

The Impact of Coronavirus (COVID-19) on Iraq Stock Market (Industrial Sector): An Event Study

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Abstract:

This research aims to give an overview of the study of events, and study the impact of the Corona virus (COVID19) on the Iraqi stock market. As well as discussing the necessary steps to apply the event methodology, and the study problem was represented by the following question: What is the impact of the covid-19 epidemic on the returns of the industrial sector in the Iraqi stock market, the study was applied to (5) companies from the industrial sector companies for a daily data series for the period from 1-1-2019 to 12-31-2020.

The data of the industrial sector in the Iraqi Stock Market was analyzed by studying the event using (Excel) program, and the results showed that most of the windows of the events that were examined, have negative abnormal cumulative returns (CAR); It was also noted that quite a few companies had positive reviews. Despite the different rates of abnormal return in different windows of events, the highest loss was in the Baghdad Company for Soft Drinks, in addition, Al-Mansour Company for Pharmaceutical Industries recorded the highest profit different and for a certain period of time.

Keywords: Event study, Coronavirus, Estimation time, Iraqi Stock exchange, Event time.

تأثير فيروس كورونا (كوفيد -١٩) على سوق العراق للأوراق المالية (القطاع الصناعي): دراسة حدث

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المستخلص:

يهدف هذا البحث الى القاء نظرة عامة عن دراسة الأحداث ودراسة تأثير فيروس كورونا (COVID19) على سوق العراق للأوراق المالية. فضلا عن مناقشة الخطوات اللازمة لتطبيق

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منهجية الحدث، وتمثلت مشكلة الدراسة بالتساؤل الاتي: ما تأثير وباء covid-19 على عوائد القطاع الصناعي في سوق العراق للأوراق المالية، طبقت الدراسة على (٥) شركات من شركات القطاع الصناعي لسلسة بيانات يومية للمدة من 1-1-2019 حتى 31-2020-12.

وتم تحليل بيانات القطاع الصناعي في سوق العراق للأوراق المالية من خلال دراسة الحدث باستخدام برنامج (Excel) واظهرت النتائج ان معظم نوافذ الأحداث التي تم فحصها، لديها عوائد تراكمية غير طبيعية سلبية (CAR)؛ كما لوحظ أن عدداً قليلاً من الشركات لديها تقييمات إيجابية. على الرغم من اختلاف معدلات العائد غير الطبيعي باختلاف نوافذ الأحداث، إلا أن أعلى خسارة كانت في شركة بغداد للمشروبات الغازية، فضلا عن ذلك سجلت شركة المنصور للصناعات الدوائية أعلى ربح، وتوصي الدراسة بتشجيع الباحثين على اجراء الدراسات الخاصة بدراسة العائد غير الطبيعي باختلاف نوافذ الأحداث، إلا أن أعلى المارة كانت في شركة بغداد للمشروبات الغازية، فضلا عن ذلك سجلت شركة المنصور الصناعات الدوائية أعلى ربح، وتوصي الدراسة بتشجيع الباحثين على اجراء الدراسات الخاصة بدراسة الحدث واختبارها بمتغيرات متعددة وتطبيقها على عينات مختلفة ولمدة زمنية معينة. وقت الحلمت الكلمات المقتاحية: دراسة الحدث، فيروس كورونا، تقدير الوقت، سوق العراق للأوراق المالية، وقت الحدث.

Introduction:

The world witnessed the beginning of the year 2020 the worst health crises in history, which was considered by the World Health Organization as a pandemic, which is a large spread of the coronavirus, or the Coronavirus Covid-19, which was discovered in December 2019 in the Chinese city of Wuhan and was classified as a pandemic by the World Health Organization on 11 March 2020, it has led most countries of the world to take global quarantine measures, by restricting air, land and sea transport, and forcing millions of people to stay in their homes. Quarantine measures in major countries led to the suspension of many sectors, the most important of which was the industrial sector, tourism and transportation, which led to a decrease in demand for oil, which witnessed the first time in its history negative prices in US crude futures contracts, and then the International Monetary Fund announced the entry The world is in a great recession, the decline in global economic growth, and high unemployment rates. All this led to sharp declines in global financial markets, which witnessed record declines. In a matter of minutes and hours, global stock exchanges lost billions of US dollars. Europe is the epicenter of the second pandemic after China, as it recorded hundreds of thousands of injuries and thousands of deaths, and financial markets were not the best condition from the Asian or American markets has also witnessed violent shocks and sharp decreases. The damage caused by the Coronavirus did not exclude a country from the countries of the world. The disease has spread to most countries of the world, but in different proportions in terms of the number

of infections or in terms of the number of deaths, as well as The rate of recovery from it, and Iraq was not immune to the damages of this virus, and the economic collapse was one of the most prominent repercussions of the epidemic on the world and on Iraq in particular, and in particular the issue of the collapse of oil prices, and Iraq is in this side the most affected because it has no alternative plans to supplement the general budget except for oil Which represents about 95% of its total budget, but this does not mean that the repercussions of this epidemic only included the economy, as it included all aspects of political, social, cultural, and even psychological life. The article is composed as follows. The repercussions of the Coronavirus on the economic level in Iraq is introduced in Section 2. Research Methodology is presented in Section 3. Methodology of the Event Study is discussed in Section 4. The main steps for studying the event are discussed in Section 5. A real example is given in Section 6. The results and discussion are discussed in Section^{\vee}, and finally, the conclusions are given in Section 8.

The repercussions of the Coronavirus on the economic level in Iraq: The Iraqi economy has been affected by the repercussions of Corona, just as the global economy is due to the stoppage of most factories, preventing movement and restricting them in order to reduce injuries and not transmit infection, and the most prominent economic repercussions are the decline in global oil prices, and the impact of this was the most severe on Iraq, which depends on its financial budget up to 95% on the money it earns from selling oil.

With the sudden drop in oil, as the price of a barrel reached about 11 dollars, Iraq today is facing a severe crisis that may threaten the economy as a whole, and the reason is that Iraq did not develop an alternative plan for such events, in addition to not activating other resources such as agriculture, industry and trade, so we find that Iraq The most affected in comparison to other oil-producing countries (the Gulf states, for example, but not limited to have multiple economic activities such as agriculture, industry, trade and multiple investments on the one hand, and on the other hand they have alternatives other than oil, for example Qatar depends on gas, and some are trying to develop investment in the sulfur issue.

It can be said that the direct impact of the Corona virus was on the economy, which represents the backbone of life, but its indirect effects are many and multiple, perhaps the most prominent of which are the political effects due to the latter's interference in the overall affairs of life in addition to the economic and political repercussions there are repercussions Another, on the cultural and psychological level, is represented in the unknown future of this virus. No one knows or can predict the future of this virus, how it will end and when? which made the Iraqi government embarrassed with regard to a number of issues, especially the issue of school and university attendance.

It is expected that the economic performance will be affected by developments related to global oil prices and the quantities of its domestic production, as well as by proceeding with the implementation of a number of structural reforms within the framework of the Stand By Agreement that the International Monetary Fund concluded with Iraq to support the government's reform program.

The main priorities of the government are to support the growth of the oil and gas sector by liquidating arrears due to international oil companies, attracting foreign investments and increasing public spending on reconstruction projects, in addition to improving public services and creating job opportunities.

Research Methodology:

- **1. The problem of the Study:** The problem of the study was represented by the main question, does covid-19 affect the returns of the industrial sector companies in the Iraqi stock market.
- **2. Objective of the Study:** The objective of the study is to verify how the industrial sector companies in the Iraqi stock market interact with the global event covid-19.
- **3. The hypothesis of the Study:** There is a causal relationship between the study of the event and the unusual returns of the study sample companies.
- **4. Population and Sample of the Study:** The study community is represented in the Iraqi Stock Exchange, and the study sample was represented in (5) companies from the industrial sector that recorded trading during the study period. It included daily series views of the closing price of its shares, as it adopted (1668) daily views, and the rest of the companies were excluded because they did not record a time series For trades during the search period.
- **5.** Time limits: 1/1/2019-31/12/2020.

Methodology of the Event Study: When designing a study of the financial or economic event, the length of the event period and the availability of the necessary data will be taken into consideration when determining the returns of the time period, as most recent studies used daily data, but previously the monthly data were adopted. But the use of monthly data makes the issue of measuring the impact of the informational content of the event on prices very difficult because there are many surprises in the month in addition to the impact of the advertisement of interest and study. Hence, to gauge market efficiency, it is important to measure the impact of advertising using the shortest possible lead time (Kumar et al, 2012: 142).

The development and expansion of various modern approaches and methods for measuring extraordinary returns in order to determine the effects of different events on prices depends on the availability of trading data. Which became easier and faster to obtain today due to the availability and richness of databases, so we see today that the databases contain all transactions, trades and price bulletins with details about their timing, prices, volumes, etc., and thus, it became possible to apply more professional methods (Bohn, et al., 2012).

The main steps for studying the event: To reach the extent of the reflection of the study of the event on the performance of companies and the returns of their shares, and in order to calculate the extraordinary returns related to the date of the announcement of share buy-back programs, the following steps can be used (Cremers, 2012: 17); (Chen, 2013: 17-19); (Isa, et.al, 2011:36-37); (Gunalpa et al., 2011: 15-16):

1. The First Step: Determining the duration of the event and the duration of the estimate: The first is called the event window, and it is the period that revolves around the event before and after it. There is no ideal event period, but there is an event period suitable for the company's circumstances (Nguyen, 2011: 7), which consists of the date of announcement To repurchase (day) 0 and the days that center before and after the announcement, and the second period is the estimation window, which is the period that precedes the day of the announcement and is specified by the negative sign, while the days following the day of the announcement have a positive sign. What is (30) days, as it consists of (15-days) (before the accident and + 14) days (after the accident in addition to the day of the event.) The evaluation window consists of 75 calendar days (90-to-16) before the event and this period is usually It is clean, that is, free from any

event, as we assume that there were no relevant factors that would affect the target event (Chen, 2013: 16-17) and the Figure 1 shows the timeline of the study of the event (Seifert & Stehle, 2003, 10).



Figure (1): the event window, the T0-T1 segment is the estimation window, the T1-T2 segment is the event window and the T2-T3 segment is the postevent window (He et al., 2020: 2203).

2. The Second Step: Finding the daily returns: In the study of the event, daily returns can be found from the data obtained from the database of companies traded in the financial markets, such as the closing price of shares. From these methods, the daily return of i share on day t can be calculated through the difference between the logarithms of the closing prices of the shares of company i for day t and day (t-1) using the following formula; (Gupta et al., 2014: 8); (Chen, 2007: 244) (Brown & Reilly, 2009: 347). $iR_t = Ln (iP_t) - Ln(iP_{t-1}) \dots (1)$

Since:

 iR_t : is the daily dividend (i) on day (t).

 iP_t : is the closing price for stock (i) on day (t).

 iP_{t-1} : is the closing price of the share (i) on the day (1-t).

3. The Third Step: Calculating the daily return of the market index: The market return can also be found from the data obtained from the database of companies traded in the financial markets, such as closing the market value index (Closing Value of Market) Index. The market index can be used as a measure of the market return. The same previous method can be calculated as follows (Chen, 2013: 17); (Wada, 2010: 21):

 $R_{m,t} = Ln \left(P_{m,t} \right) - Ln \left(P_{m,t-1} \right) \dots (2)$

Since:

 $R_{m,t}$: The closing price of the market index on the day (t)

 $P_{m,t}$: The closing price of the market index on the day (t-1)

 $P_{m,t-1}$: Market return

4. The Fourth Step: Measuring the linear relationship between the return on the stock and the market: the linear relationship between the return on the stock and the market return can be measured, which is used throughout the

period of the assessment window of (75) days to calculate the beta coefficient (β_i), so the (beta) estimates are important because they will give expected returns. During the duration of the event. For example, the pricing model can be used to find the expected returns, as it can be used to estimate prices during the period of the estimation window in a reasonable manner, as the beta represents the slope (which measures the relationship between the market return and the stock return (Axelsson & Brissman, 2011: 18); (Al-Kuwari, 2009: 44).

5. The Fivth Step: Calculating the expected return: The expected return of the security can be calculated using the Capital Asset Pricing Model (CAPM) (Cremers, 2012: presented by (Sharp, 1964: 425-442), which is used to estimate the cost of financing owned by institutions whose shares are traded in Stocks, as this model defines the relationship between market risk measured in beta and the returns required by shareholders (Harms, 2000: 66), by combining the risk-free return (interest rate) with the risk premium for stocks that reflects the market risk that is not diversified (Koch & MacDonald, 2010: 431), and this model expresses the yield of a particular security as a function of the market return, and is calculated as follows (Nossa et al., 2010: 11).

 $\hat{R}_{it} = rf + \beta_i (R_m - rf) \quad \dots (3)$

Since:

rf: The risk-free rate.

 β_i : beta measures the relationship between market return and stock return.

 $(R_m - rf)$: Risk Premium.

6. The Sixth Step: Calculating the Extraordinary Returns: The standard event methodology is used to estimate the extraordinary daily returns.

As the extraordinary return can be calculated by subtracting the expected return from the actual (realized) return, according to the following equation: $AR_{it} = R_{it} - \overline{R}_{it}$...(4)

Since:

 \hat{R}_{it} : The expected return per share i on day t computed from the asset pricing model capitalism.

 AR_{it} : The daily extraordinary return of i stock on day t.

7. Step seven: Calculating the accumulated extraordinary returns: The extraordinary return accumulated throughout the event window t is calculated from the sum of the daily extraordinary return (the daily

extraordinary returns are aggregated to form the accumulated extraordinary returns) and in the following equation (Kim & Kim, 2012: 20) (Micheloud, 2013: 13).

$$CAR = \sum_{t=t1}^{t^2} AR_{it} \quad \dots (5)$$

whereas:

CAR: The accumulated extraordinary daily return on the event window.

- t: The length of the event window.
- **8. The Eighth Step:** Calculating the average of the accumulated extraordinary returns: The average of the accumulated extraordinary returns is calculated by dividing the sum of the accumulated extraordinary returns by the number of advertisements according to the following equation (Cremers, 2012: 19):

$$CAAR = \frac{1}{N} \sum_{t=t1}^{t2} CAR \dots (6)$$

As:

CAAR: The accumulated daily abnormal average return.

N: The number of events.

It is clear from the above steps of studying the event that whenever the accumulated average abnormal return is positive, an indication of the existence of positive changes as a result of the market response to the announcement of the repurchase (event), and the opposite occurs if the accumulated average abnormal return is negative, indicating the presence of negative changes that have occurred in the price. The stock is the result of the negative market response to the event, but if the accumulated average extraordinary return is equal to zero, it is an indication that the event does not affect the share price, and this means the market response to this announcement is exhausted, because there is no new information content that is reflected in the share price.

Finally, it can be said that the ultimate goal of studying the event is to come up with experimental results that provide a clear view of how the event will affect stock prices. The stock market responds to event information because it anticipates a change in the value of the company. Accordingly, the important issue is whether the company's performance changes after the event. Thus, supplementary analysis to study the event can test future performance to determine whether the financial market response to the event of interest is appropriate or not in terms of the event's impact.

Description of data: The Iraq Stock Exchange was relied upon by choosing the industrial sector using daily data for the closing price of the Iraq Stock Exchange Index for the period from (1-1-2019) to (12-31-2020), and data were obtained for (Five) companies in which they are available data in that period is shown in the table below.

No.	Company Name	No. Observations
1	Metal and Bicycles industries Company.	262
2	Al-Kindy Company for the Production of	278
	Veterinary Vaccines.	278
3	Al-Mansour Company for Pharmaceutical	254
	Industries.	554
4	National Company for Chemical and Plastic	275
	Industries.	575
5	Baghdad Company for Soft Drinks.	399

Table (1): details of the companies affiliated with the Industrial sector and the number of observations for each of them

Results and Discussion: In this part, the objective is to discuss results of a data to reveal the empirical performance of the industrial companies (Metal and Bicycles Industries Company, Al-Kindy Company for the Production of Veterinary Vaccines, Al-Mansour Company for Pharmaceutical Industries, National Company for Chemical and Plastic Industries, Baghdad Company for Soft Drinks).

Table (2): The Descriptive Analysis of the Industrial Sector Companies

No.	Company Name	Mean	SD	MAX	MIN
1	Metal and Bicycles Industries Company	2.2355	0.51529	3.51	1.40
2	Al-Kindy Company for the Production of Veterinary Vaccines	1.5149	0.12878	2.05	1.25
3	Al-Mansour Company for Pharmaceutical Industries	1.0042	0.27558	1.50	0.62

No.	Company Name	Mean	SD	MAX	MIN
4	National Company for Chemical and Plastic Industries	1.4269	0.70921	2.92	0.62
5	Baghdad Company for Soft Drinks	3.1347	0.34475	4.15	1.91

Through the above table, which represents the statistical description of the study data for the industrial sector companies that were selected and in which data are available for the period from 1-1-2019 until 31-12-2020.

The highest standard deviation value was (0.70921) belonging to the National Company for Chemical and Plastic Industries, while the arithmetic mean values were positive, confined between (1.0042, 3.1347), and the table shows the lowest value (0.62) which is for the Al-Mansour Company for Pharmaceutical Industries, National Company for Chemical, and Plastic Industries, while the highest value was affiliated with a Baghdad Company for Soft Drinks, and their value (4.15).

Table (3) below represents the date of event (COVID-19). This disease was discovered in December 2019 in China (Wuhan city), and was classified as a pandemic by the World Health Organization on 11 March 2020. However, the date of event fixed on 11-3-2020 for all companies in the industrial sector.

No.	Company Name	Date of Event
1	Metal and Bicycles Industries Company.	11/03/2020
2	Al-Kindy Company for the Production of	11/03/2020
	Veterinary Vaccines.	11/03/2020
3	Al-Mansour Company for Pharmaceutical	11/03/2020
	Industries.	11/03/2020
4	National Company for Chemical and Plastic	11/03/2020
	Industries.	11/03/2020
5	Baghdad Company for Soft Drinks.	11/03/2020

Table (3): represents the date of the event for the companies under study

event time	Metal and Bicycles Industries Company	Al-Kindy Company for the Production of Veterinary Vaccines	Al-Mansour Company for Pharmaceutic al Industries	National Company for Chemical and Plastic Industries	Baghdad Company for Soft Drinks	CAAR
-10	-0.00134	-0.03163	0.06/683	0.05962	-0.00431	0.00826
-9	-0.00268	-0.01610	0.15846	0.15470	0.09138	0.04170
-8	-0.00402	0.03582	0.24841	0.25257	0.18654	0.07460
-7	-0.00535	0.09836	0.19937	0.20272	0.13248	0.07450
-6	-0.00669	0.05680	0.15253	0.15522	0.08077	0.04954
-5	-0.04374	0.01045	0.10771	0.10986	0.02691	0.02558
-4	-0.04508	0.01238	0.05675	0.06131	-0.02461	0.02009
-3	-0.04642	0.01430	0.02352	-0.00885	-0.05809	0.00173
-2	0.00093	-0.02982	-0.01620	-0.00901	-0.08281	-0.00528
-1	0.09836	-0.04088	-0.03243	-0.09593	-0.10712	-0.00722
0	-0.10432	-0.06427	-0.04097	-0.10064	-0.09102	-0.02786
1	-0.27976	-0.07485	-0.07134	-0.10080	-0.12695	-0.05656
2	-0.48980	-0.09133	-0.13438	-0.15269	-0.16562	-0.11391
3	-0.65280	-0.09550	-0.14895	-0.18214	-0.17373	-0.15375
4	-0.83787	-0.08123	-0.11470	-0.18647	-0.17038	-0.16522
5	-1.01739	-0.06680	-0.04799	-0.11520	-0.18979	-0.15093
6	-0.99036	-0.06488	-0.00171	-0.08784	-0.17487	-0.13810
7	-1.01592	-0.05666	0.01332	-0.03486	-0.17918	-0.12807
8	-1.02071	-0.08523	0.02862	-0.03502	-0.21334	-0.14453
9	-1.01859	-0.05830	0.04419	0.06005	-0.20633	-0.12139
10	-1.00589	-0.05638	0.04322	0.02418	-0.22551	-0.11315

 Table (4): Represents the Event Time for the Companies under Study

The results showed that most of the windows of events that were examined on various companies in the industrial sector in the Iraqi stock market for the period from 1-1-2019 to 31-12-2020, where most of the companies recorded a negative extraordinary rate of return (CAAR) and the main reason is due to the spread of The (COVID-19) pandemic and the increase in infections among citizens throughout Iraq, in addition to the measures taken by the crisis cell in the Iraqi government to impose a comprehensive curfew throughout Iraq, which led to the suspension of work in industrial companies, which led to the disruption of the workforce in Those companies, in turn, led to these negative results in addition to the fact that the citizen in this period (the consumer) became more rational and rational in consumption, as the citizen's consumption focused on food products and health and preventive supplies in that period.

On the other hand, many companies have maintained their stability in the face of the epidemic and formed strong immunity, as they recorded desired results in the cumulative extraordinary return rate (CAAR) in that period, such as the food, pharmaceutical and preventive industries.

The highest lost is found in Baghdad Company for Soft Drinks, the highest profit is found in Al-Mansour Company for Pharmaceutical Industries.





Figure (1) represents the cumulative abnormal return (CAR) for selected companies in industrial sector in Iraqi stock exchange. The values are unstable because of the effects of Covid-19 on this sector. Also, it shown the positive and negative values of that companies during (CAR) values.

Figure (2) represents the integrated drawing of cumulative abnormal return (CAR) for all companies with positive and negative values and with different colors.

In addition to the results of abnormal returns, through the study of the event, it was proven that abnormal returns appeared in varying proportions for all companies and as shown in Appendix.



Figure (2): Plots of Cumulative Abnormal Return (CAR) for all Companies



Figure (3): Plots of Cumulative Abnormal Return (CAR) for all Companies

Figure (3) trepresents the plot of cumulative average abnormal return (CAAR), which represents the average of (CAR). In this figure, the negative values are more than positive values in most of the companies because of the effect of covid-19 on the industrial sector.

Conclusions and Recommendations: This study examines the impact of the COVID-19 outbreak, which originates in China and spreads to the World, on the financial markets of Iraq. The event study method is used and the day of the event is considered as of March 11, 2020, the day on which the pandemic is declared by WHO. The industrial sector in the Iraqi stock exchange is examined. By comparing the company's cumulative average abnormal returns, it is aimed to reveal which company the pandemic affects more.

The effect of the event was clear on the results of the study through the negative values that appeared in the results of CAR and CAAR.

In different periods, the results vary by sector. Pandemics, on the other hand, appear to have the most negative impact on industrial sector indexes. COVID-19 is an epidemic for which no vaccine has been created, no permanent therapeutic options have been established, and the disease continues to have a severe influence on humanity. As a result, uncertainty about the future has an impact on cash flow projections in several industries, particularly in the luxury sector.

Each sector is an important part of the real and financial sectors. The revival of the investors' demand in the face of the developments experienced depends on the creation of an environment of confidence. Although it is not known when the process will be terminated, if the perception that all safety importance is taken most strictly and that human health will always be a priority, the disrupted cash flows will be revived. This will encourage investors to invest in these sectors again.

Conclusions:

- 1. The study of the financial event focuses on the unusual returns of company stock prices, and this centers on the date of the announcement of the financial event. Baghdad Soft Drinks Company recorded the highest loss, in addition to that, Al-Mansour Pharmaceutical Industries recorded the highest profit.
- 2. The results indicate that most of the companies of the Iraq Stock Exchange were negatively affected during the epidemic period, which was reflected

in the unusual returns compared to the period preceding the outbreak of the epidemic. The reason is due to:

- A.Reducing the economic activities caused by the epidemic.
- B.As well as political responses such as social distancing, quarantine and temporary market closure.

While some stocks witnessed positive returns due to the event, such as some companies in the commercial sector, especially health products and services companies.

C. The program (Excel) was used to calculate the results of the event study.

Recommendations:

- 1. It is expected that the methodology of studying the financial and economic event will continue to be a valuable tool widely used in economics and finance.
- 2. The study recommends the importance of human safety and that it should be among the priorities, in addition to that it urged the rationality of the individual and the restriction of consumption to meet basic needs, and that investors should be more confident and solid to face crises.

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