**The impact of COVID-19 on the banking sector. Are we heading for the next banking crisis?**

**Abstract**

The aim of this research is to study the effect of the COVID-19 pandemic on the banking sector and to assess if COVID-19 was a trigger for the banking crisis. In order to analyse the extent of the impact of the COVID-19 pandemic the beta of the banking sector was calculated and analysed for selected countries. In addition, using the panel data technique over the period from the 30th of December 2019 until the 24th of September 2021, we examined variables contributing to the banking crisis development. The results suggest that the pandemic and government bond yield spread contributed to higher volatility and risk in the banking sector but did not lead to the banking crisis.

**JEL classification codes: G00, G21, G01**

**Introduction**

The COVID-19 outbreak, first in China and then globally hit the economies and businesses on an unprecedented scale. The measures introduced to control the spread of the virus led to a severe economic crisis. The contraction in economic activity was sudden and deep and the decline in the global output was three times higher than during the last financial crisis (IMF, 2021). Additionally, the global financial markets were also affected by the COVID-19 pandemic, the assets prices declined, and the volatile market conditions led to investors’ flight to safety and liquidity.

The recession and economic downturn caused by the global pandemic decreased the banks’ profits and worsen the outlook of the banking sector. An economic recession had the potential to result in credit losses, and a decrease in profitability as the asset prices were falling (IMF 2020a). Additionally, banks’ vulnerabilities such as the high level of debts of nonfinancial firms were amplified by the COVID-19 crisis and banks’ profits were affected by easing monetary policy. For example, in many countries very low interest rates were introduced before the pandemic which could have contributed to a low net interest margin (the difference between interest earned on assets and interest paid on liabilities).

The aim of this study is to investigate the impact of the COVID-19 pandemic on the banking sector in the countries most affected by the coronavirus including: Brazil, Belgium, France, Germany, India, Italy, Japan, Mexico, Russia, Spain, Switzerland, the UK and the US.

Our primary research question is whether the pandemic of COVID-19 triggered the banking crisis. To answer this question, we will analyse how different factors related to the banking crisis occurrence affected the banking beta an indicator of risk. The COVID-19 pandemic increased the level of uncertainty and government-imposed restrictions negatively impacted economic growth, so we expect that the COVID-19 pandemic increased the risk in the banking sector and thus the probability of the banking crisis development.

The remainder of this paper is as follows. The literature review provides a general description of the impact of the pandemic on the economy and the banking sector. The methodology presents the empirical methods used in the study. The analysis section discusses the results of statistical analysis. The final section concludes the paper.

**Literature review**

The pandemic of COVID-19 forced many countries into lockdowns which resulted in a sudden stop of economic activities. There were fears that the COVID-19 pandemic could cause a recession similar to the Great Influenza Pandemic which led to a 6% decrease in GDP and an 8% decrease in consumption (Barro *et al.,* 2020).

The COVID-19 pandemic also had a negative effect on the financial markets. Zhang *et al.,* (2020) analysed financial markets’ reaction to COVID-19 and concluded that risk and volatility increased substantially. Similarly, Ashraf (2020) confirmed that stock market returns declined as the number of conﬁrmed cases increased. According to Baker *et al.,* (2020) government intervention and especially restriction on economic activity was the main reason for the strong financial market response to the COVID-19 pandemic.

Many economists predict that the current pandemic crisis might be the most severe since the Great Depression. The question remains if the pandemic can trigger the financial crisis and banking crisis as well.

A banking crisis is deﬁned as the occurrence of severely impaired ability of banks to perform their intermediary role. A banking crisis is characterised by a decline in the ratio of non-performing assets to total assets (Pericoli & Sbracia, 2003) or when there is a signiﬁcant decrease in banking capital (Caprio & Klingebiel, 1996). Kaminsky and Reinhart (1999) perceived a banking crisis as a closure merger, takeover by the public sector of one or more ﬁnancial institutions, or a large-scale government bail-out of a ﬁnancial institution.

The banking crisis can be caused by a macroeconomic crisis or by a domestic bust and boom cycle. In times of boom, banks are optimistic about the future and tend to increase the ﬁnancing of projects with doubtful returns. The results of credit boom can be seen in the downturn phase of an economic cycle when an accumulation of arrears increases and banks’ liquidity is threatened (Gorton, 1998).

The first signs of the banking crisis were visible in the global banking sector as the recession caused by the COVID-19 pandemic and high levels of debt led to an increase in the number of non-performing loans (Park and Shin, 2021). Similarly, Beck (2021) showed that the lockdown and the COVID-19 pandemic increased loss provisions and non-performing loans together with an increase in interest spreads and a decrease in maturities in the US banks. In turn, in Eurozone banks, the COVID-19 pandemic increased volatility connectedness (Foglia *et al*., 2022).

Furthermore, it was documented that the COVID-19 pandemic had a negative effect on banks’ financial performance indicators and financial stability i.e., high-risk indicators such as default risk, liquidity risk and asset risk (Elnahass *et al.,* 2021). Likewise, Duan *et al.* (2021) found that the COVID-19 pandemic increased systematic risk in banks across 64 countries mainly in banks highly leveraged, undercapitalised and with high loan to assets ratio. Likewise, Acharya *et al.* (2021) confirmed that liquidity risk was responsible for the poor performance of banks’ stock relative to other financial and non-financial firms. However, Abboud *et al.* (2021) noticed that banks enter the COVID-19 pandemic with much robust capitalisation and liquidity which helped them withstand the initial stage of the pandemic crisis. There is evidence that banks with higher capitalisation and deposits, more diversification, lower non-performing loans and larger size were more resilient to the COVID-19 pandemic (Demir and Danisman, 2021).

In a cross-countries analysis of the banking sector, Tabak *et al.* (2022) showed that there was an increase in spillover in banking markets, especially in 2020. Laborda and Olmo (2021) demonstrated that an increase in volatility spillovers could be used as an early sign of a financial crisis and the banking sector can play a significant role in crisis transmission.

Another sign of the banking crisis is significant government intervention. There are several studies that focused on the impact of government policy on banks’ performance during the pandemic. Demirgüç-Kunt, *et al*. (2021) focused on the impact of the financial sector policy announcements on the banks’ stock at the beginning of the pandemic. Their findings suggested that banks’ stocks were more affected by the COVID-19 crisis than other corporations and that the policy announcement such as liquidity support, borrower assistance and monetary easing had some positive effects on banks. However, banks’ stock movement depended on pre-crisis vulnerabilities. Additionally, a decrease in banks’ stock prices was also mitigated by government policy such as income support, debt and contract relief and fiscal policy measures (Demir and Danisman, 2021).

The literature on the impact of the COVID-19 pandemic on the banking sector is fast developing. However, research on the effects of the current pandemic on the banking sector is still scarce. We contribute to the literature by analysing the COVID-19 pandemic as a potential trigger for a banking crisis. We also contributed by studying the effects of COVID-19 on the banking sector, especially on the risk in the banking sector.

**Methodology**

Our data contains both cross-sectional and a time series dimension, so to examine the impact of COVID-19, the panel random effect model was estimated using weekly data from the 30th of December 2019 until the 24th of September 2021.

The random effect model (Equation 1) was selected based on the Hausman test presented in Table 1. The null hypothesis of the Hausman test states that random effect is a preferred model and as the p-value is greater than the critical value, the random effect model was selected.

**Table 1. The Hausman test results**

|  |  |
| --- | --- |
| Chi squared | 6.8029 |
| Degree of freedom | 4 |
| P-value | 0.1467 |

**Equation 1. Random effect panel model**

$$Y=β\_{0}+β\_{ 1 }COVID19 +β\_{2}yield+β\_{3}govern+β\_{4}liquidity+e$$

Y - beta of banking sector

$β\_{0}$ - intercept

$β\_{1 }COVID19- $COVID-19 confirmed cases

$β\_{2} yield$ - the slope of the yield curve for government bonds

$β\_{3} govern$ - government policy based on University of Oxford policy tracker

$β\_{4} liquidity$ - liquidity ratio (liquidity assets to short term liabilities)

e- error

Beta was selected as a dependent variable because it is an indicator of a bank’s risk and banking sector condition.The beta of a banking sector was calculated in line with Capital Assets Pricing Model (Equation 2). Beta measures the sensitivity of banking stock to market movements and it is an indicator of market risk. Illing & Liu (2006) used the beta of the banking sector to assess the volatility of banks’ shares. Tomczak (2017) used beta to measure the impact of the 2007-2009 financial crisis on the banking sector. Similarly, Cardarelli *et al.* (2009), Tomczak (2022) and IMF (2009) used beta of the banking sector as one of the variables related to the banking crisis in their Financial Stress Index.

**Equation 2. Beta of the banking sector**

$$β\_{i}=\frac{σ\_{bm}}{σ\_{m}^{2}}$$

$σ\_{bm}$ is the is the covariance between banking stocks’ return and the market return

$σ\_{m}^{2}$ the variance of the market return

Beta greater than 1 indicates that the banking stock amplifies the overall movement of the financial market, suggesting that the banking sector is relatively risky.

Beta was calculated for each country weekly from the 30th of December 2019 until the 24th of September 2021 (Figures 1 to 12). The results vary across countries. Beta was negative at the beginning of the pandemic (March/April 2020) in all countries apart from the US and Russia, which means that banking stocks were moving in the opposite direction to market movement. During the pandemic in all countries a short period of high beta (greater than 1) was observed, indicating higher risk in the banking sector. Nevertheless, the short period of volatility did not confirm the presence of systematic risk in the banking sector that would signal the banking crisis.













To measure the effect of COVID-19 on the banking sector, the number of COVID-19 cases reported by each country was used. Another independent variable in this study is the slope of the yield curve which is calculated as the difference between long-term government bonds and short-term government bonds (Appendix 2, Figures 13-24). The slope of the yield curve is linked to the business cycle as a negative yield spread (inverted yield spread) often precedes a recession (Cwik, 2005) which can worsen banks’ profits. The negatively sloped yield curve was marked in several countries: Germany (Appendix 2, Figure 14), Japan (Appendix 2, Figure 17), Mexico (Appendix 2, Figure 19), the UK (Appendix 2, Figure 20), the US (Appendix 2, Figure 21) and Switzerland (Appendix 2, Figure 24).

Government intervention is an important sign of a banking crisis. During the pandemic crisis, governments around the world implemented various crisis relief packages. In this study, Economic Support Index (ESI) calculated by the Oxford University Government Response Tracker is used. ESI was selected as it records income support and debt relief, both variables can have a significant impact on banking operations.

Additionally, deterioration of financial soundness indicators can contribute to a banking crisis development. For example, a bank’s liquidity problems may arise from too high ratios of illiquid assets relative to liquid liabilities. This risk can be linked to an adverse information model. An adverse information model states that if there are signals or evidence of a recession then this may raise a question about the solvency of a bank and lead to a bank run (Davis and Karim, 2008). In this study, liquidity ratio was included to control for the bank’s internal vulnerabilities.

**Results**

The results presented in Table 2 indicate that the coronavirus outbreak and the slope of the yield curve had a statistically significant effect on a beta of banking sector.

**Table 2. Random effect regression results**

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Significance codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

The results suggest that the pandemic of COVID-19 increased the risk in the banking sector which could be linked to uncertainty. Uncertainty increased significantly during the COVID-19 pandemic because of supply and demand shocks as well the government imposition of lockdowns. An increase in uncertainty of economic outlook can contribute to risk aversion among investors and banks and lead to credit tightening. Moreover, the bank problems or banking crises are usually strongly connected to the business cycle. In times of economic prosperity, there is an increase in optimism concerning economic outlook and credit is usually widely available and tends to be elevated (Jordà *et al.,* 2011). Banks, investors, and households are more likely to take a risk, which includes investing in more risky assets usually ﬁnanced by credit. When the economy slows down, investors become pessimistic and this leads to a decline in the supply of credit, which aﬀects ﬁnancial arrangements and can fuel further volatility in financial markets (Gorton, 1998; Borio and Lowe, 2002).

The results presented in Table 2 suggest that the effect of COVID-19 is significant but small. This is in line with findings in the literature. For example, Carriero *et al.* (2022) estimated that there was an increase in macroeconomic and financial uncertainty following the COVID-19 pandemic which led to a decline in financial economic conditions. However, the effect of uncertainty was smaller than changes in macroeconomics and financial indicators.

Szczygielski *et al.* (2022) found evidence that COVID-19 impacted not only the financial sector but many global industries. Similarly, Xu (2021) confirmed that COVID-19 had a negative impact on the financial market in Canada.

Positive government bond yield also increased the risk in the banking sector. The results are in line with empirical findings in the literature, for example, OECD (2017) report suggests that positive government bond yield can have a negative impact on the banks’ balance sheet. Aydemir and Ovenc (2016) confirmed that in the short run the slope of the yield curve had a negative effect on banks’ profit in emerging market economies but positive in the long run. However, Killins *et al.* (2021) found evidence of a positive impact of the yield curve on bank profit. Moreover, during the COVID-19 pandemic, sovereign risk was transmitted to the banking sector in Eurozone (González-Velasco *et al.,* 2022). Similarly, Borri and diGiorgio (2022) proved that sovereign default risk affected risk in the European banking sector.

Overall, the presented results showed that the COVID-19 pandemic elevated uncertainty but did not lead to a systematic banking crisis. Since the global financial crisis of 2007-2009 (GFC) banks were well prepared to withstand a crisis mainly due to the new regulations introduced after the GFC. Lewrick *et al.* (2020) showed that globally, banks were well capitalised before the COVID-19 pandemic with around US$ 5 trillion of capital above their Pillar 1 regulatory requirements. Similar findings were reported by Acharya and Steffen (2020); Li *et al.* (2020), Cao and Chou, (2022) and Dursun-de Neefa and Schandlbauer (2021). Additionally, after GFC new liquidity requirements for banks were introduced through the Basel III framework: the LCR and the Net Stable Funding Ratio (NSFR). These liquidity measures required banks to have an adequate number of high liquidity assets (LCR) and to maintain a stable funding profile regarding off-balance sheet (NSFR) (Duncan *et al.,* 2022).

Although banks were well prepared for the COVID-19 crisis, the results presented in this study can be also used by the authorities to implement and design policies and regulations to prevent potential banking stress. Additionally, the COVID-19 pandemic’s effect on the banking sector helps to enhance knowledge of the banking sector stability.

**Conclusions**

This study documented the impact of COVID-19 on the banking sectors in selected countries.

The Covid-19 pandemic had a negative impact on many sectors of the economy, but it is especially important to analyse the banking sector as it plays a crucial role in the economy as the financial intermediator.

A beta of banking sector was used to assess the extent of stress in the banking sector. Beta indicated an increase in banking stress but did not confirm a systematic banking crisis. However, the results of the panel data model showed that COVID-19 and government bond yield increased the risk in the banking sector. The higher risk in the banking sector can be linked to higher uncertainty during the pandemic and a decrease in economic growth. Further research would benefit from investigating if deteriorating economic conditions decreased banking sector profit and increased the ratio of non-performing loans.

The findings in this research can also be valuable to policymakers. The results presented in this paper showed that the pandemic type of crisis is likely to increase risks in the banking sector which should be considered when designing new policies or regulations.

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**Appendix 1**

**Table 3. Description of variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Description** | **Frequency**  | **Source** |
| Dependent variable Beta of banking sector  |
| Banking stock return | Country series, Banking service total market return index. The observation for Japan for beta for the week 3rd of January 2019 because the variance of total market return was 0 as the closing stock reported in Thomas Reuters database was 210.18 for the whole week. | weekly | Thomson Reuters  |
| Market return  | Country series, Banking service total return index | weekly | Thomson Reuters |
| Independent variables  |
| COVID-19  | Confirmed number of cases of Covid- 19 | weekly | EU open data portal  |
| The slope of the yield curve | The difference between 10 years government bonds and 3 months government bonds. For Russia the slope of the yield curve was calculated as the difference between 10 years bond yield and 1 year bonds yield and for Switzerland as the difference between 10 years bond yields and 3-year bond yield | weekly | Thomson Reuters |
| Government policy | Economic support index, daily data. Average of daily data to calculate weekly  | daily  | Covid-19 Government Response Tracker. University of Oxford |
| Liquidity ratio | Liquid assets to short term liabilities  | quarterly | IMF: Financial Soundness Indicators |

**Appendix 2**

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