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Market Shocks and Firm Resilience: A Study on COVID-19's Impact in a Resource-rich Emerging Market

Abstract

Purpose: This study examines the impact of the COVID-19 pandemic on the Kuwaiti stock market and firm performance within an emerging market context.

Study design/methodology/approach: We analyze the immediate and lagged effects of daily COVID-19 cases and deaths on the stock market. We then investigate the pandemic's effect on firm performance, measured by Tobin's Q and Altman Z-Score, and explore the moderating roles of firm size and industry.

Sample and data: The dataset comprises 952 annual observations across 146 firms and 103,436 daily stock price observations.

Results: The pandemic negatively affected stock market performance, with both immediate and delayed effects of COVID-19 cases and deaths. Firms also saw a drop in their market value and financial health, as indicated by declines in Tobin's Q and the Altman Z-Score. While larger firms saw a more significant decline in market valuation, smaller firms encountered increased challenges in maintaining financial stability as the impact of the pandemic varied across industries. Sectors such as consumer goods and telecommunications showed notable resilience, possibly benefiting from changes in demand during the pandemic.

Originality/value: Contrary to the majority of papers that studied the effect of the pandemic on large and developed markets using short timeframes, this study contributes to the literature by analyzing the full effect of the pandemic on an emerging market by using an extensive timeframe.

Research limitations/implications: These findings underscore the pandemic's complex economic impact, pointing to the need for recovery strategies that address the varied experiences of different regions, firms, and industries.

Keywords: COVID-19, Financial Performance, Tobin's Q, Altman Z-Score, Pandemic.

JEL classification: M41, M48, G01, G32, G38, L25

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الملخص

صدّات السوق ومرونة الشركات: دراسة حول تأثير جائحة كوفيد-19 في الأسواق الناشئة الغنية بالموارد

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هدف الدراسة: تدرس هذه الورقة تأثير جائحة كوفيد-19 على سوق الأوراق المالية الكويتية وأداء الشركات، وذلك ضمن سياق الأسواق الناشئة.

تصميم/ منهجية/ طريقة الدراسة: تحليل التأثيرات المباشرة والمتأخرة لحالات ووفيات كوفيد-19 اليومية على سوق الأوراق المالية. ثم ندرس تأثير الجائحة على أداء الشركات، باستخدام مقياسي Tobin's Q و Altman Z-Score، ونستكشف الأدوار المعدلة لحجم الشركة والصناعة.

عينة الدراسة وبياناتها: تتكون مجموعة البيانات من 952 ملاحظة سنوية من 146 شركة و103,436 ملاحظة يومية لأسعار الأسهم.

نتائج الدراسة: أثرت الجائحة سلباً على أداء سوق الأوراق المالية، مع تأثيرات مباشرة ومتأخرة لحالات ووفيات كوفيد-19. كما شهدت الشركات انخفاضاً في قيمتها السوقية وصحتها المالية، كما يتضح من الانخفاضات في Tobin's Q و Altman Z-Score. في حين شهدت الشركات الكبيرة انخفاضاً أكبر في التقييم السوقي، وواجهت الشركات الصغيرة تحديات متزايدة في الحفاظ على الاستقرار المالي، وتنوع تأثير الجائحة عبر الصناعات. كما أظهرت قطاعات مثل السلع الاستهلاكية والاتصالات مرونة ملحوظة، ربما بسبب استفادتها من التغيرات في الطلب أثناء الجائحة.

أصالة الدراسة: تسهم هذه الدراسة عن طريق تحليل التأثير الكامل للجائحة على سوق ناشئة باستخدام إطار زمني مطول.

حدود الدراسة وتطبيقاتها: تُبرز هذه النتائج التأثير الاقتصادي المعقد للجائحة، مشيرة إلى الحاجة لاستراتيجيات تعافٍ تعالج التجارب المتنوعة لمختلف المناطق والشركات والصناعات.

الكلمات المفتاحية: كوفيد-19، الأداء المالي، مؤشر توبين كيو، الجائحة، درجة Altman Z.

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Introduction

The outbreak of the Coronavirus Disease in 2019 (COVID-19) had devastating effects on the lives of many. The health risks associated with the disease rightfully prompted governing bodies to mitigate those risks by introducing policies that restricted social interaction and mobility. Nonetheless, these policies introduced economic risks that negatively affected individuals and economies alike. COVID-19 and the policies associated with it devastated the world economy and were responsible for negatively affecting stock markets (Boshnak et al., 2021; Iyke, 2020; Liu et al., 2020; Phan & Narayan, 2020; Shen et al., 2020) and firms' financial performance (Boshnak et al., 2021; Fu & Shen, 2020; Qin et al., 2020; Shen et al., 2020).

Although the negative effects of the pandemic on financial performance were consistently reported and proven in the literature, the severity varied across industries and firm characteristics. For example, the negative effect of COVID-19 was relatively reduced for firms with higher sustainability measures (Bose et al., 2022), higher leverage (Xiong et al., 2020), and higher managerial ability (Kumar & Zbib, 2022). It is also worth mentioning that most COVID-19-related literature was conducted on Chinese firms, with a handful that focused on the US market or a specific industry globally.

Another common attribute of the COVID-19 literature was their timeliness. Although this attribute provided timely and thus necessary information with regards to the early stages of the pandemic, the data used in these studies might not have captured the comprehensive impact of COVID-19 on financial and market stability. This can be illustrated by Boshnak et al. (2021), where their study shows the negative effects of COVID-19 on both financial and market measures in Saudi Arabia without any of them being significant in conventional methods. They attribute this result to the fact that they only used data that covered two quarters before and after the pandemic.

Previous literature demonstrates that the financial environment in the Organization of Economic Cooperation and Development (OECD) countries significantly varies to that of non-OECD countries (Allam et al., 2024). Previous studies also show that financial crises affect various regions, industries, and firms differently (Kim et al., 2013). Since most studies in the subject area concentrated on a relatively short period in the Chinese market or a specific industry, we contribute to the literature by examining the financial effects of COVID-19 on firms in Kuwait.

The Kuwaiti market features distinct characteristics relative to the US and Chinese markets. Kuwait is considered a resource-rich country, which enables it to implement substantial fiscal measures such as monetary and liquidity stimulants, increased budgets for ministries, and central bank aid measures (e.g. reduced discount rate and relief of loan payments and interest charges). Moreover, the Kuwaiti market is considered a globally acknowledged emerging market, which established a unique model of corporate and financial governance (AL-Mutairi et al., 2017).

By utilizing a relatively longer timeframe and focusing on the moderating effects of firm-specific characteristics such as size and industry, we test if the same associations exist in a smaller emerging market that underwent different COVID relief measures by capturing delayed and lagged effects of economic recovery patterns and health consequences.

This study was conducted by integrating data from Kuwait Stock Exchange (Boursa) and World Health Organization (WHO) COVID-19 dashboard. The final dataset comprised 952 annual observations across 146 firms and 103,436 daily stock price observations. We first investigate the impact of COVID-19 on the overall stock market performance by analyzing both the immediate and lagged effects of daily COVID-19 cases and deaths on the stock market. Our tests show that COVID cases and deaths have a significant negative impact on stock market return. It is also worth mentioning that the delayed effect of death rates had a significantly stronger negative effect on stock market return.

We then investigate the effect of COVID-19 on firm performance in Kuwait and explore the moderating effect of both firm size and industry on that relationship. This was examined by utilizing Tobin's Q and Altman Z-Score as indicators of market-based firm performance. The results of our tests show a significant negative impact of COVID-19 on firm valuations, as measured by Tobin's Q, and financial health, as measured by Altman Z-Score.

Furthermore, the results of the models imply that while larger firms saw a more significant decline in market valuation, smaller firms encountered relatively higher challenges in maintaining financial stability. It is also worth noting that the models show that the pandemic had a significantly different effect across various sectors.

The next section presents a review of the COVID-19 literature and hypotheses development. It is followed by the methodology section which discusses the

data and models. After that, we show the results and analysis of the descriptive statistics and regression models. Finally, we conclude the paper by summarizing the findings, providing insights for policymakers and related stakeholders, and indicating areas for further research.

Literature Review and Hypotheses Development

The pandemic had a devastating effect on many individuals. Most countries implemented various measures to mitigate the negative effects of COVID-19. These measures caused the economic activity to slow down, and ultimately negatively impacted businesses' profits and growth (Vasileiou, 2021). Moreover, previous studies have asserted that health risks are positively correlated to economic and financial risks due to their effect on investors' risk aversion (Decker & Schmitz, 2016; Vasileiou, 2021). Various studies have confirmed these risks by providing empirical evidence for the negative influence of COVID-19 on financial performance.

Shen et al. (2020) quantified the impact of COVID-19 on firm performance at regional, industry, and firm levels in China and found that the disease reduced corporate revenues, thus negatively influencing firm performance. Størdal et al. (2021) found that COVID-19 had a negative impact on the financial performance of the global forest products industry. Chu et al. (2021) also affirm that COVID-19 had a negative impact on real estate firm returns in China. Nonetheless, they posit that some mitigating factors exist. In their study, they highlight how the geographic scope and diversification of investments in firms mitigated the adverse effects of COVID-19. Cho and Saki (2022) studied the effect of the pandemic on firm performance of the textile and apparel industry in the United States and also found that it had a negative effect. Additionally, they illustrate that the negative impact on the textile and apparel industry was significantly worse than that on the overall market.

Firm performance as a construct is often used to communicate the operational and financial outcome of a company, and thus show its competitiveness, efficiency, and effectiveness in the market (Cho & Saki, 2022; Taouab & Issor, 2019). Indicators for measuring the construct are either sourced from the financial statements of the target firm or from its relative market information. Nonetheless, it is worth noting that market-based indicators are considered relatively more comprehensive and communicate a more holistic view of the company (Cho & Saki, 2022; Lubatkin & Shrieves, 1986).

Due to the evident negative effect of COVID-19 across various regions and

industries, the insignificant result of the study by Boshnak et al. (2021), and the unique characteristics of the Kuwaiti market and economy, we propose the following research hypothesis:

H1: *COVID-19 has a negative impact on stock market performance in Kuwait.*

The literature on COVID-19 demonstrates that various factors moderate the effect of the pandemic, such as the geographic scope, diversification of investments, and industry (Cho & Saki, 2022; Chu et al., 2021). Moreover, Bose et al. (2022) conducted a study on firms from 47 countries to examine the moderating effect of sustainability measures on the COVID and firm value relationship. They prove that COVID has a stronger negative impact on firm value in countries with higher COVID infections. However, their other tests illustrate that the firm value reduction caused by COVID is higher for firms with lower sustainability performance and lower for firms with higher sustainability performance, which is consistent with studies that illustrate the positive effect of sustainability performance on the long-term financial performance of firms (Giannopoulos et al., 2022). Additionally, Xiong et al. (2020) observed how firm-specific characteristics affect the market reaction to firms listed in the Chinese market during the pandemic. They find that firms in vulnerable industries with relatively more fixed assets and more institutional investors were associated with significantly lower abnormal returns during the outbreak. Whereas firms' profitability, growth opportunity, and leverage had positive effects on abnormal returns. Qin et al. (2020) investigated the effect of COVID on the cash holding level of firms in the Chinese market. Their results show that firms increased their cash holding levels during the pandemic to mitigate the systemic risks. Furthermore, they also explored the effect of goodwill on the Covid-cash holding relationship and found that goodwill and goodwill impairment weakened the positive effect of COVID on cash holdings. Finally, Kumar and Zbib (2022) examine whether managerial ability influenced firms' performance during the pandemic. They find that firms with higher managerial ability witnessed a lower decline in stock price, higher abnormal returns, and higher return on equity than firms with lower managerial ability. Thus, it is evident that different firm characteristics such as sustainability performance, type of industry, and cash holding levels moderate the negative effect of COVID-19 on firms' performance.

The effect of any crisis or market shock on heterogeneous sectors is different (Narayan & Sharma, 2011; Shen et al., 2020). Specifically, and as aforemen-

tioned, COVID-19 affected various regions, industries, and firms differently. Since the Kuwaiti emerging market is significantly different than the Chinese and American markets, and since Kuwait's fiscal policies in dealing with the crisis were also different, we propose the following research hypotheses to test whether COVID-19 had the same negative effect on Kuwaiti firms and whether some firm characteristics such as size and industry significantly moderate the effect of the crisis:

H2(a): COVID-19 has a negative impact on firm performance in Kuwait.

H2(b): Firm size significantly moderates the effect of COVID-19 on firm performance in Kuwait.

H2(c): Firm industry significantly moderates the effect of COVID-19 on firm performance in Kuwait.

Research Method

Data Collection

The primary dataset was obtained from the official Kuwait Stock Exchange (Boursa) website¹, and consisted of financial records and performance metrics for 150 firms. To understand the market dynamics during the pandemic, the dataset was supplemented with daily All-Share Total Return (TR) Index data from March 2020 to September 2023. Additionally, to capture the impact of the COVID-19 pandemic, we integrated data from the World Health Organization (WHO) COVID-19 dashboard², which provided daily updates on cases and fatalities in Kuwait. As of the latest update, Kuwait reported a total of 666,501 confirmed COVID-19 cases and 2,570 deaths. This integration of data facilitates a robust analysis of the pandemic's economic impact within Kuwait's emerging market. After cleaning and addressing missing values, our final dataset consisted of 952 annual observations across 146 firms and 103,436 daily stock price observations.

Models

Impact of COVID-19 on Stock Market Performance

Hypothesis 1 investigates the impact of COVID-19 on the overall stock mar-

¹ <https://www.boursakuwait.com.kw/en/participants/participants/listed-companies>

² <https://Covid19.who.int/region/emro/country/kw>

ket performance. Our model assesses the direct and immediate effects of daily new COVID-19 cases and deaths on the stock market, while also considering the lagged effects of these variables. This approach captures the market's potential delayed response to the pandemic. The model is structured as follows:

$$\begin{aligned} TR_{ij} = & \beta_0 + \beta_1 NEW_CASES_{ij} + \beta_2 LAG_NEW_CASES_{ij} + \beta_3 NEW_DEATHS_{ij} \\ & + \beta_4 LAG_NEW_DEATHS_{ij} + \beta_5 BRENT_{ij} + \beta_6 MARKET_{ij} \\ & + \beta_7 CURFEW_{ij} + u_j + \epsilon_{ij} \end{aligned}$$

Impact of COVID-19 on Firm Performance

The primary models for assessing the impact of COVID-19 on firm performance are as follows:

$$\begin{aligned} TOBINSQ_{ij} = & \beta_0 + \beta_1 COVID_{ij} + \beta_2 COVID_TOBINSQ_{ij} + \beta_3 SIZELOGT_{Aij} \\ & + \beta_4 AUDITOPINION_{ij} + \beta_5 ROA_{ij} + \beta_6 LEVERAGE_{ij} \\ & + \beta_7 DEBTEQUITY_{ij} + \beta_8 BIG4_{ij} + \beta_9 CASHFLOW_{ij} + \beta_{10} LOSS_{ij} \\ & + u_j + \epsilon_{ij} \end{aligned}$$

$$\begin{aligned} ZSCORE_{ij} = & \beta_0 + \beta_1 COVID_{ij} + \beta_2 COVID_ZSCORE_{ij} + \beta_3 SIZELOGT_{Aij} \\ & + \beta_4 AUDITOPINION_{ij} + \beta_5 ROA_{ij} + \beta_6 LEVERAGE_{ij} \\ & + \beta_7 DEBTEQUITY_{ij} + \beta_8 BIG4_{ij} + \beta_9 CASHFLOW_{ij} + \beta_{10} LOSS_{ij} \\ & + u_j + \epsilon_{ij} \end{aligned}$$

Study Variables

Our key dependent variable for the first hypothesis is TR Index. TR captures the changing average value of the share prices of all companies on a stock exchange, which is used as a measure of how well a market is performing (Ikechukwu & Alajekwu, 2016; Osisanwo & Atanda, 2012). The primary independent variable is the count of new COVID-19 cases (NEW_CASES) and deaths (NEW_DEATHS). Additionally, we included lagged variables to assess delayed market reactions (LAG_NEW_CASES and LAG_NEW_DEATHS). Additionally, several control variables were included to account for other influential factors: BRENT, to acknowledge the impact of global oil market fluctuations on stock prices (Al-Dahlaki et al., 2021; Lee et al., 2020), CURFEW, the imposition of country wide curfews or lockdowns (Alexakis et al., 2021; Baig et al., 2021), and MARKET, to control for overall market performance (Wu, 2022).

In exploring hypotheses 2(a-c), we utilized Tobin's Q (TOBINSQ) and Altman Z-Score (ZSCORE) as dependent variables and indicators of firm performance. Tobin's Q ratio, as conceptualized by Tobin and Brainard (1968, 1976) and further refined by Tobin (1969, 1978), compares the market value of a firm to the replacement cost of its assets, serving as an indicator for overall firm health. This ratio has been extensively utilized in various financial studies, examining investment decisions, managerial ownership, firm value, and risk (Fu et al., 2016; Jose et al., 1986; Malkiel et al., 1979; McConnell & Servaes, 1990; Morck et al., 1988; Wolfe & Sauaia, 2003). We employed Chung and Pruitt's (1994) simple approximation of Tobin's Q for our calculation:

$$Tobin's\ Q = \frac{MVE + DEBT}{TA}$$

Where:

Market Value of Equity (MVE) is calculated from the firm's share price and outstanding common stock shares.

DEBT is the firm's short-term liabilities and the book value of long-term debt.

TA denotes the total assets' book value.

On the other hand, Altman Z-Score offers an additional perspective by examining the firm's financial stability and health, as established by Altman (1968, 1983) and Biggs et al. (1995). We utilized Altman's (1968, 1983) calculation of Z-Score:

$$ZSCORE = (A \times 3.3) + (B \times 0.99) + (C \times 0.6) + (D \times 1.2) + (E \times 1.4)$$

Where:

A = Earnings Before Interest and Taxes / Total Assets

B = Net Sales / Total Assets

C = Market Value of Equity / Total Liabilities

D = Working Capital / Total Assets

E = Retained Earnings / Total Assets

Several studies have demonstrated the adaptability and effectiveness of Altman's (1968, 1983) Z-Score model across various contexts, including similar emerging markets. Al Zaabi (2011) applied the Z-Score model in UAE Islamic banks, showing that it accurately predicts financial performance and distress with more than

80% reliability. Similarly, Manaseer and Al-Oshaibat (2018) validated the Z-Score model's predictive power in the Jordanian firms, confirming its value for managers, investors, and auditors as a reliable indicator to make informed financial decisions and prevent financial distress. On a broader scale, Altman et al. (2017) demonstrated that the Z-Score model functions effectively across 31 European and three non-European countries, including both manufacturing and non-manufacturing sectors. The study highlights the model's classification accuracy of up to 75%. Collectively, these studies affirm the Z-Score model's utility and reliability, supporting its use for financial distress prediction in diverse economic environments, particularly in Kuwait.

The primary independent variable is "COVID," a binary variable designed to measure the impact of the pandemic on firms. This variable identifies the pandemic period by assigning a value of '1' for the years of the pandemic and '0' for all other years. This categorization allows for a complete analysis of the direct effects of COVID-19 on the performance metrics of firms (Aqabna et al., 2023). Additionally, based on prior literature, several control variables are included (Fu et al., 2016; Rashata, 2021; Shan et al., 2015). These variables include firm size, measured as the natural log of total assets (SIZELOGTA), type of audit opinion issued (AUDITOPINION), firm's Return on Assets (ROA), firm's leverage (LEVERAGE), firm's debt-to-equity ratio (DEBT-EQUITY), whether audited by Big 4 (BIG4), firm's cash flow (CASHFLOW), and whether a firm incurred operating losses (LOSS). The incorporation of these various control variables, as evidenced in prior literature, ensures a thorough examination of the factors influencing firm performance in the context of this unprecedented global event. Table 1 presents a comprehensive list of all variables included in our models.

In examining hypothesis 2a, which focuses on the impact of COVID-19 on firm performance, we introduce an interaction term. This term combines the COVID-19 binary variable with Tobin's Q (COVID_TOBINSQ) to capture the dynamic influence of the pandemic. A similar approach is adopted for the Altman Z-Score, incorporating the interaction term COVID_ZSCORE. These interaction terms aim to identify the moderating effects of firm valuation and health during the pandemic.

For the differential impact of COVID-19 on small and large firms (H2b). We introduce an interaction term between COVID-19 and firm size in our regression models. This allows us to examine if the pandemic's influence varies between

firms of different sizes. To mitigate potential multicollinearity, we centered the variables prior to their inclusion, reducing the correlation between the interaction term and its principal components (Jaccard et al., 1990; Jaccard & Turrisi, 2003).

Finally, the industry-specific impacts of COVID-19 on firm performance (H2c) are assessed by including industry dummy variables in our regression models. Additionally, to address industries with limited observations, we consolidated certain industry categories with close economic and operational similarities.

Table 1
Comprehensive List of Modeled Variables

Hypothesis	Variable Type	Variable Name	Description
H1	Dependent	TR	All-Share Total Return Index
H1	Independent	NEW_CASES	Daily new COVID-19 cases
H1	Independent	NEW_DEATHS	Daily new COVID-19 deaths
H1	Independent	LAG_NEW_CASES	Previous day COVID-19 cases
H1	Independent	LAG_NEW_DEATHS	Previous day COVID-19 deaths
H1	Control	BRENT	Global oil market fluctuations
H1	Control	CURFEW	Country-wide curfews/lockdowns
H1	Control	MARKET	Overall market performance
H2a, H2b, H2c	Dependent	TOBINSQ	Tobin's Q ratio
H2a, H2b, H2c	Dependent	ZSCORE	Altman Z-Score
H2a, H2b, H2c	Independent	COVID	Binary variable for pandemic period
H2a, H2b, H2c	Control	SIZELOGTA	Natural log of total assets
H2a, H2b, H2c	Control	AUDITOPINION	Type of audit opinion issued
H2a, H2b, H2c	Control	ROA	Firm's return on assets
H2a, H2b, H2c	Control	LEVERAGE	Firm's leverage
H2a, H2b, H2c	Control	DEBTEQUITY	Firm's debt-to-equity ratio
H2a, H2b, H2c	Control	BIG4	Whether audited by Big 4
H2a, H2b, H2c	Control	CASHFLOW	Firm's cash flow
H2a, H2b, H2c	Control	LOSS	Whether a firm incurred operating losses

Results and Discussion

Descriptive Statistics

Table 2 and Table 3 provide a summary of the descriptive statistics for firm performance and stock market-related variables, respectively. These results offer important insights into the economic and firm-specific conditions that frame our analysis. The average Tobin's Q is 0.936, with a standard deviation of 0.524, indicating significant heterogeneity across firms, potentially due to industry differences and the varying impacts of COVID-19 on firm performance. The Altman Z-Score, with a mean of 2.265 and a high standard deviation of 5.485, suggests that while some firms maintained strong financial health, others faced significant financial distress, particularly during the COVID-19 period. Firms in highly impacted industries may have struggled to maintain solvency, which could explain the dispersion in Z-Scores. The impact of COVID-19 is captured through the binary variable COVID, with about 44.6% of the observations falling in the pandemic period. Firm size has an average of 4.893, reflecting a broad spectrum of firm sizes in the sample, which is vital for understanding the differential impact of the pandemic.

Furthermore, the presence of Big 4 auditors in 53.1% of cases indicates a substantial representation of high-quality audits in the sample. Other financial health indicators, such as leverage, return on assets, debt-to-equity ratio, cash flow, and operating losses show a range of values, highlighting diversity in financial structures, profitability, and operational efficiency among the firms. Notably, 27.4% of the firms experienced operating losses.

Table 2
Descriptive Statistics for Firm Performance Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
TOBINSQ	952	0.936	0.524	0.084	5.158
ZSCORE	952	2.265	5.485	-5.638	84.271
COVID	952	0.446	0.497	0	1
SIZELOGTA	952	4.893	1.794	0.896	10.518
AUDITOPINION	952	0.173	0.379	0	1
LEVERAGE	952	0.468	0.262	0.002	0.994

Cont. Table 2
Descriptive Statistics for Firm Performance Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	952	0.009	0.097	-0.96	0.446
DEBTEQUITY	952	2.354	7.029	0.002	160.038
BIG4	952	0.531	0.499	0	1
CASHFLOW	952	0.03	0.082	-0.542	0.803
LOSS	952	0.274	0.446	0	1

Table 3
Descriptive Statistics for Stock Market Performance

Variable	Obs	Mean	Std. Dev.	Min	Max
TR	103436	8265.33	1316.765	5134.79	10613.6
NEW CASES	103436	526.823	922.384	0	6913
NEW DEATHS	103436	1.915	3.141	0	20
BRENT	103436	75.028	22.446	19.33	127.98
MARKET	103436	5460.229	751.801	3879.72	6779.78
CURFEW	103436	0.156	0.363	0	1

With respect to the stock market performance variables in Table 3, the TR index and MARKET index average 8265.33 and 5460.23 respectively, indicating that the overall market remained volatile during the period. This volatility may have been further driven by pandemic-specific factors such as the rise in daily new COVID-19 cases and deaths. Overall, these descriptive statistics highlight the variability in firm performance and financial health during the pandemic period, with notable differences across firms due to their size, financial structure, and industry affiliation. These results provide initial insights and emphasize the importance of further analysis.

Table 4 offers insights into mean statistics for various industries, highlighting distinct financial profiles. The banking sector, with the largest average firm size, shows significant leverage, while the technology sector, despite its smaller size, has low leverage but a higher incidence of losses. The healthcare industry is notable for its very high debt-to-equity ratio, suggesting heavy investment funded

through debt. Consumer sectors display moderate sizes and leverage, with consumer staples being slightly more stable.

The energy and healthcare sectors face profitability challenges, as indicated by their negative mean ROA. Financial services appear conservative with lower leverage and fewer losses. Utilities show a healthy ROA despite high leverage, possibly due to stable, regulated income streams. Across the board, differences in size, leverage, profitability, and incidences of losses reflect the unique economic environments of each industry.

Table 4
Mean Statistics for Industry Variables

	(A) FIRMSIZE	(B) AUDITOPINION	(C) LEVERAGE	(D) ROA	(E) DEBT/EQUITY	(F) BIG4	(G) CASHFLOW	(H) LOSS
Banking	8.73	0.00	0.88	0.01	7.54	1.00	0.00	0.01
Basic Materials	4.50	0.39	0.26	0.04	0.47	1.00	0.06	0.17
Consumer Discretionary	4.11	0.24	0.42	0.02	4.02	0.53	0.06	0.25
Consumer Staples	4.80	0.14	0.46	0.01	0.94	1.00	0.05	0.29
Energy	4.20	0.28	0.43	-0.01	1.13	0.55	0.05	0.35
Financial Services	4.58	0.12	0.40	0.00	1.67	0.52	0.01	0.34
Health Care	4.82	0.00	0.86	-0.02	33.88	0.57	0.10	0.25
Industrials	4.77	0.27	0.45	0.03	1.43	0.40	0.06	0.25
Insurance	4.61	0.13	0.54	0.02	1.73	0.71	0.00	0.15
Real Estate	4.53	0.18	0.44	0.00	1.15	0.50	0.02	0.34
Technology	2.66	0.17	0.13	0.00	0.15	0.20	0.01	0.67
Telecomm	6.15	0.25	0.57	0.05	1.48	0.75	0.11	0.04
Utilities	6.21	0.00	0.85	0.03	7.41	1.00	0.09	0.00

Regression Analysis and Hypotheses Testing

In our regression analysis for the various hypotheses, we employed several key diagnostic tests to ascertain the suitability and robustness of our models. These tests included the Hausman test, the Breusch and Pagan Lagrangian multiplier test, the Modified Wald test, and the Variance Inflation Factor (VIF) test. The Hausman test played a key role in determining whether fixed or random effects models were more appropriate, ensuring our estimates were unbiased and well-suited to the data structure. Similarly, the Breusch and Pagan Lagrangian multiplier test confirmed the importance of random effects in models like TOB-INSQ, capturing firm and industry variability. The Modified Wald test confirmed that there was no heteroskedasticity in key models, while VIF analysis showed low multicollinearity, with mean VIF values well below critical thresholds. Results of these tests can be summarized in Table 5.

Table 5
Goodness of Fit Indices

Measure	(Hypothesis 2a)	(Hypothesis 2b)	(Hypothesis 2c)
Hausman	N/A	66.51**	55.87**
Breusch and Pagan Lagrangian Multiplier	199.11**	3.82**	173.69**
Variance Inflation Factor (VIF)	Mean VIF = 1.78	Mean VIF = 1.39	Mean VIF < 2
R^2	0.538	0.518	0.553
F -Test	**	**	**
Chi-Square	**	**	**

Standard errors are in parentheses

** $p < 0.01$

Hypothesis 1 Testing

In testing Hypothesis 1, our initial analysis included lag_new_cases; however, Variance Inflation Factors test (VIF) revealed a high level of multicollinearity (VIF = 49.28). Therefore, this variable was removed from the model which significantly improved the multicollinearity issue, reducing the mean VIF from 17.17 to 3.89. Table 6 presents the findings of Hypothesis 1.

Table 6
Hypothesis 1 Regression Results

TR	Coef.	St.Err.	t-value	p-value	95% Conf. Interval	
NEW_CASES	-0.024	0.002	-10.21	< 0.01	-0.029	-0.02
NEW_DEATHS	-23.787	1.232	-19.30	< 0.01	-26.202	-21.372
LAG_NEW_DEATHS	-33.473	1.244	-26.90	< 0.01	-35.912	-31.034
BRENT	37.268	0.218	170.93	< 0.01	36.841	37.696
MARKET	0.363	0.007	52.32	< 0.01	0.349	0.377
CURFEW	-90.598	7.341	-12.34	< 0.01	-104.986	-76.21
Constant	3620.934	25.53	141.83	< 0.01	3570.895	3670.973
Mean dependent var	8281.740					
R ²	0.816		SD dependent var		1302.952	
F-test	55817.791		p-value		< 0.001	

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Our results show that both the current instances of new COVID-19 cases (NEW_CASES) and deaths (NEW_DEATHS), as well as the lagged instances of deaths (LAG_NEW_DEATHS), demonstrate significant negative correlations with stock market performance (TR). Specifically, recent cases and deaths are negatively linked with stock market performance, as shown by coefficients of -0.024 and -23.787, respectively. This indicates that as the number of new cases and deaths increases, there is an immediate negative impact on stock market returns. Additionally, past death rates, with a coefficient of -33.473, also negatively influence stock market returns. This suggests that the stock market not only reacts to current pandemic conditions but also to the aftermath of past death rates, suggesting a delayed response of the financial markets to the pandemic's severity.

Brent oil prices (BRENT) and the market index (MARKET) are positively correlated with TR. This suggests that stock markets are responsive to broader economic factors like oil prices and overall market trends. On the other hand, curfew or lockdown measures (CURFEW) have had a significant negative effect on stock market performance, with a coefficient of -90.598. This likely reflects the impact of such measures on economic activities, where curfews and lockdowns,

despite being necessary for public safety, can hinder business operations and investor confidence, leading to lower stock market returns.

The statistical strength of our model is confirmed by several key metrics. The high R^2 value of 0.8161 indicates that a significant portion of the variation in stock market performance is explained by our model. The F -statistic of 55817.79, with a very low probability value ($p < 0.001$), along with a meaningful F -test for group differences, underscores the model's overall significance. Additionally, the reduction of the mean VIF to 3.89, after removing LAG_NEW_CASES, addresses any concerns about multicollinearity, thus enhancing the reliability of our findings. Finally, the Modified Wald test results, with a chi-square statistic of 48.87 and a p -value of 1.0000, suggest that heteroskedasticity is not a concern across different stock groups, further strengthening the reliability of our model.

Hypothesis 2 Testing

Table 7 presents a comprehensive view of the results of hypothesis 2, focusing on the economic impact of COVID-19 on firm performance. For Hypothesis 2a, our findings show a considerable negative impact of COVID-19 on the Tobin's Q (TOBINSQ) ratio. The COVID variable has a notable negative coefficient of -0.478 ($p < 0.01$), pointing to reduced firm valuations during the pandemic. Additionally, the interaction term COVID_TOBINSQ has a positive effect (coefficient of 0.578, $p < 0.01$), suggesting that the pandemic's impact on firm valuation varies depending on their Tobin's Q ratio. Moreover, our results reveal a significant negative impact of COVID-19 on firms' financial health, as measured by the Altman Z-Score (ZSCORE). The COVID variable's significantly negative coefficient (-1.602, $p < 0.01$) underscores the pandemic's damaging effect on financial stability. The interaction term COVID_ZSCORE, with a positive coefficient (0.769, $p < 0.01$), indicates that this impact was influenced by the firms' pre-existing financial condition.

In terms of TOBINSQ, other important variables also show significant relationships. The negative coefficient for SIZELOGTA suggests that larger firms suffered more during the pandemic. Conversely, firms with higher leverage (LEVERAGE) and better operational efficiency (ROA) seem to have fared better, as shown by their positive coefficients, which confirms prior literature (Xiong et al., 2020). With the ZSCORE, variables like LEVERAGE and CASHFLOW emerge as significant predictors. Their negative coefficients imply that firms with higher leverage and lower cash flows were at a greater risk of financial distress during the pandemic.

The TOBINSQ model's suitability is confirmed by the Breusch and Pagan Lagrangian multiplier test, which shows significant random effects, supporting our model choice. The model is robust, with a strong R^2 of 0.538 and a significant chi-square statistic. For the ZSCORE model, the Hausman test results (chi-square value of 66.51 and $p < 0.001$) supported the use of the fixed effects (FE) model. Similarly, this model also shows strong validity, demonstrated by an R^2 of 0.518 and a significant F -test statistic. The VIF for both models are below the thresholds of 5, indicating manageable multicollinearity levels, further supported by their mean VIFs being less than 2.

Table 7
Hypothesis 2 Regression Results

	(Hypothesis 2a)		(Hypothesis 2b)		(Hypothesis 2c)	
	TOBINSQ	ZSCORE	TOBINSQ	ZSCORE	TOBINSQ	ZSCORE
COVID	-0.478** (0.042)	-1.602** (0.226)	-0.492** (0.042)	-1.541** (0.225)	-0.48** (0.042)	-1.88** (0.217)
SIZELOGTA	-0.061** (0.017)	-0.475 (0.519)	-0.052** (0.017)	-0.871 (0.529)	-0.064*** (0.017)	-0.015 (0.101)
AUDITOPINION	-0.027 (0.038)	0.466 (0.43)	-0.03 (0.038)	0.473 (0.427)	-0.047 (0.038)	0.373 (0.295)
LEVERAGE	0.428** (0.091)	-6.497** (1.386)	0.423** (0.09)	-5.905** (1.388)	0.444** (0.092)	-4.127** (0.612)
ROA	0.86** (0.181)	1.571 (1.83)	0.86** (0.179)	1.82 (1.819)	0.882*** (0.18)	5.042** (1.565)
DEBTEQUITY	-0.002 (0.002)	0.017 (0.02)	-0.002 (0.002)	0.014 (0.02)	-0.002 (0.002)	0.023 (0.017)
BIG4	0.041 (0.034)	-0.356 (0.451)	0.042 (0.034)	-0.395 (0.448)	0.044 (0.035)	-0.229 (0.235)
CASHFLOW	0.807** (0.158)	-3.205** (1.602)	0.807** (0.156)	-3.349* (1.591)	0.705** (0.159)	-1.524 (1.384)
LOSS	0.007 (0.035)	0.317 (0.343)	0.01 (0.034)	0.3 (0.34)	0.012 (0.035)	0.297 (0.308)

Cont. Table 7
Hypothesis 2 Regression Results

	(Hypothesis 2a)		(Hypothesis 2b)		(Hypothesis 2c)	
	TOBINSQ	ZSCORE	TOBINSQ	ZSCORE	TOBINSQ	ZSCORE
COVID_TOBINSQ	0.578** (0.036)		0.577** (0.036)		0.581** (0.036)	
COVID_ZSCORE		0.769** (0.033)		0.791** (0.033)		0.929** (0.022)
COVID_SIZELOGTA			-0.06** (0.015)	0.484** (0.15)		
_cons	0.941** (0.071)	7.294** (2.266)	0.907** (0.071)	8.854** (2.301)	0.878** (0.079)	3.549** (0.48)
R^2	0.538	0.518	0.545	0.525	0.553	0.762
Chi2	*	**	**	**	**	**
Industry Dummy					YES	YES

Standard errors are in parentheses

** $p < 0.01$, * $p < 0.05$

For H2b, The TOBINSQ model reaffirms the negative impact of COVID-19 on firm valuations, consistent with the findings from Hypothesis 2a. Specifically, the COVID variable shows a significant negative association with Tobin's Q (coefficient of -0.1986, $p < 0.01$). The interaction term COVID_SIZELOGTA interaction reveals a significant and more substantial negative impact on larger firms (coefficient of -0.0599, $p < 0.01$). This pattern suggests that the pandemic exerted a more pronounced effect on the valuations of larger firms, potentially due to their wider exposure to pandemic-induced market and operational disruptions. Similarly, the ZSCORE model echoes the negative implications of the pandemic found in Hypothesis 2a. The COVID variable's significant negative coefficient (-1.5409, $p < 0.01$) indicates a detrimental effect on firms' financial health. The positive coefficient of COVID_SIZELOGTA (0.4844, $p < 0.01$) reveals that smaller firms experienced more significant challenges to their financial stability compared to their larger counterparts. Both models proved to be strong, each with an R^2 of at least 0.5 and significant chi-square statistics, underscoring their reliability. These results collectively underscore that the economic ramifications of the COVID-19

pandemic were not uniformly distributed across firms. While larger firms saw a more significant decline in market valuation, smaller firms encountered heightened challenges in maintaining financial stability.

In addressing our final hypothesis (H2c), we faced two primary challenges: the presence of sparse observations and collinearity issues with certain industries in our model. To enhance the reliability and interpretability of our results, we merged industries that exhibited related economic and operational characteristics. Specifically, the Consumer Discretionary and Consumer Staples sectors, both driven by consumer demand and sharing similar market behaviors, were combined into a single Consumer Industry category. Similarly, the Banking and Financial Services sectors were consolidated into a single industry to reflect their shared financial frameworks and regulatory landscapes. Our approach was further refined when analyzing different models. For the TOBINSQ model, we encountered collinearity issues within the technology and telecommunication sectors. To resolve this, we combined these sectors into a Techcomm category, which allowed us to streamline the model and address the collinearity issues effectively. In contrast, when assessing the ZSCORE model, such collinearity was not detected, enabling us to preserve the distinction between the technology and telecommunication sectors for a more reliable analysis.

Overall, the TOBINSQ model further reaffirmed the pandemic's negative impact on firm valuations, aligning with previous findings. Yet, it uncovered significant industry-specific variations. Notably, the Materials sector, with a positive coefficient of 0.299, may suggest resilience or even growth during the pandemic. This could imply that firms in this sector were less affected by the pandemic's economic disruptions, possibly due to increased demand or successful adaptation strategies. The Consumer sector, with a coefficient of 0.159, and the Techcomm (Telecommunication and Technology) sector, with a coefficient of 0.366, both experienced noticeable pandemic's impacts on their market valuations. These sectors were likely influenced by shifts in consumer behavior and technological demands during the pandemic.

Similarly, the ZSCORE model highlights the pandemic's financial implications across industries. The Consumer sector, with a coefficient of 0.787, and the Insurance sector, with a coefficient of 1.304 show significant negative impacts. These effects could be due to the industries' unique responses to the pandemic's challenges, such as adapting to shifts in consumer demand.

The Telecommunications industry's coefficient of 1.216 could reflect an increased demand for remote operations. The findings from both models collectively underscore that the pandemic's impact was not uniform across all industries. Certain sectors exhibited resilience or even growth in both firm valuation and financial stability, while others faced more pronounced challenges.

The significant negative effect of COVID-19 on stock market returns in our analysis is consistent with Shen et al. (2020), who reported similar declines in firm performance within the Chinese market. Furthermore, our results regarding the moderating role of firm size and industry align with Xiong et al. (2020), who demonstrated how firm-specific characteristics influenced market reactions during the pandemic. Moreover, while Boshnak et al. (2021) reported insignificant results, our extended dataset captures delayed and lagged impacts, offering a more comprehensive and detailed perspective of COVID-19's financial effects. Overall, our findings not only build upon but also extend prior research on the financial impacts of COVID-19, enhancing the reliability of our results and contributing valuable insights to the broader discussion of the pandemic's economic effects.

Conclusion

Our study has provided a detailed examination of the COVID-19 pandemic's extensive impact on an emerging market, shedding light on the significant shifts in firm performance and market landscapes. Consistent with previous literature, our results confirmed the negative impact of new COVID-19 cases and deaths on stock market performance and firm valuation. This was apparent through changes in the Tobin's Q and Altman Z-Score, underscoring how the pandemic's impact varied depending on the pre-existing financial conditions of firms.

The analysis highlighted that larger firms experienced more significant negative impacts on their valuations than smaller firms. In contrast, smaller firms faced more challenges in maintaining their financial stability during the same period. These findings underscore the importance of developing strategies that account for both firm size and local market conditions. For instance, larger firms could strengthen their resilience by diversifying supply chains, refining crisis management practices, and maintaining lower leverage during periods of uncertainty to safeguard their financial positions. Smaller firms, in contrast, could focus on building robust financial networks and securing emergency funding. Across all

firm types, integrating sustainability measures, ESG considerations, and scenario planning can facilitate faster recovery and build long-term resilience.

The investigation into industry-specific variations revealed that the pandemic's effects were not similar across all sectors. Some industries, like Consumer and Techcomm, demonstrated resilience or growth. Consumer industries include essential goods like food, beverages, and household products, all of which have relatively stable demand. Whereas Techcomm industries benefited from the lockdowns and the sudden increase in demand to facilitate remote work and schooling. This aspect of our research emphasizes the uneven spread of the pandemic's economic repercussions across different industries.

These findings illustrate the importance of providing targeted policies by regulators, in oppose to standardized policies for all. The diverse impacts of the pandemic highlight the critical need for well-informed recovery plans and strategies to build resilience against future crises. Moreover, in emerging markets like Kuwait, tailoring policies to local contexts is crucial. Such measures may include subsidized loans for SMEs, targeted fiscal initiatives for key industries, and government and regulatory frameworks designed to maintain market confidence during economic volatility.

While comprehensive, our study focuses primarily on a unique market and a specific period of the pandemic, which may affect the generalizability of the study. Moreover, some industries had limited observations due to the overall size of the Kuwaiti market. Future research could investigate the long-term effects of COVID-19 and post-pandemic recovery patterns for firms and their unique effects on various industries. Furthermore, given that key audit matters and corporate narrative risk disclosure levels also vary across industries (Elmarzouky et al., 2022), it would be interesting to study whether these variations affected their response to the pandemic.

In conclusion, our analysis confirms that the economic impact of COVID-19 is multifaceted, with both firm size and industry playing critical roles in how firms have weathered the pandemic. These insights could prove invaluable for policymakers seeking to devise targeted support mechanisms for firms in the ongoing economic recovery.

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