



RESEARCH ARTICLE

Evaluating the Effect of COVID-19 on Profitability and Bank Performance

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Abstract

The primary purpose of this study is to investigate the effect of COVID-19 on profitability and employee performance in state-owned and private banks in Iran. In other words, the present study seeks to find an answer to whether COVID-19 can affect the profitability and performance of employees of Iranian banks or not. In terms of objective, the study method is a practical and descriptive survey. The study's statistical population comprises all managers, staff, and customers of state-owned and private banks in Iran, through which 540 questionnaires were filled and analyzed. The sampling method of the study is available non-random that is used as the study's sample. In this paper, the PLS tests are employed to assess the effect of independent variables on the dependent ones. The results from the study's hypotheses show that COVID-19 has a positive and significant effect on profitability and employee performance. Moreover, the effect is more tangible in state-owned banks than the private ones. The present study was carried out in emergent financial markets, like Iran, which is highly competitive and suffering from severe economic sanctions since due to the sanctions, most countries, including the United States, did not allocate vaccines to the Iranian people and that exacerbated the conditions in Iran, it can provide the readers with useful information to develop science and knowledge in this field.

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1. Introduction

The COVID-19 pandemic caused a global economic shock and caused the deepest global recession in nearly a century (OECD 2020). Although the global economy is on the path to recovery, returns are expected to be unequal among countries, so returns in developing countries may be much later than in developed countries (World Bank, 2021). The countries of the Persian Gulf are among the regions that have been severely affected by this pandemic and are expected to face serious problems in developing and increasing per capita income for at least a decade. (World Bank, 2021). Continued implementation of large-scale restrictive measures by governments and uncertainty about the timing of the pandemic continue to negatively affect developing countries' economic and financial conditions, making a recovery more diverse, difficult, and uncertain. The financial sector of the Middle East, especially Iran, has not escaped this pandemic, as it has exposed financial institutions to tremendous operational and financial challenges.

The COVID-19 pandemic contributed to the sharp rise in corporate and household debt and negatively affected banks' financial performance and ability to mediate and support economic recovery (Minney 2020; Tyson 2020; Barua and Barua 2020). Given the central role of banks in economic prosperity, growth and development of countries, banking performance is still considered by industry experts, policymakers and researchers. The most common measure of a bank's performance is profitability, often characterized by profitability ratios such as return on assets (ROA), return on equity (ROE), and net income margin (NIM) (Sufian and Habibullah, 2009; Rahman et al., 2015; Kumar et al., 2020; Titko et al., 2015). In the extensive existing literature, bank profitability is generally expressed as a function of internal (especially bank) and external (macroeconomic and industry-specific) factors (Titko et al., 2015; Sufian and Habibullah, 2009; Rahman et al., 2015). However, various internal and external factors contribute to banks' profitability in emerging and developing economies, largely due to the thematic literature's mixed and sometimes contradictory empirical results. A comparative analysis of this study showed that Nigeria's most consistent determinants of bank profitability are the ratio of overhead cost to total assets and the cost-efficiency ratio. In contrast, in South Africa, the ratio of capital adequacy and overhead cost is the total assets. In the United States, no determinants of bank profitability had a statistically significant effect on bank performance. He also found that the return on assets is higher in Nigeria and lower in the United States, indicating that the Nigerian banking sector is more profitable than the US banking sector. At the same time, inflation and GDP growth are lower in the US and much higher in Nigeria. This shows that the United States has greater macroeconomic stability than Nigeria. Therefore, the study concluded that the factors determining banks' profitability are divergent in different countries according to the country's specific characteristics, such as the nature of banking systems, the level of development of the financial sector, and banking regulations and supervision. One of the studies highlighting the differences in the determinants of banks' profitability between countries is Boateng (2018). While examining specific factors affecting bank profitability, this study showed that credit risk, net profit margin, capital adequacy, and inflation significantly affect bank profitability as measured by asset returns in Ghana and India. In contrast, liquidity risk and GDP growth had little effect on banks' profitability in both countries, while the cost-to-income ratio and bank size had little effect on the profitability of the Bank of India but were very important to the profitability of the rich bank. On the other hand, Almaqtari et al. (2019) showed that bank size, number of branches, asset management ratio, operating efficiency and leverage ratio are the key bank-specific factors in explaining the profitability of Indian commercial banks.

Therefore, the factors determining banks' profitability vary over time in countries. For example, Sufian and Habibullah (2009) and Rahman et al. (2015) examined the factors affecting the profitability of banks and both studies showed that the intensity of loans positively and significantly

affects the bank's profitability. [Sufian and Habibullah \(2009\)](#) also found that interest-free income, credit risk and cost significantly affect all three criteria of bank profitability, while [Rahman et al. \(2015\)](#) found that the power of capital (both regulatory capital and capital Stocks), cost efficiency and off-balance sheet activities significantly affect all three criteria of bank profitability. Further, [Sufian and Habibullah \(2009\)](#) also found that the effect of size is not the same in all measures of bank profitability and that macroeconomic determinants except inflation, which is negatively related to the profitability of Bangladeshi banks, do not significantly affect bank profitability. Next, [Adelopo et al. \(2018\)](#) examined the behavior of bank profitability determinants before, during and after the global financial crisis in the economic community of West African countries. This study showed that the return on assets before, during and after the financial crisis was significantly affected by cost management, liquidity and size, while the impact of bank-specific factors such as market power, credit risk and capital strength and macroeconomics factors such as GDP and inflation were sensitive to applied periods of analyzing and measuring bank profitability. Therefore, the study concluded that the financial crisis generally does not affect the relationship between some of the bank's specific determinants and profitability. Moreover, [Kohlscheen et al. \(2018\)](#) showed that the global financial crisis and economic growth have significantly affected banks' profitability.

An emerging collection of articles on the effects of the COVID-19 pandemic on the banking sector mainly applies to advanced economies ([Barua and Barua 2020](#)), while the pandemic is expected to have a more adverse effect on banking systems in low-income and developing countries. ([Damak et al., 2020](#)). Among the few existing studies in emerging and developing countries, [Elnahass et al. \(2021\)](#) and [Barua and Barua \(2020\)](#), [Elnahass et al. \(2021\)](#) examined the impact of the COVID-19 pandemic on global banking stability and found that the prevalence of COVID-19 had a negative impact on financial stability and financial performance. The results were consistent in different regions and countries in the global banking sector as well as in different levels of the country's revenue generation and banking characteristics. Besides, these studies showed that the pandemic has significant changes and effects on conventional and Islamic banking systems. Since the start of the Corona pandemic, regulators have taken steps to ensure financial stability and reduce risks to the banking system. However, understanding the effects of the COVID-19 pandemic on the profitability of banks and their employees in developing countries is crucial, given their pivotal role in flexibility and improving the situation in Iran ([Barua and Barua, 2020](#)). Although many studies have been conducted on the impact of COVID-19 on stock market returns, no study has been published on the impact of COVID-19 on the profitability and performance of bank employees. ([Anh and Gan, 2021](#); [Insaidoo et al., 2021](#)), COVID-19 and stock returns ([Narayan et al., 2021](#)). For this purpose, due to the lack of empirical research on the impact of the COVID-19 pandemic on the performance of banks in developing countries, this article examines the impact of the COVID-19 pandemic on profitability and employee performance in state-owned and private banks in Iran. A literature review has shown that no previous empirical study has explicitly examined the effect of the COVID-19 pandemic on the profitability and performance of state-owned and private bank employees in developing countries, including Iran.

2. Theoretical Framework and Hypothesis Development

2.1 *The impact of COVID-19 on bank profitability*

Economies worldwide have been hit hard by COVID-19. Unemployment in the United States increased unprecedentedly in the first half of 2020. At the same time, such a shock is unlikely to affect banks. Equity buffers have improved significantly since the 2007 national crisis, and monetary and regulatory responses have been rapid to strengthen the flexibility of the financial system ([Feyen](#)

et al., 2020). In addition, governments acted to support the real economy, which indirectly benefited the banks. The pandemic has affected banks' health and ability to support the economy through lending (Beck and Keil, 2021). In addition to the health crisis, COVID-19 caused a severe recession worldwide. The economic downturn caused by COVID-19 and the shock of falling oil prices will push the national economy into its next recession. With the severe outbreak of the disease, financial markets suffered heavy losses. On February 27, the Dow Jones Industrial Average saw its biggest one-day drop. Although there has been a significant increase in the government response, the stock market has failed several times. However, research shows that the five major US banks have seen the strongest results in nearly a decade, as trading and debt issuance levels have risen sharply in the mid-1930s (Fitch, 2020). Instability in the stock market will increase business activity, so the commercial income of banks will increase significantly. Moreover, increasing the need for liquidity by companies to survive in the economic downturn caused by the pandemic leads to debt expectations (Fitch, 2020). On the other hand, during the pandemic, they reduced the Fed rate to 0.25% (Fitch, 2020). Therefore, reducing short-term and long-term interest rates can disrupt banks' profitability. Besides, as Fitch (2020) shows, declining economic activity may significantly reduce banks' profitability for several months. Also, due to closures, social distancing, and telecommuting due to pandemics, bank customers' activities will decrease and reduce the income from fees. Therefore, the financial effects of COVID-19 have caused banks' profitability to decline.

However, researchers must focus on how Iranian banks react to the epidemic and how to maintain them in the long run while maintaining a healthy and safe profit margin. As the disease continues, many economic factors affect banks' efficiency. The previous literature shows some factors that affect the bank's performance. For example, Ashraf and Shen (2019) have studied the relationship between economic policy uncertainty and bank loan pricing. They have shown a positive relationship between economic policy uncertainty and bank lending pricing. Francis et al. (2014) also stated that political uncertainty increases lending rates. Karadima and Louri (2020) also stated that political uncertainty affects the performance of banks. Bordo et al. (2016) also showed a negative and significant relationship between political uncertainty and the growth of banks' credit. Jin et al. (2019) also argued that political uncertainty has a significant positive relationship with bank profitability. Also, Sharif et al. (2020) and Zhang et al. (2020) examined the impact of COVID-19 on economic conditions. Therefore, we expect COVID-19 to lead to a change in banks' profitability. Since no research has been done in Iran, some believe the epidemic has decreased profitability. Some have stated that the increase in bank visits will increase profitability. Therefore, we express the research hypothesis pointlessly. Hence, according to what has been said, the first hypothesis is as follows:

H1: COVID-19 affects bank profitability.

2.2 The impact of COVID-19 on the performance of bank employees

In addition to mortality, the impact of COVID-19 has increased the incidence of the disease in all countries. Since the first case was reported on March 2, 2020 (Compass, 20/5/2020), the COVID-19 pandemic has profoundly affected global mental health. Many people feel helpless because of the epidemic, panic and anxiety (Zhang and Ma, 2020). COVID-19 has directly impacted all global economic, social and psychological aspects of stock markets (Liu et al., 2012). The COVID-19 pandemic can also disrupt banking performance (Disemadi and Shaleh, 2020). Thus, banks' operational risk management must be done properly to improve the performance of banking services to customers. Achieving superior performance requires systematic innovation (Nwachukwu et al., 2018) and retaining competent and motivated employees to compete in unstable environments (Adeola and Adebisi, 2016). At the time of the COVID-19 pandemic, most banking services were normal to serve customers, to prevent the transmission of the virus and customers could make

financial transactions through the bank's electronic channels. Information and communication technology changes businesses and organizations (Cascio and Montealegre, 2016), and the performance of banks that use Internet banking services and banks that do not use electronic banking services are different. Margaretha (2015) and Mardiah (2017) examined the application of technology in banking and stated that technology in the banking industry positively affects their performance. Marsal and Hidayati (2018) also stated that social media affects the performance of banks and rapid technological advances in the banking sector has begun. Jarkom SP Banking Communication Networks said 50,000 employees had been fired for replacing machines (Detikfinance, 2019). Employees are the main elements of an organization. An organization's success or complaint depends on employees' performance (Hameed and Waheed, 2011). The outbreak of COVID-19 has disrupted banking operations. Although this was not the case until the first quarter of 2020, the banking industry's performance was disrupted in 2020. In order to continue working during the COVID-19 pandemic, employees are required to perform well. According to Armstrong and Baron (1998), performance is about how work is done and its results. Performance is the result of work that has a strong relationship with the strategic goals of an organization, institution or company, customer satisfaction, and economic participation. Performance is the foundation of an organization because if there is no performance, the organization's goals are not achievable. Employee performance significantly affects service quality and customer satisfaction (Supit et al., 2015; Amelia and Rodhiyah, 2016; Virgiawansyah et al., 2019). Employee performance can be improved by increasing employee compensation and better implementation of human resource development (Hamzah et al., 2018). Studies such as Bima (2017), Nawawi et al. (2018) show that rewards and motivation simultaneously affect employee performance. Also, Nasution et al. (2019) state that reward, motivation and job satisfaction affect performance. During this illness, analyzing the impact of employee rewards and motivation on the performance of bank employees will be very important. By being aware of the performance of bank employees, we can use it as assessment material for leaders to determine the level of performance in the event of an outbreak of the COVID-19 pandemic. As the bank functions as a collector and distributor of public funds and its purpose are to support the implementation of national development, to improve distribution and development, economic growth and national stability, and to improve the lives of many people, it will be important to review the performance and impact of COVID-19. Therefore, according to what has been said, the second hypothesis is as follows:

H2: COVID-19 affects the performance of bank employees.

3. Research Methodology

This paper is practical in terms of objective and type based on analyzing the collected data in the survey method. In this method, referred to as the field method, the scholar will collect data and information by being present at the statistical population level and using different tools, including a questionnaire. The survey method is applied to assess the distribution of the characteristics of the statistical population to analyze the status quo and explore the relationship between events. The collected data were analyzed using the PLS Statistical Software, through which the authenticity of the hypotheses and the obtained results will be generalized to the entire statistical population.

3.1 Data collection

The information used in this paper is divided into two groups. The first group is for information related to theoretical principles and the literature of the study provided by studying local and international resources; the second group is for information collected through the questionnaire. The questionnaire of the present study is scholar-made and most of its questions are omitted since they

are irrelevant to the condition of Iran. This paper was carried out 2021 in the Iranian Stock Exchange, private and state-owned banks section. The scholar-made questionnaire concerns COVID-19, electronic banking, and information technology factors (cloud computing, investment in IT, etc.). In this section, the respondents face two types of questions. By answering the initial part of the questions, we can determine whether or not the factor currently exists in Iranian banks regarding the professional experience of the respondent and the answer to the second part expresses the amount of significance (extremely high, high, average, low, extremely low) of the factor from the respondent's viewpoint. The reliability of the questionnaire is assessed based on the opinion of the opinion leaders and the validity of that is determined based on the Cronbach's Alpha.

3.2 Research sample and population

The study's statistical population includes all managers, executives, staff, and customers of Iranian state-owned and private banks.

3.3. Research model

3.3.1 Conceptual model of the first hypothesis: COVID-19 affects bank profitability

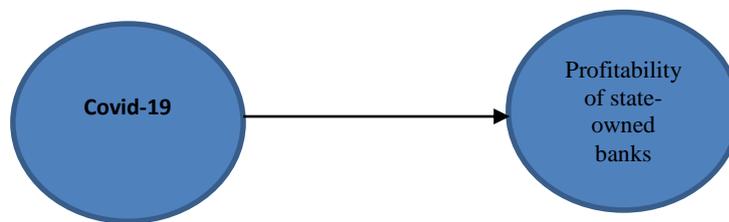


Figure 1. The general model of the first hypothesis on state-owned banks

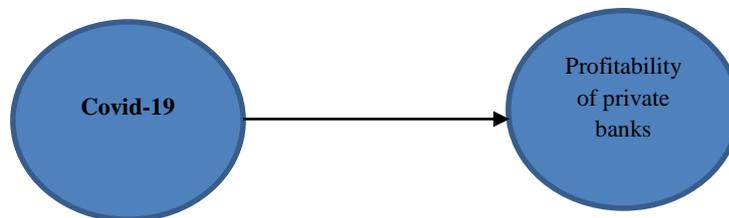


Figure 2. The general model of the first hypothesis on private banks

3.3.2 Conceptual model of the second hypothesis: COVID-19 affects the performance of bank employees.



Figure 3. The general model of the second hypothesis on state-owned banks

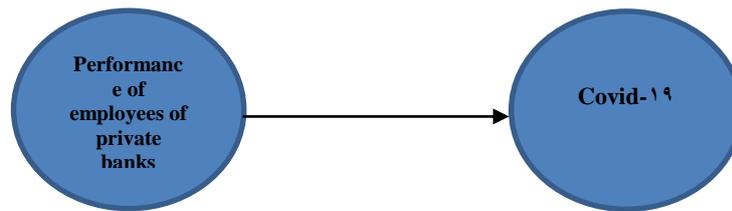


Figure 4. The general model of the second hypothesis on private banks

The scholar-made questionnaire examines Corona and standard questionnaires to assess profitability and employees' performance.

4. Data Analysis

4.1 Statistical population status based on gender

Given the data analysis of the statistical sample under study, 205 participants (59%) are male and 141 (41%) are female. The highest frequency is for men (Table 1)

Table 1. The frequency distribution of gender status of respondents

	Gender	Frequency	Frequency percentage	cumulative frequency
Respondent	Male	439	81.3	81.3
	Female	65	12.0	93.3
	No answer	36	6.7	100
	Total	540	100%	100%

As shown in Table 1, 439 respondents (81.3%) are male and 65 respondents (12%) are female, and 36 did not answer.

4.2 Statistical sample status based on respondents' age

The obtained information from the frequency of subjects' questionnaire based on the respondents' age is presented in the following Table and diagram.

Table 2. The frequency of distribution of respondents' age

	Age	Frequency	Frequency percentage	cumulative frequency
Respondent	26-30	34	6.3	6.3
	31-35	108	20	26.3
	More than 35	385	71.3	97.6
	No answer	13	2.4	100
	Total	540	100%	100%

Given the data analysis among the statistical sample under study, 34 participants (6.3%) aged between 26 and 30, 108 participants (20%) aged between 31 and 35, 385 participants (71.3%) aged more than 35 and 13 participants did not answer. The highest frequency is for ages over 35 (Table 2).

4.3 Statistical sample status based on the education level

The obtained information from the frequency of subjects' questionnaires based on the education level is presented in the following Table and diagram.

Table 3. The frequency of distribution of education level

	Education	Frequency	Frequency percentage	cumulative frequency
Respondent	Diploma and lower	15	2.8	2.8
	Associate Degree	28	5.2	8
	Bachelor's	211	39.1	47.1
	Master's degree and higher	250	46.2	93.3
	No answer	36	6.7	100
	Total	540	100%	100%

Given the data analysis among the statistical sample under study, 15 participants (2.8%) have a high school diploma or lower degree, 28 participants (5.2%) have an associate degree, 211 participants (39.1%) bachelor's degree, 250 participants (46.2) master's degree and higher, and 36 participants did not answer. The highest frequency is for a master's degree or higher.

4.4 Statistical sample status based on the field of study

The obtained information from the frequency of subjects' questionnaires based on the field of study is presented in the following Table.

Table 4. The frequency of distribution of the field of study

	Field of Study	Frequency	Frequency percentage	cumulative frequency
Respondent	Accounting and auditing	154	28.5	28.5
	Economy	12	2.2	30.7
	Financial Management	97	18.0	48.7
	Other disciplines	227	42.0	90.7
	No answer	50	9.3	100
	Total	540	100%	100%

Given the data analysis among the statistical sample under study, 154 participants (28.5%) in accounting and auditing, 12 participants (2.2%) in economics, 97 participants (18.0%) in financial management, and 227 participants (42.0%) in other disciplines.

4.5 Statistical sample status based on the work experience of respondents

The obtained information from the frequency of subjects' questionnaire based on the work experience of respondents is presented in the following Table and diagram.

Table 5. The frequency of distribution of the work experience of respondents

	Work experience	Frequency	Frequency percentage	cumulative frequency
Respondent	Less than 5	15	2.8	2.8
	6-10	16	3	5.8
	11-15	56	10.4	16.2
	More than 15	417	77.2	93.4
	No answer	36	6.6	100
	Total	346	100%	100%

Given the data analysis among the statistical sample under study, 15 participants (2.8%) were five years and lower, 16 participants (0.3%) were between 6 and 10 years, 56 participants (10.4%) between 11 and 15, 417 participants (77.2%) more than 15 years and 36 participants did not answer. The highest frequency is for work experience of more than 15 years (Table 5).

4.6 Statistical sample status based on the job position of respondents

The obtained information from the frequency of subjects' questionnaire based on the job position of respondents is presented in the following Table.

Table 6. The frequency of distribution of the job position of respondents

	Work experience	Frequency	Frequency percentage	cumulative frequency
Respondent	Senior Manager	6	1.1	1.1
	Mid-level manager	18	3.3	4.4
	operational manager	72	13.4	17.8
	Employee	103	19.1	36.9
	Customer	341	63.1	100
	Total	346	100%	100%

Given the data analysis among the statistical sample under study, 6 participants (1.1%) were senior managers, 18 participants (3.3%) were middle managers, 72 participants (13.4%) were operational managers, 103 participants (19.1%) employees, and 341 (63.1%) have job title of customer.

4.7 Reliability and validity in PLS

4.7.1 Cronbach's Alpha

Internal consistency shows the amount of correlation between a structure and its related indicators. The Cronbach's Alpha value higher than 0.7 is indicative of acceptable reliability.

Table 7. The Cronbach's Alpha value for state-owned banks

Row	Measurement Model	Amount
1	Profitability of state-owned banks	0.868
1	Covid-19	0.844

Table 8. The Cronbach's Alpha value for private banks

Row	Measurement Model	Amount
1	Profitability of private banks	0.823
2	Covid-19	0.731

Table 9. The Cronbach's Alpha value for state-owned banks

Row	Measurement Model	Amount
1	Performance of employees of state-owned banks	0.749
2	Covid-19	0.873

Table 10. The Cronbach's Alpha value for private banks

Row	Measurement Model	Amount
1	Performance of employees of private banks	0.862
2	Covid-19	0.868

Given the above Tables, they have Cronbach's Alpha values of more than 0.7 and are acceptable.

4.7.2 Combined reliability (CR)

If the CR value for each structure is more than 0.7, internal sustainability would be appropriate for measurement models.

Table 11. The combined reliability values of state-owned banks

Row	Measurement Model	Amount
1	Profitability of state-owned banks	0.935
2	Covid-19	0.866

Table 12. The combined reliability values of private banks

Row	Measurement Model	Amount
1	Profitability of private banks	0.895
2	Covid-19	0.733

Table 13. The combined reliability values of state-owned banks

Row	Measurement Model	Amount
1	Performance of employees of state-owned banks	0.825
2	Covid-19	0.903

Table 14. The combined reliability values of private banks

Row	Measurement Model	Amount
1	Performance of employees of private banks	0.863
2	Covid-19	0.873

According to the above Tables, the combined reliability value of the state-owned and private banks variables is more than 0.7, indicative of appropriate reliability.

4.7.3 Examining the coefficients of factor loads

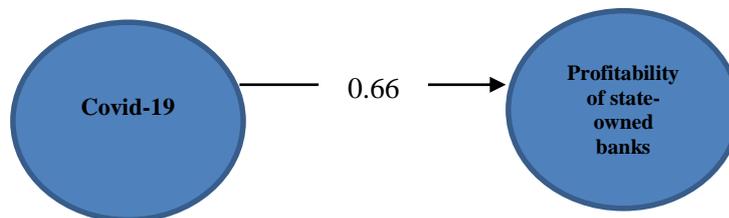


Figure 5. The standardized coefficients of factor load about the probability of state-owned banks

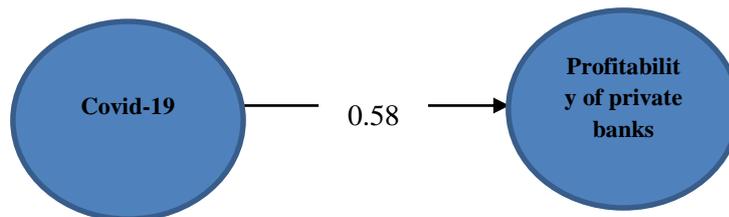


Figure 6. The standardized coefficients of factor load about the probability of private banks

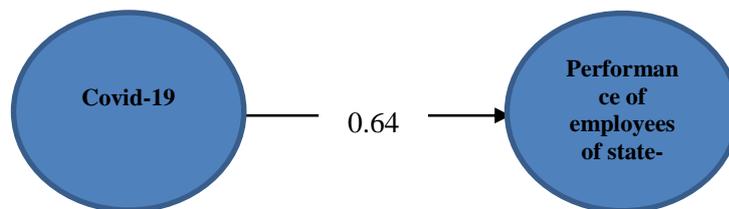


Figure 7. The standardized coefficients of factor load about the staff performance of state-owned banks

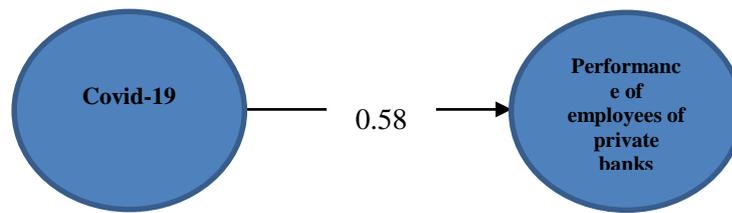


Figure 8. The standardized coefficients of factor load about the staff performance of private banks

According to the above Figures, it is clear that the high factor value of the first hypothesis for state-owned and private banks is higher than 0.4, indicating this criterion's appropriateness.

4.7.4 Convergent validity

Table 15. The convergent validity values (AVE) for state-owned banks

Row	Measurement Model	Amount
1	Profitability of state-owned banks	0.678
2	Covid-19	0.573

Table 16. The convergent validity values (AVE) for private banks

Row	Measurement Model	Amount
1	Profitability of private banks	0.541
2	Covid-19	0.501

Table 17. The convergent validity values (AVE) for state-owned banks

Row	Measurement Model	Amount
1	Performance of employees of state-owned banks	0.534
2	Covid-19	0.541

Table 18. The convergent validity values (AVE) for private banks

Row	Measurement Model	Amount
1	Performance of employees of private banks	0.574
2	Covid-19	0.592

Fornell and Larcker consider the appropriate value for AVE to be 0.5 or higher, while the obtained results in the above Tables show that the AVE value for the COVID-19 structure for the profitability of state-owned and private banks is more than 0.5, which is acceptable.

4.7.5 Divergent validity

Divergent validity in PLS is analyzed using the Fornell and Larcker method.

Table 19. The divergent validity measurement matrix using the Fornell and Larcker method for the profitability of state-owned banks

Variables	Profitability of state-owned banks	Covid-19
Profitability of state-owned banks	0.937	0.000
Covid-19	0.706	0.770

Table 20. The divergent validity measurement matrix using the Fornell and Larcker method for the profitability of state-owned banks

Variables	Profitability of private banks	Covid-19
Profitability of private banks	0.813	0.000
Covid-19	0.582	0.732

Table 21. The divergent validity measurement matrix using the Fornell and Larcker method for the staff performance of state-owned banks

Variables	Performance of employees of state-owned banks	Covid-19
Performance of employees of state-owned banks	0.731	0.000
Covid-19	0.644	0.681

Table 22. The divergent validity measurement matrix using the Fornell and Larcker method for the staff performance of private banks

Variables	Performance of employees of private banks	Covid-19
Performance of employees of private banks	0.821	0.000

Table 23. The R² values

Variables	R Square
Profitability of state-owned banks	0.268
Profitability of private banks	0.339

The square root matrix's major diameter is the AVE values for profitability structures in state-owned and private banks. As seen in the above Tables, the AVE structure square root value for the profitability of state-owned banks (0.937) is more than the correlation value with COVID-19. As for the COVID-19 structure, the AVE structure square root value is more than the structure correlation value for state-owned profitability. In other words, the divergent validity of the model is at an appropriate limit for the profitability of the state banks. Moreover, the Fornell and Larcker criterion for the profitability of private banks is significant.

4.8 Z coefficients of significance (t-values)

The Z significance coefficient is used to confirm the study's hypothesis at a 0.95 confidence level. The relationship between structures would be correct if that value is more than 1.96.

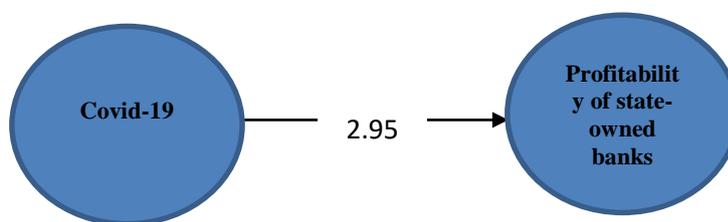


Figure 9. The first hypothesis model, along with z significant coefficients about the profitability of state-owned banks

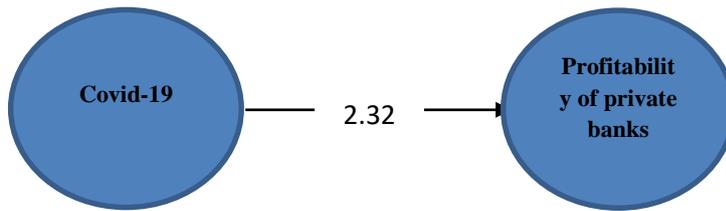


Figure 10. The first hypothesis model, along with z significant coefficients about the profitability of private banks

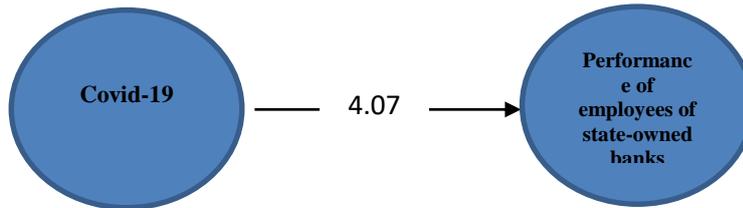


Figure 11. The second hypothesis model, along with z significant coefficients about employees' performance in the state-owned bank

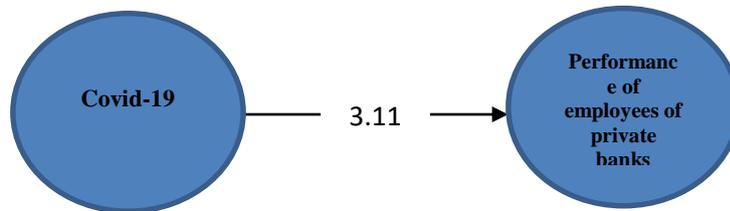


Figure 12. The second hypothesis model, along with z significant coefficients about employees' performance in private banks

As seen from the Figures above, the coefficients for COVID-19 on the profitability of state-owned and private banks have exceeded 1.96, confirming the structural model's fit.

4.9 R2 criteria

The second criterion to be assessed for the structural model fitting within a study is the R² coefficients related to the dependent variables of the model. Three values of 0.19, 0.33, and 0.67 are considered the weak, average, and strong thresholds.

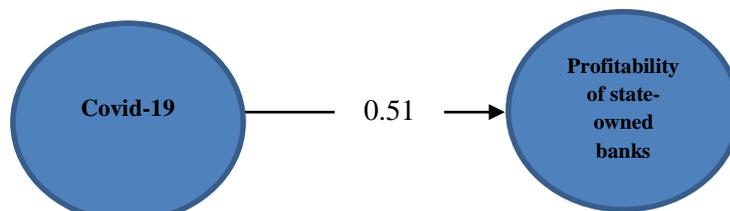


Figure 13. The R² value for profitability in state-owned banks

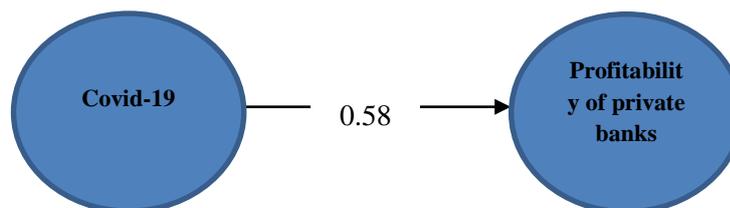


Figure 14. The R² value for profitability in private banks

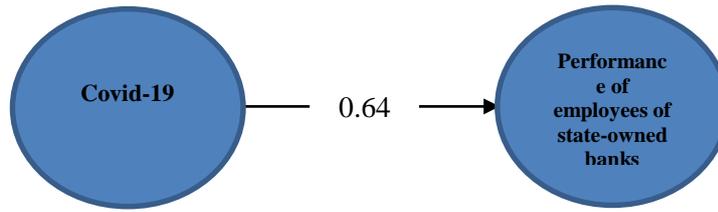


Figure 15. The R² value for employees’ performance in state-owned banks

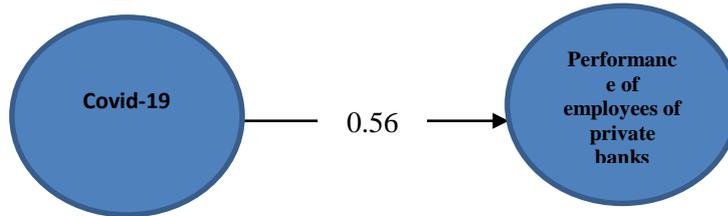


Figure 16. The R² value for employees’ performance in private banks

Table 24. The R² values

Variables	R Square
Performance of employees of state-owned banks	0.415
Performance of employees of private banks	0.321

As can be seen in the above Figure, the R² value for the structure of profitability in state-owned banks is 0.268 and for private banks 0.339, employees’ performance in state-owned banks is 0.415, and 0.321 for employees’ performance in private banks given the threshold value, it is an almost average fitting of the structural model for the structure of profitability in state-owned banks and an average value for the structure of profitability in private banks.

4.10 Impact size criterion (F2)

The criterion determines the relationship intensity between model structures and values of 0.02, 0.15, and 0.35 indicate the small, medium, and large size of a structure over another one.

Table 25. The f² values

f ²	Profitability of state-owned banks	Covid-19
Covid-19	0.366	0.000

As seen in the Table, the amount of impact size is large for the COVID-19 structure for the profitability of state-owned banks (0.336).

Table 26. The f² values

f ²	Profitability of private banks	Covid-19
Covid-19	0.513	0.000

As seen in the Table, the impact size is large for the COVID-19 structure for the profitability of private banks (0.513).

Table 27. The f^2 values

f^2	Performance of employees of state-owned banks	Covid-19
Covid-19	0.710	0.000

As shown in the Table, the impact size is large for the COVID-19 structure for employees' performance in state-owned banks (0.710).

Table 28. The f^2 values

f^2	Performance of employees of private banks	Covid-19
Covid-19	0.474	0.000

As seen in the Table, the amount of impact size is large for the COVID-19 structure regarding employees' performance in private banks (0.474).

4.11 Q^2 criterion (Stone-Guisser Criterion)

This criterion should be calculated for all endogenous structures of the model and the result should be stated in the model interpretation section. Regarding the intensity of the model's predictive power for endogenous structures, three values are 0.2, 0.15 and 0.35, indicating the structure's weak, medium, and strong predictive power or related exogenous structures, respectively.

Table 29. The Q^2 values

Q^2	SSO	SSE	1-SSE/SSO
Profitability of state-owned banks	97.000	72.451	0.253
Covid-19	776.000	776.000	0.000

Since the Q^2 value of the endogenous structure for the profitability of the state-owned banks is 0.253, the prediction power of the model is medium.

Table 30. The Q^2 values

Q^2	SSO	SSE	1-SSE/SSO
Profitability of private banks	495.000	445.032	0.101
Covid-19	792.000	792.000	0.000

Since the Q^2 value of the endogenous structure for the profitability of private banks is 0.101, the prediction power of the model is weak.

Table 31. The Q^2 values

Q^2	SSO	SSE	1-SSE/SSO
Performance of employees of state-owned banks	388.000	244.246	0.370
Covid-19	776.000	776.000	0.000

Since the Q^2 value of the endogenous structure of employees' performance in state-owned banks is 0.370, the prediction power of the model is strong.

Table 32. The Q^2 values

Q^2	SSO	SSE	1-SSE/SSO
Performance of employees of private banks	1683.000	1432.017	0.149
Covid-19	792.000	792.000	0.000

Since the Q^2 value of the endogenous structure of employees' performance in private banks is

0.149, the prediction power of the model is medium.

4.12 General model fitting criteria

Moreover, according to Table 16, the mean shared values for the profitability of private banks and COVID-19 are equal to: $\overline{Communality} = (0.54+0.50)/2 = 0.52$

The $\overline{R^2}$ value (Table 23) is equal to the profitability of the state-owned banks (0.27) and the use of profitability in private banks is equal to 0.34.

Therefore, the GOF standard value for the profitability of state-owned banks is equal to (0.21) and for using the profitability of private banks is equal to (0.25), which according to the three values of 0.01, 0.25 and 0.36, which are introduced as weak, medium and strong values for GOF and obtaining the value (0.21) for GOF on the effect of COVID 19 on the profitability of state-owned banks proves the approximate average fit of the model. And on the profitability of private banks with the value (0.25), the average fit of the general model is confirmed.

Moreover, according to Table 17, the mean shared values for the employees' performance of private banks and COVID-19 are equal to: $\overline{Communality} = (0.54+0.60)/2 = 0.59$

The $\overline{R^2}$ value (Table 24) is equal to the employees' performance of the state-owned banks (0.42) and the use of profitability in private banks is equal to 0.32.

Therefore, the GOF standard value for the employees' performance of state-owned banks is equal to (0.31) and for using the employees' performance of private banks is equal to (0.25), which according to the three values of 0.01, 0.25 and 0.36 which are introduced as weak, medium and strong values for GOF and obtaining the value (0.31) for GOF on the effect of COVID 19 on the employees' performance of state-owned banks proves the approximate average fit of the model. And on the employees' performance of private banks with the value (0.25), the average fit of the general model is confirmed.

4.13 H1 result: COVID-19 affects bank profitability

Table 33. The hypothesis one table for bank profitability

Hypothesis	Standard beta coefficient	T Statistics	P-value	Result
Covid-19 → Profitability of state-owned banks	0.517	2.951	0.003	Confirm
Covid-19 → profitability of private banks	0.582	2.320	0.021	Confirm

Based on the results of T and P, the path coefficient of COVID-19 explains the amount (0.517) of changes in profitability of state-owned banks, which is significant; however, the value of T (2.951) is larger than 0.196 and the P-value is less than 0.05, so the COVID-19 hypothesis on the profitability of state-owned banks is confirmed. Also, the path coefficient of COVID-19 explains (0.582) changes in the profitability of private banks, which is significant so that the T-value (2.320) is greater than 1.96 and the P-value is less than 0.05. Accordingly, the first hypothesis of research on the impact of COVID-19 on the profitability of state-owned banks is influential.

4.14. H2 result: COVID-19 affects the performance of bank employees

Table 34. The hypothesis two table for the performance of bank employees

Hypothesis	Standard beta coefficient	T Statistics	P-value	Result
Covid-19 → Performance of employees of state-owned banks	0.644	4.070	0.000	Confirm
Covid-19 → Performance of employees of private banks	0.567	3.112	0.004	Confirm

Based on the results of T and P, the path coefficient of COVID-19 explains the amount (0.644) of changes in the performance of bank employees in state-owned banks, which is significant and the T-value (4.070) is larger than 0.196. The P-value is less than 0.05, so the COVID-19 hypothesis on the performance of bank employees in state-owned banks is confirmed. Also, the path coefficient of COVID-19 explains (0.567) changes in the performance of bank employees in private banks, which is significant so that the T-value (3.112) is greater than 1.96 and the P-value is less than 0.05. Accordingly, the second research hypothesis on COVID-19 on the performance of bank employees in state-owned and private banks is influential.

5. Discussion and Conclusion

Overall, this study provides new insight into the impact of the COVID-19 pandemic on the profitability and performance of employees of state-owned and private banks in Iran while also controlling specific and macroeconomic factors that determine a bank's profitability in Iran. The results of the hypothesis testing indicate that COVID-19 had a positive and significant effect on the profitability and performance of subsidiary banks, which was far more effective in state-owned banks than private banks. This is in line with the results of Katusiime (2021), who states that COVID-19 affects the performance of banks and in contrast with Kohlscheen et al. (2018), Damak et al. (2020); Elnahass et al. (2021) and Barua and Barua (2020). Elnahass et al. (2021) stated that the pandemic could adversely affect the banking system in less developed and developing countries. This can be because the factors determining banks' profitability in different countries differ in political and economic conditions. The banking sector in Iran was not doing well before the advent of COVID-19, as it had lower liquidity ratios and poor financial health. Increasing non-performing loans, capital flight from Iran, and aggressive lending methods cause the current liquidity situation in the banking sector, and profitability and financial health are also affected. Liquidity is significant because it can affect a business's most important goal, profitability. In the second quarter of 2020, all liquidity ratios and the financial health of listed banks were severely affected and worsened. The emergence of this pandemic affects not only the banking sector but also the ongoing concerns about uncertainty about the duration of the pandemic and containment measures, as well as the speed of economic recovery and its impact on the performance of banks, the need for monitoring systems and addressing emerging risks is essential to stabilizing the financial sector, maintain profitability, and improve performance (Sande, 2020). But the results of the present study showed that Iranian banks, especially state-owned banks in Iran, could maintain and improve their performance during COVID-19 and increase their profitability these days. This can be due to various factors such as job closures and economic recession due to the disease pandemic. In the days of quarantine, only banks continued to operate. These banks could use new financial technologies and electronic banking to facilitate their customers' affairs.

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