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THE IMPACT OF INCREASED DIVIDEND ANNOUNCEMENTS ON STOCK PRICE: A TEST OF MARKET EFFICIENCY

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ABSTRACT

The purpose of this study is to test the semi-strong form efficient market hypothesis by analyzing the effects of increased dividend announcements on stock price. Specifically, is it possible to earn an above normal return on a publicly traded stock when the firm announces an increased dividend? Numerous past studies suggest that with a company's increased dividend announcement goes a positive signal about the firm's future, thereby significantly increasing the firm's stock price. Likewise, the positive signal implies that the firm now attracts a new breed of investors, thus driving up demand for the firm's stock. According to the semi-strong form efficient market hypothesis, it is not possible to consistently outperform the market — appropriately adjusted for risk — by using public information such as increased dividend announcements. This type of information should impound stock price sufficiently fast to disallow any investor's earning an above normal risk adjusted return. Evidence here supports the positive signal associated with the sample of increased dividend announcements examined. Likewise, the study results support the semi-strong form efficient market hypothesis.

INTRODUCTION

Dividend announcements are one of the most highly studied and meaningful events for investors to research. They can be used as a direct signal of strength regarding a company's liquidity in today's market. A dividend can be thought of as the cost of equity capital to equity shareholders. The announcement of a dividend can be seen in two perspectives: if the dividend that is announced is up to expectations of shareholders, the market price of the shares will be positively affected. Whereas, if the dividend that is announced is not up to expectations of the equity investors, the market price of the shares will be negatively affected.

Market efficiency is defined as the amount of time it takes for the stock market to react to announced public information. Thus, there are three different levels of market efficiency. If a market is weak-form efficient, then the market reacts so fast to the announced information that no investor is able to earn a substantial return or a return higher than that of the S&P 500 Market Index. Semi-strong market efficiency is similar, but is defined as the impracticality of gaining an above average return based on announcements of public information. Finally, when a market is strong-form efficient, investors are unable to earn above normal returns by relying on both public

and private information. The only possible way an investor would be able to benefit would be to engage in the illegal act of insider trading. Investors in the past have been able to obtain gains based off public information, so it is safe to say that the market is not strong-form efficient. Is the market semi-strong efficient with respect to dividend announcements? To answer this question, this study will analyze stock prices before the public dividend announcements and examine how this type of information affects trading, and how in advance investors can earn a return before the announcement is made. Is it possible for investors to "beat" the market relying solely on public information? In order to test the semi-strong efficient market hypothesis, this research will analyze how increased dividend announcements affect stock up to 30 days price before and after the announcement.

BACKGROUND AND PURPOSE

The purpose of this event study is to test market efficiency theory by analyzing the impact of a sample of 30 increased dividend announcements on the firm's stock price. Specifically, how fast does the market price of the firms' stock react to the sample of increased dividend announcements examined? This research tests whether the announcement of increased dividends directly incorporates the strong form, semi-strong form, or weak form of the efficient market hypothesis based on the timing of the announcements and the modifications in stock price that occur.

This study tests the effects of a sample of 30 increased dividend announcements on stock price using the standard risk adjusted event study methodology. If a strong correlation exists between an announcement and an immediate equity market price change, there may not be opportunity to earn an above normal return and such evidence would support efficient market theory.

LITERATURE REVIEW

Fama defined market efficiency in respect to how quickly the stock market reacts to announced public information and proposed three levels of market efficiency. These three levels are characterized by how quickly the stock market responds as well as the amount of returns investors can possibly seek from carrying out legal trading actions. Weak-form, semi-strong form, and strong-form efficiency are the three different ways a market can be differentiated. The impact of an increased dividend announcement on stock prices has been widely researched and documented.

Mehndiratta and Gupta (2010) stated that the semi-strong form of efficient market hypotheses (EMH) states that stock prices reflect all the publicly available information instantaneously and accurately. An increased dividend announcement normally signals higher future earnings, which is seen in investor's eyes as a signal of strength. Fracassi (2008) however found interesting information when examining stock price reactions to increased dividend announcements. On a short time scale, Fracassi found a 3-day cumulative abnormal return of 1.34% for dividend increases. However, among companies that announce a dividend increase 42% have actually seen a negative stock price reaction. The reasoning behind this dispersion of returns is thought to be due to daily idiosyncratic and systematic volatility in respect to the dividend announcement.

Sheikhbahaei and Mohd investigated the market reaction of 356 dividend announcements by 138 firms at the Malaysia stock exchange. The result of their study concluded, "The market reacts positively to dividend increasing stocks but no significant react to the constant dividend or the decreasing group of dividend announcements. It was also observed from the information in a

day prior to the announcement day that there is a probable leakage of information by the excess access to the insider information of the firms.”

Dividend announcements, whether a surprise or an increase to an already existing dividend, are one of the most common actions firms take in order to attract new investors. These announcements by firms are usually seen as a sign of strength, suggesting that the firm has a substantial amount of excess capital. This study will test the efficiency and effect of the public announcement of an increased dividend on stock price.

METHODOLOGY AND STUDY SAMPLE

This study sample includes 30 randomly selected increased dividend announcements between the time period May 10, 2005 and February 5, 2013. The random sample was selected from increased dividend announcements in which the company is traded either on the NYSE or NASDAQ. Table 1 describes the sample.

Table 1: DESCRIPTION OF STUDY SAMPLE

TICKER	FIRM NAME	ANNOUNCEMENT DATE	TRADED INDEX
BA	The Boeing Company	December 12 2011	NYSE
DIS	Walt Disney	November 30 2011	NYSE
AAPL	Apple	July 24 2012	NASDAQ
XOM	ExxonMobil Corp	April 25 2012	NYSE
NVS	Novartis	February 1 2012	NYSE
SO	Southern Company	April 16 2012	NYSE
CAT	Caterpillar, Inc.	June 13 2012	NYSE
IBM	International Business Machines	April 24 2012	NYSE
JNJ	Johnson & Johnson	April 23 2009	NYSE
NKE	Nike	November 20 2008	NYSE
MCD	McDonalds Corporation	September 22 2010	NYSE
AEP	American Electric Power Company Inc.	October 26 2010	NYSE
MSFT	Microsoft Corporation	September 20 2011	NASDAQ
PM	Philip Morris International Inc.	September 14 2011	NYSE
INTC	Intel Corporation	July 26 2012	NASDAQ
WMT	Wal-Mart Stores Inc.	March 3 2011	NYSE
MO	Altria Group Inc.	August 26 2011	NYSE
KMB	Kimberly-Clark Corporation	February 23 2010	NYSE
WAG	Walgreen Company	June 19 2012	NYSE
SWK	Stanley Black & Decker, Inc.	July 18 2012	NYSE
KO	The Coca-Cola Company	February 21 2008	NYSE
MMM	3M Company	February 5 2013	NYSE
AWR	American States	August 1 2012	NYSE

	Water Company		
EMR	Emerson Electric Company	November 1 2011	NYSE
ITW	Illinois Tool Works Inc.	August 3 2007	NYSE
HRL	Hormel Foods Corporation	November 22 2010	NYSE
SYU	Sysco Corporation	November 10 2005	NYSE
BDX	Becton, Dickinson, and Company	November 20 2012	NYSE
LEG	Leggett & Platt, Incorporated	August 8 2012	NYSE
MSA	Mine Safety Appliances Company	May 10 2005	NYSE

To test semi-strong market efficiency with respect to public announcements of increased dividends and to examine the effect of increased dividends on stock return around the announcement date, this study proposes the following null and alternate hypotheses:

H₁₀: The risk adjusted return of the stock price of the sample of firms announcing a dividend is not significantly affected by this type of information on the announcement date.

H₁₁: The risk adjusted return of the stock price of the sample of firms announcing a dividend is significantly positively affected by this type of information on the announcement date.

H₁₂: The risk adjusted return of the stock price of the sample of firms announcing a dividend is significantly negatively affected by this type of information on the announcement date.

H₂₀: The risk adjusted return of the stock price of the sample of firms announcing a dividend is not significantly affected by this type of information around the announcement date as defined by the event period.

H₂₁: The risk adjusted return of the stock price of the sample of firms announcing a dividend is significantly affected by this type of information around the announcement date as defined by the event period.

This study uses the standard risk adjusted event study methodology from the finance literature. The announcement date (day 0), obtained from <http://finance.yahoo.com/>, is the date of the firm's announcement of the increased dividend. The required historical financial data, i.e. the stock price and S&P500 index during the event study period was also obtained from the internet website <http://finance.yahoo.com/>.

1. The historical stock prices of the sample companies, and S&P 500 index, for the event study duration of -180 to +30 days (with day -30 to day +30 defined as the event period and day 0 the announcement date) were obtained.
2. Then, holding period returns of the companies (**R**) and the corresponding S&P 500 index (**R_m**) for each day in this study period were calculated using the following formula:

$$\text{Current daily return} = \frac{\text{current day close price} - \text{previous day close price}}{\text{previous day close price}}$$

A regression analysis was performed using the actual daily return of each company (dependent variable) and the corresponding S&P 500 daily return (independent variable) over the pre-event period (day -180 to -31 or period prior to the event period of day -30 to day +30) to

obtain the intercept alpha and the standardized coefficient beta. Table 2 shows alphas and betas for each firm.

Table 2: ALPHAS AND BETAS OF STUDY SAMPLE

FIRM name	Alpha	Beta
BA	-0.0002409	1.098504
DIS	0.0009307	1.080323
AAPL	0.0022015	0.9599692
XOM	0.0002125	0.9158344
NVS	-0.000066	0.7304069
SO	0.0007643	0.3269699
CAT	0.0003611	1.491303
IBM	0.0005025	0.7247484
JNJ	0.0001248	0.6031184
NKE	0.0013191	0.8471123
MCD	0.0011377	0.5949518
AEP	0.0006397	0.6966376
MSFT	-0.0001563	0.8877574
PM	0.0013069	0.6767706
INTC	0.0004659	1.143574
WMT	.0000674	.4586088
MO	.0007643	.4380419
KMB	.0006488	.5633564
WAG	-.0002316	.5774825
SWK	-.0001101	1.4850590
KO	.0016401	.5055068
MMM	.0002035	.9518649
AWR	.0004031	.6599839
EMR	-.0010350	1.2458390
ITW	.0006254	.9857035
HRL	.0005688	.4298258
SYN	-.0005105	.8877918
BDX	.0000544	.6635091
LEG	-.0010485	1.1846740
MSA	-.0009430	1.4375850

- For this study, in order to get the normal expected returns, the risk-adjusted method (market model) was used. The expected return for each stock, for each day of the event period from day -30 to day +30, was calculated as:

$$E(R) = \alpha + \beta (R_m)$$
 where R_m is the return on the market i.e. the S&P 500 index.
- Then, the Excess return (ER) was calculated as:

$$ER = \text{the Actual Return (R)} - \text{Expected Return } E(R)$$
- Average Excess Returns (AER) were calculated (for each day from -30 to +30) by averaging the excess returns for all the firms for given day.

$$AER = \text{Sum of Excess Return for given day} / n,$$

- where n = number of firms in sample i.e. 30 in this case
6. Also, Cumulative AER (CAER) was calculated by adding the AERs for each day from -30 to +30.
 7. Graphs of AER and Cumulative AER were plotted for the event period i.e. day -30 to day +30. Chart 1 below depicts Average Excess Return (AER) plotted against time. Chart 2 below depicts Cumulative Average Excess Return (CAER) plotted against time.

QUANTITATIVE TESTS AND RESULTS

Did the market react to the announcements of increased dividends? Was the information surrounding the event significant? One would expect there to be a significant difference in the Actual Average Daily Returns (Day -30 to Day +30) and the Expected Average Daily Returns (Day -30 to Day +30) if the information surrounding the event impounds new, significant information on the market price of the firms' stock (see AER graph in Chart 1 below). If a significant risk adjusted difference is observed, then we support our hypothesis that this type of information did in fact significantly either increase or decrease stock price. To statistically test for a difference in the Actual Daily Average Returns (for the firms over the time periods day -30 to day +30) and the Expected Daily Average Returns (for the firms over the time periods day -30 to day +30), we conducted a paired sample t-test and found a significant difference at the 5% level between actual average daily returns and the risk adjusted expected average daily returns. Results here support the alternate hypothesis H_{21} : The risk adjusted return of the stock price of the sample of firms announcing increased dividends is significantly positively affected around the announcement date as defined by the event period. This finding supports the significance of the information around the event since the market's reaction was observed.

Is it possible to isolate and observe the sample's daily response to the announcement of an increased dividend from day -30 to day +30? If so, at what level of efficiency (weak, semi-strong, strong form according to efficient market theory) did the market respond to the information and what are the implications for market efficiency?

Another purpose of this analysis was to test the efficiency of the market in reacting to the announcement of an increased dividend event. Specifically, do we observe weak, semi-strong, or strong form market efficiency as defined by Fama, 1970, in the efficient market hypothesis? The key in the analysis or tests is to determine if the AER (Average Excess Return) and CAER (Cumulative Average Excess Return) are significantly different from zero or that there is a visible graphical or statistical relationship between time and either AER or CAER. See AER and CAER graphs in Charts 1 and 2 below. T-tests of AER and CAER both tested different from zero at the 5% level of significance. Likewise, observation of Chart 2 (graph of CAER from day -30 to day +30) confirms the significant positive reaction of the risk adjusted returns of the sample of firms tested, up to 10 days prior and 26 days after to the announcement of an increased dividend.

Chart 1: AVERAGE EXCESS RETURN OVER EVENT PERIOD

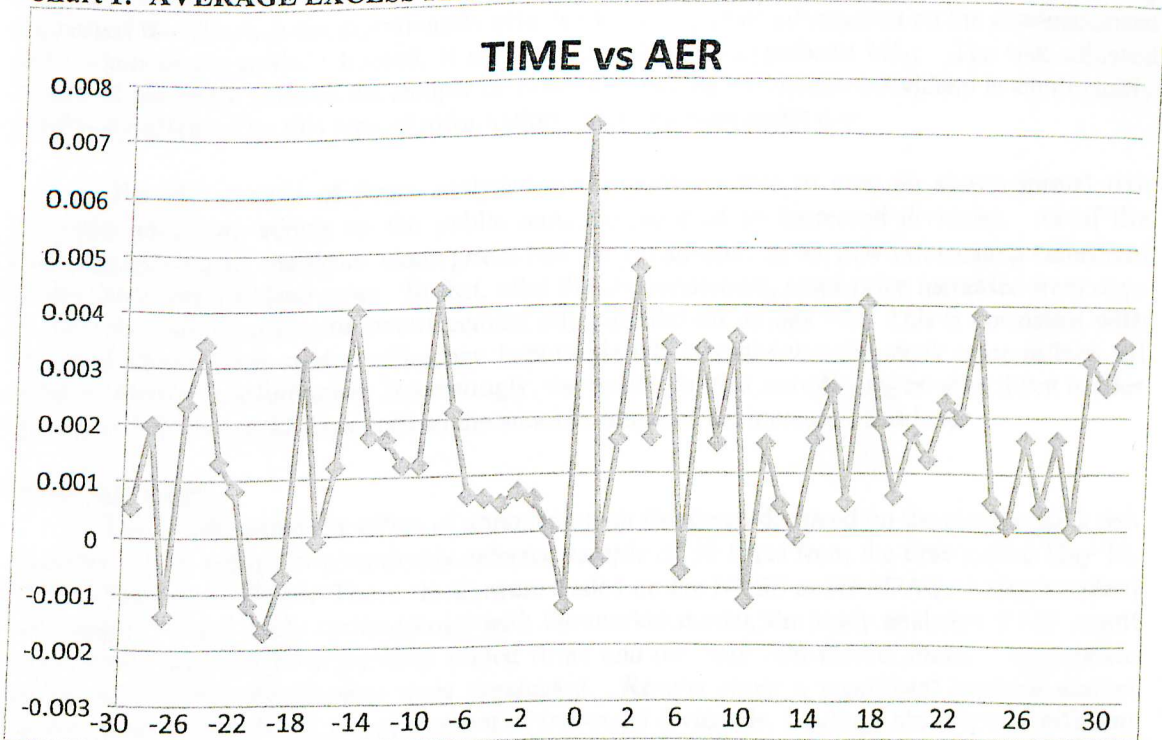
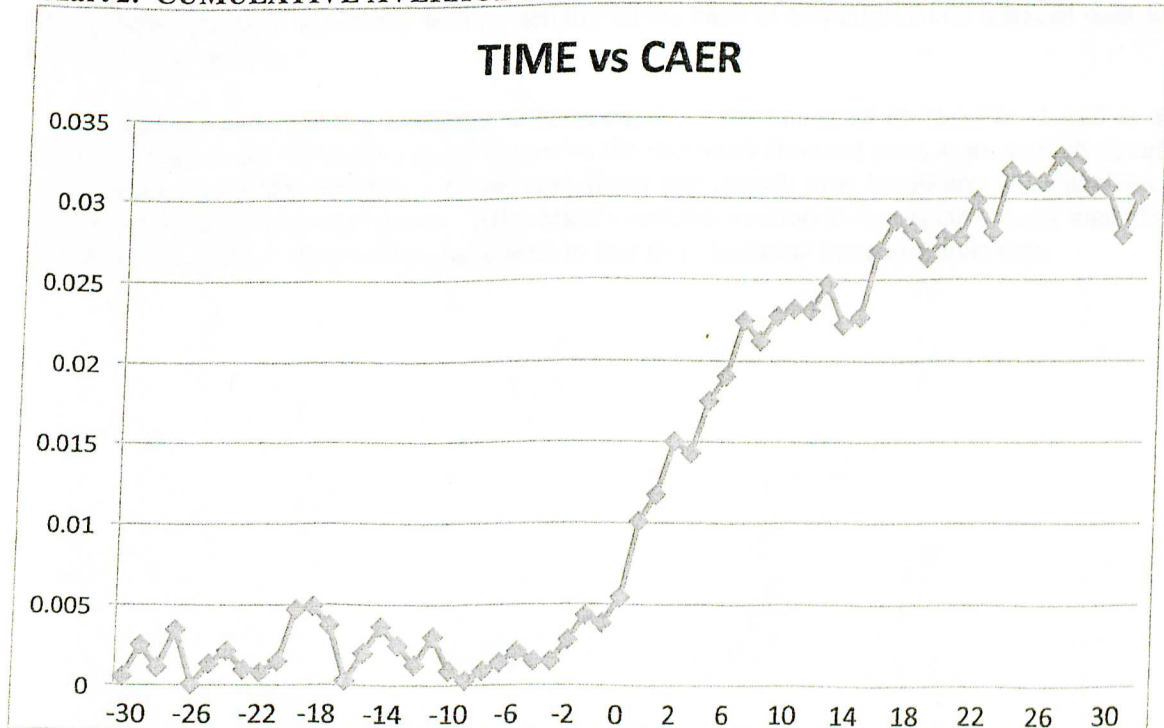


Chart 2: CUMULATIVE AVERAGE EXCESS RETURN OVER EVENT PERIOD



The graph in Chart 2 demonstrates that the announcements of increased dividends had a significant positive impact on the firm's share price up to twelve days prior and ten days after to announcement day 0, the increased dividend announcement date. The evidence rejects the null

hypothesis H_{10} : The risk adjusted return of the stock price of the sample of firms announcing increased dividends is not significantly affected by this type of information on the announcement date when made public. Instead, it supports the alternate hypothesis H_{11} : The risk adjusted return of the stock price of the sample of firms announcing an increased dividend is significantly positively affected by this type of information on the announcement date.

For the sample of firms analyzed, an investor is able to earn an above normal risk adjusted return by acting on the public announcement of an increased dividend. As of the announcement date, the firms' stock prices had not yet adjusted to the new information embedded in the increased dividend news. In fact, after the announcement, stock price increased from days +1 to +10, then returning to announcement day equilibrium on day +30. This is consistent with the semi-strong form market efficiency hypothesis which states that the stock price reflects all publicly available information. Interestingly, the results for this sample suggest significant insider trading activity up to 12 days prior to the announcement of the increased dividend.

CONCLUSION

This study tested the effect of announcing an increased dividend on the stock price's risk adjusted rate of return for a randomly selected sample of 30 firms from the time period May 10, 2005 to February 5, 2013. These stocks were traded on the NYSE or NASDAQ. Using standard risk adjusted event study methodology with the market model, the study analyzed 8,130 recent observations on the fifteen publicly traded firms and the S&P 500 market index. Appropriate statistical tests for significance were conducted. Results show a significant positive market reaction prior to the firms' announcement of increased dividends. Findings also support efficient market theory at the semi-strong form level as documented by Fama (1970). Similar to many other event study's findings in the finance literature (stock options, repurchase, dividend announcements etc.), apparently trading activity on the basis of this information surfaced prior to it being made public.

Specifically, for this study the announcement of the increased dividend is viewed as a signal of good news. Investors appear to receive the increased dividend news as an implicit signal from management that the firm's future cash flows and growth look bright and will culminate into continuously rising stock price. The market's positive reaction to the announcement suggests that management and stockholders have little to fear from initiating increased dividends.

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