"Food and beverage stocks responding to COVID-19"

AUTHORS	Lai Cao Mai Phuong (iD)

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Lai Cao Mai Phuong (Vietnam)

FOOD AND BEVERAGE STOCKS RESPONDING TO COVID-19

Abstract

This paper investigated how food and beverage (F&B) stocks react to COVID-19. The event study method was applied to four events, including the first and second events were the first COVID-19 positive patients detected in the largest and second-largest economic center of Vietnam. The third and fourth events are related to strong measures to prevent the spread of COVID-19: the nationwide lockdown at the beginning of the second quarter of 2020, and the lockdown of Danang at the beginning of the third quarter of 2020. The results show that the reaction of F&B stock prices to events supports the semi-strong form of efficient market theory. The strong and lasting negative reaction of F&B stocks to the first event can be explained by surprise (first case in Vietnam) and Hochiminh city's economic engine driving role in the development of Vietnam's economy. The study finds that heuristic decision-making from nationwide lockdowns (suppression of supply chains during lockdowns) can explain the sub-sector of farming-fishing-ranching products reacted more strongly to the lockdown event in Danang. Based on the research results, this paper provides some policy implications for managers and notes for securities investors.

Keywords	COVID-19, abnormal return, heuristic, market efficiency, market response, psychological factors
JEL Classification	G14, G40

INTRODUCTION

The outbreak of COVID-19 has had a significant impact on economic growth (Baldwin & Tomiura, 2020) and social activities (Ammar et al., 2020) in many countries around the world including Vietnam. Vietnam's GDP growth in 2020 is only 2.91%, the lowest level in 15 years in the period from 2006–2020 (NEU & JICA, 2020). As an agricultural country with a large population, reaching over 97.5 million people by the end of 2020 (General Statistics Office, 2021), the shares of the food and beverage (F&B) industry in Vietnam always attract the attention of investors on the stock market.

The COVID-19 pandemic is an unexpected health crisis, but an understanding of its impact on the F&B industry on the stock market in Vietnam is still limited. Studies on the impact of COVID-19 on industries on Vietnam's stock market mainly focus on industries such as banking (Phuong, 2021a), consumer goods (Anh & Gan, 2021), oil and gas (Phuong, 2021b), and pharmaceuticals (Phuong, 2021c). However, there is still a lack of interest in the response of the F&B industry to this pandemic. Studies around the world on the impact of COVID-19 related to the F&B industry are mainly concentrated in developed countries such as the United States (Goodell & Huynh, 2020; Ramelli & Wagner, 2020), Australia (Alam et al., 2020), Canada (Hailu, 2020), New Zealand (Bouri et al., 2021), and other developed countries (Höhler & Lansink, 2021). Studies mainly use the general index of the F&B industry without analyzing the reaction of each sub-sector in this industry. Furthermore, Phuong (2021b, 2021c) indicated that the response of the oil and gas industry and the pharmaceutical

industry in Vietnam's stock market caused by COVID-19 is much different from the response in developed stock markets. Based on the reasons mentioned above, this paper studies the response of the food and beverage industry on the Vietnamese stock market to events related to COVID-19 in 2020. In which, sub-sectors in the F&B industry (food production, farming-fishing-ranching, alcoholic and non-alcoholic beverages) are also studied together with the general index of the F&B industry.

1. LITERATURE REVIEW

Determining the value of a company on the stock market is often built on financial theories. The efficient market hypothesis, the capital asset pricing model (CAPM), and psychological factors in behavioral finance such as heuristics and decision anchors are often used as background theories in studies to examine the effect of events on the firm's value. In particular, efficient market theory and investor psychology often support and complement each other in explaining stock market reactions (Ackert & Deaves, 2010; Brahmana et al., 2012). The efficient market theory of Fama (1970) assumes that investors make decisions to buy/sell securities based on the determination of fair value, in which the fair value is estimated using all available information in the market. In this way, stock prices will all and immediately reflect all relevant information in determining security prices (Malkiel, 2003). If stock prices do not respond immediately to new information, then behavioral finance theory will support the parts that efficient market theory cannot adequately explain (Taffler & Tuckett, 2010). Decisions based on heuristics and anchors are often used to explain economic behavior. A heuristic decision is a rule that uses part of all information in a market (Gilovich et al., 2002). The anchor is the final estimate obtained from a multi-stage adjustment from the estimate starting on the initial set of values (Epley & Gilovich, 2001, 2005). The CAPM defines the relationship between risk and expected return for an asset. The beta in CAPM measures the risk of an asset relative to the market index (Lintner, 1965; Sharpe, 1964). A value of Betas greater than (smaller than) one will result in a security's return higher (lower) than the market average. Therefore, CAPM is often used as an intermediate step to calculate abnormal returns in event studies (Armitage, 1995; Chen et al., 2007).

COVID-19 has caused losses to industries in many countries around the world. You et al. (2020) estimate the economic, physical, and mental health damage to Chinese people after a month of lockdown of Wuhan city at 119 billion yuan, equivalent to 7.437% of GDP in 2019 and 35.454% of GDP in the first quarter of 2019 of this city. Of which, the direct economic loss to the food and beverage industry was 392 million yuan, equivalent to 1.078% (392.285631/36396.61994) of the total direct loss of 149 industries in China (You et al., 2020). Loss in the F&B industry is also shown in developed countries (Höhler & Lansink, 2021; Goodell & Huynh, 2020) and developing countries (FiinPro, 2020). Using data of 71 large listed companies in the food value chain in the US, Japan, and Europe, Höhler and Lansink (2021) showed that the profits of these companies in the first four months of 2020 were lower than the previous period. Similar to You et al. (2020) and Höhler and Lansink (2021), FiinPro (2020) also showed that F&B industry profit in the first quarter of 2020 in Vietnam decreased by –33.3% over the same period.

The above studies have shown economic losses due to COVID-19 to the F&B industry; however, this impact on the sub-sectors in this industry is not the same. COVID-19 positively affects demand for food technology products but negatively impacts handcrafted food or food service in Canada (Hailu, 2020). The fact that COVID-19 can spread quickly and stick to the surfaces of objects when it is spread may have rapidly increased demand for the food production sub-sector but sharply reduced demand for the foodservice sub-sector or handcrafted food. In addition, Höhler and Lansink (2021) pointed out that agricultural products are bulky and perishable products, so the supply chain of these products in this sub-sector is highly influenced by geographical location. Therefore, when countries implement lockdown and social distancing, it is easy to increase transportation costs, limiting opportunities to sell farming products (Bui et al., 2021; OECD, 2020). Between food and beverage, the food sub-sector is often rated as essential and preferred by consumers. Non-alcoholic beverages are also the dominant choice

over alcoholic beverages during the COVID-19 pandemic because alcoholic beverages are often used at large parties. As a result, operating profits in the first quarter of 2020 for alcohol companies decreased by an average of 35.7% while that of the food retail sub-sector increased by 9.6% (Höhler & Lansink, 2021).

Using Google search data to study the impact of the COVID-19 pandemic on consumer sentiment across 54 countries in the first four months of 2020, Keane and Neal (2021) discovered that consumer trends increased via buying and hoarding goods in most countries, mainly in March 2020. Consumer hoarding is a common phenomenon during natural disasters (Hori & Iwamoto, 2014; Kurihara et al., 2012), disease outbreaks (Keane & Neal, 2021), and hyperinflation (Musvanhiri, 2017). Keane and Neal (2021) argue that the spread of COVID-19 domestically and internationally has significantly contributed to consumer panic. The higher consumers perceive the risks of the COVID-19 pandemic, the stronger their attitude to purchase food stocks (Long & Khoi, 2020). Consumers' focus on buying and hoarding goods during the COVID-19 pandemic carries a herd mentality. Aspects such as psychological, economic, and health explain this behavior. Stockpiling gives consumers a sense of control over the current risky situation and gives them more peace of mind (Grohol, 2020). In economic terms, consumer hoarding is also explained by the tendency to avoid future losses (Hailu, 2020). Because they assume that stocking up will reduce the cost of going to the store (due to a decrease in purchase frequency compared to before), reducing the likelihood of having to buy the same item at a higher price in the future due to temporary short-term shortages. In terms of health, hoarding helps to reduce the frequency of purchases, thereby reducing the risk of COVID-19 infection.

Hailu (2020) suggests that the increase in prices of food items during the COVID-19 pandemic can be of two different degrees. When the information provided to consumers is sufficient, the demand for processed food only increases slightly, and the food-service decreases sharply. On the contrary, when consumers lack trust in organizations, fear the risk of supply disruption, the situation of buying goods will occur, leading to a short-term spike in demand.

In Vietnam, the fear of being infected with COVID-19 when shopping in crowded places has led consumers to reduce the frequency of shopping but increase the hoarding of goods more than before the pandemic. A NielsenIQ survey conducted in February 2020 in Vietnam showed that COVID-19 caused 45% of consumers to increase their food stock at home more than before, 50% of them to reduce the frequency of going to places to buy goods (supermarkets, grocery stores, food markets) and 25% of respondents limit eating out activities. The items most hoarded by Vietnamese consumers include instant noodles (+67%), frozen foods (+40%), and pasteurized sausages (+19%) (An, 2020). Increasing consumer demand for hoarding has a positive impact on sales growth of essential goods. Kantar survey shows that before the nationwide lockdown in April 2020, sales of packaged bread and canned milk in Ho Chi Minh City increased by 112% and 12% respectively over the same period in 2019 (Kantar, 2020a). In the eight weeks leading up to the lockdown, the value of fast-moving consumer goods in four major cities has increased by 21% compared to the last eight weeks of 2019. In contrast, the alcoholic beverage and sugary drinks sub-sector still experienced a decline in consumption in the first quarter of 2020 (An, 2020; Kantar, 2020b).

A special feature in Vietnam is that the black market phenomenon for F&B products is almost non-existent during the lockdown. On the contrary, Vietnamese people know how to share and support the poor through the free "rice ATM" project (Alicia, 2020; Duong, 2020) based on the contributions of domestic organizations and individuals (Tuoitre, 2020). This is a project initiated by Hoang Tuan Anh – a businessman in Ho Chi Minh City and it has spread to all provinces in Vietnam to help the poor and disadvantaged people in the society during the outbreak of COVID-19 in Vietnam. For "rice ATMs" who need only press the button, 1.5-2.0kg of rice will flow out enough for a family of four to use in a day (Alicia, 2020; Duong, 2020; Klingler-Vidra et al., 2021).

The impact of COVID-19 on the stock price of the F&B industry on the stock market has been published by several studies. The same research is related to the F&B industry on the US stock market, but the results of Ramelli and Wagner (2020), and

Goodell and Huynh (2020) have a difference in the reaction of F&B stocks to investment information related to COVID-19.

The difference between the results of these two studies is due to the choice of time of the event. Ramelli and Wagner (2020) indicate that the food and food retail industry reacted negatively after the announcement from China to WHO about the first case of pneumonia detected in Wuhan (January 2-17, 2020). However, it is different from the results of Goodell and Huynh (2020) when choosing January 21, 2020, as the event date. The stock returns of the F&B industry on the US stock market were all insignificant after the news that the US detected the first case of COVID-19; stock prices were not significantly affected by the news (Godell & Huynh, 2020). Even in the alcoholic beverage sub-sector, stock returns were significantly positive in the last month before the event was announced (Godell & Huynh, 2020).

Share prices of companies in the food value chain are less volatile than the general market index (Höhler & Lansink, 2021) and the industry is less affected by COVID-19 than other industries (Ramelli & Wagner, 2020).

Alam et al. (2020) studying the COVID-19 outbreak in Australia to eight different stock market sectors found that both the anomalous returns and the cumulative abnormal returns of the food industry reached the greatest value. Specifically: Abnormal profit AR[0] = +3.16% and cumulative abnormal profit CAR[−10;10] = +17.54%.; days after the AR event of the food industry were positive but not statistically significant. Alam et al. (2020) believe that because people are rushing to buy necessities, both revenue and profit of this industry have increased well.

In New Zealand, Bouri et al. (2021) showed the F&B sector stock return of +4.3% on the first day after the announcement of the city lockdown, the days from $t = 2$ to $t = 5$ the stock return of this industry is −1.35% to −4.6%. The cumulative abnormal return (CAR) of the F&B industry only fluctuated slightly with CAR[−1;3] = −0.65% and CAR[4;40] = 0.17% for the news of early 2020 lockdown in China (Huo & Qiu, 2020). Bouri et al. (2021) show that in the 5 days before the lockdown

time in New Zealand, there is a significant impact on the stock price of the F&B industry. Stock price reacted negatively on days $t = −5; −4; −2$ but the positive response on days $t = −3; −1$, and the closer the lockdown date is, the increasing absolute value shows that the government's efforts to limit the spread of COVID-19 have increased investor confidence (Bouri et al., 2021).

2. METHODOLOGY

To analyze the reaction of stocks of food sub-sectors before and after each event, the event research method is used. The essence of this method is simple but very effective by comparing actual returns with expected returns to determine if an anomaly caused by an event exists. If abnormal returns exist, it indicates an event that has affected the stock price or investor behavior. In other words, by measuring the impact of an event, the event research method helps better understanding investor behavior. In addition, this method allows for a separate comparison of events based on return changes in stock prices.

The research process for an event needs to be carried out through several main steps, including (1) Identify the event of interest; (2) Determine the period to check; (3) Calculate expected profit, abnormal profit, and accumulated abnormal profit; (4) Statistical testing.

Step 1: Identify events of interest

The four timelines for releasing information about COVID-19 in Vietnam in 2020 are events to be considered in this paper. The first event: on January 23, 2020, the first case of COVID-19 infection was recorded in Hochiminh city – the largest economic center of Vietnam (Nhandan, 2020; Phuong, 2020). The second event: the first patient in Hanoi with COVID-19 was confirmed on March 6, 2020, after 22 days in Vietnam without a case of community transmission (Dung, 2020). Third event: given the number of COVID-19 infections detected in many provinces and cities across the country, to prevent the spread of the disease, Vietnam announced a nationwide lockdown for 15 days from April 1, 2020 (Quynh & Uyen, 2020). Fourth event: after 99 days, Vietnam did not have

Table 1. Events related to COVID-19 in Vietnam in 2020

Events	Event start date	Description
1	1/23/2020	Vietnam confirmed the first patient infected with COVID-19 in Hochiminh city – the largest economic center in the country
2	3/06/2020	Vietnam confirms the first patient infected with COVID-19 in Hanoi
3	4/01/2020	Vietnam lockdowns the whole country to prevent the COVID-19 pandemic
4	7/26/2020	Notice from 0:00 on July 28, 2020, to block Danang city for 15 days

a case of COVID-19 infection in the community until July 26, 2020, when the new case was detected. Danang government announced a lockdown of this city within 15 days from July 28, 2020 (Binh, 2020; Danangfantasticity, 2020). Investors' perception of COVID-19 information was initially shown on the date of the announcement of the event or the date of the event (date t = 0). The four days of this event announcement are summarized chronologically in Table 1.

Step 2: Determine the period to check

Indexes of sub-sectors including food production, farming-fishing-ranching, alcoholic beverages, non-alcoholic beverages, and the general index of the F&B sector were examined. Government movement restrictions announcements have had a significant impact on consumer sentiment and behavior in the short term and will largely disappear after a week to ten days (Keane & Neal, 2021). Besides, the long event window is not compatible with the efficient market hypothesis (McWilliams & Siegel, 1997). Therefore, to reduce the noise level of irrelevant information, the period 1 week before the event date is the event window. In other words, the selected event window ranges from [–5; 5].

Step 3: Calculate expected return, abnormal return, and cumulative abnormal return

To determine whether an event anomaly exists, it is necessary to know the expected return and the actual return. Therefore, it is necessary to use historical data before the event date to calculate the expected return for each stock. Using daily frequency, the most commonly used estimate is one year (250 transaction days) prior to the event (MacKinlay, 1997). To calculate the expected return, MacKinlay (1997) suggests that it should be related to the benchmark index and estimated by

equation (1):

$$E\left(r_{it} \mid X_t\right) = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}. \qquad (1)$$

The market model (2) is used to determine abnormal returns because it takes into account the specific risk of stock i and the benchmark index:

$$AR_{it} = R_{it} - \widehat{\alpha}_i - \widehat{\beta}_i R_{m,t}, \qquad (2)$$

where $E\left(r_{it} \mid X_t\right)$ is the expected return; $\widehat{\alpha}_i$ và $\widehat{\beta}_i$ are the constant term and stock-specific risk obtained from regression equation (1). R_{it} và $R_{m,t}$ are the actual returns of stock i and the market benchmark at time t. AR_{it} is the extraordinary return of stock i when each event is announced. It reflects the impact of this information on stock price i.

Cumulative abnormal return (CAR) is calculated according to formula (3) based on the total daily abnormal return of stocks from t_1 to t_2:

$$CAR\left(t_1, t_2\right) = \sum_{t=t_1}^{t_2} AR_{it}. \qquad (3)$$

Step 4: Statistical testing

The parametric approach is used to check market anomalies. If the test result is statistically significant, it indicates the existence of an anomaly in the market. On the contrary, if the results are not statistically significant, the article concludes that the published information about COVID-19 is not an abnormal cause in the market.

According to Frunza (2015), a cross-sectional test t is applied daily from t_1 to t_2 as equation (4)

$$t\text{-test} = \frac{\widehat{CAAR}_{(t_1, t_2)}}{\hat{\sigma}_{CAAR_{(t_1, t_2)}}}, \qquad (4)$$

in which cumulative average abnormal returns (*CAAR*) for *N* shares are calculated by formula (5):

$$C\widehat{AAR}_{(t_1,t_2)} = \frac{1}{N}\sum_{i=1}^{N} C\widehat{AR}_{i,(t_1,t_2)}. \qquad (5)$$

The standard deviation in the event window t_1 to t_2 is calculated by formula (6):

$$\hat{\sigma}_{CAAR_{(t_1,t_2)}} =$$
$$= \frac{1}{N}\sqrt{\sum_{i=1}^{N}\left[C\widehat{AR}_{i,(t_1,t_2)} - C\widehat{AAR}_{(t_1,t_2)} \right]^2}. \qquad (6)$$

Since this paper uses the general index of each F&B sub-sector or industry compared with the market benchmark, the value of $C\widehat{AR}_{(t_1,t_2)}$ will coincide with $C\widehat{AAR}_{(t_1,t_2)}$. Then, calculate S_i^2 as the residual variance from equation (1). T is the number of days in the event window from t_1 to t_2, and $\hat{\sigma}_{CAR_{(t_1,t_2)}}$ is calculated by formula (7):

$$\hat{\sigma}_{CAR_{(t_1,t_2)}} =$$
$$= \frac{AR_{it}}{\sqrt{S_i^2 \, x \, [1 + \dfrac{1}{T} + \dfrac{\left(R_{mt} - \overline{R_m}\right)^2}{\sum_{t=t1}^{t2}\left(R_{mt} - \overline{R_m}\right)^2}]}}. \qquad (7)$$

3. DATA

Fireant Company classifies industries on the Vietnam stock market according to the Industry classification benchmark proposed by FTSERussell (2017). Daily closing prices for four sub-sectors including food production, farming-fishing-ranching, alcoholic beverages, non-alcoholic beverages, and the general index of the F&B industry are collected from Fireant Company. Prior to each event, historical data for 250 trading days (MacKinlay, 1997) for the VNIndex, the F&B sector index, and each of its sub-sectors is used to estimate expected returns and calculate the indices. One week before and after each event or event window [–5;5] is used to determine abnormal profit and cumulative abnormal profit. The four research events in this paper span the first three quarters of 2020, so the data used in this paper is January 2, 2020, at the earliest, and July 31, 2020.

4. RESULTS

Tables 2 and 3 show the food and beverage industry's abnormal return and cumulative abnormal return related to the four events studied in this paper.

The first event – January 23, 2020

Vietnam recorded the first case of COVID-19 on January 23, 2020, in Ho Chi Minh City, two citizens from Wuhan (China). Both the F&B industry's cumulative abnormal return and abnormal return are negative after the event date. In which, except for the abnormal return of the non-alcoholic beverage sub-sector, there is no statistical significance; abnormal returns for sub-sectors such as food production, farming-fishing-ranching, and alcoholic beverages are all less than zero and significant after the event date. In the five days after the first event, the F&B abnormal return was as low as AR[1] = –2.0% as all four sub-sectors ranged in value from –4.4% to –1.0%. The lowest cumulative abnormal return of the F&B industry was CAR(0;5) = –6.8%, in which the alcoholic beverage sub-sector CAR(0;5) = –13.7% fell the most, followed by the farming-fishing-ranching CAR(0;5) = –8.9% and food production sub-sector CAR(0;5) = –4.1%.

This result is similar to the response of the sub-sectors of food and food retail on the US stock market (Ramelli & Wagner, 2020), the oil and gas, and pharmaceutical industries on the Vietnam stock market (Phuong, 2021a, 20021b). The finding of the study is that the alcoholic and non-alcoholic beverage sub-sectors both reacted negatively to the events of January 23, 2020, as demonstrated by the cumulative abnormal returns that were both less than zero and statistically significant. It contrasts with the results of Goodell and Huynh (2020) that the alcoholic beverage sub-sector and the candy and soda sub-sector responded positively after the day the US recorded its first COVID-19 case. The difference in the response of the beverage sub-sector to the announcement of the first case of COVID-19 in Vietnam and the United States can be attributed to the fact that the alcoholic beverage sub-sector in Vietnam has been negatively impacted by both information on COVID-19 and Vietnam's regulations on alcohol restriction come

Table 2. Abnormal return (AR) and cumulative abnormal return (CAR) of the food and beverage industry related to the events on January 23, 2020, and March 6, 2020

T	01/23/2020					3/6/2020				
	FBP	FP	FFR	AB	NAB	FBP	FP	FFR	AB	NAB
t	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
−5	−0.3	−0.6	−0.7	0.4	0.2	−1.4***	−0.4	0.5	−4.3***	0.3
−4	−0.5	−0.5	0.3	−0.6	−1.8	0.6	−0.4	0.0	3.5***	0.3
−3	−0.1	−0.3	−1.0	0.3	−0.5	−0.2	−0.2	0.3	−0.2	0.4
−2	0.2	0.0	−0.3	0.5	−0.2	−0.2	−0.1	−0.6	−0.7	0.0
−1	−0.2	0.5	1.0	−1.9*	2.1	0.2	0.2	−1.0	0.2	−1.0
0	−0.6	−0.7	−0.2	−0.3	−2.0	0.1	1.1**	0.2	−2.8**	−1.8
1	−2.0***	−1.0*	−3.5***	−4.4***	−0.4	−0.6	−0.8	0.0	0.0	−2.1
2	−1.7***	−1.7***	−2.5**	−1.5	−0.7	1.8***	2.4***	0.5	−0.1	0.3
3	−1.2**	−1.0*	−2.6***	−1.5	−1.9	0.4	0.4	−1.1	0.3	−0.7
4	−1.8***	−1.3**	−0.2	−3.1***	−1.6	0.2	0.5	−1.1	−0.7	−0.7
5	−0.1	1.0*	−1.1	−3.2***	1.3	−0.4	−0.6	−0.2	0.2	−1.5
t	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR
[−5;0]	−1.0	−0.9	−0.7	−1.2	−0.1	−1.1	−0.9	−0.7	−1.5	0.1
[−4;0]	−0.7	−0.3	0.0	−1.7	−0.4	0.4	−0.5	−1.2	2.8	−0.2
[−3;0]	−0.2	0.2	−0.3	−1.1	1.4	−0.2	−0.1	−1.3	−0.7	−0.5
[−2;0]	−0.1	0.5	0.7	−1.4	1.9	0.0	0.1	−1.6	−0.5	−1.0
[0;2]	−3.7***	−2.8***	−5.9***	−5.9***	−1.2	1.2	1.6**	0.5	−0.1	−1.8
[0;3]	−4.8***	−3.8***	−8.5***	−7.4***	−3.1	1.5*	2.0**	−0.6	0.2	−2.5
[0;4]	−6.7***	−5.1***	−8.7***	−10.5***	−4.7*	1.8*	2.6**	−1.7	−0.5	−3.2
[0;5]	−6.8***	−4.1***	−9.8***	−13.7***	−3.4	1.3	2.0	−1.9	−0.3	−4.7

Notes: FBP: Food Producers and Beverages; FP: Food Products; FFR: Farming, Fishing, and Ranching; AB: Alcoholic Beverages; NAB: Non-Alcoholic Beverages.

into effect. The drop in return from many other industries due to COVID-19's impact on sentiment made the non-alcoholic beverage sub-sector in Vietnam also drop. Besides, Vietnam has a border with China stretching from North to South while the US is located entirely on another continent, so the potential risk of COVID-19 outbreak in Vietnam is higher than that of the United States. Therefore, geographical location may have influenced investor sentiment in Vietnam more and more strongly than investors in the United States.

The second event – March 6, 2020

After 22 days without new cases, on March 6, 2020, Vietnam detected the first case of COVID-19 infection in Hanoi. This is a citizen who returned from abroad and became a new source of COVID-19 transmission in the community before this citizen was transferred for treatment. The alcoholic beverage sub-sector reacted negatively as soon as this news was released as demonstrated by an abnormal return on the event day of –2.8% at a 5% level of statistical significance. It can be seen that alcoholic beverages are often used at par-

ties with many people. To avoid the outbreak of COVID-19 in the community, crowded activities are minimized, so the negative reaction of stocks in the alcoholic beverage sub-sector to this news is completely consistent with reality. It is similar to the response of the F&B industry in the US stock market (Ramelli & Wagner, 2020). The F&B industry and the food production sub-sector responded positively to the news that the first COVID-19 patient was detected in Hanoi. After the second event day, the F&B industry abnormal return of AR[2] = +1.8% was mainly contributed by the positive response of the food production sub-sector with AR[2] = 2.4%. The cumulative abnormal returns of these two sub-sectors are CAR(0;4) = +1.8% and CAR(0;4) = +2.6%, respectively. This can be explained by the products of the food sub-sector which are often essential items that every family has to consume daily. When the COVID-19 epidemic breaks out, non-essential goods may be reduced, thereby affecting business results, but for the food production sub-sector, the demand is always maintained, even demand for food technology products has increased during the pandemic. Therefore, it is logical for the share price of the food

production sub-sector to react positively to the news as of March 6, 2020. This result is different from the reaction of the food sub-sector in the event as of January 23, 2020, on the Vietnam stock market and the US stock market (Godell & Huynh, 2020). The reaction of the food sub-sector share price in the first event was negative but in the second event, it was positive which can be explained by the psychological surprise in the first event and the use of experience to act in the second event. Information about the first event is unprecedented, so investors are influenced by psychology leading to the sell-off of stocks. However, when the first event was experiential they were calm and analyzed to identify the sub-sector that had an advantage over this information. The discovery of the first domestic citizen infected with COVID-19 in the capital and a new source of infection in the community had a strong enough impact for the stocks of the food production sub-sector in Vietnam to react significantly positively, but similar information in the US stock market, this effect is positive but not statistically significant (Godell & Huynh, 2020).

The third event – April 1, 2020

After the number of COVID-19 cases was recorded in many provinces and cities, on April 1, 2020, Vietnam began a nationwide lockdown for 15 days. Five days before the event, the F&B sub-sectors' abnormal returns were significant on some days, and when cumulative, this sector's cumulative abnormal returns were most impacted (positively) by the food production sub-sector. At the 10% statistical significance level, the cumulative abnormal returns of the food production sub-sector are CAR[–3;0) = +1.6% and CAR[–4;0) = +2.1%, which contributes significantly to the cumulative abnormal return of the F&B industry, which is CAR[–4;0) = +2.4% . This result shows that this group of stocks has reacted in advance to information about developments from COVID-19 and complements Anh and Gan (2021) who study a larger industry group than consumer goods. The difference in the days before the announcement of the third event compared to the second event was that the farming-fishing-ranching sub-sector reacted negatively when abnormal returns AR[–1] = –2.1% at a 5% significance level. This can be ex-

Table 3. Abnormal return (AR) and cumulative abnormal return (CAR) of the food and beverage industry related to the events on April 1, 2020, and July 26, 2020

T	4/1/2020					7/26/2020				
	FBP	FP	FFR	AB	NAB	FBP	FP	FFR	AB	NAB
T	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR
−5	−1.0*	−1.0	−1.2	−1.0	−4.3***	0.1	0.2	1.0	0.1	−1.2
−4	1.1**	0.5	−1.6	3.5***	2.9**	0.0	−0.3	−1.0	0.7	−1.4
−3	0.7	0.1	0.4	2.8**	−4.4***	0.0	0.2	0.3	−0.3	−3.3**
−2	0.6	1.6***	1.4	−2.6	2.6**	−0.2	−0.5	−0.8	0.7	−1.9
−1	−0.1	−0.3	−2.1**	0.6	−0.1	−0.7	−0.6	−2.3**	−1.0	1.3
0	0.0	0.5	1.5	−1.4	−0.2	−0.4	−0.3	−2.0*	−0.5	0.7
1	0.2	0.7	−0.9	−1.8	0.8	−1.1*	−1.6**	−3.5***	0.4	−2.6
2	0.4	0.2	1.4	1.2	−2.0	1.4**	1.6**	1.6	0.7	0.3
3	1.4***	1.4**	0.9	1.6	0.5	−0.7	−0.2	1.3	−2.1	1.8
4	0.4	0.4	1.1	0.7	−1.2	0.4	1.1	−0.3	−1.6	1.4
5	−0.6	−0.8	−1.3	0.1	0.9	−0.5	−0.4	−0.7	−0.5	−1.2
t	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR	CAR
[−5;0]	1.4	1.0	−1.0	2.7	−3.3	−0.7	−1.0	−2.8	0.2	−6.5*
[−4;0]	2.4**	2.1*	0.1	3.7	1.0	−0.8	−1.1	−3.8*	0.1	−5.4*
[−3;0]	1.3	1.6*	1.8	0.2	−1.9	−0.8	−0.9	−2.8	−0.6	−4.0
[−2;0]	0.5	1.3	−0.7	−2.0	2.5	−0.9	−1.1	−3.1**	−0.3	−0.7
[0;2]	0.6	0.9	0.5	−0.6	−1.2	0.3	0.0	−2.0	1.1	−2.3
[0;3]	2.0**	2.3**	1.4	1.0	−0.8	−0.4	−0.2	−0.6	−1.0	−0.5
[0;4]	2.4**	2.7**	2.5	1.7	−1.9	0.0	0.9	−0.9	−2.7	0.9
[0;5]	1.8	1.8	1.2	1.8	−1.0	−0.5	0.4	−1.6	−3.2	−0.3

Notes: FBP: Food Producers and Beverages; FP: Food Products; FFR: Farming, Fishing, and Ranching; AB: Alcoholic Beverages; NAB: Non- Alcoholic Beverages.

plained by the characteristics of the farming-fishing-ranching sub-sector that is fresh, bulky, has a short shelf life, and is heavily affected by the passivity in the supply chain, so when the disease breaks out, the sub-sector is vulnerable to negative impacts. After Vietnam announced the nationwide lockdown, the food production sub-sector had abnormal return AR[3] = 1.4% and accumulated abnormal returns CAR(0;3] = +2.3% and CAR(0;4] = +2.7%, all have the 5% level of statistical significance, which has largely contributed to the positive response of the F&B industry. This result is similar to the reaction of the F&B industry to the March 6, 2020 event in Vietnam, Australia (Alam et al., 2020), USA (Ramelli & Wagner, 2020). It implies that a large-scale lockdown will contain the COVID-19 outbreak and is the time for the authorities to trace and cut off the sources of infection in the community to soon return the country to a new normal. Besides, the food production industry belongs to the group of essential goods and can be stored for several months, so the demand has increased sharply before the release time. The increase in demand and still maintained during the pandemic is the main driver supporting the share price of this industry.

The fourth event – July 26, 2020

As soon as there was information about a suspected COVID-19 case in Danang, the stock price of the non-alcoholic beverage sub-sector reacted significantly when the abnormal return was AR[–3;0] = –3.3 % and cumulative abnormal returns are CAR[–5;0) = –6.5% and CAR[–4;0) = –5.4%. When information from Danang confirmed that the patient was infected with COVID-19 after 99 days of Vietnam having no cases in the community, the abnormal return of the agriculture, fishery, and seafood sub-sector was AR[–1] = –2.3% and AR[0] = –2.0% and the cumulative abnormal return is CAR[–4;0) = –3.8% and CAR[–2;0) = –3.1%. The results of the pre-event reaction of the non-alcoholic beverages sub-sector and the farming-fishing-ranching sub-sector showed that these two sub-sectors had strong price expansions with negative news related to COVID-19. This reaction may be that investors have learned from the previous nationwide lockdown in Vietnam. The lockdown makes it impossible to consume perishable and bulky food items, and drinks are less essential than food because households can boil their own drinking water at home. After the event day, the F&B industry had a negative abnormal return at day t = 1 with AR[1] = –1.1% mainly due to the negative impact from the farming-fishing-ranching sub-sector (AR[1] = –3.5%) and food production sub-sector (AR[2] = –1.6%). However, when it comes to day t = 2, the response of the F&B industry is positive, similar to that of the industry after the second event day and after the third event day. The food production sub-sector had a significant negative reaction during the day t = 1 and t = 2 but the cumulative abnormal return was not significant, indicating that the cumulative response of this sub-sector is weak than the second and third events. This result can be explained by two reasons. Firstly, the three previous events happened first, so the impact was stronger. Secondly, the previous events that occurred in Vietnam's largest economic centers, Ho Chi Minh City and Hanoi, will therefore have a stronger impact on the stock market than this event in other regions. Thirdly, the movement of "rice ATM" and free food distribution – to support people facing difficulties due to COVID-19 – has been widely deployed across the country.

CONCLUSION

This paper examines the impact of COVID-19 on the reaction of stocks in four sub-sectors of the F&B industry listed on the Vietnam stock market. Four research events include two events related to the time when the first COVID-29 patient was detected in Hochiminh City (the first event) and Hanoi capital (the second event) – the largest economic center in Vietnam; and two events related to the two biggest lockdowns in 2020 in Vietnam: the nationwide lockdown (the third event) and the Danang city lockdown (the fourth event). The results show that the responses of the four sub-sectors all support the semi-strong-form efficient market theory. In particular, all sub-sectors maintained strong negative reactions after the first event – Vietnam confirmed the first case of COVID-19 infection in Hochiminh city. It shows that the stock of the F&B industry was really surprised by this unforeseen event, the strongest

reaction of the events because it happened in the largest economic center in Vietnam. F&B stock prices have reduced reaction strength and reaction times to subsequent events, suggesting that investors' decisions are more rational according to the theory of efficient markets. They were more experienced and calmer to analyze the impact of the following events. When comparing the responses of the farming-fishing-ranching sub-sector to the two lockdown events in Vietnam, this study finds that the stocks of this sub-sector reacted more immediately and strongly to the lockdown event in Danang (the later events) compared to the nationwide lockdown event (the earlier events). This result supports the view that investors have made decisions based on their own availability heuristics. In other words, the weaknesses in the food supply chain that were exposed during the nationwide lockdown were remembered by investors and responded to the lockdown event in Danang. In addition, the results show that the non-alcoholic beverage sub-sector is the least affected in the F&B industry.

There are four main contributions from the findings from this paper. Firstly, the paper provides an initial assessment of the impact of COVID-19 on the F&B industry in frontier stock markets like Vietnam. Second, it shows the response (positive/negative) of the F&B industry due to contributions from which of the four sub-sectors of this industry. Third, it provides an understanding of the response of each sub-sector (food production, farming-fishing-ranching, alcoholic and non-alcoholic beverages) and the entire F&B industry on the Vietnamese stock market to each event related to COVID-19. Fourth, the study compares the response of four sub-sectors and the general index of the F&B industry to the event of detecting the first patient positive for COVID-19 at the largest economic center in Vietnam (Hochiminh city) compared to the first patient was discovered in Hanoi capital, and for the event that Vietnam blocked the whole country compared to the event of Danang city lockdown.

RECOMMENDATIONS

For policymakers: Up to now, the COVID-19 pandemic is still complicated, and the proportion of people who have been vaccinated against this disease in Vietnam is still very low. Therefore, the possibility of issuing a lockdown order in the near future is still there. During the lockdown or social distancing, consumers still have to use essential items. Therefore, policymakers should consider giving priority to vaccination for drivers, transport and logistics workers in order not to disrupt production chains in the context of localities implementing social distancing or lockdown.

For investors: The results of this study show that the food production sub-sector benefits when the COVID-19 lockdown is announced, especially in the country's major economic-financial centers. The agriculture, farming-fishing-ranching sub-sectors are generally negatively affected by this pandemic. The evolution of the COVID-19 pandemic is still complicated, investors need to update information about the disease, the government's policy response (for example, who are prioritized for vaccination, who are priority sectors), and its impact on industries before making a decision.

AUTHOR CONTRIBUTIONS

Conceptualization: Lai Cao Mai Phuong.
Data curation: Lai Cao Mai Phuong.
Formal analysis: Lai Cao Mai Phuong.
Methodology: Lai Cao Mai Phuong.
Project administration: Lai Cao Mai Phuong.
Resources: Lai Cao Mai Phuong.
Validation: Lai Cao Mai Phuong.
Writing – original draft: Lai Cao Mai Phuong.
Writing – review & editing: Lai Cao Mai Phuong.

REFERENCES

1. Ackert, L., & Deaves, R. (2010). *Behavioral finance: Psychology, decision-making, & markets*. Cengage Learning.

2. Alam, M. M., Wei, H., & Wahid, A. N. (2020). COVID-19 outbreak & sectoral performance of the Australian stock market: An event study analysis. *Australian economic papers*, e12215. https://doi.org/10.1111/1467-8454.12215

3. Alicia, L. (2020, April 13). *Rice ATMs' provide free rice for people out of work in Vietnam due to the coronavirus crisis*. CNN. Retrieved from https://edition.cnn.com/2020/04/13/world/coronavirus-vietnam-rice-atm-trnd/index.html

4. Ammar, A., Chtourou, H., Boukhris, O., Trabelsi, K., Masmoudi, L., Brach, M., Bouaziz, B., Bentlage, E., How, D., Ahmed, M., Mueller, P., Mueller, N., Hsouna, H., Aloui, A., Hammouda, O., Paineiras-Domingos, L. L., Braakman-Jansen, A., Wrede, C., Bastoni, S., ... ECLB-COVID19 Consortium. (2020). COVID-19 home confinement negatively impacts social participation and life satisfaction: a worldwide multicenter study. *International journal of environmental research & public health, 17*(17), 6237. https://doi.org/10.3390/ijerph17176237

5. An, B. (2020). *How has Covid-19 impacted Vietnamese living and consumption habits?* Hanoitimes Retrieved from http://hanoitimes.vn/how-has-covid-19-impacted-vietnamese-living-and-consumption-habits-311247.html

6. Anh, D. L. T., & Gan, C. (2021). The impact of the COVID-19 lockdown on stock market performance: evidence from Vietnam. *Journal of Economic Studies, 48*(4), 836-851. https://doi.org/10.1108/JES-06-2020-0312

7. Armitage, S. (1995). Event study methods and evidence on their performance. *Journal of Economic Surveys, 9*(1), 25-52. https://doi.org/10.1111/j.1467-6419.1995.tb00109.x

8. Baldwin, R., & Tomiura, E. (2020). Thinking ahead about the trade impact of COVID-19. *Economics in the Time of COVID-19*, 59-71.

9. Binh, T. (2020). *Bản tin dịch COVID-19 trong 24h qua: Quản lý chặt chẽ người nhập cảnh, sẵn sàng ứng phó với diễn biến mới của dịch bệnh. [Newsletter on COVID-19 in the past 24 hours: Strictly manage people entering the country, ready to respond to new developments of the disease]*. Vietnam Ministry of Health. Retrieved from https://ncov.moh.gov.vn/en/-/ban-tin-dich-covid-19-trong-24h-qua-quan-ly-chat-che-nguoi-nhap-canh-san-sang-ung-pho-voi-dien-bien-moi-cua-dich-benh

10. Bouri, E., Naeem, M. A., Nor, S. M., Mbarki, I., & Saeed, T. (2021). Government responses to COVID-19 and industry stock returns. *Economic Research-Ekonomska Istraživanja*. https://doi.org/10.1080/1331677X.2021.1929374

11. Brahmana, R. K., Hooy, C. W., & Ahmad, Z. (2012). Psychological factors on irrational financial decision making: Case of day-of-the week anomaly. *Humanomics, 28*(4), 236-257. https://doi.org/10.1108/08288661211277317

12. Bui, T. N., Nguyen, A. H., Le, T. T. H., Nguyen, V. P., Le, T. T. H., Tran, T. T. H., Nguyen, N. M., Le, T. K. O., Nguyen, T. K. O., Nguyen, T. T. T., Dao, H. V., Doan, T. N. T., Vu, T. H. N., Bui, V. H., Hoa, H. C., & Lebailly, P. (2021). Can a Short Food Supply Chain Create Sustainable Benefits for Small Farmers in Developing Countries? An Exploratory Study of Vietnam. *Sustainability, 13*(5), 2443. https://doi.org/10.3390/su13052443

13. Chen, M. H., Jang, S. S., & Kim, W. G. (2007). The impact of the SARS outbreak on Taiwanese hotel stock performance: an event-study approach. *International Journal of Hospitality Management, 26*(1), 200-212. https://doi.org/10.1016/j.ijhm.2005.11.004

14. Danangfantasticity. (2020, July 28). *From 0:00 On July 28, 2020: Implementing Lockdown According To Directive No. 16 / CT-TTg In 6 Districts Within 15 Days*. Retrieved from https://danang-fantasticity.com/en/covid-19-en/from-000-on-july-28-2020-implementing-lockdown-according-to-directive-no-16-ct-ttg-in-6-districts-within-15-days.html

15. Dung, T. (2020, July 3). *VN confirms 17th COVID-19 infection case, first in Ha Noi*. Vgpnews. Retrieved from http://news.chinhphu.vn/Home/VN-confirms-17th-COVID19-infection-case-first-in-Ha-Noi/20203/39076.vgp

16. Duong, Y. (2020, April 13). *'Rice ATM' feeds Vietnam's poor amid virus lockdown*. Reuters. Retrieved February 20, 2021, from https://www.reuters.com/article/us-health-coronavirus-vietnam-rice-atm-idUSKCN21V0GQ

17. Epley, N., & Gilovich, T. (2001). Putting adjustment back in the anchoring and adjustment heuristic: Differential processing of self-generated and experimenter-provided anchors. *Psychological Science, 12*(5), 391-396. https://doi.org/10.1111%2F1467-9280.00372

18. Epley, N., & Gilovich, T. (2005). When effortful thinking influences judgmental anchoring: differential effects of forewarning and incentives on self-generated and externally provided anchors. *Journal of Behavioral Decision Making, 18*(3), 199-212. https://doi.org/10.1002/bdm.495

19. Fama, E. (1970). Efficient Capital Markets: A Review of Theory & Empirical Work. *The Journal of Finance, 25*(2), 383-417. https://doi.org/10.2307/2325486

20. FiinPro. (2020). *Corporate Earnings Back on Track but Oil & Gas and Travel & Leisure*. Retrieved from https://web.fiin-trade.vn/Upload/data-digest/FiinPro_Digest_6_EN_Dec2020_Corporateearningsbackontrack.pdf

21. Frunza, M. C. (2015). *Solving modern crime in financial markets: Analytics and case studies*. Academic Press. https://doi.org/10.1016/C2015-0-02293-6

22. FTSERussell. (2017). *Industry Classification Benchmark: Structural enhancements to the industry categorization framework*. Retrieved from https://content.ftserussell.com/sites/default/files/research/industry_classification_benchmark-final.pdf

23. General Statistics Office. (2021). *Infographic population, labour & employment in 2020*. Retrieved February 20, 2021, from https://www.gso.gov.vn/en/data-and-statistics/2021/01/infographic-population-labour-and-employment-in-2020/

24. Gilovich, T., Griffin, D., & Kahneman, D. (2002). *Heuristics and biases: The psychology of intuitive judgment*. Cambridge University Press. https://doi.org/10.1017/CBO9780511808098

25. Goodell, J. W., & Huynh, T. L. D. (2020). Did Congress trade ahead? Considering the reaction of US industries to COVID-19. *Finance Research Letters, 36*, 101578. https://doi.org/10.1016/j.frl.2020.101578

26. Grohol, J. (2020, March 19). *Panic buying: The psychology of hoarding toilet paper, beans & soup*. Psych Central. Retrieved from https://psychcentral.com/blog/panic-buying-the-psychology-of-hoarding-toilet-paper-beans-soup/

27. Hailu, G. (2020). Economic thoughts on COVID-19 for Canadian food processors. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie, 68*(2), 163-169. https://doi.org/10.1111/cjag.12241

28. Höhler, J., & Lansink, A.O. (2021). Measuring the impact of COVID-19 on stock prices and profits in the food supply chain. *Agribusiness, 37*(1), 171-186. https://doi.org/10.1002/agr.21678

29. Hori, M., & Iwamoto, K. (2014). The run on daily foods & goods after the 2011 Tohoku earthquake: a fact finding analysis based on homescan data. *The Japanese Political Economy, 40*(1), 69-113. https://doi.org/10.2753/JES2329-194X400103

30. Huo, X., & Qiu, Z. (2020). How does China's stock market react to the announcement of the COVID-19 pandemic lockdown? *Economic and Political Studies, 8*(4), 436-461. https://doi.org/10.1080/20954816.2020.1780695

31. Kantar. (2020a). *Living in C-19 times – FMCG: Asian consumer/shopper reaction during lockdown*. Retrieved from https://www.kantarworldpanel.com/dwl.php?sn=publications&id=1497

32. Kantar. (2020b). *COVID-19: Abnormal FMCG spend in Vietnam pre-lockdown*. Retrieved February 20, 2021, from https://www.kantarworldpanel.com/global/News/Abnormal-FMCG-spend-in-Vietnam-pre-lockdown

33. Keane, M., & Neal, T. (2021). Consumer panic in the COVID-19 pandemic. *Journal of econometrics, 220*(1), 86-105. https://doi.org/10.1016/j.jeconom.2020.07.045

34. Klingler-Vidra, R., Tran, B., & Uusikyla, I. (2021). Vietnam & innovation in COVID-19 testing. *BMJ Innovations, 7*(1), 19-22. http://dx.doi.org/10.1136/bmjinnov-2021-000680

35. Kurihara, S., Maruyama, A., & Luloff, A. E. (2012). Analysis of consumer behavior in the Tokyo metropolitan area after the Great East Japan Earthquake. *Journal of Food System Research, 18*(4), 415-426. https://doi.org/10.5874/jfsr.18.415

36. Lintner, J. (1965). Security prices, risk, and maximal gains from diversification. *The Journal of Finance, 20*(4), 587-615. https://doi.org/10.2307/2977249

37. Long, N. N., & Khoi, B. H. (2020). An empirical study about the intention to hoard food during COVID-19 pandemic. *Eurasia Journal of Mathematics, Science & Technology Education, 16*(7), em1857. https://doi.org/10.29333/ejmste/8207

38. MacKinlay, A. C. (1997). Event studies in economics & finance. *Journal of Economic Literature, 35*(1), 13-39. Retrieved from https://www.jstor.org/stable/2729691

39. Malkiel, B. G. (2003). The efficient market hypothesis & its critics. *Journal of Economic Perspectives, 17*(1), 59-82. https://doi.org/10.1257/089533003321164958

40. McWilliams, A., & Siegel, D. (1997). Event Studies in Management Research: Theoritical & Empirical Issues. *Academy of Management Journal, 40*(3), 626-657.

41. Musvanhiri, P. (2017, September 28). *Zimbabweans stock up on essentials amid fears of hyperinflation*. Deutsche Welle. Retrieved February 20, 2021, from https://www.dw.com/en/zimbabweans-stock-up-on-essentials-amid-fears-of-hyperinflation/a-40724529

42. NEU & JICA. (2020). *Assessment of policies to cope with covid-19 AND recommendations* (Report). Hanoi. Retrieved from https://www.jica.go.jp/vietnam/english/office/topics/c8h0vm0000ecmc4u-att/210305_01_en.pdf

43. Nga, L. (2020, July 25). *Vietnam confirms first case of Covid-19 community transmission in 100 days*. VnExpress International. Retrieved February 20, 2021, from https://e.vnexpress.net/news/news/vietnam-confirms-first-case-of-covid-19-community-transmission-in-100-days-4135963.html

44. Nhandan (2020). *Ho Chi Minh City strives to maintain role as Vietnam's economic engine*. Retrieved February 20, 2021, from https://en.nhandan.vn/business/item/9185402-ho-chi-minh-city-strives-to-maintain-role-as-vietnam%E2%80%99s-economic-engine.html

45. OECD. (2020). *COVID-19 and the food and agriculture sector: Issues and policy responses*. Retrieved February 20, 2021, from https://www.oecd.org/coronavirus/policy-responses/covid-19-&-the-food-&-agriculture-sector-issues-&-policy-responses-a23f764b/

46. Phuong, L. (2020, January 23). *Vietnam confirms first acute pneumonia cases in Saigon*. VnExpress International. Retrieved February 20, 2021, from https://e.vnexpress.net/news/news/vietnam-confirms-first-acute-pneumonia-cases-in-saigon-4046310.html

47. Phuong, L. C. M. (2021a). How COVID-19 impacts Vietnam's banking stocks: An event study method. *Banks and Bank Systems, 16*(1), 92-102. https://doi.org/10.21511/bbs.16(1).2021.09

48. Phuong, L. C. M. (2021b). The Impact of COVID-19 on Stock Price: An Application of Event Study Method in Vietnam. *The Journal of Asian Finance, Economics and Business, 8*(5), 523-531. https://doi.org/10.13106/jafeb.2021.vol8.no5.0523

49. Phuong, L.C.M. (2021c). How Covid-19 affects the share price of Vietnam's pharmaceutical industry: Event study method. *Entrepreneurship and Sustainability Issues, 8*(4), 250-261. http://doi.org/10.9770/jesi.2021.8.4(14)

50. Quynh, N. X., & Uyen, N. D. T. (2020, March 31). *Vietnam Orders 15-day Nationwide Isolation From April 1*. Retrieved February 20, 2021, from https://www.bloomberg.com/news/articles/2020-03-31/vietnam-orders-15-day-nationwide-isolation-from-april-1

51. Ramelli, S., & Wagner, A. F. (2020). Feverish stock price reactions to COVID-19. *The Review of Corporate Finance Studies*, 9(3), 622-655. https://doi.org/10.1093/rcfs/cfaa012

52. Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance, 19*(3), 425-442. https://doi.org/10.1111/j.1540-6261.1964.tb02865.x

53. Taffler, R. J., & Tuckett, D. A. (2010). Emotional finance: The role of the unconscious in financial decisions. In H. K. Baker & J. R. Nofsinger (Eds.), *Behavioral finance: Investors, corporations, and markets* (pp. 95-112). John Wiley & Sons. http://dx.doi.org/10.1002/9781118258415

54. Tuoitre. (2020). *"ATM gạo" nhân bản yêu thương, lan tỏa tình người. ["Rice ATM" clones love, spreads humanity]*. Retrieved February 20, 2021, from https://tuoitre.vn/atm-gao-nhan-ban-yeu-thuong-lan-toa-tinh-nguoi-20200412234741985.htm

55. You, S., Wang, H., Zhang, M., Song, H., Xu, X., & Lai, Y. (2020). Assessment of monthly economic losses in Wuhan under the lockdown against COVID-19. *Humanities & Social Sciences Communications, 7*(1), 52. https://doi.org/10.1057/s41599-020-00545-4