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Measuring the Relationship between Market Value Disclosure, COVID-19 Outbreak, and Profitability in Egyptian Listed Companies

Dalia Adel Abbass Elsayed Nasser
Assistant Professor – Accounting

Tarek Abdelazeem Youssef Alrashedy
Assistant Professor – Accounting

Faculty of Commerce - Damietta University

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Abstract:

The main objective of the paper is to measure the relationship between the market value disclosure of Egyptian Listed Companies, COVID-19 outbreak, and profitability. Multiple linear regressions, paired sample t-test, cross tabulations analysis and chi-square test are used to measure such a relationship, to analyze the effect of industry type on profitability and market value and to test for the significance of differences of market values and profitability before (for the period ended December 31, 2019) and after COVID-19 outbreak (for the period ended March 31, 2020). Results show that the market value and profitability of Egyptian Listed Companies before COVID19 outbreak differs significantly from the market value and profitability after COVID19 outbreak. Results also show that industry type has a significant impact on the market value and profitability of Egyptian Listed Companies. Detailed analysis for every sector in the Egyptian stock Market shows that there is a negative relationship between market value of all Egyptian listed companies and COVID-19 outbreak. Results also show that there is a positive relationship between market value disclosure of Egyptian Listed Companies and profitability except for Trades and Distributions sector and Paper and Packaging Sector. These results have important implications for investors, practitioners and company management on how to stabilize performance during pandemic disease outbreaks by having fixed diversified portfolio of high-quality stocks and fixed-income investments.

Keywords: COVID-19 Outbreak; Market value disclosure; Profitability; Egyptian Listed Companies.

1. Introduction

Pandemic diseases outbreaks effects are unusual, unpredicted and represent hidden risks that have severe and varying effects on the performance of different sectors of any economy. There are winners and there are losers depending on the case. Analyzing the effects of pandemic diseases outbreaks on different industries is important for practitioners and capital providers to help them make informed decisions within the light of firm characteristics that help mitigate the unexpected effects. The Egyptian Stock Exchange (EGX)[1] started the trading session on Sunday, 15th of March, 2020 with a collective retreat of all indicators, affected by the decline in global financial markets, as a result of fears of the spread of the Corona virus (COVID-19), and the market capital fell by 23 billion pounds after 15 minutes of the start of the trading session. Its main indices, "EGX30" index[2] Year to Date Change (YTD)% decreased by 30.02%, EGX50 index YTD% decreased by 34.82 %, and the EGX 30 index of the overall return[3] YTD% decreased by 30.01%, EGX70 index YTD% decreased by 28.65%, EGX100 index YTD% decreased by 28.33%, EGX 30 Crapped index YTD% decreased by 32.66%, S&P/EGX ESG index YTD% decreased by 32.79%. The only increase was for the Nile index which includes small and medium sized Egyptian Listed Companies as its YTD % increased by 22.77%.

For the performance of the stock market indices for the last three months from December 26 when COVID-19 spread started till March 24 when the most recent available data is reported, all EGX indices fell from about 30% to 34% for the last three months except for Nile Index. This period coincides with the emergence of COVID-19 in China and then the spread all over the

[1] EGX has 7 main indices which are EGX30, EGX50 EWI, EGX70 EWI, EGX100, Nile Index of small and medium sized companies, S&P/EGX ESG, EGX30 Capped, EGX30 TR

[2] The EGX 30 Index is the main EGX index. It is a free-float capitalization weighted index of the 30 most highly capitalized and liquid stocks traded on the Egyptian Exchange. EGX 30 constituents are reviewed and changed twice a year (end of January and end of July). The index was developed with a base level of 1000 as of January 1st 1998 and previously named CASE 30 Index.

[3] EGX 30 TR Index measures the total return on the underlying index, combining both capital performance and reinvested income using declared dividends. The index calculation depends on last price instead of the closing price. It is adjusted by the value of ordinary cash dividends allocated to the company.

world. So, this research aims at answering this question "what are the Egyptian stock market reactions to COVID-19 outbreak? More specifically, what is the effect of COVID-19 outbreak on the market value disclosure and profitability of Egyptian Listed Companies? What is the effect of industry type on market value of Egyptian Listed Companies after COVID-19 outbreak? Profitability and market value disclosures of Egyptian Listed Companies are analyzed for the period ended December 31, 2019 before COVID-19 outbreak - when the first positive case of COVID-19 is reported by China – compared with results for the period ended March 31, 2020 -the most recent data available when preparing the research- after COVID-19 outbreak.

Big accounting firms (KPMG, EY, PWC) , and the CPA Hong Kong Institute of Certified Public Accountants issued reports in 2020 about the implications of coronavirus COVID19 outbreak from a financial instruments accounting perspective and how COVID-19 outbreak may affect the measurement of expected credit losses (ECLs) as per the requirements of IFRS9 and related disclosures as per IFRS7. This is in addition to the accounting and financial reporting impacts, going concern, and subsequent events. Literature examined the effects of disease outbreaks on stock markets and stock market reactions (Ramelli, 2020; Kim et al., 2020; Loharikar et al., 2012; Fox & Peterson, 2002; Chen et al.,2007; Jin, 2008; Nippani et al., 2004; Pendell et al., 2013). This paper extends this line of research as it aims at measuring the relationship between the market value disclosure of Egyptian Listed Companies, COVID-19 outbreak, and profitability of these companies. Profitability is a firm characteristic used as a control variable in the measuring such a relationship. Paired sample T test, cross tabulations analysis and chi-square test are used to measure the significance of differences between market values and profitability of Egyptian Listed companies before (for the period ended December 31, 2019) and after COVID-19 outbreak (for the period ended March 31, 2020). Results show that the market value and profitability of Egyptian Listed Companies before COVID19 outbreak differs significantly from the market value and profitability after COVID19 outbreak. Simple linear regression is used to analyze the effect of industry type on profitability and market value. Results show that industry type has a significant impact on the market value and profitability of Egyptian Listed Companies. Moreover, detailed analysis of the relationship between the market value of Egyptian Listed Companies, COVID-19 outbreak, and profitability is measured using multiple linear

regressions for every sector in the Egyptian Stock Exchange (EGX). There are 16 sectors in the Egyptian Stock Market. The Utilities sector includes one company only which is Misr Gas Company. So, this sector is merged with the Energy and Support Services. Results show that all sectors are affected negatively by COVID-19 outbreak even the health care and pharmaceutical sector and the Information Technology, Media, and Communications Sector. Results also show that there is a positive relationship between the market value disclosure of Egyptian Listed Companies and profitability for all sectors except for Trade & Distributors and Paper and Packaging Sector.

The remainder of this paper proceeds as follows. Section two discusses literature review and concludes with hypotheses development. Section three discusses the empirical study, results and recommendations.

2. Literature Review and Hypotheses Development

A line of research analyzed the eff ects of infectious pandemic disease outbreaks on different industries and stock market reactions (Ramelli et al., 2020, Kim et al., 2020; Albulescu, 2020; Bouey, 2020; Fox & Peterson, 2002; Pendell et al., 2013; Loharikar et al., 2012; Nippani et al., 2004). Ramelli et al., (2020) analyzed stock price effects to COVID-19 outbreak in the US and China for the period December 31 till March 6. Cumulative returns for all industries are analyzed for both US and China for the period from January 2 to February 27. In US, cumulative Capital Assets Pricing Model (CAPM) adjusted returns for the Utilities, Telecom Services, Health Care, Diversified Financials and Real State were the highest while Energy, Transportation, Automobiles, and retailing were the lowest during this period. In China, Telecom, Semiconductors, Health Care, Software and Services were the highest CAPM adjusted returns while Insurance, Diversified Financials, Energy, Banks, and transportation were the lowest. They suggested that investors were concerned about corporate debt and so is an important firm characteristic for investors during this period. This implies that some firm characteristics are important in analyzing the stock market reactions during pandemic outbreaks. In the same line of research, Albulescu (2020) investigated the impact of COVID-19 outbreak on crude oil prices, while controlling for the impact of financial volatility and the United States (US) economic policy uncertainty. The Autoregressive Distributed Lag (ARDL) estimation approach of the study confirmed the COVID-19 daily reported cases of new infections marginal negative impact on the crude oil prices in the long run. Nevertheless, by amplifying the financial markets volatility, he found that COVID-19 also had an indirect effect on the recent

dynamics of crude oil prices. The effects extended to commodity prices and so the amplitude of the economic contraction is correlated with the coronavirus persistence.

Similarly, and other than COVID-19 outbreak, a line of literature analyzed the impact of other infectious diseases outbreak on different industries. kim et al., (2020) analyzed the influence of infectious pandemic disease outbreaks on financial performance focusing on the restaurant industry in the US during 2004–2016. Event study method was used to estimate the eff ect of three firm characteristics which are brand reliability, advertising eff ects, and service types on firms' value. The study confirmed the negative influence of pandemic disease outbreaks (Avian flu, Swine flu, ovine spongiform encephalopathy, and Salmonella Infantis) on the restaurant industry, and identified all the three firm characteristics analyzed on the study as risk mitigating factors during diff erent food-related pandemic disease outbreaks in the restaurant industry. The market model and the Fama-French three-factor model were employed to estimate accumulated return and cumulative accumulated returns of restaurant firms aff ected by these four pandemic diseases outbreaks. Similarly, Pendell et al., (2013) examined the market reactions of Korean agribusiness companies following five foot-and-mouth disease (FMD) outbreaks using an event study analysis. Using abnormal and cumulative returns, results suggested that the FMD outbreaks caused the stock market to react both negatively and positively to allied companies. The results suggested that the market reactions were more gradual than instantaneous to the FMD outbreaks and increased the volatility of the daily returns of smaller companies. In the same vein, Nippani et al., (2004) examined the impact of SARS on the stock markets of Canada, China, Hong Kong Special Administrative Region of China, Indonesia, the Philippines, Singapore, Thailand and Vietnam. The leading stock indices of these countries during the SARS outbreak from 1 June 2002 to 25 February 2003 are compared with a non-SARS period and also with the S&P 1200 Global Index. The daily returns are compared on these stock indices for the pre-event window, short event window and long event window with the comparison period returns. It is concluded that SARS had no negative impact on the aff ected countries' stock markets with the exception of China and Vietnam.

From the previous discussion, we conclude that most literature empirically focused on the stock market reactions to pandemic diseases outbreaks effects on different types of industries using different methodologies reaching different results. Some studies analyzed the effects of pandemic diseases outbreaks on the financial performance while others analyzed the effects on

market value and firm value. Some studies analyzed these effects on the short run while others analyzed the effects on the long run. Some of these studies analyzed the effects on selected sectors which are the most affected sectors while others concentrate on analyzing the effects on one sector only. Different methodologies and measurement approaches are applied. They include cumulative Capital Assets Pricing Model, the market model and the Fama-French three-factor model abnormal and cumulative returns. Firm characteristics are found to be important in mitigating and controlling for these effects. They include corporate debt, financial volatility, and risk factors such as brand reliability, advertising effects, and service types provided. Results of previous studies are contradictory. In addition, no previous study in this line of research analyzed the effect of firm profitability on the market value of listed companies. In addition, this is one of the early studies to the best knowledge of the researchers to analyze the relationship between market value, COVID-19 outbreak and profitability in Egyptian Listed Companies.

This discussion leads to constructing the following hypotheses:

H1: COVID-19 outbreak has a significant impact on market values of Egyptian Listed Companies.
H2: COVID-19 outbreak has a significant impact on profitability of Egyptian Listed Companies.
H3: Industry type has a significant impact on the market value and profitability of Egyptian Listed Companies. This hypothesis can be subdivided into the following sub hypotheses:
H(3a): Industry type has a significant impact on the market value of Egyptian Listed Companies.
H(3b):Industry type has a significant impact on the profitability of Egyptian Listed Companies.

3- Methodology and Research design.

Three periods are investigated by (Ramelli et al., 2020) for both US and China to analyze stock market reactions in US and China to COVID-19. The first period was the Incubation (Thursday January 2 to Friday, January 17), and the second period was the Outbreak (Monday/Tuesday, January 20/21 to Friday, February 21), and the third Fever (Monday, February 24 to Friday, March 6). For comparability purposes, the main Index in Egyptian Stock

Exchange, EGX30[4] didn't suffer from a significant change[5] for the first (Incubation) and second (Outbreak) periods, as it fell 13926.98 points to 13766.96 points with less than 1% decrease in the first period ; and decreased from 13773.73 points to 13631.72 points with less than 1% decrease consecutively. But, for the third period (Fever), it fell 9.36% from 13441.28 points to 12182.46 points. From March 9 till March18, EGX30 fell by 26.1% from 11,849.39 points to 8,756.70 points. The results are not surprising as the incubation, outbreak and fever periods of COVID-9 for Egypt differ from China and US and it must differ from one country to another depending on the first reported COVID-19 positive case in every country. We will concentrate in this paper on analyzing COVID-19 outbreak effect on the whole period from December 31, 2019 the first trading day after cases of pneumonia detected in Wuhan, China, were first reported to the WHO till March 19, the last date of available data while doing the research. In Egypt, the first reported positive COVID-19 by WHO and Egyptian Ministry of Health was on February 26, 2020. The first trading day after this date was February 27 and then March1[6]. EGX30 fell by 6% from 13009 points on February 27, 2020 to 12223 points on March 1. It is important to analyze the effect of the whole period from the first time of announcement of pneumonia detected in Wuhan, China on December31, 2019 and not only from the date of confirmation of first positive COVID-9 in Egypt on February 26, 2020. EGX30 fell from December 31, 2019 till January 26 by 5.45% from 13961.56 points to 13200.66 points. So, EGX30 is not far from what happened on the other stock markets. It is expected that what happened in a specific stock market anywhere affect the other stock markets all over the world. This is the reason for including this period in the analysis.

From the previous discussion, analyzing Egyptian Stock Market reactions to COVID-19 outbreak by measuring the relationship between market value disclosure of Egyptian Listed Companies and COVID-19 outbreak was on the whole period since the first date of closing the Huanan Seafood Wholesale from December 31 till March 31. This is consistent with **Ramelli** et al., 2020 approach when analyzing the stock price reactions to COVID-19 in US and China for the period from January 2 till March 6. In their study,

[4]The EGX 30 Index is a free-float capitalization weighted index of the 30 most highly capitalized and liquid stocks traded on the Egyptian Exchange. EGX 30 constituents are reviewed and changed twice a year (end of January and end of July). The index was developed with a base level of 1000 as of January 1st 1998 and previously named CASE 30 Index.

[5] Cumulative changes for the period reported are calculated rather than daily changes.

[6] The trading day in EGX starts Sunday and Ends Thursday.

they concluded that an event study can't be used to analyze such an event where there is one clear event date, which is followed by price adjustment as the situation is one of a series of news. At any given point in time it is impossible to state whether a price movement is the incorporation of new information on that day, or continuation of adjustment (or reversal of adjustment) on prior days. So, their study concentrated on providing an overall assessment of the stock price development over time[7]. We will follow the same approach in this study. So, our analysis covered the period from December 31, 2019 to March 31, 2020.

3.1 Sample, variables, and model

The sample represents all Egyptian Listed Companies in the Egyptian Stock Exchange after excluding the financial sector companies as they have specific regulations and their nature differs from other types of companies. In addition, the Central Bank of Egypt took many decisions to support the financial sector during COVID-19 outbreak. The final sample after excluding the financial sector companies and companies with incomplete data is as follows in table (1):

Table One: Final Sample

Total Number of Listed Companies (stocks)	202
Less: Financial Sector Companies	(29)
Less: Companies with Incomplete Data	(12)
Final Number of Companies	161

The Egyptian Stock market consists of 16 sectors, the Utilities sector consists of one company only (Misr Gas). So, it is merged with the Energy and Support Services sector. The following table (2) shows the structure of the different sectors of the Egyptian Stock Market:

[7] This approach is also similar to Wagner et al. (2019) who analyzed the stock price adjustment to the US Presidential Election 2016 over the first ten days after the election, when little new news came in.

Table Two: The structure of the different sectors of the Egyptian Stock Market:

Sector	Percentage
1. Basic Resources	9.25%
2. Health Care and Pharmaceutical	9.83%
3. Industrial Goods, Services, and Automobiles	4.05%
4. Real Estate	18.50%
5. Travel & Leisure	8.67%
6. IT , Media & Communication Services	2.89%
7. Food, Beverage, and Tobacco	16.18%
8. Energy and Support Services	1.73%
9. Trades and Distribution	2.31%
10. Shipping &Transportation	2.31%
11. Education Services	1.73%
12. Construction &Construction Engineering	5.20%
13. Textile & Durables	5.78
14. Building Materials	8.67
15. Paper and Packaging	2.89

The regression model used to measure the relationship between the market value of Egyptian Listed Companies, COVID-19 outbreak, profitability, and industry type is:

$MVit = \beta 0+\beta 1BCOVID\text{-}19 + CONROLS\ (P\ it;\ INDUS\ it)+ \varepsilon it$

The following table (3) explains the variables definitions and their measurements.

Table (3): Model and Variable Definitions

Market Value (MV_{it})	The market value of stocks of company i at period t. Market value disclosures are measured at two dates which are December 31 and March 19. The total market value is scaled by the number of outstanding shares of the company.
COVID-19	The main independent variable of interest taking the value of 0 on December 31, 2019 before COVID-19 outbreak and the value of 1 on March 19 after COVID-19 outbreak.
Profit(P_{it})	The total profit of the company i at period t scaled by the number of outstanding shares of the company.
INDUS	Industry type taking the value of 1 for basic resources, 2 for health care, 3 for industrial goods, 4 for real estate, 5 for travel and leisure, 6 for IT, media, and communication, 7 for food, 8 for energy and support, 9 for trades and distributions, 10 for transportation, 11 for education services, 12 for construction and construction engineering, 13 for textiles and durables, 14 for building materials, 15 for paper and packaging, and 16 for utilities.
β0	the intercept
εit	the error term of firm i at period t.

3.2 Results and Discussion

Using IBM.SPSS Statistics Package (Version 24), statistical analysis is performed to analyze first: the impact of COVID19 outbreak on the market value and profitability of Egyptian Listed companies. So, market value and profitability before and after pandemic COVID-19 for Egyptian listed companies for the specified period from December 31, 2019 to March 31, 2020 are analyzed and compared to determine whether the impact of COVID19 outbreak is significant. First, cross tabulations analysis is used to analyze the association and correlation between market value of Egyptian

Listed Companies before and after COVID-19 outbreak and profitability of Egyptian Listed Companies before and after COVID-19 outbreak; Chi-square tests are used to test for the significance of this association and correlation. Paired sample t-test is used to test for the significance of differences between market value before and after COVID-19 outbreak. Paired sample t-test is also used to test for the significance of differences between profitability before and after COVID-19 outbreak. Second, the effect of industry type on the market value and profitability of Egyptian listed companies is analyzed. Simple linear regression is used to analyze the effect of industry type on market value and profitability of Egyptian Listed Companies and whether this effect is significant. Moreover, detailed analysis is performed to measure the relationship between market value (as a dependent variable), COVID19 outbreak (as an independent variable) and profitability (as a control variable) for every sector in the Egyptian Stock market.

3.2.1 Cross tabulations analysis and Chi square test:

3.2.1.1 Market value before and after COVID-19 outbreak.

The following table (4) shows the results of using cross tabulations analysis to analyze the association and correlation between market value of Egyptian Listed Companies before and after COVID-19 outbreak. Chi-Square Test is used to test for the significance of this association and correlation. Results show that significance value of Pearson chi-square statistics is 0.202 with an alpha-value of 0.05. Therefore, we conclude that there is an association and correlation between market value before and after COVID-19 outbreak and it is significant.

Table (4): Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	22660.750[a]	22484	.0202
Likelihood Ratio	1579.714	22484	1.000
Linear-by-Linear Association	157.325	1	.000
N of Valid Cases	161		

3.2.1.2 Profitability before and after COVID-19 outbreak.

The following table (5) shows the results of using cross tabulations analysis to analyze the association and correlation between profitability of Egyptian Listed Companies before and after COVID-19 outbreak. Results show that significance value of Pearson chi-square statistics is 0.000 with an alpha-value of 0.01. Therefore, we conclude that there is an association and correlation between profit before and after COVID-19 outbreak.

Table (5): Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	19803.000[a]	18600	.000
Likelihood Ratio	1522.710	18600	1.000
Linear-by-Linear Association	159.372	1	.000
N of Valid Cases	161		

3.2.1.3 Paired sample t test:

The following table (6) illustrates the descriptive statistics of the paired samples and their correlations (table 7). Two paired samples are analyzed which are: market value before and after COVID19 outbreak and profitability before and after COVID19 outbreak.

Table (6): Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	MVafter	13.6365	161	42.52268	3.35126
	MVBefore	17.0287	161	49.24048	3.88069
Pair 2	AfterProfit	1.7728	161	6.29647	.49623
	BeforeProfit	1.8009	161	6.26450	.49371

Table (7): Results of paired samples correlations

		N	Correlation	Sig.
Pair 1	MV before COVID19 outbreak & MV after COVID19 Outbreak	161	.992	.000
Pair 2	Profit before COVID19 outbreak & Profit after COVID19 Outbreak	161	.998	.000

Table (8): Results of paired samples test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	MV after COVID19 – MV before COVID19	-3.39216	8.95982	.70613	-4.78670	-1.99762	-4.804	160	.000
Pair 2	Profit after COVID19 – Profit before COVID19	-.02810	.39490	.03112	-.08957	.03336	-.903	160	.0368

Results in the previous table (8) show that the difference between the market value before and after COVID19 outbreak is significant as sig. of t is .000 which is less than the .05 significance level. *So, the first research hypothesis H(1): COVID-19 outbreak has a significant impact on market values for Egyptian Listed Companies is accepted.*

Results in the previous table (8) also show that the difference between the market value before and after COVID19 outbreak is also significant as sig. of t is .0368 which is less than the .05 significance level. So, the second research hypothesis H(2): COVID-19 outbreak has a significant impact on profitability for Egyptian Listed Companies is also accepted.

3.2.2 Effect of industry type on the market value and profitability of Egyptian listed companies:

3.2.2.1. Simple linear regression for the effect of industry type as a control variable on market value and profitability through the following model is performed.

$$MVit = \beta0+\beta1INDUS\ it+ \varepsilon it.$$

The following table (9) shows results of the simple linear regression for the effect of industry type as a control variable on market value and profitability:

Table (9)

Model		Market Value	Profitability
	F	7.354	7.431
	Sig.	.004	.003
	R Square	.022	.023
	t	-2.712	-2.626
	Sig.	.004	.003

The previous results show the *significance* of the effect of industry type on both market value and profitability at the 5% confidence level as Sig. of F is .004 and 0.003 is less than .05 for both market value and profitability accordingly and also t value is .004 and .003 less than .05 for both market value and profitability accordingly.

3.2.2.1. Using multiple linear regressions for the effect of COVID-19 as an independent variable and industry type as a control variable on market value as a dependent variable through the following model:

$$MVit = \beta0+\beta1COVID\text{-}19 + \beta2INDUS\ it+ \varepsilon it$$

Table (10)

Model		F	Sig.	Adjusted R Square
1	Regression	.438	.010[b]	.302
	Residual			
	Total			
2	Regression	3.894	.021[c]	.525
	Residual			
	Total			

Two models are used to analyze the effect of industry type, the first regression model by including COVID19 only and the second model by including both COVID19 and industry type. Results in table (10) show the significance of the two models and the increase in adjusted R square by adding industry type to the second model. Results in table (11) show the significance of the effect of both COVID 19 and industry type on market value of Egyptian Listed Companies.

Table 11: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	17.029	3.626		4.697	.010
	COVID19	-3.392	5.127	-.037	-.662	.009
2	(Constant)	27.455	5.263		5.217	.000
	COVID19	-3.392	5.077	-.037	-.668	.030
	Industry Type	-1.466	.541	-.150	-2.709	.007

a. Dependent Variable: MarketValue

3.2.2.1. Using multiple linear regressions for the effect of COVID-19 outbreak as an independent variable and industry type as a control variable and profitability as a dependent variable through the following model:
$Pit = \beta 0 + \beta 1 COVID\text{-}19 + \beta 2 INDUS\ it + \varepsilon it.$

Table (12)

Regression Model	F	Sig.	Adjusted R Square
1	.172	.030[b]	.332
2	3.794	.024[c]	.575

a. Predictors: (Constant), COVID19b. Predictors: (Constant), COVID19, Industry Type

Two models are used to analyze the effect of industry type, the first regression model by including COVID19 only and the second model by including both COVID19 and industry type. Results in table (12) show the significance of the two models and the increase in adjusted R square by adding industry type to the second model. Results in table (13) show the significance of the effect of both COVID 19 and industry type on profitability of Egyptian Listed Companies.

Table (13): Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.801	.483		3.729	.000
	COVID19	-.283	.683	-.023	-.415	.0409
2	(Constant)	3.196	.701		4.560	.000
	COVID19	-.283	.676	-.023	-.419	.036
	Industry Type	-.196	.072	-.151	-2.723	.007

a. Dependent Variable: Profit

3.2.3 Relationship between market value,COVID-19 outbreak, and profitability by sector:

More detailed analysis for the effect of profitability and COVID19 outbreak on the market value of Egyptian Listed Companies is performed for every sector and for the whole Egyptian Stock Market using multiple linear regressions. The model used to test this relationship is as follows:

$FVit = \beta 0+\beta 1BCOVID\text{-}19 + P\ it + \varepsilon it$

1- For the IT , Media & Communication Services

Results in table (14) show that -contrary to expectations- there is a negative relationship that is statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value that is statistically significant. R square is very high as the outbreak of COVID-19 and the change in profit explain 97.3% of the change in the market value disclosure of firms in the IT, Media & Communication Services.

2-For the Health Care and Pharmaceutical Sectors

Results in table (14) show that there is a positive relationship between the profit and the market value disclosure of the firm that is statistically significant. R square is very high as the outbreak of COVID-19 and the change in profit explain 70% of the change in the market value disclosure of firms in the Health Care and Pharmaceutical Sector.

3-For the Travel & Leisure Sector

Results in table (14) show that -as expected- there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value disclosure of the firm that is statistically significant. R square is 32.4%.

4-For the Energy & Support Services& Utilities

Results in table (14) show that -as expected- there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value disclosure of the firm that is statistically significant. R square is very high as the outbreak of COVID-19 and the change in profit explain 99.7% of the change in the market value disclosure of firms in the Energy and Support Services sector.

5-Shipping & Transportation Services

Results in table (14) show that -as expected- there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value disclosure of listed firms in this sector that is statistically significant. R square is very high as the outbreak of COVID-19 and the change in profit explain 81.8% of the change in the market value disclosure of firms in the Shipping &Transportation Services sector.

6-Trade & Distributors

Results in table (14) show that -as expected- there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a negative relationship for the first time between the profit and the market value disclosure of the firm that is statistically not significant. R square is very high as the outbreak of COVID-19 and the change in profit explain 80.8% of the change in the market value disclosure of firms in the Trade & Distributors sector.

7- Food, Beverages, and Tobacco

Results in table (14) also show that there is a positive relationship between the profit and the market value disclosure of the firm that is statistically significant. R square is very high as the outbreak of COVID-19 and the change in profit explain 65.1% of the change in the market value disclosure of firms in the Food, Beverages, and Tobacco sector.

8- Education Services Sector

Results in table (14) show that there is a positive relationship between the profit and the market value disclosure of the firm that is statistically significant. R square is very high as the outbreak of COVID-19 and the change in profit explain 95.4% of the change in the market value disclosure of firms in the Education Services Sector.

9- Services, Industrial Products, and Automobiles

Results show that there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value disclosure of the firms that is statistically insignificant. R square is 34.8%.

10-Paper and Packaging

Results show that there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a negative relationship between the profit and the market value disclosure of the firms that is statistically insignificant. R square is acceptable as the outbreak of COVID-19 and the change in profit explain 40.6% of the change in the market value disclosure of firms in the Education Services Sector.

11- Basic Resources

Results show that there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value disclosure of the firms that is statistically significant. R square is very high as the outbreak of COVID-19

and the change in profit explain 97.9% of the change in the market value disclosure of firms in the Basic Resources Sector.

12- Real Estate

Results show that there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value disclosure of the firms that is statistically significant. R square is 12.9%.

13- Construction & Construction Engineering

Results show that there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value disclosure of the firms that is statistically significant. R square is 1.5% only.

14- Textiles and Durables

Results show that there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value disclosure of the firms that is statistically significant. R square is very high as the outbreak of COVID-19 and the change in profit explain 80.6% only of the change in the market value disclosure of firms in the Utilities Sector.

15- Building Materials

Results show that there is a negative relationship but it is not statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value disclosure of the firms that is statistically insignificant. R square is very low as the outbreak of COVID-19 and the change in profit explain 2.8% only of the change in the market value disclosure of firms in the Building Materials Sector.

16- For All Egyptian Listed Companies

Results show that there is a negative relationship between COVID-19 and the market value disclosure of Egyptian Listed Companies (EGX) but it is not statistically significant at 5%. Results also show that there is a positive relationship between the profit and the market value disclosure of the firms that is statistically significant. R square is high as the outbreak of COVID-19 and the change in profit explain 60.4% of the change in the market value disclosure of EGX.

Table 14: Regression Results

Dependent Variable: MarketValue b. Predictors: (Constant), Profit, COVID19

Sector Regression Model	R Square	F	Sig.	B	t	Sig.	B	t	Sig.
				COVID19			Profit		
1-The IT , Media & Communication Services **FMVit = 2.434 - 0.958 COVID + 2.577 Pit+ εit**	.973	90.002	.000	-.958	-2.816	.037	2.577	13.118	.000
2-For the Health Care and Pharmaceutical Sector **FV it = 18.501-0.732COVID-19 + 4.368Pit+ εit**	.680	33.889	.000	-.732	-.114	.910	4.368	8.232	.000
3-For Travel & Leisure Sector **FV it = 4.092-0.1.172COVID-19 + 2.647Pit+ εit**	.270	6.000	.007	-1.172	-.574	.571	2.647	3.416	.002
4- Energy & Support Services& Utilities **FV it = 2.172-2.038 COVID + 7.720 Pit+ εit**	.996	563.249	.000	-2.038	-1.392	.258	7.720	33.534	.000
5-Shipping & Transportation Services **FV it = 3.139 - 4.084 COVID-19 + 6.355 Pit + εit**	.745	11.213	.014	-4.084	-2.420	.060	6.355	4.071	.010
6-Trade & Distributors **FVit = 18.214-1.171COVID-19 - 9.978Pit+ εit**	.680	6.305	.084	-1.171	-.716	.526	-9.978	-3.478	.040

7-Food, Beverages, and Tobacco **FV it = 12.37-5.791COVID-19 +2.271Pit+ εit**	.638	48.493	.000	-5.791	-1.284	.205	2.271	9.753	.000
8-Education Services **FV it = 9.274-2.93COVID-19 +4.861Pit+ εit**	.924	31.393	.010	-2.930	-1.083	.358	4.861	7.850	.004
9-Services, Industrial Products, and Automobiles **FV it = 4.773-2.313COVID-19 +3.056Pit+ εit**	.203	2.401	.146	-2.313	-.654	.529	3.056	2.091	.066
10-Paper and Packaging **FV it = 4.966-1.62COVID-19 +0.547Pit+ εit**	.168	1.709	.272	-1.620	-.781	.470	-.547	-1.675	.155
11- Basic Resources **FV it = 5.17-10.881COVID-19 +10.906Pit+ εit**	.978	674.55	.000	-10.881	-1.569	.127	10.90	36.697	.000
12-Real Estate **FV it = 5.108-2.024COVID-19 +1.574Pit+ εit**	.098	4.090	.022	-2.024	-1.547	.128	1.574	2.405	.020
13-Construction& Construction Engineering **FV it = 16.598-5.806COVID-19 +0.183Pit+ εit**	-.116	.114	.893	-5.806	-.473	.643	.183	.066	.948
14- Textiles and Durables	.770	22.801	.000	-.528	-1.027	.326	3.743	6.674	.000

FV it = 1.25-0.528COVID-19 +3.743Pit+ εit									
15- Building Materials **FV it = 6.571-1.248COVID-19 +0.243Pit+ εit**	-.044	.396	.677	-1.248	-.588	.561	.243	.667	.510
16- For All Egyptian Listed Companies **FV it = 6.754 -3.392COVID-19 +5.705Pit+ εit**	.602	243.40	.000	-3.392	-1.049	.295	5.705	22.039	.000

Table 15: Summary of Results

Sector	Relationship between market value and COVID-19 Outbreak.
IT, Media & Communication Services	Statistically Negative
Health Care and Pharmaceutical	Non-Statistically Negative
Travel & Leisure	Non-Statistically Negative
Energy & Support Services	Non-Statistically Negative
Trade and Distributors	Non-Statistically Negative
Food, Beverage, and Tobacco	Non-Statistically Negative
Education Services	Non-Statistically Negative
Basic Resources	Non-Statistically Negative
Utilities Sector	Non-Statistically Negative
Real Estate	Non-Statistically Negative
Construction& Construction Engineering	Non-Statistically Negative
Textile and Durables	Non-Statistically Negative
Statistically Negative	Non-Statistically Negative
Building Materials	Non-Statistically Negative
All Egyptian Listed Companies	Non-Statistically Negative

4- Recommendations:

Current investors are advised not to panic sell in pandemic disease times. Instead, a better strategy is to build a diversified portfolio of high-quality stocks and fixed-income investments, New investors are advised to buy during pandemic disease times as the stock prices change significantly. Many stocks are traded at the lowest 52 week.

5- Conclusion

The main objective of the study was to measure the relationship between the market value disclosure of Egyptian Listed Companies and the outbreak of COVID-19 since the announcement of the first confirmed positive case December 31, 2019 till the most recent data available March 31, 2020. Company profit is used as a control variable. Paired sample T test, cross tabulations analysis and chi-square test are used to measure the significance of differences between market values and profitability of Egyptian Listed companies before (for the period ended December 31, 2019) and after COVID-19 outbreak (for the period ended March 31, 2020). Results show that the market value and profitability of Egyptian Listed Companies before COVID19 outbreak differs significantly from the market value and profitability after COVID19 outbreak. Simple linear regression is used to analyze the effect of industry type on profitability and market value. Results show that industry type has a significant impact on the market value and profitability of Egyptian Listed Companies. Moreover, detailed analysis of the relationship between the market value of Egyptian Listed Companies, COVID-19 outbreak, and profitability is measured using multiple linear regressions for every sector in the Egyptian Stock Exchange (EGX). Results show that for ALL sectors of the Egyptian Listed Companies, there was a negative relationship is that is statistically significant for IT, and Media & Communication Services only but not statistically significant for All other sectors of the Egyptian Stock Market. The relationship between the market value disclosure of Egyptian Listed Companies and profitability was positive for all sectors except for trade and distributors sector and paper and packaging sector. These results have important implications for investors as most stocks are traded at the lowest values in 52 weeks which is a purchase time and for practitioners for stabilizing the performance of companies during high risk periods as in the case of diseases outbreaks.

Future Research:

More research can be done to analyze the relationship between the market value disclosure of Small and Medium Sized Enterprises listed in their index (SME/NILEX) and COVID-19 outbreak. Analyzing such a relationship is interesting and important as the movement of the SME/NILEX index is different from all other Egyptian Stock Market Indices. It is clear that size is a key determinant in this case as SME/NILEX consists of small and medium sized enterprises only. Moreover, future research is needed to analyze the effect of COVID-19 after March 19 as the Egyptian Government has taken many decisions to support the Egyptian Stock Exchange. Analysis should include such changes. Also, analysis for the banking and insurance sector reactions is important and it is expected to differ from the other sectors of the stock market.

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