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THE IMPACT OF FLUCTUATING FINANCIAL MARKETS ON THE SIGNALING EFFECT OF E-COMMERCE ANNOUNCEMENTS

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Abstract

This paper presents an event study of business signaling through electronic commerce announcements during fluctuating financial markets. This topic is of unique and substantial importance. If there are abnormal returns on an eCommerce initiative, and these returns are different during bull and bear markets, then we know that the markets value these investments, but the value is subjective rather than inherent to the investment. If the value is subjective, then gains to the investor and corporation itself will vary in sympathy with market movement. This paper researches these new aspects of returns due to eCommerce announcements and compares them with other recent studies. We use event study methodology and assess the cumulative abnormal returns from eCommerce initiatives announced by firms in the S&P 100 Index between January 1999 and December 2000.

Keywords: eCommerce, IT valuations, event-study.

RESEARCH OBJECTIVES

Recent studies in the IS literature have analyzed abnormal stock returns through the signaling mechanism of IT-related news announcements (e.g., Dos Santos et al. 1993; Im et al. 2001; Subramani and Walden 2001). Our research expands upon that of Im et al. and of Subramani and Walden by examining eCommerce announcements during fluctuating financial markets. This is of unique and substantial importance. If there are abnormal returns on eCommerce initiatives, and these returns are different during bull and bear markets, then we know that the markets value these investments, but the value is subjective rather than inherent to the investment. If the value is subjective, then gains to the investor and the corporation itself will vary in sympathy with market movement.

Corporate news announcements, which influence a firm’s stock price, are important to both corporations and shareholders. Corporations need to justify (economic value added) the additional IT expenditures, and investors need justification in purchasing a firm’s stock with an expectation of future gains. Therefore, the unexpected release of asymmetrical information (management versus public), received by the financial market, may be perceived as contributing positively or negatively toward future cash flows, and is associated with stock price reaction in the same direction (Kalay and Lowenstein 1985). A widely accepted explanation for this empirical finding emphasizes the role of signaling asymmetric information (Miller and Modigliani 1961). Consistent with this reasoning, the objectives of our research are to examine the relationship between a news announcement of an eCommerce initiative by a firm and the reaction of the financial community upon this endeavor. More specifically, this paper presents an event study of business signaling through eCommerce announcements during fluctuating financial markets. This focus, we believe, has significant importance and has not been examined before. If the markets value these initiatives, then are these abnormal returns? Is there a difference in cumulative abnormal returns (CARs) over increasing and decreasing markets? Is there a difference in CARs between industries (Im et al. 2001)? Is there a difference in CARs by the type of eCommerce initiative undertaken (Subramani and Walden 2001)? Finally, this study examines the significance of trading volume differences in response to eCommerce announcements (Im et al. 2001).
THEORETICAL FOUNDATION

The last half of the 1990s saw a tremendous expansion of the Internet. It has been reported that the number of Web users is growing at a parabolic rate. NUA Internet Surveys (2000) estimates that over one million new users come online every week. This designates an enormous market of likely consumers for eCommerce activities. Giga Information Group (2000) projects U.S. business-to-commerce sales to grow to over $233 billion by 2004. The ability to draw upon Internet users and make them consumers is a business priority. As the information economy transforms into an eBusiness environment, firms positioned to take advantage of this shift will prosper and those who do not will fall behind (Porter 2001).

Contrary to published news reports, however, the value of eCommerce initiatives and the associated empirical evidence of benefits to corporations are not unequivocal. These initiatives promise to greatly reduce costs, allow efficient and flexible transaction methods, improve market liquidity, and allow greater access to buyers and sellers (Wise and Morrison 2000). Competitive firms plan on leveraging new technologies and procuring the organizational capabilities to benefit from the growing online markets. However, the costs to receive these benefits are very real. Reports estimate the cost to businesses for launching their web site at between $1 million and $20 million (Diederich 1999). Since an increasing number of businesses are considering restructuring their business model to take full advantage of this growing customer access channel, a logical question to answer before the huge investments are incurred should be: What are the returns to shareholders from engaging in eCommerce activities? The financial community expects these activities to position the firms advantageously for the future by enabling them to exploit opportunities created by the growth in eCommerce.

The efficient-market hypothesis states that stock prices fully reflect all available information. Investors, one would assume, recognize potential future cash flow changes associated with new policy announcements. It is intuitively thought that eCommerce activities will increase this cash flow. Therefore, the financial markets are expected to acknowledge this favorably and reward the companies involved by increases in their stock prices.

Subramani and Walden examined eCommerce announcements during the period between October and December, 1998. It was not surprising that they found CARs significantly larger than those of previous studies. Their data set consisted primarily of smaller capitalized corporations with limited history and potential survival rate. Because of higher associated risks, there were higher associated rewards. Furthermore, examining only eCommerce announcements for three months and not firms per se allowed them to study a limited number of firms announcing initiatives during this timeframe.

We address these and other issues and expand on the findings of Im et al. An expanded timeframe for observation enables us to examine these phenomena during both bull and bear market conditions. Since the eCommerce revolution has just recently begun, and with few economic or financial analyses, we anticipate this investigation will increase comprehension of the issue. We also concentrated on the largest U.S. firms, believing they are the drivers of eCommerce. In addition, we have attempted to strengthen the methodological approach and econometrics used by Subramani and Walden.

RESEARCH METHODOLOGY

We utilize event-study methodology to ascertain the impact of eCommerce announcements by firms on the U.S. financial markets. Our sample is comprised of the firms in the S&P 100 Index. Since these firms are deemed the most valuable (market capitalization), and are leaders in their industries, the actions they collectively take may well impact the future direction and structure of eCommerce. The study period was between January, 1999, and December, 2000. The strategic selection of this timeframe allows us to examine differences in effects between bull (January, 1999, through March, 2000) and bear (April through December, 2000) markets. It spans a period beginning with one of the strongest expansionary periods and ending in a market slowdown approaching recession.

We examine the market’s reaction to these announcements, controlling for confounding events upon different subgroups of the sample (bull versus bear). We also examine the effect these announcements have on different industrial groups and announcement types. Furthermore, the changes in trading volume associated with these announcements are explored.

The firms are all actively traded in the U.S. equity markets, and are considered liquid enough to be efficient. Their market capitalization is high and increasing over the long run. Moreover, this data set is sufficiently broad and should not be an impediment to conducting an event-study analysis. We examine these firms’ announcements of eCommerce activities. These are defined as public news announcements by the firms using all news sources within the Lexis/Nexis search engine. Following Subramani and Walden, we use the online search features of Lexis/Nexis to search for announcements containing the words (launch OR announce) within the same sentence as the words (online OR commerce), AND (NYSE OR NASDAQ OR AMEX)
OR OTC) AND (S&P firm name or ticker symbol). The daily returns and trading volume of the individual S&P 100 firms were compiled from the Center for Research on Security Prices (CRSP) tapes and confirmed using Commodity Systems, Inc. (CSI) data. The indices used for the market return regression were the S&P 100 Index (OEX) and S&P 500 Index (SPX). Since all of the firms under study are part of the S&P 100 Index, it should have the smallest variance. Any significant abnormal returns will thus impute a strong econometric significance. Furthermore, the use of the S&P 500 Index is used for comparison, and is widely accepted in event-studies (MacKinlay 1997). Any other indices would have exaggerated the variances and significance of the abnormal returns. We defined our event window as ±1 day from the event (day 0) and plotted any information leakages or anticipated actions surrounding this date.

Event-study methodology is based on the assumption that capital markets are sufficiently efficient to evaluate the impact of new information on expected future profits of the firms. We used the market model to obtain the estimated abnormal returns.

**Market Model**

The market model assumes a linear relationship between the return of any security to the return of the market portfolio:

\[ R_{i,t} = \alpha_i + \beta_i R_{m,t} + \epsilon_{i,t} \]

Where: 
- \( R_{i,t} \) = the rate of return on the share price of firm \( i \) on day \( t \), 
- \( R_{m,t} \) = the rate of return on a market portfolio of stocks (S&P 100 or 500 Indices) on day \( t \), 
- \( \alpha_i \) = the intercept term, 
- \( \beta_i \) = the systematic risk of stock \( i \), and 
- \( \epsilon_{i,t} \) = the error term, with \( \mathbb{E}(\epsilon_{i,t}) = 0 \).

To validate the assumption of linearity, we perform a Chow test on the parameters of the regression. Barring any significant differences, we should be able to continue to find the abnormal returns.

Using (1) and following McWilliams and Siegel (1997), we derive estimates of daily abnormal returns (AR) for the \( i \)th firm:

\[ AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t}) \]

Where: 
- \( \alpha_i \) and \( \beta_i \) are the ordinary least squares (OLS) parameter estimates obtained from the regression of \( R_{i,t} \) on \( R_{m,t} \) over an estimation period (T) preceding the event, in this case 200 days prior to the event. The abnormal returns (AR\(_{i,t}\)) represent returns received by shareholders after the event’s effect on equity prices adjusting the normal return process. Therefore, the AR\(_{i,t}\) is the rate of return on the stock after being adjusted by subtracting the expected return from the actual return. Any significant difference is considered abnormal, or an excess return.

Following Dodd and Warner (1983), we compute a standardized abnormal return (SAR), where the abnormal return is standardized by its standard deviation:

\[ SR_{i,t} = AR_{i,t} / SD_{i,t} \]

Where

\[ SD_{i,t} = \left( \frac{\sum_{i=1}^{T} (R_{m,t} - R_{m})^2}{T} \right)^{1/2} \]

Note: \( \sum_i^{i} \) is the residual variance from the market model as computed for firm \( i \). \( R_{m} \) = the mean return on the market portfolio (S&P 100 or 500 indices) calculated during the estimation period, and \( T = 200 \), the number of days in the estimation period.

The standardized abnormal returns can then be cumulated over a number of days, \( k = \pm 1 \) (the event window), to derive a measure of the cumulative abnormal return (CAR) for each firm:

\[ CAR_i = \frac{(1/k^{2})}{\sum_{t=1}^{k} SAR_{i,t}} \]

A standard assumption is that the values of CAR, are independent, normal, and identically distributed. With this assumption, we convert these values to identically distributed variables by dividing CAR, by its standard deviation, which is equal to \( [(T-2)/(T-4)]^{1/2} \).
Thus, the average standardized cumulative abnormal returns (ACAR) across n firms over the event window is:

\[
\text{ACAR}_j = \frac{1}{\sqrt{n}} \times 1/((T - 2)/(T - 4))^{1/2} \sum_{t=1}^{n} \text{CAR}_{j,t}
\]

The test statistic used to assess whether the average cumulative abnormal return is significantly different from zero (its expected value) is:

\[
Z = \text{ACAR}_j \times n^{1/2}
\]

Since the degrees of freedom are large, this test statistic is assumed unit normal. By using a time-series of excess portfolio returns, the test statistic accounts for cross-sectional dependence of security-specific excess returns (Brown and Warner 1985). If this test statistic tests significant, then it is assumed to measure the average effect of the event on the value of the nth firm.

CURRENT STATUS AND PROPOSITION

We have completed all relevant background studies and the data collection, and are currently completing Chow tests to control the parameters of the market model regressions. The cumulative abnormal return regressions have as yet to be done.

We expect to present empirical evidence about the benefits of eCommerce initiatives by market leading firms. Furthermore, the effects of bull versus bear markets, industry classification, type of eCommerce activity undertaken, and differences in trading volume on CARs will be examined. Therefore, although utilizing a financial economics methodology, we believe this research is valuable to the IS community since it will provide empirical evidence of benefits of eCommerce initiatives. Because the empirical value of eCommerce is still relatively unknown, economic value added results can allow managers to fully exploit the benefits of eCommerce initiatives. We hope to extend the IS literature with robust empirical findings and provide a mechanism for future research.

References


