

Impact of COVID-19 pandemic on some fiscal and monetary indicators in the kingdom of Saudi Arabia

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Abstract

Purpose – The purpose of this study is to investigate the impact of COVID-19 on some fiscal and monetary indicators in the Kingdom of Saudi Arabia.

Design/methodology/approach – The research relied on data, studies and reports issued by the International Monetary Fund, Arab Monetary Fund, Saudi Central Bank, Investing Website and the World in Data Website.

Findings – Many sectors have been affected by the COVID-19 pandemic, which outbreak has been associated with a high cost, in addition to increased inflation and prices, a result that was confirmed by the increase in consumer price indices for different sectors. The general consumer price index for the second period rose above that of the first period, while an upward shift occurred in the curve depicting the Saudi Riyal exchange rate against the United States (US) dollar during the second period above that of the first period, only in slope, due to outbreak of the pandemic. Impact of the number of daily new cases infected with COVID-19 was the highest on the opening and closing price indices of the food retail sector, the pharmaceutical sector and the transportation sector; while impact of the number of daily deaths by COVID-19 was the highest on the opening and closing price indices of the banking sector, the general index and the investment and finance sector. In addition, impact of the daily reproduction rate of COVID-19 was the highest on the opening price indices of the energy sector, the food production sector and the transportation sector.

Research limitations/implications – The research aims to demonstrate measures taken by the Kingdom of Saudi Arabia through fiscal and monetary policies.

Practical implications – The COVID-19 pandemic is still an ongoing global pandemic. The virus was first identified in Wuhan City in China at the beginning of December 2019. At the end of January 2020, the World Health Organization (WHO) declared that the outbreak of the virus represented a public health emergency, and later, on March 11, 2020, WHO declared the situation had transformed into a pandemic. Until January 17, 2022, the pandemic had caused more than 328 million cases and 545 million deaths, while 188 million of the cases had recovered. It is worth mentioning that the pandemic caused several social and economic disruptions, including a global economic recession; shortages in goods, supplies and equipment due to consumers' panic and thus tendency to buy; besides causing other disruptions like the negative impacts on health, as well as political, cultural, religious and sport events that influenced economic policies, including both the fiscal and monetary policies of world countries (Wikipedia, 2022).

Social implications – Social implications steps that taken to reduce the impacts of the COVID-19 pandemic, in addition to measuring the impacts of the COVID-19 pandemic (as the main event next to which other events fade up) on some of the fiscal and monetary indicators for the Kingdom of Saudi Arabia.

Originality/value – The research aims to demonstrate measures taken by the Kingdom of Saudi Arabia through fiscal and monetary policies to mitigate the impacts of the COVID-19 pandemic, in addition to measuring the impacts of the COVID-19 pandemic (as the main event next to which other events fade up) on some of the fiscal and monetary indicators for the Kingdom of Saudi Arabia.

Keywords KSA- COVID-19, Fiscal and monetary indicators, General consumer price index, US dollar exchange rate, Interbank offered rate, Money supply M3

Paper type Research paper



1. Introduction

The COVID-19 pandemic is still an ongoing global pandemic. The virus was first identified in Wuhan City in China at the beginning of December 2019. At the end of January 2020, the World Health Organization (WHO) declared that the outbreak of the virus represented a public health emergency, and later, on March 11, 2020, WHO declared the situation had transformed into a pandemic. Until January 17, 2022, the pandemic had caused more than 328 million cases and 545 million deaths, while 188 million of the cases had recovered. It is worth mentioning that the pandemic caused several social and economic disruptions, including a global economic recession; shortages in goods, supplies and equipment due to consumers' panic and thus tendency to buy; besides causing other disruptions like the negative impacts on health, as well as political, cultural, religious and sport events that influenced economic policies, including both the fiscal and monetary policies of world countries (Wikipedia, 2022).

The COVID-19 pandemic has resulted in a complete or partial economic shutdown as a result of precautionary measures taken by most countries around the world to contain and mitigate its effects, where supply disruptions occurred as a result of slowing production, as well as postponing investment plans and a sharp decline in export volumes and thus revenues. Demand also declined due to shortages in liquidity as a result of low incomes associated with reduced working hours and layoffs, which led to augmented unemployment. Financing, either for individuals or institutions, was also affected, which led to a decline in global growth, in addition to the impacts on both the fiscal and monetary sectors due to an imbalance in the performance of global financial markets resulting from the increased pressures on financial markets associated with the growing need to borrow.

The first case infected by coronavirus appeared in the Kingdom of Saudi Arabia on March 2, 2020. Until April 2022, the Kingdom of Saudi Arabia recorded approximately 751,518 confirmed cases, with approximately 736,316 recovered cases and nearly 9,054 confirmed deaths (Wikipedia, 2022).

2. Research problem

In light of the abovementioned impacts on the economic sector of various world countries, including the Kingdom of Saudi Arabia, and measures taken using fiscal and monetary policies' tools to mitigate and contain the economic impact of COVID-19, the research attempts, in light of fiscal and monetary policy responses, to answer the following question: What is the impact of the COVID-19 pandemic on some of the fiscal and monetary indicators in the Kingdom of Saudi Arabia?

3. Research objective

In light of the research problem, the research aims to demonstrate measures taken by the Kingdom of Saudi Arabia through fiscal and monetary policies to mitigate the impacts of the COVID-19 pandemic, in addition to measuring the impacts of the COVID-19 pandemic (as the main event next to which other events fade up) on some of the fiscal and monetary indicators for the Kingdom of Saudi Arabia.

4. Research methodology

The research relied on descriptive and econometric approaches to determine the extent to which some of the fiscal and monetary indicators have been affected by the outbreak of the COVID-19 pandemic. The research applied analysis of variance (ANOVA) to evaluate the difference between the means of two periods; the first period (9/2017 till 11/2019) represents the preCOVID-19 pandemic period, i.e. the period before taking measures to mitigate the impacts of COVID-19 pandemic, whereas the second period (12/2019 till 2/2022) represents the

post-COVID-19 period, i.e. the period after taking measures to mitigate the impacts of COVID-19 pandemic. The most important variables used include the General Consumer Price Index, Consumer Price Index for food and beverages, Consumer Price Index for health and Consumer Price Index for restaurants and hotels (2018 = 100), (Indices are defined as relative numbers, or a statistical indicators, that measure the relative change in one phenomenon or more, and can be obtained by calculating the ratio between the value of the phenomenon in the comparison period and its value in the base period), as well as the United States (US) dollar exchange rate, Euro exchange rate, interbank offered rate interbank offered rates (IBORs) are benchmark rates at which major global banks lend to one another in the international interbank market for short-term loans) and money supply M3.

Dummy variables were also used, which is a method applied to measure qualitative changes, in order to measure impacts of the pandemic on some fiscal and monetary indicators (Attiah, 2005; Rihan, 2021) for the same previously mentioned variables, as follows:

$$Y = \alpha + \beta_1 t + \beta_2 d + \beta_3 dt$$

where,

t represents the time period (9/2017 till 2/2022),

d represents the dummy variable that takes the value zero for the pre-COVID-19 pandemic period, and the value 1 for the post-COVID-19 pandemic period,

dt is the product of multiplying the dummy variable (d) by time (t). Therefore:

When $d = 0$, the constant = α , and the slope = β_1

When $d = 1$, the constant = $+\alpha\beta_2$, and the slope = $\beta_1 + \beta_3$

There are three cases for the occurrence of the impact, these are:

The impact occurs in the constant, and thus a shift occurs in the intersection with the vertical axis, either downward or upward.

The impact occurs in the slope, and thus a change occurs in the angle of intersection with the vertical axis, either an increase or decrease.

The impact occurs in both the constant and the slope, and thus a shift occurs in intersection with the vertical axis, whether downward or upward. A change in the angle of intersection with the vertical axis also occurs, whether an increase or decrease.

Regression analysis was also applied to measure the pandemic's impact on some fiscal and monetary indicators (Attiah, 2005; Rihan, 2021) as follows:

$$\text{Dependent Var.} = f(\text{new_cases}_t)$$

$$\text{Dependent Var.} = f(\text{new_deaths})$$

$$\text{Dependent Var.} = f(\text{reproduction_rate}_t)$$

where,

Dependent Var. refers to the dependent variables representing daily closing price, daily opening price, and daily trading volume for the study variables, including the general index of Saudi Arabia Stock Market (TASI), Food production Sector Index (TFBI), Investment and Financial Sector Index (TDFI), Banking Sector Index (TBNI), Retail Food Sector Index (TFSI), Medical Drug Sector Index (TPBI), Health Care Sector Index (THEI), Energy Sector Index (TENI) and Transportation Sector Index (TTNI) as the main sectors affected by COVID-19

pandemic. The variables (*new_cases*, *new_deaths* and *reproduction_rates*) are independent (exogenous) variables representing the number of daily new cases infected by COVID-19, number of daily deaths due to COVID-19 and daily reproduction rate of COVID-19, respectively, over the period from March 2, 2020 till March 21, 2022.

5. Sources of data

The research relied on data, studies and reports issued by the International Monetary Fund, Arab Monetary Fund, Saudi Central Bank, Investing Website and our World in Data Website.

6. Theoretical framework and review of literature

6.1 Theoretical framework

In 2020, Arab Countries, including the Kingdom of Saudi Arabia, witnessed major challenges pertinent to the economic and financial repercussions of the COVID-19 pandemic due to the high cost of financial incentive packages adopted by the Saudi Government to revive economic activities, which affected revenues, expenditures, deficits and public debt. Declines in crude oil prices in world markets added extra challenge to the situation. Accordingly, the Kingdom of Saudi Arabia implemented a set of stringent measures to control the pandemic, including: curfew; travel restrictions, whether international or internal; suspending prayers in mosques; closing schools, universities and shopping centers; suspending the attendance of employees in governmental and private workplaces (with the exception of important employees); building new temporary hospitals to accommodate the possible increase in the number of patients; providing temporary housing and flights to return to the homeland for expatriates; and restricting the Hajj season to only 1000 pilgrims for the year 2020.

On May 26, 2020, a 3-phase plan was announced to drop restrictions, which led to almost reopening the economy. Umrah performance was resumed on October 4 for citizens and residents with a preliminary capacity of 30%, while the second stage started in October 18 with a capacity of 75%. On November 1, Umrah was resumed for foreign pilgrims between the ages of 18–50 years and International Travels were resumed on May 17, 2021. On June 12, 2021, the Kingdom of Saudi Arabia announced increasing attendance of the 2021 pilgrimage season, which started in mid-July, to 60,000 citizens and residents. Vaccination began in mid-December 2020, upon which more than 17.6 million doses of vaccines, or 51 per 100 people, were given.

Real oil gross domestic product (GDP) contracted by 6.7% in 2020, while nonoil real GDP declined by 2.3% in 2020, but grew by 5.6% during the second half of 2020 (compared to the first half of 2020), and by 2.9% year-over-year in Q1/2021. Recovery continued into early Q2/2021.

Through the Ministry of Finance and the Central Bank, the Kingdom of Saudi Arabia adopted stimulus packages and announced that such packages target the business sector in terms of exemption and postponing some government financial dues, extending the submission of tax declarations, as well as postponing the payment of income tax, value-added tax, selective tax and Zakat, in addition to accelerating requests for value-added tax refunds, suspending the implementation of penalties on delayed payment of installments and fines for taxpayers, postponing the payment of some governmental services' fees and municipal fees for a 3-month period, with the possibility of extending the postponement period beyond 30 days for the most affected sectors, and exempting expatriates whose resident visa has expired from financial compensation and visa fees. The KSA also adopted the initiative that the government bears 60% of the salaries of private sector workers for a 3-month period (the [Arab Monetary Fund, 2021, 2022](#); [Abd El-Moneim and Talha, 2020](#); [International Monetary Fund, 2022](#)).

6.2 Fiscal policy and monetary policy

Fiscal policy has several definitions, including that it can be defined as “the set of policies related to public revenues and public expenditures with the intent of achieving specific goals”

(Hussein, 1988). It can also be defined as “the policy of using various public financial tools, including government revenue and expenditure programs, to bring about a change in macroeconomic variables such as national product, employment, savings and investment to achieve the desired impacts and reduce undesired impacts on economic variables, such as the national income and national product, employment rate as well as other variables (Al-Wadi and Azzam, 2000). It can also be defined as “the set of goals, mechanisms, activities and procedures adopted and implemented by the country to influence the national economy and the society to develop such society, maintain its general stability, and address existing problems” (Heikal, 1980). Fiscal policy mainly aims to achieve optimal use of economic resources to reach the level of full employment, achieve stability in the general level of prices, boost economic growth rates, redistribute income in a fair manner and achieve welfare of the society, which can be realized by implementing its tools such as: public revenues from progressive or proportional taxes; transfer payments, including transfers in the form of aid or subsidies from the government to the family sector, or support policies for the production sectors within the country, general government spending, taxes and public loan (Bilhaj, 2016).

Monetary policy, on the other hand, is defined as “the set of measures taken by the monetary authorities with the objective of influencing the economy and ensure stability of exchange rates” (Bukhari, 2010). It is also defined as “all monetary decisions and actions, regardless of whether their objectives are monetary or not, and all non-monetary measures that aim at influencing the monetary system” (Saleh, 2005). Monetary policy aims to achieve stability of prices and exchange rate, meet the requirements of economic sectors and absorb shocks caused by economic fluctuations, which can be realized by implementing its tools such as: discount rates, legal reserve, open market operations, minimum liquidity ratio, conditional advance deposits for imports, interest rate and exchange rate (Al-Hawass, 2021a, b).

Despite variations in the scope of fiscal and monetary policies’ impacts on countries’ economy, the effect and mutual coordination between them has effective impact on the economies of countries, where together they can affect the volume and level of aggregate demand through different channels, and thus cannot replace one another but rather coordinate to achieve economic growth, where several differences exist between them (Khalaf, 2016), including the following:

	Fiscal Policy	Monetary Policy
Performed Activities	The Government or Executive Entity in the Country	Central Bank in the Country
Related to	Government Expenditure and Taxes	Pumping or reining in money inside the Country
Focus on	Measuring Government Spending and Taxes	Measuring Interest Rate
Affect	Budget Deficit	Cost of Borrowing and Mortgages

The top priority of financial and monetary policies' response is reflected in providing health expenditure, either for the health of individuals, caring for patients, reducing virus transmission, ensuring the production of medical supplies or mitigating the economic impact of the pandemic through cash transfers, wage support, tax reduction, providing liquidity to small and medium enterprises, or directing liquidity towards the most affected sectors, in addition to supporting demand, ensuring the adequacy of credit supply, and providing liquidity to balance the risk of financial stability (Werner, 2020; Georgieva, 2020a, b).

Financial and Monetary Policies' Response (International Monetary Fund, 2022): A support package for the private sector worth 70 billion Saudi Riyals (US\$18.7 billion or 2.7% of GDP) was announced on March 20, 2020. The package included suspending government tax payments, fees and other dues to provide liquidity for the private sector and increase the financing available through the National Development Fund. The government reallocated the budget to increase available resources for the Ministry of Health to combat the virus.

On April 3, 2020, the government allowed the use of the unemployment insurance fund Customer Support and Monitoring System (SANED) to provide wage benefits support, within certain limits, for private sector companies that retain their Saudi employees (6 Billion Saudi Riyals accounting for 0.2% of the Saudi GDP in 2020). Restrictions on the movement of expatriate employees and their contractual arrangements have also been eased.

On April 15, 2020, additional measures were announced to mitigate impacts on the private sector, including temporary electricity subsidies for the commercial, industrial and agricultural sectors (0.9 billion Saudi Riyals).

On May 10, the Saudi Ministry of Finance announced new financial measures to increase nonoil revenues and rationalize spending including suspending the cost of living allowance for public sector employees as of June first, 2020, and raising the value-added tax threefold, from 5% to 15% as of July first, 2020.

At the end of May 2020, the General Authority of Saudi Customs announced an increase in the rate of customs duties on a range of imported goods, which entered into force on June 20, 2020.

On July 14, the Saudi Ministry of Finance launched a 670-million Saudi Riyals program to help companies defer repayment of loans due in 2020. Deferred tax payments from March 18 to the end of June, 2020, have almost been fully repaid by the end of 2020, and thus most of the financial support has been withdrawn. The wage support program through SANED unemployment insurance fund has been extended until July 2021, but only for sectors still affected by the pandemic.

The Saudi Central Bank (SAMA) has cut sovereign bond yield twice in March, and lowered reverse repo and repo rates by 1.25% points to 0.5 and 1%, respectively. On March 14, the Monetary Agency unveiled a package worth 50 billion Saudi Riyals (US\$13.3 billion, or 2.0% of the GDP) to support the private sector, especially small and medium enterprises, by providing financing and guarantees to banks to allow them defer repayment of existing loans and increase lending to companies.

The Central Bank also covered the fees of all private sector stores and entities for point-of-sale (POS) transactions and e-commerce as of March 14, until the end of September. The Saudi Arabian Monetary Agency also directed banks to postpone the repayment of loans disbursed to all Saudi employees for a 3-month period, from March to June, without additional fees to provide the financing necessary for customers who lost their jobs, as well as exempting customers from various banking fees.

On June 1, the Monetary Agency announced pumping 50 billion Saudi Riyals into the banking sector through deposits to support banking liquidity and private sector credit. The loan guarantee program of the Saudi Arabian Monetary Agency expired at the end of December 2020. The deferred payments program was extended until the end of September

2021, while the guaranteed facility program was extended until March 14, 2022. No measures were taken regarding exchange rate and the balance of payments.

6.3 Review of literature

A study conducted by [Ahmed and Al-Tahir \(2020\)](#) concluded that the impacts were sharp in the short term due to the decline in the growth of global manufacturing, and that the services sector might be the most affected. All such factors led to the demobilization of workers and exacerbation of the unemployment crisis. As for the medium term, all scenarios, either optimistic or pessimistic, prove continuity of the pandemic's impacts on the global economy.

Another study that was conducted by [Sabbagh \(2020\)](#) to demonstrate the impact of the spread of coronavirus on the global economy revealed that repercussions of such crisis are the worst and the most influential compared to previous crises, where it caused negative impacts on the financial, economic and social aspects, in addition to huge human losses the world has all witnessed. However, while many economic sectors were adversely affected, such as the tourism and aviation sectors, other sectors have made gains like the pharmaceutical industry, the masks industry as well as the digital economy. It was found that the environment is the largest beneficiary of the crisis repercussions, where thousands of factories around the world have stopped pumping their toxic gases, which resulted in a noticeable decline in carbon dioxide emissions. The occurrence of changes in the mechanisms of the global economic system's map is also certain after the COVID-19 pandemic.

Moreover, a study conducted by [Salah El-Deen \(2020\)](#) concluded that the COVID-19 pandemic has caused severe repercussions on the global economy, as well as the Algerian economy, on which impacts of the pandemic have been aggravated by deteriorations of global oil prices and the decline in demand for hydrocarbons. The study praised Algerian economic policy's response to repercussions of the pandemic, proposed a set of solutions to enhance Algerian economy's ability to overcome repercussions associated with the crisis, and stressed the importance of the new economic model in achieving welfare and development.

The study conducted by [Bozifi and Heiba \(2021\)](#) concluded that global spread of the COVID-19 pandemic caused huge losses to film production and distribution companies due to the considerable decline in revenues from the global box office, as well as the decline in the value of their financial stocks after closure of more than 82 thousand cinema halls in the United States, China and countries of the European Union since early March 2020, which made major film production companies think seriously about investing more in digital and video-on-demand platforms on the internet that represented a valuable opportunity for them to realize huge profits they never realized in the past years.

A study conducted by [Saadeh \(2021\)](#) concluded that the COVID-19 pandemic resulted in an economic depression, unprecedented since the Second World War. Both the tourism and labor sectors have been the most affected economic sectors. The study also concluded that many sectors witnessed great recovery, especially the transformative industry sector, as a result of canceling the closure procedures and some other measures that have been taken by many governments and global economic organizations to reduce economic impacts of the pandemic.

The study conducted by [Kholifi \(2021\)](#) concluded that the COVID-19 crisis caused severe and negative impacts on the performance of the Tunisian tourism season for the year 2020, as 95% of the hotels were closed, and 80% of the flights were canceled despite the partial cancellation of banning international travel.

A research was conducted by [Al-Karbouli \(2021\)](#) to study the impact of the COVID-19 pandemic on a targeted sample of low-income individuals and day-laborer with the help of a questionnaire form, and to study some of the population characteristics (size, relative and density dispersion, as well as population growth rate), and some of the economic and social

characteristics related to the research subject. Results revealed clear difference between individual's income and the nature of his work before and during the COVID-19 pandemic due to full closure by the National Crisis Management Cell, which prompted most of them to change the nature of their work due to the need and surrounding circumstances that banned the transformation or closure of some professions, such as popular food restaurants, barber shops, sellers in vegetable markets and others, where losing their daily work means losing the monthly or daily income they spend on their families.

Results of the study conducted by [Ahmed and Rashid \(2022\)](#) revealed contraction in the size of development projects compared to financial allocations from crude oil revenues to confront the impacts of COVID-19 pandemic, and that severity of the issue aggravated by the decline in crude oil prices, which negatively affected economic development.

A study conducted by [Al-Hawass \(2021a, b\)](#) concluded that monetary policy came on top of the policies that quickly responded to addressing repercussions of the COVID-19 pandemic, and that such response has been achieved by adopting a set of measures and procedures that helped increase spending on the health sector; expand cash transfers and support wages; provide support to the most vulnerable sectors, business owners and the unemployed; expand unemployment insurance and benefits; expand social aid; and defer due taxes.

A study conducted by [Al-Hawass \(2021a, b\)](#) concluded that monetary policy is one of the policies that rapidly responded to confronting repercussions of the COVID-19 pandemic based on measures that centered on the work of central banks to support the facilitation of financial conditions, ensuring the flow of credit to the real sector, and enhancing liquidity in financial markets, both domestic and international. Therefore, interest rates were lowered in many countries, and main central banks activated currency exchange lines and established new lines to ease pressure on financial markets. Regulatory and supervisory authorities responded to maintain financial stability and integrity of the banking system and maintain the continuity of economic activity.

The study conducted by [Saliha, 2021a, b\)](#) with the objective of trying to define the impacts of the COVID-19 pandemic on Arab countries' labor markets and associated procedures, including partial and full closure of economic institutions, in addition to analyzing labor market policies that Arab countries have followed to counter repercussions of the pandemic, where the economic crisis that resulted from the outbreak of coronavirus led to millions of workers losing their jobs, as well as the decline in job opportunities in all sectors, which greatly contributed to exacerbating the problem of unemployment due to increased number of unemployed individuals, in addition to causing harm to economic institutions or declaration of bankruptcy by a number of them.

A research paper written by [Saliha \(2021a, b\)](#) also aimed at studying the impacts of COVID-19 pandemic on e-commerce at the global level in general, and Algeria in particular. The paper concluded that social spacing and quarantine imposed by various countries, in addition to the wide use of the internet, increased individuals' tendency to use e-commerce, indicating that COVID-19 pandemic confirmed that electronic commerce is the most successful solution in light of the comprehensive closure procedures.

7. Results

Analysis of Variance: Results presented in [Table 1](#) indicate that the values of index numbers in the second period (December 2019–February 2022) are statistically significant higher than those in the first period (September 2017–December 2019), whether the consumer price index for food and beverages, consumer price index for health, consumer price index for restaurants and hotels, or the general consumer price index, which means that each of these sectors has been affected by the COVID-19 pandemic and associated high cost, considering that such

index numbers express the most important sectors that have direct relationship with the procedures related to precautions taken to confront the pandemic.

Results also indicate that changes in Saudi Riyal exchange rates against both the US dollar and the Euro are not statistically significant, indicating the strength and stability of the Saudi Riyal in the face of economic crises. However, the decline in IBORs proved statistically significant, indicating a statistically significant decline in the cost of lending between banks, and a statistically significant increase in money supply M3, which may indicate an increase in inflation and prices, a result that has been confirmed by the increase in consumer price indices of various sectors.

- (1) *Dummy variables analysis*: dummy variables were used to determine whether an actual impact of the pandemic rather than time trend of the variable exists. Results indicate a statistically significant impact of the dummy variable representing the pandemic on the general consumer price index, and Saudi Riyal exchange rate against US dollar, where the difference between the constant of the second period's equation and that of the first period reached 0.03 and 0.52, respectively, while the difference between the slope of the second period's equation and that of the first period reached 0.32 and 0.03, respectively, indicating an upward shift in the general consumer price index curve depicting the second period above that depicting the first period, in addition to an upward shift in the curve depicting Saudi Riyal's exchange rate against US dollar in the second period above that of the first period, only in slope, which may mean an upward change in both of them due to the pandemic. It is also clear that the change that occurred in other variables is attributed to change in time rather than what has occurred due to the pandemic [Table 2](#).
- (2) *Regression Analysis*: Results presented in [Table 3](#) indicate a statistically significant impact of the number of daily new cases infected with COVID-19 on most indices of daily closing price, daily opening price and daily trading volume for different sectors. Finding indicates the following:
 - A positive impact of the number of daily new cases infected with COVID-19 on some indices concerning different sectors. However, it did not prove to be statistically significant.
 - A negative impact of the number of daily new cases infected with COVID-19 on most indices concerning different sectors, which proved statistically significant for most cases.

Indicators	First period Average	Second period Average	F	Sig
Consumer Price General Index 2018 = 100	98.7	102.9	53.2	0.00
Consumer Price Index for Food and beverages 2018 = 100	99.9	114.2	153.6	0.00
Consumer Price Index for Health 2018 = 100	99.5	102.1	46.0	0.00
Consumer Price Index for Restaurants and Hotels 2018 = 100	100.2	110.2	94.3	0.00
Exchange Rate of U.S. Dollar	3.8	3.8		
Exchange Rate of Euro	4.3	4.3	0.1	0.75
Interbank Interest Rate	2.4	1.1	149.3	0.00
Money Supply M3	1832915.8	2149924.3	191.1	0.00
M3 = Money Supply M2 + Other Quasi – Money Deposits				
M2 = Money Supply M1 + Time & Savings Deposits				
M1 = Demand Deposits + Currency Outside Banks				

Source(s): Saudi Central Bank, database

Table 1.
Analysis of variance for some financial and monetary indicators of Saudi Arabia during two periods (September 2017–December 2019), (December 2019–February 2022)

Indicators		B	t	Sig	Adjusted R square	F	Sig
Consumer Price General Index 2018 = 100	Constant	99.31	180.77	0.00	0.78	63.47	0.00
	t	-0.04	-1.26	0.22	Effect	First Period	Second Period
	d	-7.96	-5.20	0.00	Constant	99.31	91.34
Consumer Price Index for Food and beverages 2018 = 100	Constant	95.71	108.56	0.00	0.93	229.71	0.00
	t	0.30	5.49	0.00	Effect	First Period	Second Period
	d	-4.83	-1.96	0.06	Constant	95.71	90.88
Consumer Price Index for Health 2018 = 100	Constant	97.82	250.44	0.00	0.72	47.58	0.00
	t	0.12	4.91	0.00	Effect	First Period	Second Period
	d	-1.07	-0.98	0.33	Constant	97.82	96.75
Consumer Price Index for Restaurants and Hotels 2018 = 100	Constant	94.61	131.07	0.00	0.91	190.33	0.00
	t	0.40	8.93	0.00	Effect	First Period	Second Period
	d	-2.06	-1.02	0.31	Constant	94.61	92.55
Exchange Rate of U.S. Dollar	Constant	4.56	95.08	0.00	0.39	12.15	0.00
	t	-0.02	-5.47	0.00	Effect	First Period	Second Period
	d	-0.52	-3.92	0.00	Constant	4.56	4.04
Exchange rate of Euro	Constant	2.07	16.33	0.00	0.84	92.58	0.00
	t	0.03	4.01	0.00	Effect	First Period	Second Period
	d	0.19	0.54	0.59	Constant	2.07	2.27
Interbank interest rate	Constant	1.47	11.22	0.00	0.83	85.88	0.00
	t	0.04	4.56	0.00	Effect	First Period	Second Period
	d	-0.06	-5.28	0.00	Slope	0.03	-0.03
Money supply M3	Constant	1.99	15.32	0.00	0.84	92.35	0.00
	t	0.03	3.97	0.00	Effect	First Period	Second Period
	d	0.50	1.37	0.18	Constant	1.99	2.49
	dt	-0.07	-5.87	0.00	Slope	0.03	-0.04

Table 2.

Analyzing dummy variables for some financial and monetary indicators of Saudi Arabia during two periods (September 2017–December 2019), (December 2019–February 2022)

Source(s): Saudi Central Bank, database

- Impact of the number of daily new cases infected with COVID-19 is the highest on the closing price indices of the food retail sector, the pharmaceutical sector, and the transportation sector, with impact values amounting to -0.187 , -0.182 and -0.174 , respectively, while the closing price indices of the food production sector and the health care sector are the least affected, with impact values amounting to -0.104 and -0.112 , respectively.
- Impact of the number of daily new cases infected with COVID-19 is the highest on the opening price indices of the food retail sector, the pharmaceutical sector, and the transportation sector, with impact values amounting to -0.189 , -0.186 , and

Dependent variables			Unstand. Coeff	Stand. Coeff	R Square	t	Sig
General indicator	Closing price	constant	9623.509		0.002	92.00	0.00
		slope	-0.069	-0.046		-1.04	0.30
	Opening price	constant	9620.409		0.002	92.02	0.00
slope		-0.074	-0.049		-1.12	0.26	
Food production sector	Trading volume	constant	300682834.687		0.016	43.94	0.00
		slope	-12675.153	-0.127		-2.91	0.00
	Closing price	constant	5359.551		0.011	189.29	0.00
slope		-0.043	-0.104		-2.37	0.02	
Investment and finance sector	Opening price	constant	5362.760		0.013	188.22	0.00
		slope	-0.046	-0.112		-2.55	0.01
	Trading volume	constant	14964024.083		0.001	22.50	0.00
slope		-343.003	-0.036		-0.81	0.42	
Banking sector	Closing price	constant	5680.031		0.007	53.68	0.00
		slope	-0.125	-0.081		-1.85	0.06
	Opening price	constant	5683.103		0.007	53.58	0.00
slope		-0.130	-0.085		-1.92	0.06	
Food retail sector	Trading volume	constant	7694708.099		0.004	18.09	0.00
		slope	-408.641	-0.066		-1.51	0.13
	Closing price	constant	9110.445		0.001	64.14	0.00
slope		0.060	0.029		0.66	0.51	
Pharmaceutical sector	Opening price	constant	9103.852		0.001	64.25	0.00
		slope	0.055	0.027		0.61	0.54
	Trading volume	constant	34484261.907		0.000	31.54	0.00
slope		158.465	0.010		0.23	0.82	
Healthcare sector	Closing price	constant	10011.648		0.035	156.57	0.00
		slope	-0.176	-0.187		-4.32	0.00
	Opening price	constant	10010.708		0.036	155.27	0.00
slope		-0.179	-0.189		-4.36	0.00	
Energy sector	Trading volume	constant	2224437.774		0.002	15.35	0.00
		slope	-93.592	-0.045		-1.01	0.31
	Closing price	constant	5310.026		0.033	86.67	0.00
slope		-0.163	-0.182		-4.18	0.00	
Energy sector	Opening price	constant	5317.169		0.035	86.41	0.00
		slope	-0.168	-0.186		-4.29	0.00
	Trading volume	constant	576639.423		0.007	14.14	0.00
slope		-48.760	-0.083		-1.88	0.06	
Energy sector	Closing price	constant	6281.027		0.013	69.92	0.00
		slope	-0.146	-0.112		-2.56	0.01
	Opening price	constant	6277.130		0.013	69.85	0.00
slope		-0.151	-0.116		-2.63	0.01	
Energy sector	Trading volume	constant	5037286.669		0.009	22.07	0.00
		slope	-321.965	-0.097		-2.21	0.03
	Closing price	constant	5456.428		0.021	252.47	0.00
slope		-0.045	-0.144		-3.29	0.00	
Energy sector	Opening price	constant	5454.978		0.023	253.47	0.00
		slope	-0.048	-0.153		-3.50	0.00
	Trading volume	constant	15267401.731		0.033	29.05	0.00
slope		-1391.189	-0.181		-4.15	0.00	

Table 3. Regression analysis of impact of number of daily new cases of COVID-19 on some financial and monetary indicators of Saudi Arabia during period (March 2, 2020–March 21, 2022)

(continued)

Dependent variables			Unstand. Coeff	Stand. Coeff	R Square	t	Sig
Transport sector	Closing price	constant	5138.745		0.030	93.12	0.00
		slope	-0.141	-0.174		-4.00	0.00
	Opening price	constant	5143.659		0.032	92.96	0.00
		slope	-0.145	-0.179		-4.11	0.00
	Trading volume	constant	7004504.718		0.005	27.38	0.00
		slope	-258.058	-0.070		-1.58	0.11

Source(s): Investing

<https://sa.investing.com/indices/saudi-arabia-indices?&majorIndices = on&primarySectors = on>

-Our world in data

<https://ourworldindata.org/>

<https://ourworldindata.org/coronavirus>

<https://github.com/owid/covid-19-data/tree/master/public/data>

Table 3.

-0.179, respectively, while the opening price indices of the food production sector and the health care sector are the least affected, with impact values amounting to -0.112 and -0.116, respectively.

- Impact of the number of daily new cases infected with COVID-19 is the highest on the trading volume index of the energy sector, with impact value amounting to -0.181, while the least affected trading volume index is that of the health care sector, with impact value amounting to -0.097.

Results in [Table 4](#) indicate a statistically significant impact of the number of daily deaths by COVID-19 on most of the daily closing price and daily opening price indices, and daily trading volume for different sectors. Findings indicate the following:

- (1) A positive impact of the number of daily deaths by COVID-19 on some of the indices for different sectors, which proved statistically significant.
- (2) A negative impact of the number of daily deaths by COVID-19 on most of the indices for different sectors, which proved statistically significant.
- (3) Impact of the number of daily deaths by COVID-19 is the highest on the closing price indices of the banking sector, the general index and the investment and finance sector, with impact values amounting to -0.507, -0.473 and -0.465, respectively, while the closing price indices of the retail food sector and the pharmaceutical sector are the least affected, with impact values amounting to 0.153 and -0.264, respectively.
- (4) Impact of the number of daily deaths by COVID-19 is the highest on the opening price indices of the banking sector, the general index and the investment and finance sector, with impact values amounting to -0.508, -0.475 and -0.467, respectively, while the least affected opening price indices are those of the retail food sector and the pharmaceutical sector, where impact values reached 0.148 and -0.270, respectively.
- (5) Impact of the number of daily deaths by COVID-19 is the highest on the trading volume index of the food production sector, with impact value amounting to 0.387, while the least affected trading volume index is that of the banking sector, with impact value amounting to 0.098.

Results in [Table 5](#) indicate a statistically significant impact of the daily reproduction rate of COVID-19 on most of the daily closing price and daily opening price indices and the daily trading volume for different sectors. Findings indicate the following:

Dependent variables			Unstand. Coeff	Stand. Coeff	R Square	t	Sig
General indicator	Closing price	constant	10371.101		0.224	104.99	0.00
		slope	-70.035	-0.473		-12.15	0.00
	Opening price	constant	10365.902		0.225	105.08	0.00
slope		-70.268	-0.475		-12.20	0.00	
Food production sector	Trading volume	constant	245107327.536		0.145	35.89	0.00
		slope	3719460.566	0.381		9.33	0.00
	Closing price	constant	5186.874		0.078	177.26	0.00
slope		11.278	0.280		6.60	0.00	
Investment and finance sector	Opening price	constant	5189.853		0.074	175.65	0.00
		slope	11.003	0.271		6.38	0.00
	Trading volume	constant	10390759.640		0.150	15.81	0.00
slope		364427.277	0.387		9.50	0.00	
Banking sector	Closing price	constant	6370.699		0.216	63.29	0.00
		slope	-69.760	-0.465		-11.87	0.00
	Opening price	constant	6374.128		0.218	63.22	0.00
slope		-70.238	-0.467		-11.94	0.00	
Food retail sector	Trading volume	constant	6953899.100		0.002	15.25	0.00
		slope	29598.937	0.049		1.11	0.27
	Closing price	constant	10354.377		0.257	78.96	0.00
slope		-101.906	-0.507		-13.31	0.00	
Pharmaceutical sector	Opening price	constant	10341.939		0.258	79.11	0.00
		slope	-101.801	-0.508		-13.34	0.00
	Trading volume	constant	32868535.710		0.010	28.22	0.00
slope		152063.642	0.098		2.24	0.03	
Healthcare sector	Closing price	constant	9676.835		0.023	140.49	0.00
		slope	14.106	0.153		3.51	0.00
	Opening price	constant	9676.618		0.022	139.18	0.00
slope		13.765	0.148		3.39	0.00	
Energy sector	Trading volume	constant	2040166.347		0.002	13.15	0.00
		slope	8034.014	0.039		0.89	0.38
	Closing price	constant	5422.739		0.070	84.29	0.00
slope		-23.293	-0.264		-6.20	0.00	
Transport sector	Opening price	constant	5432.269		0.073	84.14	0.00
		slope	-23.913	-0.270		-6.35	0.00
	Trading volume	constant	402009.327		0.036	9.34	0.00
slope		10942.733	0.189		4.36	0.00	
Transport sector	Closing price	constant	6764.958		0.177	77.04	0.00
		slope	-53.800	-0.421		-10.50	0.00
	Opening price	constant	6761.068		0.179	77.04	0.00
slope		-54.173	-0.423		-10.58	0.00	
Transport sector	Trading volume	constant	4432475.989		0.006	18.10	0.00
		slope	25136.904	0.078		1.76	0.08
	Closing price	constant	5508.742		0.072	244.52	0.00
slope		-8.278	-0.268		-6.30	0.00	
Transport sector	Opening price	constant	5505.081		0.073	245.18	0.00
		slope	-8.303	-0.270		-6.34	0.00
	Trading volume	constant	13171231.663		0.007	23.11	0.00
slope		64169.357	0.085		1.93	0.06	
Transport sector	Closing price	constant	5352.625		0.144	96.44	0.00
		slope	-30.122	-0.380		-9.30	0.00
	Opening price	constant	5358.903		0.148	96.42	0.00
slope		-30.597	-0.385		-9.43	0.00	
Transport sector	Trading volume	constant	6491595.511		0.004	23.69	0.00
		slope	22566.445	0.062		1.41	0.16

Source(s): Investing

- <https://sa.investing.com/indices/saudi-arabia-indices?&majorIndices=on&primarySectors=on>
- Our world in data
- <https://ourworldindata.org/>
- <https://ourworldindata.org/coronavirus>
- <https://github.com/owid/covid-19-data/tree/master/public/data>

Table 4.
Regression analysis of
impact of number of
daily deaths of
COVID-19 on some
financial and monetary
indicators of Saudi
Arabia during period
(March 2, 2020–March
21, 2022)

Dependent variables			Unstand. Coeff	Stand. Coeff	R Square	t	Sig
General indicator	Closing price	constant	10712.311		0.052	45.37	0.00
		slope	-1145.863	-0.227		-5.26	0.00
	Opening price	constant	10729.403		0.054	45.52	0.00
		slope	-1170.467	-0.232		-5.38	0.00
Food production sector	Trading volume	constant	336365725.703		0.019	21.16	0.00
		slope	-46688755.739	-0.140		-3.18	0.00
	Closing price	constant	5828.336		0.131	94.36	0.00
		slope	-498.725	-0.361		-8.76	0.00
Investment and finance sector	Opening price	constant	5839.777		0.135	94.10	0.00
		slope	-510.165	-0.367		-8.91	0.00
	Trading volume	constant	17326131.501		0.007	11.23	0.00
		slope	-2602908.641	-0.081		-1.83	0.07
Banking sector	Closing price	constant	6634.532		0.043	27.49	0.00
		slope	-1062.438	-0.207		-4.77	0.00
	Opening price	constant	6648.738		0.044	27.48	0.00
		slope	-1078.201	-0.209		-4.83	0.00
Food retail sector	Trading volume	constant	7976886.239		0.001	8.04	0.00
		slope	-651651.909	-0.032		-0.71	0.48
	Closing price	constant	10300.142		0.027	31.82	0.00
		slope	-1129.137	-0.165		-3.78	0.00
Pharmaceutical sector	Opening price	constant	10324.593		0.029	32.01	0.00
		slope	-1164.138	-0.171		-3.91	0.00
	Trading volume	constant	36161044.057		0.001	14.22	0.00
		slope	-1543705.480	-0.029		-0.66	0.51
Healthcare sector	Closing price	constant	10638.159		0.061	72.42	0.00
		slope	-779.828	-0.247		-5.76	0.00
	Opening price	constant	10657.288		0.064	72.02	0.00
		slope	-802.822	-0.252		-5.88	0.00
Energy sector	Trading volume	constant	2279548.749		0.000	6.78	0.00
		slope	-155608.346	-0.022		-0.50	0.62
	Closing price	constant	5981.175		0.072	42.79	0.00
		slope	-812.545	-0.269		-6.30	0.00
Energy sector	Opening price	constant	6008.073		0.076	42.84	0.00
		slope	-836.611	-0.275		-6.47	0.00
	Trading volume	constant	644104.345		0.003	6.77	0.00
		slope	-111524.791	-0.056		-1.27	0.20
Energy sector	Closing price	constant	7345.256		0.074	36.39	0.00
		slope	-1190.913	-0.273		-6.40	0.00
	Opening price	constant	7348.271		0.075	36.39	0.00
		slope	-1201.700	-0.275		-6.45	0.00
Energy sector	Trading volume	constant	4249487.864		0.002	7.96	0.00
		slope	469874.019	0.042		0.95	0.34
	Closing price	constant	5829.734		0.158	127.17	0.00
		slope	-413.540	-0.397		-9.78	0.00
Energy sector	Opening price	constant	5833.351		0.165	128.18	0.00
		slope	-420.979	-0.406		-10.03	0.00
	Trading volume	constant	19048447.979		0.038	15.64	0.00
		slope	-5065043.295	-0.196		-4.51	0.00

Table 5. Regression analysis of impact of number of daily spread rate of COVID-19 on some financial and monetary indicators of Saudi Arabia during period (March 2, 2020–March 21, 2022)

(continued)

Dependent variables			Unstand. Coeff	Stand. Coeff	R Square	t	Sig
Transport sector	Closing price	constant	5794.329		0.082	46.35	0.00
		slope	-778.544	-0.287		-6.75	0.00
	Opening price	constant	5803.553		0.083	46.30	0.00
		slope	-786.801	-0.289		-6.81	0.00
Trading volume		constant	7360415.156		0.002	12.35	0.00
		slope	-583119.671	-0.047		-1.06	0.29

Source(s): Investing

<https://sa.investing.com/indices/saudi-arabia-indices?&majorIndices = on&primarySectors = on>

-Our world in data

<https://ourworldindata.org/>

<https://ourworldindata.org/coronavirus>

<https://github.com/owid/covid-19-data/tree/master/public/data>

Table 5.

- (1) A positive impact of the daily reproduction rate of COVID-19 on the trading volume of the healthcare sector. However, it did not prove statistically significant.
- (2) A negative impact of the daily reproduction rate of COVID-19 on the rest of indices of different sectors, but it did not prove to be statistically significant in most cases.
- (3) Impact of the daily reproduction rate of COVID-19 is the highest on the closing price indices of the energy sector, the food production sector and the transportation sector, with impact values amounting to -0.397 , -0.361 and -0.287 , respectively, while the least affected closing price index is that of the banking sector, with impact value amounting to -0.165 .
- (4) Impact of the daily reproduction rate of COVID-19 is the highest on the opening price indices of the energy sector, the food production sector and the transportation sector, with impact values amounting to -0.406 , -0.367 and -0.289 , respectively, while the least affected closing price index is that of the banking sector, with impact value amounting to -0.171 .
- (5) Impact of the daily reproduction rate of COVID-19 is the highest on the trading volume index of the energy sector, with impact value amounting to -0.196 , while the least affected trading volume index is that of the general index, with impact value amounting to -0.140 .

It is clear from what proceeded that the achieved results are logical, as the closing and opening prices of some directly related stocks have been affected with the number of daily new infections, daily deaths number and daily reproduction rate of COVID-19. Trading volume of some sectors has also been affected due to vagueness of information regarding the future of COVID-19 pandemic.

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