

Capital Structure and Firm Performance for Non-Financial Saudi Firms: COVID-19 Crisis

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Abstract

The relationship between capital structure and firm performance has been extensively investigated in the recent decades. However, only a few studies investigate this relationship during the Sanitary Crisis. The paper investigates the relationship between company performance and firm specific characteristics; investment, free cash flow, and sales revenue. To our knowledge, this study is the first to investigate the simultaneous impact of indicators, drawn from multiple theories, on firms' performances during the coronavirus pandemic. The investigation has been performed based on a sample of 138 Saudi companies listed on the Saudi Stock exchange Tadawul over two specific periods of the COVID-19 pandemic; the pre-pandemic (2016-2019), and the pandemic (2020-2022). The research findings suggest that the crisis had a negative impact on firms with greater sensitivity to aggregate demand and international trade. Additionally, the study found a positive correlation between sales revenues and financial performance indicators, while leverage was linked to lower financial performance. Moreover, increased investment during a crisis was found to create agency problems and a free-rider problem, leading to decreased financial performance. On the other hand, Free Cash Flow was found to be positively associated with firm market performance, supporting agency theory.

Keywords

Capital Structure, Performance, Financial Leverage, COVID 19, Saudi Firms

1. Introduction

Financing decision, especially capital structure decision which refers to how a

company finances its assets by combining liabilities and equity (Gul & Cho, 2019), is one of the most critical decisions managers make in any organization. Therefore, it depends on the risk and return characteristics of the firm. If an inappropriate combination of finance is made, the survival and performance of the firm may be seriously impacted.

Capital Structure is a mix of debt and equity capital maintained by a firm. The capital structure of a firm is very important since it is related to the ability of the firm to meet the needs of its stakeholders.

Companies often face crises, they must choose the right composition of capital in order to provide maximum benefits to the company and so that they are not increasingly burdened by crisis conditions. The choice of capital structure can affect the company's performance (Wamiori et al., 2016; Basit et al., 2017; Salim & Yadav, 2012; Vätavu, 2015).

During economic and financial crises, the ability of a firm to access external finance, especially through debt with short-term maturity, is decreased (Judge & Korzhenitskaya, 2012), corporate performance and default risk will likely be affected (Titman & Wessels, 1988).

Other studies have examined the financial crisis's effect on firms' performance and investment opportunities. Campello, Graham, and Harvey (2010) found that the financial crisis negatively affected firms' investment opportunities in Asia, Europe, and the United States. Zeitun and Haq (2015), found that the performances of GCC firms with shorter debt maturity were negatively affected by the crisis. It would therefore seem that financial crises decrease investment opportunities. consecutively, this decreased corporate performance and limited firms' ability to borrow which made it harder to recover from the crisis. Moreover, Diamond (1991) shows that firms with a higher proportion of short-term debt ratio face greater risk due to the risk of refinancing, especially during a financial crisis or economic downturn. It therefore seems that financial crises influence investment, debt structure and firm performance.

Recently, the COVID-19 pandemic has caused an economic crisis, not only in Saudi Arabia but also in the world but this pandemic may be unique given its speed of change and the scale of its impact on both private and public segments of the economy (Mather, 2020; Kells, 2020). Evidence indicates that COVID-19 affects the financial performance of listed firms. Zhang & Zhang (2021) showed that a higher number of COVID-19 cases significantly decreased profitability in 107 countries. Moreover, Jin et al. (2022) confirmed that over the period of COVID-19 spread (2020), the profitability of Chinese-listed firms was significantly and inversely affected.

Our paper adds to the current research on firms' performance as follows: firstly, the COVID-19 pandemic offers a unique setting of extreme uncertainty given its speed of change and the scale of its impact on both private and public segments of the economy (Mather, 2020; Kells, 2020).

The primary contribution of the study is to investigate the relationship be-

tween corporate governance and firm performance during the Crisis period. The COVID-19 pandemic has raised awareness of the importance of multiple factors that impact firms' performance (Kells, 2020; Obrenovic et al., 2020). Accordingly, we respond to this call by investigating the link between company performance and firm specific characteristics; investment, free cash flow, and sales revenue. To our knowledge, this study is the first to investigate the simultaneous impact of indicators, drawn from multiple theories, on firms' performances during the coronavirus pandemic.

Secondly, the investigation is done in the context of Saudi Arabia where the Saudi Stock Exchange, Tadawul, is considered the largest capital market in the Middle East and North Africa, and the Saudi economy is among the wealthiest economies in the Middle East. It has demonstrated sustainable high growth rates during recent decades and it is rapidly becoming one of the world's largest financial markets in terms of market value (Alsharif, 2021). Thus, it is important to address this gap in literature and look into the determinants of performance and capital structure such as, leverage (Al-Gamrh et al., 2020; Atayah et al., 2021) and how it can affect the performance of Saudi firms during COVID-19 pandemic.

Thirdly, our study is among the first to apply a multiple regression model to assess the relationship between capital structure and firm performance over three specific periods: the pre-crisis (2016-2019), crisis (2020-2021), and post-crisis recovery (2022).

The remainder of the article is organized as follows. We provide the theoretical background and develop the hypotheses to be tested. The model's econometric specification and variable definitions are then presented and the sample design and descriptive statistics follow. Next, we detail the empirical analysis, report the results and discuss their implications. Results from a number of robustness tests are also discussed. Finally, we offer a brief summary and concluding remarks.

2. Literature Review

Many existing studies focus on stock performance when evaluating the impact of a pandemic. The COVID-19 pandemic significantly negatively impacted the performance of listed Chinese firms, according to Shen et al. (2020), and Rababah et al. (2020). Firms with smaller investment scales or sales revenues are more affected by COVID-19.

These findings are among the first empirical evidence of the association between pandemics and firm performance.

Shen et al. (2020) showed that the COVID-19 pandemic had a significant negative impact on the performance of listed Chinese companies due to a decrease in the value of total revenue, which also affected the decrease in ROA. The research also proved that some industries were significantly affected in the first quarter of 2020 including tourism, catering, and transportation. The COVID-19

pandemic hurts the production, operations, and sales of the industry. Company managers are expected to pay attention to environmental changes outside, make adjustments to the business, establish strategies to make production, and carry out operational activities that meet consumption trends during the COVID-19 pandemic to assist business recovery.

Research related to company performance during the COVID 19 pandemic was also carried out by Hadiwardoyo (2020) using a qualitative phenomenological approach on the Indonesia Stock Exchange. This study included 214 companies, which were divided proportionally into nine sectors or 49 sub-sectors. The results show that the most affected business sectors rely on crowds, such as tourism and tourism supporting businesses including mass transportation, hotels, and tertiary product businesses whose sales depend on public savings funds, property, and credit-giving institutions. Besides, many other sectors have been affected in a variety of ways. Business sectors that can benefit from social restrictions during the COVID-19 pandemic include goods delivery service providers, cellular operators and internet providers, emergency credit providers, and health insurance.

Aqabna et al. (2023) focused on the effects of COVID-19 on firm performance conducted in MENA region during the period 2007-2021. This study used GMM regressions model and their results suggest that over the period of COVID-19 pandemic (2020-2021), the ROA decreased significantly. In addition, there is an insignificant correlation between the COVID-19 outbreak, and Tobin's Q and ROE.

Boshnak et al. (2023) examined the factors of financial performance (ROA and ROE) of 11 Kuwaiti listed banks for the period 2013-2020. The investigation was done using GMM regression model. He found that COVID-19 affected the ROE of Kuwaiti listed banks significantly and negatively.

In the context of Saudi Arabia, Boshnak et al. (2023) investigated how firm characteristics affect the performance of Saudi listed firms during the COVID-19 pandemic between Q3 2019 and Q3 2020. The results show that the onset of the COVID-19 pandemic had a significant impact on firms' operational, financial, and market performance measures. The study also reported that larger firms performed better both before and during the pandemic, while leverage is a clearly negative factor affecting firm performance. Furthermore, certain industries, such as materials (petrochemicals), consumer services, real estate, and consumer durables and apparel, appear to be the most affected by the pandemic.

As a first hypothesis, we can state the following:

H1: The COVID-19 pandemic has a significant negative impact on the performance of listed companies.

Due to the COVID-19 pandemic, managers are forced to increase their cash reserves to deal with emergencies, which drains investment funds and reduces enterprises' momentum toward sustainable growth. Maslow's hierarchy of needs indicates that health and safety are more imperative than social contact during

the pandemic, resulting in a shrinking demand in the short term (Hagerty & Williams, 2020). The implementation of quarantine measures led to a sharp decline in company productivity and revenue, which, in turn, led to a decline in corporate performance.

Sales revenue is the income received by a company from its sales of goods or the provision of services. Sales revenue was investigated as a determinant of firm performance. Usually, growth is seen as having a positive impact, mainly due to the additional income that company generates. Tan (2012) using the Asian Financial Crisis has shown that during a crisis, demand for goods and services will be weaker than normal; investors lose confidence in the economy. Firms are expected to perform below average. Thus, the economic crisis can have an impact on the decline in product sales (Wijayangka, 2014). If sales in the industrial sector experienced a decrease during COVID 19 pandemic, this would certainly affect the company's financial condition in general, including the value of the company's current assets.

Therefore, we expect a positive relationship between firms' sales revenue and firm performance, in accordance with the results of Asimakopoulos et al. (2009), Nunes et al. (2009) and Yazdanfar (2013). Based on this analysis, we proposed the following research hypothesis:

H1.1: During the COVID-19 crisis a firm's sales revenue is positively associated with firm performance.

An extensive number of past studies show that during crisis investment impacted negatively on firm performance but few studies confirm a significant and positive correlation between investment and financial performance.

Shen et al. (2020) found that the COVID-19 outbreak resulted in a decline in corporate performance both by industry and region dimensions. More investment and income would effectively reduce the negative impact of the pandemic.

Past studies have shown that investment declined over the crisis period (Duchin et al., 2010; Akbar et al., 2013). In the meantime, Bo et al. (2014) also found that the financial crisis affected corporate investment negatively. Moreover, financial distress also affects investment in a different manner, depending on investment opportunities available in the firms (López-Gutiérrez et al., 2015).

Fundamental options theory states that managers tend to defer investment when uncertainty rises so that they may miss out on profitable projects (Zeng et al., 2016).

Due to the COVID-19 pandemic, managers are forced to increase their cash reserves to deal with emergencies, which drains investment funds and reduces enterprises' momentum toward sustainable growth. Maslow's hierarchy of needs indicates that health and safety are more imperative than social contact during the pandemic, resulting in a shrinking demand in the short term (Hagerty & Williams, 2020). The implementation of quarantine measures led to a sharp decline in company productivity and revenue, which, in turn, led to a decline in corporate performance. Based on this analysis, we proposed the following re-

search hypothesis:

H1.2: During the COVID-19 crisis, investment is negatively associated with firm performance.

In a downturn, an in-depth examination of free cash flow is necessary to understand its impact on performance during a crisis. The finding of the current research contributes to the body of knowledge already available by conducting an empirical analysis to examine the unique relationship between free cash flow and firm performance during the COVID 19 period.

The Free cash flow represents cash flow that exceeds what is required to maintain assets and finance expected upcoming investments (Richardson, 2006).

Cash flow and financial slack are commonly used as recessionary hedges. While some studies have pointed to the value of cash as a strategic asset (Kim & Betis, 2014), a body of research indicates that cash flow buildups tend to increase managerial inefficiencies and degrade firm performance (Latham & Braun, 2009; Park & Jang, 2013). Increasing free cash flow is often critical to decrease firm performance in many asset deployment strategies.

Following agency theory, free cash flow positively and significantly impacts performance. A higher FCF will result in better performance and increased shareholder wealth. This coefficient shows a positive value, supporting the hypothesis that increased free cash flow improved company performance during the COVID-19 crisis. The ultimate financial management challenge is to use free cash flows to invest in new business opportunities that build shareholder value.

During the crisis, companies improved cash flow by refinancing loans, delaying new projects and reducing their workforce, using free cash flow to improve cash flow, and adopting growth strategies such as buying land and offering high-end products. In response to future financial distress, FCF will allow managers of property development companies to improve their financial management (Chan & Abdul-Aziz, 2017).

The COVID-19 crisis had a profound impact on the relationship between firm performance and free cash flow. With the pandemic introducing economic uncertainty and volatility, companies that maintained or increased their free cash flow found themselves better equipped and ultimately exhibited more robust firm performance. The excess cash generated, beyond what was required for day-to-day operations and investments, offered firms greater financial flexibility during the crisis. Several empirical studies conducted during this period have confirmed this association. For instance, a research done by Alhassan (2020) found that companies in Nigeria with higher free cash flow levels demonstrated greater resilience and outperformed their counterparts. Similarly, Farag (2021) investigated the role of free cash flow in firm performance during the pandemic and observed a positive relationship between the two factors. The study by Wang et al. (2021) on U.S. companies provided further evidence of the beneficial impact of maintaining free cash flow on firm performance. These findings unders-

core the importance of liquidity management, as a strong cash position during uncertain times contributed to the ability of firms to adapt, invest, and sustain their overall performance.

We hypothesize that increased free cash flow is positively associated with firm performance in a recessionary environment.

H1.3: During the COVID-19 crisis, increased free cash flow is associated with stimulating firm performance.

Economic crisis caused many companies to reduce their production activities due to the decline in people's purchasing power. The company's activities and performance have decreased so that when companies need loans, fund providers, such as banks and other financing institutions, are reluctant to provide loans. Thus, the economic crisis tends to reduce the company's debt ratio. Previous studies also reveal different results regarding the impact of the financial crisis on financial leverage. Proença, Laureano, and Laureano (2014) prove that financial crises cause a firm's debt ratio to decrease.

However, some empirical studies have shown a mixed or no significant relationship between capital structure and firm performance.

According to the trade-off theory, firms prefer internally generated funds over externally generated funds and debt over equity financing (Myers & Majluf, 1984). As per the pecking order theory, Cetorelli & Goldberg (2011) demonstrated that firms are less profitable during financial crises and attempt to replace liquidity due to a higher level of debt with external financing.

Empirical studies indicate that an external macroeconomic or financial uncertainty will influence the capital structure of companies in diverse ways (Kenc & Dibooglu, 2010; Atici & Gursoy, 2011). Generally, during any crisis, expected returns will weaken as risk and uncertainty increase. The borrowers and lenders become hesitant to advance funds for long term projects. Considering the higher probabilities of default during a crisis, the lenders would demand a higher term premium on their lending. This high-cost of long-term borrowing makes them less appealing compared to short-term borrowing (Demirgüç-Kunt et al., 2020). Thus we test the second hypothesis:

H2: During COVID-19, leverage has a negative impact on firm performance.

3. Methodology

3.1. Data and Sample

This paper will examine the relationship between capital structure and the performance of listed companies in Saudi Arabia using panel data. The study period is divided into pre-crisis (2016-2019), crisis (2019-2021) and after crisis. A total of 138 companies are selected based on the following conditions:

- 1) Companies' financial statements should be available during the period of study;
- 2) Financial year of the companies should remain the same during the study period.

The required financial data are taken from the financial reports of the companies.

3.2. Model Specification

The main objective of this paper is:

- to explore the effect of COVID-19 crisis on firms' performance;
- to investigate if some determinants of the performance such as investment, free cash flow and sales revenues can moderate the impact of pandemic on firm's performance;
- to analyze the impact of the financial leverage on a firm's performance.

The following research model was adopted to gauge the financial performance of the Saudi listed companies.

$$\text{PER}_{it} = \beta_0 + \beta_1 \text{COVID}_{it} + \beta_2 \text{DEBT}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{SALES}_{it} + \beta_5 \text{TANG}_{it} + \beta_6 \text{FCF}_{it} + \beta_7 \text{GROWTH}_{it} + \varphi_{it}$$

where:

β_0 : The intercept of the equation.

β : Coefficients for independent variables.

PER: Performance company measured by ROA and ROE for firm *i* at year *t*.

The other performance variable (EPS) is used for robustness checks.

In the estimation process, all performance indicators are estimated individually.

COVID: dummy variable that take 1 after COVID-19 period; 0 otherwise.

DEBT: financial leverage for firm *i* at year *t*.

SIZE: size of the firm *i* at year *t*.

SALES: sales revenues of the firm *i* at year *t*.

TANG: Tangible assets for firm *i* at year *t*.

FCF: free cash flow of the firm *i* at year *t*.

GROWTH: growth of firm *i* at year *t*.

3.3. Variables of study (Table 1)

Table 1. Variables of study.

Dependent Variable			
Variable	Measurement	Formula	References
Firm Performance	Return on Assets (ROA)	Earnings Before Interest & Tax (EBIT)/Total Assets	Joliet and Muller (2013), Al-Taani (2013), Visic (2013)
	Return on Equity (ROE)	Earnings Before Interest & Tax (EBIT)/Total Equity	Pouraghajan et al. (2012), Visic (2013), Nirajini and Priya (2013)
Independent Variables			
Variable	Measurement	Formula	References
Debt	Financial leverage	Debt to total assets ratio	(Amore et al. 2022)
Size	Firm Size	Natural Logarithm of Total Assets	(Setiawan et al. 2016)

Continued

Sales	sales revenues	sales revenues	(Wijayangka, 2014)
FCF	Free cash flow	Cash flow generated from firm operations—cash flow required for capital expenditures	(Richardson, 2006) Brush, Bromiley, and Hendrickx, 2000; Kim and Bettis, 2014
Growth	capital expenditure over assets	$\Delta(\text{in assets—in liabilities})/\text{total assets}$	(Smith et al., 2012)
COVID 19	COVID 19	Dummy to differentiate between pre-epidemic and epidemic periods	Perwitasari et al., 2022 Amore et al., 2022
Tang	Tangible assets	net fixed assets/total assets	Dessi and Robertson (2003), Weill (2007) and Margaritis and Psillaki (2010)

(Source: Compiled by the authors.)

4. Results

4.1. Descriptive Statistics

The following **Table 2** shows descriptive statistics of the sample study. It includes the number of observations, mean values of variables, minimum and maximum values, and standard deviation from the mean.

According to the above results, the number of total observations is 980, and the mean value of return on assets ROA is an average of 2.70%. It varies between -58.15 % and 38.69%. ROE had an average value of 1.56% during 2016-2022 indicative of a decrease in overall returns or profitability of the companies. The mean value of the free cash flow is 102815.9. The mean firm leverage is approximately 18%, ranging from 0% to 98%, and the results for tangibles show an average of 41.666%.

4.2. Univariate and Multivariate Analysis

Table 3 provides a Spearman rank correlation analysis of the model variables before the onset of the COVID-19 pandemic to identify multicollinearity issues. The correlation matrix of the study variables indicates the absence of a serious multicollinearity problem because no correlation coefficient exceeds the 0.8 level (Gujarati & Porter, 2009).

As regards to independent variables, the table shows that financial performance measured by ROA and ROE is significantly and negatively correlated with COVID-19 (-0.015 and -0.03 respectively), Leverage (DEBT) (0.12 and 0.191) Investment (GROWTH) (-0.1147, -0.112) and Tangible assets (tang) (-0.0367). Moreover, Leverage is significantly and negatively associated with Size (-0.09). However, Financial performance (ROA and ROE) is significantly and positively associated with size (SIZE) (0.1626 and 0.1681), Free Cash Flow (FCF) (0.0189 and 0.0091), and Sales Revenues (SALES) (0.1755 and 0.1154). In addition, Size is significantly and positively associated with Free Cash Flow (FCF) (0.179).

Table 2. Descriptive statistics.

Variable	obs	mean	std.dev	min	max
roa	980	0.0270188	0.2121568	-0.5815866	0.3869818
roe	980	0.0156147	0.5229064	-0.6009092	0.3348875
sales	980	0.2342645	4.533452	-0.565366	0.1298756
debt	980	0.1784027	0.1558632	0	0.9801798
tang	980	0.4166647	0.2499307	0	1.012
fcf	980	102815.9	5009228	-7.75E+07	9.39E+07
size	980	14.68499	1.659813	9.856606	21.3726
growth	980	0.0013074	0.0015617	0	0.0244807

(Source: Results of data processing.)

Table 3. Univariate analysis.

	roa	Roe	covid19	sales	debt	tang	fcf	size	growth
roa	1								
roe		1							
covid19	-0.0155*	-0.03*	1						
sales	0.1755**	0.1154*	-0.0107**	1					
debt	-0.1264*	-0.191*	0.0601**	-0.0379	1				
tang	-0.0367***	-0.0262	-0.0679**	-0.0759**	-0.222*	1			
fcf	0.0189*	0.0091**	0.0151	0.0069	0.0012	-0.029	1		
size	0.1626*	0.1681*	0.0101	-0.0487	-0.090*	0.179*	-0.078**	1	
growth	-0.1147*	-0.112*	0.1977*	0.0319	-0.0631***	0.024	0.0157	-0.32*	1

***, **, and * represent $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively. (Source: Results of data processing.)

After carrying out the specification tests of our model (especially the Hausman test), we retained the fixed effects model. The empirical results are presented in **Table 4**.

As shown in **Table 4**, the COVID-19 pandemic has a statistically less than 5% negative impact on both measures of performance. COVID-19 negatively impacts corporate performance, resulting in a profit margin decline that supports hypothesis H1. This research result supports [Notta and Vlachvei's \(2014\)](#) findings. According to the authors, firm performance somewhat deteriorates during crisis periods.

We also support [Claessens et al. \(2011\)](#)'s results which demonstrates that the crisis negatively affected firms whose performance was more sensitive to aggregate demand and international trade.

Sales revenues are positively associated with the two measures of financial performance (ROA and ROE) for the entire sample period but are significant at the 5% levels only for ROA, providing support for Hypotheses 1.1.

Results are in accordance with the results of [Asimakopoulos et al. \(2009\)](#), [Nunes et al. \(2009\)](#). Thus, if sales decrease during COVID-19 pandemic, this would certainly affect the company's financial condition in general.

Table 4. Multivariate analysis.

Variable	roa		roe	
	coefficient	ρ value	coefficient	ρ value
covid19	-0.011*	-2.72	-0.12511**	-2
sales revenus	0.0229**	2.45	0.017	1.33
debt	-0.046*	-3.85	-0.03339**	-1.96
tang	-0.0235*	-3.33	-0.0305*	-2.85
fcf	0.0396*	3.25	0.0763**	2.19
size	0.0112*	8.14	0.02837*	12.83
growth	-0.1387*	-5.23	-0.38144*	-12.17
R2 adjusted	32.132		34.455	

***, **, and * represent $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively (Source: Data processing results of authors).

Growth is significantly and negatively correlated with firm performance (ROA and ROE) and is significant at the 1% level, providing support for Hypotheses 1.2.

This suggests that an increase in investment during a crisis period increases agency problems and is less effective and creates a free-rider problem, which in turn generates a decrease in firms' financial performance. This result is consistent with Maslow's hierarchy of needs, which indicates that health and safety are more imperative than investment during the pandemic.

Free Cash Flow is significantly and positively associated with firm market performance (ROA and ROE) and is significant at the 1% and 5% levels respectively, providing support for agency theory and hypothesis H1.3.

Therefore, in line with agency theory, Free Cash Flow positively and significantly impacts performance. A higher FCF will result in better performance and increased shareholder wealth. This coefficient shows a positive value, supporting the hypothesis that increased free cash flow improved company performance during the COVID-19 crisis. The ultimate financial management challenge is to use free cash flows to invest in new business opportunities that build shareholder value. This result is consistent with the existing empirical research, which indicates that free cash flow has a positive impact on firm financial performance during crises (Chan & Abdul-Aziz, 2017).

Leverage is significantly and negatively associated with firm financial performance and is significant at the 1% and 5% levels, providing support for Hypothesis 2. Thus, Debt financing can, however, adversely affect the profitability of businesses. Therefore, firms should carefully consider their funding strategies and manage their total debt. The aim is to sustain the company's overall performance and keep its market-based performance stable. This result is consistent with the finding of Crotty (2009) which indicates that companies seek capital through debt during financial crises because borrowers and lenders become hesitant to advance funds for long term projects

Based on the analysis results, the size of the examined firms positively influ-

ences profitability (at a 1% significance level), demonstrating that large firms are more competitive and profitable even in an economic crisis. According to [Bri-congne et al. \(2012\)](#), the crisis has primarily affected the intensive margins of large firms rather than the products offered to export markets. [Latham \(2009\)](#) reveals that small businesses are the first victims of a prolonged economic crisis. In addition to limited financial resources, SMEs are also disproportionately impacted by bank lending. Due to this, they have to pay higher interest rates than large firms, which becomes even more evident in times of crisis.

In [Chen & Chen \(2005\)](#), economies of scale are an influential factor in company profitability. Traditional company views contain this concept. The result is that large businesses can produce goods at a much lower cost. Size is measured by the increase in employees in companies with a high market capitalization. It has been shown that companies with significant total assets are more likely to generate profits over a relatively stable period than those with smaller total assets. Due to their large market, large companies have higher competitiveness than small ones.

In contrast to [Kebewar \(2013\)](#) and [Dawar & Chandra \(2014\)](#), tangibility also negatively impacts profitability, as demonstrated by [Zeitun and Tian \(2007\)](#), [Soumadi and Hayajneh \(2012\)](#), and [Vätavu \(2015\)](#). When tangible assets decline, profits rise because firms with a high ratio of intangible assets have more investment opportunities, R&D intensity, and innovation ([Kebewar, 2013](#)).

4.3. Robustness Tests

We used the alternative dependent variable of Earnings per Share to measure the corporate performance of the Saudi companies. EPS represents the financial performance of the company calculated by the ratio of Net Income—Preferred Dividend to Weighted average common stock outstanding. The fixed effects of industry and period in the model are controlled by variables of firm i and year t ([Table 5](#)). Our results are similar to the main findings. Highlighting [Table 5](#), the adjusted R2 is 35.61% which means that the independent variables explain 35.61% of the variations in the EPS.

Table 5. Multivariate analysis for Robustness Tests

Variable	EPS	
	coefficient	ρ value
covid19	-0.036**	-2.56
sales revenues	0.0435*	1.83
debt	-0.058*	-3.66
tang	0.0235	7.33
fcf	0.0396***	5.76
size	-0.0362*	-6.57
growth	-0.2387***	-4.786
R2 adjusted		35.61

(Source : Data processing results of authors.)

5. Conclusion

For seven years (2016-2022), before, during and after the severe crisis of COVID-19, this study attempts to identify the factors that affect the performance, measured as profitability, of Saudi firms.

To conduct our study, we collected annual balance sheet data from 138 listed firms operating in Saudi Arabia. We have calculated a series of selected financial indexes. A possible explanation for the results obtained could be the size of the companies examined.

In times of crisis, this result could confirm the resilience of the cooperative business model.

The results of this study have broad implications for decision-makers. Clearly, regulatory bodies, governments, and central banks should combine forces to soften the financial and economic impacts of the pandemic. Comprehensive policies are essential to deal with the negative impact of current and future crises of this type in the interest of business sustainability.

Our findings are helpful for managers and investors in order to help them make the best decisions for their managing and investing activities. Moreover, governments need to know how companies respond to the pandemic, know which activity sectors are more vulnerable to the crisis' effects, and the significant financial management decisions to be taken by companies during a crisis. These results also have an international echo; as worldwide governments have implemented supporting measures for the pandemic vulnerable economic sectors.

This study has several limitations. First, it investigated the financial performance using limited profitability measures. Second, this study is limited to firms that belong to the non-financial sectors. Finally, it used a limited data set for seven years. Hence, future research can take a large number of ratios and financial measures using firms from all sectors to investigate the impact of COVID-19 on the financial performance of Saudi firms. Another future research direction could use a dynamic panel approach to include the lagged variables within the models once we have enough available data.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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