Analyzing the Resilience of Amazon and Darden Amidst the COVID-19 Pandemic: A Time-Series Study with ARIMA Modeling

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Abstract: On March 16, 2020, in response to the emergence of the COVID-19 virus, the United States implemented an indefinite quarantine mandate. This unprecedented measure had repercussions, affecting businesses, schools, and government facilities across the nation. The mandate required these entities to either operate at reduced capacity or to halt operations altogether. Consequently, the stock market experienced extreme volatility during this period. This study aims to conduct an in-depth analysis of the responses to the pandemic of two firms operating in different industries. Amazon, an e-commerce and technology giant in the broadband retail industry, found itself with unprecedented demand for online shopping and cloud services considering the prevalent supply chain disruptions at the time. On the flip side, Darden Restaurants, a prominent player in the restaurant industry, had to either operate at a limited capacity, or shut down most of its restaurants altogether in coordination with the mandated closures issued by the government. This study will employ time series analysis techniques, specifically Autoregressive (AR), Moving Average (MA), and ARIMA (Autoregressive Integrated Moving Average) models. The objective is to assess the influence of COVID-19 on the selected firms and extract valuable insights from the data.

Keywords: Amazon, Darden, COVID-19, ARIMA model, Stock performance

1.   Introduction

1.1.   Research Background

The emergence of COVID-19 in late 2019 marked a pivotal point in modern history. However, it wasn't until March 2020 that the United States began to fully acknowledge the seriousness of the COVID-19 pandemic, altering the nation's stance toward the crisis: People were forced to be in quarantine for months, businesses were being forced to shut down, universities introduced "remote learning" to accommodate self-quarantine policies. As the virus spread across the globe, the stock market responded with unrivaled volatility: the general S&P 500 Index declined 12%, which was the steepest decline since Black Monday in 1987.

1.2. Amazon

Amazon is a multinational technology conglomerate that started as an online bookstore and quickly expanded into one of the world's largest e-commerce and cloud services companies. Amazon has achieved remarkable financial success and has become a dominant player in multiple industries throughout the years. Its journey over the years can be summed up as a story of continuous growth and innovation. When looking at Amazon's historical performance in the broad stock market, its historical prices are the key evidence of its impressive growth narrative and a testament to investor confidence, with some periods of volatility.

Amazon went public on May 15, 1997. Over the years, Amazon has experienced significant fluctuations in its stock price. During the dot-come bubble, its stock price skyrocketed but then plummeted to about $0.3 per share by the time the bubble burst. From 2002 to 2007, Amazon incurred steady growth, with its stock priced at $4.72 per share by the end of 2007[1].

The global financial crisis of 2008 caused a dip in Amazon's stock price, but the company managed to recover through strategic management, aggressive expansions, along with the success of products like the Kindle [2]. By the end of 2013, Amazon's stock price was back on track, at around $19.82 per share [1]. Subsequently, constant growth was received for Amazon from 2014 to 2019.

While the emergence of COVID-19 has been proven detrimental for most businesses, it did the opposite for Amazon as Amazon benefited from increased demand for essential products and online shopping. In response to this surge in demand, Amazon has taken actions such as hiring new full and part-time employees across the U.S. in their fulfillment centers, as well as increasing workers' pay as means of motivation [3]. As a result, Amazon's stock price reached a record high of $170 per share roughly.

As of august 2023, Amazon is to be valued at $130 per share, reflecting its continued dominance in the e-commerce and cloud services [1].

1.3. Darden Restaurants

Darden Restaurants (Darden) is a prominent restaurant company that owns and operates a diverse portfolio of restaurant brands including Olive Garden, LongHorn Steakhouse, Yard House, The Capital Grille, Bahama Breeze, etc. Darden is known for its focus on casual dining and has built a good reputation for providing quality dining experience across its brands. Darden is a pioneer in the restaurants industry, that is, its historical stock prices will not only reflect the company's economic performance, but also provide insight into the broader trends in the restaurant industry.

Darden went public in May 1995, initially valued at $6.26, experienced gradual growth throughout the late 1990s and early 2000s. This stable growth was to be interrupted by the 2008 financial crisis. During the crisis, economic uncertainties were high, consumer spending declined, as a result, Darden suffered a significant reduction in its stock prices, nearly 50% decrease in its stock price. Darden was able to recover from the crisis, although it did take time. During the 2010s, Darden demonstrated a somewhat consistent growth rate in its stock price. Over this period, the company's stock displayed an upward trend, showcasing its ability to generate wealth for investors.

The COVID-19 pandemic had a significant negative impact on the restaurant industry. Just like other businesses, Darden had to adapt to the newly issued mandates, experienced reduced consumer traffic and operational disruptions due to lockdowns. They also incurred extra spending to best accommodate social distancing measures. With no reasonable strategies to cover its fixed overheads, the company experienced a significant blow in its stock prices: an approximate 68% decline from January 2020 to March 2020 [4].

As the restaurant industry started recovering from COVID-19, Darden's stock price went back aboard. By the end of 2022, Darden was priced at $140 per share, and by August 2023, Darden is at $160 per share.

1.4. Purpose and Structure

Analyzing the movement of the two firms' stock prices not only offers insights into the pandemic's economic ramifications, but also sheds light on the necessity for businesses to cultivate adaptability and financial resilience in times of uncertainty.

This paper will be structured as follows: research design (Section III) will include the aim of this study in detail, data source, stationary test for data, and a breakdown of the ARIMA model being used. Results, insights, and findings will be concluded in the result section (Section IV), along with a full discussion and analysis about the two firms' data (Section V. Lastly, an overall conclusion will be included in the last section (Section VI)

2. Literature Review

2.1. Impact of the COVID-19 pandemic: Evidence from the U.S. Restaurant Industry

This study conducted an experiment to investigate the impact of COVID-19 on the stock returns of U.S. restaurant firms and how this impact differed based on the firms' characteristics before the pandemic. Those variations were examined across three dimensions: 1) financial conditions, looking into ratios such as the leverage ratio and cash flow provide insights regarding the financial health of the firm 2) corporate strategies, including factors like the firm's degree of franchising and internationalization, and 3) ownership structure, specifically the extent of institutional and managerial ownership.

The study defined a regression model as follows:

$$Returns_{it} = a_0 + a_1 COVID19_t + a_2 X_{i,pre2020} + a_3 COVID19_t * X_{i,pre2020} + e_{it} \qquad (1)$$

Defining variables in this model:
RETURNS: Returns of firms' stocks on a weekly basis.
COVID19: The growth rate of confirmed COVID-19 cases in the United States on a weekly basis.
Xpre2020: Pre-pandemic firm characteristics.
Xpre2020*COVID19: Interaction term that results from combining COVID19 and Xpre2020.
e: Error term, accounting for the unexplained variation in the data that cannot be attributed to the other variables.
Subscript i, t: firm and time, respectively

It is to be concluded that 1) The relationship between COVID-19 and weekly stock returns is positively influenced by firm size and cash flow. Suggesting that larger firms with more excess cash tend to weather challenging periods better than others on average, by means of self-financing. This trait turns out to be favorable in the eyes of the investors, assigning them a positive market valuation compared to firms with similar characteristics but smaller size and lower cash reserves. 2) Previous research stated that leverage plays a negative moderating role; However, current study offers contradictory evidence: Increased leverage of a firm when confronted with external shocks signals a potential rise in risks. Triggering investor concerns and often results in a decline in stock prices. However, in this case, restaurant firms with more leverage are more resilient in the face of stock reactions to COVID-19 shock. Because during a crisis like COVID-19, the overall financial distress faced by restaurant firms tends to become much more severe across the board. Consequently, the financial distress associated with a firm's leverage becomes less significant in proportion, while the

tax benefits from leverage persist. As a result, investors might perceive additional value in restaurant firms which have high leverage due to this tax advantage, despite the financial challenges posed by the crisis. 3) Internationalization is the sole factor that positively moderates the relationship between COVID-19 and stock returns. This means that the level of international presence helps those restaurant firms' stock prices during challenging times.

2.2. The Impact of the COVID-19 Pandemic on Amazon's Business

In 2020, the COVID-19 pandemic led to significant changes in shopping patterns, with a notable increase in online shopping for essential goods. Amazon, a global e-commerce giant, experienced record net sales of $75.5 billion in the first quarter of 2020, driven by this surge in demand. Investors recognized the potential for profit in online platforms like Amazon, shifting their investments away from sectors negatively impacted by the pandemic, such as leisure tourism and transportation, towards online entertainment, education, and shopping [5].

Lowering interest rates worldwide also played a role in encouraging investment in online businesses, boosting their availability to take credit. However, recent trends have shown a slowdown in Amazon's growth, which can be attributed to several factors. These include households adjusting their spending from panic buying to more typical levels, economic challenges faced by individuals, limited demand for online shopping in some developing countries due to cultural habits and distrust in online transactions, and a potential saturation point in the demand for online shopping platforms, particularly in the context of the pandemic.

In conclusion, this research demonstrates the profound impact of the COVID-19 pandemic on consumer behavior, investment decisions, and the e-commerce industry, with Amazon as a prominent example. While the pandemic initially drove significant growth in online shopping, various factors now influence its future trajectory, suggesting a complex and evolving landscape in the digital and financial era.

3. Research Design

3.1. Introduction

This research is dedicated to comprehensively examine the genuine impacts of COVID-19 on Amazon and Darden by employing techniques of time series analysis. To achieve this, historical pricing data for both firms spanning the years 2010 to 2023 were collected on a daily, weekly, and monthly basis. Those pricing data served as the foundations for projecting prices beyond 2020, as though the pandemic hadn't occurred. Through the development of advanced models, expected values of price were derived, enabling the calculation of disparities and percentage deviations between actual and projected prices. Valuable insights were obtained from these findings, leading to informative conclusions and robust discussions.

3.2. Data Source

For the purpose of this study, the collection of daily, weekly, and monthly stock prices was facilitated through Yahoo! Finance, spanning the years 2010 to 2023. The dataset would require excess processing steps before conducting further analysis. The application of natural logarithm transformation was carried out on the price data to ensure variance stabilization. That is, $\ln(1+Price)$. This logarithmic conversion effectively reduced the impact of extreme values, or outliers, on the overall data variability. Subsequently, returns were calculated for both firms, with a subsequent application of the natural logarithm transformation, $\ln(1+Return)$, to those data.

Upon finishing data processing phase, a specific date was chosen as the pivotal point for the outbreak of COVID-19. This date corresponds to Monday, March 16, 2020. On this day, official restrictions regarding COVID-19 were imposed: universities announced indefinite closure, quarantine mandates were put in place. The S&P 500 Index recorded a notable 12% drop, marked the highest decline since Black Monday in 1987.

3.3. Weak Stationarity Test

Before conducting any analysis on a time series, it is crucial to assess its stationarity. The Augmented Dickey-Fuller Test (ADF Test) was used to detect any potential presence of a unit root in the time series. The presence of unit root signifies that the time series is non-stationary, meaning that its mean and variances change over time [6].

In the context of the ADF test, the null hypothesis (Ho) states that the price data has a unit root, implying non-stationarity. The alternative hypothesis suggests that the price data does not have a unit root, implying stationarity.

After conducting the ADF test using STATA, the results are shown in Table 1.

Table 1: Weak stationarity test

	DRI		AMZN	
	t	p	t	p
Daily				
Raw	-1.629	0.7807	-3.075	0.1124
1st order difference	-35.270	0.0000	-36.997	0.0000
Weekly				
Raw	-2.045	0.5765	-2.876	0.1703
1st order difference	-12.483	0.0000	-16.819	0.0000
2nd order difference	-25.941	0.0000	-27.255	0.0000
Monthly				
Raw	-2.558	0.2996	-2.557	0.2999
1st order difference	-8.111	0.0000	-8.105	0.0000
2nd order difference	-11.676	0.0000	-13.798	0.0000

When applying raw data into the ADF tests at various intervals (daily, weekly, and monthly), there wasn't sufficient evidence to reject null hypothesis, suggesting that the raw data are non-stationary, as there is the presence of a unit root. Consequently, an ordered difference was applied to take the ADF test once again.

When taking the first order difference data into the ADF test, the null hypothesis was rejected for all instances. Suggesting that the ordered difference data are stationary and allow for the construction of an Auto Regressive Integrated Moving Average Model (ARIMA).

Although the first order difference data were rejected at all intervals, a second order difference was still applied. This decision was driven by the fact that when determining the appropriate orders of the ARIMA model, the results did not yield statistically significant values for the order selection when working with weekly and monthly data. Hence, a second order difference was applied. More details will be provided in later sections. The second ordered difference data are proven to be stationary, allowing for the construction of an ARIMA model.

3.4. Auto Regressive Integrated Moving Average Model (ARIMA)

The Auto Regressive Integrated Moving Average Model (ARIMA) is widely used for the purpose of capturing and describing the underlying patterns, trends, and seasonality within a time series data set. Those insights are then used to make short- to medium-term forecasts. A typical ARIMA model combines both autoregressive (AR) model and moving average (MA) model. Both models will be broken down into the following:

3.4.1. Autoregressive Model (AR)

$$y_t = \phi_0 + \phi_1 y_{t-1} + \cdots + \phi_p y_{t-p} + \alpha_i \tag{2}$$

The general equation for an Autoregressive (AR) model is displayed above in equation (2). The AR(p) model captures the serial correlation in the time series by relating the current value to its past values. The coefficients ϕ represents the strength and direction of the relationship between the current value and lagged values, the error term α accounts for the variability that is not explained by the lagged values [7].

3.4.2. Moving Average Model (MA)

$$y_t = C_0 + \alpha_t - \theta_1 \alpha_{t-1} - \cdots - \theta_q \alpha_{t-q} \tag{3}$$

The general equation for a Moving Average (MA) model is displayed above in equation (3). The MA(q) model captures short-term dependencies and random fluctuations in a time series by examining the relationship between the current observation and its past forecast errors (residuals). It helps in forecasting, smoothing time-dependent patterns [8].

3.4.3. ARIMA Model

$$y_t = C_0 + \phi_1 y_{t-1} + \cdots + \phi_p y_{t-p} - \theta_1 \alpha_{t-1} - \cdots - \theta_q \alpha_{t-q} + \alpha_t \tag{4}$$

The general equation for an ARIMA model is displayed above in equation (4). The differencing component (d) in the ARIMA (p, d, q) model comes into play when the time series data is non-stationary. This observation aligns with the ADF test conducted earlier where the raw datasets were confirmed to lack stationarity. To address this, ordered differences were applied, leading to the construction of an ARIMA model.

### 4. Empirical Results and Analysis

4.1. Order of ARIMA Model

To determine the order for ARIMA model, Partial Autocorrelation Function (PACF) test and Autocorrelation Function (ACF) test are required. The PACF test helps identify the direct impact of past observations on the current observation, excluding the indirect effects mediated by intermediate observations [9]. The PACF test is particularly useful for identifying the order of an AR model.
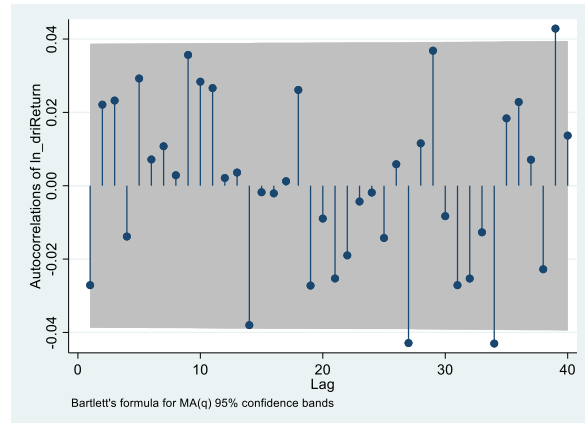
The ACF test helps determine how much an observation depends on its past values, providing insights into the underlying patterns and trends in the time series data [9]. This test is particularly useful for identifying the order of a MA model.

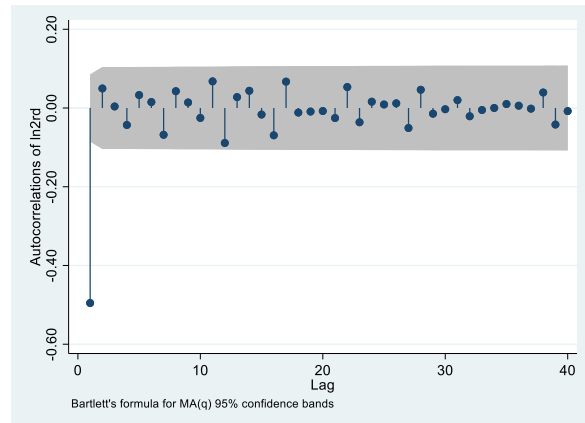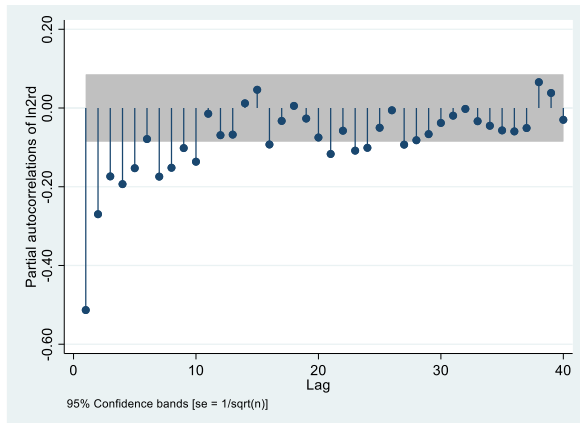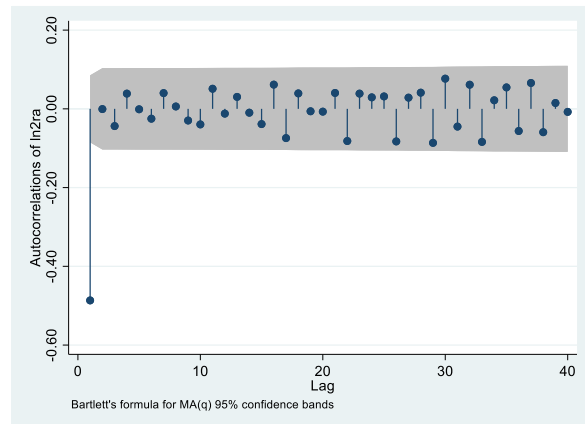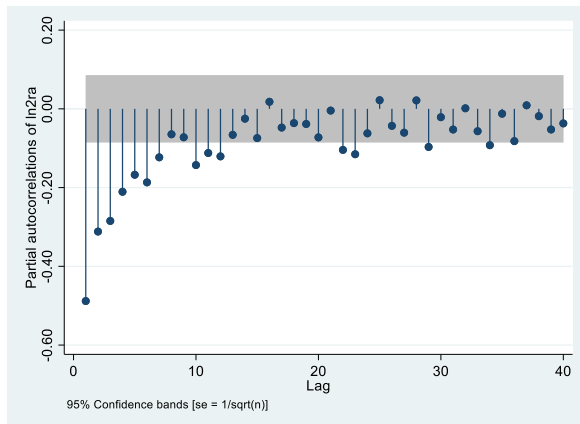The results of both PACF and ACF test for both firms are displayed below:
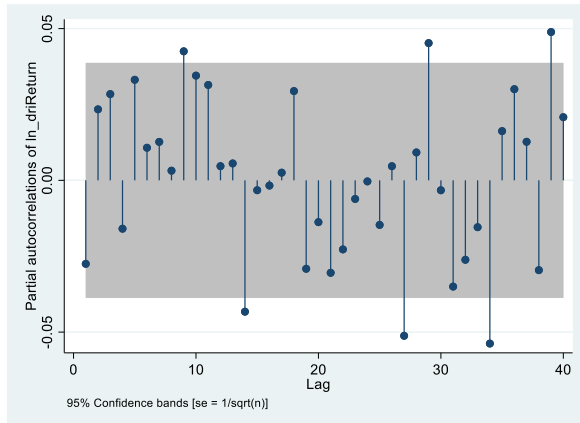
Figure 1: ARMA (p, q) identification, DRI
Photo credit: Orignial

Figures 1 and 2 unveil some compelling insights into the daily, weekly, and monthly price dynamics of Darden and Amazon, respectively. For Darden's daily prices, the optimal order for the AR model suggests an order of p=9, while the MA model suggests q=0. The determination steps are

quite smooth, only first-order differences will be taken, d=1. For Amazon's daily prices, the orders are p=8, q=8, d=1.

When looking at weekly prices for Darden, both the AR and the MA model indicate an order selection of p=1 and q=1. Results are relatively insignificant; thus, a second-order difference was taken. Yielding a refined arrangement of p=10, q=1, d=2. Similarly for Amazon, the first-order difference was insignificant. When taking a second order difference, the test suggests the order to be p=10, q=1, d=2, identical to Darden's data.

For Darden's monthly prices, a second-order difference will be taken again, since the first-order difference yielded the same results as above. As a result, the derived configuration gave p=6, q=1, and d=2. In the case for Amazon, a first-order difference proves sufficient to determine the optimal orders. The results are p=4, q=4, d=1.

Subsequently, the optimal orders for the ARIMA model were determined for both Amazon and Darden, spanning across its daily, weekly, and monthly price datasets.
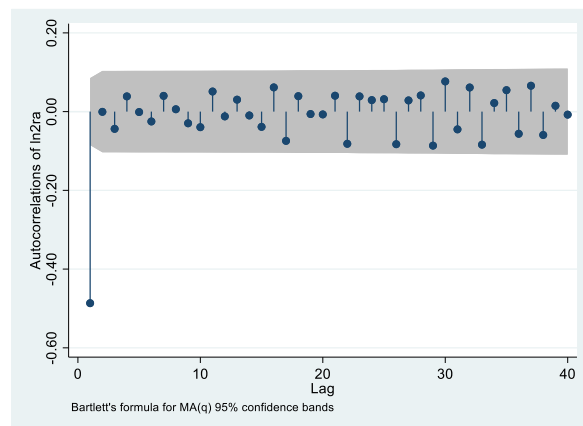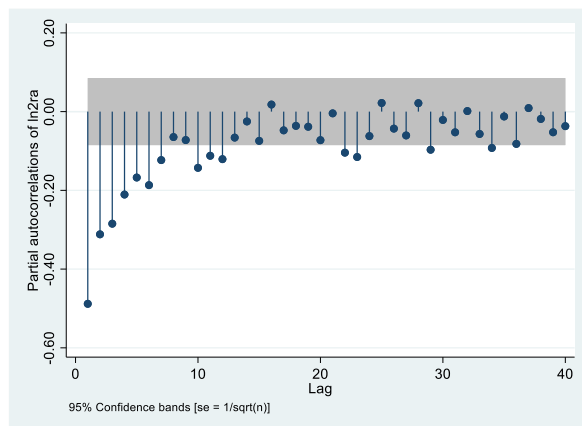
PACF   ACF
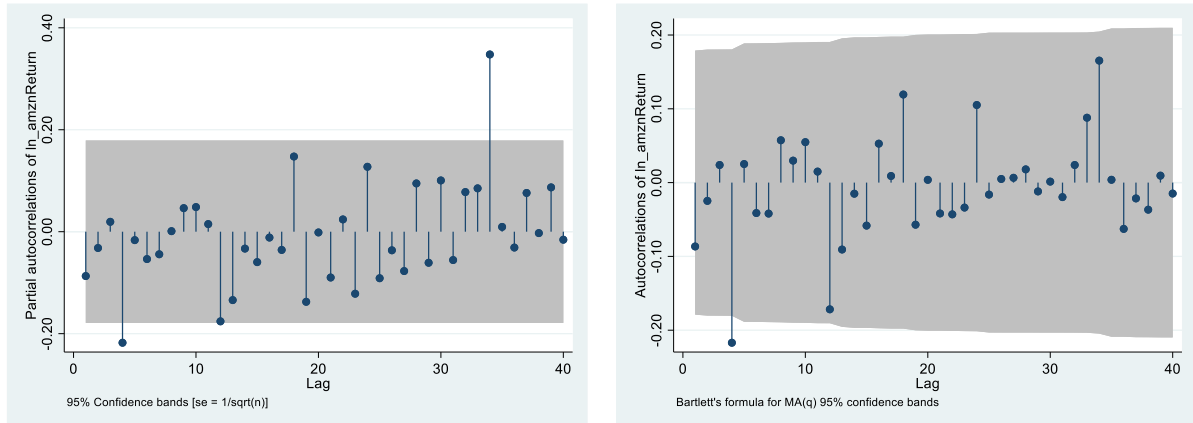
Daily
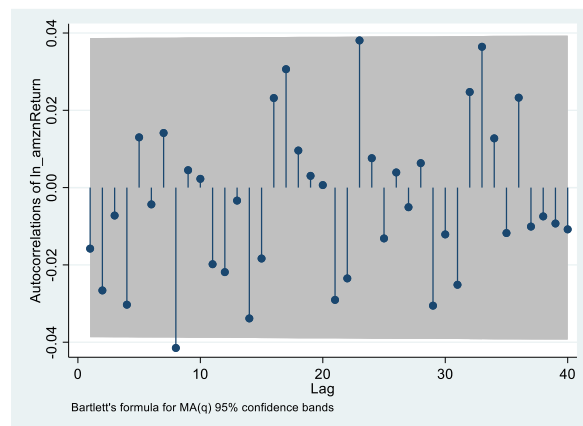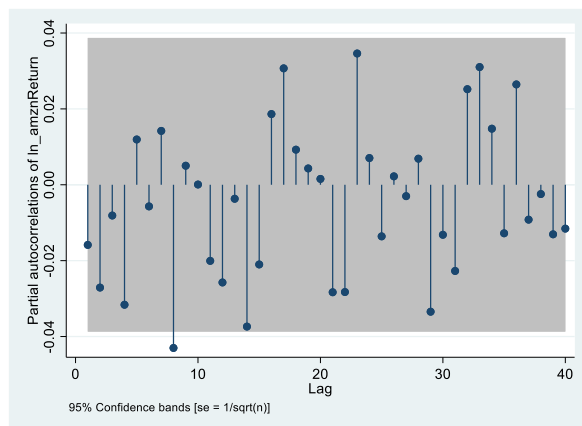
Weekly

Monthly

Figure 2: ARMA (p, q) identification, AMZN
Photo credit: Orignial

4.2. White-Noise Determination

White-Noise refers to a series of random and uncorrelated data points with constant mean and variance. It serves as a benchmark for assessing the adequacy of a model's fit to the data [10]. To determine if the residual terms are white noise, a Box & Pierce and Ljung & Box test needs to be carried out. Those tests are used to evaluate whether the autocorrelations of the residuals are significantly different from 0. The Portmanteau Q statistic is the test statistic derived from the tests. If Q is larger than the critical value of Chi-Square, then the residuals are not white noise; conversely, if Q is smaller than the critical value of Chi-Square, then the residuals are white noise.

The summary table of Portmanteau Q statistics is displayed below:

Table 2: Residual test

Model	Portmanteau (Q) statistic	Prob > chi2
DRI		
Daily-ARIMA(9,1,0)	217.4964	0.0000
Weekly-ARIMA(10,2,1)	82.3522	0.0001
Monthly-ARIMA(6,2,1)	71.5053	0.0016
AMZN		
Daily-ARIMA(8,1,8)	40.6941	0.4397
Weekly-ARIMA(10,2,1)	47.2204	0.2013
Monthly-ARIMA(4,1,4)	34.0344	0.7349

Table 2 provides essential insights into the residual tests. Note, Darden's Portmanteau Q Statistics exceeded the critical chi-squared value across all three scales: daily, weekly, and monthly. This outcome implies that the residuals do not conform to the characteristics of white noise. However, this result is acceptable for the purpose of this study: trend forecasting rather than precise dollar valuation.

For Amazon, the Portmanteau Q Statistics were smaller than the critical chi-squared value across all three scales. The residuals do align with the characteristics of white noise, regardless, dataset is acceptable to make predictions.

4.3. ARIMA Model Forecast Results

Figure 3 visually summarizes the interplay between actual and forecasted daily stock prices for both Darden and Amazon. In the case of Darden, a distinct pattern emerges, showcasing an average disparity of -26% between the two value sets across a 10-day projection horizon. COVID-19 has caused Darden to lose 26% of its value on a per share basis.

In contrast, Amazon's actual daily price consistently exceeds the projected daily price by an average margin of 2.48%. This revelation stands in stark contrast to Darden's forecast, telling an entirely different story. The data suggests that Amazon has reaped economic benefits from the pandemic in the short run.
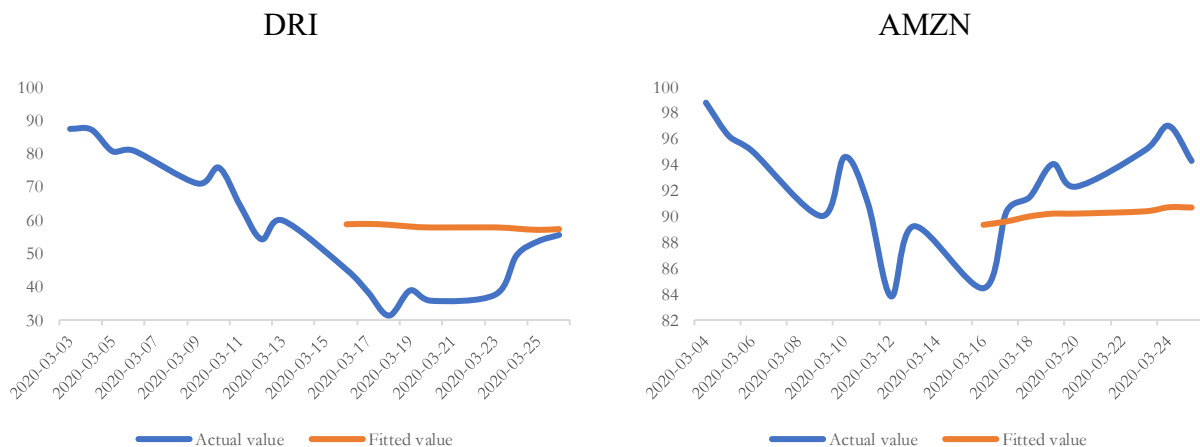

Figure 3: Actual value and fitted value, daily
Photo credit: Orignial

Figure 4 provides an overview between the actual weekly prices and its forecasted values for both Darden and Amazon.

When focusing on Darden, a consistent pattern emerges: for each week, the firm's stock would be undervalued by 5.47% relative to its forecasted value. Note, when examining the entirety of the period from Jan 6, 2020, to May 18, 2020, Darden's cumulative stock price decreased by 33.46%. The repercussions of COVID-19 were not limited to the short term for Darden. Rather, they were extended into the mid-term as well.

Conversely, Amazon's price movement is drastically different from Darden's. Over the same period, the tech giant's stock prices increased by 30% in total. On average, Amazon's stock price was approximately 17.93% higher every week than its forecasted valuation, leveraging COVID-19 to its economic advantage as much as possible.
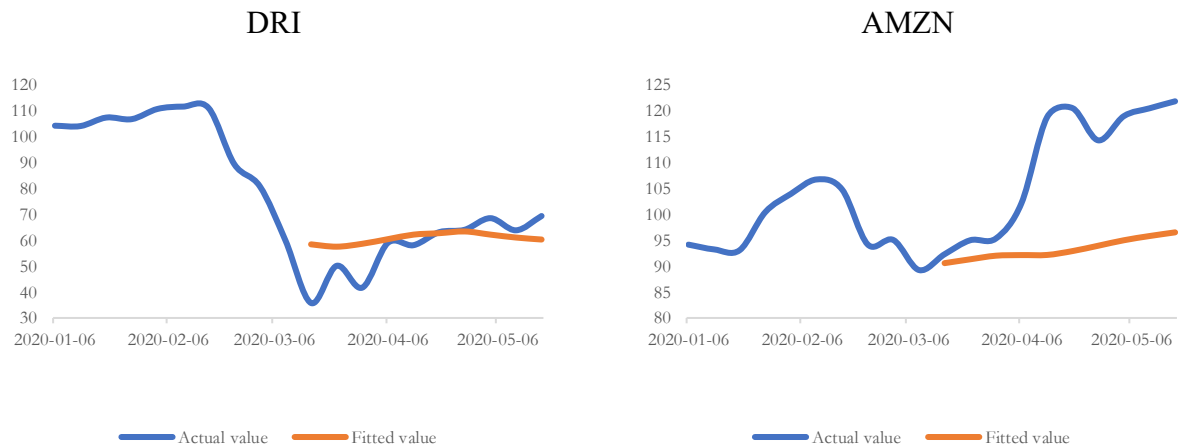
Figure 4: Actual value and fitted value, weekly
Photo credit: Orignial

Figure 5 shows the relationship between actual monthly price data and their corresponding forecasted values for both Amazon and Darden. 12 months span for Darden and 8 months for Amazon.
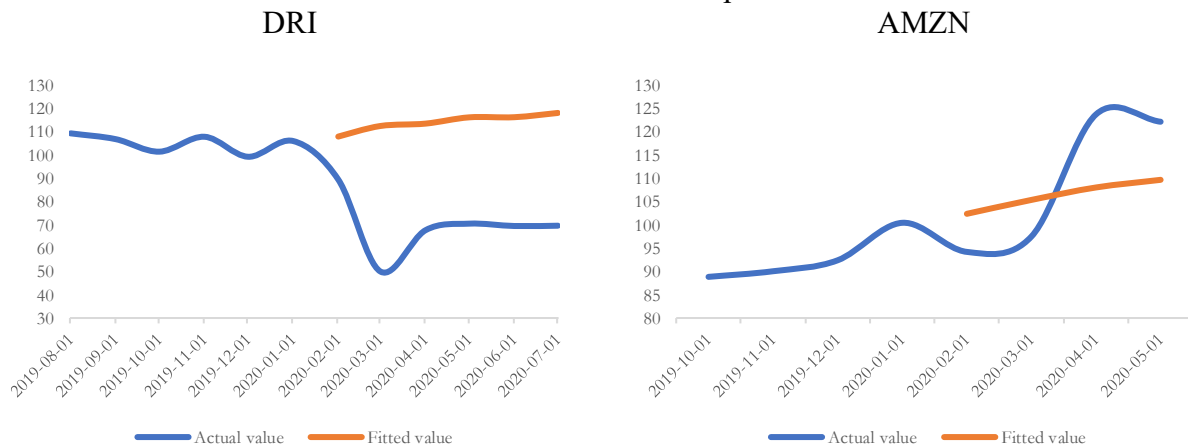

Figure 5: Actual value and fitted value, monthly
Photo credit: Orignal

Darden's stock price was undervalued by 39.09% on average, relative to its projected value. This trend translates into a substantial 36.28% decline in Darden's stock value per share from August 2019 to July 2020. Note, this degree of undervaluation on a monthly scale stands out in comparison to the patterns observed on a weekly basis. Additionally, Darden still has yet to recover from the impact of COVID-19 in July, four months after the initial outbreak of the virus.

On the flip side, Amazon showed a remarkable surge of 37.47% in their monthly stock prices from October 2019 to May 2020. The data underscores a consistent theme, with Amazon's stock price being, on average, overvalued by approximately 2.85% per month.

In the case of Darden, the impact of COVID-19 extended far beyond a mere short-term disruption. Rather, it inflicted significant damage across all three-time scales: short-term, mid-term, and long-term. Each of these scales were categorized by a concerning undervaluation trend: a monthly average of -39%, a daily average of -26.06%, and a weekly average of -5.47%. Note, it took Darden an entire year to fully recover from the extensive repercussions of the pandemic.

Despite the significant setbacks inflicted by COVID-19, Darden's impressive journey of recovery stands out as a testament to its resilience and adaptability. Darden's management team responded to the pandemic in a very quick manner, implementing strategic changes that proved to be both effective and essential. In the initial stages, they offered limited-capacity seating until compelled to shut down. Their shift of emphasis towards take-out services was an ingenious move from them. Those strategic management decisions in the face of adversity resonated positivity with investors.

It is worth noting that Darden's ability to rebound considering its unique challenges is remarkably more impressive than one might initially imagine. Unlike Amazon, which operates via the internet and was earning sufficient revenue, Darden has numerous physical locations under lease contracts. Throughout the crisis, while operating at minimal capacity, or not operating at all, Darden continued to bear the financial burdens of lease expenses, utilities, and fixed overheads across all its locations. Their ability to meet short-term obligations even in times of crisis wasn't accidental: it was the result of meticulous planning and strategic adaptability. The crisis underscored their adept management strategies and prudent financial planning, positioning them to weather the storm and emerge stronger.

Amazon, on the other hand, was prospering during the pandemic. In fact, COVID-19 acted as a "catalyst" for the firm's growth. Prior to the pandemic, Amazon's shares averaged around $100. During and after the COVID-19 period, its stock price ranged from $140 to $180. Its stock experienced very consistent overvaluation during this time: weekly average of 7.93%, monthly average of 2.85%, and daily average of 2.48%. This remarkable economic success, driven by the emergence of COVID-19, represents a turning point for Amazon's business, showcasing an unprecedented level of prosperity.

Amazon seized the unfolding opportunity with remarkable finesse. Rather than halting advertising to cut expenses, Amazon's management team committed to maintain its marketing channels. Amazon perceived the pandemic as a strategic window of opportunity. The rationale was clear: as people's lives transitioned drastically, the necessity for online purchases surged. The rise of e-commerce was inevitable and imminent. By continually promoting its offerings and expanding its service reach, Amazon has turned the pandemic to work in their favors. In essence, the pandemic acted as a catalyst for the booming of Amazon's e-commerce platform, solidifying its status as a tech giant.

Additionally, the pandemic showcased the importance of e-commerce and digital services, and Amazon's ability to serve customers during this time highlighted its relevance and market dominance, showcasing a promising long-term growth potential.

5.   Discussion & Implication

In contrast to other studies that focus on analyzing the stock price movements of restaurant firms based on various factors like excess cash, leverage, size, degree of franchising, and internationalization, or those that explore the key drivers behind Amazon's exceptional growth during the COVID-19 pandemic, this particular study adopts a different objective.

Rather than assessing the impact of COVID-19 on Darden and Amazon, this study started with the conclusion that COVID-19 had a contrasting impact on the two entities. It posits that while Darden faced adverse effects from the pandemic, Amazon experienced benefits. The construction of a hypothetical scenario which assumes COVID-19 never occurred allows for the examination of stock prices in two different cases. As a result, instances of both undervaluation and overvaluation in stock prices were identified.

Darden's consistent undervaluation in the market can be attributed to the overarching impact of COVID-19 on the entire restaurant industry, or the whole market. However, as time progresses and market conditions regain its stability, Darden can be perceived to recapture its pre-pandemic performance levels.

Darden held a stock price of $80 at the end of 2020, while its price was valued at $120 in 2019. Fast forward to the present day, September 2023, Darden is presently valued at $155. Affirming our earlier conclusion that Darden's stock was indeed undervalued because of the volatile conditions of the market. This significant increase in Darden's stock price from its 2020 levels further emphasizes the belief that, given time and a more stable market environment, Darden has the potential to recover and recapture its pre-pandemic performance levels.

Amazon consistently demonstrated overvaluation in its stock price in the market. This trend can be attributed to the surging demand for e-commerce throughout the pandemic. In other words, the e-commerce sector as a whole experienced robust performance during that time, and Amazon, being the prominent leader in this sector, enjoyed substantial success. COVID-19 has brought Amazon to a record high which Amazon never anticipated. From there, Amazon would not return to its pre-pandemic performance levels. Instead, Amazon fully capitalized on the opportunity and has since exhibited remarkable growth.

Amazon's stock price was at $93 at the end of 2019, jumping to $160 by the end of 2020 after the emergence of COVID-19. Fast-forwarding to the present day, Amazon is currently valued at $138 per share. Amazon effectively utilized the emergence of the virus as a catalyst for its business. However, it is worth noting that Amazon's present-day price has declined from its peak during the pandemic. This can be attributed to various factors: As consumers' lives returned normal, the surge in demand for online shopping quickly faded, leading to downward pressure on Amazon's stock price; Over time, investors may have gained better understandings of market behavior during the pandemic and adjusted their expectations accordingly, this could contribute to a more realistic assessment of Amazon's future growth prospects.

Regardless of the reason, Amazon's stock price movement suggests that COVID-19 did play a role in inflating its stock price in 2020. As market conditions returned to normalcy, the stock price gradually adjusted to reflect the firm's intrinsic value.

The insights gathered can be deemed valuable for investors in terms of

(1) Risk Assessment: These insights provide a better understanding of how firms' stock prices can fluctuate during times of crisis. This knowledge enables investors to assess the potential risks associated with their investments more accurately.

(2) Long-Term Perspective: Recognizing the importance of a long-term perspective can help investors adopt a more patient and strategic approach to their investments. Rather than reacting impulsively to short-term market fluctuations, investors can focus on the fundamental strengths of the companies.

6.   Conclusion

In conclusion, the impact of COVID-19 on Amazon and Darden has been a stark contrast.

For Darden, the pandemic introduced a series of challenges throughout different scales of time horizons: short-term, mid-term, and long-term. This was evidenced by the notable undervaluation of its stock prices on a monthly, weekly, and daily basis. However, Darden's ability to weather the storm and initiate a meaningful recovery attest to its resilience, adaptive management, and strategic planning.

On the other hand, Amazon's experience during the pandemic can be summarized by rapid growth and unprecedented demand. As the world's reliance on e-commerce surged, Amazon's approach to maintaining marketing channels and capitalizing on the evolving consumer behavior has no doubt put them on top. The overvaluation of its stock prices on different time scales underscores the transformative impact of the pandemic on the company's economic stance.

Overall, COVID-19 acted as a crucible: revealing the strengths and weaknesses for each company. Darden's journey of recovery showcased its capability to handle adversity, while Amazon's rise showcased its agility and market leadership. Both stories serve as compelling case studies in how

organizations navigated an unprecedented global crisis, despite the differences in industries and the contrasting effects that COVID-19 has upon them.

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