

An Empirical Investigation of the Uncertain Information Hypothesis: Evidence From Borsa Istanbul

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Abstract

This paper investigates the reaction of investors to the arrival of major political and economical news in Borsa Istanbul from October 2004 to September 2011. While the empirical results of the paper cannot support the prediction of Overreaction Hypothesis, they are consistent with the Uncertain Information Hypothesis which means investors in Turkey set security prices below their fundamental values in response to unexpected information. In comparison with the studies examining previous periods, we found that this impact is diminishing and Borsa Istanbul has become more efficient for the period of 2004 to 2011.

Key Words: *Uncertain Information Hypothesis, Overreaction Hypothesis, Efficient Market Hypothesis, Borsa Istanbul*

JEL Classification: *G14, G15*

Özet - Belirsiz Bilgi Hipotezi Üzerine Ampirik Bir İnceleme: Borsa İstanbul Örneği

Bu çalışma, Ekim 2004 ile Eylül 2011 arasında Borsa İstanbul'a ulaşan, büyük öneme sahip, politik ve ekonomik haberlere yatırımcıların verdiği tepkileri incelemektedir. Çalışmanın ampirik sonuçları Aşırı Tepki Verme Hipotezinin öngörülerini desteklememekle birlikte sonuçlar Belirsiz Bilgi Hipotezi ile tutarlı bulunmuştur. Dolayısıyla Türkiye'deki yatırımcıların beklenmeyen bilgilere karşı menkul kıymet fiyatlarını temel değerlerinin altında belirlediği görülmüştür. Ancak çalışmanın sonuçları önceki dönemleri inceleyen çalışmalarla karşılaştırıldığında, bu etkinin azaldığı ve Borsa İstanbul'un 2004-2011 döneminde daha etkin hale geldiği sonucuna ulaşılmıştır.

Anahtar Kelimeler: *Belirsiz Bilgi Hipotezi, Aşırı Tepki Verme Hipotezi, Etkin Piyasalar Hipotezi, Borsa İstanbul*

JEL Sınıflandırması: *G14, G15*

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1. Introduction

Since Efficient Market Hypothesis (EMH) has emerged in the 1960s (Cootner, 1964; Fama, 1965; Samuelson, 1965; Fama, 1970), it has been subject to great numbers of studies. Under the assumption of rational investor, this hypothesis proposes that stock prices fully reflect all relevant information and expectation, and that any new information is incorporated into stock prices rapidly (see Figure 1). On the contrary, empirical studies indicate that stock prices do not always reflect all available information. This contradiction has led to the emergence of new study fields in behavioral finance such as the Overreaction Hypothesis (OH) of De Bondt and Thaler (1985, 1987) and the Uncertain Information Hypothesis (UIH) of Brown et al., (1988, 1993) (Mehdian et al., 2008).

The OH argues that investors overreact to information in some cases such as stock price moves upward too far in reaction to favorable news and moves downward too far in reaction to unfavorable news, while under-react in others such as stock price does not move upward far enough in reaction to favorable news, or does not move downward far enough in reaction to unfavorable news (Bloomfield et al. 2000). Howe (1986) indicates that investors overreact to dramatic and unanticipated news in more cases. From these points of views, the OH suggests that stock prices tend to fall after an extreme reaction to favorable news, and rise after extreme reaction to unfavorable news. In addition, the rises and falls in stock prices will be as greater as the initial price movements (see Figure 2) (De Bondt and Thaler, 1985). Consistent with the prediction of the OH, De Bondt and Thaler (1985) find that the losers portfolios consistently beat the market index, while the winners portfolio consistently underperformed in the U.S. stock markets. Akkoc (2003) and Sevim et al. (2007) reach similar results for Borsa Istanbul. Sevim et al. (2007) suggest a trading strategy of buying past losers and selling past winners to achieve abnormal returns. There are numerous studies on the existence of the OH in international markets (Howe, 1986; Alonso and Robio, 1990; Zarowin, 1989; Pettengill and Jordan, 1990) but still there is not general consensus in the literature whether the OH holds true.

The UIH asserts that uncertainty and risk will increase in financial markets following the release of unexpected information. So that investors cannot properly

react to unexpected news and therefore they could initially set security prices below their fundamental values. According to the UIH, there will always be a positive market correction following both favorable and unfavorable events (see Figure 3) (Ajayi et al. 2006; Mehdian et al., 2008).

In recent years, there has been an increasing amount of literature examining the reactions of investors to the arrival of unexpected information in the small stock markets. However, these studies have reached different and contradictory results. Shacmurove (2002) examines the investor reactions in thirteen small European stock markets in order to find an international support for the presence of the above mentioned Hypotheses. The author indicates that the UIH is not supported by nine of thirteen stock markets because the return variances of favorable news are larger than the return variances of unfavorable news. The author also states that the arrival of unexpected information does not increase European stock market volatility. Consequently, he decides that the European investors operating in the small continental stock exchanges generally react to uncertain information in an efficient and rational behavior. In contrast to the findings of Shacmurove (2002), De Medeiros (2005) demonstrates that Brazilian investors do otherwise. In Brazilian stock market, following the release of positive (negative) events, investors increase (decrease) stock prices immediately, but they fall (rise) back to an intermediate level after about 5 days verifying that overreaction has occurred. Mehdian et al. (2008) cannot find a statistical support of significant price reversals following the release of unexpected news in the Turkish stock market while they indicate strong statistical evidence that the positive cumulative abnormal returns following both positive and negative events. A recent study, in Turkish stock market by Erzurumlu (2011) suggests that the OH holds true for BIST 100 Index especially following unfavorable events while the EMH is valid for BIST 30 Index. The author associates efficiency on BIST 30 Index to the highly liquid and informational efficient stocks in the Index. Another emerging market study by Rezvanian et al. (2011) get consistent results with the UIH. The authors conclude that investors in Chinese stock market initially set equity prices below their fundamental values in response to unexpected information.

Figure 1: Efficient Market Hypothesis

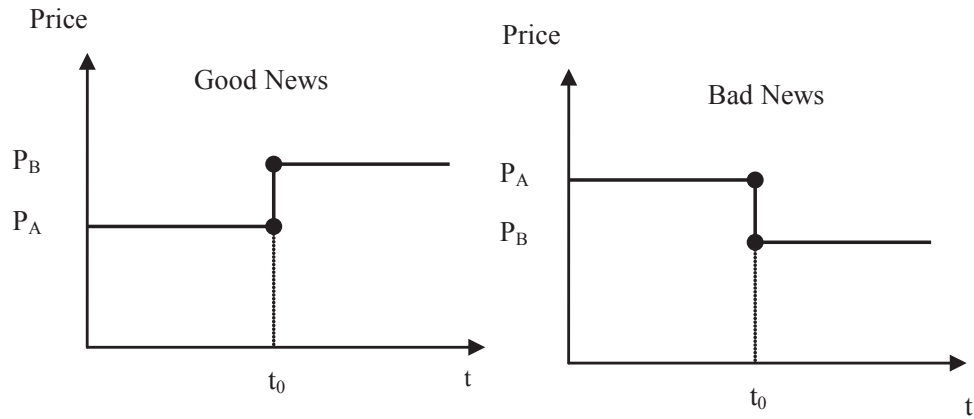


Figure 2: Overreaction Hypothesis

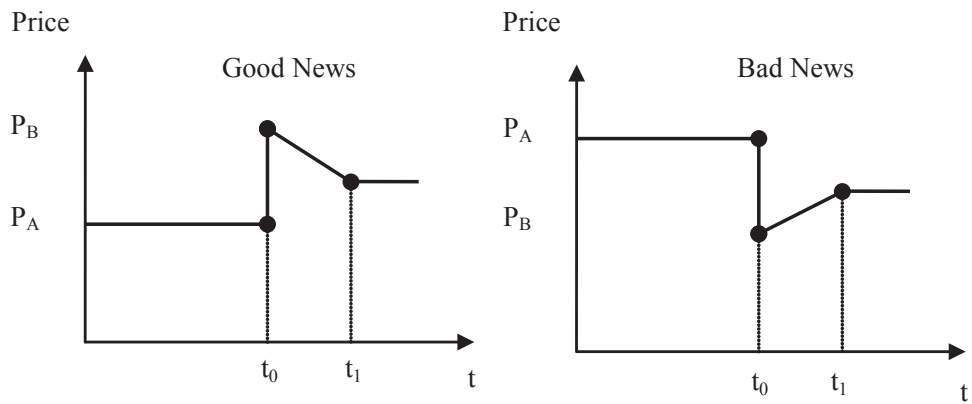
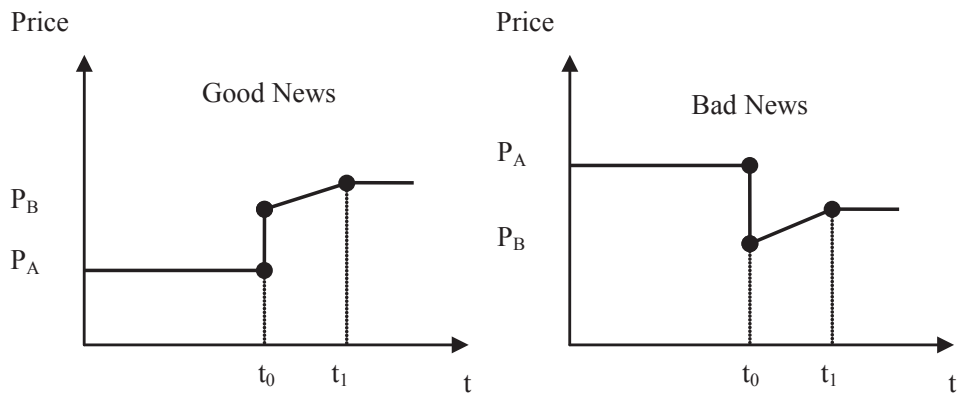


Figure 3: Uncertain Information Hypothesis



P_A = price before the news
 P_B = price after the news

Mehdian et al. (2008) states that there is a need to study on investors' reaction in emerging equity markets with high volatility such as Turkey. In this context, the aim of this paper is to examine investor reaction to the arrival of major political and economic events in Borsa Istanbul from 2004 to 2011. This paper can be seen as a follow up study of Mehedian et al. (2008) study. We use daily returns from the five major Borsa Istanbul indices (BIST 100 Index, BIST 30 Index, BIST All-Share Index, BIST Industrials Index, BIST Financials Index) following 27 major unexpected events to investigate whether investors' reaction are consistent with the predictions of the EMH, the OH, and the UIH.

This paper has been organized in the following way. The data and methodology are presented in Section II. Section III presents the empirical results and Section IV includes a conclusion.

2. Data and Methodology

The data for this study were collected from Borsa Istanbul website and consist of daily closing values for five major Borsa Istanbul indices from 11 October 2004 to 19 September 2011. These indices include BIST 100 Index (BIST 100), BIST 30 Index (BIST 30), BIST All-Share Index (BIST TUM), BIST Industrials Index (BIST SIN), and BIST Financials Index (BIST MAL). The 2004-2011 sample period is appropriate for this study since Mehedian et al. (2008) examines the preceding period.

The daily rates of return for each Turkish stock market index are calculated as follows:

$$R_{it} = \ln\left(\frac{I_{it}}{I_{it-1}}\right) * 100 \quad (1)$$

where R_{it} denotes the daily percentage rate of return for stock index i on day t ; I_{it} and I_{it-1} represent the closing values of stock index i on day t and $t-1$ respectively; and \ln is the natural log. To avoid inappropriate interpretation of the analysis, all stock market indices returns are tested for stationary using the Augmented Dickey Fuller unit root tests (Dickey and Fuller, 1981). The test results show that daily stock returns are stationary for the all stock market indices.

Table 1: Summary statistics for the stock indices

Index	Mean Return (%)	SD (%)	Maximum (%)	Minimum (%)
BIST 100	0.0539	1.8833	12.1272	-9.0137
BIST 30	0.0510	2.0154	12.7255	-9.7398
BIST TUM	0.0565	1.8095	11.6517	-8.9134
BIST SIN	0.0503	1.5668	8.3876	-9.6219
BIST MAL	0.0583	2.2041	14.1217	-10.8776

The sample period is from 11 October 2004 to 19 September 2011

Table 1 presents the summary statistics of daily mean returns for all stock market indices included in the analysis. Compared to the 0.0539% daily mean return for BIST 100, the basic index for the Borsa Istanbul, two of the indices have lower returns (BIST 30 and BIST SIN) and two of the indices have higher returns (BIST TUM and BIST MAL). The figures in Table 1 demonstrates that the BIST MAL generates the highest daily mean return (0.0583%) and standard deviation (2.2%) while the daily mean return for the BIST SIN records the lowest return (0.0503%) with a lowest standard deviation (1.57%) among the indices.

In order to determine event days, we use simple and similar approach consistent with Atkins and Dyl (1990), Cox and Peterson (1994), Bremer et al. (1997), and Pham et al. (2008). We examine all daily rates of return for BIST 100 Index that were less (greater) than or equal to -5 (+5) percent over the period from October 2004 to September 2011. We then define these rates of returns as extreme price change events. Atkins and Dyl (1990), and Bremer et al. (1997) state that extremely large one-day price changes are caused by unexpected information related to the value of the stock such as unexpected operating results, or unanticipated government decisions. Therefore, it can be said that these events provide an opportunity to discover whether stock prices accurately reflect unexpected information or overreact to such information (Pham et al., 2008). Using this method, we identify 27 major political and economic events which had a significant impact on Borsa Istanbul Indices either positively (11 events) or negatively (16 events) (see Table 2). Furthermore, we track daily stock returns over a 30-day window after each event and define a total of 441 post-event days¹. Post-event days consist of 198 post-favorable and 243 post-unfavorable event days. The rest of the sample, 1254 days, is called as non-event days which do not fall within any of the 30 day windows following major events.

¹ All event days are not followed by a full 30 day post event window because there are several cases where two events occur within a 30 day period.

We next investigate whether the arrival of unexpected information (favorable or unfavorable) affects the volatility of the stock market returns. In order to do this, we calculate the variance of daily stock returns for the post-event days (favorable and unfavorable events) and for the non-event days. The variances are computed as follows:

$$\text{Var} = \frac{1}{N_j - 1} \sum_{t=1}^{N_j} (R_{it} - \bar{R}_{ij})^2 \quad (2)$$

where N_j is the number of days in each category (post-event or non-event days), R_{it} denotes the daily return of stock index i on day t , \bar{R}_{ij} represents the average return of each category (post-event or non-event days), while $j=1, 2, 3$ stands for unfavorable events, favorable events and non-events, respectively. Then, F-test is performed and F-statistics is calculated to compare the volatility of all post-event days to the volatility of the all non-event days. The null hypothesis of the F-test asserts that the variance of returns for post-event days is equal to the variance of returns for all non-event days. Due to unexpected events increase market volatility and uncertainty, we expect that the variance of returns in post-event windows to be significantly higher than the variance of returns for non-event days. Therefore, the null hypothesis needs to be rejected in consistent with the UIH. Moreover, similar procedures can be employed to test for any differences between the variances of returns for favorable events and the variances of returns for unfavorable events (Bush et al., 2010).

In order to determine whether the pattern of stock returns following unexpected information is consistent with the predictions of either the Overreaction Hypothesis or the Uncertain Information Hypothesis, we compute cumulative abnormal returns (CARs) for each favorable and unfavorable event periods by using the method of calculation outlined by Ajayi and Mehdiian (1994) and reproduced by Mehdiian et al. (2008) and Rezvanian et al. (2011). This method involves several steps.

Table 2: Dates and sources of unexpected favorable and unfavorable events

Date	Daily Return (%)					Event
	BIST 100	BIST 30	BIST TUM	BIST SIN	BIST MAL	
Unfavorable news						
22.05.2006	-8.67	-8.53	-8.51	-8.62	-8.59	FED increased interest rates, attack against Council of State, and early election rumors
13.06.2006	-5.84	-5.01	-5.91	-7.15	-5.54	Decline in major world indices
16.08.2007	-7.03	-6.94	-7.03	-7.09	-7.26	Uncertainty of the presidential election, Abdullah Gul made public his presidential candidacy and government formation process. Also, the sharp decline in Asian markets over the last three years.
21.01.2008	-6.61	-6.65	-6.39	-6.07	-6.51	Concerns about the economic recession in the US economy after a \$150 billion economic stimulus package announced by the President Bush
17.03.2008	-7.75	-7.70	-7.42	-7.10	-8.15	The opening of the closure case against the ruling Justice and Development Party
01.07.2008	-5.51	-6.11	-5.35	-5.65	-6.20	Oil prices reached record levels because of an increasing tension between Iran and Israel. High interest rate levels because of Treasury's domestic debt payments and increasing internal political tension (ongoing political uncertainty after the closure case against the ruling Justice and Development Party)
15.09.2008	-5.42	-5.25	-5.37	-4.85	-6.48	Bankruptcy announcement of Lehman Brothers
03-06.10.2008*	-14.65	-15.97	-14.39	-11.43	-17.73	Ongoing concerns about a slowdown in the US economy although the \$700 billion bailout package was accepted by the House of Representatives
10.10.2008	-8.03	-7.24	-8.09	-8.10	-9.98	The announcement of the US foreign trade deficit for August (59.14 billion) and increasing sales in world stock markets
16-17.10.2008*	-12.94	-15.01	-12.28	-6.94	-17.24	Severe decline in the Dow Jones and S&P 500 indices (7.87% and 9% respectively)
05.11.2008	-5.20	-5.51	-4.99	-3.71	-7.05	The IMF spokesmen announced that Turkey did not request a new economic program
17-18-19.11.2008*	-14.79	-15.25	-14.10	-14.67	-15.70	Announcements of several major institutions: Standard & Poor's revised Turkey's outlook to negative. The European Central Bank claimed that the financial system of industrialized countries was imperiled due to global crises. Fitch asserted that Turkish banks face challenges in the short term. Merrill Lynch Survey indicated that economic recession will continue in 2009 too.
01.12.2008	-5.53	-6.23	-5.34	-4.63	-6.98	Euro zone manufacturing PMI index fell to its lowest level. Turkish Exporters Assembly stated that export volume fell by 22% in November. Central Bank of the Republic of Turkey Monetary Policy Committee indicated that the global credit conditions would limit the internal and external demand.

(continued on next page)

Table 2 (continued)

Date	Daily Return (%)					Event
	BIST 100	BIST 30	BIST TUM	BIST SIN	BIST MAL	
08.01.2009	-6.22	-6.34	-6.08	-5.26	-7.59	Industrial production decreased by 13.9% in November. GDP figures from the Euro zone showed that Euro zone's economy shrunk by 0.2% in the third quarter of 2008. Developments in the framework of the Ergenekon case.
30.10.2009	-6.59	-6.55	-6.63	-5.95	-7.42	US consumer spending figures recorded the sharp decrease by 0.5% in 2009
05-08-10.08.2011*	-16.49	-17.12	-16.61	-16.64	-18.85	Standard & Poor's downgraded the US's AAA credit rating by one notch to AA+
Favorable news						
20.07.2006	5.10	5.65	4.88	3.54	5.74	Rate cut expectations in the US
19.09.2007	6.48	7.18	6.06	3.85	7.62	The FED cut interest rates by 50 basis points
24.01.2008	5.65	6.08	5.42	4.58	5.68	Expectations for another rate cut in the US and the growing prospect of expanded economic rescue plan
12.02.2008	5.18	5.99	4.82	2.96	5.23	Warren Buffet offered help to troubled bond insurers by reinsuring \$800 billion worth of municipal bonds
30.07.2008	5.44	6.66	4.90	1.59	6.89	Turkey's Constitutional Court decided not to close the ruling Justice and Development Party
19.09.2008	12.13	12.73	11.65	8.39	14.12	Moody's signaled that it may increase Turkey's credit rating
14.10.2008	5.29	5.37	5.12	4.87	5.54	Announcement of the US's decision to help the banks by \$250 billion
30.10.2008	9.39	10.71	9.17	7.99	12.12	The FED cut its benchmark interest rate by half a percentage point to 1%
24.11.2008	9.43	10.26	9.11	7.69	10.90	Rise in global stock markets and expectation of a new agreement between Turkey and IMF
29.04.2009	5.20	5.52	4.80	2.69	6.56	Optimistic expectations regarding the Turkish banks' balance sheets for the 1 st quarter
10.05.2010	6.90	6.97	6.88	6.46	7.69	Europe's finance ministers approved a rescue package worth €750 billion

* Daily returns of the consecutive days added together

In the first stage, the abnormal return for each index i on day t ($t=+1, \dots, +30$) following the unexpected event d , AR_{itd} , is calculated as by structuring the mean return of each index i (\bar{R}_{i3}) from the daily return on the same index:

$$AR_{itd} = R_{itd} - \bar{R}_{i3} \quad (3)$$

where $d = 1, \dots, n$, is the number of favourable or unfavourable events in each index i . R_{itd} denotes the return of each index i on day t for event d , and \bar{R}_{i3} equals the mean return of each index i for non-event days.

In the second step we obtain the mean abnormal return, \overline{AR}_{it} , on day t by adding the abnormal return for every event and divide them into the number of such events (n) as follows:

$$\overline{AR}_{it} = \frac{1}{n} \left(\sum_{d=1}^n AR_{itd} \right), \quad (t = +1, \dots, +30) \quad (4)$$

Eventually, the CARs are calculated by adding the mean abnormal returns over 30 days as:

$$CAR_{it} = CAR_{i(t-1)} + \overline{AR}_{it} \quad (5)$$

The statistical significance of the CARs is tested by using a standard t-test of the null hypothesis in which the CARs for each day are equal to zero during the post-event window. T-statistic is obtained as:

$$t = \frac{CAR_{it}}{[\text{Var}(CAR_{it})]^{1/2}} \quad (6)$$

The graphical representations of CARs for post-event windows following unfavorable and favorable events are presented for each index to determine whether investor reactions to unexpected information consistent with the predictions of the OH or the UIH (Bush et al., 2010).

3. Empirical Results

Table 3 provides the daily mean returns for all non-event days, post-event days, post-favorable event days, and post-unfavorable event days for each Borsa Istanbul Indices. As Table 3 displays, the post-event daily mean returns are higher than the non-event daily mean returns for all indices, except the BIST SIN index. In addition, as the figures in Table 3 shows, the daily mean returns for the post-unfavorable events days are higher than the daily mean returns for the post-favorable event days for all indices, but this is not the case for the BIST SIN index.

Table 3 : Mean daily returns for non-event days, all post-event days, post-favorable event days and post-unfavorable event days

INDEX	Non-event days (%)	All post-event days (%)	Post-favorable event days (%)	Post-unfavorable event days (%)
BIST 100	0.0855	0.1200	0.1005	0.1359
BIST 30	0.0742	0.1333	0.0855	0.1723
BIST TUM	0.0886	0.1226	0.1090	0.1337
BIST SIN	0.0997	0.0844	0.1093	0.0641
BIST MAL	0.0893	0.1449	0.1005	0.1810

Non-event days, all post-event days, post-favorable event days and post-unfavorable event days consist of 1254, 441, 198, and 243 number of days respectively.

In order to test whether unexpected events increase market volatility and uncertainty, predicted by UIH, we examine the variances of the return volatilities following unexpected events (see Table 4). The reason is that many papers report that unexpected events cause increased volatility statistics. In order to sustain the UIH, it is also suggested that variance volatilities following unfavorable news should be higher than volatilities following favorable news (Shachmurove, 2002).

Table 4: Variance of returns for non-event days, all post-event days, post-favorable days and post-unfavorable days

Index	Sample	Days	Variance (%)	F-stats ^a	F-stats ^b
BIST 100	Non-event days	1254	0.0228	0.58*	
	All post-event days	441	0.0394		
	Favorable	198	0.0349	1.53*	0.81***
	Unfavorable	243	0.0432	1.89*	
BIST 30	Non-event days	1254	0.0262	0.57*	
	All post-event days	441	0.0461		
	Favorable	198	0.0414	1.58*	0.83***
	Unfavorable	243	0.0500	1.91*	
BIST TUM	Non-event days	1254	0.0209	0.58*	
	All post-event days	441	0.0359		
	Favorable	198	0.0317	1.52*	0.80***
	Unfavorable	243	0.0395	1.89*	
BIST SIN	Non-event days	1254	0.0151	0.56*	
	All post-event days	441	0.0272		
	Favorable	198	0.0234	1.55*	0.77**
	Unfavorable	243	0.0304	2.01*	
BIST MAL	Non-event days	1254	0.0317	0.59*	
	All post-event days	441	0.0538		
	Favorable	198	0.0480	1.51*	0.82***
	Unfavorable	243	0.0587	1.85*	

^a F-statistic for equality of post-event and non-event variances.

^b F-statistic for equality of post-favorable and unfavorable event variances.

*, ** and *** indicates statistical significance at the 1%, %5 and 10% level respectively.

F test is used to analyze the relationship between the variance of daily returns for non-event days, all post-event days, favorable post-event days and unfavorable post-event days. Table 4 presents the results obtained from F-test which helps us to determine equality of variances. The results of F-test show that the variance of returns following unexpected events (favorable and unfavorable) is statistically significantly higher than the variance of returns for non-event days for all stock market indices (see Table 4 F-stats^a). The column of F-stats^b in Table 4 provides that the variance of returns for unfavorable event days is statistically significantly higher than the variance of returns for favorable event days for all stock market indices. These findings demonstrate that the arrival of unexpected information increase volatilities in Borsa Istanbul consistent with the UIH.

Table 5: Post-event cumulative abnormal returns (CARs) for BIST 100, BIST 30, BIST TUM, BIST SIN, BIST MAL indices: Unfavorable events

Day	BIST 100		BIST 30		BIST TUM		BIST SIN		BIST MAL	
	CARs	t-stat	CARs	t-stat	CARs	t-stat	CARs	t-stat	CARs	t-stat
1	0,0068	0,6797	0,0092	0,7375	0,0063	0,6848	0,0011	0,1394	0,0095	0,7021
2	-0,0055	-0,5546	-0,0038	-0,3036	-0,0055	-0,6013	-0,0074	-0,9625	-0,0072	-0,5363
3	-0,0035	-0,3555	-0,0012	-0,0990	-0,0033	-0,3545	-0,0045	-0,5946	-0,0052	-0,3859
4	-0,0034	-0,3428	-0,0006	-0,0465	-0,0032	-0,3487	-0,0098	-1,2852	-0,0025	-0,1881
5	-0,0023	-0,2356	0,0008	0,0658	-0,0022	-0,2394	-0,0098	-1,2829	-0,0013	-0,0961
6	-0,0057	-0,5766	-0,0010	-0,0818	-0,0056	-0,6104	-0,0166	-2,1774	-0,0008	-0,0625
7	0,0018	0,1822	0,0074	0,5931	0,0016	0,1785	-0,0103	-1,3523	0,0084	0,6216
8	-0,0020	-0,1982	0,0040	0,3168	-0,0018	-0,2011	-0,0138	-1,8071	0,0053	0,3946
9	-0,0077	-0,7698	-0,0021	-0,1679	-0,0067	-0,7312	-0,0199	-2,5989	0,0012	0,0877
10	-0,0095	-0,9497	-0,0026	-0,2061	-0,0086	-0,9366	-0,0239	-3,1284	0,0013	0,0991
11	-0,0007	-0,0679	0,0069	0,5549	-0,0006	-0,0664	-0,0201	-2,6300	0,0113	0,8369
12	0,0075	0,7581	0,0166	1,3329	0,0073	0,7930	-0,0179	-2,3371	0,0218	1,6115
13	0,0038	0,3808	0,0113	0,9054	0,0037	0,4073	-0,0159	-2,0833	0,0139	1,0314
14	0,0076	0,7616	0,0163	1,3096	0,0073	0,7935	-0,0119	-1,5594	0,0185	1,3693
15	0,0058	0,5805	0,0146	1,1739	0,0055	0,6031	-0,0132	-1,7243	0,0166	1,2286
16	0,0032	0,3202	0,0118	0,9443	0,0033	0,3629	-0,0150	-1,9620	0,0152	1,1228
17	0,0079	0,7955	0,0175	1,3989	0,0075	0,8126	-0,0114	-1,4988	0,0206	1,5239
18	0,0041	0,4098	0,0133	1,0678	0,0037	0,4003	-0,0134	-1,7585	0,0149	1,1004
19	0,0095	0,9549	0,0195	1,5598	0,0086	0,9314	-0,0069	-0,9072	0,0209	1,5481
20	0,0230	2,3058	0,0353	2,8296	0,0210	2,2849	-0,0013	-0,1639	0,0387	2,8684
21	0,0337	3,3865	0,0468	3,7520	0,0311	3,3821	0,0044	0,5764	0,0514	3,8114
22	0,0305	3,0671	0,0430	3,4432	0,0282	3,0646	0,0058	0,7528	0,0452	3,3501
23	0,0165	1,6576	0,0266	2,1328	0,0153	1,6690	0,0011	0,1498	0,0276	2,0463
24	0,0081	0,8099	0,0182	1,4580	0,0066	0,7169	-0,0049	-0,6366	0,0172	1,2718
25	0,0108	1,0872	0,0211	1,6887	0,0097	1,0531	-0,0008	-0,1024	0,0190	1,4056
26	0,0120	1,2009	0,0214	1,7131	0,0111	1,2038	0,0002	0,0320	0,0204	1,5092
27	0,0086	0,8678	0,0180	1,4429	0,0081	0,8781	-0,0017	-0,2240	0,0187	1,3888
28	0,0026	0,2570	0,0112	0,8994	0,0019	0,2109	-0,0124	-1,6249	0,0123	0,9085
29	0,0026	0,2656	0,0122	0,9766	0,0015	0,1590	-0,0172	-2,2465	0,0102	0,7540
30	0,0081	0,8174	0,0182	1,4562	0,0070	0,7577	-0,0105	-1,3693	0,0144	1,0660

Note: t-statistics in bold indicate statistical significance at the %10 level or higher

Figure 4: Unfavorable post-event cumulative abnormal returns

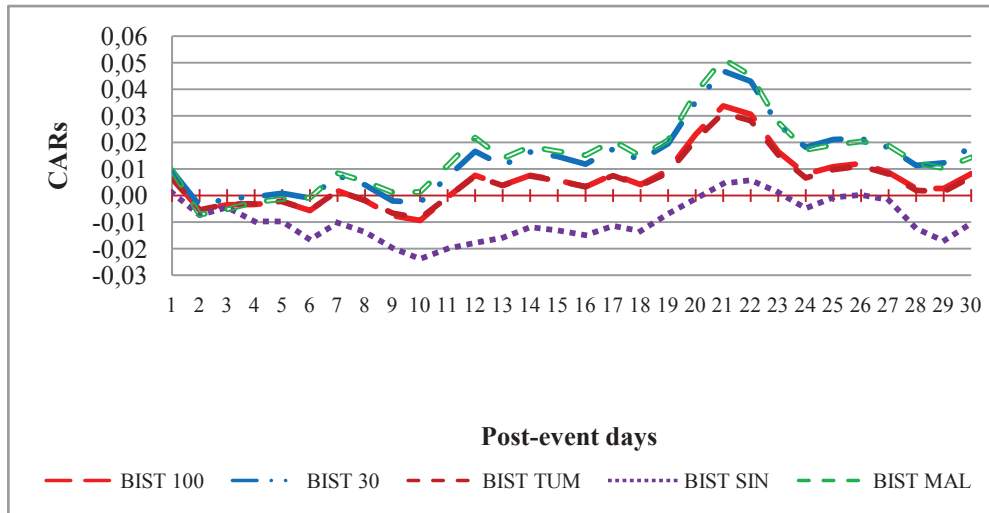


Table 6 : Post-event cumulative abnormal returns (CARs) for BIST 100, BIST 30, BIST TUM, BIST SIN, BIST MAL indices: Favorable events

Day	BIST 100		BIST 30		BIST TUM		BIST SIN		BIST MAL	
	CARs	t-stat	CARs	t-stat	CARs	t-stat	CARs	t-stat	CARs	t-stat
1	0,0067	0,6326	0,0065	0,6023	0,0061	0,6476	0,0081	0,8065	0,0055	0,4602
2	0,0086	0,8118	0,0067	0,6275	0,0078	0,8193	0,0105	1,0488	0,0065	0,5419
3	0,0185	1,7427	0,0174	1,6186	0,0175	1,8455	0,0192	1,9140	0,0168	1,4022
4	0,0219	2,0670	0,0214	1,9896	0,0209	2,2046	0,0213	2,1261	0,0224	1,8767
5	0,0212	2,0006	0,0216	2,0149	0,0196	2,0680	0,0180	1,7968	0,0230	1,9268
6	0,0234	2,2121	0,0232	2,1583	0,0217	2,2930	0,0229	2,2916	0,0230	1,9291
7	0,0157	1,4780	0,0134	1,2519	0,0143	1,5028	0,0178	1,7738	0,0126	1,0577
8	0,0124	1,1672	0,0095	0,8828	0,0112	1,1788	0,0148	1,4758	0,0084	0,7026
9	0,0065	0,6134	0,0032	0,3002	0,0062	0,6566	0,0109	1,0892	0,0015	0,1246
10	-0,0064	-0,6022	-0,0101	-0,9434	-0,0065	-0,6811	0,0000	-0,0044	-0,0138	-1,1530
11	0,0090	0,8526	0,0064	0,5941	0,0082	0,8604	0,0116	1,1591	0,0034	0,2847
12	0,0122	1,1555	0,0101	0,9410	0,0112	1,1857	0,0138	1,3787	0,0068	0,5662
13	0,0171	1,6130	0,0153	1,4220	0,0158	1,6698	0,0131	1,3075	0,0134	1,1234
14	0,0096	0,9051	0,0087	0,8097	0,0085	0,8942	0,0044	0,4393	0,0057	0,4791
15	0,0036	0,3434	0,0019	0,1778	0,0034	0,3555	0,0004	0,0373	-0,0002	-0,0193
16	0,0106	0,9969	0,0098	0,9152	0,0099	1,0434	0,0050	0,5041	0,0085	0,7121
17	0,0074	0,7000	0,0061	0,5686	0,0069	0,7252	0,0061	0,6045	0,0033	0,2731
18	0,0038	0,3578	0,0026	0,2464	0,0036	0,3827	0,0033	0,3272	-0,0001	-0,0079
19	-0,0033	-0,3123	-0,0057	-0,5345	-0,0026	-0,2724	0,0007	0,0651	-0,0094	-0,7844
20	-0,0061	-0,5780	-0,0080	-0,7445	-0,0055	-0,5752	-0,0030	-0,3003	-0,0112	-0,9336
21	-0,0012	-0,1167	-0,0028	-0,2596	-0,0006	-0,0617	0,0015	0,1523	-0,0051	-0,4246
22	-0,0055	-0,5239	-0,0081	-0,7584	-0,0043	-0,4487	0,0002	0,0190	-0,0111	-0,9273
23	-0,0108	-1,0162	-0,0132	-1,2296	-0,0094	-0,9934	-0,0082	-0,8225	-0,0164	-1,3756
24	-0,0083	-0,7823	-0,0096	-0,8925	-0,0068	-0,7189	-0,0073	-0,7306	-0,0134	-1,1253
25	-0,0043	-0,4058	-0,0047	-0,4351	-0,0030	-0,3137	-0,0040	-0,4025	-0,0084	-0,7047
26	-0,0131	-1,2412	-0,0140	-1,3040	-0,0112	-1,1792	-0,0097	-0,9670	-0,0193	-1,6117
27	-0,0117	-1,1001	-0,0120	-1,1135	-0,0098	-1,0372	-0,0091	-0,9046	-0,0170	-1,4221
28	-0,0014	-0,1294	0,0001	0,0111	0,0000	0,0009	-0,0064	-0,6356	-0,0020	-0,1675
29	-0,0011	-0,1038	0,0004	0,0368	0,0008	0,0877	-0,0077	-0,7696	0,0008	0,0647
30	-0,0086	-0,8163	-0,0091	-0,8478	-0,0057	-0,6046	-0,0110	-1,0962	-0,0081	-0,6817

Note: t-statistics in bold indicate statistical significance at the %10 level or higher

Figure 5: Favorable post-event cumulative abnormal returns

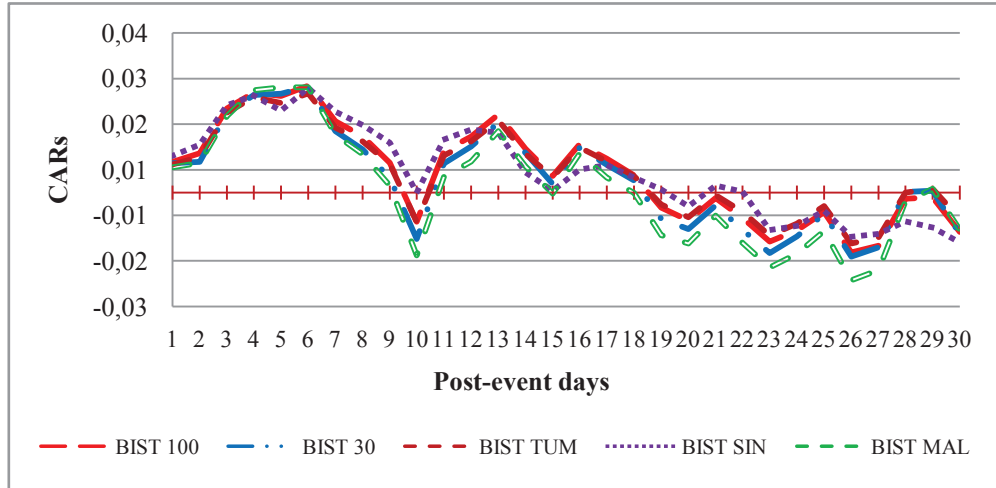


Table 5 displays the post-event CARs next to their related t-statistics for each of the 30 days following the unfavorable events and Table 6 shows the same results for the favorable events for each stock market index. T-statistics are computed to test the null hypothesis that the CARs are equal to zero. We generally observe an upward trend in the CARs following the arrival of both favorable and unfavorable news. As can be seen in Table 5, the CARs do not exhibit a statistically significant increase for the BIST 100, BIST 30, BIST TUM, and BIST MAL indices during the 19 day period following the arrival of unfavorable news. The CARs reach their highest level at day 21 following unfavorable news for these indices. In addition, when the CARs are their highest level, they are statistically different from zero for all of these indices. On the other hand, there is a downward trend in the CARs of BIST SIN and they are statistically significant in the first 18 days (see Table 5). The CARs of all indices exhibit statistically significant increases during the first 6 days following the arrival of favorable news. Then, the CARs of all indices exhibit decreases which are not statistically different from zero (see Table 6).

Figure 4 and 5 present the graphs of the CARs over the entire 30-day post-event windows for each index. The patterns displayed in these figures are consistent with the discussion and the statistical analysis in Table 5 and 6. In Figure 4, there is an upward trend in the CARs of BIST 100, BIST 30, BIST TUM, and BIST MAL for almost 21 days, after which the CARs decrease. On the other hand, Figure 5 illustrates an upward trend in the CARs for all indices for approximately 6 days, after which the CARs exhibit declining trends ranging.

Table 4, 5, 6 and Figure 4, 5 indicate that the arrival of unexpected news (favorable or unfavorable) increase uncertainty and volatility of markets, and there is an upward price movement following the arrival of unexpected information in Borsa Istanbul. The empirical results presented in this paper provide a support for the prediction of the UIH, and are consistent with the findings of Mehdian et al. (2008). As Mehdian et al. (2008) state in their study, these findings also indicate that the reaction of investors following unexpected news in Borsa Istanbul is not characterized by subsequent price reversals. Therefore, a contrarian trading rule of buying current losers and selling current winners may not produce abnormal returns in the short term.

4. Conclusion

This study investigates the reaction of investors to the arrival of major political and economical news in Borsa Istanbul from October 2004 to September 2011. In

order to examine whether investors' reaction are consistent with the predictions of the Efficient Market Hypothesis (EMH), Overreaction Hypothesis (OH), and Uncertain Information Hypothesis (UIH), daily stock returns are used from the five major Borsa Istanbul indices. These indices include BIST 100 Index, BIST 30 Index, BIST All-Share Index, BIST Industrials Index, and BIST Financials Index.

The empirical results demonstrate that the arrival of unexpected information do not cause statistically significant price reversals in Borsa Istanbul, contrary to the OH. On the other hand, the findings show that the arrival of unexpected information increase volatilities in Borsa Istanbul consistent with the UIH. The UIH is also supported with the positive cumulative abnormal returns (CARs) following the arrival of both favorable and unfavorable information. These empirical results indicate that investors in Turkey set security prices below their fundamental values in response to unexpected information. However, when we examine the post-event CARs for Borsa Istanbul indices, we determine that the average CARs approaches 0%. In other words, we can say that the prediction of UIH seem no to hold true anymore. Therefore, we conclude that the efficiency of Borsa Istanbul has increased since 2004, in comparison with the study of Mehdiyan et al. (2008) examining the period 1997 to 2004. The reasons for this decision are as follows; the reduced budget deficits, a reasonable debt level, the decreased inflation and interest rates, a growing political stability and the high growth rates.

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