

The Covid-19 Pandemic and the Consumer Staples Sector: A Test of Market Efficiency

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On Wednesday March 11, 2020, the World Health Organization (WHO) declared the covid 19 outbreak a global pandemic (Cucinotta, 2020). How efficient is the consumer staples market reaction to the announcement of a global pandemic? The purpose of this study is to examine the risk adjusted returns on and around the pandemic announcement to test the semi-strong form market efficiency hypothesis using the standard event study methodology in the finance literature. Will returns in the consumer staples industry show larger than expected gains on and surrounding the WHO's COVID-19 pandemic announcement? The finance literature offers little evidence supporting the link between pandemics and the stock market. The announcement of a pandemic by the WHO should significantly and quickly affect the market. According to Eugene Fama (1970), if the market is semi-strong form efficient, all public information is immediately factored into the market and no investor can use this information to achieve an above normal return when adjusted for risk. To study this relationship, data for the S&P 500 and 10 consumer staples sector firms were collected for the event period surrounding the announcement of the COVID-19 pandemic. This study tests the global pandemic announcement for semi-strong form market efficiency (Bacon & Howell 2021). Evidence here supports the expected positive signal associated with the sample of consumer staples sector firms in reaction to the announcement of the pandemic. Likewise, the study results support the semi-strong form efficient market hypothesis and suggest the possibility of trading on this information up to 15 days prior to the announcement consistent with the behavioral finance literature (Bacon & Howell 2021).

Keywords: market efficiency, Covid-19 pandemic, announcement

INTRODUCTION

On March 11, 2020, the WHO declared the coronavirus outbreak a global pandemic. Director General, Dr. Tedros Adhanom Ghebreyesus, stated that they are deeply concerned by alarming amounts of spread and severity (Cucinotta, 2020). How fast does the market respond to public information? In particular this study focus is on the following research question: How does the consumer staples market react to the Covid-19 pandemic announcement? The consumer staples market consists of food and beverage, household goods, hygiene products, tobacco, and alcohol products. These are essential products that people will continue to buy regardless of their financial situation.

The purpose of this study is to test the semi-strong form market efficiency theory by examining the effect of the March 11, 2020 WHO global pandemic announcement on the risk adjusted stock price returns of a sample of major consumer staples sector firms using the standard risk adjusted event study methodology in the finance literature (Bacon & Howell 2021). We test to see how quickly 10 major stocks in the consumer staples sector react on or around the announcement that Covid-19 is officially a global pandemic.

LITERATURE REVIEW

The consumer staples sector is recession resistant (Rosenberg, 2022). When a recession or economic slowdown occurs, such as Covid-19 pandemic, investors sell stock leading to a volatile market. There are certain industries that tend to see strong performance in an economic downturn and consumer staples is one of them. No matter what happens, people still need certain necessity household items on a recurring basis. Some of these include toothpaste, soap, shampoo, laundry detergent, dish soap, toilet paper, and paper towels. These products are owned by major companies, always are in demand, and are sold across the world.

Market Efficiency

This study tests market efficiency on and around the pandemic announcement by the WHO. Fama (1970, 1976) defined market efficiency in three forms: weak-form, semi-strong-form and strong-form. Accordingly, with weak-form efficiency no investor can earn an above normal return by trading based on past information. Numerous studies support the random walk theory in support of the weak form market efficiency hypothesis (Fama, 1965; Alexander, 1961; Fama and Blume, 1966; Granger and Morgenstern, 1970). According to weak form efficiency, stock price reacts so fast to all past information that no investor can earn an above normal risk adjusted return (i.e., higher than the risk adjusted return using the S&P 500 index) by acting on this type of information. For example, if an investor reviews a firm's newly released annual report, discovers higher than expected positive earnings results for the past year and buys the firm's stock and the stock price does not rise, the market is weak form efficient based on to past information (Bacon & Howell, 2021; Bacon & Cannon, 2018; Bacon & Gobran, 2017; Bacon & Spradlin, 2019).

According to semi-strong-form market efficiency no investor can earn an above normal, risk adjusted return using publicly available information. Tests of semi-strong form efficiency (Fama, Fisher, Jensen, & Roll, 1969; Ball & Brown, 1968; Aharony & Swary, 1980; Joy, Litzenberger, & McEnally, 1977; Watts, 1978; Patell & Wolfson 1979; Scholes, 1972; Kraus & Stoll, 1972; Mikkelson & Partch, 1985; Dann, Mayers, & Raab, 1977) support the hypothesis that no investor can earn an above normal return using public information such as dividend announcements, sale of stock announcements, repurchase of stock announcements, accounting statements, stock split announcements, block trades, and earnings announcements. If the market is semi-strong form efficient, then stock price reacts so fast to all public information that no investor can earn an above normal risk adjusted return by acting on the public announcement of this type of information. If one buys the stock on the announcement and still does not make an above normal risk adjusted return, the market is semi-strong form efficient (Bacon & Spradlin, 2019; Bacon & Gobran, 2017, Bacon & Hutchinson, 2020). In a controlled environment Tung & Marsden (1998) performed trading behavior tests which resulted in a positive relationship between information quality and market trading profits in support of semi-strong form efficiency.

Strong-form efficiency theory claims that no investor can earn an above normal risk adjusted return using any information, public or private. Studies testing strong form efficiency show mixed results (Jaffe, 1974; Finnerty, 1976; Givoly & Palmon, 1985; Friend, Blume, & Crockett, 1970; Jensen, 1968). In this case, the market reacts to an event even before it is publicly announced. For this to occur, investors must act on insider information, an illegal act. If an investor buys the stock on the event using inside information, and earns no above normal risk adjusted return, the market is strong form efficient (Bacon & Hutchinson, 2021; Bacon & Spradlin, 2019; Bacon & Gobran, 2017).

Market Efficiency and Investment Advice

This study tests the semi-strong market efficiency theory by using the standard event study methodology in the finance literature (Bacon & Greis, 2008; Bacon & Gobran, 2017). If the market is semi-strong form efficient, then two popular methods of stock valuation become useless, a significant implication of this study. Investors pay billions of dollars annually to analysts for investment advice based on these valuation models. If the market is efficient, these investors are wasting billions of dollars on useless investment advice. Efforts to determine the “right” value of stock are useless if the market is semi-strong form efficient since the “right” price is the market price that impounds all available information (Bacon & Howell, 2021; Bacon & Cannon, 2018).

Stock Analysis Valuation Models

A popular model in the finance investment literature called into question by efficient market theory is technical stock analysis. Technical analysis follows the actual history of trading prices and determines the future trend based on this historical analysis. Technical analysts determined buy and sell target points by analyzing past price movement with charts and graphs. Often called chartists, they closely examine the effect of demand, popular opinion trends, and investor moods (Gitman & Joehnk, 2002; Bodie, Kane., & Marcus, 2007). Technical analysis disregards the minor fluctuation in the market and instead focus on how stock prices tend to move in long-run trends. Trend movements are identified by changes in supply and demand relationships and are detected in the market (Levy, 1966). Critics claim that the past price behavior is not indicative of the future and that the market moves in a random pattern. The market reacts to information, and since information arrives randomly, the market responds in a similar fashion. These critics also argue that if technical analysis were continually profitable, an influx of technical traders would bid away whatever profit potential that exists (Levy, 1966; Bacon & Howell, 2021; Bacon & Cannon, 2018).

The other stock valuation model used by analysts to determine market value is fundamental stock analysis. Fundamental stock analysis assumes that each security has an intrinsic value, which is the present value of expected future cash flows of the firm. Therefore, stock value is a function of the firm’s earning potential, economic variables, and financial factors that cause actual market prices to move toward intrinsic values (Levy, 1966; Bacon & Howell, 2021; Bacon & Cannon, 2018; Madura, 2020). If the fundamental intrinsic value is below the market value, the analyst recommends a sell signal and the opposite for a buy signal when the intrinsic value is above the market value. Critics of fundamental analysis argue that the market reacts quickly to information making it is impossible to maximize profit since the investor has to wait for information to be publicly available which is hard to collect, costly and not always reliable. A fundamental investor may be heavily invested in a security for a considerable length of time before the market comes around to his way of thinking (Levy, 1966; Bacon & Howell, 2021; Bacon & Cannon, 2018).

Semi-Strong Form Efficiency

If the market is semi-strong form efficient, investors are wasting billions of dollars on technical and fundamental analyst fees since their advice is worthless. This study tests the semi-strong form efficient market hypothesis which claims that stock prices reflect all public information. This would make it impossible to earn an abnormal risk adjusted return by investing on public information rendering technical and fundamental stock analysis useless. This information includes historical stock prices and published accounting statements of a firm (Ross et. al., 2016). This study tested the semi-strong form efficient market hypothesis by examining the risk-adjusted returns of 10 firms’ stock prices from thirty trading days before the March 11, 2020 WHO global pandemic announcement to thirty days after. Ross defines an efficient market response as an immediate stock price adjustment to new information. There is no tendency for subsequent increases and decreases (Ross et. al., 2016; Bacon & Howell, 2021; Bacon & Cannon, 2018).

There are few studies regarding literature specific to the effect of pandemics on the markets. Barker and Bacon (2015) found that the Ebola outbreak of 2014 had a significant negative impact on a sample of airline firms. They also found that the market was semi-strong efficient, showing declining returns roughly 15 days before the event date. Unlike Ebola in 2014, COVID-19 is a respiratory illness that is easy to

contract from person to person resulting in far greater financial, economic, and humanitarian damage (Bacon & Howell, 2021; Bacon & Cannon, 2018).

METHODOLOGY

This study examines 10 consumer staples sector companies that the COVID-19 pandemic could potentially impact (Treece, 2022). The study uses the standard event study methodology from the finance literature and risk adjusted returns for the following large company, blue chip stocks comprising the greatest economic impact in the consumer staples sector (see Table 1). The 10 stocks have a market cap between 70 and 360 billion.

TABLE 1
SAMPLE OF CONSUMER STAPLES SECTOR FIRMS

1. Walmart (WMT)
2. Procter & Gamble CO (PG)
3. Nestle SA (NSRGY)
4. Coca-Cola Co (KO)
5. PepsiCo Inc (PEP)
6. Costco Wholesale Corp (COST)
7. L’Oreal SA (LRLCY)
8. Philip Morris International INC (PM)
9. Unilever PLC (UL)
10. Target Corp (TGT)

The purpose of this study was to test the semi-strong form efficient market hypothesis by examining the risk-adjusted returns of 10 firms’ stock prices from thirty trading days before the March 11, 2020 WHO global pandemic announcement to thirty days after. The firms’ stock price returns were analyzed against the S&P 500 from 180 trading days before March 11, 2020 to 30 trading days after (June 21, 2019 – April 23, 2020 (Yahoo Finance, 2020)). The following hypotheses were tested:

H1₀: *The risk adjusted rate of return of the sample of consumer staples sector companies is not significantly affected by this information on the announcement date.*

H1₁: *The risk adjusted rate or return of the sample of consumer staples sector companies is significantly positively affected by this information on the announcement date.*

H2₀: *The risk adjusted rate of return of the sample of consumer staples sector companies is not significantly positively affected by information around the announcement date as defined by the event period.*

H2₁: *The risk adjusted rate of return of the sample of consumer staples sector companies is significantly positively affected by information around the announcement date as defined by the event period.*

Using the standard risk adjusted event study methodology, the stock market’s response is tested on the announcement date of March 11, 2020 or WHO global pandemic announcement. For this study, all of the stock return information for the sample of firms and the S&P 500 over and before event period were collected from Yahoo! Finance. This data included stock prices of the firms and S&P 500 from 180 days before to 30 days after the announcement date.

The daily holding period returns of the companies (R) and S&P 500 (R_m) were calculated using the following formula:

$$\text{Current Daily Return} = \frac{(\text{current day close price} - \text{previous day close price})}{\text{previous day close price}}$$

Using the holding period returns, a regression analysis was performed for each sample firm with the actual daily return for each company as the dependent variable and regressing it on the corresponding S&P 500 Index return, the independent variable. The regression was performed over the pre-event period (day -180 to -31) to obtain the intercept, alpha, and the standardized coefficient, beta, for each firm. This regression analysis yielded the alpha and beta for each company over the pre-event period as shown in Table 2.

TABLE 2
FIRM ALPHAS AND BETA

FIRM	ALPHA	BETA
WMT	0.00113	0.51626
PG	0.00024	0.71091
NSRGY	-0.00015	0.50032
KO	-0.00055	0.80686
PEP	-0.00022	0.88819
COST	0.00078	0.60002
LRLCY	0.000717	0.79149
PM	-0.00049	0.8884
UL	-0.00021	0.6758
TGT	0.00194	0.67961

To calculate the normal expected returns, the risk-adjusted method (market model) was used. The expected returns for each stock, for each day of the event period was calculated using the formula: **E(R)= alpha+ Beta (R_m)**. Then, the excess return was calculated as: **ER= actual return – E(R)**. Average Excess Return was found for each day by averaging the Excess Returns for each firm on a given day as follows: **AER= Sum of Excess Returns/N where N= number of sample firms**. In addition, cumulative AER was calculated by adding the AERs for each day of the event period, days -30 to +30. For the event period, graphs of AER and CAER were plotted to show their movement over time. Exhibit 1 and 2 below display the Average Excess Returns and the Cumulative Average Excess Returns plotted against time over the event period for the sample of firms (Bacon & Howell, 2021; Bacon & Cannon, 2018; Bacon & Greis, 2008).

QUANTITATIVE TESTS AND RESULTS

Did the market react to the March 11, 2020 WHO global pandemic announcement? Were the risk-adjusted stock price returns of the sample of firms significantly positively affected? If there was a significant reaction to the event, it would be expected that a substantial difference between the Actual Average Daily Returns (Day -30 to Day +30) and the Expected Average Daily Returns (Day -30 to +30) should be observed. If a significant risk adjusted difference is observed, then the evidence supports the alternative hypotheses that the global pandemic announcement caused a significant increase in stock prices returns. In order to test for a significant difference between the Actual Average Daily Returns and the Expected Average Daily Returns, a paired sample t-test was conducted and found a significant difference at a 5% level between actual and expected risk adjusted returns of the sample of firms. The results of these tests support the alternative hypotheses H1₁ and H2₁ and concludes that the risk adjusted return of the stock price of the sample firms is indeed significantly positively affected on and around the announcement date (Bacon & Howell, 2021; Bacon & Cagigas, 2022; Keely & Bacon, 2023).

It is also important to determine how fast the market reacted to the March 11, 2020 WHO global pandemic announcement to assess the level of efficiency of the market response. Basically, did the market display weak, semi-strong, or strong form market efficiency? Specifically, are the Average Excess Returns (AERs) and the Cumulative Average Excess Returns (CAERs) for the samples of stocks significantly different than zero. T-tests of AER and CAER indicate a difference at the 5% significance level. Observation of AER and CAER over the event period for Exhibits 1 and 2 shows a significant positive reaction of the risk adjusted returns of the stock prices of the sample prior to the event date (Bacon & Howell; Bacon & Cagigas, 2022; Keely & Bacon, 2023).

When analyzing the CAER over the event period in Exhibit 2 below, the goal is to determine how fast the market reacted to the event. According to Exhibit 2, there is an increase from day -15 to day 0, then a significant increase from day 0 to day +4. Possibly the observed positive reaction prior to the global pandemic announcement surfaced as a result of the increasing number of positive COVID-19 cases being reported in the international news. Consistent with market efficiency and behavioral finance theories (Fama, 1997), we observe a positive overreaction from day 0 to day +4 followed by a negative overreaction from day +4 to day +10, then another positive overreaction from day +10 to day +16 and finally leveling off to equilibrium in positive territory by day +30.

Evidence shows that the market had substantially already imbedded the global pandemic announcement information into the stock prices of the sample of companies prior to the announcement date of March 11, 2020, thus supporting semi-strong form efficiency. Since the market already substantially responded prior to the announcement date, no investor could earn an above normal risk adjusted rate of return on the announcement date.

FIGURE 1

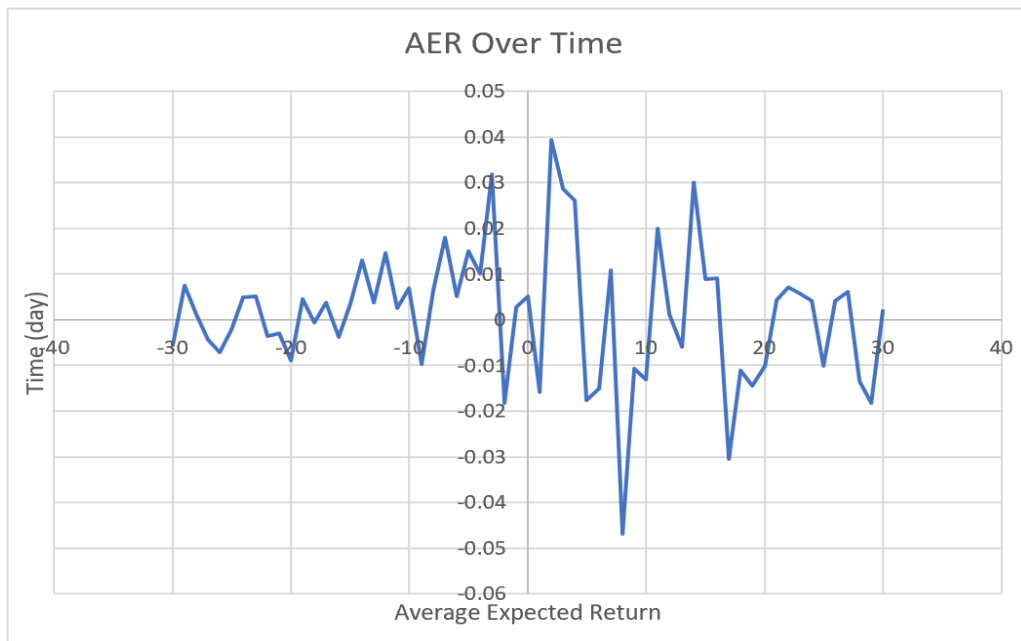
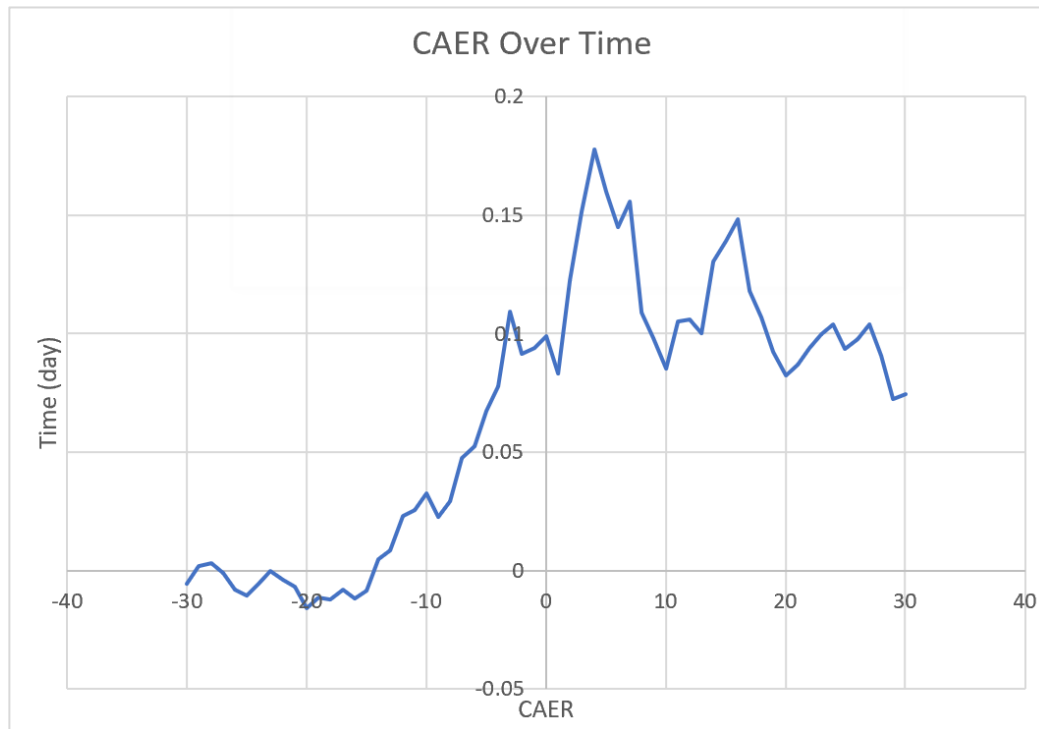


FIGURE 2



CONCLUSION

On Wednesday March 11, 2020, the WHO declared the coronavirus outbreak a global pandemic. The purpose of this study was to test the pandemic announcement for semi-strong form market efficiency. Will returns in the consumer staples industry exhibit excess positive returns over the event period of the COVID-19 announcement? There is little research in the finance literature that investigates the link between pandemics and the market. Fama (1970) proposes that under semi-strong form market efficiency all public information impounds the market so fast that no investor can achieve an above normal risk adjusted return. To test for semi-strong form market efficiency, data for the S&P 500 and 10 major consumer staples firms were collected for the event period surrounding the announcement of the COVID-19 pandemic. Using the standard event study methodology from the finance literature, this research tests the WHO global pandemic announcement for the presence of semi-strong form market efficiency. Evidence supports the expected positive signal associated with the sample of consumer staples firms in response to the WHO announcement. The study results support the semi-strong form efficient market theory and observed trading on this information up to 15 days prior to the announcement. Consistent with market efficiency, signaling, and behavioral finance theories (Fama,1998), we observe is an increase from day -15 to day 0, then a positive overreaction from day 0 to day +4 followed by a negative overreaction from day +4 to day +10, then another positive overreaction from day +10 to day +16 and finally leveling off to equilibrium in positive territory by day +30. Since the market already substantially responded prior to the announcement date, no investor could earn an above normal risk adjusted rate of return on the announcement date in support of semi-strong form market efficiency.

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