



**Journal of Contemporary Research in Business Administration
and Economic Sciences
(JCR-BAES)**

ISSN: 2777-7391
www.jcrbaes.press

**Volume 1
Issue 2
2021**

**Research
type: Article**

**Received
February 2021**

**Accepted
September
2021**

The effect of COVID-19 on Qatar and Italy stock exchanges

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DOI: 10.52856/jcr311280124

Abstract

The aim of this research is to study the effect of Covid-19 on both Qatar and Italy stock exchanges between 2018 and 2020. Based on a sample derived from five different indexes from Qatar and Italy stock exchange (Banking index, Industrial index, Insurance index, Goods and Services index, Telecommunication index), the results reveal that Covid-19 has a negative effect on both stock exchange indexes. It is also revealed that Italy stock exchange was more volatile to changes caused by Covid-19 than Qatar stock exchange.

Keywords: Covid-19, Stock Exchange, Indexes, Qatar, Italy, Volatility.

1.Introduction

A stock market is a group of markets where financial activities take place such as buying, selling, and issuing shares. Its main importance falls under the opportunity it gives to business owners to raise their capital through dividing itself into several shares and selling these shares for a certain price. The stock market has been one of the most relied-on indicators to measure the financial health of the economy and the trust of investors, but also one of the most affected sectors by economic downfalls. By going back through history, many records indicate how epidemics affected stock markets, to start with the “1793 Yellow Fever” that hit Philadelphia-US capital back then- and caused the securities market and the prices of the bonds to fall. Later on, the “1832 Cholera” that caused Railroads stocks to decrease and not recover until the following year. Few years afterwards, the “AIDS Fever” appeared and caused the S&P industrial average to decrease by 16.5% (Market Watch, 2020). Then, the “1918 Spanish flu” that came right after World War I and killed almost 2% of the population and affected the world’s GDP and economic growth which caused the inflation to increase in the US by 5% and reduced the US real stock returns by 7%. Another epidemic faced by the world was the “2003 SARS” that caused the S&P 500 to decline by 12% and the Chinese stock market to underperform (Duré, 2020). Today, with the beginning of 2020 a new epidemic is pervading the world the “Covid-19” that just like the above-mentioned epidemics had its effect on the world’s stock market and economy.

Covid-19 was first spotted in Wuhan-China on the 31 of December 2019 and was primarily diagnosed as a pneumonia respiratory infection by an unknown cause where 27 cases were confirmed on that day. By the beginning of January 2020, the cases were increasing which was alarming for the Chinese authorities as well as for the World Health Organization (World Health Organization, 2020) to look into it as soon as possible. On January 9, the Chinese authorities were able to define the disease, its symptoms and mainly named it “Covid-19”. Covid-19 developed so fast

that by March the world experienced a serious shortage in equipment's and supplies. The World Health Organization (WHO) help was necessary.

By highlighting the stock market industries performance before Covid-19, during it, and within the vaccination processes worldwide generally and Italy and Qatar mainly, the article will answer the following questions: What was Covid-19 effect on the stock market as a whole? How did Covid-19 affect the Qatar stock exchange from a side and the Italy stock exchange from the other side?

The first objective of this research is to study the effect of Covid-19 on different stock market industries. The second objective is to compare between the performance of Italy's stock market and Qatar's stock market before and during Covid-19.

The first section of this paper presents the literature review. It discusses main theories and personal factors explaining the stock market behavior. It also treats past empirical studies related to the impact of Covid-19 on stock market. The methodology of the research is explained in the second section. The third section presents the empirical findings and the last section concludes the research.

2.Literature review

Behavior of investors on stock market depends on multiple factors. Many theories have tried to explain how investors proceed on stock market and determine their preferences. Also, some studies have highlighted on the relation between psychological factors and the behavior of investors on stock market (2.1). As for Covid-19, many recent studies have tried to understand the relation between its impact and the performance of the stock market (2.2).

2.1.Theories and personal factors explaining the stock market behavior

Stock market behavior could be learned from different theories. Modern portfolio theory, introduced by Markowitz (1952), assumes that investors seek to make investments decisions that will provide them with the highest return at a given level of risk, or the least risk at a given level of return. The liquidity preference theory explained that the higher the maturity rate, the higher the interest rate required by investors. Thus, investors tend to prefer cash over any other liquid holding. That's why, Keynes explained in his theory three main motives that explained why investors demand liquid cash (Runde, 1994): "the transaction motive", "the precautionary motive" and "the speculative motive".

On other hand, many studies indicate that there is a relation between psychological factors and stock market behavior (El-Chaarani, 2016). Jackson & Schmidt (2021) indicated that there's a positive correlation between weather changes and investors' performance on stock market. It means that the weather affects people's moods and make them feel better when it's sunny and the opposite when it's cloudy (Jackson & Schmidt, 2021). Furthermore, Shumway & Hirshleifer (2003) studied the relationship between the weather and the stock returns. They found that investors' mood is positively affected by the sunlight and hence investors' mood in its turn positively affects the prices on the financial market.

Moreover, most of human feelings and instincts are based on how their mental state of mind is and what affected their sentiments. No one can deny that people by spending a lot of time on social media will experience many mixed emotions and changing feelings. For example, a person reads about the bank in which he deposits his money is going bankrupt, he will immediately go to withdraw his account even if all evidences prove the opposite of this rumor (Pineiro et al., 2017). The same thing happens in stock market, when a person sees that a certain stock price is going up, he buys it and if he sees that the market is in a bad situation, he might sell his shares. All these decisions are affected by how the message is delivered to the investor and through what. These forecasts are based on how investors "feel" about the market.

In fact, actions on stock market are contagious just like emotions (Pineiro et al., 2017). Therefore, it's arguable that tweets about a certain stock can predict the stock's performance later on (El-Chaarani & Shaker, 2018). Thus, if a person of influence tweeted about his interest in a certain stock, people will start to believe that this stock is a good investment and start investing in it. However, the future stock performance is not affected by the tweet itself but by peoples' reactions to this tweet. This means that tweets concerning a positive or negative sentiment of the stock market might affect investor's behavior.

Another example by several scholars indicates that investor who trade during Ramadan can make a better decision than other days. This is related to the feeling of calmness they experience when fasting (Hashibul & Shahidullah,

2019). By going back to the history of studies related to this topic, many studies indicated that Ramadan month and the expansion of stock market returns are positively correlated. For example, Al-Ississ (2010) concluded that Ramadan has a positive impact on stock market returns after testing his assumption on 17 countries between 1998 and 2008. Alatiyat (2014) analyzed the effect of the month of Ramadan on the 19 listed banks in Abu Dhabi Security Exchange (ADX) and Dubai Financial Market (DFM) during 2008 – 2013. It concluded that Islamic banks stocks increased during the Ramadan period, which is also a good indicator that Ramadan positively affects investors sentiments and hence positively affect the stock market returns.

2.2. Empirical studies related to the impact of Covid-19 on stock market

2.2.1. Studies related to Australia

After tracking the data for 30 days, Brueckner & Vespignani (2020) found that with each one percent increase of standard deviation in new cases of Covid-19, the growth of ASX-200 increased by one percent as well. By applying the VAR model once again as an indicator variable to test the results from the March period shutdown, the results from this model indicated that by applying restrictions, new cases of registered Covid-19 decreased which negatively affected the growth rate of the ASX-200. From the other side, the VAR model indicated that the opposite happens to the ASX-200 financial market when Covid-19 cases decreased. In fact, on March 24, the Australian government-imposed restrictions on peoples' behavior and shut down all activities so that many business activities were not allowed to be carried out, which reduced the number of registered Covid-19 cases. VAR model was also applied to test the volatility in exchange rate changes AUD-USD. The results indicated that there's a positive effect of Covid-19 infections on the growth rate of the AUD-USD exchange rate. Estimates from this model show that an increase of Covid-19 infections in Australia leads to a significant strengthening of the Australian dollar (Brueckner & Vespignani, 2020). In conclusion, Covid-19 had a positive impact on Australia's financial performance rather than a reverse impact.

2.2.2. Studies related to GCC countries

Studies on Gulf Cooperation Council (GCC) financial markets are important for three main reasons: First, most studies focused on the United States, Canada, Asia, and China where no clear studies were applied to track the effect of Covid-19 on GCC countries. Second, GCC countries are known for their special economic structure that is directly linked to the price of oil because they present the main source of the revenues of the countries, where the oil market was one of the most affected markets by the restrictions applied on imports and exports (El-Chaarani, 2019; Bahrini & Filfilan, 2020). Third, the GCC stock markets have different characteristics compared to other stock markets. In other words, it responds differently to the Covid-19 pandemic and oil price shocks. Unlike the stock markets, GCC countries' stock markets are mostly dominated by domestic investors, financial contracts are based on the principle of profit and loss sharing (PLS) (Bahrini & Filfilan, 2020). This study is applied for the period between April 1, 2020, and June 26, 2020. Panel data regression analysis was used to test how GCC stock markets responded to Covid-19. Results of the study indicates that the returns on the majority of GCC stock market indices declined during the Covid-19 outbreak with the increase of Covid-19 registered cases. Whereas further analysis showed that GCC stock markets are impacted positively by the crude oil price (WTI) and negatively by the variation of the implied volatility in the global oil market and the global stock markets (Bahrini & Filfilan, 2020)

2.2.3. Studies related to Covid-19 effect on different stock market industries

2.2.3.1. Information Technology industry

This sector includes companies such as Apple Inc. (AAPL), Microsoft Corp. (MSFT), and Amazon.com Inc. (AMZN). In fact, with the emergence of Covid-19 epidemic big Technology stocks faced a huge decline in their values in April. After the market collapsed in March, the FAMAG stocks: Facebook, Apple, Microsoft, Amazon and Google parent company Alphabet, and recovered regained almost 44% of their values by September (Figure 1, Table 1). The rise was mainly linked to the change in the working systems where all individuals were supposed to get their work and studies done from home because of the lockdown and the social distancing regulations implied by governments and the increase of the need for telecommunications and information technology sector.

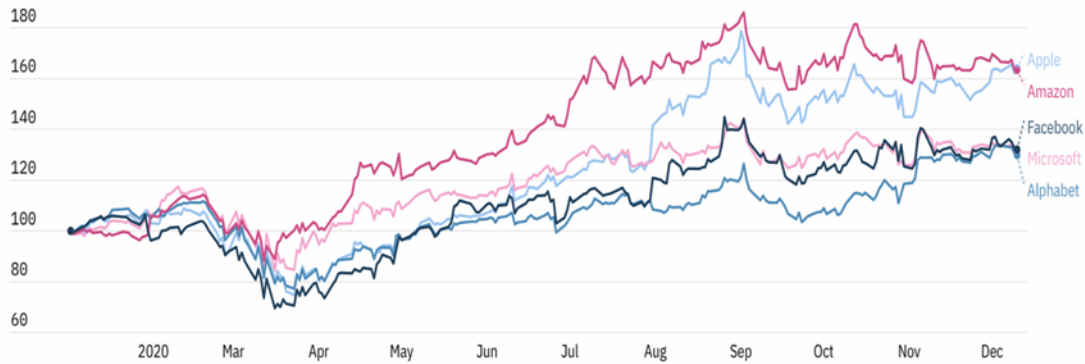


Figure 1: Graphical representation of the FAMAG stock prices in 2020
 Source (YahooFinance, 2020)

Table 1: Table summarizing stock prices in April and September (in US Dollars)

Average stock prices	Apple	Amazon	Facebook	Microsoft	Google
April	74.7	84.7	70.6	84.7	77.3
September	178.7	184.8	144.2	144.2	126.4

By referring to Figure 1 and Table 1, the stock prices of FAMAG portfolio recorded an increase in their values between April and September to reach their peak in September periods (Figure 1). This means that the spread of Covid-19 negatively affected the portfolio in the period of April just like its effects on the whole stock market. However, FAMAG stocks recorded an increase in their values in early September (Figure 1), this is related to the change in the lifestyle of people where everyone starts to work from home and turn into consuming more time using electronic devices and social media because of the need to work and study from home.

2.2.3.2. Healthcare industry

The healthcare sector’s importance emerged at the beginning of 2020, a year that revealed new reasons to stick with healthcare stocks. The world’s battles against the coronavirus were in favor of the innovation prevalent across the healthcare sector. The sequence of Covid-19 was also known soon after the virus was discovered, and so soon many biomedical factories started their research for an adequate vaccine to slow down the spread of the disease. All of this helped to attract capital to the pharmaceutical industry, and almost 150 vaccine programs were in the making. Figures 2 and 3 show that NASDAQ healthcare industry in March 2020 was worth 739.12\$ (Figure 2). It means that just like the whole stock market, NASDAQ healthcare industry recorded a decrease in the value of its portfolio. However, NASDAQ healthcare industry portfolio value reached its peak of 1,352.77\$ in February 2021 and that is mainly linked to the innovation in creating and testing the vaccines to fight against the spread of Covid-19 virus.

Figure 2: NASDAQ healthcare index records for average records for 2017-2021 (Nasdaq, 2020)



Figure 3: NASDAQ healthcare index average for 2017-2021 (Nasdaq, 2021)



3. Methodology

This study is based on samples of primary data derived from Qatar stock exchange (QSE) and Italy Stock exchange (Borsa Italiana). Stock market records are collected between 2018 and 2020 which is the period before Covid-19, during Covid-19, and after the vaccination processes. The main reason for choosing both countries is because of the specific characteristics that differentiate each one of them during the period of Covid-19: Qatar, from one side, is known as the richest country in the world and the most capable country to fund Covid-19 medical supplies and necessary equipment. Italy, on the other side, was ranked as one of the most affected countries during the Covid-19 epidemic and one of the least capable countries to control the spread of Covid-19 across its citizens. This study will compare the effect of Covid-19 on similar industries from both the Qatar Stock Exchange and the Italy Stock Exchange. The data for this study is collected by referring to the historical records of the stock market industries stated on the country's website. The samples will compare the countries' performance in 5 sectors: Banking sector, consumer goods and services sector, industrial sector, insurance sector, and telecommunication sector. Two main variables are selected:

- **Standard deviation**

A standard deviation is a mathematical measure that indicates the dispersion of a set of data from their mean [formula $\sigma = \sqrt{\sum(X - \bar{X})^2 / (n-1)}$]. This measure is directly linked to the volatility of the stocks to market changes. A stock is considered to be more volatile and hence riskier when the value of the standard deviation is higher.

- **Maximum drawdown ratio**

A Maximum drawdown is a measure of a stock's largest price drop from the peak to the trough. Maximum drawdown is directly related to a stock's volatility. A stock is more volatile when the Maximum drawdown ratio is higher.

The first part of the empirical study compares the Volatility and the Maximum drawdown ratios for Qatar and Italy stock market industries between 2018 and 2020. The second part compares the performance of the five stock market industries of both countries during the pre-Covid-19 period, the expansion period of Covid-19, and within the vaccination processes. The main objective of this part is to identify which of the countries' stock markets were negatively affected by Covid-19, which stock markets were positively affected by Covid-19, and more specifically which industries reached their peak season during these epidemic and which ones fell to the trough of their performance.

4. Results and findings

4.1. Volatility and Maximum drawdown ratios for Qatar and Italy stock market industries between 2018 and 2020

Numbers in Table 2 are concluded by using the standard deviation formula in an excel sheet, for all 5 sectors (Banking sector, Industrial sector, Insurance sector, Consumer goods and services sector, and telecommunications sector) for years 2018, 2019 and 2020.

Table 2: Comparing the volatility of Qatar and Italy's indexes to market changes between 2018 and 2020

Indexes	Country	2018	2019	2020
Banking sector	Qatar	365.0182	149.6342	168.9912
	Italy	1584.012	628.7779	1237.498
Industrial sector	Qatar	201.1449	149.9527	306.4461
	Italy	3953.146	1499.898	3762.284
Insurance sector	Qatar	173.0395	214.4774	247.554
	Italy	811.6878	1302.122	2136.857
	Qatar	612.6386	514.7948	557.2124

Consumer goods and services sector	Italy	8174.536	7022.718	15162.57
	Qatar	58.39136	37.70042	66.72209
Telecommunication sector	Italy	1791.668	736.1039	967.4432

Table 2 illustrates that all of the sectors experienced an increase in their volatility (standard deviation) from 2019 to 2020. The main reason is because of the emergence of the Covid-19 epidemic and its direct correlation with the economic performance of the country and how it is reflected in the stock market industry. This increase in the volatility can be explained in simple terms: when Covid-19 started to affect more people, countries went into lockdown and businesses had to shut down their operations which affected individuals' salaries and changed their behavior in the stock market. Because the stock market is not the safest place for a person to invest during the recession, people became more conservative and preferred to keep their money for emergency needs instead of risking losing it in the stock market. By comparing Qatar's standard deviation in 2020 and Italy's standard deviation in 2020, it's clear that Italy's industries were more volatile to Covid-19 than Qatar's industries because of the different impact that Covid-19 had on Italy and Qatar in terms of numbers of infected people, death cases, recovery cases and lockdown period.

Numbers in Table 3 are concluded by using the Maximum drawdown ratio: Value of the peak- value of the trough, in an excel sheet for all 5 sectors (Banking sector, Industrial sector, Insurance sector, Consumer goods and services sector, and telecommunications sector) for years 2018, 2019 and 2020.

Table 3: Comparing maximum drawdown ratios for each of Qatar and Italy stock market industries

Indexes	Country	2018	2019	2020
Banking sector	Qatar	0.323393	0.156797	0.175799
	Italy	0.412422	0.255083	0.490116
Industrial sector	Qatar	0.23908	0.172857	0.363169
	Italy	0.34389	0.212805	0.446535
Insurance sector	Qatar	0.256298	0.230435	0.305753
	Italy	0.19835	0.274715	0.442943
Consumer goods and services sector	Qatar	0.324158	0.226236	0.280708
	Italy	0.2660402	0.2540307	0.4191386
Telecommunication sector	Qatar	0.193484	0.180513	0.361839
	Italy	0.400816	0.246058	0.393704

Table 3 shows that MDD ratio increased for all sectors in different values which means that all the stock market indexes in Qatar and Italy experienced a decrease in the indexes price that caused this increase in MDD ratio. However, Qatar recorded a lower decrease than Italy's in terms of index prices for all industries except for the Telecommunication industry where MDD increased by almost 0.18 in 2020 from the previous year for Qatar. However, the MDD ratio for Italy's Telecommunication index increased by almost 0.14. This means that the Telecommunication industry in Qatar was more volatile to the changing event caused by Covid-19 than Italy. All the

four residual industries increased more for Italy than Qatar. It means that they experienced a more serious decrease in prices than Qatar which caused the increase in MDD ratio.

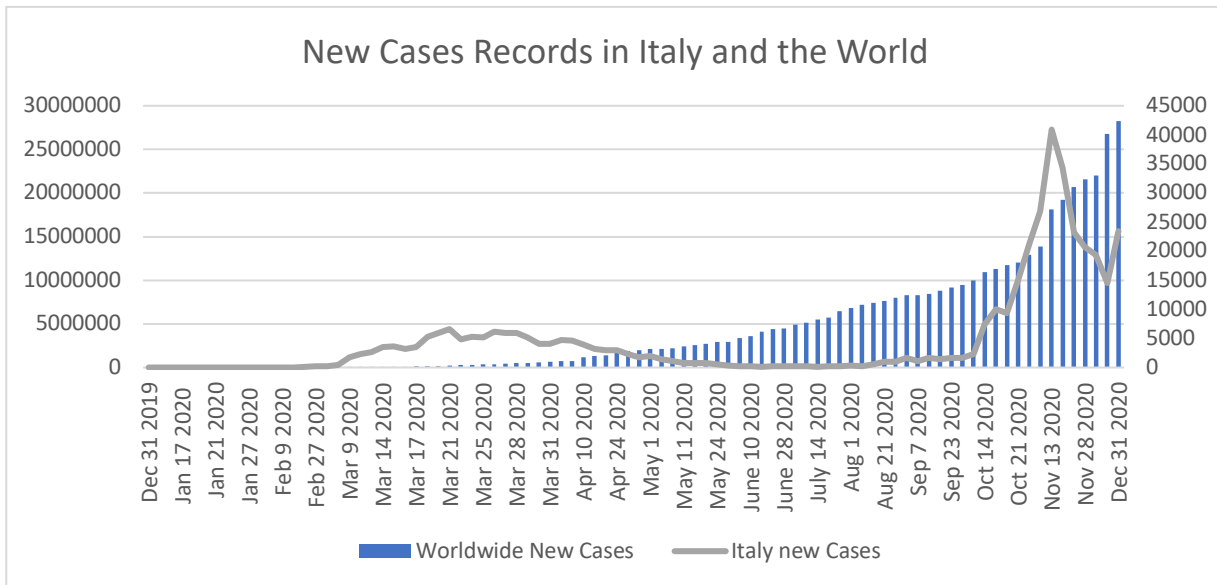
4.2. Comparative analysis between the number of cases in Italy and the world

As seen in Figure 4, the net number of worldwide cases (taking into consideration death cases and recovery cases) was increasing fast since the beginning of March 2020. The worldwide new cases increased by more than 15,000 between March 14 and 15, having more than 3,500 cases from Italy. At that period many European countries such as Spain started to go into lockdown in both public and private industries. By March 26, Italy's number of daily cases surpassed 6,000 as the number of deaths worldwide was increasing to reach more than 2,800 death cases per day. The United States alone was responsible for more than 1,000 death cases.

At the beginning of April, Italy went into lockdown after reaching an average number of almost 4,000 daily cases. By Mid-May the number of daily cases in Italy started to fall to almost 800 cases per day and declined even more by the end of June, where the number of daily Covid-19 positive cases was 113 cases per day. Italy was one of the few countries having low rates of daily cases in June in contrast with other countries such as the US that recorded more than two million cumulative cases by June 10. However, by Mid-October the number of Covid-19 cases in Italy and the world increased again after ending the lockdown in Mid-June and Italy went back to record more than 10,000 daily cases.

In conclusion, the reason behind the increasing volatility in Italy's stock market indexes is because of the implications that came along with the Covid-19 pandemic, which played a role in affecting the economy and the stock market performance of the country.

Figure 4: Chart comparing between the number of Covid-19 new cases in Italy and the world between Dec 31 2019 and Dec 31 2020



4.3. Comparative analysis between Qatar and Italy total cases and changes in volatility

According to Figure 5, the first positive case in Qatar was recorded on the 29 of February 2020. On that day, the number of positive cases was 1 for Qatar and 1128 for Italy. On March 11, Qatar recorded an increase of more than 200 Covid-19 cases in one day. The world health organization (WHO) assessed that Covid-19 could be characterized as a global pandemic after that the total number of deaths surpassed the 4,000 cumulative cases on that day. In refer to Figure 5, it's clear that the cumulative number of people affected by Covid-19 in Qatar remained lower than the cumulative number of people infected in Italy between the period of 31 December 2019 and 21 December 2020. The daily increase in Covid-19 cases in Qatar remained constant with an average of 100 cases per day until April 10 where the number of cumulative cases reached 2512 and increased by 719 cases to reach 3231 on April 13 which was alarming. While Qatar average increase of daily Covid-19 infection was almost on the same pattern of 2,000 cases a day between July and November, Italy's daily cases started to increase unbelievably after ending the lockdown period to surpass a 4,000 infected case per day. Thus, the economic performance in Italy was negatively affected and companies became more volatile to Covid-19.

Figure 5: Chart comparing between the cumulative positive cases of Covid-19 in Qatar and Italy between Dec 31 2019 and Dec 31 2020

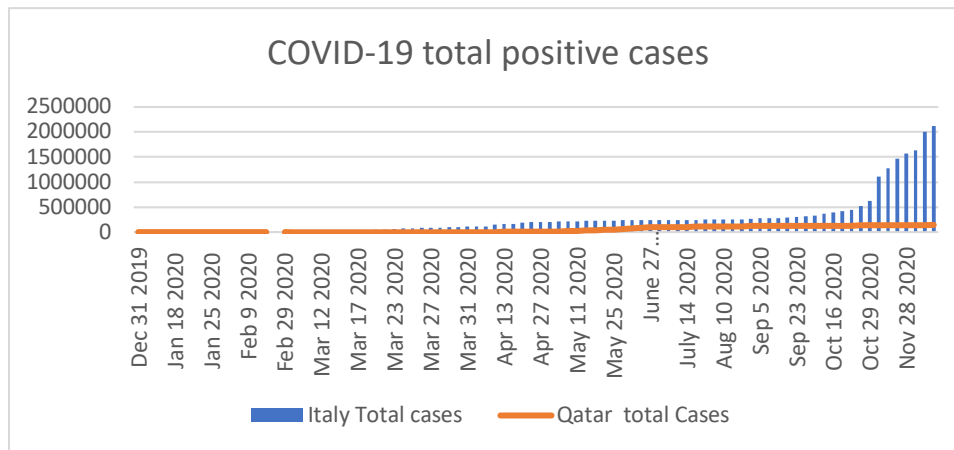


Table 4 demonstrates that the increase in volatility of the five industries calculated earlier is higher for Qatar indexes in all five industries as per point. In other words, Italy's industries were more volatile to the changes in the economic environment following the hit of Covid-19 than Qatar industries. This is demonstrated by the larger number of people infected in Italy than in Qatar as shown in Figure 5.

Table 4: Changes in volatility of Qatar and Italy industries during Covid-19

Indexes	Country	2018	2019	2020	Volatility increase/point
Banking sector	Qatar	365.0182	149.6342	168.9912	19.357
	Italy	1584.012	628.7779	1237.498	608.7201
Industrial sector	Qatar	201.1449	149.9527	306.4461	156.4934
	Italy	3953.146	1499.898	3762.284	2262.386
Insurance sector	Qatar	173.0395	214.4774	247.554	33.0766
	Italy	811.6878	1302.122	2136.857	834.735
Consumer goods and services sector	Qatar	612.6386	514.7948	557.2124	42.4176
	Italy	8174.536	7022.718	15162.57	8139.852
Telecommunication sector	Qatar	58.39136	37.70042	66.72209	29.02167
	Italy	1791.668	736.1039	967.4432	231.3393

4.4.Comparative analysis between Qatar and Italy indexes

Figure 6 shows that both Industrial Indexes were remarkably volatile to the changes caused by Covid-19 in the financial market. However, Italy industrial indexes in 2020 fell for an all-time low since 2018 which indicates the huge drop in the period of January 2020 in Figure 6 when it indicates that the volatility of the industrial index increased by 2262 points (Table 4).

Figure 6: Volatility of Qatar and Italy Industrial index to Covid-19

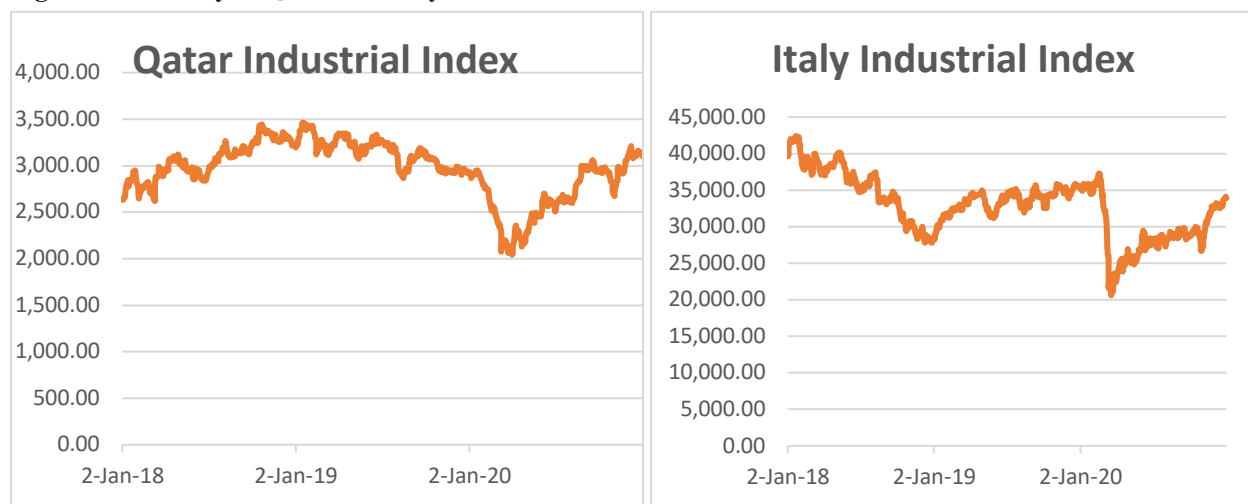
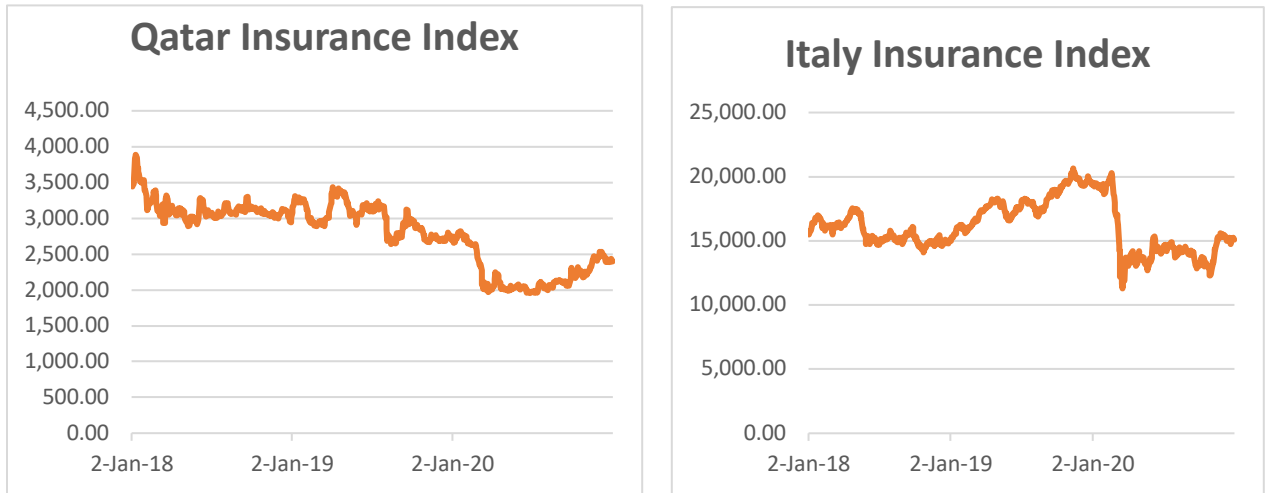


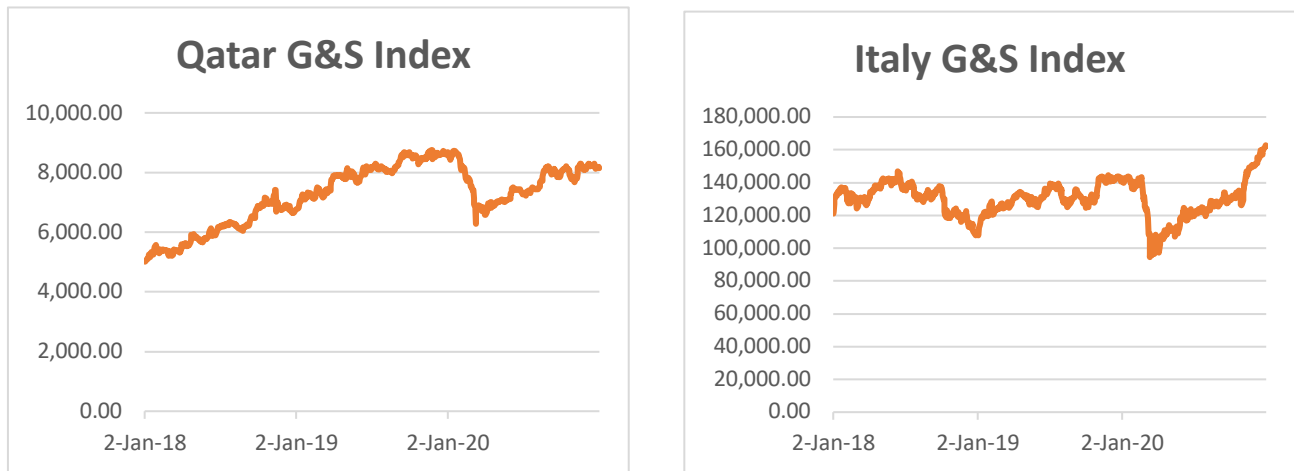
Figure 7 reveals that both indexes experienced a drop in their values. However, Italy insurance index was more volatile to Covid-19 hit and increased by 834 points while Qatar insurance index volatility only increased by 33 points in 2020 (Table 4).

Figure 7: Volatility of Italy and Qatar Insurance index to Covid-19



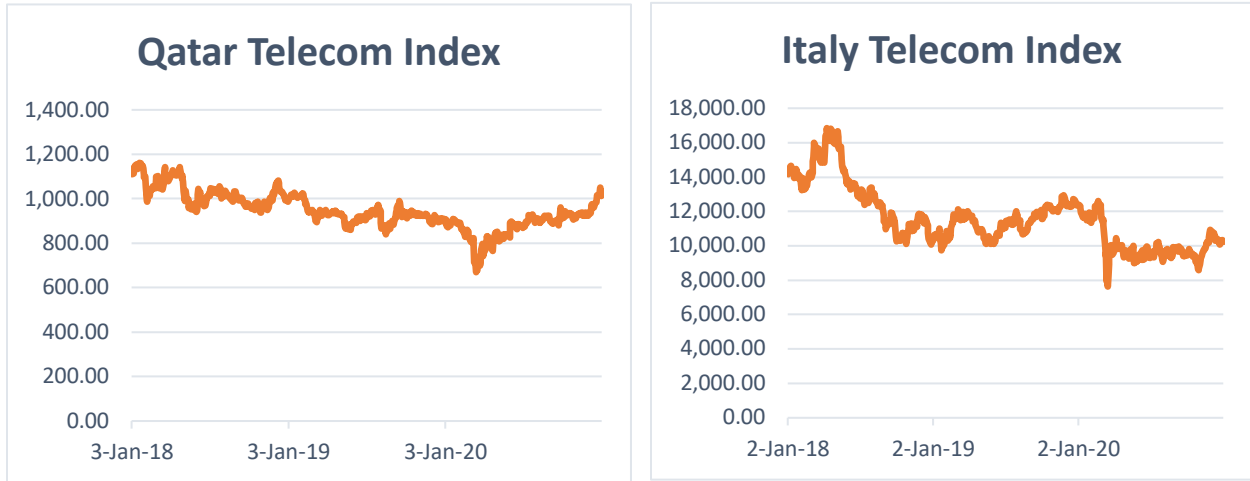
By referring to Figure 8, both Goods and Services indexes fell dramatically after the hit of Covid-19 which is stated by the increase of their volatility by 8139.35 points (Table 4). However, a recovery in the average prices occurred later in Italy after March's decrease in the number of positive cases.

Figure 8: Volatility of Italy and Qatar Goods and Services index to Covid-19



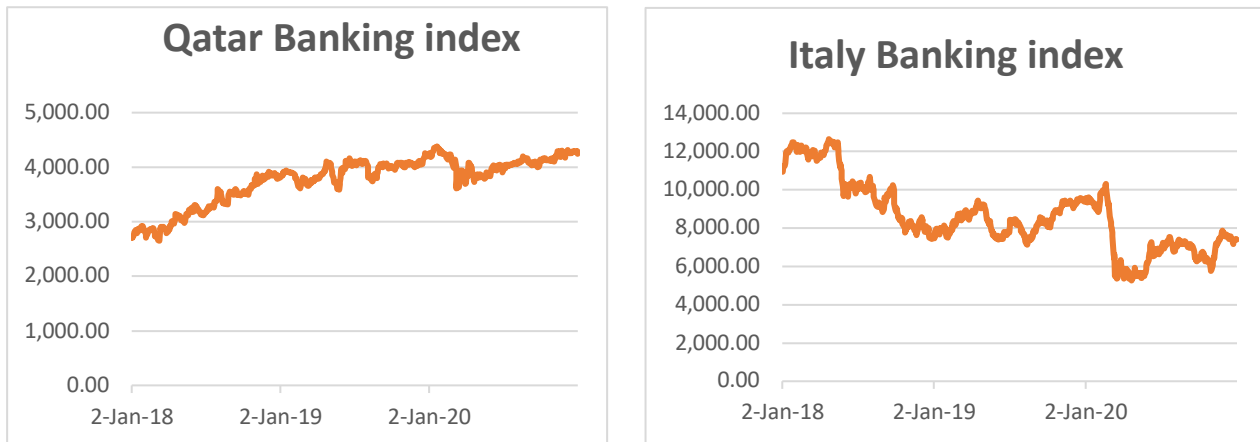
In addition, the volatility of Italy and Qatar Telecommunication indexes is presented in Figure 9. It is observed that Telecommunication indexes dropped during Covid-19 hit in Qatar and Italy. However, based on the volatility calculation, Italy Telecom index was more volatile to Covid-19 changes than Qatar telecom index, where the volatility increased by 231 points (Table 4).

Figure 9: Volatility of Italy and Qatar Telecommunication indexes to Covid-19



In refer to Figure 10, both indexes were volatile to the changes caused by Covid-19. However, by the period of March, Italy banking indexes were more volatile than Qatar Banking indexes (stated in Figure 10 Italy downfall pattern). This observation explains the results of the ratios in Table 4 where the volatility of Italy Banking index increased by 608.72, while the volatility of Qatar Banking index increased by only 19.35 points.

Figure 10: Volatility of Italy Banking index to Covid-19



5. Conclusion

This research purpose is to study the effect of Covid-19 on the stock market in Italy and Qatar for the period between 2019 and 2020. Based on five stock market indexes: Banking sector, industrial sector, insurance sector, consumer's goods and services sector and telecommunication sector in both Italy and Qatar, the result revealed the relationship between Covid-19 and the stock market industries. Volatility ratios (Standard deviation, Maximum drawdown ratios) indicate that both Qatar and Italy stock markets were volatile to Covid-19 and were affected by the changes that Covid-19 brought to the economic environment. These results come along with the theoretical part that indicates that investors prefer to hold cash over any other liquid holding, especially during crisis period. Decline in stock market investments was reflected by the decrease of prices on the stock market indexes and the increase of the MDD ratio. In addition, global trends on social media played an important role in increasing the effect of Covid-19 on different stock market industries whether positively such as the effect of Covid-19 on healthcare and information technology industries, or negatively such as its effect on the manufacturing industry.

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