THE IMPACT OF THE DOMESTIC AND FOREIGN MACROECONOMIC NEWS ANNOUNCEMENTS ON THE TURKISH STOCK MARKET[1]

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Abstract

This study investigates the impacts of the US and domestic macroeconomic news announcements on the Turkish stock market volatility. We analyze the GARCH volatilities behaviour of Borsa Istanbul (BIST) 100 stock index around announcement and non-announcement days. We test 13 US and 8 Turkish macroeconomic news announcements and used daily data for the period 01.04.2010-12.31.2015. We find that both US and Turkish GDP news announcements and also US new residential sales have significant impacts by increasing the volatility, which indicates the increasing uncertainty in these news announcements days. On the other hand, the total US and total domestic macroeconomic news effects do not have significant impacts on the BIST 100 volatility. Since the world stock markets integration can be investigated with respect to the macroeconomic news announcements of developed markets, our results indicate that Turkish stock market is less integrated and suggest portfolio diversification opportunities for international investors regarding Turkish stock market.

Keywords: US macroeconomic news, Turkish macroeconomic news, Turkish stock market, volatility, stock market integration, GARCH

JEL Classification: G14, G15

1. Introduction

The reactions of the stock markets to the macroeconomic news announcements of the developed markets are an important research interest especially to understand the formation of prices. Efficient market hypothesis states that prices fully reflect all available information at any instant time. According to this hypothesis, only the unexpected component of news announcements should have an impact on stock prices, because the expected component of announcements should already be incorporated in prices (Pearce and Roley, 1985). Although efficient market hypothesis suggests that the prices should fully reflect all available information about underlying fundamentals instantaneously, a feeling for the relation between economic fundamentals and asset prices is that they may be somewhat disconnected (Andersen et al., 2007). For instance, Flannery and Protopapadakis (2002) argue that the hypothesis of the influence of the macroeconomic news on the stock markets is intuitively appealing but has little empirical evidence, and Birz and Lott (2011) note that it is hard to find empirical evidence for the relationship between stock prices and real sector news announcements according to the related literature. Also, the reactions of the stock markets volatility to the macroeconomic news announcements can be either increasing or decreasing. Kim (2003) state that the volatility increase because of the mixed interpretation of the news, and decrease because the news announcements can lower the market uncertainty.

Analyzing the reactions of the global stock markets to the macroeconomic news announcements of the developed markets helps to determine the stock markets integration process. Nikkinen et al. (2006) investigate the effects of the US macroeconomic new announcements on 35 stock markets in six regions, and find that G7 countries, developed European countries other G7s and emerging and developed Asian countries are highly integrated with respect to US macroeconomic news announcements. They also document that Latin American markets and some emerging markets like Slovakia, Russia etc. are not affected significantly by US macroeconomic news announcements indicating the portfolio diversification opportunities regarding the segmented markets. Büttner et al. (2012) examine the effects of the US and Euro Area (EA) macroeconomic news announcements on the financial markets of Czech Republic,

Hungary, and Poland. They report that there are significant US and EU news announcements effects on these markets even though the reactions of the markets differentiate. They also demonstrate that there is a slightly increasing impact of EU news comparing to the US news over time, which indicates the process of the European integration.

Among previous studies regarding the impacts of the macroeconomic news announcements on the stock markets, Kim (2003) examines the effects of the US and Japanese macroeconomic news announcements on Hong Kong, Australia, and Singapore markets and it is documented that the announcements have a significant effect on the first and second moments of returns. Kim et al. (2004) investigate the effects of US macroeconomic news announcements on US FX, bond and stock markets, and find that reactions of the markets to the government releasing act of information are not significant, but their "news" contents have a significant impact on the markets. They discover that the consumer and producer price indices play an important role on the US stock market. They also report mixed impacts of the announcements on the volatility of the markets, while some of them increase and the others decrease the volatility. Brenner et al. (2009) study the impact of the US macroeconomic news announcements on the volatility and comovement of US stock, treasury, and corporate bond markets, and find that the price formation process of these markets and the interaction between them are affected by the economic fundamentals. However, they document that the reactions of the markets to the macroeconomic news surprises differentiate. Birz and Lott (2011) investigate the effects of real economic news on US stock markets, and argue that these relationship has a weak empirical evidence in the literature. They use a different approach, the newspaper stories as their measure of news and first time, to their knowledge, it is evidenced that US GDP news affects the US stock market. Harju and Hussein (2011) investigate the effects of the US market on the major European stock markets, and find that the US stock market opening have a significant impact on the volatility level of European markets and also major US macroeconomic news affect both return and volatility of European markets immediately after their releasing. Nguyen and Ngo (2014) study the impacts of the US macroeconomic news announcements on twelve developed and emerging Asian markets. They find that there is a strong relationship between US

macroeconomic news announcements and Asian stock markets return and volatility, and the impacts of the announcements on the emerging markets are more prominent than the developed markets. They also document that the US labor news has a greater impact than other news.

There are also some studies investigating the impacts of the macroeconomic news announcements on the Turkish stock market[2]. Önder and Şimga-Mugan (2006) investigate the effects of the political and economic news on the Argentina and Turkey stock markets in the context of domestic and global effects. They show that domestic political and global economic news have a significant impact on Turkish stock market volatility. In addition, they report that Turkish stock market trading volume significantly reacts to the world political news and country-related world economic news. Ehrmann and Fratzscher (2009) examine the effects of the US monetary shocks to the fifty stock markets around the world, and find that Turkish stock market do not respond significantly to US monetary shocks. Gümüş et al. (2011) investigate the effects of four US and seven Turkish macroeconomic news on BIST 100 index for 2002-2010 period. They find that only the domestic macroeconomic news have an impact on the volatility of the market. Cakan et al. (2014) study the impacts of the US unemployment rate and inflation news announcements on twelve emerging markets including Turkey in the light of positive and negative surprises. They evidence that good news of US unemployment rate significantly decreases the Turkish stock market volatility, which indicates that an unexpected decreasing in unemployment rate make Turkish stock market less risky. Solakoglu and Demir (2014) examine the effects of the public information arrival on Turkish stock market during the crisis period. They classify economic news as real economy and inflation/money news, and also classify them by the origin as Turkish, US, and EA news. They find

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[2] *The effects of the developed markets on the emerging markets can be classified as spillover and macroeconomic news effects (Hanousek and Kočenda, 2011). In terms of return and volatility spillover between developed markets and Turkey, Gök and Kalaycı (2013) evidence that US and Turkish stock markets are not cointegrated and there is one way return and volatility spillover from US stock markets to the Turkish stock market. Also, Demirgil and Gök (2014) find that developed European stock markets affect both return and volatility of Turkish stock market and the comovement of Turkish and European stock markets is very low though it is significant.*

that US real economy news and European/Turkish real economy and inflation news have a significant impact on return volatility of BIST 100 index. But, they note that the influence of the expected component of some European and Turkish news on the volatility is inconsistent with the efficient market hypothesis. Fedorova et al. (2014) study the impacts of the EA macroeconomic news announcements on some emerging markets including Turkey. They find that consumer price index and unemloyment news of EA have significant impacts on Turkish stock market.

This study examines the impacts of the US and Turkish macroeconomic news announcements on the Borsa Istanbul stock market volatility. The daily data for the period 01.04.2010-12.31.2015 is used and thirteen US and eight Turkish macroeconomic news announcements are included in the study. Following Nikkinen et al. (2006) we investigate the GARCH volatilities behaviour around announcement and non-announcement days. The major contribution of this study to the literature is that it has the largest macroeconomic news data set to examine the effects of the US macroeconomic news announcements.

The remainder of this paper is organized as follows: Section II presents the data and methodology, Section III discusses the empirical findings, and Section IV concludes the paper.

2. The Data and Methodology

In this study, the impacts of the Turkish and US macroeconomic news announcements on BIST 100 index is empirically investigated. BIST 100 is a capitalization-weighted index. It is the major stock index for Turkey. The data is used for the period 01.04.2010-12.31.2015, which consists 1510 trading days. We include thirteen US and eight Turkish macroeconomic news announcements in the study. The details of the macroeconomic news announcements are presented in Table 1. We analyze 8.30 am and 10.00 am EST (GMT-5) US macroeconomic news announcements. Because there is seven hours time difference between Turkey and US (EST), the time is 3.30 pm in Turkey for the 8.30 am US news announcements and 5.00 pm in Turkey for 10.00 am US news announcements[3]. Since Borsa Istanbul trading session ends[4] at 5.40

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[3] *The time difference between Turkey and US (EST) can reduce to six hours for a short period, because daylight saving time practices may differ for both countries.*

pm, it is possible to detect the effects the US news announcements[5] on Borsa Istanbul in the announcement days.

Table 1

Macroeconomic News Announcements Included in the Study

	Macroeconomic News	Announcement		Distribution of Release Days Across Weekdays					
		Frequency	Time	Mon	Tue	Wed	Thu	Fri	Total
TURKEY	Gross Domestic Product	*Quarterly*	10.00 am	8	6	5	4	1	24
	Foreign Trade Statistics	*Monthly*	10.00 am	8	11	8	13	32	72
	Labor Force Statistics	*Monthly*	10.00 am	30	12	11	12	13	78
	Industrial Production Index	*Monthly*	10.00 am	30	12	8	8	14	72
	Consumer Price Index	*Monthly*	10.00 am	30	11	10	11	10	72
	Business Tendency Survey and and Real Sector Confidence Index	*Monthly*	02.30 pm [1]	32	11	10	7	12	72
	Consumer Confidence Index	*Monthly*	10.00 am	23	9	11	19	11	73
	House Sale Statistics	*Monthly*	10.00 am	9	4	6	11	10	40
US	Gross Domestic Product	*Monthly*	08.30 am	0	6	9	29	23	67
	Consumer Price Index	*Monthly*	08.30 am	0	16	14	19	20	69
	Producer Price Index	*Monthly*	08.30 am	0	11	21	19	19	70
	Durable Goods Manufacturers' Shipments, Inventories and Orders	*Monthly*	08.30 am	3	14	27	16	8	68
	New Residential Construction	*Monthly*	08.30 am	0	28	23	12	5	68
	International Trade in Goods and Services	*Monthly*	08.30 am	0	15	15	26	14	70
	Personal Income And Outlays	*Monthly*	08.30 am	22	4	5	7	27	65
	Nonfarm Payroll Employment	*Monthly*	08.30 am	0	1	0	3	67	71
	Sales For Retail And Food Services	*Monthly*	08.30 am	6	18	14	15	17	70
	Manufacturing and Trade Inventories and Sales	*Monthly*	10.00 am	6	18	14	14	17	69
	Manufacturers' Shipments, Inventories and Orders	*Monthly*	10.00 am	8	19	12	20	10	69
	New Residential Sales	*Monthly*	10.00 am	9	16	24	7	9	65
	Construction Spending	*Monthly*	10.00 am	27	14	10	7	8	66
Total				251	256	257	279	347	1390

[1] *Before 2011, the release time was 04.30 pm*

To examine the effects of Turkish and US macroeconomic news on BIST 100 index volatility, we follow Nikkinen et al. (2006) and investigate the GARCH volatilities behaviour around announcement and non-announcement days for 21 news announcements.

Daily return series is calculated by using $r = \ln(\frac{P_t}{P_{t-1}})$, where P_t is index closing value of day *t*, and P_{t-1} is the closing value of day *t-1*. To obtain the GARCH volatilities, the GARCH (1,1) model as in equations (1) and (2) are estimated.

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[4] *The trading session was ending at 5.30 pm till 07.16.2012.*
[5] *Federal open market committee news announcement of US is not included in the study, because it is released after the trading hours of Borsa Istanbul.*

$$r_t = \mu + \varepsilon_t \tag{1}$$

$$\sigma_t^2 = a_0 + a_1 u_{t-1}^2 + \beta_1 \sigma_{t-1}^2 \tag{2}$$

After getting the GARCH volatility series, to examine the news effects on volatility behaviour, log difference of the volatility series $(log\sigma_t^2 - log\sigma_{t-1}^2)$ is taken[6] as a dependent variable. Then, OLS regression is estimated including the macroeconomic news announcements as independent variables in form of dummy variable, which takes the value "1" on announcement days and "0" on non-announcement days.

3. Empirical Findings

Descriptive statistics of the return series is reported in Table 2. The ADF test result of the return series shows that it is level stationary.

Table 2

Descriptive Statistics of Return Series

	Return
Panel A	
Mean	0.000196
Median	0.000881
Maximum	0.068952
Minimum	-0.110638
Std. Dev.	0.014947
Skewness	-0.515223
Kurtosis	6.823342
Jarque-Bera	985.8652
Panel B	
ADF Test (Level)	-39.97728**

*Note: ** indicates significance at the 5% level. Critical values for ADF test are -2.566496, -1.941034, -1.616558 for 1%, 5%, and 10% levels, respectively.*

OLS regression results are reported in Table 3. It is seen that only three macroeconomic news announcements have statistically significant impacts out of 21 announcements. These are Turkish GDP

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[6] *Nikkinen et al. (2006) derived the $log(\sigma_{t+1}^2) - log(\sigma_t^2)$ series.*

and US GDP news announcements and also US new residential sales. But the impact of the US new residential sales is less significant than the other two announcements. These findings are in line with the findings of Solakoglu and Demir (2014), who find that the US real economy news are more influential on BIST 100 index return volatility than US inflation news, although the data of their study consists the crisis period of 2008-2009. As we evidence that US nonfarm payroll employment news do not have a significant impact, this finding contradicts to Cakan et al. (2014), who find that US unemployment report has a significant impact on conditional volatility of BIST 100 index.

Turkish GDP, US GDP, and US new residential sales announcements increase the volatility of BIST 100 index. Hence, releasing these news increase the uncertainty in the announcement days. This finding contradicts to Nguyen and Ngo (2014), who find that US macroeconomic news reduce uncertainty in Asian markets. They interpret their findings as the US news can resolve the uncertainty about the health of US economy for market participants.

Table 3

OLS Regression Results

Variable	Coefficient	t-Statistic
TR_GDP	0.070307	2.256506**
TR_Business Tendancy Survey	-0.021919	-1.159933
TR_Labor Force Statistics	-0.007060	-0.391927
TR_House Sales	0.015517	0.622760
TR_Industrial Production Index	0.003238	0.176297
TR_Foreign Trade Statistics	-0.021143	-1.078193
TR_Consumer Price Index	-0.001337	-0.069219
TR_Consumer Confidence Index	0.014822	0.810775
US_ Dur. Goods Manufacturers' Ship., Inv. and Orders	0.013267	0.661230
US_ Manufacturers' Shipments, Inventories and Orders	0.021002	1.075899
US_GDP	0.050626	2.599086***
US_Construction Spending	-0.001397	-0.070585
US_Personal Income and Outlays	-0.013827	-0.686053
US_Int.Trade in Goods and Services	0.020200	1.092101
US_ Sales For Retail And Food Services	0.139042	0.933219
US_Nonfarm Payroll Employment	0.012481	0.675720

US_Consumer Price Index	-0.001338	-0.070550
US_Producer Price Index	-0.009284	-0.486256
US_Manufacturing and Trade Inventories and Sales	-0.133328	-0.888377
US_New Residential Construction	0.005906	0.309558
US_New Residential Sales	0.034565	1.691029*
C	-0.005963	-1.057482

R-squared	0.014675
Adjusted R-squared	0.000750
Durbin-Watson stat	2.062677

*Note: *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates at the 10% level.*

In sum, because it is evidenced that only US GDP and new residential sale announcements have impacts on volatility out of 13 US news, and only Turkish GDP news announcement play a significant role out of 8 Turkish news, the effects of the domestic and US economic news on BIST 100 volatility are very limited. We also confirm this finding by analyzing the total domestic news effect and total US news effect on the volatility as shown in Table 4. It is seen that, although both total domestic and total US economic news announcements increase the volatility, their effects are not significant. These findings are in line with Gümüş et al. (2011), who find that US macroeconomic news do not have a significant impact on BIST 100 index volatility, and also partially consistent with Önder and Şimga-Mugan (2006), who find that domestic economic news does not play a significant role on BIST volatility even though the effect of the world economic news is significant.

The number of the statistically insignificant announcements indicate that as a developing market, the investors of the Turkish stock market's responses to the US macroeconomic news announcements are less identical comparing to the G7 markets, developed European markets other than G7's, and developed and emerging Asian markets as reported in Nikkinen et al. (2006). As a result, it is inferred that while developing and also some emerging markets are integrated, Turkish stock market is segmented with respect to the US news announcements. This result indicates the portfolio diversification opportunities for international investors regarding the Turkish stock market.

Table 4

Total Effect of Domestic and US Economic News

Variable	Coefficient	t-Statistic
TR_ALL	0.000999	0.120890
US_ALL	0.011368	1.476045
C	-0.005250	-0.908454
R-squared	0.001461	
Adjusted R-squared	0.000134	
Durbin-Watson stat	2.068506	

4. Conclusion

This study investigates the impacts of the US and domestic macroeconomic news announcements on the Turkish stock market. We analyze 13 US and 8 Turkish news announcements for the period 01.04.2010-12.31.2015. We include only 8.30 am and 10.00 am (EST) US news announcements in the study since their effects can be observed in the same day of announcements in Borsa Istanbul. We follow the approach of Nikkinen et al. (2006) and examined the Borsa Istanbul 100 stock index volatility behaviour around announcement and non-announcement days. We find that Turkish GDP and US GDP news announcements and also US new residential sales significantly affect the volatility on the announcement days. We document that these announcements increase the volatility, which indicates an increasing in the uncertainty following the release of these macroeconomic news. Despite the scarce evidence about the significant impacts of GDP announcements in the literature, our results provide evidence for their significance in Turkish stock market. This result is important for investors, analysts and academicians.

On the other hand, the number of insignificant news announcements for both US and Turkish news suggests that the impact of the news announcements are limited. This result is confirmed by also testing the total US and total domestic news announcement effects. Considering the integration of the developed and also some emerging stock markets with respect to the US news announcements as reported in Nikkinen et al. (2006), our results indicate that Turkish stock market is less integrated, which imply the

international portfolio diversification opportunities for investors regarding Turkish stock market.

But as pointed out by Wongswan (2006) and Gümüş et al. (2011) using low frequency data may be the cause of the weak evidence of the spillover effects of the news across international markets. Thus, using high frequency data may result different impacts of news in an intraday frame for further studies. Also, studying surprise components of news as positive and negative surprises will help to better understand the effects of the macroeconomic news announcements in an intraday frame.

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