sciendo International Journal of Management and Economics 2019; 55(2): 83–98

Empirical Paper

Sleiman Karime*, Özlem Sayilir

Political news and stock market reactions: evidence from Turkey over the period 2008–2017

https://doi.org/10.2478/ijme-2019-0013
Received January 10, 2019; accepted June 02, 2019

Abstract: The primary objective of the study is to examine the impact of political news (good and bad news) on the returns and volatility of Borsa Istanbul 100 Index (BIST-100). Sample data cover the period from January 2008 to December 2017. The main sample was divided into two subperiods to insulate the dominating impacts of both the 2008 Global Financial Crisis and 2013 Federal Reserve Tapering on Turkish stock markets. The daily stock market data were collected from the Electronic Data Delivery System (EVDS) web service, while political news headlines were collected from the Guardian newspaper. Different nonlinear volatility models (symmetric and asymmetric Generalized AutoRegressive Conditional Heteroskedasticity [GARCH]-type models) were used to model and estimate BIST-100 volatility in response to political news. The findings of the paper highlight four main results. First, there seems to be a significant impact of political news on the returns and volatility of BIST-100 index. Second, negative shocks derived from bad news tend to have a significant impact on the returns and volatility of BIST-100, while positive shocks derived from good news do not tend to have any significant impact on the returns, but decreased returns volatility. Third, political news, both good and bad, can affect stock return and stock return volatility in different directions, and this direction is time-varying. Fourth, the findings strongly reveal the presence of "Leverage Effect" in the returns of BIST-100 index. Therefore, one can say that political uncertainty is still a problem for the Turkish stock market.

Keywords: uncertainty, shock, return, volatility, BIST-100, GARCH
JEL Classification: C22, G11, G12, G14
Extracted from the thesis: Political News and Stock Market Reactions: Evidence from Turkey over the Period 2008-2017, Graduate School of Social Sciences, Anadolu University, 2018.

1 Introduction

Whether the Turkish financial market is efficient, and major news such as the political news headlines of credible newspapers can affect to market prices are attractive questions for both researchers and investors, especially in the era of the new information revolution, the revolution that has triggered a serious boom in formulating events and news, presenting them and tailoring their consumption patterns. When talking about the factors affecting stock prices, a substantial number of researchers and economic specialists agree that economic and political variables are among the main driving forces behind stock market movements.

In the last decades and with the rapidly changing dynamics of trade and investment internationalization, political risk has gained more significance for policy makers. Political risk, as a concept, was proposed

***Corresponding author: Sleiman Karime,** Faculty of Business Administration, Anadolu University, Eskişehir, Turkey, E-mail: soulayman.karimeh@gmail.com; ska002@dohainstitute.edu.qa
Özlem Sayilir, Faculty of Business Administration, Anadolu University, Eskişehir, Turkey, E-mail: osayilir@anadolu.edu.tr

firstly in the 1960s as a part of country risk, related with a country's insolvency. Political risk can be defined as the possibility that the performance of a particular investment can be negatively impacted by conditions related to unexpected changes or extreme events in the domestic or international political scene [Sottilotta, 2013]. Therefore, understanding the components of country risk and their correlation with financial markets' volatilities and returns is of great significance, especially given the increasing extent of the global nature of investment portfolios [Erb et al., 1996].

The relationship between political events and financial market prices was illustrated by numerous studies before and proven by many researchers. Cuban crisis in 1962, unification process of Germany during 1989–1990, October 30, 1995, Quebec referendum and September 11, 2001, attacks are major examples of the key world events that had an impact on financial markets. Bilson et al. [2002] suggest that political risk has a great role in explaining return variations in emerging markets. Białkowski et al. [2008] postulate that country's income distribution and growth are significantly affected by its politics. Osa [2014] contend that values of stock markets vary extremely in the periods of political transition.

When studying the case of Turkey over the last 10 years (2008–2017), one can notice a large number of major political events. Continuous terrorist attacks in the Turkish biggest provinces and border cities, election of Recep Tayyip Erdoğan as the Turkish president, tension with Europe and with some Middle East countries, signing a landmark accord with Armenia, signing a gas deal with the European Union, Gezi Park protests movement, downing of the Russian Jet, 2016 coup attempt and the 2017 Constitutional Referendum. Hence, it is not out of the question that Turkey's political situation has had a role in the pricing of stocks traded on Turkish exchanges.

The objective of this paper is to explore the impact of political news on a country's financial market, more specifically, the Turkish stock market, represented by the Borsa Istanbul 100 (BIST-100) index. The study may contribute to the existing literature in the following way. First, it investigates the period 2008–2017, a critical period in the modern political history of Turkey, in which two fateful events were occurred (2016 Coup Attempt and 2017 Constitutional Referendum), which the current literature lacks. Second, to the best knowledge of the authors, current literature lacks the empirical evidence regarding the impact of political news on the Turkish stock market performance and volatility using different nonlinear volatility models together and covering the same study period. The remainder of the paper is organized as follows. Literature review section presents the literature review on the effect of political news on stock market. Methodology section describes the methodology used for estimating stock returns and volatility. Findings section discusses the empirical findings. Finally, Conclusions section presents the conclusion.

2 Literature review

In the literature, there are several studies examining the relationship between political news and stock markets using ARCH/GARCH models, and the majority of studies found an impact of good and bad political news on stock market return and volatility (a negative impact for negative news and a positive impact for positive news).

For instance, Kim and Mei [1994] investigated the impact of political risk on the Hong Kong equity market. The study adopted an event study methodology to examine the direct impact of political changes in security returns. The study also constructed Components–Jump model in order to quantify the market volatility reaction to political events. The model consists of two parts, the fundamental ARCH-derivative model of Engle and Lee [1993], which serves in capturing time-varying nature of long-term volatility, and the Jump/Poisson process, which explicates return shocks. The primary sample covered the period from 1989 to 1993, and data utilized are daily, weekly, and quarterly stock returns data derived from the Hang Seng Index. Political news was extracted from the *Wall Street Journal* and the *New York Times*. The results from the study indicated that political events occurred during the sample period have significantly impacted movements in the index of Hang Seng. Moreover, volatility effects of the political risk variables were also significant.

İlkuçan [2004] analyzed the direct impact of political news on the intra-daily performance of Istanbul Stock Exchange index ISE-100. The study covered the period between 2002 and 2003. Domestic and foreign political news data were collected from the Reuters Turkish language news service. İlkuçan employed an event study methodology and GARCH (1,1) model. The study resulted that political news significantly increased both the mean and variability of ISE-100 returns. Furthermore, key political news such as the news about Iraq war, Cyprus peace negotiations, and November 2002 elections had significantly impacted the intra-daily ISE-100 index returns.

Beaulieu et al. [2006] examined the short-run effect of the October 30th, 1995 referendum on the common stock returns of Quebec firms. A classic event study methodology was used to measure the economic impact of the referendum on the value of 102 firms headquartered in Quebec and listed on the Montreal Stock Exchange and/or on the Toronto Stock Exchange. The study also used the GARCH model to estimate the volatility of stock returns and assess whether the significance of abnormal returns is influenced by variable volatility. The results showed that uncertainty regarding the outcome of the referendum has had an effect on the stock returns of the Quebec firms. The study also indicated that Quebec firms exposed to political risk are the firms most affected by the referendum.

Białkowski et al. [2008] tested whether national elections stimulate greater volatility in the stock market by investigating a broad international sample (containing all Organization for Economic Co-operation and Development [OECD] member states) excluding Iceland, Luxembourg, and Slovakia. The sample included 134 elections took place in the period between 1980 and 2004. An event study methodology was employed to gauge the impact of elections on the second moment of return distribution, while GARCH models served as a benchmark for measuring abnormal volatility and for isolating the country-specific component of variance. The results indicated that the variance in the country-specific component of index return was simply doubled during the week around election day, which demonstrates the investor's surprise about the outcomes of the elections.

Suleman [2012] studied the effect of good and bad political news on the return and volatility of Pakistan's Karachi Stock Exchange (KSE100) Index and eight-sector indices. Index data consisted of daily closing prices and ranged from 1992 to 2010. Suleman selectively collected 186 political news items. The study employed the Exponential Generalized Autoregressive Conditional Heteroscedastic (EGARCH) model of Engle and Ng [1993]. Results of the study indicate that good and bad political news have different impact on stock return and volatility, precisely, good news has positive impact on stock returns, and decreased volatility, while bad news has negative impact on returns and increased volatility. Moreover, the results confirmed that bad news has a stronger impact on the volatility than good news.

Kulwarothai [2013] conducted a study examining the effect of political risk (measured through political news) on the return volatility of Thai Stock Exchange (SET) between 2006 and 2011. The study used GARCH-M and EGARCH-M models. Results demonstrated that political news significantly impacts stock return volatility, and negative shocks derived from unfavorable news have greater effect on the volatility than positive shocks derived from favorable news.

3 Methodology

The findings of the study were obtained using a quantitative research methodology. In order to test whether the presence or absence of good and/or bad political news has an impact on stock market returns and volatility, a correlational study was conducted. The statistical technique used in the paper is univariate time series analysis. The research design of this paper is based on the following two hypotheses; H(1): There is a significant effect of political news releases on both stock market returns and volatility, H(2): Bad political news has greater effect on stock market returns and volatility than good news.

3.1 Sample

Stock market data cover the period from January 2008 to December 2017 and include 2441 observations. The main sample was also divided into two subperiods to insulate the dominating impacts of both the 2008 Global Financial Crisis and 2013 Federal Reserve Tapering on the overall Turkish economy, and especially on BIST-100 index. Thus, the first subperiod spans the time from January 2008 to May 2013 and includes 1336 observations, while the second subperiod runs from June 2013 to December 2017 and includes 1105 observations.

During the overall study period, a total of 324 out of almost 3000 political news headlines were carefully selected, categorized, and analyzed. Selection criteria was based on ambiguity avoidance, meaning that, if the news headline is not obviously declaring a good or a bad political event that would clearly impact the country's economy and the response of both domestic and foreign investors, the day is classified as a nonevent day, and when there is more than one political event per day, the event selected is the one which is expected to have a stronger impact on investors' stock investment decision. Furthermore, news was classified according to their apparent "political" nature and immediate potential impact on the market in the short run, more than to their possible consequences that may occur in the long run.

It's also important to clarify that classification of Good news and Bad news was as objective as possible, and news was classified not only on the basis of their content, but also were classified and seen through an eye of a profit-driven and information-seeking "investor," not through that of an ideologized individual or general public. Besides, contrary to some other literature, news classification was performed manually, without the use of text categorization and mining softwares, thus, it was based on the subject or the political purport of the news, not on specific or predetermined keywords such as "coups," "protest," "accord," "reforms," "ceasefire," and so on, and this is because that classification may be misleading if the keywords relied upon do not accurately reflect the real whole situation or the main message of the news headline. Table 1 provides an example and additional explanation of the categorizing criteria.

3.2 Data collection

The study is based on secondary data analysis. To examine the impact of political news on stock market returns and volatility, BIST-100 index was used as a capitalization-weighted index which represents the Turkish national market companies, other than investment trusts.

Table 1. Political news headlines categorizing criteria

News headlines	Categorizing	Decision
Kurdish leader Abdullah Ocalan declares ceasefire with Turkey.	Good News	Included
Vladimir Putin: Turkey's downing of Russian jet "a stab in the back."	Bad News	Included
Turkey and United States "agree in principle" to provide air support for Syrian rebels.	Nonevent	Excluded
Dilek Öcalan, niece of jailed Kurdish leader, enters Turkish parliament.	Nonevent	Excluded
Good news	Political news with positive nature, which are expected to increase stock market investors' appetite such as: – signing new deals and accords – declaring ceasefire – ending conflicts – peaceful and successful elections – quick and easy government formation – fruitful diplomatic visits – freeing prisoners, etc.	
Bad news	Political news with negative nature, which are expected to decrease stock market investors' appetite such as: – military incursion into a war zone – protest movements – coup attempts – bombing attacks – detaining journalists – cut off diplomatic relations – unfair elections, etc.	

3.2.1 Data source

Time series data of the study consist of daily closing prices, presented in local currency (TRY) and collected from the EVDS web service developed by the Central Bank of the Republic of Turkey. The data on political news events were collected from the Guardian newspaper, one of the world's deep-rooted news organizations. The reason behind choosing the Guardian as a foreign source of news was its selectivity and universality, especially for the growing number of foreign investors investing in Borsa Istanbul during the last years.

3.3 Empirical model

The study is focusing on the parametric models, as they are more suitable to analyze nonlinear relationships. Different nonlinear volatility models (symmetric and asymmetric GARCH type models) were used to test the two hypotheses, since they have the ability to explain major features common to financial market data such as leptokurtosis, volatility clustering, long memory, and leverage effects [Brooks, 2002]. The models used are GARCH(1,1), GARCH-M(1,1), EGARCH(1,1), and TGARCH(1,1). All models and tests were run on EViews 9.0 software. Akaike Information Criterion (AIC) and Schwarz Criterion (SC) were considered when selecting the most appropriate models. Logarithmic returns were used to build returns time series, since they are time additive, so log return was defined as:

$$r\ BIST100_t = \ln\left(\frac{BIST100_t}{BIST100_{t-1}}\right) \tag{1}$$

where $BIST100_t$ means stock price at time t, $r\ BIST100_t$ is the return between time $t-1$ and t.

Two symmetric GARCH models are used to test the effect of political news releases on BIST-100 returns and volatility. Therefore, in practice, one dummy variable is added to the mean and variance equations of the two models to indicate the presence or absence of political news. The dummy variable is:

$$D_N = \begin{cases} 1 & \text{if there is political news} \\ 0 & \text{if there is no political news} \end{cases}$$

3.3.1 GARCH (1,1) model

This model was developed independently by Bollerslev and Taylor [1986]. The model proved its success in predicting conditional variances and had a good reputation of avoiding overfitting and being more parsimonious than high-order ARCH model [Brooks, 2002]. The mean and variance equations of GARCH(1,1) model are defined as:

$$r_t = \mu + \varepsilon_t \tag{2}$$

$$\sigma_t^2 = \omega + \alpha_1 u_{t-1}^2 + \beta_1 \sigma_{t-1}^2 \tag{3}$$

where ω, α_1, and β_1 are the three parameters of the model. r_t is the stock return at time t, μ is the average return, ε_t is the error term (or unexplained return), and $\omega > 0$, α_1, $\beta_1 \geq 0$, $\beta_1 > \alpha_1$.

3.3.2 GARCH-M (1,1) model

The GARCH-in-mean model was developed by Engle et al. [1987]. This model can be linked to the Capital Asset Pricing Model (CAPM) financial theory which states that the return of a security may depend on its volatility or risk. GARCH-M model adds a heteroscedasticity term into the mean equation. Another important feature of the model is that it can capture risk not only by using the variance series but also by using the standard deviation of the series [Asteriou and Hall, 2007]. The GARCH-M(1,1) model can be defined as:

$$r_t = \mu + \lambda\sigma_t^2 + \varepsilon_t \tag{4}$$

$$\sigma_t^2 = \omega + \alpha_1 u_{t-1}^2 + \beta_1 \sigma_{t-1}^2 \tag{5}$$

where μ and ω are the constants. $\lambda\sigma_t^2$ is the time-varying risk premium parameter. A positive risk premium λ indicates that asset returns are positively related to their volatility. That is to say, a positive risk premium value denotes that there is a positive relationship between the mean and the variance of asset return [Rossi, 2004].

Asymmetric models were also employed to capture the leverage effects or the asymmetric responses to negative and positive shocks. In simple words, asymmetric models can help in determining whether the influence of a negative shock to the volatility of an asset is greater than that of a positive shock of the same magnitude [Brooks, 2002]. Here, two asymmetric GARCH models are used to test the impact of bad and good political news releases on the returns and volatility of BIST-100 index. In these models, only two dummy variables are added "independently" to the mean and variance equations, to numerically indicate the occurrence and non-occurrence of bad and good events. The dummy variables are:

$$D_B = \begin{cases} 1 \text{ if Bad news} \\ 0 \text{ if otherwise} \end{cases}, \text{ and } D_G = \begin{cases} 1 \text{ if Good news} \\ 0 \text{ if otherwise} \end{cases}$$

3.3.3 EGARCH (1,1) model

The EGARCH model of Nelson [1991] is regarded as a remarkable structure with features to (1) allow good news and bad news to have a different impact on volatility and (2) allow big news to have a greater impact on volatility, whereas the standard, symmetric GARCH models do not [Engle and Ng, 1993]. The model suggests that there is no need to artificially impose non-negativity constraints on the model, because as long as the $\log(\sigma_t^2)$ is modeled, then even if the parameters are negative, σ_t^2 will be positive [Brooks, 2002]. The EGARCH(1,1) can be written as:

$$\ln\left(\sigma_t^2\right) = \omega + \alpha_1\left\{\left|\frac{\varepsilon_{t-1}}{\sigma_{t-1}}\right| - \sqrt{\frac{2}{\pi}}\right\} + \gamma_1\frac{\varepsilon_{t-1}}{\sigma_{t-1}} + \beta_1\ln\left(\sigma_{t-1}^2\right) \tag{6}$$

where Capital Asset Pricing Mode is the leverage effect parameter. The existence of leverage effect can be tested by the hypothesis that $\gamma_1 < 0$. The effect of shocks is asymmetric if $\gamma_1 \neq 0$.

3.3.4 TGARCH/GJR-GARCH (1,1) model

Although it is known that asymmetric GARCH models are not essentially different from each other in their results, another asymmetric model was used to confirm the results from the EGARCH model. The threshold GARCH model was proposed by Glosten et al. [1993] and Zakoian [1994]. The model has a special modeling structure that adds a further term (dummy variable) to capture potential asymmetries in terms of negative and positive shocks. The TGARCH(1,1) model can be written as:

$$\sigma_t^2 = \omega + \alpha_1\varepsilon_{t-1}^2 + \gamma_1 d_{t-1}\varepsilon_{t-1}^2 + \beta_1\sigma_{t-1}^2 \tag{7}$$

where the dummy variable $d_{t-1} = \begin{cases} 1 \text{ if } \varepsilon_{t-1} < 0 \\ 0 \text{ if otherwise} \end{cases}$

In other words, “bad news” and “good news” are having a different impact on volatility. Good news has an impact α_1, while bad news has an impact of $\alpha_1 + 0$. So, when the asymmetry term $\gamma_1 > 0$, this means that there is a leverage effect, or the impact of news is asymmetric, but when $\gamma_1 = 0$, the effect of news is symmetric [Asteriou and Hall, 2007].

3.4 Preliminary data analysis

The aim of this analysis is to check the competency of the model and the readiness of the data for the next analysis. From Figures 1 to 3, it is clearly seen that when the global financial crisis had struck in 2008 BIST-100 prices witnessed a sharp decline and huge volatility. The other sharp decline occurred in the beginning of 2013, when the Federal Reserve signaled that the tapering of asset purchases could begin very early. When returning back to the collected political news and flipping through the events happened in that two periods, it was concluded that none of the collected news at that time was at the same importance level as the news of both the global financial crisis and Fed tapering (to be confirmed next section). However, the period from mid-2013 to the end of 2017 was much influenced by Turkey-related political events.

The withdrawal of The Kurdistan Workers’ Party (PKK) fighters from Turkish territory in March 2013 and the victory in the constitutional referendum of April 2017 are examples of good events accompanied by periods of low volatility, whereas the Turkish downing of the Russian jet in November 2015 and the failed coup attempt of July 2016, are examples of bad events in which accompanied by periods of high volatility. Another important feature of the graphs is that volatility clustering is strongly discernible in the series and can be observed through the periods of high volatility followed by periods of high volatility and vice versa. Thus, one can say that there is some empirical evidence that volatility is autocorrelated.

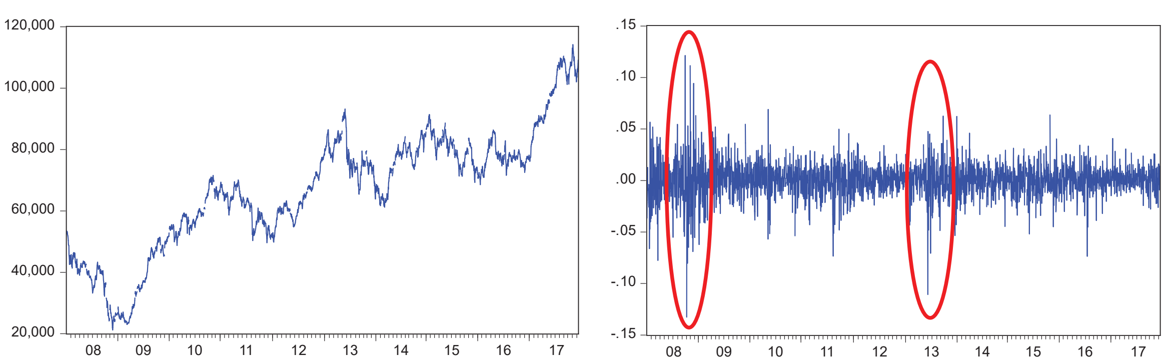

Figure 1. BIST-100 Index Closing Prices and Returns (January 2008–December 2017).

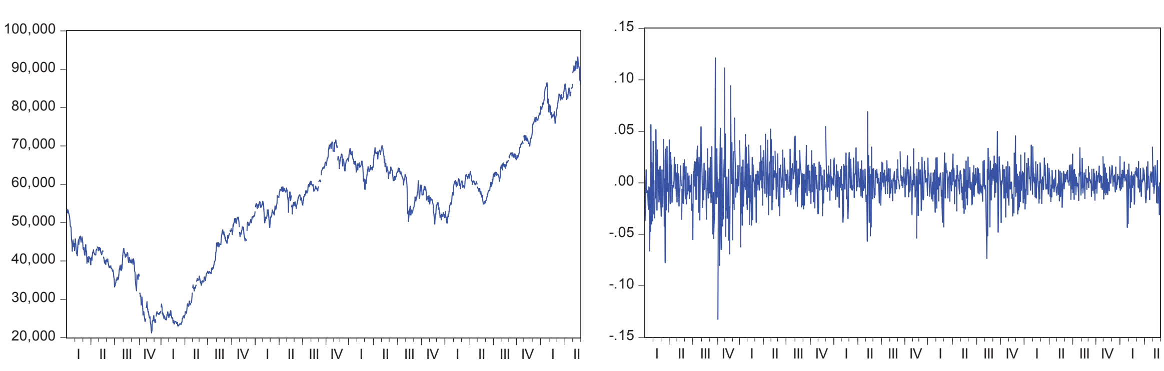

Figure 2. BIST-100 Index Closing Prices and Returns (January 2008–May 2013).

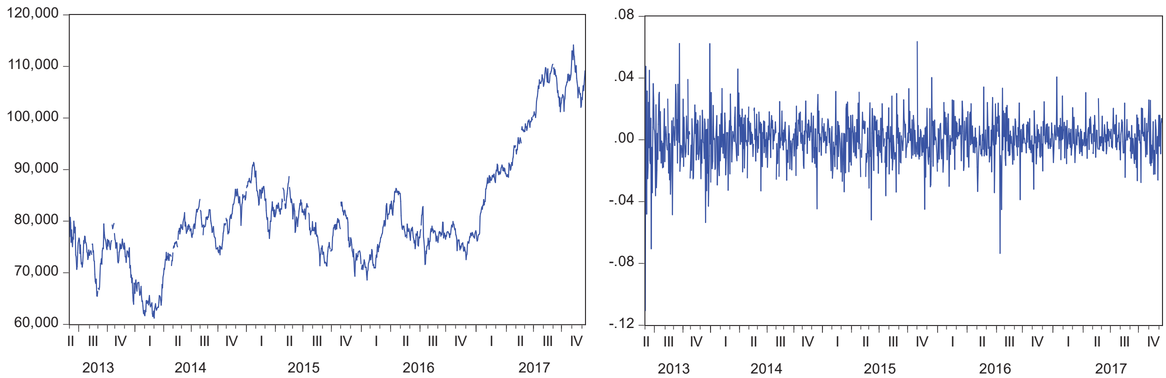

Figure 3. BIST-100 Index Closing Prices and Returns (June 2013–December 2017).

Table 2. Descriptive statistics of the daily returns of the BIST-100 index

Statistical indicator	Full sample period	First subperiod	Second subperiod
Mean	0.000277	0.000327	0.000216
Median	0.000737	0.000914	0.000526
Maximum	0.121272	0.121272	0.063602
Minimum	−0.132585	−0.132585	−0.110638
SD	0.016851	0.018572	0.014508
Skewness	−0.288541	−0.177630	−0.556939
Kurtosis	9.147130	8.798611	8.232316
Jarque–Bera	3877.145	1878.755	1317.614
Probability	0.000000	0.000000	0.000000
Sum	0.675713	0.437161	0.238551
Sum SD	0.692872	0.460487	0.232378
Observations	2441	1336	1105

3.4.1 Summary of descriptive statistics

Descriptive statistics can help in characterizing the main features of our data. Table 2 summarizes some statistical properties of the daily returns of the BIST-100 index in the three periods studied. As can be noticed in the table, mean returns are all positive, but vary slightly across periods. The second subperiod appears to have a smaller mean return and standard deviation than the first subperiod.

Moreover, skewness is negative in all periods, which means that the more of the returns lie on the left side of the average return. The kurtosis is positive and extremely large (more than three) and this means there is a high probability for extreme values in the series. According to the Jarque–Bera value, the null hypothesis of normality can be rejected for the whole period and the subperiods, since its p value is less than 0.001.

3.4.2 Normality test

Additional testing for normality can be done using graphical examinations such as the Quantile–quantile (Q–Q) plots. Figure 4 presents the results of this examination.

The guideline for this test states that the data set is following a normal distribution if the (blue) points are falling on the 45°-angle reference line (red). Seemingly, all the three quantiles each appear to be non-normally distributed and have heavy tails, since the pattern is above, below, above, and below the reference line. Consequently, the blue points crossed the reference line three times, which indicates that our data are leptokurtic.

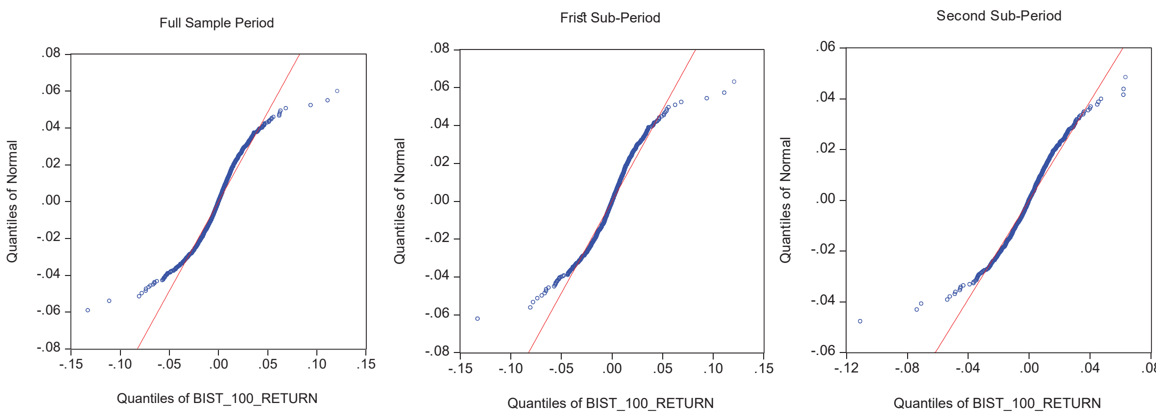

Figure 4. Quantile–Quantile (Q–Q) normal distribution plots.

Table 3. ADF unit root test for the BIST-100 return series

			Critical values		
Unit root test	**ADF statistic**	**Prob.***	**1%**	**5%**	**10%**
Full period	−48.34709	0.0001	−3.433	−2.862	−2.567
First subperiod	−34.458	0.0000	−3.435	−2.863	−2.568
Second subperiod	−36.152	0.0000	−3.436	−2.864	−2.568

ADF, augmented Dickey–Fuller.

Note: (1). MacKinnon [1996] one-sided p values. (2). Test equations include only constant term.

Table 4. ARCH–LM test for residuals of BIST-100 index returns

	Full sample	**First subperiod**	**Second subperiod**
ARCH–LM test statistic	160.20	96.011	38.601
Prob. Chi-Square (5)	0.0000	0.0000	0.0000

Note: (1). The equations include up to five lags. (2). Null hypothesis: There is no ARCH effect in the residuals. (3). Null hypothesis rejected at 1%.

3.4.3 Stationarity test

In this section, augmented Dickey–Fuller (ADF) unit root test was utilized for testing whether the return series are stationary or not. ADF test is the most widely used test for this purpose. The test statistics rejects the null hypothesis of the existence of unit root (non-stationarity in series) at 1% level of significance. Table 3 reports the results of the ADF test with an automatically selected maximum lag length (used by the AIC) of 26 for the full sample period, 22 for the first subperiod, and 21 for the second subperiod.

ADF statistics are statistically significant at 1% level and smaller than all their corresponding critical values, signaling that we can convincingly reject the null hypothesis of unit root in series, and therefore, conclude that return series of the three periods seem to be stationary.

3.4.4 Heteroscedasticity test

Performing a test for conditional heteroscedasticity and nonlinearity is an essential step when we think of using volatility models. In this section, our focus relies on the ARCH Lagrange Multiplier (LM) test proposed by Engle [1982]. According to Engle [1982], a time series is said to have autoregressive conditional heteroskedastic effects when conditional heteroscedasticity or autocorrelation in the squared series is present. The aim of this test, then, is to reveal the presence of ARCH effect in the residual series of the initial regression. Table 4 reports the results of ARCH–LM test. The examination was done after obtaining a least squares estimation with a simple ARMA(1,1) regression model.

The ARCH–LM test results for the equation with five lags in the test lead to strongly rejecting the null hypothesis in all periods, indicating that there is an ARCH effect in the returns of BIST-100, and therefore, GARCH models are appropriate to be used for modeling and forecasting the volatility of BIST-100 index returns.

4 Findings

This section presents the empirical results obtained from the symmetric and asymmetric volatility specifications used to model the previously observed conditional heteroscedasticity. Residual diagnostic checking was also done to confirm the absence of serial correlation and ARCH effect in the residuals. It is worth mentioning that all models were estimated with normal Gaussian error distribution and data were analyzed based on the assumption that investors' responses regarding political news headlines are reflected in the closing prices of BIST-100 on the same day.

4.1 The impact of political news

In this part of the analysis, both GARCH(1,1) and GARCH-M(1,1) models were used to test the first hypothesis that, political news releases have an impact on the returns and volatilities of BIST-100 index. In Table 5, the empirical results from GARCH(1,1) model for the full sample period indicate that political news releases have no significant impact on the returns and volatility of BIST-100 index, since the coefficients of the dummy variable $\boldsymbol{D_N}$ in the mean and variance equations are not statistically significant at any level.

However, when the full sample period is divided into two subperiods, the coefficients of the dummy variable $\boldsymbol{D_N}$ for the first subperiod are positive (0.002617**) and statistically significant at 5% in the mean equation, and negative (–2.31E05***) and statistically significant at 1% in the variance equation, suggesting that political news releases had a significant impact on both BIST-100 returns and volatility during that period, a positive impact on returns and a negative impact on volatility.

For the second subperiod, the coefficients of the dummy variable $\boldsymbol{D_N}$ are negative (–0.001916*) and statistically significant at 10% in the mean equation, and positive (7.00E-06***) and statistically significant at 1% in the variance equation, indicating a close similar impact result as the first subperiod, but with opposite signs.

The coefficients of the estimated ARCH α_1 and GARCH β_1 terms are positive and highly significant at the 1% level for all periods, suggesting the high existence of ARCH and GARCH effects in the returns of BIST-100 index. Further, the coefficients of GARCH term are quite larger than that of the ARCH term, indicating that the market has a memory lasting for more than one period.

Moreover, persistence in volatility clustering was also tested by calculating the sum of the coefficients of the estimated parameters α_1 and β_1. The coefficients of $\alpha_1 + \beta_1$ are close to unity for all periods, indicating a relatively high level of persistence in volatility clustering. In other words, the effect of volatility shocks tends to die out slowly, which in term might imply an inefficiency of the studied stock market [Arora, 2013].

Results from GARCH-M(1,1) model showed near similar results as were seen with GARCH(1,1) model. The model, as known, allows the conditional mean to depend on its own conditional variance or standard deviation. From estimation results in Table 5, the time-varying risk premium parameter α_3 in the mean equation is negative for all periods, meaning that the findings failed to prove the expected positive relationship between the returns and volatility of BIST-100 index. However, it is worth mentioning that if there was a positive relationship between volatility and returns of BIST-100 index, it was better captured by the standard deviation.

Results from symmetric GARCH models (after dividing the main sample into two subperiods) are in line with those of Kim and Mei [1994] who found that political events have a significant and measurable impact on the returns and volatility of Hang Seng index for the period 1989–1993.

Table 5. Estimation of GARCH(1,1) and GARCH-M(1,1) for BIST-100 with political news

Model	GARCH(1,1)			GARCH-M(1,1)		
	Full sample	First subperiod	Second subperiod	Full sample	First subperiod	Second subperiod
Mean equation						
α_0	0.001111***	0.001128**	0.000948**	0.001978*	0.002472*	0.002450
α_1	−0.002174	0.031160	−0.054024*	−0.002785	0.029342	−0.055269*
α_2	−0.000760	0.002617**	−0.001916*	−0.000780	0.002426*	−0.001862*
α_3	−0.061635	−0.091964	−0.118868			
Variance equation						
ω	7.41E-06***	1.00E-05***	6.43E-07	7.36E-06***	9.94E-06***	6.57E-07
α_1	0.076551***	0.102251***	0.015308***	0.076102***	0.102292***	0.015462***
β_1	0.898723***	0.874146***	0.972044***	0.899766***	0.874655***	0.972123***
α_2	−4.46E-06	−2.31E05***	7.00E-06***	−5.14E06	−2.37E-05***	6.71E-06***
$\alpha_1+\beta_1$	0.975274	0.976397	0.987352	0.975868	0.976947	0.987585
AIC	−5.526698	−5.393872	−5.765890	−5.526090	−5.393065	−5.764631
SC	−5.510059	−5.366623	−5.734145	−5.507075	−5.361924	−5.728350
Standardized residuals (12)						
AC	0.050	0.062	0.030	0.048	0.060	0.029
Standardized residuals squared (12)						
AC	0.012	0.012	0.052	0.012	0.012	0.051
ARCH–LM Test (12)						
Obs*R^2	9.984522	9.742550	13.28401	9.960117	9.442707	13.38535

AIC, Akaike Information Criterion; SC, Schwarz Criterion.

Note: The results in the table are derived based on the following symmetric GARCH(1,1) and GARCH-M(1,1) models:

$$r_t = a_0 m + a_1 r_{t-1} + a_2 D_N + e_t$$

$$\sigma_t^2 = \omega + \alpha_1 u_{t-1}^2 + \beta_1 \sigma_{t-1}^2 + \alpha_2 D_N$$

$$r_t = \alpha_0 \mu + \alpha_1 r_{t-1} + \alpha_2 D_N + \alpha_3 \lambda \sigma_t^2 + \varepsilon_t$$

$$\sigma_t^2 = \omega + \alpha_1 u_{t-1}^2 + \beta_1 \sigma_{t-1}^2 + \alpha_2 D_N$$

The dummy variable D_N used as a proxy for political news. Significance is denoted with asterisks. *, **, and ***indicate significance at the 10%, 5%, and 1% levels, respectively.

Results from asymmetric GARCH models are more detailed and tend to be of superior accuracy than the results from symmetric models, because they help in quantifying the magnitude of the impact of both news categories and testing if one category has the dominant impact on the results among the other category. In the next two parts, both EGARCH(1,1) and TGARCH(1,1) models were used to test the second hypothesis that bad political news has a greater effect on stock market returns and volatility than good news.

4.1.1 The impact of good news

Table 6 reports the empirical results from EGARCH(1,1) and TGARCH(1,1) models for the impact of good political news on BIST-100 index. The results from both models indicate that good political news has no significant impact on the returns of BIST-100 index for all the studied periods. This is evidenced by the coefficients of good news dummy variable D_G in the mean equation part, which is insignificant in all models and periods.

However, some interesting results arose from the variance equations of both models. Results from EGARCH show that good political news has a negative (–0.071438**) and significant impact on the volatility during the second subperiod. Moreover, results from TGARCH also show a negative (–2.17E-05**) and significant

Table 6. Estimation of EGARCH(1,1) and TGARCH(1,1) for BIST-100 with good news

Model	EGARCH(1,1)			TGARCH(1,1)		
	Full sample	First subperiod	Second subperiod	Full sample	First subperiod	Second subperiod
Mean equation						
α_0	0.000724***	0.000906**	0.000333	0.000729**	0.000934**	0.000522
α_1	0.005798	0.057195*	−0.040277	0.008394	0.043277	−0.050734
α_2	−0.000510	−0.000947	0.000183	−0.000632	−0.000833	0.000335
Variance equation						
ω	−0.366020***	−0.433170***	−0.138736***	1.02E-05***	1.02E-05***	3.25E-06***
α_1	0.147939***	0.192757***	0.003007	0.035126***	0.053410***	−0.008972*
γ_1	−0.07549***	−0.084255***	−0.058738***	0.092297***	0.105968***	0.040310***
β_1	0.969516***	0.965389***	0.984060***	0.881138***	0.863366***	0.970516***
α_2	−0.047879	0.012282	−0.071438**	−2.17E-05**	−2.13E-05	−1.08E-05
$\alpha_1+\beta_1$	1.117455	1.158146	0.987067	0.916264	0.916776	0.961544
AIC	−5.540874	−5.395254	−5.785344	−5.540191	−5.400103	−5.769109
SC	−5.521858	−5.364113	−5.749063	−5.521175	−5.368962	−5.732828
Standardized residuals (12)						
AC	0.052	0.060	0.043	0.055	0.028	0.048
Standardized residuals squared (12)						
AC	0.032	0.032	0.061	0.028	0.028	0.073
ARCH–LM test (12)						
Obs*R^2	15.58045	18.11254	16.88094	12.18862	13.19092	13.47925

AIC, Akaike Information Criterion; SC, Schwarz Criterion.

Note: The results in the table are derived based on the following asymmetric EGARCH(1,1) and TGARCH(1,1) models:

$$r_t = a_0 m + a_1 r_{t-1} + a_2 D_G + e_t$$

$$\ln\left(\sigma_t^2\right) = \omega + \alpha_1\left\{\left|\frac{\varepsilon_{t-1}}{\sigma_{t-1}}\right| - \sqrt{\frac{2}{\pi}}\right\} + \gamma_1\frac{\varepsilon_{t-1}}{\sigma_{t-1}} + \beta_1\ln\left(\sigma_{t-1}^2\right) + \alpha_2 D_G$$

$$r_t = \alpha_0\mu + \alpha_1 r_{t-1} + \alpha_2 D_G + \varepsilon_t$$

$$\sigma_t^2 = \omega + \alpha_1\varepsilon_{t-1}^2 + \gamma_1 d_{t-1}\varepsilon_{t-1}^2 + \beta_1\sigma_{t-1}^2 + \alpha_2 D_G$$

The dummy variable DG used as a proxy for good political news. Significance is denoted with asterisks. *, **, and ***indicate significance at the 10%, 5%, and 1% levels, respectively.

impact of good news on volatility during the full sample period. Suggesting that, good news, as was expected, decreased BIST-100 index's return volatility during the full sample period and the second subperiod, with greater magnitude during the second subperiod which spans from June 2013 to December 2017. This result is in line with the findings of Suleman [2012], who analyzed the consequences of political news on KSE between 1992 and 2010 and found that good news has decreased KSE-100 index's return volatility.

Table 6 also presents the results of asymmetry and leverage effect in the returns of BIST-100 index. As seen in the variance equation part for all periods tested, the value of γ_1 is negative in EGARCH estimations and positive in TGARCH, indicating the presence of leverage effect, which means that the impact of the positive shocks to the volatility of BIST-100 index is smaller than that of the negative shocks of the same magnitude.

4.2 The impact of bad news

After testing BIST-100 index reaction to political news, and quantifying the impact of good news on stocks, it is time to check the impact of bad news to better understand why the results of the "full sample" period have indicated an insignificant impact of political news on the returns and volatilities of the studied index. So, this will help in determining if the impact of bad news variable was absorbed by the impact of good news variable when the two variables were combined into one inclusive or general variable (political news).

Table 7 reports the empirical results from EGARCH(1,1) and TGARCH(1,1) models for the impact of bad political news on BIST-100 index. The results from both models for the full sample period indicate that bad political news has no significant impact on the returns and volatilities of BIST-100 index, this evidenced by the insignificant coefficients of the bad news dummy variable D_B in the mean and variance equations.

Nevertheless, results from both models for the first and second subperiods suggest that there is a statistically significant impact of bad news on the returns and volatility of BIST-100 (with a relatively higher significance level associated with the second subperiod), which is clearly shown by the coefficients of D_B in the mean and variance equations in Table 7.

Therefore, it can be concluded that (1) The impact of bad news variable might be absorbed by the impact of good news variable when the "general" political news variable was analyzed alone, (2) It seems that the assumption of the impacts of both the 2008 Global Financial Crisis and 2013 Federal Reserve Tapering on

Table 7. Estimation of EGARCH(1,1) and TGARCH(1,1) for BIST-100 with bad news

Model	EGARCH(1,1)			TGARCH(1,1)		
	Full sample	First subperiod	Second subperiod	Full sample	First subperiod	Second subperiod
Mean equation						
α_0	0.000821***	0.000743*	0.000744*	0.000774**	0.000716*	0.000934**
α_1	0.006147	0.059654**	−0.046279	0.008156	0.042385	−0.054156*
α_2	−0.001054	0.003145**	−0.002748***	−0.001045	0.003549**	−0.003142***
Variance equation						
ω	−0.335437***	−0.380741***	−0.142205***	8.82E-06***	1.06E-05***	7.00E-07
α_1	0.139369***	0.184271***	0.013892	0.033089***	0.049834***	−0.014458**
γ_1	−0.071022***	−0.079453***	−0.050282***	0.092487***	0.100430***	0.039582***
β_1	0.972227***	0.969907***	0.985540***	0.886495***	0.870900***	0.978532***
α_2	−0.030995	−0.145424***	0.034923**	−1.11E-06	−2.82E-05***	1.18E-05***
$\alpha_1+\beta_1$	1.111596	1.154178	0.999432	0.919584	0.920734	0.964074
AIC	−5.541641	−5.401561	−5.789227	−5.539515	−5.406895	−5.782023
SC	−5.522625	−5.370420	−5.752947	−5.520500	−5.375754	−5.745742
Standardized residuals (12)						
AC	0.050	0.059	0.033	0.053	0.064	0.036
Standardized residuals squared (12)						
AC	0.031	0.025	0.058	0.026	0.022	0.063
ARCH–LM Test (12)						
Obs*R^2	15.72301	16.89227	13.51268	12.02281	12.06731	11.94038

AIC, Akaike Information Criterion; SC, Schwarz Criterion.

Note: The results in the table are derived based on the following asymmetric EGARCH(1,1) and TGARCH(1,1) models:

$$r_t = a_0 m + a_1 r_{t-1} + a_2 D_B + e_t$$

$$\ln\left(\sigma_t^2\right) = \omega + \alpha_1\left\{\left|\frac{\varepsilon_{t-1}}{\sigma_{t-1}}\right| - \sqrt{\frac{2}{\pi}}\right\} + \gamma_1\frac{\varepsilon_{t-1}}{\sigma_{t-1}} + \beta_1\ln\left(\sigma_{t-1}^2\right) + \alpha_2 D_B$$

$$r_t = \alpha_0\mu + \alpha_1 r_{t-1} + \alpha_2 D_B + \varepsilon_t$$

$$\sigma_t^2 = \omega + \alpha_1\varepsilon_{t-1}^2 + \gamma_1 d_{t-1}\varepsilon_{t-1}^2 + \beta_1\sigma_{t-1}^2 + \alpha_2 D_B$$

The dummy variable D_B used as a proxy for bad political news. Significance is denoted with asterisks. *, **, and ***indicate significance at the 10%, 5%, and 1% levels respectively.

the BIST-100 is justified, evidenced by the significant results obtained when the full sample period was split into two subperiods, (3) Political news, both good and bad, can affect stock returns and stock return volatility in different ways or directions, and this direction differs across periods (a time-varying direction). Accordingly, in our case, the impact direction during the first subperiod was positive for the returns and negative for the volatility, whereas it was negative for the returns and positive for the volatility during the second subperiod. This conclusion, is to some extent, in line with the findings of [Kulwarothai, 2013] who studied SET in 2006–2011 and found that stock returns and volatility vary according to political parties and their policies, and political news, both favorable and unfavorable, increase the volatility of stock return and affect stock return in different ways.

Finally, the asymmetric effect in the returns of BIST-100 index is tested again for more accuracy, and as observed in Table 7, the value of γ_1 is negative in EGARCH estimations and positive in TGARCH, which ensures the presence of leverage effect in stock returns. In other words, it can be concluded again that the impact of the negative shocks to the volatility of BIST-100 index is greater than that of the positive shocks.

4.3 Residual diagnostic and model robustness

In this part, two serial correlation tests (Correlogram-Q-statistics and Correlogram squared residuals) and one heteroscedasticity test (ARCH LM) were implemented to confirm the absence of both serial correlation and ARCH effect in the residuals after estimating GARCH models. Residual Diagnostic was done using a maximum lag length of 12 for serial correlation tests, and 12 lags for heteroscedasticity test.

Results from Tables 5 to 7 show that serial correlation tests for the estimated GARCH models all confirm the null hypothesis that there is no serial correlation in the residuals, since their p values are greater than 0.05 for all lags (insignificant). The results also imply that all models do not longer exhibit any ARCH effect in the residuals, evidenced by the p values that in all cases were greater than 0.05.

Finally, fitness and robustness of the models were examined by comparing the values of AIC and SC. The guideline for this examination is that the lower the AIC or SC, the better is the fit of the model. The values of AIC and SC for every specification are reported in the previous Tables 5–7. According to those values, it can be said that GARCH(1,1) model is better than GARCH-M(1,1) model in capturing the symmetric effect of political news on the returns and volatility of BIST-100 index. While EGARCH(1,1) model is better than TGARCH(1,1) model in capturing the asymmetric effects of good and bad political news on the returns and volatility of BIST-100 index during the study periods.

5 Conclusions

Turkey's political uncertainty arises from its geopolitical position and strategic location as a bridge between west and east. Since the election of Abdullah Gül as the president in August 2007, Turkey has entered a new era in its internal and external politics and relationships to other countries, but the question is; is this new era characterized by political uncertainty which adversely affecting the Turkish stock market? or one can say political uncertainty is no longer a problem for the Turkish stock market? This paper attempted to empirically answer the previous questions through examining the impact of political news on the returns and volatility of the Turkish stock market represented by the BIST-100 index. Different GARCH-type models were used to test the hypotheses, since they have the ability to explain main features prevalent in financial market.

The data on political news events were collected from the Guardian newspaper and split into two categories (good and bad) news. Time series data of the study consists of daily closing prices, presented in local currency (TRY), and collected from the EVDS web service developed by the Central Bank of the Republic of Turkey. Stock market data cover the period from January 2008 to December 2017. The main sample was also divided into two subperiods to insulate the dominating impacts of both the 2008 Global Financial Crisis and 2013 Federal Reserve Tapering on the overall Turkish economy, especially BIST-100 index. Thus, the first subperiod spans the time from January 2008 to May 2013, while the second subperiod runs from June 2013 to December 2017.

The findings of the study highlight four main results. First, there seems to be a significant impact of political news on the returns and volatility of BIST-100 index. Second, negative shocks derived from bad news tend to have a significant impact on the returns and volatility of BIST-100, while positive shocks derived from good news do not tend to have any significant impact on the returns, but decreased return volatility. Third, political news, both good and bad, can affect stock return and stock return volatility in different ways or directions, and this direction is time-varying. Fourth, the findings strongly reveal the presence of leverage effect in the returns of BIST-100 index. Therefore, one can say that political uncertainty is still a problem for the Turkish stock market.

Broadly, the implications of the study are that (1) in spite of Turkey's fast-growing economy and regional political influence, domestic and foreign investors who plan to invest in the Turkish stock market still need to carefully take into consideration political risk and (2) this continuing political risk requires Turkey's political and economic/financial–policy makers to work together in closer harmony and integration to mitigate risk and create a more secure investment environment.

This paper contributes to the existing literature mainly by covering a critical period in the modern political history of Turkey, since two fateful events were occurred: July 15, 2016 coup attempt and April 16, 2017 constitutional referendum. In this paper, there are two limitations that must be addressed. The first limitation is associated to the news data. Selected news may not be the most appropriate to explain political risk and uncertainty in Turkey. The second limitation is that the study ignored all other factors that may also affect stock market, and focused only on the political factors, that may explain a part of the relationship with stock market. Thus, the research can be expanded to include further analysis on the industry or individual stock level, or by including other BIST indices, such as BIST 50 and BIST 30, or even other countries' indices. Moreover, additional variables such as the economic variables and global factors could be included.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

References

Arora, H. (2013). Testing weak form of efficiency of Indian stock market, *Pacific Business Review International*, Vol. 5. No. 12, pp. 16–23.

Asteriou, D., Hall, S.G. (2007). *Applied econometrics: a modern approach*, Rev. edn, Palgrave Macmillan, New York.

Beaulieu, M.-C., Cosset, J.-C., Essaddam, N. (2006). Political uncertainty and stock market returns: evidence from the 1995 Quebec referendum, *Canadian Journal of Economics, Canadian Economics Association*, Vol. 39, No. 2, pp. 621–642.

Białkowski, J., Gottschalk, K., Wisniewski, T.P. (2008). Stock market volatility around national elections, *Journal of Banking and Finance*, Vol. 32, No. 9, pp. 1941–1953.

Bilson, C.M., Brailsford, T.J., Hooper, V.C. (2002). The explanatory power of political risk in emerging markets, *International Review of Financial Analysis*, Vol. 11, No. 1, pp. 1–27.

Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity, *Journal of Econometrics*, Vol. 31, No. 3, pp. 307–327.

Brooks, C. (2002). *Introductory econometrics for finance*, Cambridge University Press, Cambridge.

Engle, R., Lee, G. (1993). *A permanent and transitory component model of stock return volatility*, University of California at San Diego, San Diego. Discussion Paper 92-44R.

Engle, R.F. (1982). Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflation, *Econometrica*, Vol. 50, No. 4, pp. 987–1007.

Engle, R.F., Lilien, D.M., Robins, R.P. (1987). Estimating time varying risk premia in the term structure: the arch-m model, *Econometrica*, Vol. 55, No. 2, pp. 391–407.

Engle, R.F., Ng, V.K. (1993). Measuring and testing the impact of news on volatility, *The Journal of Finance*, Vol. 48, No. 5, pp. 1749–1778.

Erb, C., Harvey, C., Viskanta, T. (1996). Political risk, economic risk and financial risk, *Financial Analysts Journal*, Vol. 52, No. 6, pp. 29–46.

Glosten, L.R., Jagannathan, R., Runkle, D.E. (1993). On the relation between the expected value and the volatility of the nominal excess return on stocks, *The Journal of Finance*, Vol. 48, No. 5, pp. 1779–1801.
İlkuçan, A. (2004). *The effects of political and economic news on the intradaily performance of the Istanbul Stock Exchange*, Bilkent University, Dept. of Management - Master's degree [289], Ankara. Retrieved from http://hdl.handle.net/11693/29585.
Kim, H.Y., Mei, J. (1994). *Political risk and stock returns: the case of Hong Kong*, NYU Working Paper No. FIN-94-039.
Kulwarothai, T. (2013). *The effect of political risk on the volatility of stock return: evidence from Thailand*, Thammasat University, Pathum Thani. Retrieved from http://203.131.219.242/cdm/ref/collection/thesis/id/31026
MacKinnon, J. G. (1996). Numerical distribution functions for unit root and cointegration tests, *Journal of Applied Econometrics*, Vol. 11, pp. 601–618.
Nelson, D.B. (1991). Conditional heteroskedasticity in asset returns: a new approach, *Econometrica*, Vol. 59, No. 2, pp. 347–370.
Osa, P.B. (2014). *Political leaders and financial markets: a quantitative study of the markets response to changing political leadership*, University of Oslo, Institutt for statsvitenskap [2806], Oslo. Retrieved from http://urn.nb.no/URN:NBN:no-45094.
Rossi, E. (2004). *Lecture notes on Garch models*, University of Pavia, Lombardy. Retrieved from http://economia.unipv.it/pagp/pagine_personali/erossi-old/note32004a.pdf.
Sottilotta, C.E. (2013). Political risk: concepts, definitions, challenges, *Paper Presented at Annual LUISS School of Government Annual Conference*. LUISS Guido Carli, Rome.
Suleman, M.T. (2012). Stock market reaction to good and bad political news, *Asian Journal of Finance and Accounting*, Vol. 4, No. 1, pp. 299–312.
Taylor, S. (1986). *Modelling financial time series*, Wiley, Chichester.
Zakoian, J.-M. (1994). Threshold heteroskedastic models, *Journal of Economic Dynamics and Control*, Vol. 18, No. 5, pp. 931–955.