures. The data of the study includes the period between January 2011 and December 2014 with daily data range. Our results have evidence that the foreign exchange rate markets in Turkey are driven by the equity market.

Keywords: *Exchange Rates, Equity Index, Equity Index Futures, Causality*

JEL Codes: *G15 and G10*

1. Introduction

International financial markets have become increasingly linked, both as a result of rapid financial and technological innovation. The instruments of the international financial markets like equities, stock market indices, interest rates, exchange rates, futures prices and swaps are linked with each other. There have been many studies examining the relationship between these financial instruments and financial markets. foreign exchange rates and stock market. On the other hand there have been some studies examining the relationship between the same variables and futures markets. This study aims to show the differences between spot and futures markets in the scope of relation with the foreign exchange rates' returns.

Additionally, we analyzed the effects of foreign exchange rates on basis between spot and futures index. Theoretically, the futures price is the sum of spot price and cost of carrying, where cost of carrying includes time value of money from the spot date to the futures date. There should be a difference between spot price and futures price in any date except the maturity. The actual basis is the difference between the futures price and the same day's spot price and it should be zero in the maturity.

2. Literature Review

In the early studies, Franck and Young (1972) could not find a significant relation between stock prices and foreign exchange rate. Aggarwal (1981) finds a stronger positive relation in the short term than long term using the simple regression method. However, Soenen and Hennigar (1988) find a negative relation. Roll's (1992) study show that there are three main factors effecting stock market returns. First, stock market indices vary widely in the number of constituent individual common stocks and in their diversification. Some indices are more diversified than others. Second, each country's industrial structure plays a major role in explaining stock price behavior. Third, for the majority of countries, a portion of national equity index behavior can be ascribed to foreign exchange rate behavior. Roll's basic data are equity price indices for 24 countries. The foreign exchange rate variable is statistically significant for

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most of the countries. Malaysia and Sweden are not significant and Norway is significant at only the 5% level. Some other studies show that stock prices have a significant effect on the exchange rate (Smith, 1992; Bahmani-Oskooee and Sohrabian, 1992; Morley 2007) and some studies (Hasan and Javed, 2009) cannot find. Gay (2008) investigates the relationship between foreign exchange rate and oil price among the equity markets Brazil, Russia, India, and China (BRIC) by employing Box-Jenkins ARIMA model and finds no evidence about existence of significant relationship among variables.

One of the studies in Turkey is Kasman (2003) analyzed the relationship between the foreign exchange rate and BIST100, finance sector index, industry index and service index. The results show that causality relationship exists only from foreign exchange rate to the industry sector index. Kasman (2003) uses the daily returns, besides Ayvaz (2006), Savaş and Can (2011), Ceylan and Şahin (2015) used the montly returns.

The results of Savaş and Can (2011) indicate that Euro-Dollar Parity and Real Effective Exchange Rate Index affect the BIST100 positively with 77,5%. In addition, according to Granger Causality Test results, a causality has been found from BIST 100 to the Euro-Dollar Parity and Real Effective Exchange Rate. The cointegration test results of Ayvaz (2006) reveal that there exists a long-term stable relationship between foreign exchange rate and BIST 100, foreign exchange rate and financial sector index, and foreign exchange rate and industry sector index. However, there is no relationship between foreign exchange rate and service sector index. Besides, the results indicate that there is a bi-directional causality among foreign exchange rate and stock price indices. Ceylan and Şahin (2015)'s findings obtain that; rate of foreign exchange and equity indices are stationary at the same level and cointegrated, there is a strong causal correlation from the rates of foreign exchange to the indices.

There are some studies about the relationship between exchange rates and futures prices. In some studies (Klitgaard and Weir (2004), Tornell and Yuan (2012), Hossfeld and Röthig (2016)), the relationship between the spot and futures markets of the exchange rates are investigated. These studies investigate two different markets of the same financial asset. One of the focus of the study is on the effect of the exchange rates on index futures prices. The related literature is bound with the futures prices except exchange rate futures. By using the Granger causality tests and impulse response functions of VAR, Li (2011) indicate that US exchange rate isn't related with the energy futures prices. Moussa (2012) cannot find an effect of the exchange rates on the frozen concentrated orange juice futures return. Bernardina (2014) finds that US/Euro exchange rate is one of the drivers are relevant in explaining commodity futures returns.

3. The Data and Methodology

The sample of the study consists of USD/TRY, EUR/TRY, BIST 30 Index and BIST 30 Index Futures with the nearest maturity. The data of the study includes the January 2011 and December 2014 with daily data range and obtained from Finnet. BIST 30 index, consists of 30 stocks selected among the stocks of companies traded on the National Market and the stocks of real estate investment trusts and venture capital investment trusts traded on the Collective Products Market. A the same time, the underlying security of BIST30 Futures is BIST30 price index. The settlement of the futures index is by cash. The contracts months are February, April, June, August, October and December (Contracts with three different expiration months nearest to the current month shall be traded concurrently. If December is not one of those three months, an extra contract with an expiration month of December shall be launched.) The expiry date is the last business day of each contract month. In case domestic markets are closed for half day due to an official holiday, expiry date shall be the preceding business day.
We also analyzed the basis. Basis is the difference between the spot index price and the futures index price with the nearest maturity.

We used vector autoregression (VAR) model which is an econometric model used to capture the linear interdependencies among multiple time series. We chose this model, because in VAR, the researcher does not need to specify which variables are endogenous or exogenous all are endogenous (Brooks). Vector autoregression model (VAR) is used to discover the connection of the different time series without selecting any of them independent. The models are applied to binary series which are consist of an equity index/equity index futures/basis and foreign exchange. Six

different models are studied. VAR is applied to the stable time series. We calculated the logarithmic differences and applied the unit root tests. It is found that all of the five time series have unit root and become stable in the first differences. Thus, we run the VAR lag order selections. By the lag order decisions, we run the VAR models. We didn't clarify the VAR models in detail. Owing to the appointed VAR models, we tried to explain the short term and long term relationship between the variables. Impulse Response and Variance Decomposition tests are used to extract the short term relationship, following Granger Causality Test is used to point the long term.

4. Results and Analysis

The results of the unit root tests are shown in Table 1. The Augmented Dickey–Fuller (ADF) regression tests for the existence of unit root of the variable. The null hypothesis indicates that the variable is stationary, and the alternative hypothesis tests the existence of the unit root. Phillips-Perron (PP) developed an alternative unit root test procedure that does not affect the asymptotic distribution of the test statistics while testing for a unit root and also robust to general forms of heteroscedasticity (Teker and Alp: 2014). The null hypothesis in PP indicates that the variable is stationary, and the alternative hypothesis tests the existence of the unit root. Kwiatkowski-Phillips–Schmidt–Shin (KPSS) tests are used for testing a null hypothesis that an observable time series is stationary around a deterministic trend. The null hypothesis in KPSS is different from the other tests and tests the existence of the unit root (Kwiatkowski, Phillips, Schmidt and Shin, 1992). It is shown in Table 3 that both of the time series that calculate from logarithmic differences are stationary.

Table 1: Unit Root Tests

	ADF						PhilipsPerron		KPSS
	Schwarz			Akaike					
	Lag	T-stat.	Prob.	Lag	T-stat.	Prob.	T-stat.	Prob.	Prob.
BIST30	0	-33.1532	0.00	3	-15.7517	0.00	-33.1314	0.00	0.09532
BIST30FT	0	-33.6476	0.00	2	-17.3183	0.00	-33.6073	0.00	0.09746
Basis	4	-20.0057	0.00	14	-10.9729	0.00	-108.7631	0.00	0.05289
USD/TRY	0	-30.7750	0.00	0	-30.7750	0.00	-30.7684	0.00	0.05609
EUR/TRY	1	-23.0496	0.00	1	-23.0496	0.00	-26.9736	0.00	0.1152

VAR lag order selection results of USD/TRY and BIST30 are shown in Table 2. The criteria that used in the VAR are LR (sequential modified LR test statistic (each test at 5% level)), FPE (Final prediction error), AIC (Akaike information criterion), SC (Schwarz information criterion), HQ (Hannan-Quinn information criterion).
The VAR lag order selection criteria for USD/TRY and BIST30 (log differences) are shown in Table 2. The results indicate that the model should be done by three lags.

Table 2: VAR Lag Order Selection Criteria: USD/TRY - BIST30

Lag	LogL	LR	FPE	AIC	SC	HQ
0	6360.590	NA	0.000.1	-12.7555	-12.7456	-12.7517
1	6397.438	73.4728	0.0001	-12.8214	-12.7918	-12.8101
2	6436.060	76.8583	0.0001	-12.8908	-12.8416*	-12.8721*
3	6441.984	11.7643*	0.0001*	-12.8947*	-12.8258	-12.8685
4	6445.917	7.7950	0.0001	-12.8945	-12.8060	-12.8609
5	6448.530	5.1684	0.0001	-12.8917	-12.7835	-12.8506
6	6452.565	7.9647	0.0001	-12.8918	-12.7639	-12.8432
7	6453.783	2.3989	0.0001	-12.8862	-12.7386	-12.8301
8	6454.231	0.8805	0.0001	-12.8791	-12.7118	-12.8155

The VAR lag order selection criteria for EUR/TRY and BIST30 (log differences) are shown in Table 3. The results indicate that the model should be done by two lags.

Table 3: VAR Lag Order Selection Criteria BIST30 –EUR/TRY

Lag	LogL	LR	FPE	AIC	SC	HQ
0	6378.959	NA	0.0001	-12.7923	-12.7825	-12.7886
1	6413.112	68.1007	0.0001	-12.8528	-12.8233	-12.8416
2	6435.276	44.1058	0.0001*	-12.8892*	-12.8400*	-12.8705*
3	6437.622	4.65856	0.0001	-12.8859	-12.8170	-12.8597
4	6439.752	4.2215	0.0001	-12.8822	-12.7936	-12.8485
5	6445.023	10.4262*	0.0001	-12.8847	-12.7765	-12.8436
6	6445.963	1.8548	0.0001	-12.8786	-12.7507	-12.8299
7	6446.094	0.2581	0.0001	-12.8708	-12.7232	-12.8147
8	6446.624	1.0427	0.0001	-12.8638	-12.6966	-12.8003

The coefficients of the VAR Models between BIST30 – USD/TRY and BIST30 – EUR/TRY are shown in Table 4.

Table 4: VAR Model - Substituted Coefficients

(BIST30- USD/TRY) (BIST30 – EUR/TRY)

	USD/TRY(-1)	USD/TRY(-2)	USD/TRY(-3)	BIST30 (-1)	BIST30 (-2)	BIST30 (-3)	C
BIST30	0.0912	-0.1184	-0.0307	-0.0448	0.0579	0.0441	0.0002
USD/TRY	-0.0817	-0.0538	-0.0218	-0.1016	-0.1021	0.0360	0.0005

	EUR/TRY(-1)	EUR/TRY (-2)		BIST30 (-1)	BIST30 (-2)		C
BIST30	0.0648	0.1504		-0.0430	0.0524		0.0002
EUR/TRY	0.1294	0.1132		-0.0755	-0.0581		0.0003

Figure 1 shows the results of impulse response tests and variance decomposition of the VAR model which applied to BIST30 and USD/TRY with two lags. If one standard deviation's shock is applied to BIST30, USD/TRY decreases 1.5 days, then it approaches to zero until 4 days. If one standard deviation's shock is applied to USD/TRY, there is a small decrease in BIST30 in the first day, and it approaches to zero in the same day. The variance decomposition of the model shows that nearly 20% of the variance of USD/TRY can be explained by the variance of BIST30, besides the variance of BIST30 only can be explained by its own variance.

Figure 1: Impulse Response Tests and Variance Decomposition of BIST30-USD/TRY

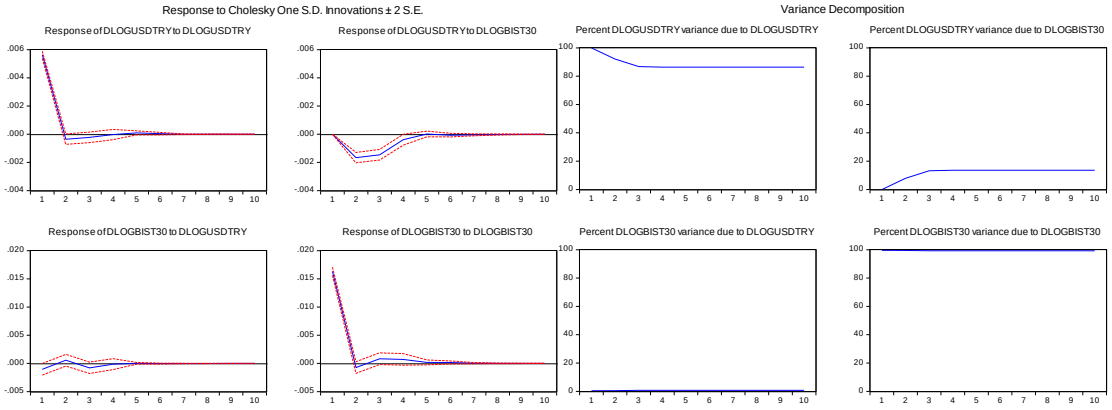
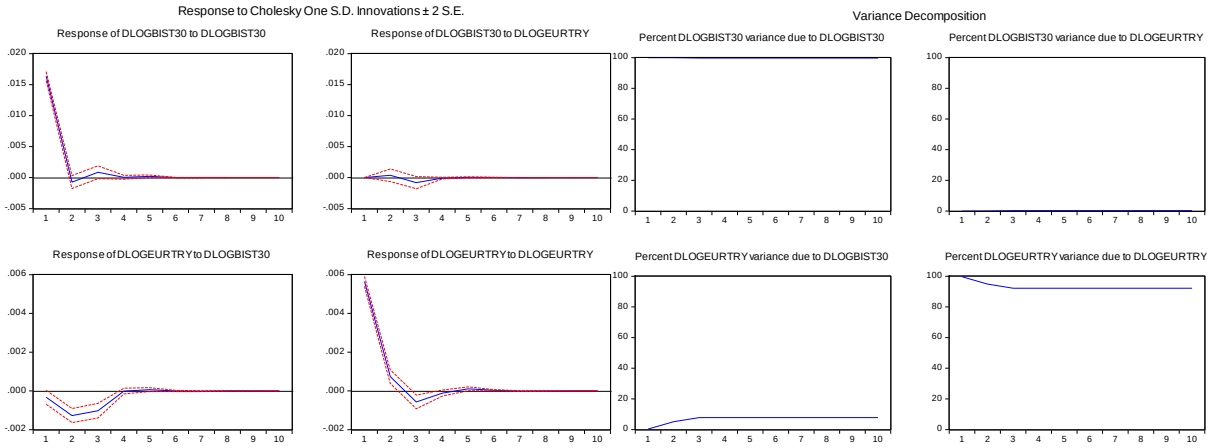


Figure 2 shows the results of impulse response tests and variance decomposition of the VAR model which applied to BIST30 and EUR/TRY with two lags. If one standard deviation's shock is applied to BIST30, EUR/TRY decreases 1.5 days, then it approaches to zero until 4 days. If one standard deviation's shock is applied to EUR/TRY, there is a very small increase in BIST30, in the second day, and it approaches to zero in the same day. The variance decompo-

sition of the model shows that nearly 10% of the variance of EUR/TRY can be explained by the variance of BIST30, besides the variance of BIST30 only can be explained by its own variance.

Figure 2: Impulse Response Tests and Variance Decomposition of BIST30-EUR/TRY



The VAR lag order selection criteria for USD/TRY and BIST30 Futures (log differences) are shown in Table 5. The results indicate that the model should be done by three lags.

Table 5: VAR Lag Order Selection Criteria: BIST30 Futures-USD/TRY

Lag	LogL	LR	FPE	AIC	SC	HQ
0	6332.066	NA	1.05e-08	-12.6982	-12.6884	-12.6945
1	6368.669	72.9869	9.81e-09	-12.7636	-12.7341	-12.7524
2	6406.024	74.3352	9.18e-09	-12.8305	-12.7814*	-12.8118*
3	6412.990	13.8342*	9.13e-09*	-12.8365*	-12.7676	-12.8103
4	6415.068	4.11865	9.16e-09	-12.8326	-12.7441	-12.7990
5	6417.893	5.5870	9.18e-09	-12.8303	-12.7221	-12.7891
6	6422.389	8.8743	9.17e-09	-12.8313	-12.7034	-12.7827
7	6423.553	2.2922	9.23e-09	-12.8256	-12.6780	-12.7695
8	6424.195	1.2628	9.29e-09	-12.8189	-12.6516	-12.7553

The VAR lag order selection criteria for EUR/TRY and BIST30 Futures (log differences) are shown in Table 6. The results indicate that the model should be done by two lags.

Table 6: VAR Lag Order Selection Criteria: BIST30 Futures-EUR/TRY

Lag	LogL	LR	FPE	AIC	SC	HQ
0	6350.153	NA	0.0001	-12.7345	-12.7247	-12.7308
1	6386.040	71.5579	0.0001	-12.7985	-12.7690	-12.7873
2	6407.716	43.1347*	0.0001*	-12.8339*	-12.7847*	-12.8152*
3	6410.732	5.98895	0.0001	-12.8320	-12.7631	-12.8058
4	6411.453	1.42938	0.0001	-12.8254	-12.7368	-12.7917
5	6416.052	9.0966	0.0001	-12.8266	-12.7184	-12.7854
6	6416.676	1.2321	0.0001	-12.8198	-12.6919	-12.7712
7	6416.950	0.5394	0.0001	-12.8123	-12.6648	-12.7562
8	6417.443	0.9686	0.0001	-12.8053	-12.6380	-12.7417

The coefficients of the VAR Models between BIST30 Futures – USD/TRY and BIST30 Futures – EUR/TRY are shown in Table 7.

Table 7: VAR Models - Substituted Coefficients (BIST30 Futures- USD/TRY)

(BIST30 Futures– EUR/TRY)

	USD/TRY (-1)	**USD/TRY (-2)**	**USD/TRY (-3)**	**BIST30FT (-1)**	**BIST30 FT (-2)**	**BIST30FT (-3)**	C
BIST30FT	0.0722	-0.1699	-0.0217	-0.0597	0.0249	0.0495	0.0003
USD/TRY	-0.0788	-0.0535	-0.0263	-0.0993	-0.0976	-0.0381	0.0005

	EUR/TRY (-1)	**EUR/TRY (-2)**	**BIST30FT (-1)**	**BIST30FT (-2)**	C
BIST30FT	0.0414	-0.1980	-0.0597	0.0196	0.0003
EUR/TRY	0.0133	-0.1119	-0.0759	-0.0543	0.0003

Figure 3 shows the results of impulse response tests and variance decomposition of the VAR model which applied to BIST30 Futures and USD/TRY with three lags. If one standard deviation's shock is applied to BIST30 Futures, USD/TRY decreases 1.5 days, then it approaches to zero until 4 days.

If one standard deviation's shock is applied to USD/TRY, there is a small decrease in BIST30 Futures in the third day, and it approaches to zero in the next day. The variance decomposition of the model shows that nearly 20% of the variance of USD/TRY can be explained by the variance of BIST30 Futures, besides the variance of BIST30 Futures only can be explained by its own variance.

Figure 3: Impulse Response Tests and Variance Decomposition of BIST30 Futures-USD/TRY

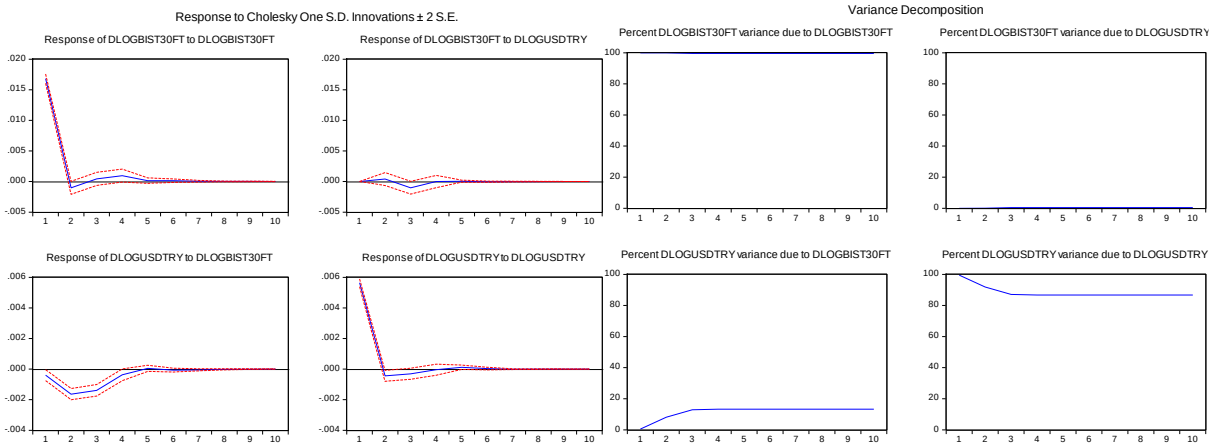
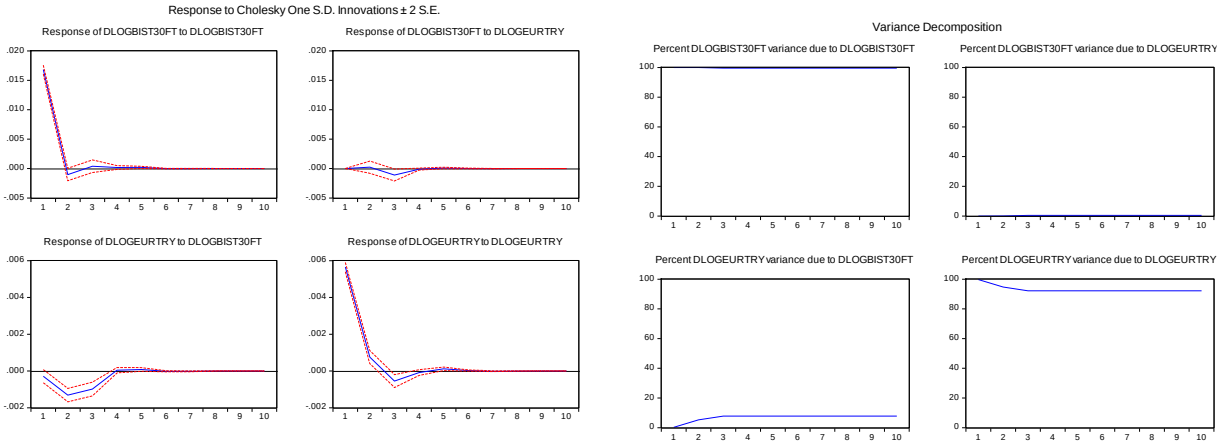


Figure 4 shows the results of impulse response tests and variance decomposition of the VAR model which applied to BIST30 Futures and EUR/TRY with two lags. If one standard deviation's shock is applied to BIST30 Futures, EUR/TRY decreases 1.5 days, then it approaches to zero until 4 days. Although, if one standard deviation's shock is applied to EUR/TRY, there is a very small decrease in BIST30 Futures in the third day, and it approaches to zero in the next day. The variance decomposition of the model shows that nearly 10% of the variance of EUR/TRY can be explained by the variance of BIST30 Futures, besides the variance of BIST30 Futures only can be explained by its own variance.

Figure 4: Impulse Response Tests and Variance Decomposition of BIST30 Futures-EUR/TRY



The VAR lag order selection criteria for USD/TRY and Basis (log differences) are shown in Table 11. The results indicate that the model should be done by six lag.

Table 8: VAR Lag Order Selection Criteria: BASIS-USD/TRY

Lag	LogL	LR	FPE	AIC	SC	HQ
0	7738.244	NA	0.0001	-15.5190	-15.5092	-15.5153
1	7863.296	249.3520	0.0001	-15.7619	-15.7324	-15.7507
2	7895.524	64.1330	0.0001	-15.8185	-15.7693*	-15.7998
3	7904.494	17.8146	0.0001	-15.8285	-15.7596	-15.8023*
4	7907.668	6.2903	0.0001	-15.8268	-15.7383	-15.7932
5	7916.652	17.7686	0.0001	-15.8368	-15.7286	-15.7957
6	7924.567	15.6245*	0.0001*	-15.8447*	-15.7168	-15.7961
7	7925.179	1.2055	0.0001	-15.8379	-15.6903	-15.7818
8	7928.551	6.6284	0.0001	-15.8366	-15.6694	-15.7730

The VAR lag order selection criterias for EUR/TRY and Basis (log differences) are shown in Table 9. The results indicate that the model should be done by six lag.

Table 9: VAR Lag Order Selection Criteria: BASIS-EUR/TRY

Lag	LogL	LR	FPE	AIC	SC	HQ
0	7759.177	NA	0.0001	-15.5610	-15.5512	-15.5573
1	7896.122	273.0660	0.0001	-15.8277	-15.7982	-15.8165
2	7933.541	74.4633	0.0001	-15.8948	-15.8456*	-15.8761
3	7943.174	19.1297	0.0001	-15.9061	-15.8372	-15.8799*
4	7946.946	7.4760	0.0001	-15.9056	-15.8171	-15.8720
5	7954.588	15.1147	0.0001	-15.9129	-15.8047	-15.8718
6	7962.547	15.7118*	0.0001*	-15.9209*	-15.7930	-15.8722
7	7963.589	2.0528	0.0001	-15.9149	-15.7673	-15.8588
8	7965.837	4.4187	0.0001	-15.9114	-15.7441	-15.8478

The coefficients of the VAR Models between Basis – USD/TRY and Basis – EUR/TRY are shown in Table 10.

Table 10: VAR Models: Basis and USD/TRY, Basis and EUR/TRY

	Basis	USD/TRY		Basis	EUR/TRY
USD/TRY (-1)	0.0136	-0.0204	**EUR/TRY (-1)**	0.0111	0.1769
USD/TRY (-2)	-0.0448	0.0148	**EUR/TRY (-2)**	-0.0435	-0.1235
USD/TRY (-3)	-0.0167	0.0197	**EUR/TRY (-3)**	-0.0192	0.0459
USD/TRY (-4)	0.01	0.0075	**EUR/TRY (-4)**	0.0031	-0.0237
USD/TRY (-5)	0.0022	-0.0271	**EUR/TRY (-5)**	-0.0042	0.056
USD/TRY (-6)	-0.0257	-0.1384	**EUR/TRY (-6)**	-0.0304	-0.0224
Basis (-1)	-0.6409	0.0305	**Basis (-1)**	-0.6427	-0.0983
Basis (-2)	-0.3649	-0.0159	**Basis (-2)**	-0.3649	-0.0649
Basis (-3)	-0.2309	0.0001	**Basis (-3)**	-0.2333	-0.0977
Basis (-4)	-0.1769	0.0008	**Basis (-4)**	-0.1803	-0.1318
Basis (-5)	-0.1621	0.0687	**Basis (-5)**	-0.1644	-0.1233
Basis (-6)	-0.799	0.0341	**Basis (-6)**	-0.0805	-0.1289
C	0.0001	0.0004	C	0.001	0.0003

Figure 5 shows the results of impulse response tests and variance decomposition of the VAR model which applied to Basis and USD/TRY with six lags. If one standard deviation's shock is applied to Basis, USD/TRY has a late and weak response in the seventh day. Besides if one standard deviation's shock is applied to USD/TRY, there is a small decrease in Basis in the third day, and it approaches to zero in the same day. The variance decomposition of the model shows that Basis and USD/TRY only can be explained by their own variances.

Figure 5: Impulse Response Tests and Variance Decomposition of Basis-USD/TRY

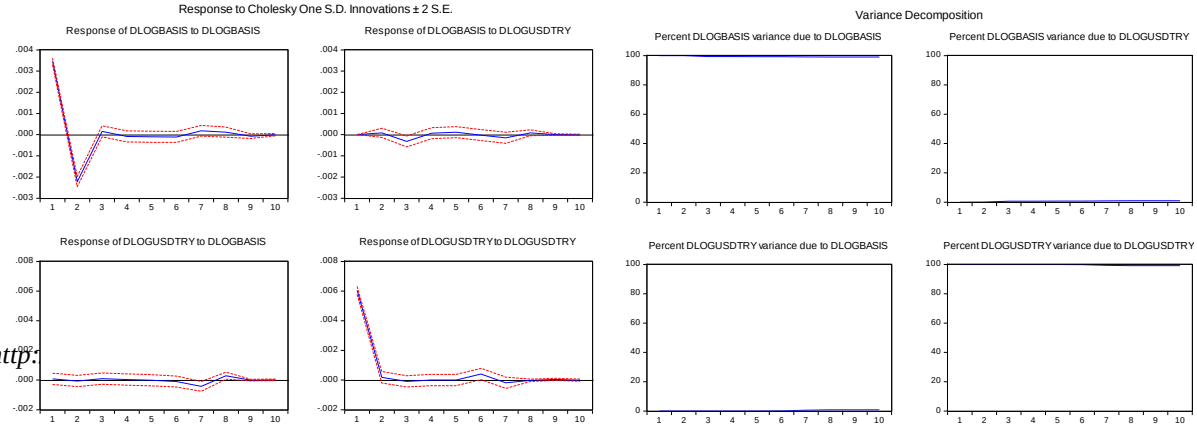
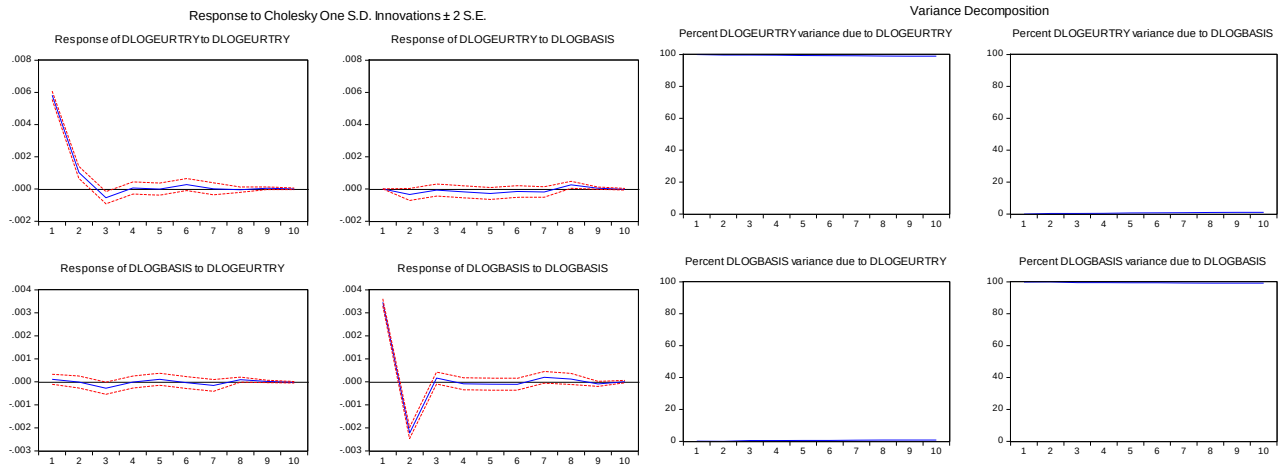


Figure 6 shows the results of impulse response tests and variance decomposition of the VAR model which applied to Basis and EUR/TRY with six lags. If one standard deviation's shock is applied to Basis, EUR/TRY has a weak decrease in the second day. Although, if one standard deviation's shock is applied to EUR/TRY, there is a small decrease in Basis in the third day, and it approaches to zero in the same day. The variance decomposition of the model shows that Basis and EUR/TRY only can be explained by their own variances.

Figure 6: Impulse Response Tests and Variance Decomposition of Basis-EUR/TRY



The results of the Granger Causality for all of the VAR Models are shown in Table 11. The Granger causality test is a statistical hypothesis test to determine whether one time series is an explaining variable for the other. The test identifies any causal relationship between the variables. Three types of Granger causality might be identified between two time series A and B. A might be the Granger cause of B, B might be the Granger cause of A or two of the series might be Granger cause of each other. As mentioned before, while the impulse-response tests and the variance decomposition tests explain the short run relationship, the Granger Causality Test explains the long run relationship.
The results indicate that the logarithmic differences of BIST30 Index and BIST30 Index Futures are Granger Causality of the logarithmic differences of the foreign exchange rates. Especially if an international investor decide to invest in Turkey in a long term maturity, following BIST30 Index and BIST30 Index Futures would be recommended. Changes in index prices would be an indicator for foreign exchanges. Conversely, USD/TRY or EUR/TRY is not a Granger cause for BIST30 Index, BIST30 Index Futures or the basis.

Table:11 Granger Causality Tests

Dependent Variable	Causality Variable	Chi- sq	Lags	Probability
BIST30	USD/TRY	3.1014	3	0.3763
USD/TRY	BIST30	161.8467	3	0.0000
BIST30	EUR/TRY	3.1508	2	0.2069
EUR/TRY	BIST30	70.7317	2	0.0000
BIST30 FT	USD /TRY	4.3318	3	0.2278
USD/TRY	BIST30 FT	156.4857	3	0.0000
BIST30 FT	EUR/TRY	4.8139	2	0.0901
EUR/TRY	BIST30 FT	71.3616	2	0.0000
BASIS	USD/TRY	9.8910	6	0.1293
USD/TRY	BASIS	7.9607	6	0.2410
BASIS	EUR/TRY	10.2830	6	0.1252
EUR/TRY	BASIS	9.9876	6	0.1132

5. Conclusion:

Both BIST30 and BIST30 Futures have the same effect on the foreign exchange rates. The impulse response tests indicates that if there is a shock in spot or futures index Borsa Istanbul, each of the two foreign exchange rates (USD/TRY and EUR/TRY) give the same response. They decrease in the first two days, and the response disappears in the fourth day. Besides, the variance decomposition tests show that nearly 10%-20% of the variance of foreign exchange rates can be explained by the variance of the spot or futures equity indices. However foreign exchange rates' variances don't explain the variances of the equity indexes. In addition, basis between spot and futures indices do not have a prominent response to the changes in foreign exchange rates and foreign exchange rates do not have to the change in basis too.

While the impulse-response tests and the variance decomposition tests explain the short run relationship, the Granger Causality Test explains the long run relationship. The results indicate that the logarithmic differences of BIST30 and BIST30 Futures are Granger Causality of the logarithmic differences of the foreign exchange rates.

In literature, there are different results for the relationship between foreign exchange rates and Borsa Istanbul equity market. We found an evident result in the short run and also long run. Our results confirm Ayvaz (2006), Savaş and Can (2011) thus the foreign exchange rate markets in Turkey are driven by the equity market. One of the reasons might be the international investors who interest in those equities in BIST30. Therefor BIST30 is an important indicator for Turkey financial markets. In further studies we recommend searching the related literature and doing analyses between the variables in this study and portfolio invests.

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