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COVID-19 post-implications for sustainable banking sector performance: evidence from emerging Asian economies

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ABSTRACT

The novel COVID-19 virus, and the pandemic that has followed its spread, has had a massive impact on the banking industry on a global level. Therefore, considering this context, this study examines the effect of the COVID-19 pandemic on the banking sector's performance in the Asian emerging economies, over a time span ranging from 2016Q1–2021Q2. For this purpose, this study makes use of the FE, RE, 2SLS, and PPML regression models. The empirical findings show that the GDP and banking size are positively related to bank performance in the pre-COVID era, and the COVID pandemic era thus far in the Asian emerging economies. In addition to this, the findings also reveal that the impact of GDP and bank size on banking performance is lower in the pandemic period, as compared to the pre-COVID period. Furthermore, the results show that the COVID pandemic has significantly affected the banking sector performance in the Asian emerging economies. Findings have also suggested that the central bank should shift their focus on the banking industry in the Asian emerging economies. Various other policy implications have also been suggested under the present study.

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1. Introduction

In December 2019, several cases of Pneumonia were reported in the Wuhan province of China. It wasn't until later on that it was recognized as the novel coronavirus that would create ripples across the world. Then, a few months later, precisely on March 11, 2020, due to its widespread rate of infection, it was confirmed as a pandemic by the World Health Organization, and given the name COVID-19 (Gao et al., 2021;

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WH Organization, 2020). This pandemic has caused large-scale human deaths and has wreaked havoc on the global financial markets and economic activities thus far. The impact of this pandemic has been so colossal that it has managed to curtail the flow of economic and financial activities. Experts believe that such a type of economic contraction has not been experienced before. Mounting uncertainties and the international economic interruption have prompted the financial markets to close down (Song & Zhou, 2020; Wang et al., 2021b). After the pandemic was recognized for its ability to spread at a rapid rate, the stock markets crashed from the record high to the lowest points within a week. Moreover, it was the most severe test for the world's financial system, since the global financial crisis of 2008. According to the Asian Development Bank, the total economic cost attached to the COVID-19, in monetary terms, has been predicted to be about \$5.8–\$8.8 trillion. This is roughly equal to 6.4%–9.7% of the global GDP (Park et al., 2020). Apart from other things, the unmatched shocks associated with the macroeconomic indicators and health systems are most probably deemed to have had negative external effects on the financial structure of every state, developed or developing. Moreover, Due to the fear, apprehension and uncertainty surrounding the pandemic-related matters, the aggregate demand, production, trading activities, and economic actions also showed a slowdown, causing unemployment and poverty to rise. There has also been a high level of risk attached to the financial institutions in almost every nation that revolves around the notion that they will collapse without the adequate government support (IMF 2020).

A plethora of studies have appeared in this regard, which have confirmed that the COVID-19 pandemic has already started to damage the economies. It is doing so by disturbing the macroeconomic signs such as aggregate demand and supply, savings and investments, production, trading activities, and employment. The implication if this is that it will eventually cause poverty to rise, and is more likely to instigate a recessionary or depressive period (Baldwin & Di Mauro, 2020; Bank, 2020; Barua, 2020; Chen et al., 2020; Coibion et al., 2020; Sun et al., 2021). Hence, in a world that is hit by a pandemic, there are bigger threats to cater to when the survival and existence of financial institutions, the financial stability, and safety, and supervisory restraint across nations, irrespective of their economic status, i.e., developed or developing, are factors that need to be addressed (Barret et al., 2020; Beck & Hensher, 2020; Feyisa, 2020; Stiller & Zink, 2020; Su et al., 2020b; Umar et al., 2021b, 2021d). More importantly, due to this pandemic, the banks have been, and most likely will continue to be the ultimate sufferers. This is because banks are more vulnerable to a large variety of risks, as compared to other financial institutions. These risks include the fluctuations in the interest rate, cash flow, credit, and other risks that can damage the bank's reputation. Moreover, they are involved in day-to-day dealings with various stakeholders like individuals, businesses, firms, and the government, which makes their position even more vulnerable (Carey & Stulz, 2007; Ji et al., 2021).

Under such circumstances where each sector of the economy is affected by the ongoing pandemic, banks are more prone to the wide variety of risks that may cause the banking sector to breakdown because the depositors will lose their faiths in banking institutions which will squeeze the liquidity capacity of the bank and its ability to

forward the credits. On the other side, more and more people will default; thus, causing the non-performing assets to rise and returns from the loan to reduce (Goodell, 2020; Stiller & Zink, 2020; Su et al., 2021b; Umar et al., 2020; Wang et al., 2021a). Since the banks are under much more pressure during the pandemic, they will be in a dicey situation to face the threats (e.g., credit, liquidity, market, and interest rate risks) posed by the post-pandemic world. However, the gravity of these risks will be much higher in the developing economies as banks in these countries are connected to millions of individuals and firms and serve them under a much riskier economic and financial environment as they are not protected against any external threats posed by natural calamity. On one side, the policies under which banks operate in these countries are not stable. On the other side, the banks have to face aggressive competition inside the banking industry, which seriously curtails their ability to perform well in the uncertain environment caused by pandemics (Sibley et al., 2020).

The consequences of the COVID-19 for the banking industry in the developing economies could be severe as there will be a massive rise in the number of loan-defaulters, retrievals will become difficult and tougher, clients will drain savings to fund day-to-day expenses, accessibility of loanable reserves will reduce, and new investment request will also squeeze (Lagoarde-Segot & Leoni, 2013; Su et al., 2020a, 2020b). Though banks are considered an engine of growth in any economy, their importance in greasing the wheel of the developing and emerging economies has increased manifold due to their role in providing capital financing both in the short and long run (Rizvi et al., 2020b). The task and influence of banks are massive, predominantly in states where the financial arrangement is immature due to feeble or non-operative security market, the deficiency of effectual and tolerable legal set-up, the absence of contemporary and essential pecuniary instruments, and knowledge and novelty performing an inadequate part (Barua, 2020). Furthermore, in developing and emerging economies, banks are crucial for intensifying economic growth. If the banks are at the disposal of high risk, the process of funds utilization will be significantly hampered (Naqvi et al., 2021; Umar et al., 2021a). Consequently, the economic development in the emerging economy will suffer.

To the best of our knowledge, empirical evidence on the impact of a pandemic on banking sector performance is also insufficient. To date, no one empirical study has inspected the effect of the Covid-19 pandemic on the banking sector's performance. This paper attempts to identify the transmission channels between the COVID-19 pandemic and banking sector performance. This study is an effort to explore the implications of the COVID-19 pandemic for the banking industry in emerging Asian economies. As discussed above, banking in emerging economies is more vulnerable to such external and massive threats. Hence, it is imperative to study their performance in the post-COVID-19 era, particularly in emerging Asian economies. The findings in this study offer valuable implications to regulators' banking sectors across several Asia regions and different banking systems.

There are various sections involved in this study. The next section is reported the literature review. In [Section 3](#), we have discussed data and methodology, followed by the results in [Section 4](#) and the conclusion in [Section 5](#).

2. Literature review

Global financial markets exerted negative influence by the COVID-19 pandemic. Specifically, financial institutions are expected to be weak in response to shocks in both domestic and international economic markets (Kwabi et al., 2020). Thus, banking systems are presently at excessive threat due to the influences of the Covid-19 pandemic. Current literature explores the possible effects of the COVID-19 pandemic on the banking sector and financial markets, for instance, its impact on the behavior of the gold market (Akhtaruzzaman et al., 2021), bond markets (Mirza et al., 2020), cryptocurrencies (Goodell & Goutte, 2021), the stock market (Zaremba et al., 2021), and oil prices (Su et al., 2021a; Umar et al., 2021c). Thus, very few studies investigate the influence of the COVID-19 pandemic on sustainable banking sector performance.

After the 2008 global financial crisis, strict liquidity and capital supplies were placed for financial institutions with Basel III that helped the worldwide financial framework enhance its protection to a certain degree (Baldwin & Di Mauro, 2020). Conversely, banking sectors are still smashing harder than the industrial sector due to the speedy blowout of the COVID-19 pandemic. The negative effect on the financial sector is expected to be larger as compared to earlier calamities because the banking sector is, by nature, susceptible to the crisis.

The emerging literature on the financial sector investigates the potential effects of COVID-19 on financial markets. One strand of this literature explores how the COVID-19 pandemic influences the stock markets. The study done by Shanaev et al. (2020) explored the effect of COVID-19 pandemic on stock markets, taking a sample of 51 economies by employing three proxy measures of COVID-19 pandemic such as COVID-19 cases, numbers, and infection peak, government monetary and fiscal measures, and reflecting sentiments measures such as 'Google trends search volume for COVID-19'. Although all aspects severely affected the stock markets, the extent of the effect varied considerably. The key driver of the reduction in stock market returns is the magnitude of policy involvements. Ashraf (2020) revealed that although the response of stock markets of 64 economies to the expansion of the COVID-19 confirmed numbers are negative, the effect on the growth of COVID-19 confirmed deaths cases is insignificant. The study of Al-Awadhi et al. (2020) demonstrated the negative impact of the expansion in total numbers of COVID-19 confirmed and death cases on the stock return in China. Wang and Enilov (2020) reported that the growth of COVID-19 confirmed cases exert a significant decline in stock returns in the United States, Italy, Germany, France, and Canada. Zaremba et al. (2021) revealed that the COVID-19 pandemic tends to increase volatility in the stock market.

COVID-19 pandemic might influence the banking sector in several manners (Rizvi et al., 2020a). For example, Aldasoro and Ehlers (2018) denoted that the worldwide banking sector holds large-scale US\$denominated borrowings to financial investments, international trade, and an assorted set of dollar sets. Financial crises squeeze the monetary sector that provides loans, inferring risks for the worldwide financial system (Mirza et al., 2020). The banking system in emerging countries is more harshly by the decline in the movement of these funds. Bahaj and Reis (2020) reported that in response to COVID-19, central banks expand the current swap lines and generate new lines to reduce the costs of dollar financing. Sensible regulatory

measures of the banking sector, for instance, easing capital buffers and relaxing the handling of non-performing loans, have been located to alleviate the COVID-19 negative effects on the financial system stability (Goodell, 2020). The study of Demir and Danisman (2021) demonstrated that equity markets of the economies with tighter regulatory needs on liquidity and capital are inclined to be more resilient to this pandemic. In response to Basel III liquidity and capital reforms after the 2008 financial crisis, the banking sector is well-positioned to captivate the severe effects of the COVID-19 pandemic. Thus, facilitating the behavior of capital buffers and non-performing loans during the COVID-19 pandemic could risk the solvency of banks. Inspired by such vulnerability, our study investigates how the COVID-19 pandemic affects banking sector performance in the emerging Asian market.

3. Model, methods, and data

Banking sectors globally responded negatively to the COVID-19. The spread of the COVID-19 shock has severely affected banking activities in Asian countries via many transmission channels such as depositors, financial intermediaries, and creditors (Demir & Danisman, 2021). With the various local and global transmission of the COVID-19, all economic players (suppliers, financial intermediaries, consumers, etc.) are facing an extraordinary crisis. The present study examines the impact of the COVID-19 pandemic on banking sector performance; we followed Demir and Danisman (2021) empirical framework.

In this study, we have used panel data econometric approaches, which have many advantages over cross-sectional and time series. First and foremost, the number of observations increased manifold, and we do not need to worry about the problems of a limited degree of freedom and omitted variables bias. As the panel data contains both the time series and cross-sectional characteristics, it provides more information, and results are more reliable due to more sample impulsiveness (Gujarati et al., 2012; Hsiao, 2007). Various panel data techniques can be used to deal with panel data, and in this study, we apply four different techniques, namely Pooled Ordinary Least Square (POLS), Fixed Effect Model (FEM), Random Effect Model (REM), and Poisson Pseudo-maximum Likelihood (PPML) estimators. The panel model is:

$$ROA_{it} = \beta_0 + \beta_1.GDP_{it} + \beta_2.Bank\ size_{it} + \beta_3.COVID19_{it} + \alpha_i + et_{it}$$

where ROA_{it} is the return on assets of country banks i at time t , GDP_{it} is nominal GDP; Bank size is bank size; and $COVID19_{it}$ is a pandemic of COVID-19; α_i individual-specific unobservable effects; and et_{it} the idiosyncratic error. Firstly, the model is estimated through POLS, REM, and FEM. Pooled OLS is a good technique to start with because it can serve as a baseline model, and its results can be compared with other more advanced techniques (Ranilović, 2017). The basic assumption behind pooled OLS is to combine all the time series and cross-section observations and analyze them through a single grand regression (Gujarati et al., 2012). However, this method has the disadvantage of not accounting for the undetected heterogeneity, which could provide misleading results. To solve this problem, we can use the fixed-effect model to take care of the unobserved heterogeneous effects but assume that

Table 1. Descriptive statistics.

	ROA	GDP	Bank size	COVID-cases	COVID-deaths
Descriptive statistics					
Mean	1.192	16.77	18.73	3.256	2.058
Median	1.100	16.33	19.04	0.000	0.000
Maximum	2.600	22.15	22.94	16.46	12.05
Minimum	-0.200	13.24	14.62	0.000	-0.693
Std. Dev.	0.743	3.097	2.823	5.194	3.713
Skewness	0.106	0.333	-0.133	1.178	1.513
Kurtosis	1.949	1.675	1.638	2.729	3.741
Jarque-Bera	8.432	16.13	14.12	41.23	71.19
Probability	0.015	0.000	0.001	0.000	0.000
Correlation matrix					
ROA	1.000				
GDP	0.092	1.000			
Bank size	0.260	0.675	1.000		
COVID-cases	-0.096	0.006	0.035	1.000	
COVID-deaths	-0.091	0.006	0.066	0.861	1.000

Source: Author's estimation.

they are constant across time. Nonetheless, this method cannot estimate the time-invariant variables due to perfect collinearity with specific fixed effects. This model is applicable if the selection of cross-sectional units is not random rather pre-determined. On the other hand, if the cross-section units are randomly selected, the random effect model is an appropriate technique. The random effect model assumes that unobserved heterogeneous effects are independent and are not correlated with any of the regressors. Hence, in this technique, we can add time-invariant variables. Nevertheless, if the regressors and unobserved factors are correlated, then it gives rise to erroneous estimates. The selection between random and fixed effect models is not easy to choose, but the Hausman specification test made this difficult task easy.

Secondly, the main panel equation has the problem of endogeneity, and this issue is easily tackled by the instrumental variables approach, which is named 2SLS (Carson & Sun, 2007). Finally, the Poisson Pseudo-maximum Likelihood estimation technique is getting popular these days while estimating panel data. This method has many advantages over other techniques. Silva and Tenreiro (2006) contended that if the equation under discussion is given in the log-linearized form and the standard errors hurt from the problem of heteroscedasticity, which is a normal thing, then the estimates could be prejudiced and erratic. This type of problem can be solved with robust standard errors, which could change the estimation methodology. The PPML estimator solved this problem without changing the estimation technique, and the estimates of the basic equation become consistent. Moreover, it can also deal with the problem of zero values without making any changes in the original model (Silva & Tenreiro, 2006, 2011). In the case of the OLS technique, if there are zero values in the variable, we can't take a log of zero. Hence, we need to either drop the zero values or make any changes that provide inconsistent results. The PPML also provides a solution to this problem and allows us to take the log of all the regressors except the dependent variable. Hence, it can solve the zero values problem without disturbing the original model.

We use quarterly data of eight Asian emerging economies named India, Turkey, Japan, China, Indonesia, Korea, rep, Saudi Arabia, Thailand; over the period

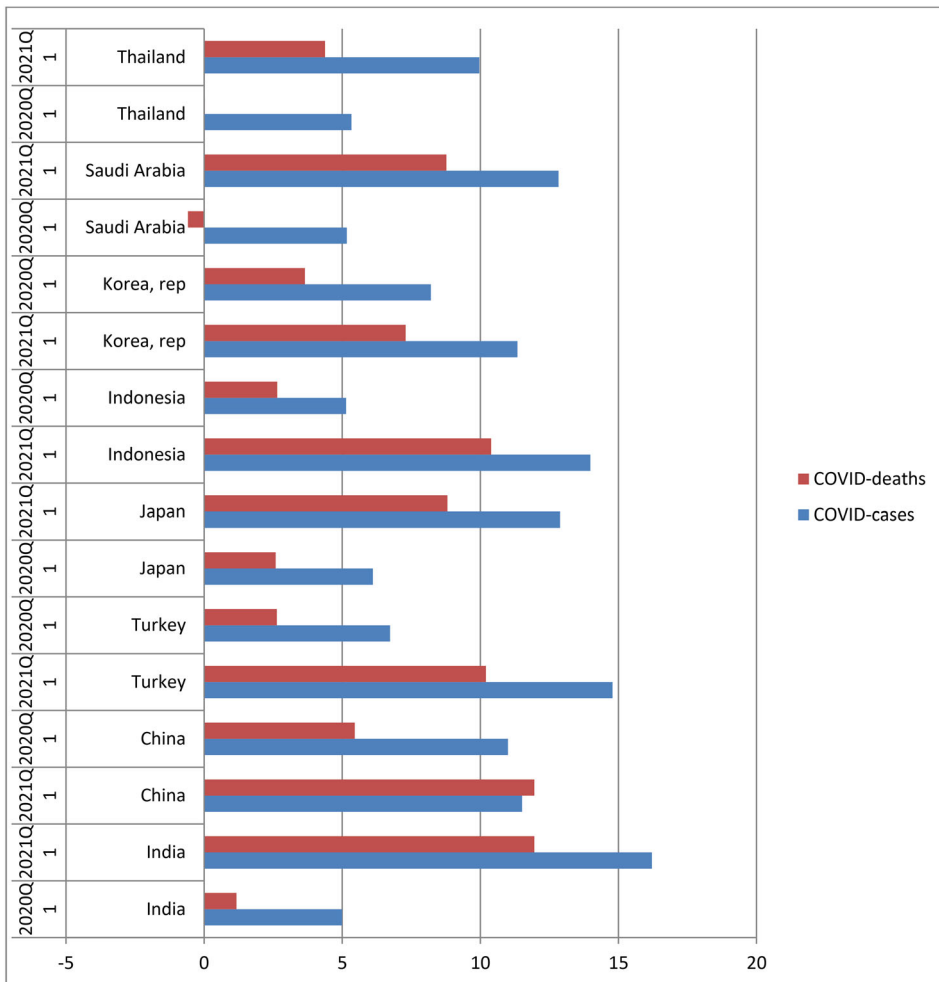


Figure 1. COVID-19 cases and deaths in Asian emerging economies.

Source: Author's estimation.

2015Q1–2021Q2. The dependent variable used in this study is the return on assets (ROA). Following past studies of Sufian and Habibullah (2009) and Sufian and Noor Mohamad Noor (2012), we used bank performance as a dependent variable that is a proxy of return on asset. The dependent variable of ROA is obtained International Monetary Fund (IMF). The choice of independent variables are used in the analysis is based on data availability and previous literature (Barua & Barua, 2021). We used the COVID-19 pandemic as an independent variable, while a set of other focused variables are also GDP and bank size. We captured the shock of the COVID-19 pandemic through COVID confirmed cases and COVID deaths. We converted all datasets into a natural logarithm except ROA. We obtained all datasets from IMF except the COVID-19 pandemic, while the COVID-19 cases and deaths dataset has been retrieved from 'Our World in Data'. In Table 1, the mean of ROA, GDP, bank size, COVID-cases, and COVID-deaths are 1.192, 16.77, 18.73, 3.256, and 2.058,

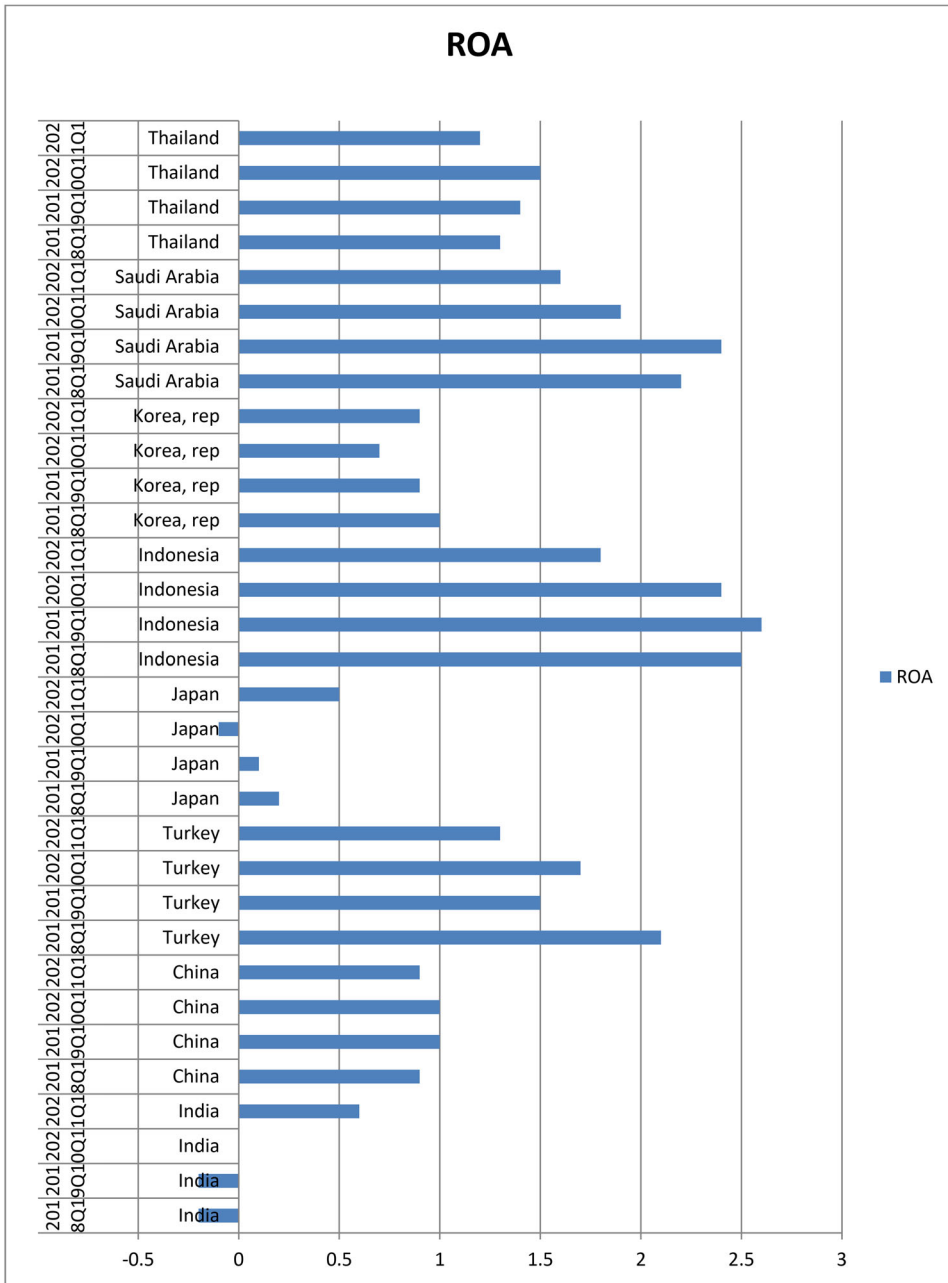


Figure 2. ROA in COVID-pandemic in Asian emerging economies.
 Source: Author's estimation.

respectively, while the standard deviation is 0.743, 3.097, 2.823, 5.194, 3.713, respectively. Figure 1 shows the COVID cases and deaths in Asian emerging economies. Findings revealed that COVID confirmed cases and deaths are high in India as compared to other economies. While Figure 2 reported that the COVID pandemic is severely affected the banking industry of India and Japan. Some Asian emerging

Table 2. FEM and REM regression results of ROA.

	Without COVID-pandemic shocks			With COVID-pandemic shocks		
	(1) Pooled OLS	(2) FE	(3) RE	(4) Pooled OLS	(5) FE	(6) RE
GDP	0.144*** (0.045)	0.136 (0.337)	0.090 (0.180)	0.147*** (0.035)	0.715** (0.326)	0.202* (0.106)
Bank size	0.219*** (0.050)	0.208 (0.320)	0.243 (0.189)	0.212*** (0.039)	1.096*** (0.354)	-0.289** (0.116)
COVID-cases				-0.059 (0.037)	-0.016 (0.015)	-0.026* (0.015)
COVID-deaths				-0.071 (0.052)	-0.027 (0.020)	-0.023** (0.011)
Constant	2.916*** (0.457)	7.402** (2.997)	4.276** (1.749)	2.745*** (0.358)	9.723** (3.775)	3.263*** (1.078)
Observations	120	120	120	176	176	176
R-squared	0.152	0.037		0.161	0.114	
Number of code		8	8		8	8

Note. Standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: Author's estimation.

countries such as Indonesia, Saudi Arabia, and Turkey also have well financial sector performance in COVID-pandemic. Thus, the pandemic has had a differential impact on the bank's return on assets.

4. Empirical analysis and discussion

Our primary analysis is offered in Table 1. For empirical estimates of the Jarque-Bera (J-B) test show that all values are statistically significant, inferring that data all variables are normality distributed. Hence we can estimate our econometric model. Regarding the correlation matrix, the measures of ROA show a positive correlation with GDP and bank size. At the same time, COVID-pandemic variables are negatively correlated with ROA. We also observed that model variables are free from the problem of multicollinearity because their mean value is fairly small.

The study examines the impacts of COVID-19 post-implications on the performance of the banking sector for emerging Asian economies. For that purpose, the study disaggregated the data into two categories, i.e., before COVID-19 pandemic shock and with COVID-19 pandemic shock. Following the recent trends, we have applied five different methodologies to confirm the banking performance in the post-COVID world. These methodologies include Pooled OLS, FEM, REM, 2SLS, and PPML. In total, 10 models are estimated using each method, with and without the proxies of COVID-19. First, we discuss the models that are without the variables of COVID-19, and after that, we discuss the models that include the variables of COVID-19.

Models 1–3 in Table 2 and models 1 and 2 in Table 3 are the models which don't consider the effects of COVID-19 on banking performance. First, we discuss these results, and the estimated coefficient of GDP in the first model is significant if we apply the pooled OLS technique, 2SLS, and PPML. The size of the estimates is 0.144, 1.645, and 0.048 in the POLS, 2SLS, and PPML, respectively. These results imply that as the size of GDP increases, the return on assets also increases by 0.144% with

Table 3. 2SLS and PPML regression results of ROA.

	Without COVID-pandemic shocks		With COVID-pandemic shocks	
	(1) 2SLS	(2) PPML	(3) 2SLS	(4) PPML
GDP	1.645* (0.902)	0.048*** (0.011)	10.18 (27.79)	0.039*** (0.009)
Bank size	1.678** (0.766)	0.070*** (0.009)	9.532 (24.77)	0.061*** (0.008)
COVID-cases			−0.0341 (0.152)	−0.019** (0.009)
COVID-deaths			−0.0675 (0.127)	−0.023* (0.013)
Constant	5.023 (3.530)	1.681*** (0.121)	8.722 (9.803)	1.638*** (0.094)
Observations	120	120	176	176
R-squared		0.164		0.173
Number of code	8		8	

Note. Standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: Author's estimation.

POLS, 1.645% with 2SLS, and 0.048% with the PPML model. Similarly, the estimated coefficients of bank size appeared to be significant with POLS, 2SLS, and PPML estimation techniques, whereas insignificant with FE and RE techniques. A 1% rise in banking size causes the ROA to increase by 0.219% in the POLS, 1.678% in the 2SLS, and 0.070% in the PPML estimators. The 2SLS and PPML coefficients of GDP and bank size confirm that ROA has increased in response to an increase in GDP and bank size without pandemic shocks. However, in the case of without pandemic shocks, the findings of PPML are quite similar to 2SLS. However, one noticeable thing is that the size of the estimates for both the GDP and Bank Size is largest in the case of the 2SLS technique and smallest in the case of the PPML technique.

Next, we discuss the results of models 4–6 in Table 2 and models 3 and 4 in Table 3, which have included the variables of COVID-19. In all these models, the estimated coefficients of GDP are positive except for the 2SLS estimation technique – a 1% rise in the economic growth of the Asian economies give rise to ROA by 0.147%, 0.715%, 0.202%, 0.049% in the POLS, FE, RE, and PPML models respectively. Likewise, the estimates attached to the Bank Size are positively significant in POLS, FE, and the PPML models, whereas negative in the RE model and insignificant in the 2SLS model – a 1% increase in the Bank Size increase the ROA by 0.212% in the POLS model, 1.096% in the FE model, and 0.069% in the PPML model, conversely, a 1% rise in the Bank Size decreases the ROA in the RE model. The estimated coefficients of COVID-cases are negative but insignificant in most of the models except in the RE and PPML models, implying that a 1% rise in the COVID-cases reduces the ROA by 0.026% in the RE model and by 0.019% in the PPML model. On the other hand, a 1% rise in the COVID-deaths reduces the ROA by −0.023 in the RE and PPML models, whereas, in other models, the estimates are negative though insignificant.

These results are clearly stating that return on assets is negatively affected by the COVID-19 pandemics, which is not surprising because banks are exposed to a wide variety of risks such as interest rate, credit, and reputational risks as compared to

other financial institutions due to their interaction with a large number of economic agents on a daily basis (So et al., 2021; Wang & Wang, 2021). Therefore, it is more likely that banks will break down due to severe negative external effects of pandemics, particularly in the emerging economies where the banks are not protected against such external threats. The aftershocks of the pandemic for the banks may come in the forms of a massive rise in loan defaulters, difficult recoveries, and a decline in the saving trends may squeeze the bank's ability to forward credits and funds for new investments (Acharya et al., 2021; Rebucci et al., 2020), all these factors contribute in the falling profits of the banks during and after the pandemic, and consequently, the return on its assets are also negatively affected (Ichsan et al., 2021; Wu & Olson, 2020; Zhang et al., 2020).

The COVID-19 has a negative impact on financial sector performance because banks are, by nature, very helpless during crisis periods (Demir & Danisman, 2021). They also observed that COVID has directly and indirectly affected financial performance. COVID pandemic has tightened the money markets that shrank the flow of funds to banking sectors. Our finding is also confirmed by Elnahass et al. (2021), who revealed that COVID-19 has adverse effects on Islamic and conventional banks' financial performance. Another possible reason is that the COVID pandemic has increased credit line drawdowns, directly harming the banking sector's performance. The pandemic has also declined loan growth remarkably, which in return also indirectly affected banking sector performance in emerging economies.

5. Conclusion and implications

Compared to other financial institutions, banks are exposed to a wide variety of risks due to their excessive interactions with many economic agents. The role of banks is important, particularly in the emerging economies where it provides short and long-term capital financing for large projects. Banks are performing an important job, and their contribution is massive in economies where the financial structure is undeveloped due to fragile and nonfunctional security markets. In this perspective, it has become imperative to know the bank's performance in the Asian economies in the post-COVID-19 times. Hence, in this study, our main objective is to analyze COVID-19 implications for the banking sector in Asian economies. Two different proxies of COVID-19 are used to represent its impact on the bank's performance. To get the estimates of the variables, we have applied five different methodologies: POLS, FEM, REM, 2SLS, and PPML.

Our findings show that GDP and bank size are positively significant in most models, implying that both these variables help increase the return on assets in Asian economies. The estimates attached to COVID-cases are negative in almost all the models whereas negatively significant in the REM and PPML models, implying that there is a rise in the COVID-19 cases in the Asian economies, but return on assets declines. Similarly, the estimates attached to COVID-deaths are significantly negative in the REM and the PPML model suggesting that as the number of deaths from COVID rises, the return on assets will decrease. However, the size of the estimates

attached to both the variables is too small, confirming that the gravity of COVID-19 consequences on the bank's performance is not that severe.

Based on these findings, we have forwarded some important policy implications that will provide important guidelines for the policymakers in these testing times. In emerging economies, banks are exposed to a wide variety of high risks, and they are not protected against any external threat such as a pandemic. Hence, the central banks of the respective countries, with the help of federal governments, should protect the financial institutions, particularly, the banks against such external threats by devising policies that would safeguard their interests in case of any natural calamity. Though the magnitude of the negative effects of COVID-19 on the banking performance is not large, it is a warning sign for all the emerging Asian economies where banks forward most of their credit facilities to the sectors which are more sensitive to COVID-19 impacts, and in these countries, the banks suffer from the poor asset quality and weak regulations and policy framework. Hence, the governments in these countries should take preemptive measures to protect the banks against any further shocks. Generally, outcomes of the paper ask for instantaneous, stage-wise, and innovation-based policy procedures with a long-term tactic to avert a forthcoming banking industry crisis in Asia.

The present study has limited empirical analysis for emerging Asian economies by ignoring other economies. The upcoming studies should be conducted at a global level by using the rich level of the dataset and advanced econometric techniques. The upcoming studies should also identify transmission channels among COVID-19 and financial sector performance. Another better way to capture the incremental or marginal negative effects of COVID-19 on financial performance indicators is by using the dummy variables of pre-COVID and post-COVID.

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References

- Acharya, V. V., Engle, R. F., III, & Steffen, S. (2021). *Why did bank stocks crash during COVID-19?* National Bureau of Economic Research.
- Akhtaruzzaman, M., Boubaker, S., Lucey, B. M., & Sensoy, A. (2021). Is gold a hedge or a safe-haven asset in the COVID-19 crisis? *Economic Modelling*, 102, 105588. <https://doi.org/10.1016/j.econmod.2021.105588>

- Al-Awadhi, A. M., Alsaifi, K., Al-Awadhi, A., & Alhammadi, S. (2020). Death and contagious infectious diseases: Impact of the COVID-19 virus on stock market returns. *Journal of Behavioral and Experimental Finance*, 27, 100326.
- Aldasoro, I., & Ehlers, T. (2018). The credit default swap market: What a difference a decade makes. *BIS Quarterly Review*. https://www.bis.org/publ/qtrpdf/r_qt1806b.htm
- Ashraf, B. N. (2020). Stock markets' reaction to COVID-19: Cases or fatalities? *Research in International Business and Finance*, 54, 101249. <https://doi.org/10.1016/j.ribaf.2020.101249>
- Bahaj, S., & Reis, R. (2020). Central bank swap lines during the Covid-19 pandemic. *Covid Economics*, 2, 1–12.
- Bank, W. (2020). *The Economy in the Time of Covid-19*. The World Bank.
- Barret, J. P., Chong, S. J., Depetris, N., Fisher, M. D., Luo, G., Moiemmen, N., Pham, T., Qiao, L., Wibbenmeyer, L., & Matsumura, H. (2020). Burn center function during the COVID-19 pandemic: An international multi-center report of strategy and experience. *Burns: Journal of the International Society for Burn Injuries*, 46(5), 1021–1035. <https://doi.org/10.1016/j.burns.2020.04.003>
- Barua, S. (2020). COVID-19 pandemic and world trade: Some analytical notes. <http://dx.doi.org/10.2139/ssrn.3577627>
- Barua, B., & Barua, S. (2021). COVID-19 implications for banks: Evidence from an emerging economy. *SN Business & Economics*, 1(1), 19–28.
- Beck, M. J., & Hensher, D. A. (2020). Insights into the impact of COVID-19 on household travel and activities in Australia—The early days under restrictions. *Transport Policy*, 96, 76–93.
- Carey, M., & Stulz, R. M. (2007). Front matter, the risks of financial institutions. In *The risks of financial institutions* (pp.1–14). University of Chicago Press.
- Carson, R. T., & Sun, Y. (2007). The Tobit model with a non-zero threshold. *The Econometrics Journal*, 10(3), 488–502. <https://doi.org/10.1111/j.1368-423X.2007.00218.x>
- Chen, S., Igan, D. O., Pierri, N., Presbitero, A. F., Soledad, M., & Peria, M. (2020). Tracking the economic impact of COVID-19 and mitigation policies in Europe and the United States. *IMF Working Papers*, 2020(125), 25. <https://doi.org/10.5089/9781513549644.001>
- Coibion, O., Gorodnichenko, Y., & Weber, M. (2020). *Labor markets during the COVID-19 crisis: A preliminary view*. National Bureau of Economic Research.
- de Mauro, A. C. J., & Pereira, H. B. (2020). A influência de booktubers em autores nacionais de ficção. A crítica literária contemporânea e seu lugar no debate público de ideias, 75.
- Demir, E., & Danisman, G. O. (2021). Banking sector reactions to COVID-19: The role of bank-specific factors and government policy responses. *Research in International Business and Finance*, 58, 101508. <https://doi.org/10.1016/j.ribaf.2021.101508>
- Elnahass, M., Trinh, V. Q., & Li, T. (2021). Global banking stability in the shadow of Covid-19 outbreak. *Journal of International Financial Markets, Institutions and Money*, 72, 101322. <https://doi.org/10.1016/j.intfin.2021.101322>
- Feyisa, H. L. (2020). The world economy at COVID-19 quarantine: Contemporary review. *International Journal of Economics, Finance and Management Sciences*, 8(2), 63–74.
- Gao, X., Ren, Y., & Umar, M. (2021). To what extent does COVID-19 drive stock market volatility? A comparison between the U.S. and China. *Economic Research-Ekonomiska Istraživanja*, 1–21. <https://doi.org/10.1080/1331677X.2021.1906730>
- Goodell, J. W. (2020). COVID-19 and finance: Agendas for future research. *Finance Research Letters*, 35, 101512. <https://doi.org/10.1016/j.frl.2020.101512>
- Goodell, J. W., & Goutte, S. (2021). Diversifying equity with cryptocurrencies during COVID-19. *International Review of Financial Analysis*, 76, 101781. <https://doi.org/10.1016/j.irfa.2021.101781>
- Gujarati, D. N., Porter, D. C., & Gunasekar, S. (2012). *Basic econometrics*. Tata McGraw-Hill Education.
- Hsiao, C. (2007). Panel data analysis – Advantages and challenges. *TEST*, 16(1), 1–22. <https://doi.org/10.1007/s11749-007-0046-x>

- Ichsan, R. N., Suparmin, S., Yusuf, M., Ismal, R., & Sitompul, S. (2021). Determinant of Sharia Bank's Financial Performance during the Covid-19 Pandemic. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 4(1), 298–309.
- Ji, X., Chen, X., Mirza, N., & Umar, M. (2021). Sustainable energy goals and investment premium: Evidence from renewable and conventional equity mutual funds in the Euro zone. *Resources Policy*, 74, 102387. <https://doi.org/10.1016/j.resourpol.2021.102387>
- Kwabi, F. O., Boateng, A., & Du, M. (2020). Impact of central bank independence and transparency on international equity portfolio allocation: A cross-country analysis. *International Review of Financial Analysis*, 69, 101464. <https://doi.org/10.1016/j.irfa.2020.101464>
- Lagoarde-Segot, T., & Leoni, P. L. (2013). Pandemics of the poor and banking stability. *Journal of Banking & Finance*, 37(11), 4574–4583. <https://doi.org/10.1016/j.jbankfin.2013.04.004>
- Mirza, N., Hasnaoui, J. A., Naqvi, B., & Rizvi, S. K. A. (2020). The impact of human capital efficiency on Latin American mutual funds during Covid-19 outbreak. *Swiss Journal of Economics and Statistics*, 156(1), 1–7. <https://doi.org/10.1186/s41937-020-00066-6>
- Naqvi, S. A. A., Shah, S. A. R., Anwar, S., & Raza, H. (2021). Renewable energy, economic development, and ecological footprint nexus: Fresh evidence of renewable energy environment Kuznets curve (RKC) from income groups. *Environmental Science and Pollution Research International*, 28(2), 2031–2051.
- Park, S. W., Cornforth, D. M., Dushoff, J., & Weitz, J. S. (2020). The time scale of asymptomatic transmission affects estimates of epidemic potential in the COVID-19 outbreak. *Epidemics*, 31, 100392.
- Ranilović, N. (2017). The effects of economic integration on Croatian merchandise trade: A gravity model study. *Comparative Economic Studies*, 59(3), 382–404. <https://doi.org/10.1057/s41294-017-0032-6>
- Rebucci, A., Hartley, J. S., & Jiménez, D. (2020). *An event study of COVID-19 central bank quantitative easing in advanced and emerging economies*. National Bureau of Economic Research.
- Rizvi, S. A. R., Narayan, P. K., Sakti, A., & Syarifuddin, F. (2020a). Role of Islamic banks in Indonesian banking industry: An empirical exploration. *Pacific-Basin Finance Journal*, 62, 101117. <https://doi.org/10.1016/j.pacfin.2019.02.002>
- Rizvi, S. K. A., Yarovaya, L., Mirza, N., & Naqvi, B. (2020b). The impact of COVID-19 on valuations of non-financial European firms. <http://dx.doi.org/10.2139/ssrn.3705462>
- Shanaev, S., Shuraeva, A., & Ghimire, B. (2020). The financial pandemic: COVID-19 and policy interventions on rational and irrational markets. <http://dx.doi.org/10.2139/ssrn.3589557>
- Sibley, C. G., Greaves, L. M., Satherley, N., Wilson, M. S., Overall, N. C., Lee, C. H. J., Milojev, P., Bulbulia, J., Osborne, D., Milfont, T. L., Houkamau, C. A., Duck, I. M., Vickers-Jones, R., & Barlow, F. K. (2020). Effects of the COVID-19 pandemic and nationwide lockdown on trust, attitudes toward government, and well-being. *American Psychologist*, 75(5), 618–630. <https://doi.org/10.1037/amp0000662>
- Silva, J. S., & Tenreyro, S. (2006). The log of gravity. *Review of Economics and Statistics*, 88(4), 641–658. <https://doi.org/10.1162/rest.88.4.641>
- Silva, J. S., & Tenreyro, S. (2011). Further simulation evidence on the performance of the Poisson pseudo-maximum likelihood estimator. *Economics Letters*, 112(2), 220–222. <https://doi.org/10.1016/j.econlet.2011.05.008>
- So, M. K., Chu, A. M., & Chan, T. W. (2021). Impacts of the COVID-19 pandemic on financial market connectedness. *Finance Research Letters*, 38, 101864. <https://doi.org/10.1016/j.frl.2020.101864>
- Song, L., & Zhou, Y. (2020). The COVID-19 pandemic and its impact on the global economy: What does it take to turn crisis into opportunity? *China & World Economy*, 28(4), 1–25. <https://doi.org/10.1111/cwe.12349>

- Stiller, M., & Zink, T. (2020). *Impact of COVID-19 on the European banking industry*. IDC Perspective, International Data Corporation. Retrieved June 27, 2020, from <https://www.idc.com/getdoc.jsp?containerId=EUR246178520>
- Sufian, F., & Habibullah, M. S. (2009). Bank specific and macroeconomic determinants of bank profitability: Empirical evidence from the China banking sector. *Frontiers of Economics in China*, 4(2), 274–291. <https://doi.org/10.1007/s11459-009-0016-1>
- Sufian, F., & Noor Mohamad Noor, M. A. (2012). Determinants of bank performance in a developing economy: Does bank origins matters? *Global Business Review*, 13(1), 1–23. <https://doi.org/10.1177/097215091101300101>
- Su, C.-W., Huang, S.-W., Qin, M., & Umar, M. (2021a). Does crude oil price stimulate economic policy uncertainty in BRICS? *Pacific-Basin Finance Journal*, 66, 101519. <https://doi.org/10.1016/j.pacfin.2021.101519>
- Su, C.-W., Khan, K., Umar, M., & Zhang, W. (2021b). Does renewable energy redefine geopolitical risks? *Energy Policy*, 158, 112566. <https://doi.org/10.1016/j.enpol.2021.112566>
- Sun, T.-T., Su, C.-W., Mirza, N., & Umar, M. (2021). How does trade policy uncertainty affect agriculture commodity prices? *Pacific-Basin Finance Journal*, 66, 101514. <https://doi.org/10.1016/j.pacfin.2021.101514>
- Su, C.-W., Qin, M., Tao, R., Shao, X.-F., Albu, L. L., & Umar, M. (2020a). Can bitcoin hedge the risks of geopolitical events? *Technological Forecasting and Social Change*, 159, 120182. <https://doi.org/10.1016/j.techfore.2020.120182>
- Su, C.-W., Qin, M., Tao, R., & Umar, M. (2020b). Financial implications of fourth industrial revolution: Can bitcoin improve prospects of energy investment? *Technological Forecasting and Social Change*, 158, 120178. <https://doi.org/10.1016/j.techfore.2020.120178>
- Umar, M., Ji, X., Kirikkaleli, D., & Alola, A. A. (2021a). The imperativeness of environmental quality in the United States transportation sector amidst biomass-fossil energy consumption and growth. *Journal of Cleaner Production*, 285, 124863. <https://doi.org/10.1016/j.jclepro.2020.124863>
- Umar, M., Ji, X., Kirikkaleli, D., & Xu, Q. (2020). COP21 roadmap: Do innovation, financial development, and transportation infrastructure matter for environmental sustainability in China? *Journal of Environmental Management*, 271, 111026. <https://doi.org/10.1016/j.jenvman.2020.111026>
- Umar, M., Mirza, N., Rizvi, S. K. A., & Furqan, M. (2021b). Asymmetric volatility structure of equity returns: Evidence from an emerging market. *The Quarterly Review of Economics and Finance*. <https://doi.org/10.1016/j.qref.2021.04.016>
- Umar, M., Su, C.-W., Rizvi, S. K. A., & Lobonç, O.-R. (2021c). Driven by fundamentals or exploded by emotions: Detecting bubbles in oil prices. *Energy*, 231, 120873. <https://doi.org/10.1016/j.energy.2021.120873>
- Umar, M., Su, C.-W., Rizvi, S. K. A., & Shao, X.-F. (2021d). Bitcoin: A safe haven asset and a winner amid political and economic uncertainties in the US? *Technological Forecasting and Social Change*, 167, 120680. <https://doi.org/10.1016/j.techfore.2021.120680>
- Wang, W., & Enilov, M. (2020). The global impact of COVID-19 on financial markets. <http://dx.doi.org/10.2139/ssrn.3588021>
- Wang, K.-H., Su, C.-W., & Umar, M. (2021a). Geopolitical risk and crude oil security: A Chinese perspective. *Energy*, 219, 119555. <https://doi.org/10.1016/j.energy.2020.119555>
- Wang, J., Umar, M., Afshan, S., & Haouas, I. (2021b). Examining the nexus between oil price, COVID-19, uncertainty index, and stock price of electronic sports: Fresh insights from the nonlinear approach. *Economic Research-Ekonomska Istraživanja*, 1–17. <https://doi.org/10.1080/1331677X.2021.1937260>
- Wang, J., & Wang, X. (2021). Covid-19 and financial market efficiency: Evidence from an entropy-based analysis. *Finance Research Letters*, 21, 101888. <https://doi.org/10.1016/j.frl.2020.101888>
- WH Organization. (2020). *WHO timeline-Covid-19*. 2020. WH Organization. <https://www.who.int/news-room/detail/08-04-2020-who-timeline--covid-19>

- Wu, D. D., & Olson, D. L. (2020). The effect of COVID-19 on the banking sector. In *Pandemic risk management in operations and finance* (pp. 89–99). Springer.
- Zaremba, A., Aharon, D. Y., Demir, E., Kizys, R., & Zawadka, D. (2021). COVID-19, government policy responses, and stock market liquidity around the world: A note. *Research in International Business and Finance*, 56, 101359.
- Zhang, D., Hu, M., & Ji, Q. (2020). Financial markets under the global pandemic of COVID-19. *Finance Research Letters*, 36, 101528.