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STOCK DIVIDEND EX-DAY ABNORMAL RETURN: EVIDENCE FROM TURKISH STOCK MARKET

This study examines the impact of the ex-day of stock dividend on stock return and volume on Borsa Istanbul stock exchange. The data covers 1,220 stock dividends associated with 305 companies over the period 1997-2018. A positive abnormal return and volume is seen around the ex-day of stock dividend. The cumulative average excess return over market return starts to significantly rise ten days before ex-day and reaches its highest level on the ex-day before falling back in the days following. Our findings show that abnormal return around ex-day is strongly associated with stock dividend pay-out ratio, asset size and a company's market value. The share of listed companies with higher stock dividend pay-out ratio or lower asset size or lower market capitalization, can generate respectively 5.97%, 6.08% and 5.88% abnormal return over market index return.

Keywords: *stock dividend; ex-day effect; market anomaly; market microstructure, investment strategy*

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E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

671

1. INTRODUCTION

Stock dividends simply increase the number of shares outstanding and should not have any effect on shareholders' wealth. From an accounting perspective, the value of stock dividends is determined by the transfer of retained earnings or some other special funds under owner's equity to the firm's paid capital. Unlike cash dividends, this pay-out is for accounting purposes and is not meant to inflate shareholders' wealth. However, under certain conditions, we see an abnormal return around ex-dividend day, even after taking adjusted prices into account.

Although there is no fundamental explanation, many studies have documented that stock dividends lead to an excess returns around ex-day. The studies by Woolridge (1983), Eades, Hess, and Kim (1984) of stock markets in the US, Dhatt, Kim, and Mukherji (1994) of those in Japan, Dhatt, Kim, and Mukherji (1996) in Korea, Athanassakos and Smith (1996) in Canada, Anderson, Rose, and Cahan (2004) in New Zealand, Balachandran, Faff, and Tanner (2005) in Australia, Jiang and Huang (2010) in Taiwan, and Al-Yahyaee (2014) in Oman, examined price reaction to stock dividend payment, and observed significant positive abnormal returns around ex-day. Woolridge (1983) suggested that this was likely to be caused by market imperfections, market inefficiency, or taxes and transaction costs. He also mentions factors such as odd lots cost and their taxation to further strengthen his argument. Grinblatt, Masulis, and Titman (1984) support Woolridge (1983)'s view, noting that the ex-day effect emerges as a result of stock prices not fully adjusting to the payment of small stock dividends. On the other hand, Eades et al. (1984) could not find a satisfactory explanation to this anomaly, even though they examined many possible factors behind extraordinary price movements around ex-day. A decade later, Dubofsky (1992) suggested that the excess arises from asymmetry in handling open limit orders due to stock exchange rules, that in turn lead to unusual wide bid-ask spreads on ex-day.

In general, studies conducted in the US that sought to explain abnormal returns around ex-day have found market microstructure to be the main reason. This conclusion is also supported by aforementioned studies from countries like Australia, New Zealand and Canada which provided evidence of odd lot pricing and transaction costs along with imputation tax explanations. These findings prompted various other researchers around the world to look at the relationship between extraordinary price movement around ex-day and market microstructure in different markets. Studies by Dhatt et al. (1994) for Japan, Dhatt et al. (1996) for Korea and Al-Yahyaee (2014) for Oman indicate that the explanations in the main literature do not fully explain the ex-day anomaly in these markets, suggesting the need for further empirical studies on this issue.

In Turkey, such studies have generally focused on announcement day effect and ex-day effect on cash dividends. The current study differs in that it uses a large data set to investigate the effects of stock dividend payments on stock return and volumes in an important emerging market. Accordingly, we also sought to establish whether the ex-day anomaly of stock dividend on price could be a useful information to benefit from abnormal return.

Borsa Istanbul Stock Exchange (Borsa Istanbul) is the only stock exchange in Turkey and has been one of the leading emerging markets since its establishment in 1986. By 2018, it listed 399 companies with free float market capitalization, 66% of shares were owned by foreign investors and daily trading volume was roughly 2 billion USD, making it the seventh largest stock market in Europe in terms of the value of equity traded. When compared to US markets, Borsa Istanbul differs in that odd lots are not traded, but may be paid out as a stock dividend. Transaction costs for odd and round lots are the same, meaning that brokerage firms are prevented from requesting higher fees for odd lots. Also, stock dividends or fractional shares, not paid out in cash, are not taxable. Furthermore, tick size is very small and Borsa Istanbul does not have bid-ask spreads under a specialist setting and limit orders are only valid for a day and do not have to be adjusted on the ex-day.

Considering the microstructure differential between Turkish and US stock markets and investigating the existence of abnormal returns around ex-day of stock dividend will provide important facts in this context. If the stock dividend ex-day effect only arises due to market factors in the US, then we should not see any ex-day effect in the Turkish market as the characteristics associated with US markets are either not present or very weak. The current study comprises an analysis of 1,220 stock dividend payments associated with 305 companies listed in Borsa Istanbul over the period 1997 to 2018. In order to reveal abnormal return and volume, a classical event study methodology is applied that uses adjusted closing prices of shares and the value of most extended market index. The market-adjusted model is employed to calculate abnormal returns within the event windows considering 30 days back and forward.

In finance literature many attempts have been made to explain this price anomaly as the ex-day is known in advance and hence should contain no new information. Unlike the US where this phenomenon is explained by market specific rules and characteristics, our findings are similar to ones for Japan, Korea, Taiwan and Oman where the price anomaly has been explained as dividend per se and investor overreaction rather than market microstructure. Our findings show that stock dividend pay-out ratio, asset size and the market value of the company can have a significant role on abnormal return around ex-day. On average, buying a share which has a higher stock dividend pay-out ratio, or one that is associated

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

673

with a company having a lower asset size or a lower market capitalization value, provides respectively 5.97%, 6.08% and 5.88% abnormal return over market index return in addition to stock dividend.

Section 2 of the study provides an overview of the relevant literature. Section 3 introduces the data and methodology and the empirical results, and their implications are presented in Section 4. Section 5 summarizes the conclusions of the study.

2. LITERATURE REVIEW

Price anomaly or abnormal returns around ex-dividend day have been studied theoretically and empirically in the framework of the information content of a dividend, market microstructure, or taxation of dividend. Early US studies found significantly positive market reactions to stock dividend payment around the ex-day. Chottiner and Young (1971) investigated the price behaviour of 945 stock splits and stock dividends declared by NYSE firms over a 1963-1968 period around ex-day and found that payment of 25% to 200% of stock splits or dividends, cause significant differential between market opening prices and the theoretical opening prices, and concluded that within these size range stock prices do not fully adjust for stock distributions. Foster and Vickrey (1978) tested the information content of 82 stock dividend events from 1974 to 1976, evaluating both abnormal return around declaration date and abnormal return around ex-day using closing price rather than opening prices on ex-day. The authors found evidence for small significant positive abnormal returns around the declaration date, but no abnormal returns on ex-day. Further, they found no significant ex-day effects of stock dividends. Similarly, Woolridge (1983) tested stock price adjustments on ex-day for 317 stock dividend events from 1964 to 1972 using both closing to ex-day opening and ex-day closing prices and found that stock prices increase, on average, approximately 1%. Thus, he concluded that prices do not fully adjust for stock dividend and consequently stock dividend payment increases the value of shares.

Similarly, Grinblatt et al. (1984) find in the period from 1967 to 1976 that stocks show various abnormal returns for a different time period. For example, their subsample of NYSE firms realized a 1.86% mean return for 3 days and a 1.93% mean return for 5 days around ex-day. Dubofsky (1992) suggested another explanation for the stock dividend ex-day effect. He argues that abnormal return on the ex-day arise due to stock exchange rules requiring specialists to adjust outstanding limit buy orders, but not limit sell orders. The reduced limit buy-order prices that are not multiples of $0.125 are rounded down, resulting in an unusually

wide bid-ask spread on the ex-day, which causes the stock dividend ex-day effect. Additionally, Eades et al. (1984), Frank and Jagannathan (1998), and Lakonishok and Vermaelen (1986) also developed models based on microstructure arguments and documented positive abnormal returns consistent with such arguments.

This subject also attracts attention from researchers around the world. For example, Dhatt et al. (1994) investigated whether there are excess returns around ex-day of stock dividends in Japan. Their study shows that market factors caused this anomaly, and while it is substantially weaker in Japan a significant ex-day effect exists for stock dividends similar to that seen in the US. The excess return observed in Japan is 2.06%. They concluded that excess returns on small stock dividends may be mainly due to market imperfections, whereas those of large stock dividends may primarily reflect buying pressure from small investors. Moreover, Dhatt et al. (1996) conducted a similar study in Korea which also has different market characteristic to the US markets. They reported positive abnormal returns around stock dividend ex-day, with the largest stock dividends having the highest abnormal returns. These findings are very similar to their previous findings on the situation in Japan and hence their conclusion that the ex-day effect is related to stock dividends per se rather than specific market conditions. Le, Yin, and Zhao (2019) documented that tax heterogeneity between domestic and foreign investors leads ex-dividend anomaly. On the other hand, the tax explanation is not supported by Paudel, Silveri, and Wu (2019). They found that ex-day anomaly of the dividend can be explained by free dividends fallacy and short-term trading hypothesis.

In their study of the Taiwan Stock Exchange, Jiang and Huang (2009) show that there is a significant positive abnormal return of 1.99% on the ex-day and it is positively related to stock dividend. The average ex-day return for small stock dividend is 1.21% whereas large stock dividend return is 3.65%. They concluded that these results are consistent with the transaction cost hypothesis suggested by Woolridge (1983) which predicts a higher ex-day abnormal return due to the higher transaction cost of holding stock dividends. Moreover, they made an important contribution to the literature by examining behavioural aspects of price reaction surrounding ex-day of stock dividends. According to the overreaction hypothesis proposed also by Woolridge (1983), an uninformed trader may be over-optimistic about the prospects of firms that declare more stock dividends. Buying pressure from uninformed traders may lead to a positive cumulative abnormal return in the period preceding the ex-day. Following the ex-day, informed traders may reveal the true value to the market by selling or short selling the overpriced stock. Their study indicates an overreaction pattern in the 15 days pre-ex–date period and 90 days post-ex-day period which are consistent with overreaction hypothesis.

In Oman, Al-Yahyaee (2014) examined the stock dividend ex-day effect on Muscat Securities Market, where several market microstructure explanations for

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

675

the ex-day effect can be ruled out. First, he found positive abnormal return on Omani stock dividend ex-day and such returns are positively related to stock price increments in the pre-announcement period and stock dividend percentage. Secondly, he also found that firms distributing stock dividends have higher stock prices than firms in the same industries that do not. Thirdly, larger firms in Oman prefer a higher trading margin which supports a trading range motive. Overall, he came to similar conclusions with Dhatt et al. (1994) that the ex-day effect is most likely related to stock dividends themselves rather than being driven by market factors. Dupuis (2019) has also investigated ex-day effect of cash dividend in UAE markets, and he concluded that liquidity of shares is the main determinant of this anomaly.

Although most of the research confirms the existence of abnormal return around ex-day, some studies show no such findings. For example, in Greece, Papaioannou, Travlos, and Tsangarakis (2000) analysed the price reaction to stock dividend of firms listed on the Athens Stock Exchange, both on announcement and ex-dividend day. They saw statistically insignificant abnormal returns on ex-dividend day but found a significant decline in market-adjusted trading volume in the post dividend period. They concluded that absence of market reaction to ex-day of dividend is consistent with the absence of tax-effect in the sample analysed in their study.

In Turkey, studies in this field have generally focused on announcement day effect and the ex-day effect on cash dividends. Okuyan, Sakarya, Aydın, and Deniz (2020), Kirbas (2018), Kadioglu, Telçeken, and Öcal (2015), Adaoglu and Lasfer (2011), Günalp, Kadioglu, and Kılıç (2010), Muradoğlu and Aydoğan (2003), Batchelor and Orakcioglu (2003), Aydogan and Muradoglu (1998) can be given as examples for examining announcement day effect. Yilmaz and Gulay (2006) conducted studies examining the effect of ex-day on cash dividend.

3. DATA AND METHODOLOGY

3.1. Data

Data covering the closing prices, stock dividends and market indexes used in this study was collected from Borsa Istanbul via Matriks downloader software covering the period from 1997 to September 2018. This software serves to adjust the closing price by taking the stock dividend or cash dividend into account. Thus, it is not required to calculate closing price on ex-dividend or in the event windows in the data set. As seen from Table 1, the stock dividend paid out by listed

676

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

companies has dropped over time. While 31% of the firms paid dividend as stock in the period from 1997 to 2009, in the last four years this percentage eased to 8%. One of the reasons for this dramatic change is deregulation. Prior to 2009, the regulations required firms to pay out 20%-30% of their distributable income as stock or cash dividend. This requirement and the associated regulation were annulled after 2008. A second reason for decreasing stock dividends is that the firms no longer have any special funds under the owner's equity part of the balance sheet to pay out after IFRS was put into force in Turkey in 2008. Before IFRS, intangible assets were inflated by a revaluation coefficient determined by the Ministry of Finance, with the increments accumulated under a special fund in the owner's equity part of the balance sheet. Prior to IFRS, under Turkish Commercial Code and capital markets regulations, these special funds could be paid out as a stock dividend by adding them to the paid in capital. However, since the introduction of IFRS, this type of fund accumulation is not permitted.

Our sample consists of 1,220 stock dividends of 305 listed companies in Borsa Istanbul during the period from 1997 to September 2018.

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

677

Table 1

NUMBER OF LISTED FIRMS IN BORSA ISTANBUL AND DESCRIPTIVE STATISTICS OF STOCK DIVIDEND PAID OUT PER SHARE

Year	# of Firms Listed Borsa Istanbul	# of Stock. Div.	# of Stock. Div. in the sample	Mean of Stock. Div.	St. Dev. of Stock. Div.	Max. of Stock. Div.	Min. of Stock. Div.
1997	258	85	78	1.41	1.77	12.00	0.0571
1998	277	87	76	1.36	1.42	9.00	0.0867
1999	285	83	78	2.36	4.95	38.00	0.1250
2000	315	100	84	2.41	4.63	34.00	0.0140
2001	310	96	93	1.32	1.57	9.00	0.0990
2002	288	77	75	1.32	1.62	8.00	0.0200
2003	285	75	70	1.36	1.33	7.00	0.0383
2004	297	96	90	1.34	1.85	13.00	0.0002
2005	306	53	47	0.94	1.89	12.31	0.0100
2006	322	66	62	0.99	1.78	10.00	0.0260
2007	327	57	56	0.54	0.65	3.00	0.0021
2008	326	48	48	2.21	9.73	68.00	0.0295
2009	325	58	54	0.47	0.72	4.00	0.0250
2010	350	42	38	0.88	1.56	9.00	0.0025
2011	373	36	35	0.76	1.97	12.00	0.0016
2012	395	40	40	1.84	6.40	40.00	0.0220
2013	388	40	38	0.59	0.97	4.00	0.0114
2014	422	31	29	0.91	2.82	15.18	0.0360
2015	416	35	35	0.61	1.50	8.89	0.0102
2016	405	37	37	1.42	3.82	21.66	0.0370
2017	399	29	29	0.50	0.69	3.00	0.0211
2018	409	32	28	0.62	0.81	3.55	0.0345
Total/Overall		**1,303**	**1,220**	**1.19**	**2.48**	**68.00**	**0.0322**

Source: Authors' estimation

The sample includes 1,220 observations out of 1,303. The 83 observations excluded from sample were missing price data or appeared as outliers. On average, listed companies paid 1.19 stock dividends for each share during the period 1997-2018. The highest dividend paid out was 68 stocks for one share and the lowest 0.0002 stocks for a share.

678

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

3.2. Methodology

This study investigates the price and volume anomaly caused by stock dividend around ex-day utilizing classical event study methodology.

Event study methodology is commonly used to find the effect on price or volume of any event that occurred on a specific day. It is utilized by Pettit (1972), Brown and Warner (1980), Aharony and Swary (1980), Woolridge (1982), Asquith and Mullins (1983), Akhigbe and Madura (1996), Miletić (2011) and Kadioglu et al. (2015) for testing for the announcement effects of dividends; by Dennis and McConnell (1986) for analyzing the announcement effects of earnings; by Sivakumar and Waymire (1994), Gregory, Matatko, and Tonks (1997), Hillier and Marshall (2002) for detecting insider trading; by Ghadhab (2018) for researching arbitrage opportunities and liquidity in the market; by Dimpfl (2011), Yildiz, Karan, and Pirgaip (2017), Piccoli, Chaudhury, Souza, and da Silva (2017), Marshall, McCann, and McColgan (2018) and Kočenda and Moravcová (2018) for examining the effect of news or announcement on markets and by Yilmaz and Gulay (2006), Al-Yahyaee (2014) and Chowdhury and Sonaer (2016) for analysing ex-dividend effect on price or volume.

The price data used is in the form of adjusted closing prices and closing values of the market index. Equation (1) is used to find the daily return of a share i on day t.

$$R_{i,t} = \left(P_{i,t} - P_{i,t-1} \right) / P_{i,t-1} \tag{1}$$

Here $R_{i,t}$ denotes return of share i on day t, $P_{i,t}$ is the adjusted closing price of share i at day t. $P_{i,t-1}$ is the closing price of share i on the previous day. The daily returns of market indices are calculated in the same way using the index value of Borsa Istanbul XUTUM index, covers all listed stocks in Borsa Istanbul, over two successive days.

Equation (2) is used to find the daily abnormal returns on individual stocks for each day. The abnormal return is the difference between return on stock and return on market index on that day.

$$AR_{i,t} = R_{i,t} - \left(\alpha_i + \beta R_{m,t} \right) \tag{2}$$

$AR_{i,t}$ shows the daily abnormal return of share i on day t, and $R_{m,t}$ denotes the return of the market index on day t. In order to calculate abnormal return, the market-adjusted model is used. Some other studies have previously used a market risk-adjusted model. The market-adjusted model assumes that β, which measures the risk level of each share, is equal to 1. It also assumes that the intercept term is

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

679

zero. In contrast, the market risk-adjusted model estimates the beta coefficient and intercept term by regressing daily market index returns on the daily share returns in a neutral period. Many studies have showed that the market risk-adjusted model is not superior than the market-adjusted model (Armitage, 1995; Asquith & Mullins, 1983; Aydogan & Muradoglu, 1998; Brown & Warner, 1980; Charest, 1978; Woolridge, 1982). Additionally, Marsh (1979) argued that the risk-adjusted model reduces statistical efficiency since it is using limited data.

Equations (3) and (4) are used to find the daily average abnormal return and cumulative abnormal return for the event windows.

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t} \quad (3), \qquad CAR_i = \sum_{t=T_1}^{T_2} AR_{i,t} \quad (4), \qquad CAAR = \frac{1}{N}\sum_{i=1}^{N} CAR_i \quad (5)$$

Here; AAR_t is the average abnormal return of N stocks on day t, and CAR_i is the cumulative abnormal return of stock i over an event window extending from $T=t_1$ to $T=t_2$. $CAAR$ is the cumulative average abnormal return of N number of stocks along with the event window. Cumulative average abnormal returns within event windows are tested for being statistically significant different from zero by using the following formulations.

$$t_{CAAR=\sqrt{N}} \frac{CAAR}{s_{CAAR}} \qquad (6)$$

$$s_{CAAR}^2 = \frac{1}{N-1}\sum_{i=1}^{N}\left(CAAR_i - CAAR\right)^2 \qquad (7)$$

In equation (6), s_{CAAR} is the standard deviation of a cumulative average abnormal along with an event window and its calculation is given in equation (7).

To find the abnormal trading volumes, the methodology used by Alves and Teixeira Dos Santos (2008), Landsman and Maydew (2002), Dasilas and Leventis (2011), the following formula is utilized.

$$AV_{it} = \frac{V_{it} - E\left(V_{it}\right)}{\sigma_i} \qquad (8)$$

Where, AV_{it} is the abnormal trading volume of share i on day t, V_{it} shows trading volume of share i on day t, $E(V_{it})$ and σ_i represents mean and standard deviation of daily trading volume for share i in the estimation window extending from t_{-30} to t_{+30} day respectively to ex-dividend day.

4. EMPIRICAL RESULTS

Figure 1 shows average abnormal return and cumulative average abnormal average return over an event window's period starting from 30 days prior ex-dividend day and ending 30 days after ex-dividend day where ex-day is symbolized as "t-0".

Figure 1

AR, CAAR AND AVERAGE VOLUME OVER TIME
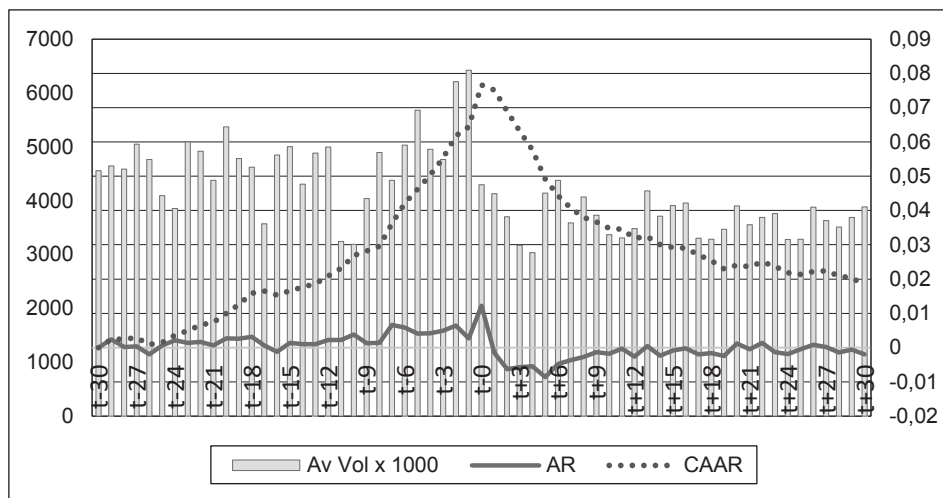
Source: Authors' estimation

Figure 1 also shows that stock prices increase from 30 days prior to ex-day up to end of ex-day, where after it declines. In general, daily average abnormal return is positive before the ex-day and negative afterwards. On average, trading volume in the pre-period to ex-day is higher than in the post-period.

Table 2 gives summary information about cumulative average abnormal return and daily abnormal volume over the event windows starting from 30 days prior and 30 days after ex-day.

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

681

Table 2

DESCRIPTIVE STATISTICS OF CAAR AND TRADING VOLUMES

Days Rel. to ex-day	Cumulative Av. Abnormal Returns (%)					Trading Volume (1000 TL)				
	Mean	Med.	St. Dev.	Max.	Min.	Mean	Med.	St. Dev.	Max.	Min.
t_{-30}	0.22	-0.22	3.13	-16.67	17.27	4,640	688	14,225	143,063	0.082
t_{-25}	0.04	-0.21	5.50	-35.76	41.11	4,135	646	11,384	93,009	0.250
t_{-20}	0.46	-0.22	8.13	-40.91	60.29	5,425	624	22,305	452,113	0.014
t_{-15}	0.74	-0.03	10.22	-89.60	71.50	5,092	670	17,346	265,387	0.281
t_{-10}	1.49	0.19	11.82	-52.32	81.15	3,228	643	8,823	97,803	0.024
t_{-5}	2.99	1.37	13.80	-72.23	92.97	5,741	704	18,500	285,592	0.011
t_{-3}	3.59	1.75	14.13	-78.51	104.20	4,824	827	18,141	409,242	0.139
t_{-2}	3.87	1.90	14.11	-78.51	104.20	6,247	874	23,648	422,556	0.118
t_{-1}	4.09	2.18	14.31	-78.76	104.20	6,489	1,046	20,867	236,497	0.868
t_{0}	5.39	2.99	15.65	-68.24	107.63	4,336	743	12,846	206,900	0.009
t_{+1}	5.30	2.84	16.75	-91.48	101.84	4,175	529	14,485	271,342	0.015
t_{+2}	4.91	2.72	17.02	-88.43	110.04	3,740	553	11,412	161,282	0.316
t_{+3}	4.52	2.43	17.13	-79.36	105.19	3,166	516	8,575	109,358	1.008
t_{+5}	3.75	1.67	17.42	-79.36	99.73	4,181	599	13,703	192,244	0.133
t_{+10}	2.73	1.10	18.28	-94.61	103.04	3,391	508	10,283	122,764	0.028
t_{+15}	2.13	0.69	19.08	-109.34	139.76	3,967	521	12,830	194,764	0.121
t_{+20}	1.72	0.39	19.78	-98.47	109.57	3,976	558	12,708	228,857	0.216
t_{+25}	1.59	0.79	20.24	-96.86	124.51	3,335	542	9,860	166,266	0.017
t_{+30}	1.32	0.40	20.81	-100.73	116.17	3,854	537	11,287	118,284	0.133

Source: Authors' estimation

As seen from the Figure 1 and Table 2, stock dividend payment causes an anomaly in stock price and volume up to the end of ex-day. The average abnormal return is generally above zero, that's why cumulative average abnormal return increases over the event window. After ex-day, average abnormal return is generally below zero, and explains why cumulative average abnormal return decreases. The cumulative average abnormal return is 1.32 % higher at the end of 60 days as compared to 30 days before ex-day. This means that stock dividend causes a 1.32% increase in prices during the period 30 days before and after ex-day of dividend inclusively. The stock dividend causes a 5.39% abnormal return in the event window extending from t_{-30} to t_0. The volume of the stock increases during the last two days prior to ex-day and drops down four days after ex-day.

Table 3 illustrates the summary statistics of cumulative average abnormal return and abnormal trading volume which is calculated by utilizing the formula (5) and (8) on different event windows covering a period of 30 days before and 30 days after ex-day of stock dividend.

Table 3

DESCRIPTIVE STATISTICS OF EVENT WINDOW CAARS

Windows	Cumulative Av. Abnormal Returns (%)					Abnormal Trading Volume				
	Mean	Med.	St. Dev.	Max.	Min.	Mean	Med.	St. Dev.	Max.	Min.
t_{-30} to t_0	5.39	2.99	15.65	-68.24	107.63	0.099	0.134	0.305	0.882	-0.716
t_{-25} to t_0	5.34	3.43	14.56	-66.14	98.52	0.097	0.108	0.326	0.930	-0.744
t_{-20} to t_0	4.93	3.06	13.27	-53.30	90.16	0.113	0.110	0.362	1.292	-0.774
t_{-15} to t_0	4.65	2.67	11.74	-40.73	84.86	0.136	0.097	0.409	1.396	-0.817
t_{-10} to t_0	3.90	2.29	10.20	-31.37	68.63	0.197	0.109	0.524	2.450	-1.092
t_{-5} to t_0	2.40	1.52	8.00	-32.80	49.63	0.306	0.150	0.719	3.383	-1.268
t_{-3} to t_0	1.80	1.07	6.90	-35.40	49.63	0.300	0.105	0.807	4.054	-1.327
t_{-2} to t_0	1.52	0.88	6.43	-30.19	36.13	0.233	-0.002	0.915	4.481	-1.355
t_0	1.30	0.47	5.66	-14.88	28.97	0.102	-0.155	0.989	5.801	-1.402
t_0 to t_{+2}	-0.47	0.00	5.37	-33.78	38.25	-0.105	-0.293	0.738	3.971	-1.369
t_0 to t_{+3}	-0.87	-0.93	5.92	-27.23	40.62	-0.128	-0.299	0.726	5.242	-1.841
t_0 to t_{+5}	-1.63	-1.65	7.23	-29.03	65.25	-0.114	-0.264	0.621	3.036	-1.841
t_0 to t_{+10}	-2.66	-2.47	9.56	-66.57	65.06	-0.105	-0.218	0.474	1.691	-1.087
t_0 to t_{+15}	-3.26	-3.51	11.58	-97.74	109.15	-0.113	-0.190	0.391	1.136	-1.074
t_0 to t_{+20}	-3.66	-3.69	12.92	-103.32	78.96	-0.117	-0.179	0.348	0.965	-0.913
t_0 to t_{+25}	-3.80	-4.08	14.04	-105.60	93.90	-0.110	-0.154	0.324	0.978	-0.920
t_0 to t_{+30}	-4.07	-4.49	15.39	-105.94	85.57	-0.103	-0.140	0.314	0.867	-0.820
t_{-3} to t_{+3}	1.27	0.43	10.04	-41.67	75.20	0.142	0.007	0.611	2.375	-1.180
t_{-5} to t_{+5}	1.04	0.52	11.56	-45.01	99.24	0.125	0.045	0.506	1.920	-0.898
t_{-10} to t_{+10}	1.53	0.51	13.86	-64.23	87.10	0.059	0.029	0.340	1.021	-0.747
t_{-15} to t_{+15}	1.43	-0.05	16.14	-76.60	134.14	0.018	0.023	0.238	0.650	-0.628
t_{-20} to t_{+20}	1.39	0.19	18.28	-88.02	111.76	0.003	0.018	0.169	0.409	-0.473
t_{-25} to t_{+25}	1.60	0.66	19.68	-99.73	124.15	-0.004	0.017	0.098	0.267	-0.308
t_{-30} to t_{+30}	1.32	0.40	20.81	-100.73	116.17					

Source: Authors' estimation

As seen in Table 3, cumulative average abnormal return and abnormal trading volume have positive means in windows extending from t_{-30} to t_0 and negative means in windows extending from t_0 to t_{+30}. The mean of cumulative average ab-

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

683

normal returns has positive value in windows extending from t_{-30} to t_{+30} including t_0. The table also gives median, minimum, maximum and standard deviation of cumulative average abnormal returns and abnormal trading volume in windows extending from t_{-30} to t_0, from t_0 to t_{+30} and from t_{-30} to t_{+30} having t_0 as a middle point.

It is seen that cumulative average abnormal return and abnormal trading volume caused by stock dividend is statistically different from zero. For this purpose, t-statistics is used, and the results are given in Table 4.

Table 4

T-STATISTICS OF EVENT WINDOW CAAR AND ABNORMAL
TRADING VOLUME

Windows	Cumulative Av. Abnormal Returns			Abnormal Trading Volume		
	(%)	St. Dev	t-Stat.	Mean	St. Dev	t-Stat.
t_{-30} to t_0	5.39	0.157	12.02 ***	0.099	0.305	11.74 ***
t_{-25} to t_0	5.34	0.146	12.82 ***	0.097	0.326	10.74 ***
t_{-20} to t_0	4.93	0.133	12.97 ***	0.113	0.362	11.28 ***
t_{-15} to t_0	4.65	0.117	13.82 ***	0.136	0.409	12.01 ***
t_{-10} to t_0	3.90	0.102	13.36 ***	0.197	0.524	13.62 ***
t_{-5} to t_0	2.40	0.080	10.48 ***	0.306	0.719	15.43 ***
t_{-3} to t_0	1.80	0.069	9.12 ***	0.300	0.807	13.46 ***
t_{-2} to t_0	1.52	0.064	8.24 ***	0.233	0.915	9.21 ***
t_0	1.30	0.057	8.00 ***	0.102	0.989	3.74 ***
t_0 to t_{+2}	-0.47	0.054	-3.08 ***	-0.105	0.738	-5.17 ***
t_0 to t_{+3}	-0.87	0.059	-5.11 ***	-0.128	0.726	-6.38 ***
t_0 to t_{+5}	-1.63	0.072	-7.90 ***	-0.114	0.621	-6.62 ***
t_0 to t_{+10}	-2.66	0.096	-9.73 ***	-0.105	0.474	-8.06 ***
t_0 to t_{+15}	-3.26	0.116	-9.84 ***	-0.113	0.391	-10.48 ***
t_0 to t_{+20}	-3.66	0.129	-9.91 ***	-0.117	0.348	-12.17 ***
t_0 to t_{+25}	-3.80	0.140	-9.44 ***	-0.110	0.324	-12.29 ***
t_0 to t_{+30}	-4.07	0.154	-9.23 ***	-0.103	0.314	-11.89 ***
t_{-3} to t_{+3}	0.65	0.093	2.45 ***	0.142	0.611	8.42 ***
t_{-5} to t_{+5}	1.04	0.116	3.13 ***	0.125	0.506	8.95 ***
t_{-10} to t_{+10}	1.53	0.139	3.85 ***	0.059	0.340	6.29 ***
t_{-15} to t_{+15}	1.45	0.161	3.14 ***	0.018	0.238	2.75 ***
t_{-20} to t_{+20}	1.47	0.183	2.80 ***	0.003	0.169	0.54
t_{-25} to t_{+25}	1.78	0.198	3.09 ***	-0.004	0.098	-1.32
t_{-30} to t_{+30}	1.32	0.208	2.22 ***	0.099	0.305	

Note: *** shows 1% significance level

Source: Authors' estimation

As seen in Table 4, in all event windows extending from t_{-30} to t_0, from t_0 to t_{+30} and from t_{-30} to t_{+30} having t_0 as a middle point, cumulative average abnormal returns are statistically different from zero. The cumulative average abnormal returns are positive in the event windows up to ex-day and negative after ex-day. The results show that stock dividend payment causes significant cumulative average abnormal return or price anomaly around ex-day. Stock prices significantly increase up to the end of ex-day as compared to market index value. After ex-day the price of those stock declined. On average, the cumulative average abnormal return of the stock dividend is 5.39% in event windows extending from t_{-30} to t_0, and -4.07% in the event windows extending from t_0 to t_{+30} and 1.32% in event windows extending from t_{-30} to t_{+30}. A significant cumulative average abnormal return prior to ex-day is also documented by Dhatt et al. (1994). On the ex-day, there is also a significant abnormal return of 1.30%. Similarly, Al-Yahyaee (2014) and Woolridge (1983) found significant abnormal return on ex-day caused by stock dividend payment. Dupuis (2019) also found 1.69% abnormal return on ex-day in UAE markets. Additionally, our findings are in line with the study of Paudel et al. (2019) and Le et al. (2019) who are documented ex-day anomaly dividend different markets.

On the volume side, stock dividend payment also causes abnormal trading volume, which is in line with Le et al. (2019). On the other hand, it is contrary to the findings of Al-Yahyaee (2014). Taking average volume in the first and last ten-day periods in the event windows extending from t_{-30} to t_{+30} as a neutral period, the trading volume is significantly higher in the event windows extending from t_{-19} to t_0 and lower in event windows extending from t_0 to t_{+19}.

Although, Yilmaz and Gulay (2006) investigates the ex-day effect of the cash dividend in Turkish stock market in the event windows 10 days before and after ex-day and in different sub periods, the findings are very similar in terms of abnormal return and volume. Abnormal return and volume increase up to ex-day and decreases afterwards.

This study also investigated the size of stock dividend that creates difference in cumulative average abnormal return. For this purpose, the sample is grouped into two subsamples by stock dividend per share where the threshold is 100%. The results are shown in Table 5 and Figure 2.

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

685

Table 5

MEAN DIFFERENCE OF CAAR GROUPED BY STOCK DIVIDEND SIZE

Windows	Diff. in Mean Return	t-statistics
t_{-30} to t_0	-3.37%	-3.78 ***
t_{-25} to t_0	-3.19%	-3.84 ***
t_{-20} to t_0	-3.50%	-4.64 ***
t_{-15} to t_0	-2.99%	-4.48 ***
t_{-10} to t_0	-2.05%	-3.53 ***
t_{-5} to t_0	-0.11%	-0.24 ***
t_0 to t_{+5}	1.20%	2.91 ***
t_0 to t_{+10}	2.25%	4.13 ***
t_0 to t_{+15}	2.70%	4.10 ***
t_0 to t_{+20}	2.60%	3.53 ***
t_0 to t_{+25}	2.10%	2.62 ***
t_0 to t_{+30}	2.47%	2.81 ***

Note: *** shows 1% significance level n

Source: Authors' estimatio

Figure 2

EFFECT OF THE STOCK DIVIDEND'S SIZE ON CAAR
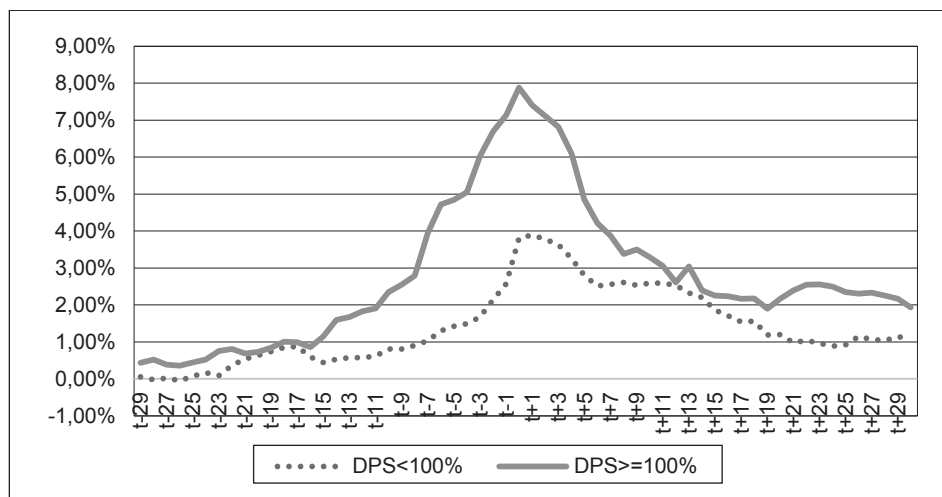
Source: Authors' estimation

As Grinblatt et al. (1984) also documented, there is significant mean abnormal return difference between cumulative average abnormal returns in event windows when the sample is divided into two subgroups based on stock dividend size. Higher stock dividend results in higher cumulative average abnormal returns. Taking this significant mean return difference into account the following practical implication could be reached.

Table 6

THE HIGHEST ABNORMAL RETURN ON THE STOCK DIVIDEND
EX-DAY ANOMALY BASED ON STOCK DIVIDEND SIZE

Event 1			Event 2		Return
Buy/Sell	**Stock**	**When**	**Buy/Sell**	**When**	
Buy	DPS>100%	10 days prior to Ex-day	Sell	At the end of Ex-day	5.97%
Short sell		At the end of Ex-day	Buy	8 days after Ex-day	4.50%

Source: Authors' estimation

Since there is a significant difference in cumulative average abnormal returns between stock which paid out higher than 100% of stock dividend, it is possible to develop investment strategies. In the first event, it can be obtained a 5.97% return over market index, return in addition to dividend by buying stock which will pay out a stock dividend higher than 100%, ten days before ex-day and sell the stock at the end of ex-day. In the second event, same stock can be short sold and bought back 8 days after ex-day can obtain a 4.5% return over market index return.

To examine the effect of the asset size of listed firms on the ex-day anomaly, the sample is grouped into two subsamples by dividing the sample from median in terms of the total assets of the companies[1]. The first subgroup is called "Small" and represents companies with total assets below the median and a second subgroup named "Big" represents companies with above median total assets. A similar sub-grouping (grouping by size of paid in capital of the firms) was done by Yilmaz and Gulay (2006). The results are given in Table 7 and Figure 3.

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[1] The descriptive statistics of total asset of the listed firms in our sample over the period of 1997-2018 as follows: Mean:1,668,237 TL; Median:147,432 TL; Max:111,926,312 TL; Min:374 TL; St. Dev:7,271,930 TL

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

687

Table 7

MEAN DIFFERENCE OF CAAR GROUPED BY COMPANIES'
TOTAL ASSET

Windows	Diff. in Mean Return	t-statistics
t_{-30} to t_0	2.08%	2.24 ***
t_{-25} to t_0	2.21%	2.58 ***
t_{-20} to t_0	2.48%	3.21 ***
t_{-15} to t_0	2.39%	3.43 ***
t_{-10} to t_0	2.10%	3.38 ***
t_{-5} to t_0	0.69%	1.42 *
t_0 to t_{+5}	-1.38%	-3.07 ***
t_0 to t_{+10}	-1.76%	-3.01 ***
t_0 to t_{+15}	-2.06%	-2.90 ***
t_0 to t_{+20}	-2.31%	-2.94 ***
t_0 to t_{+25}	-2.12%	-2.51 ***
t_0 to t_{+30}	-2.38%	-2.55 ***

Note: *** shows 1% significance level

Source: Authors' estimation

Figure 3

CAAR GROUPED BY TOTAL ASSETS OF COMPANIES
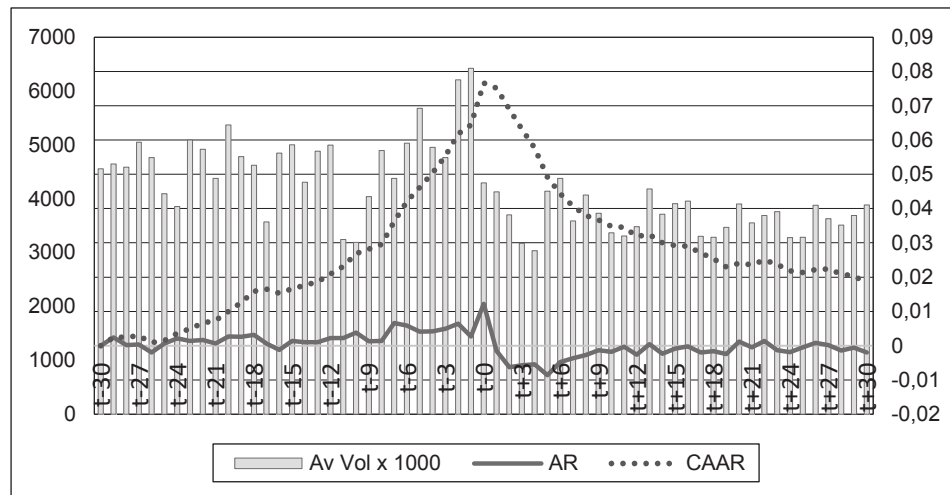
Source: Authors' estimation

As seen from Table 7 and Figure 3, there is a significant mean difference between cumulative average abnormal returns in the event windows when the sample is divided into two subgroups by firms' asset size. Higher CAAR is more likely to be caused by ex-day anomaly in the firms with lower asset size. The results related to "small" or "big" size firm support the findings Yilmaz and Gulay (2006) in which they found small firms in term of paid in capital generates higher abnormal return around ex-day.

Based on this information, the following practical implication could be attained.

Table 8

THE HIGHEST ABNORMAL RETURN ON THE STOCK DIVIDEND
EX-DAY ANOMALY BASED ON TOTAL ASSET

Event 1			Event 2		Return
Buy/Sell	Stock	When	Buy/Sell	When	
Buy	Firm with smaller asset	10 days prior to Ex-day	Sell	At the end of Ex-day	6.08%
Short sell		At the end of Ex-day	Buy	8 days after Ex-day	3.96%

Source: Authors' estimation

Since there are differences in cumulative average abnormal returns caused by stock dividend payment between small asset size firms and large asset size firms, it is possible to develop investment strategies. In the first event, it is obtained a 6.08% return over market index return in addition to dividend by buying stock which have smaller asset size ten days before ex-day and sell these stocks at the end of ex-day. In the second event, the same stock can short sold and bought back 8 days after ex-day leads a 3.96% return over market index return.

Finally, this study also explores the effect of market capitalization on the ex-day anomaly. The sample is grouped into two subsamples according to the median of market value of the companies which have distributed stock dividend[2]. The first subgroup called "Small" represents companies with a market value below the median and second subgroup named "Big" represents those with above median market value. The results are given in Table 9 and Figure 4.

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[2] The descriptive statistics of Market Value/ Book Value of the listed firms in our sample over the period of 1997-2018 as follows: Mean:2.56; Median:1.30; Max:333.87; Min:0.14; St. Dev:10.96

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

689

Table 9

MEAN DIFFERENCE OF CAAR GROUPED BY COMPANY'S MARKET
CAPITALIZATION

Windows	Diff. in Mean Ret.	t-statistics
t_{-30} to t_0	3.83%	4.23 ***
t_{-25} to t_0	3.27%	3.93 ***
t_{-20} to t_0	3.07%	4.06 ***
t_{-15} to t_0	2.94%	4.31 ***
t_{-10} to t_0	2.34%	3.87 ***
t_{-5} to t_0	1.05%	2.19 ***
t_0 to t_{+5}	-1.55%	-3.43 ***
t_0 to t_{+10}	-2.25%	-3.86 ***
t_0 to t_{+15}	-3.24%	-4.60 ***
t_0 to t_{+20}	-3.31%	-4.23 ***
t_0 to t_{+25}	-2.87%	-3.41 ***
t_0 to t_{+30}	-3.41%	-3.65 ***

Note: *** shows 1% significance level

Source: Authors' estimation

Figure 4

CAAR GROUPED BY MARKET CAPITALIZATION
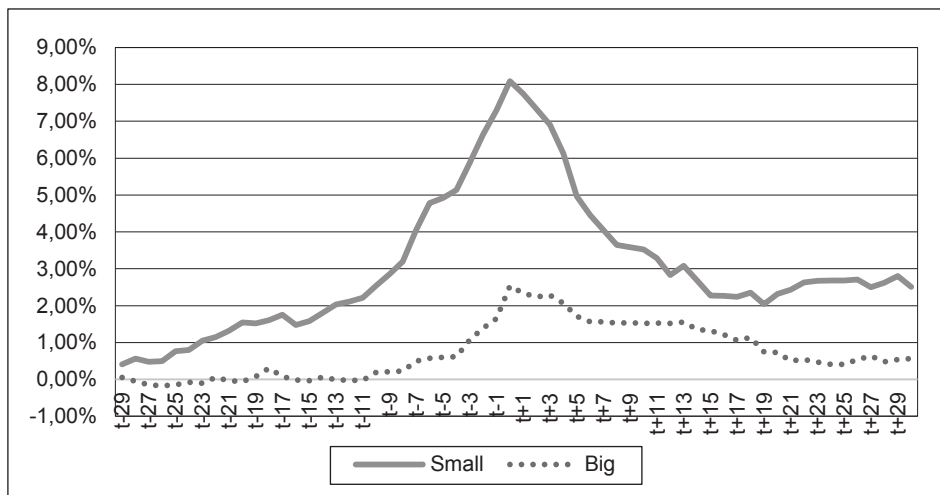
Source: Authors' estimation

As seen from Table 9 and Figure 4 there is significant mean difference between cumulative average abnormal returns in the event windows when the sample is divided in two subgroups according to market value. The higher cumulative average abnormal returns caused by ex-day anomaly in the firms is more likely to occur in firms which have lower market capitalization. Taking into account the following event, it is possible to benefited from ex-day anomaly.

Table 10

THE HIGHEST ABNORMAL RETURN ON THE STOCK DIVIDEND
EX-DAY ANOMALY BASED ON MARKET CAPITALIZATION

Event 1			Event 2		Return
Buy/Sell	**Stock**	**When**	**Buy/Sell**	**When**	
Buy	Firms with smaller market cap.	10 days prior to Ex-day	Sell	At the end of Ex-day	5.88%
Short sell		At the end of Ex-day	Buy	8 days after Ex-day	4.45%

Source: Authors' estimation

Since there is difference in cumulative average abnormal returns caused by the stock dividend payment between a small market capitalization firm and large market capitalization firm, it is possible to develop investment strategies. In the first event, it is possible to obtain a 5.88% return over the market index return in addition to dividend by buying stock associated with companies which have smaller market capitalization than others ten days before ex-day and sell these stocks at the end of ex-day. In the second event, short selling same shares and buying back them 8 days after ex-day can provide a 4.45% return over market index return.

5. CONCLUSION

This study examines the effect of stock dividend distributions in the Turkish stock market over the period 1997-2018 using data from 1,220 stock dividends paid by 305 listed companies. The Turkish stock market is unique compared to US markets in many ways such as not permitting odd lots trading, having the same transaction costs for odd and round lots, with no tax on stock dividends or frac-

E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

691

tional shares, very small tick sizes and does not have bid-ask spreads under a specialist setting and limit orders. Hence, many micro market explanations for stock dividend ex-day that are attributed to US markets are not valid for the Turkish one.

The results show that there are positive abnormal returns around ex-day, as prices significantly start to rise 10 days before the stock dividend ex-day and reach their highest level on the ex-day and finally decrease in the following days, that is similar to other studies including the US and Japan. It is found that stock dividend size, and firms' size either based on market value or total assets has statistically significant effect on abnormal returns caused by stock dividend distributions. The higher stock dividend size results in higher returns which is consistent with the transaction cost hypothesis suggested by Woolridge (1983) and the smaller sized companies provide higher returns compared to larger ones in the run up to ex-day. For example, the average abnormal return of small market value companies is 5.88% for the period 10 days before the ex-day. After the ex-day, results are reversed as seen in the other studies. In addition to price, the trading volume was also investigated and found, on average, to be higher during the pre-period of ex-day than the post-period.

These findings indicate that an ex-day effect of stock dividend exists in the Turkish market that is mainly related to stock dividends per se rather than being driven by other market factors or imperfections. In addition, the pattern of price reversal observed before and after the ex-day shows that these findings are also in line with overreaction hypothesis as suggested by Jiang and Huang (2010).

Accordingly, a practical implication could be deducted such that buying securities ten days before the ex-day and selling on the ex-day or short selling shares at the end of ex-day and buying back the same stock eight days later at a lower price could have been provided a higher abnormal return.

Since IFRS was fully adapted in 2008 and a major deregulation related to minimum dividend pay-out requirement was annulled in 2009, future research should examine the ex-day of the dividend in Turkish stock market by dividing sample into subperiods which can also give opportunity to eliminate the effect of global crisis in 2008 and 2009.

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EKONOMSKI PREGLED, 72 (5) 670-696 (2021)

693

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E. KADIOGLU, A. KIRBAS: Stock Dividend Ex-Day Abnormal Return: Evidence from Turkish Stock Market
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ABNORMALNI POVRAT NA EX-DAY DIONICE:
DOKAZI S TURSKOG TRŽIŠTA DIONICA

Sažetak

Ovaj rad ispituje utjecaj „ex-day" dividende na prinos i volumen dionica na burzi Borsa Istanbul. Podaci obuhvaćaju 1.220 dioničkih dividendi povezanih s 305 poduzeća u razdoblju od 1997. do 2018. godine. Pozitivan abnormalan prinos i volumen primjećuju se oko dana kada dionica gubi pravo na dividendu (ex-day). Kumulativni prosječni višak povrata nad tržišnim prinosom počinje značajno rasti deset dana prije ex-day-a i dostiže svoju najveću razinu na ex-day prije nego što se smanji u danima koji slijede. Rezultati pokazuju da je abnormalan prinos oko ex-day-a snažno povezan s omjerom isplate dividendi dionica, veličinom imovine i tržišnom vrijednošću poduzeća. Dionice Borsa Istanbul poduzeća koje kotiraju na burzi s većim omjerom isplate dividendi dionica i one sa skromnom imovinom ili niskom tržišnom kapitalizacijom mogu generirati 5,97%, 6,08% i 5,88% abnormalan povrat u odnosu na tržišni indeks.

Ključne riječi: dioničke dividende, „ex-day" učinak, anomalija na tržištu, tržišna mikrostruktura, strategija ulaganja