



**THE EFFECT OF COVID-19 PANDEMIC ON BANKS' RISK
AND PERFORMANCE INDICATORS; CASE OF EGYPT
AN EMPIRICAL STUDY**

By

Dr. Nehad Hosny Yusuf

Lecturer of Accounting

Faculty of Management, Economics and Business Technology

Egyptian Russian University

nehad.yusuf@eru.edu.eg

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Abstract

This paper analyzes the risk and performance indicators for the timing of 9 listed -Banks on the Egyptian Stock Exchange- during the COVID-19 outbreak. The paper examines the amount from the financial year 2019 to 2021 and shows that although most investment banks experienced stress, Egyptian banks have been largely resilient with the great support provided by the Central Bank of Egypt. The results show that the COVID 19 pandemic affects bank risk and performance indicators quarterly and annually. The study results revealed that the COVID-19 pandemic has a significant effect on Banks' risk and performance indicators-whether it was measured using bank stock price P, bank book value BV, bank return on assets ROA, bank return on equity ROE, bank Capital Adequacy Ratio CAR , and bank Nonperforming Loan NBL. The results also indicated the great role of the Central Bank of Egypt in limiting the impact of COVID-19 on the risk and performance indicators of Egyptian banks.

KEYWORDS: RISK PERFORMANCE INDICATORS- MARKET REACTION - COVID 19

1. Introduction

The global health crisis (COVID 19) showed that the worldwide banking sector and the compulsory quarantine period imposed by most countries around the world had increased risk pressures on banks' activities, especially banks active in loans to companies after many institutions around the world forced to stop.

According to (Beck, 2020), the impact of the COVID19 pandemic shows worries about the banking sector's resilience significantly in terms of continuing to fulfil its expected intermediation function. Those worries depend on three factors; the global economic effects, reactions of monetary and fiscal policies to the pandemic, and regulatory changes to the banking sector. In Egypt, it is challenging to quantify the magnitude of the impact of the COVID 19 pandemic on the Egyptian banking sector. Accordingly, and considering the above observations, the study expects that COVID 19 would affect the Egyptian bank risk and performance indicators. Severely impacted the financial markets globally. According to (The New York Times, 2020), Sand P 500, Dow Jones, Russell 2000, Nasdaq Composite, the FTSE 100, and the Nikkei 225 fell about 30–40% by the end of March from their January values and the Arab financial markets in particular, which had the most significant impact on the banking sector.

1.1 Background

(Borio, 2020) outlines in Bank's Annual General Meeting, Basel, 30 June 2020, that Rebuilding policy buffers in all policy domains are expected to be the policy issue of the decade ahead. The same trend could also lead to a shift in policy regime, with a political and economic retreat behind national borders, greater state involvement in the economy, and the reemergence of inflation as a serious policy concern. Also, the Bank for International Settlements (BIS) Annual Economic Report¹ reveals that Central banks played a key role in the unprecedented response to the Covid-19 crisis during the acute phase of the

¹ BIS, "Central banks and payments in the digital era" *Annual Economic Report 2020*, June, Chapter III. available at [Annual Economic Report 2020 \(bis.org\)](https://www.bis.org/annual-reports/2020/).

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pandemic, working with fiscal authorities to cushion the economic and financial blow and support companies and workers

In Egypt, the Egyptian banking sector has witnessed during the past four years the exit of several central foreign banks due to the decline in political and security stability and an increase in the performance risks. In addition to the reasons for the withdrawal of foreign banks, the poor financial situation of some of these banks and changing their strategy, and the economic situation in the countries of these banks.

According to the central Bank's monthly report, the Egyptian banking sector achieved positive business results during the first quarter of 2021.²Banks' financial position increased to exceed 6 trillion pounds for the first time. The report revealed that the financial position of the banking sector rose to 6,16 trillion pounds by the end of March 2020, as the total financial position of banks, unlike the Central Bank, increased by EGP 648.9 billion at a rate of 11.8% at the end of March 2020. Where the net domestic assets of the banking system increased by 584.6 billion pounds, at a rate of 16.4% at the end of the first quarter of this year, and the increase came as a result of an increase in domestic credit by 620.2 billion pounds, at a rate of 16.3%. The total deposits of the banking system, including the government, increased by 418.3 billion pounds, or 10.4%, for nine months to reach 4.426 trillion pounds last March 2020. The central statement revealed that the total volume of credit facilities granted by the banks amounted to about 2.2 trillion pounds by the end of March 2020, an increase of EGP 165.9 billion, an average of 8.9%. Also, the Balances of foreigners with treasury bills decreased to 119.1 billion pounds by April 2020, compared to 149.3 billion pounds by the end of March of the same year. The total outstanding balances of financial institutions recorded 1.57 trillion pounds by the end of April 2020, compared to 1.485 trillion pounds by the end of March 2020. The report cited that the public sector bank's investments with treasury bills recorded about 427.5.4 billion pounds at the end of April 2020, compared to 309.4 billion pounds.

² For more details, <https://economyplusme.com/39287/>

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In the Middle East, the Union of Arab Banks³ disclosed the most vital banking sectors in the Arab world, as the Egyptian banking sector ranked fourth in terms of assets by the end of 2019, while the Egyptian banking sector ranked fourth with investments amounting to 368.8 billion dollars, followed by the Kuwaiti with assets of 230.5 billion dollars - the end of the third quarter of 2019. Federation of Arab Banks report shows that the UAE banking sector came first among the Arab banking sectors concerning the volume of assets, which amounted to about 840.3 billion dollars in 2019, followed by the Saudi banking sector with combined assets amounting to 701.6 billion dollars.

International Monetary Fund report⁴ Released that the International Monetary Fund cautioned that the emergence of the new Coronavirus exposed cracks in the global financial system, provided that this crisis poses a severe threat which expected to lead to declines in asset prices leading to losses in high-risk securities bank portfolios and declines in oil prices and because the drop in oil prices Credit losses among lenders to the energy sector. In contrast, banks that incur loan losses for families in trouble suggest that the more rapidly economic activity declines over a more extended period, the more likely banks will see loan losses. Also, In April 2020, the International Monetary Agency issued a report of the Global Developments: Implications for the Middle East and Central Asia", indicating a sign of the spread of Corona (COVID 19) in 2019 to 2.8 in 2020 economic growth rates during the global financial crisis in 2008 and from prices Oil in 2015, to rise later to 4% in 2021, with the decrease in adjustments due to the virus. Divide global securities as follows: shares of 20% to 30% after reaching the level in mid-February 20 index currency exchange rates. Capitalism and the Scenario. 23 Most banks have profit, charts, and accounts linked to Basel 3 and International Accounting Standard 2. An international rating agency such as Standard & Poor estimates that Gulf banks could absorb up to \$ 36 billion in provisions and expected losses before they begin to exhaust their base.

³ Union of Arab Banks Magazine - Issue 474 - May 2020

⁴ International Monetary Fund Global Financial Stability Report: Markets in the Time of COVID-19 – April 2020.

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Remittances to the Middle East and North Africa region are projected to fall by 19.6 per cent to \$47 billion in 2020, following the 2.6 per cent growth seen in 2019. The anticipated decline is attributable to the global slowdown and the impact of lower oil prices in Gulf Cooperation Council GCC countries. Remittances from the euro area would also be impacted by the area's pre-COVID-19 economic slowdown and the euro depreciation against the U.S. dollar. In 2021, remittances to the region were expected to recover, albeit at a slow pace of around 1.6 percent, due to projected moderate growth in the euro area and weak GCC outflows. Remittance costs, the cost of sending \$200 to the region was 7 percent, essentially unchanged from the previous year. Prices vary significantly across corridors. The cost of sending money from high-income Organization for Economic Co-operation and Development (OECD) countries to Lebanon is double digits. Sending money from GCC countries to Egypt and Jordan costs between 3 percent to 5 percent in some corridors. Saudi Arabia to Syria corridor has experienced a dramatic cost fall as the civil war in Syria has receded.

(KPMG, 2020) reports that banks need to start reporting the impact of the COVID-19 pandemic on expected credit losses (ECL). Also, the report recommends banks use their previous experience of losses to reflect the current conditions and estimate the future economic situations when computing their ECLs under IFRS 9 "Financial Instruments". The report also revealed that European banks' report – on the impact of COVID-19 in their first-quarter financial statements incorporating forward-look information concerning COVID-19's economic effect on ECLs. (KPMG, 2020) also examined the interim reports of several central banks in eight European countries and showed that the European banks gave varying levels of detail about the COVID-19 impact using the ECL ratio and loan staging.

In Egypt, The Central Bank of Egypt has taken many critical financial measures to reduce the effects of the Coronavirus on the economy and financial institutions, including:

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- 1- Cutting Interest Rates whereby the overnight deposit rate, overnight lending rate, and the primary operation rate reached 8.25%, 9.25%, and 8.75%, respectively, and the discount rate is currently 8.75%.
 - 2- Deferring all Customers' Credit Dues (Corporates, Individuals and SMEs).
 - 3- Setting Measures to Limit Cash Transactions and facilitate the Usage of Electronic Payments Methods.
 - 4- Availing the Necessary Credit Limits to Finance the Imports of Strategic Commodities and Support the Sectors Strongly Affected by COVID-19.
 - 5- Adjusting Interest Rates for CBE's Initiatives.
 - 6- Supporting Tourism Sector Initiatives.
 - 7- Supporting initiatives for Non-Performing Companies in all Sectors.
 - 8- Supporting initiatives for Non-Performing Individuals.
 - 9- Supporting industrial, Agricultural, and Construction Private Sector initiatives.
 - 10- Mortgage Finance Initiative for Middle-income Class; 50 B with 8% interest rate.
 - 11- Participation in Bank's Board Meetings via Video or Teleconference till the end of 2022.
 - 12- Amending Some of the Credit Registry Rules: for blocklists.
 - 13- Exempting Banks from Calculating Additional Capital Requirement for Concentration Risk of the Top 50 Borrowers until the end of December 2022.
 - 14- Implementation of IFRS9 in Light of COVID-19.
 - 15- Supporting Initiative for Electronic Payments.
 - 16- Initiative for Providing 6500 ATMs.

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17- Enhancing the role of the Credit Risk Guarantee Company in initiatives to support the Sectors of Tourism, Industry, Agriculture, and Construction.

18- Amendments to the financial inclusion simplified KYC (Know your customer) regulations.

1.2 Research Problem

The challenge posed by the COVID-19 pandemic necessitated research, knowledge and vigilance at all scientific and practical levels, especially at the level of scientific research, as this challenge added new knowledge in the field of accounting, management, economics and other aspects of the impact of the Corona pandemic on economies, banks and companies. As Egypt is an inefficient financial market, there is a greater need for research and knowledge for more information on the impact of the COVID-19 pandemic on the financial performance of companies and banks. This is in line with the Egyptian government's directions toward financial inclusion and Egypt's 2030 vision for sustainable development, which includes financial inclusion, health and market financial performance. Based on more knowledge about the impact of the COVID-19 pandemic on the Egyptian market, the current study aims to address the effect of COVID 19 pandemic on the Egyptian bank risk and performance indicators. The current study contributes to the broad strands of literature on attempts to examine the impact of the COVID-19 pandemic on bank's performance (Sharif et al., 2020; Zhang et al., 2020; Ji et al., 2020; Salisu and Vo, 2020).

1.3 Research Aims

The current study aims to address and explain the effect of the COVID 19 pandemic on the banks' risk and performance indicators in Egypt. Over a time period of 3 years (2019-2021), the study investigates the changes in risk and performance indicators in Egyptian banks affected by COVID 19 pandemic. Banks data in the Egyptian Stock Exchange has been used. Quarterly and annually risk and performance indicators were measured by multiple measures.

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1.4 Research objectives

The purpose of this study is to explore the effect of the COVID-19 pandemic on the banks' risk and performance indicators in Egyptian banks. The main objective of the study is to determine the effect of COVID-19 on the risk and performance indicators in Egyptian banks. This main objective is divided into the following sub-objectives:

- Presenting a theoretical background of the effect of COVID-19 turmoil and shadow on risk and performance indicators.
- Determining the effect of COVID-19 pandemic on bank risk indicators.
- Determining the effect of COVID-19 pandemic on bank performance indicators.

The current study will be formulated as follows; Literature review and hypotheses development, research importance, research methodology, discussion, limitations, recommendation and future research, and summary and conclusions.

2. Literature Review and hypotheses development

The strong connection between political and health events and financial markets has driven expanding body of research over the years and across various regions of the world. (Barua and Barua, 2021) investigate the pandemic's likely effects on Bangladesh's financial industry using Bangladesh as a case study of a developing nation. The study sample includes 30 commercial banks (out of a total of 60 banks in the sector) of Bangladesh publicly listed on the Dhaka Stock Exchange Limited. The paper estimates the COVID-19 impacts on three dimensions—firm value (risk-weighted asset value), capital adequacy, and operating performance (interest incomes) of banks—under different non-performing loans NPL shock scenarios using a state-designed stress testing model. Their results suggested that the banking sector in Bangladesh already has a high proportion of non-performing loans (NPLs), and the pandemic is likely to exacerbate the problem. The findings show that risk-weighted asset values, capital adequacy ratios, and interest income are likely to collapse and that larger

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banks appear more vulnerable. Moreover, a 10% NPL shock may cause all banks' capital adequacy to fall below the minimum BASEL III requirement. A shock of 13% or more could reduce capital adequacy to zero or negative at the sectoral level suggesting advocating for fast and imaginative policy solutions to avoid Bangladesh's large-scale and infectious financial catastrophe. They also recommend that COVID-19 will likely put economic and capital stress on banks across all economies.

(Marcu, 2021) develops a narrative review approach to summarise and correlate the available and published articles discussing the impact of the COVID-19 pandemic in the banking sector. Also, the study compares the effect of the Global Financial Crisis from 2008-2009 and the impact of COVID-19 on specific sectors of the world's economy. The study summarizes articles and publications conducted in significant databases (Scopus, Elsevier), as well as audit companies' websites (around 150 articles) that discuss the crisis induced by the pandemic, differences between the previous and the current situation, and the way the banking system reacted and find that banks strive to meet client expectations by developing new goods and services. And, despite all restrictions imposed by the COVID-19 pandemic, the banking industry can cope with complex crises and support the socio-economic ecosystem by keeping promises to third-party companies (construction, retail, restaurants, hotels, etc.) and assisting them through the crisis (regular payments, new tenders) by devoting themselves to supporting the economy and helping their clients to keep their businesses going, including the jobs in these companies.

(Demirguc, et al., 2020) address the effect of the COVID-19 pandemic on the banking sector by analyzing bank stock prices worldwide using bank data, including stock prices, balance sheets, and ownership, for 52 countries covering 896 commercial banks. For each bank, the study calculates the average liquidity ratio in the year pre the COVID-19 pandemic. The ex-ante liquidity ratio corresponds to the ratio of liquid assets to total assets averaged over the 2019Q1-2019Q4 period. The study examines the impact of financial sector policy announcements on the performance of bank stocks, using a global database of policy actions throughout the pandemic. The findings suggest that the adverse

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impact of the COVID-19 shock on banks was much more pronounced and long-lasting than on the corporates and other non-bank financial institutions. The study also investigated close to 400 policy announcements between February and April 2020 and found that liquidity support and borrower assistance measures had the most significant positive impact on bank abnormal returns and that policy rate cuts primarily benefited less liquid banks, confirming that monetary policy again played an essential tool.

(Ghosh and Saima, 2020) using a sample of 18 banks in Bangladesh Dhaka Stock Exchange DSE, Bangladesh banks with high loan concentration in the industrial sectors are negatively affected by COVID-19. The study uses multiple-criteria-decision-making (MCDM) tools, TOPSIS⁵ method and HELLWIG⁶ method as linear ordering models for analyzing the data and banks categorized into three groups (six banks each), namely top resilient, moderate resilient and low resilient. for assessing the resilience of the banking industry, five diagnostic variables used (capital adequacy, liquidity ratio, profitability, non-performing loans and resilience capacity to adverse effects of the COVID-19 pandemic. The study considered ranking scores of 1–6 as the top score, 7–12 as moderate scores and 13–18 as the lowest score to identify the most, the moderate and the least resilient banks during the pandemic. The study findings show that banks can survive this crisis by maintaining a capital base of more than the required level, the highest short-term liquidity and the lowest possible NPLs. However, the banking sector of Bangladesh has already been facing a deep crisis due to severe corruption and granting of loans on political inclination. Moreover, Bangladesh Banks with low-capital adequacy, low-liquidity ratio, high-NPLs ratio, low profitability, and loan exposure to risky sectors are more vulnerable irrespective of the bank size during COVID-19. The study also recommends that Bangladesh banks maintain a high capital base, low NPLs, and a high-liquidity ratio during the COVID-19 as the demand for money will increase significantly.

⁵ TOPSIS stands for “Technique for Order Preference by Similarity to Ideal Solution”.

⁶ Professor Zdzislaw Hellwig proposed the HELLWIG method (1968).

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(Rahmi and Sumirat, 2021) investigate the function of Asset and Liability Management (ALMA) in the Indonesian banking industry in mitigating financial risk caused by asset and liability mismatches. The study examined the Bank's financial performance during the Covid-19 pandemic using multiple linear regression to non-random sampling to 4 group of business activities for 36 observations in 2020 by summarizing the selected financial ratio from Indonesia Banking Statistic from OJK Report. They investigate the relationship between ALMA and Commercial Bank Profitability in Indonesia and the short-term impact of COVID-19 in 2020 on commercial banks based on the Group of Business Activities (BUKU). The study finds that Asset and liability management has a relationship to profitability of commercial banks in Indonesia during Covid-19 pandemic from January 2020 – September 2020 and that Loan to Deposit Ratio (LDR) positively contribute to bank profit but Capital Adequacy Ratio (CAR), Cost to Income Ratio (BOPO) and Net Interest Margin (NIM) negatively contributes to the bank profit and that Return on Asset explained 93.9% by Capital Adequacy Ratio (CAR), Cost to Income Ratio (BOPO), Loan to Deposit Ratio (LDR) and Net Interest Margin (NIM). In general, most asset and liability management key indicators, such as Capital Adequacy Ratio (CAR), Cost to Income Ratio (BOPO), and Loan to Deposit Ratio, show a statistically significant link (LDR). The Net Interest Margin (NIM) has no meaningful relationship with the Return on Asset (ROA) (ROA).

(Almonifi et al., 2021) examine ten Saudi Al Rajhi Bank ratios during the full five years before and during the COVID-19 pandemic, including EPS, P/E, DPS, DY, ROE, ROA, LA/TA, CTI CAR, and DPR. Using a five-year analysis, they discovered that Al Rajhi Bank did better in 2020 than in 2019, with substantial results in EPS, P/E, DY, and CTI. They also say that, compared to before and during the COVID-19 pandemic, financial statement changes in 2020 will result in a positive percentage increase in total assets, share capital, entire reserve (except 2019), retained earnings, total shareholders' equity, customers' deposits, and actual investments net. They claim that Al Rajhi Bank had low profitability and liquidity ratios and expected that retained earnings will rise by 850.76 percent in 2020, indicating a reduction in dividend profits in the future to deal

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with the effects of future crises and an increase in customer deposits due to those customers' trust in Islamic banks during times of pandemic. Additionally, their findings reveal that the Bank's net income increased in 2020, from SAR 10,159 million in 2019 to SAR 10,596 million in 2020, indicating its best performance during the crisis. They said that the COVID-19 problem poses minimal dangers to Islamic banks and that Al Rajhi Bank can respond to all economic and financial concerns.

From the literature review, different and essential studies have explored the impact of covid-19 on banking sector performance. Either focus on the market performance, commercial and investment banks, professional and scientific, regional and global banking, different practice and analysis models, and case studies (Almonifi et al., 2021, Barua and Barua, 2021, Demirguc, et al., 2020, Ghosh and Saima, 2020, Marcu, 2021, Rahmi and Sumirat, 2021). Moreover, there is a shortage of studies covering the effect of the Covid-19 pandemic on the Egyptian banking sector. Therefore, this study contributes to the literature addressing the COVID-19 pandemic effect on the bank risk and performance indicators in Egypt and focuses on the Covid-19 period to explain how COVID-19 affects bank risk and performance indicators. Based on this, the current study examines the effect of the COVID 19 pandemic on the Egyptian listed banks⁷ using the following hypothesis:

For the quarterly risk and performance indicators comparability hypothesis:

H₀₁: COVID 19 pandemic did not affect the quarterly risk and performance indicators of listed banks on the Egyptian stock exchange.

For the annual risk and performance indicators comparability hypothesis:

H₀₂: COVID 19 pandemic did not affect the yearly risk and performance indicators of listed banks on the Egyptian stock exchange.

⁷ The study used the event study method (pre and post -COVID-19) to measure the impact of the COVID-19 pandemic on the performance and risk indicators of Egyptian banks.

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3. Research Importance

The current study provides valuable policy implications to regulators and market participants engaging with banking sectors by providing evidence of the way the market reacts to a new and challenging event, especially in the Egyptian banking sector. The study adds knowledge to the Arabic library by introducing empirical results on the recent impact of the COVID-19 pandemic on the risk and performance indicators such as bank stock price P, bank book value BV, bank return on assets ROA, bank return on equity ROE, bank Capital Adequacy Ratio CAR, and bank Nonperforming Loan NBL.

4. Research Methodology

This paper follows a quantitative approach and constructs an empirical model to investigate the evident impacts of the Covid-19 pandemic on the risk and performance indicators of Egyptian listed banks pre- and post-COVID-19 pandemic. The study methodology will be covered through the research design, Data sample and description, Research Model, and statistical analysis and empirical results.

4.1 Research design

Adopting the (Given, 2008) approach for quantitative research, the research tests the Bank's risk and performance indicators in Egypt. (Donthu and Gustafsson, 2020; Sharma, Leung, Kingshott, Davcik, and Cardinali, 2020) test the pandemic effect and shows that many banks and financial institutions have been greatly affected by the emergence of the COVID-19 pandemic. The current study examines the impact of COVID 19 pandemic on the Egyptian listed banks pre and post COVID-19 pandemic. The study analysis utilizes descriptive statistics and paired sample t-test to reveal the significance of the change post COVID-19 pandemic on bank risk and performance indicators. The following sections discuss the data sample and description, research model, and statistical analysis and empirical results to show whether the hypotheses are supported.

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4.2 Data sample and description

Table (1) shows the study sample, which includes nine listed banks⁸ Covering data for six quarters from the first quarter of 2019 to the fourth quarter of 2021 considering the four quarters of 2019 as the pre- Covid-19 period, the data was compiled from two data sources, accounting and market data. The study data were collected from the Egyptian Stock market, Egyptian Financial Supervisory Authority, Egypt for Information Dissemination – EGID, and Banks websites.

The study data span three years, from 2019 to 2021. Table (1) shows a summary of the sample composition.

Table (1)
Study sample

N	Bank Name
1	Housing and Development Bank
2	Faisal Islamic Bank
3	Qatar National Bank Alahly
4	Suez Canal Bank
5	Export Development Bank
6	Credit Agricole Egypt
7	Commercial International Bank
8	Abu Dhabi Islamic Bank
9	Al Baraka Bank Egypt

⁸ Nine of the listed 12 banks were selected due to the availability of information and that banks are traded in Egyptian pounds on the Egyptian Stock Exchange.

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4.3 Research Model

The current study Individually tests the hypotheses using multivariate regression to examine the Bank's risk indicators in the Egyptian listed banks over 2019, 2020, and 2021.

For the quarterly risk and performance indicators comparability hypothesis:

H₀₁: COVID 19 pandemic did not affect the risk and performance indicators of listed banks on the Egyptian stock exchange.

$$P_{it} = \beta_1 BV_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \beta_4 CAR_{it} + \beta_5 NPL_{it} + \beta_5 BTA_{it} + \beta_6 BAge_{it} + \beta_7 BL_{it} + e_{it}$$

For the annual risk and performance indicators comparability hypothesis:

H₀₂: COVID 19 pandemic did not affect the yearly risk and performance indicators of listed banks on the Egyptian stock exchange.

$$P_{it} = \beta_1 BV_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \beta_4 CAR_{it} + \beta_5 NPL_{it} + \beta_5 BTA_{it} + \beta_6 BAge_{it} + \beta_7 BL_{it} + e_{it}$$

Variables:

P_{it}: share price for bank *i* at time *t*.

BV_{it}: Book value for Bank *I* at time *t*.

ROA_{it}: Net Profit/Total Assets for Bank *i* at time *t*.

ROE_{it}: Net Profit/Equity for Bank *i* at time *t*.

CAR_{it}: Capital Adequacy Ratio = (Tier1+Tier2+Tier3)/Risk-weighted Assets for bank *i* at time *t*.

NPL_{it}: Nonperforming Loan (NPL)=non-performing Loans/Total loans and Advances for Bank *i* at time *t*.

BTA_{it}: Total assets size for bank *i* at time *t* as a control variable.

BAge_{it}: start year to test year for Bank *i* at time *t* as a control variable.

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BL_{it} : financial leverage in year_t (Debt/TA) for Bank _i at time t as a control variable.

β : Estimated Variables parameters.

4.4 Statistical Analysis and Empirical Results

As a start, the study regression model assumptions for all models were satisfied before testing the hypothesis.

4.4.1 Statistical Descriptive

Table (2 and 3) summarizes the quarter and annual descriptive statistics for the study variables. The quarter and annual Stock price (P_t) have a mean of (23.625 and 22.325, respectively) with a standard deviation of (20.423 and 21.022, respectively). At the same time, the Book value (BV) has a mean of (84.23 and 83.631, respectively) with a standard deviation of (22.443 and 20.554, respectively). Also, return on assets (ROA) has a mean of (0.021 and 0.025, respectively) with a standard deviation of (0.0064 and 0.0074, respectively). The tables also show that return on equity (ROE) has a mean of (0.154 and 0.201 respectively) with a standard deviation of (0.131 and 0.145 respectively) and that Capital Adequacy Ratio (CAR) has a mean of (0.162 and 0.203 respectively) with a standard deviation of (0.432 and 0.562 respectively). Also, Nonperforming Loan NPL has a mean of (0.981 and 1.124, respectively) with a standard deviation of (0.084 and 0.092, respectively). For control variables, Table (2 and 3) shows the quarter and annual mean for total assets size (BTA), start year to test year for Bank (BAge). Bank financial leverage (BL) is (12.535, 25 and 10.523) and (13.021, 25 and 11.621) respectively with a standard deviation of (0.425, 14.2 and 4.025) and (0.535, 14.2 and 5.052) respectively.

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Table (2)
Statistical Descriptive for quarter analysis

Variables	Maximum	Minimum	Mean	Standard deviation
P_{it}	82.653	7.425	23.625	20.423
BV_{it}	84.235	16.444	36.253	22.443
ROA_{it}	0.042	-0.022	0.021	0.0064
ROE_{it}	0.411	-0.352	0.154	0.131
CAR_{it}	0.213	0.074	0.162	0.432
NPL_{it}	0.245	0.091	0.981	0.084
BTA_{it}	14.235	8.452	12.535	0.425
BAge_{it}	60	10	25	14.2
BL_{it}	16.123	5.263	10.523	4.025

Table (3)
Statistical Descriptive for Annual analysis

Variables	Maximum	Minimum	Mean	Standard deviation
P_{it}	80.224	7.021	22.325	21.022
BV_{it}	83.631	17.002	34.254	20.554
ROA_{it}	0.043	-0.031	0.025	0.0074
ROE_{it}	0.521	-0.276	0.201	0.145
CAR_{it}	0.314	0.085	0.203	0.562
NPL_{it}	0.316	0.124	1.124	0.092
BTA_{it}	16.035	9.552	13.021	0.535
BAge_{it}	60	10	25	14.2
BL_{it}	17.305	6.603	11.621	5.052

4.4.2 Empirical results

To discover the statistically significant differences in risk and performance indicators in Egyptian banks pre and post COVID-19 pandemic, a paired sample t-test was conducted. This part summarizes and discusses the overall results for examining the study hypothesis; the tests are structured as follows:

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For the quarterly risk and performance indicators comparability:

H₀₁: COVID 19 pandemic did not affect the quarterly risk and performance indicators of listed banks on the Egyptian stock exchange.

$$P_{it} = \beta_1 BV_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \beta_4 CAR_{it} + \beta_5 NPL_{it} + \beta_6 BTA_{it} + \beta_7 BL_{it} + e_{it}$$

Table (4) shows the hypothesis results that present the average difference in risk and performance indicators pre COVID-19 pandemic. All indicators are significant (P value less than 0.005), which can be attributed to the COVID-19 pandemic. The change in banks stock prices average value of 0.153 (t=8.56, p=0.000), which seems normal, as the global firms share prices have fallen. According to the Egyptian Stock Exchange 2020 annual report “The COVID-19 pandemic drags the world's stock markets down during 2020 whereas EGX30 main index suffered a 22.32% decline compared to 2019”⁹. Also, The change in banks Book Value average value of 0.192 (t=5.23, p=0.000), which maybe relates to the postponing market capital of expected IPO’s in the banking sector by EGP 5,250,000,000¹⁰. Also, the risk and performance indicators of (ROA, ROE, CAR, and NPL) the change average value of (0.245, -0.152, 0.571, and -0.144 respectively with (t=9.65, p=0.002, t=6.74, p=0.000, and t=5.42, p=0.004, and 7.24, p=0.003 respectively). For the control variables (BTA, BAG, and BL the change average value of (0.352, -0.522, -0.024, respectively with (t=7.54, p=0.000, t=8.23, p=0.011, and t=9.12, p=0.001 respectively. That is, the quarter null hypothesis and accept the alternative H₁ that the COVID 19 pandemic affect the quarterly risk and performance indicators of listed banks on the Egyptian stock exchange.

⁹ The report is available at https://www.egx.com.eg/en/services_reports.aspx

¹⁰ Egyptian Stock Exchange 2020 annual report.

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Table (4)
Model (1) results for the quarterly risk and performance indicators comparability

Variables	Mean	Std. Dev	Std. Err Mean	95% Confidence Interval of the difference		T	Sig
				Lower	Upper		
P_{it}	0.153	0.198	0.024	-0.124	-0.145	8.56	0.000
BV_{it}	0.192	0.425	0.034	0.103	0.375	5.23	0.000
ROA_{it}	0.245	0.123	0.022	0.241	0.312	9.65	0.002
ROE_{it}	-0.152	0.157	0.054	-0.144	0.154	6.74	0.000
CAR_{it}	0.571	0.225	0.009	0.104	0.312	5.42	0.004
NPL_{it}	-0.144	0.127	0.040	0.121	0.211	7.24	0.003
BTA_{it}	0.352	0.201	0.022	0.203	0.315	7.54	0.000
BAG_{it}	0.522	0.351	0.014	0.401	0.622	8.23	0.011
BL_{it}	-0.024	0.133	0.045	-0.120	0.147	9.12	0.001

For the annual risk and performance indicators comparability:

H₀₂: COVID 19 pandemic did not affect the annual risk and performance indicators of listed banks on the Egyptian stock exchange.

$$P_{it} = \beta_1 BV_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \beta_4 CAR_{it} + \beta_5 NPL_{it} + \beta_6 BTA_{it} + \beta_7 BAG_{it} + \beta_8 BL_{it} + e_{it}$$

Table (5) shows the hypothesis results that present the average difference in risk and performance indicators pre COVID-19 pandemic. All annual indicators are significant (P value less than 0.005), which can be attributed to the COVID-19 pandemic. The change in banks stock prices average value of 0.165 (t=7.52, p=0.003), which seems also normal, as the global firms share prices have fallen. Also, The change in banks book value average value of 0.184 (t=5.48, p=0.000). Also, the risk and performance indicators of (ROA, ROE, CAR, and NPL) the change average value of (0.245, -0.152, 0.571, and -0.144 respectively with (t=9.65, p=0.002, t=6.74, p=0.000, and t=5.42, p=0.004, and 7.24, p=0.003

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respectively) Which is believed to be due to banks' profits shrunk by 20% on annual basis in the second quarter of the year 2020 during the closing peak, but this performance was " Not bad at all," where the reason goes to the retreat to increase provisions for losses loans, as well as legislative changes the latest on bond tax for banks In addition to postponing the repayment of corporate and private loans for 6 months¹¹. For the control variables (BTA, BAG, and BL the change average value of (0.310, -0.511, -0.025, respectively with (t=7.45, p=0.002, t=8.41, p=0.001, and t=9.11, p=0.0010 respectively. That is, the annual null hypothesis and accept the alternative H₂ that the COVID 19 pandemic affect the annual risk and performance indicators of listed banks on the Egyptian stock exchange.

Table (5)
Model (2) results for the annual risk and performance indicators comparability

Variables	Mean	Std. Dev	Std. Err Mean	95% Confidence Interval of the difference		T	Sig
				Lower	Upper		
P_{it}	0.165	0.184	0.021	-0.113	-0.130	7.52	0.003
BV_{it}	0.184	0.345	0.029	0.115	0.270	5.48	0.000
ROA_{it}	0.241	0.105	0.019	0.230	0.412	8.42	0.000
ROE_{it}	-0.124	0.172	0.051	-0.130	0.290	9.55	0.001
CAR_{it}	0.451	0.201	0.007	0.102	0.418	8.22	0.000
NPL_{it}	-0.124	0.107	0.050	0.111	0.205	6.42	0.000
BTA_{it}	0.310	0.185	0.030	0.214	0.315	7.45	0.002
BAG_{it}	0.511	0.341	0.020	0.380	0.577	8.41	0.001
BL_{it}	-0.025	0.104	0.050	-0.118	0.150	9.11	0.000

¹¹ Local Trends Series-Center for Information and Decision Support of the Egyptian Council of Ministers-December 2020-Vol 46.

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4.4.3 Hypothesis results

The overall results from the analysis indicate the following results

Table (6): Hypotheses results

Hypothesis	Decision
H ₀₁ : COVID 19 pandemic did not affect the quarterly risk and performance indicators of listed banks on the Egyptian stock exchange.	Rejected (0.050)*
H ₁ : COVID 19 pandemic affect the quarterly risk and performance indicators of listed banks on the Egyptian stock exchange.	Accepted
H ₀₂ : COVID 19 pandemic did not affect the annual risk and performance indicators of listed banks on the Egyptian stock exchange.	Rejected (0.04)*
H ₁ : COVID 19 pandemic affect the annual risk and performance indicators of listed banks on the Egyptian stock exchange.	Accepted
* Significance	

As shown in table (6), both null hypotheses were rejected. Therefore, the alternative hypotheses were accepted, implying that the COVID 19 pandemic affects both bank risk and performance indicators quarterly and annually.

5. Discussion

The current study examined how COVID-19 affected the Egyptian listed banks and the difference between the banks' risk and performance indicators pre- and post-COVID-19 pandemic. Results have shown that the COVID-19 pandemic affects both quarter and annual risk and performance in Egyptian listed banks. COVID-19 affect significantly banks stock prices, book value, return on assets, return on equity, Capital Adequacy Ratio, and non-performing Loans.

Results have also shown that the COVID-19 pandemic significantly affects the Egyptian banking industry system through working with high-risk and low-performance indicators where the regulators and bank managers need new

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regulations and implementations and accelerating the digitalization processes. Also, the Banking system should support the socio-economic ecosystem and rethinking of their flow of activities. In Egypt, the banking sector crossed the COVID-19 with a high level of support from the Egyptian Central bank regulations.

Based to (Werner, 2016), the partial reserve theory, states that “only the banking system as a whole is capable of making money collectively, while each bank is just a financial intermediary, collecting and lending deposits.” Concerning the same context of the banking system in Egypt, it confirms the importance of the banking sector along with other financial sectors on stock exchanges globally and locally and in conjunction with what the Egyptian Stock Exchange¹² announced in that the Egyptian banking sector achieved 26.2% of the total market value of the main market in 2020, followed by the basic resources sector by 11.2%, while the sector occupied Real estate ranked third with 10.7% of the total market value which considered one of the crucial sectors for study, especially in emergency and non-recurring circumstances such as the Covid-19 pandemic and its impact on risk and performance indicators for banks.

6. Limitations

Despite the contribution this study provided to knowledge in accounting and to the Egyptian bank sector, there are some limitations; the study examined only quarterly and annually from march 2019 to December 2021. The sample size is restricted to the listed banks on the Egyptian Stock Exchange. Also, the study uses the most common bank risk, and performance indicators and results can vary using different other indicators and measures.

7. Recommendation and future research

Based on the study results and its related discussion, several recommendations have been presented as follows:

¹² Annual report 2020.

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1. Replications of the current study are needed to validate the current study results.
 2. Future research also may test other risk and performance indicators.
 3. Future research also may address longitudinal changes and investigate other governmental banks.
 4. Another recommendation for future investigation should consider observing risk and performance indicators at the individual banking level.
 5. Also, future research may compare the results of the impact of the COVID-19 pandemic between Egypt and other countries.
 6. Future Analytical studies for consumers' perception of Egyptian banking systems during the pandemic are needed.

8. Summary and Conclusions

This study investigates the effect of the COVID-19 pandemic on the Bank's risk and performance indicators for listed banks on the Egyptian stock exchange. Two paired sample tests were conducted using a sample of 9 banks from 2019 until 2021 quarterly and annual information to investigate the effect of the COVID-19 pandemic on banks' risk and performance- measured by P, BV, ROA, ROE, CAR, and finally by NBL.

The study results revealed that the COVID-19 pandemic has a significant effect on Bank's risk and performance indicators-whether it was measured using P, BV, ROA, ROE, CAR, or NBL.

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أثر جائحة كورونا على مؤشرات الخطر والأداء في البنوك المصرية- دراسة إمبريقية

د. نهاد حسني يوسف

الملخص بالعربي:

تقدم هذه الدراسة تحليلاً لمؤشرات الخطر والأداء لتسعة من البنوك المقيدة بالبورصة المصرية – خلال جائحة كورونا. اختبرت الدراسة المعلومات المالية للأعوام ٢٠١٩ حتى ٢٠٢١ ووجدت الدراسة أنه على الرغم من أن الغالبية من البنوك المصرية واجهت بالفعل مشاكل مالية، إلا أن البنوك المصرية كانت مرنة جداً وذلك مع الدعم الكبير من البنك المركزي المصري. أشارت النتائج أن جائحة كورونا أثرت على مؤشرات الخطر والأداء لكل من الأداء الربع سنوي والسنوي. وأوضحت النتائج أن جائحة كورونا لها تأثير معنوي على كلاً من: سعر السهم، القيمة الدفترية، العائد على الأصول، العائد على حقوق الملكية، نسبة كفاية رأس المال، ونسبة القروض المتعثرة للبنوك. وأشارت النتائج أيضاً إلى الدور الكبير للبنك المركزي المصري للحد من التأثير الحاد لجائحة كورونا على مؤشرات الخطر والأداء للبنوك المصرية.

الكلمات المفتاحية:

مؤشرات الخطر – مؤشرات الأداء – التأثير السوقي- جائحة كورونا