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The Developments Following the COVID-19 Outbreak From the Perspective of the Turkish Banking Sector

Asiyenur Helhel¹ | Yesim Helhel^{2*}

1. Department of Management, Accounting, Governance, and Financial Management, University of Sheffield, Sheffield, UK.

Email: asiyenurhelhel98@gmail.com

2. Corresponding Author, Department of Tourism Management, Faculty of Tourism, Akdeniz University, Antalya, Türkiye.

Email: yhelhel@akdeniz.edu.tr

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ABSTRACT

In the study, developments following the COVID-19 outbreak are discussed in terms of the evolution of technology, competition, new rules in regulation, and responses to the risks posed by COVID-19 and its impact on the financial services provided. The practices made towards these developments are explained in the context of ING, one of the multinational banks, and the banking sector in Türkiye. Non-performing loans (NPLs) as riskiness measurement and loans to assets ratio (LTA) as asset quality are examined based on bank types in the Turkish banking sector by comparing the pre-pandemic and pandemic periods. Three explanatory variables, namely, capital adequacy ratio, size, and liquidity ratio which are the most important bank-specific determinants of risk and asset quality, are included in the study. The results imply that banks are also affected by the pandemic with companies and individuals. Nevertheless, in the face of this extraordinary situation, supervising institutions and policymakers tried to reduce the effects of the crisis with special policies and regulations, and thus banking sector relatively preserved its pre-pandemic situation.

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1. Introduction

The COVID-19 pandemic brought along with it a lot of unknowns and, globally, had a massive impact on the banking industry. Therefore, it put the entire financial structure, especially the banking sector, as well as other sectors, under great stress. In the studies conducted on Chinese banks which earn most of their income from branches, it is stated that the number of branches has decreased due to the spread of the COVID-19 pandemic, and as a result, sustainability in the banking sector has become difficult. On the other hand, it is emphasized that the interest in financial technologies (Fintech) has increased and in a sense, it has started to pose a threat to the banking sector (Yan & Jia, 2022). The effect of the COVID-19 pandemic on the banking sector's performance in the Asian emerging economies was examined in the time interval of 2016Q1–2021Q2 and FE, RE, 2SLS, and PPML regression models were applied during the analysis. It is observed 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. 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 (Xie, Chang, Hafeez, & Saliba, 2022). In this context, making different arrangements in financing was offered by policymakers. First hand, public policymakers emphasized the importance of the role of supervisors and regulators in public policy responses once again, and to roll out loans, they warned both the financial system and countries to be prepared for the over liquidity request. Maintaining adequate liquidity levels in the financial system is essential during the outbreak. A study considering 1090 banks from 116 countries for quarterly periods across 2019–20 underlines detrimental impacts on financial performance across various indicators of financial performance and financial stability including liquidity risk (Elnahass, Trinh, & Li, 2021). Special liquidity limits, loan guarantee programs, subsidized bank lending arrangements, comprehensive guarantees to alleviate pressures on the banking system, and monetary incentives to sustain economic activities of all sectors are the best-known indirect methods and were advised strictly (Awad, Ferreira, Gaston, & Riedweg, 2021). It is also reported that banks affected by COVID-19 should take all necessary steps to increase their funds to cover potential losses while observing a prudent capital distribution policy (Korzeb & Niedziółka, 2020). The European Commission reconsidered the banking rules to prevent the banks located within the borders of the EU from being adversely affected by the uncertainty that emerged during the COVID-19 pandemic period and to make them more resilient against possible economic shocks that may arise later. The study analyses a new dataset on NPL dynamics during banking crises and documented that elevated and unresolved NPLs substantially impede post-crisis recovery (Ari, Chen, & Ratnovski, 2021). In this context, it was recommended that the previously announced Basel III criteria would be adopted and implemented (The European Union, 2021; Anon., 2017). On the United States of America side, the Federal Reserve Board's Supervisory and Regulatory Board has issued new rules, acting on the obligation to support financial institutions in particular and the economy in general (Division of Consumer and Community Affairs, 2021). It is seen (look at Figure 1) that the asset quality of EU banks has improved with the implementation of the decisions taken by the EU, some of which are legal enforcement. The decision document also included a coordinated action plan to be implemented to overcome the crisis (Segall, Dias, Grigaite, & Magnus, 2021). It is reported that the non-performing loan ratio in Türkiye dropped to 3.5% in the 2008 crisis from 19% in 2001 due to measures compatible with the EU being taken (Yücememiş & Sözer, 2011). It is known that the same measures were also re-applied during the COVID-19 outbreak. Based on changes in regulations, technology, and competition, examined all health, financial, and fiscal measures implemented to overcome the pandemic to analyze the responses of the banking sector to the COVID-19 pandemic. Financial and fiscal measures, in addition to health systems, implemented to overcome the pandemic are critical steps, and they are responses of the banking sector to COVID-19. As understood from the study, the banking sector in Türkiye like others in the EU has positively gained lessons from the previous crises, and the banking sector well commentated on the faults faced in previous crises (Sülkü, Coşar, & Tokatlıoğlu, 2021).

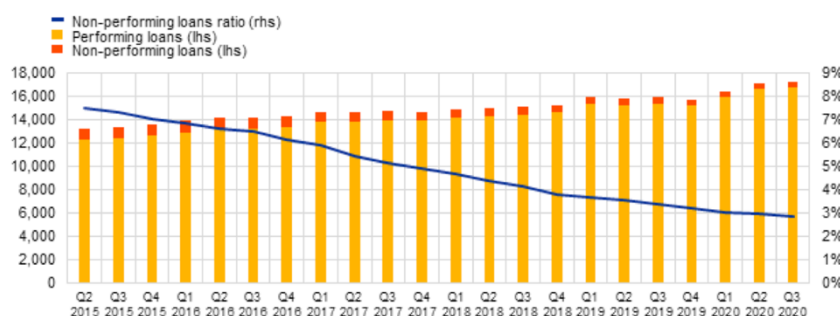


Figure 1. Non-performing loans in Europe (European Central Bank - ECB, 2021)

It is examined the variations in bank stock returns during the COVID-19 pandemic including the impact of bank-specific factors. They showed that the fiscal measures taken by governments and the rigidity of government policies alleviated the decline in bank stock prices (Demir & Danisman, 2021). The role of central bank independence in outbreak conditions is examined by taking 160 central banks from all over the world into consideration. In the study, it is shown that independent monetary policy authorities adopt smaller cuts in policy rates and required reserves. Meanwhile, it is mentioned that there is a linear relationship between the fact that a country has an independent central bank and the size of the financial and macro-financial packages of this country (Elgin, Yalaman, Yasar, & Basbug, 2021). Credit cards are major alternatives to cash, especially on outbreak days, and that is also supporting rules declared by the Ministry of Health. Card spending dynamics in Türkiye during the outbreak is examined in the study that analyzed the usage of credit cards during the pandemic in comparison with habit before the outbreak. It is an interesting finding that card spending per GDP over the period is almost to the previous 5 years (Kantur & Özcan, 2021). The shares of the three largest state-owned banks, the Republic of Türkiye Ziraat Bank, Türkiye Halk Bank, and Türkiye Vakıflar Bank, in the total bank branches in the country, are 17.62%, 10.19%, and 9.4%, respectively. The total share of public banks is about 37.21% of the total number of branches. Tuna showed that the number of call center respondents in the banking sector increased by more than 30% during the outbreak and reached above 13.000 at the end of the year 2020 (Tuna, 2021). The sustainable development of the Turkish banking sector during the COVID-19 pandemic is examined in terms of the number of banks in Türkiye, the number of domestic/foreign branches, the number of deposit/participation banks, the volume of the financial sector in the gross domestic product, and so on. In the study, it is concluded that the COVID-19 pandemic did not adversely affect the Turkish banking sector (Erden & Aslan, 2022).

This study concentrates on the developments in the Turkish banking sector following the COVID-19 pandemic period in terms of some practices, such as regulations, diversified financial instruments and services, technological innovations, competitiveness, and responses to risks resulting from the pandemic in the case of ING Bank. Subsequently, empirical evidence, it examines the impact of the pandemic crisis on the bank types in the Turkish banking sector by drawing a comparison between before the pandemic and during the pandemic period in the context of riskiness and asset quality. To our best knowledge, it is the first study that integrates the impact of the COVID-19 pandemic on the banking sector of Türkiye as a case study and empirical analysis and reveals if there is a difference between pre-pandemic and pandemic period based on two measurements, riskiness, and asset quality.

2. Changes in Regulations

International standards for bank capital regulation and their impact on financial stability and sustainability of domestic banking systems have been examined by focusing on both the 2007—2009 Global Financial Crisis and the crisis caused by COVID-19. It argues about the new ideology which suggests that in times of financial and economic crisis or anticipation of growing uncertainty in the economy, it is necessary to abandon the idea of bank capital management and the creation of financial reserves to maintain liquidity, and says that these measures will not be able to protect the bank from default and bankruptcy (Kovalenko, Sheludko, Radova, Mushudli, & Gonchar, 2021). Türkiye had regulated its banking system long before the European Union after the economic crisis it experienced

in 2001. The European Union also put new regulations on the financial system in the 2008 crisis within the framework of Basel III rules. Supervision, structural issues, secondary markets, and restriction of the banking system are the regulations reported previously in the European Central Bank report to be adopted, and right after the outbreak, as a response to COVID-19, both the EU and Türkiye announced the re-adaptation progress of regulations.

2.1 Supervision - Encourage Banks to Restructure Loans.

Loans given by banks should be subjected to restructuring. That's why, actors who assume the role of the auditor in this regard should exhibit encouraging attitudes, provided that they maintain their balanced stance. Thus, it should be ensured that companies that have a chance to survive will continue to survive, namely should be motivated. However, for loan users, there should not be a feeling that there is too much laxity in the standards. The losses that will arise naturally should never be swept under the carpet so that the trust in the system is permanent. In other words, losses arising from non-performing loans should not be hidden but should be included in the calculation of the resulting losses. In summary, audit policies should be established by considering COVID-19-related problems (Awad, Ferreira, Gaston, & Riedweg, 2021). For instance, ING Bank has formed a new partnership with the Digital Debt Resolution Agency to help loan debtors manage their debt (Hannah McGrat, 2021).

2.2 Transparency of Data and Its Accuracy

In a general perspective, foreclosing or delaying loans by banks, and converting collateral into cash with legal follow-up are those common applications. That should not be the way to be applied. Policies, when resources need to be used to help borrowers/banks who are out on a limb, that are going to be applied by governments should be temporary at first, and then be transparent and targeted. Such policies will not result in moral erosion and will not encourage poor credit risk management practices. Banks located in the Eurozone are seeing transparency as a key to sustainability. It is important to keep a slot between transparency and privacy. In the Euro Zone, disclosing a considerable amount of legal information without hampering the customers' confidentiality was preferred. For instance, ING Bank, fitting with the transparency protocol of the Dutch Banking Association, is sharing annual reports to disclose credit risk exposures per economic sector (CET, 2021).

2.3 Liquidity Buffers Including Capital Flexibility

The banking sector in Türkiye met the liquidity problem in 2001 which was about 7 years earlier than in Eurozone. While Türkiye adopted liquidity standards right after the 2001 local crisis, in the Eurozone, the Basel III framework was the first movement to clarify the liquidity requirements. The most critical time duration in the Banking sector is the first 30 days. Mismatches and liquidity problems, especially during outbreaks, are due to timing inconsistency between cash inflows and outflows. That's why banks and supervisors were warned to expect some potential mismatches within this period. The typical response of the banking system to liquidity shocks is generally by selling short-term assets because such situations affect the liability side, and the banking system strongly. The term Liquidity Coverage Ratio (LCR) was described for measuring the banks' success in resisting liquidity shocks. Banks are compelled, over a 30-day stress period, to hold enough liquid assets in case of the risk of net outflows which corresponds to $LCR \geq 100\%$. For the issue of establishing minimum regulatory capital requirements to save the Eurozone banking system, all financial actors collaborate in Europe. The related flow chart shared in Figure 2 was prepared for this common goal (Bruno & De Marco, 2021). Government bonds and central bank deposits are compromising a large share of the liquidity buffer of many banks. For potential liquidity stress scenarios, it should be expected for banks to settle agreements with the central bank for repurchase since it is a well-known way to enhance their liquidity through internal securitizations. Sensoria in Türkiye, especially for state banks, seems like this.

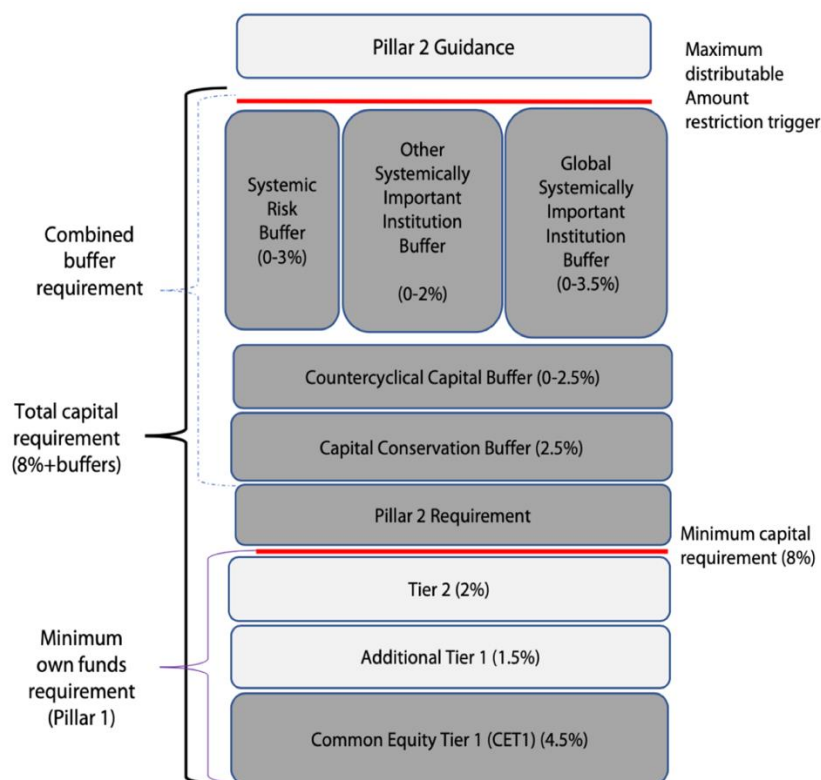


Figure 2. Summary of Regulatory Capital Requirement

2.4 Flexibility in Accounting and Prudential Treatment

Measurements related to COVID-19 such as moratoria of loans needed to be declared/noted in accounting terms for clarification while preparing a financial statement. There needs to be an eligibility criteria report for loans under moratoria. Everything but Arms (EBA) prepared the required guidelines and criteria report to fulfill and qualify these treatments on April 2, 2020. During the preparation duration, there was the strong help of banking authorities' clarifications. The moratorium of loans should be in line with the national legal system, and application to as wide a range of customers as possible has to be an essential method (Bruno & De Marco, 2021). Due to the recovery in the economy that could be observed, ING Bank, for instance, decreased 106.8% of its provisions for loan losses in the second quarter of 2021 compared to the second quarter of 2020. Therefore, the net performance during this period has reached 388% (Steven van Rijwijk, 2021).

2.5 Limited Working Hours in the Branches

The rules/guide entitled "Working safely during coronavirus" was declared to help people in business environments (UK Government, 2021). The Ministry of Health of the Republic of Türkiye shared a very large document about outbreak management and working guide in pandemics (Ministry of Health Scientific Committee, 25 June 2020). The government applied the rules determined by the Scientific Committee of the Ministry of Health. Both declare how to behave in workplaces and what kind of rules will be followed in commuting to work through Provincial Public Health Boards (Ministry of the Interior of the Republic of Turkey, 2021). The document aimed to stop the spread of coronavirus while keeping people away from close contact. First hand, the services rendered by the branch of banks were affected like other sectors. For example, Wells Fargo closed 18% of its branches temporarily and switched to the appointment system. At the September Barclays Global Financial Services Conference, the number of branches closed in 2020 was 160, and the planned number of branches to be closed in 2021 was 120 (Chang, 2020). The digitalization process in banking has become crucial and popular. In July 2020, ING announced the closing of 170 ING Banking branches was on in the Netherlands (Ruffalo, 2021).

3. Advance in Technology

Credit, marketing, operational, and liquidity-based major risks faced by banking systems need to be approached proactively. Otherwise, failure in these risks will affect millions of people and cause bank failure. On the other hand, parallel to these issues, investors' decisions are based on the risk management of a bank. Risk management using new information technologies helps the banking system to survive. On the other hand, new technological advances transferable to the financial sector since the last decade are making peoples' lives easier while adapting technology to the banking system. After COVID-19, e-banking has become more important than in previous times due to its interesting advantages. The top 5 risks in financial services are shown in Fig.3 (CFI, 2022).

Mobile apps and virtual cards related to fintech are two significant outcomes of e-banking these advancements save time, energy, and money. Being distant from traditional services with one click is so attractive. But the system becomes more complicated from the bank's point of view. IT risks become more vital than previously. The new risk portfolio includes data management risks, technology vendor and third party, cybersecurity, incident response, strategic, and IT program execution. When providing digital services, banks need to be up to date with the latest cybersecurity standards, as digital banking services increase hacking and fraudulent activities possibilities (Appert, 2018).

As discussed, the developments in financial technologies (fintech) will have an impact on loan performance inevitably. Using data from 5.5 million consumer loans by the fifth-largest private commercial bank in Türkiye and its fintech subsidiary, the pattern of borrowers in terms of age, education, and income level was investigated. It has been found that those using fintech have better credit history than traditional bank borrowers, additionally, fintech borrowers are less likely to default. It is noted that the results observed in Türkiye contrast with the earlier evidence for developed markets where fintech borrowers are found to be riskier (Karaman, Savaser, Tiniç, & Tumer Alkan, 2021). Crowdfunding (CF) is examined for the countries (Türkiye, Egypt, Iraq, Saudi Arabia, Bahrain, Kuwait, and UAE) as a kind of fintech, and the findings reveal that CF platforms are an effective financial technology tool for financing entrepreneurs in the region. Meanwhile, it is understood that the presence of crowdfunding positively impacts fundraising success (Kantur & Özcan, 2021). The historical development of fintech and its influence on the market structure in the banking industry is examined based on World Bank databases. The relationship between GDP and population and the usage of new technology and smartphones in financial transactions and payment processing was also examined. It is found that there is a significant positive relationship between per capita GDP and payment of utilities (Musabegovic, et al., 2019).

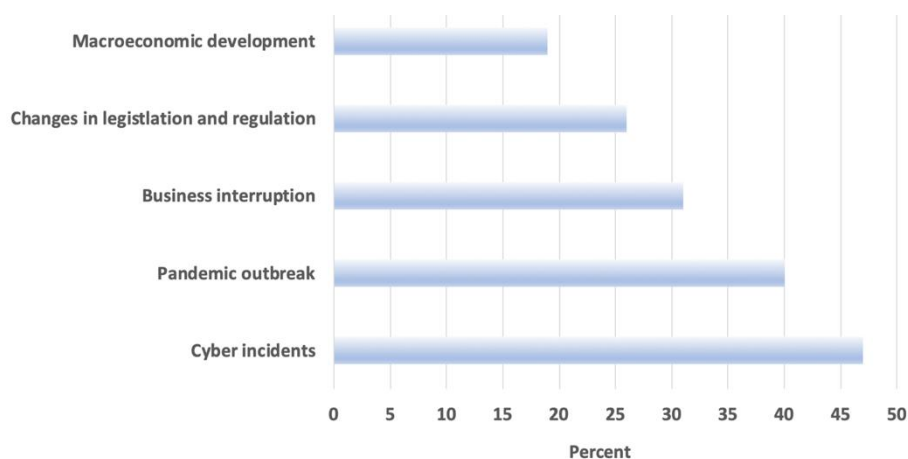


Figure 3. Top 5 risks in Financial Services (CFI, 2022)

A survey study conducted with 900 industry participants showed that cybersecurity incidents constitute the largest risk group immediately after the pandemic (Allianz Risk Barometer 2021). Data protection platforms, privacy, security services, cloud data security, encryption, and cryptography for data protection and data flexibility have become essentials in cyber security. Public authorities are increasingly regulating the e-banking industry and security services to banks have become a critical

sector. Cloud service providers have become indispensable partners of bankers in managing the risks faced by banks, and the outbreak has sped up this requirement (Schiavone, 2021; Steffen, 1995; IBM, 2022; Roel, 2021).

The decline in the number of branches started right after the Global Financial Crisis (GFC), and it became dramatically sharper after the pandemic (see Figure 4). The reason that this decline did not bring risks to the banks they cannot carry is the presence of new investment opportunities connected to advancements in technology (ING Online Banking, 2021). During this crisis, many banks like ING adopted/invested in new technologies that aim to help them switch to modern cloud-native banking platforms from legacy IT infrastructures (Thomas, 2020). Payment services with contactless cards and mobile apps were provided to the market (Simpson, 2015).

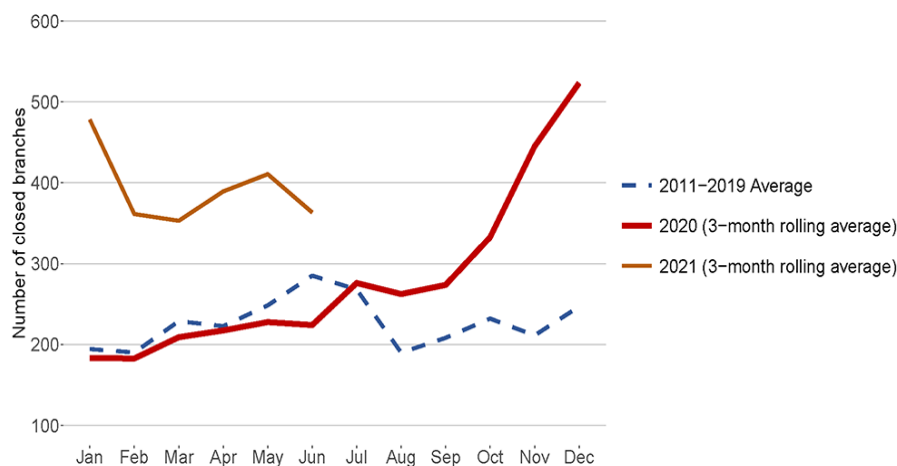


Figure 4. Number of branches in time (Kreis, 2021)

4. Competition in the banking sector

It is seen that banks completed their adaption to technological developments, with the policies they implement on innovation, and are one step ahead of the competition. The financial power of the bank is on one side, and technology and innovation are on the other side becoming two wings to fly comfortably. With the help of technology and innovation, it is possible to attract low-cost loan customers to these banks. Meantime, it should be noted that, with the transfer of technology to the banking system, it will be possible to offer more accessible financial instruments.

The level of capitalization, frequency of observing/checking risk potentials, and the importance of stability of the system for banking were augmented more in assessment procedures after the 2008 GFC (Demirgüç-Kunt & Huizinga, 2010) (Demirgüç-Kunt & Huizinga, 2010). To both prevent financial structures from deteriorating and survive the banking system, regulations were imposed very strictly right after the GFC of 2008-09. Remember that, since Türkiye faced a crisis 7-8 years earlier than the rest of the world, the implementation of regulations was adopted in 2001, and the year 2008-09 was manageable. Both announcing and adapting the capital adequacy agreement (BASEL-III) banking system had aimed to absorb both financial and economic stress-related shocks. The lessons learned from large-scale financial crises have worked well again in the outbreak. It was well in advanced and especially emerging economies, where banks have competed aggressively (Barua & Barua, 2021).

On one side, the banking industry was severely impacted by the COVID-19 pandemic, and on the other side the expectations and challenges facing households and businesses due to strict lockdowns. These are problems to be solved in a balance. (Marcu, 0221) stated that, in the 2008-2009 GFC, both the declaration of moratoria by many financial institutions and the collapse in government interventions were the most common observations. In the previous crisis, massive liquidity was injected into the financial system, and with direct and indirect government intervention, competition decreased. The crisis was turned into a scenario by financial players where they made huge profits (Verick & Islam, 2010).

Operational risk, credit risk, cost of funding, and customer behavior change are four fundamental topics potentially open to being affected by the outbreak. A set of strategies to overcome outbreaks is

required (Yılmaz, 2020). Communication with internal and external stakeholders has become critical for designing a valuable and efficient action plan to manage crises and ensure uninterrupted services.

4.1 Operational Risk

Whether it is done electronically or face-to-face, the most basic task of the banking system is to provide access to financial resources for those in need. In cases where the COVID-19 pandemic peaked, about a quarter of the bank branches were closed to protect the health of both bank employees and customers, as in many countries. In addition to this, all actions such as setting bank downtimes, making branch visits only by appointment, and temporarily closing some branches, were carried out to ensure the continuity of the system.

Almost all banks made great efforts to make the activities of the banking sector more reliable and easier during their period. To turn the pandemic process into an advantage for themselves, they gave great weight to mobile banking and internet banking applications. Major international banks such as ING and BNP Paribas have prepared business continuity plans to protect the health of their employees while maintaining basic operations and services for their customers. During this period, all banks competed with each other in providing uninterrupted access services via call centers, internet banking, and ATMs. During the COVID-19 pandemic, even if bank customers could not go to the branch, they experienced that basic banking services could continue. As a result, mobile payments increased by 19% in the last quarter of 2021 compared to the previous quarter and by 62 percent compared to 2 quarters ago (Rijswijk, 2021). To perform banking transactions quickly, ATMs regularly uploaded money, in addition, to increase of limits for both daily withdrawals at ATMs and contactless credit card transactions.

Banks developed remote working tools for their employees and encouraged them to use these tools. Thus, employees carried out banking services without encountering any difficulties in adapting to new working and cooperation methods, partially hybrid. A partial of employees have been at work physically to ensure continuity of customer support in branches, customer service centers, and IT centers. From the operational risk view, revised BASEL III perspectives were active.

4.2 Credit Risk

During the pandemic, especially small and medium-sized enterprises and export-oriented sectors faced bank defaults due to the high credit risks they carried (Barua & Barua, 2021). With the slowdown in activities especially at the beginning of the crisis, it became difficult for these companies to fulfill their obligations. This meant an alert for changing credit risk rates (Disemadi & Shaleh, 2020). Since it is important to maintain the existence of active companies during the pandemic, banks were careful about the active use of credit channels and contributed significantly to the speed of economic recovery of the countries. The banking sector was flexible in restructuring overdue loans as well as providing new loans to both businesses and household members (Goodhard, Tsomocos, & Wnag, 2021).

Many banks have offered payment deferral and retroactive restructuring options for small and medium-sized businesses. In addition, they introduced new financing methods to solve the urgent liquidity problem that businesses need. Together, the public and private sectors took a common stance on the issues of recovering the debts of the companies and ensuring the survival of the companies. To loan the export activities of Turkish exporters including SMEs, ING cooperated with Turk Eximbank and the World Bank during the outbreak. Almost 10% of the loan, during the outbreak, went to Turkish companies that support gender equality in their work. A half-year moratorium on corporate loans for 40.000 customers was announced by BNP Paribas in Türkiye Loan expectations of its professional customers were answered within a maximum of five days, and customers found a chance to overcome the slowdown. Communication with customers for BNP Paribas to consultants was important. Case by case, a half-year moratorium was also applied.

As easily observed from Figures 5 and 6, the state-owned group seems to perform better than the rest of the sector in Türkiye. The question behind this performance is how it can be. First, state-owned banks made more loans available again so that the due loans would not go into default during the crisis, thus ensuring the survival of the loan borrowers. In other words, they made a great sacrifice with the support of the Turkish Treasury to overcome this distressing condition. Second, during the pandemic period, the volume of loans continued to decrease in all bank types, including state banks. This situation can be

explained by the fact that the deposits collected are placed in public debt instruments instead of being placed as loans, avoiding risks resulting from loan lending. This policy can also be associated with the anticipation of uncertainty regarding economic structure in the wake of the COVID-19 outbreak. Unsurprisingly, overdue loans continued to decrease with the decrease in loan volume. Islamic banks mainly follow the sector average throughout the pandemic period in terms of NPLs, whereas their loan-to-asset ratios are well below the sector average. Interestingly, the domestic private banks' group has performed worse than the sector average. What is more astonishing than all these is that foreign banks have suffered the most. It seems that NPLs of foreign banks moved up 7.06 % in December 2019 and 7.03 % in January 2020. While passing two years after the outbreak, NPL approaches 2.8% overall. The average value of the NPL ratio during the COVID-19 outbreak for domestic private banks, state banks, Islamic banks, foreign banks, and sectors are measured as 5.16%, 2.56%, 3.61%, 5.35%, and 3.99%, respectively (BDDK, 2022). Meanwhile, loan-to-total asset ratios for domestic private banks, state banks, Islamic banks, foreign banks, and the overall sector are measured as 55%, 62.4%, 48.8%, 50%, and 58.3%, respectively. For these calculations, data are collected from (BDDK, 2022).

The government can set the prices of goods (or interest rates in a similar manner) under their market price. The losses emerging out of setting both prices and interest rate is compensated by the Treasury and these losses are called “Duty Loss”. Historically in Türkiye, either these have not been recorded and counted in the balance sheet of the government or ignored somehow. It is understood that this application was current during the pandemic process.

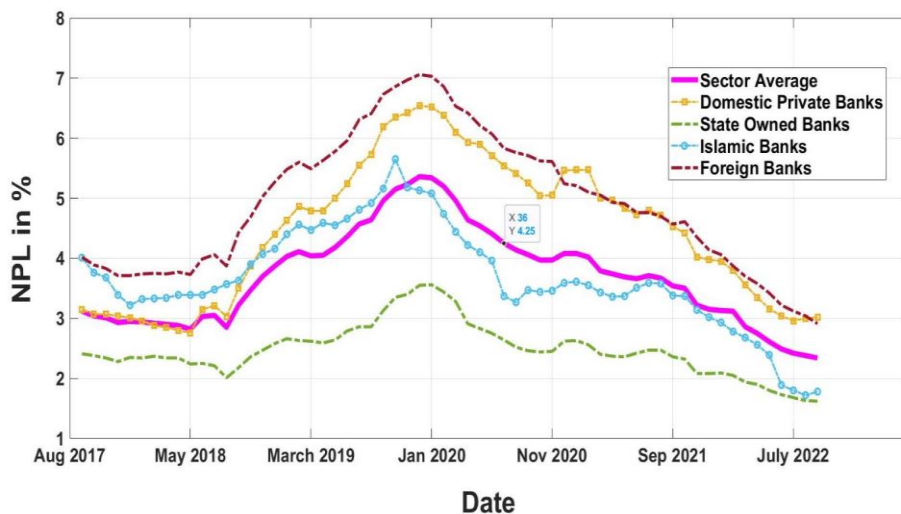


Figure 5. Non-performing loans variation (It is plotted by the researchers)

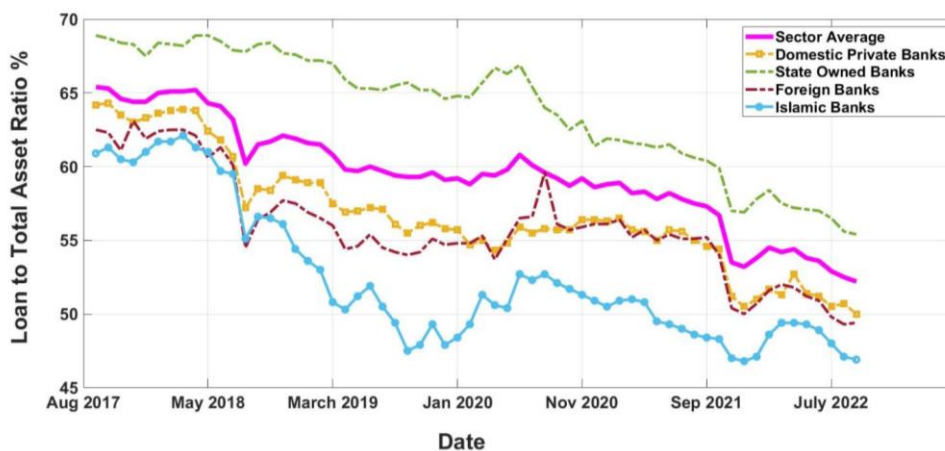


Figure 6. Loans-to-total asset ratio (It is plotted by the researchers)

4.3 Funding Cost

The funding cost of banks due to the marginal cost has been affected very negatively due to the lack of confidence resulting from the outbreak. As expected, the dramatic decline in economic activities has negative consequences (on credit quality) increasing banks' loan loss provisions. Related to this credit quality problem, many European Banks faced losses at a remarkable level in 2020 and 2021 (Judd, 2020). During a crisis like the COVID-19 outbreak, both for acceptable managing income and costs, banks should step responsibly (PwC, 2020).

It is observed during the analysis of ING that despite margin pressure on customer deposits in the last quarter (2021/3rd), strong income has continued. Another international bank BNP Paribas, despite the low-interest rates during the outbreak, has increased net interest income by 0.5% driven by re-lending activity and cost optimization (BNP Paribas Integrated Report, 2021).

5. Methodology and Data

In this section, monthly data gathered from the Banking Regulation and Supervision Agency of Türkiye (BRSA) is examined based on bank types, namely, state, foreign, domestic private, Islamic banks, and the sector in general. For this aim, it is investigated the effect of the pandemic crisis on the bank types operating in the Turkish Banking Sector by drawing a comparison between before the pandemic and during the pandemic period in terms of riskiness-NPLs (non-performing loans to total loans) and assets quality-LTA (loans to total assets). In this way, it is also evaluated whether there are differences in the reaction of both criteria to the determining factors between the two periods concerning the impact level.

Since WHO declared the date of March 2020 as the beginning of the pandemic, our research focus is on the period between August 2017-February 2020 as pre-pandemic and the pandemic period between March 2020-August 2022. The analysis was carried out for 61 months in total taking almost 30 months at an equal distance to March 2020.

Four explanatory variables, which the current literature proposes as the most important bank-specific determinants of risk and asset quality, are included in the study. The variables that existing literature provides evidence for the strong association are capital adequacy ratio-CAR (Klein, 2013; Alexandri & Santoso, 2015; Ozili, 2019), liquidity-LIQ (Ozili, 2019; Ahmed & Ariff, 2007; Manab, Theng, & Md-Rus, 2015; Al Rahahleh, Bhatti, & Mismam, 2019; Bsoul, Milhem, & Odat, 2022), the natural logarithm of total assets-SIZE (Al Rahahleh, Bhatti, & Mismam, 2019; Chaibi & Ftiti, 2015; Louzis, Vouldis, & Metaxas, 2012; Bsoul, Milhem, & Odat, 2022) and loan-to-deposit ratio-LD (Ahmed & Ariff, 2007; Al-Abedallat & Al-Shubiri, 2013; Farika, Achسانی, & Johan, 2018). All the assumptions of multiple linear regression (linearity, normal distribution of error term, homoscedasticity of residuals, and multicollinearity) are tested, and the loan-to-deposit ratio is excluded from the analysis due to the multicollinearity problem. Two dependent variables are regressed with explanatory variables for the pre-pandemic and pandemic periods, separately.

$$(NPLs, LTA) = \beta_0 + \beta_1 CAR + \beta_2 LIQ + \beta_3 SIZE + \varepsilon$$

Where “ ε ” is expressed as the error term and shows that the model is stochastic. This term represents all other variables that affect the dependent variable but cannot be measured, observed, or directly included in the model.

Table 1 gives the number of banks and the number of domestic/abroad branches by bank type. There are 61 banks in the Turkish banking system, 6 of which are Islamic banks. All banks in the system have 10,990 domestic and 76 foreign branches. State banks group is the dominant one with the largest number of domestic/foreign branches. On the other hand, the number of Islamic banks to the total number of banks and total branches is approximately 10% and 11%, respectively. Although the number of foreign banks corresponds to almost half of the total number of banks, the share of branches is only 31%.

As mentioned earlier, the data were split into two equal periods as before the COVID-19 period and during the COVID-19 period, and the results of both periods are presented in Table 2 and Table 3, respectively. Within the scope of the research, the analysis results are compared in the framework of bank types. The multilinear regression analysis results of the pre-pandemic period reveal that bank SIZE is negatively and significantly related to NPLs as the riskiness indicator for all the bank types

and the sector. The result is consistent with (Zribi & Boujelbène, 2011; Kharabsheh, 2019; Tehulu & Olana, 2014; Bsoul, Milhem, & Odat, 2022). (Zribi & Boujelbène, 2011) suggested a negative relationship due to the diversification by size. According to these researchers, since larger banks have more ability to have better-diversified portfolios and more capacity in risk management, they are expected to have fewer NPLs, in turn having less riskiness. The strongest negative impact of SIZE on NPLs exists in Islamic banks. The negative relation between SIZE and NPLs can be explained by the fact that larger banks can evaluate loan applications more effectively and arrange credit operations better like keeping track and collecting loans by taking advantage of economies of scale. Furthermore, it is possible to say that larger banks refrain from lending risky loans because of the concern that their market values will decrease. During the pandemic period, these results were replicated in all the bank types, except for the state banks group which has a significant positive impact. The positive relation in state banks is consistent with the too-big-to-fail hypothesis developed by (Stern & Feldman, 2004), who stated that a bigger size encourages banks to lend more loans, leading to higher NPLs.

Table 1. Banking Sector in Türkiye

Bank Type	Number of banks	Number of domestic branches	Number of branches abroad
State-owned	11	4125	36
Domestic Private	16	3506	27
Foreign	28	3359	13
Islamic	6	1363	4
Sector	55	10990	76

Source: <https://www.bddk.org.tr/BultenAylık/en>, miscellaneous information (access date: 01.12.2022)

Table 2. Regression results for the pre-pandemic period

dependent variable: NPLs	CAR	LIQ	SIZE	R ² (adj)	F-stat
Sector	-.143**(.019)	-.087(.093)	-.866*(.000)	.928	130.289(.000)
VIF	1.387	1.043	1.373		
State	.274*(.001)	-.255*(.001)	-.723*(.000)	.894	82.572(.000)
VIF	1.498	1.392	1.097		
Foreign	-.155**(.025)	-.177**(.015)	-.788*(.000)	.892	83.310(.000)
VIF	1.182	1.284	1.333		
D.Private	.236**(.026)	.156(.059)	-.701*(.000)	.879	73.939(.000)
VIF	2.504	1.566	1.783		
Islamic	.020(.753)	0.20(.769)	-.966*(.000)	.895	83.103(.000)
VIF	1.086	1.284	1.372		
dependent variable: total loans to total assets					
Sector	.316*(.001)	.423*(.000)	.538*(.000)	.854	59.407(.000)
VIF	1.387	1.043	1.373		
State	-.096(.152)	.615*(.000)	.588*(.000)	.918	109.720(.000)
VIF	1.498	1.392	1.097		
Foreign	.142(.081)	.622*(.000)	.385*(.000)	.845	55.521(.000)
VIF	1.182	1.284	1.333		
D.Private	.331**(.023)	.465*(.000)	.296**(.016)	.776	35.546(.000)
VIF	2.504	1.566	1.783		
Islamic	-.009(.935)	.001(.992)	.843*(.000)	.674	20.983(.000)
VIF	1.086	1.284	1.372		

Concerning the LTA ratio as the asset quality indicator, there is a significant positive impact of SIZE for the pre-pandemic period. It seems that banks with higher assets have more capacity to lend credit to the private sector and persons willing to borrow. The highest positive coefficient on SIZE is observed in the Islamic bank group. (Bashir, 2003) argued that large-scale banks have the advantage of mobilizing more funds as they have the opportunity to offer a wide variety of financial services to their clients. On the other hand, SIZE is a significant negative determinant of LTA in all the bank types during the pandemic except for the state bank group which has a highly negligible positive impact. The positive impact of SIZE on LTA is consistent with the study of (Sharma & Gounder, 2012), (Chernykh & Theodossiou, 2011), (Tomak, 2013), and (Malede, 2014).

CAR is a statistically significant determinant of NPLs except for the Islamic bank group in the pre-pandemic period which has a nonsignificant link. It is positively related to state banks while the others' NPLs have been affected negatively. It can be interpreted positive response of NPLs to CAR that state banks have been lax in lending since they have adequate capital with support government treasury. The negative relationship can be explained by the moral hazard hypothesis developed by (Berger & DeYoung, 1997). Under this hypothesis, banks with relatively low capital adequacy ratios respond to moral hazard stimuli by increasing the riskiness of their loan portfolios, so an increase in non-performing loans in the future is inevitable (Kharabsheh, 2019; Zribi & Boujelbène, 2011). Nevertheless, this relationship is very thin as can be seen from the coefficient of CAR in Table 3. The analysis indicates that CAR does not have a statistically significant impact on NPLs in all the bank types during the pandemic. This result is consistent with (Tehulu & Olana, 2014) but inconsistent with (Farika, Achسانی, & Johan, 2018) and (Al-Abedallat & Al-Shubiri, 2013). It can be said that the empirical evidence relating to the impact of CAR on NPLs seems to be mixed like the literature presented.

When the CAR and LTA ratio relationship in the pre-pandemic period is evaluated, there is no significant link, except for sector and private domestic bank groups which have a significantly positive impact. Similarly, during the pandemic period, the coefficient of CAR is significantly positive but very slight in the sector and foreign banks whilst there is no significant relationship in the other three bank groups. The positive result is consistent with (Chernykh & Theodossiou, 2011) who suggested that low capital leads to fewer long-term loans. Banks with high CAR can channel more loans by capturing more business opportunities (Jessica & Chalid, 2019). Higher CAR can limit the negative effect of increased NPLs on bank loan growth (Leroy, 2014). In general, banks with high capital adequacy ratios have higher lending capacity since they have the opportunity to use capital as a buffer against risk. Moreover, higher-capitalized banks could attract creditworthy borrowers with their lending capacities. It is a realization that the loan amount to be lent by the banks that cannot meet the minimum CAR determined by the laws is limited by the legal regulators.

The results regarding the LIQ impact on NPLs in pre-pandemic show that the coefficient of LIQ is significantly negative with NPLs in state and foreign banks while the others have nonsignificant links. During the pandemic period, no significant impact of LIQ on NPLs is observed in the bank type groups except for sector and Islamic banks, which have significant positive and negative impacts, respectively. According to (Altunbaş, Gambacorta, & Marqués-Ibáñez, 2009), excess liquidity in banks may trigger more risk-taking, thus increasing NPLs. The theoretical prediction of (Viral & Hassan, 2012) suggests that increased liquidity as a result of deposit inflows supports the tendency of bank managers to decrease the lending rate aggressively, supporting their incentive to increase loan volumes and take more risks. The result of the nonsignificant link is consistent with (Tehulu & Olana, 2014), (Kharabsheh, 2019), and (Bsoul, Milhem, & Odat, 2022). The negative finding is in line with several studies in the literature, such as (Maharmah Ghada & Saadeh, 2015), (Ahmed & Ariff, 2007), and (Yağcılar & Demir, 2015). A negative relation means that as the credit growth decreases, liquidity increases, causing diminishing NPLs. Furthermore, a high level of liquidity in banks arises from placing collected deposits in securities issued by the government treasury, instead of lending in the form of loans. By investing in securities, banks increase their liquidity and have the ability to earn more gain when interest rates are high and the state treasury has more financing requirements. With the remaining liquidity, banks give the best attention when evaluating loan applications and avoid placing loans on risky customers. This is the explanation for the low NPL ratios in banks with high liquidity.

Table 3. Regression results during the pandemic period

dependent variable: NPLs					
	CAR	LIQ	SIZE	R ² (adj)	F-stat
Sector	.045(.311)	.208*(.001)	-.1.103*(.000)	.951	151.315(.000)
VIF	1.029	1.870	1.838		
State	-.052(.507)	-.080(.314)	.930*(.000)	.884	72.458(.000)
VIF	1.464	1.482	1.516		
Foreign	-.086(.367)	.124(.375)	-.986*(.000)	.781	35.498(.000)
VIF	1.182	1.284	1.333		
D.Private	-.099(.284)	.010(.988)	-.868*(.000)	.816	43.813(.000)
VIF	1.292	1.336	1.618		
Islamic	-.058(.406)	-.209**(.036)	-.750*(.000)	.900	87.842(.000)
VIF	1.362	2.579	2.875		
dependent variable: total loans to total assets					
Sector	.071**(.029)	-.086**(.048)	-.928*(.000)	.974	180.548(.000)
VIF	1.029	1.870	1.838		
State	-.070(.219)	.224*(.000)	1.057*(.000)	.940	148.504(.000)
VIF	1.464	1.482	1.516		
Foreign	.183*(.000)	-.061(.294)	-.898*(.000)	.963	251.643(.000)
VIF	1.182	1.284	1.333		
D.Private	.062(.094)	-.026(.482)	-.999*(.000)	.972	332.398(.000)
VIF	1.292	1.336	1.618		
Islamic	.275(.055)	.270(.165)	-1.096*(.000)	.599	15.446(.000)
VIF	1.362	2.579	2.875		

In the pre-pandemic period, LIQ is significantly and positively related to LTA ratio in all bank types, the only exception is the Islamic banks' group, whereas, during the pandemic, LIQ has a statistically negative and positive impact on LTA in the sector and state banks, respectively. The results are inconsistent with Olokoyo's study (2011) which showed no impact of LIQ on loan lending. (Rabab'ah , 2015) who found a negative relationship suggested that a high level of liquidity limits banks' ability to lend loans. The positive impact is consistent with (Malede, 2014).

6. Conclusion

The COVID-19 pandemic, like other pandemics and epidemics in history, has deeply affected world trade and humanity. Working habits are not unique to the pandemic period but have changed permanently. This change deeply has affected all sectors, especially the banking sector. Many regulations were introduced to enable banks to obtain loans with the liquidity risk they carry. Opportunities offered by technological developments and previously kept aloof were quickly adapted and put into practice. A significant increase in productivity was observed in the banking sector, as in all other sectors. All kinds of online platforms found applications in the banking industry and spread rapidly. As a natural result of this, data security and cyber security issues have become more critical than they are, bringing the necessity of increasing cooperation with these sectors.

After all these developments, the areas of competition for the banking sector have changed and operational moves such as cost funding, credit risk attitudes, and technology adaptation have become more important. The flexibility that banks gain against systematic risks can only be explained by their ability to adapt and their proactive approach skills. The study also evaluates these improvements by considering a comparison between the pre-pandemic and the pandemic period for the types of the Turkish banking system. In this context, it is investigated the impact of SIZE (logarithm of total assets), capital adequacy ratio (CAR), and liquidity ratio (LIQ) on both NPLs (non-performing loans to loans ratio) and LTA(loans to assets ratio), separately. The analysis is replicated for the period of pre-pandemic, which is between August 2017-February 2020, and the pandemic, which is between March 2020-August 2020 using monthly data. Thus, our empirical study which comprises 310 observations in total concentrates on whether there are differences in the reaction of both criteria against determining factors between the two periods in parallel to applied regulations.

The results of our analysis reveal that SIZE has a highly strong negative impact on NPLs in both pre-pandemic and pandemic periods, but only in state banks, there exists a highly positive impact in the pandemic period. On the other hand, while SIZE affects the LTA of all bank types positively in the pre-pandemic period, this positive effect converts to negative except for state banks. According to various regulations and interventions made by policymakers during the first phase of the outbreak, the redemption of loan payments to the banks from which the companies whose cash flow deteriorated were postponed for a minimum of 3 months. Additionally, both the principal and interest payments of the loan debts of the tradesmen and artisans to the banks for April, May, and June of 2020 were postponed for 3 months, interest-free. The loanable housing loan amount for houses under TL 500 thousand was increased from 80 percent to 90 percent, and the minimum down payment was reduced to 10 percent. (Yetiz, 2021). It is well known that these transactions were mainly carried out through state banks.

It has been determined that CAR has positive, negative, and insignificant impacts on NPLs of bank types in the pre-pandemic period, but no significant impact is found for all bank types in the pandemic period. Regarding the impact of CAR on LTA, there exists no difference between the pre-pandemic and pandemic periods. When these results are evaluated in terms of CAR's impact on NPLs and LTA, it is concluded that with various regulations and preventive policies that were taken during the pandemic period by supervisor institutions and organizations; while NPL has not been not significantly affected, LTA has remained the same as in the pre-pandemic period.

The impact of LIQ on NPLs and LTA seems to be mixed for both periods compared. By considering the types of banks, only the domestic private banks' group has the same impact which is insignificant in both pre-pandemic and pandemic periods in terms of LIQ and NPL relation. In the same way, the positive and insignificant impact of LIQ on LTA has remained the same in state bank and Islamic bank groups, respectively. The positive relationship between LIQ and LTA in the state bank group in both periods indicates that banks do not use their liquidity levels as a buffer, on the contrary, they offer them to credit users as a loan facility. The results of LIQ impact reveal that, among bank types, the COVID-19 pandemic has affected the Turkish banking sector with several exceptions.

The main limitation of this research is that the pandemic period is still short, so data is very limited. It is vital to extend the time to evaluate how the pandemic will affect the sector in comparison to the pre-pandemic in the long run. Future studies could broaden other measurements and investigate practices including all bank types in Türkiye as well as some emerging economies.

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