

## **THE IMPACT OF THE COVID-19 PANDEMIC ON THE OPERATIONAL RISK LOSSES OF HUNGARIAN CREDIT INSTITUTIONS**

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### **ABSTRACT**

The operation of the banking sector in 2020 was determined by the outbreak of the coronavirus pandemic and, in connection with this, the maintenance of business continuity and safe operation. Due to the pandemic, losses appeared in different forms in banking operations, some of which are classified as operational risk losses. Through a quantitative and qualitative analysis of the operational risk losses of Hungarian banks linked to the pandemic, this study shows that despite the high nominal losses, the operation of the banking sector remained stable, and the capital allocated by the credit institutions for operational risks provided sufficient coverage for unexpected losses. The focus of the analysis on small and large banks showed that it was not the size of the institution and its capital calculation method, but the immediate decisions made to deal with the pandemic, as well as the infrastructural background, that determined the extent of the realized damages.

*JEL codes:* G21, G32, L25

*Keywords:* pandemic, operational risk, COVID-19, bank, credit institution, coronavirus, loss, loss event

### **1 THE RELATIONSHIP BETWEEN THE COVID-19 PANDEMIC AND OPERATIONAL RISK**

The operation of the banking sector in 2020 was determined by the outbreak of the coronavirus pandemic and, in connection with this, the maintenance of business continuity and safe operation, as well as adaptation to changed external conditions and internal operations.

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Due to the pandemic, credit institutions suffered additional losses compared to the risks incurred in their previous operations, and due to the long-lasting impact of the pandemic, the potential operational risk exposure also increased significantly. The latter also means that, in addition to the identified losses, the identification of damages whose root cause can be linked in some way to the pandemic can be expected later. The incurred losses and the identified risks can be classified into two main groups based on their characteristics: on the one hand, there were prevention and protection costs directly related to the pandemic, and on the other hand, there were also indirect costs that were due to the economic and social factors that arose as a result of the pandemic.

### **1.1 The pandemic as operational risk**

Direct costs related to the coronavirus are considered operational risk losses by the EU regulations, since according to the definition of the CRR<sup>2</sup>, operational risk is the risk of loss arising from inadequate or possibly faulty functioning of people, IT systems, internal processes, or from external events. Although the causes of pandemic risks were external and unavoidable, they caused considerable damage to the banking sector and, at several points, far-reaching risk reduction measures were necessary to mitigate the severity of the damage or prevent the occurrence of new losses.

However, the above definition of CRR does not provide a universal solution for the identification, management and classification of operational risk losses related to the pandemic, as it is a new type of risk that has not arisen in the credit institution sector since the formal regulation of operational risk in 2007. For this reason, it was necessary to formulate and clearly communicate detailed rules that define common identification and classification principles for the banking sector so that losses can be uniformly managed.

On the initiative and with the cooperation of the Central Bank of Hungary (MNB), the European Banking Authority (EBA) developed its guideline EBA Report on the Implementation of Selected COVID-19 Policies, which was published on 7 July 2020, and then revised its operational risk aspects on 21 December 2020.<sup>3</sup> In this guideline, it was laid down that one-time costs incurred in order to maintain business continuity due to COVID-19 should be considered operational

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2 Regulation (EU) No. 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No. 648/2012

3 Chapter 3 (*Operational risk*) of the referenced document deals with operational risks.

risk losses. In addition, the EBA also determined that direct losses related to the pandemic should be classified in the Basel event type Business disruption and systems failures and should be treated as a related event (EBA, 2021).

The latter means that the loss events that have occurred - although of different types - can all be traced back to the same root cause, therefore they shall be treated as group operational risk events, i.e. the impact of these events shall be aggregated in the operational risk capital calculation and in the internal and external risk reports. Another characteristic of operational risk loss events - in addition to the type of event - is the banking business line to which they belong. The losses related to the pandemic are most often at the corporate level, i.e. they affect the entire banking operation. Accordingly, the institution's loss data collection practice for these events is the guiding principle, i.e. the loss can be detected in the technical line of business, the institution's dominant line of business, or the loss can also be divided between various business lines.

The guidelines listed above created the interpretation of the operational risks of the COVID-19 pandemic along the same principles and created the structure that could serve as the basis of standardised loss data collection. This set of rules is also essential in order to analyse the impact of the pandemic on the Hungarian banking sector.

## **1.2 Background literature, international outlook**

In international literature, primarily qualitative research has been conducted on the effects of the COVID-19 pandemic on banks. These studies primarily focused on the effects of the pandemic regarding the process of business continuity, crisis management, and risk management, which are issues of corporate governance. At the time of our study, we had not yet come across a quantitative analysis based on numerical data.

Approached from the perspective of business continuity and crisis management, the pandemic can be considered an organizational crisis, as it equals with the following definition in literature: „an event that managers and stakeholders consider to be extremely unusual, unexpected and potentially destructive” (Phillips, 2013). This definition supports the belief that an organization's operating losses can result from suffering expected and unexpected losses. The majority of unexpected losses - which seriously affect the capital position and reputation of financial institutions - are the result of low-probability and high-impact operational risk events.

The fact that the literature typically dealt with the issue of the pandemic only at the level of crisis management does not mean that the regulators did not assess

this type of risk in advance. However, the applied approaches considered the impact of a possible epidemic situation not from the perspective of the loss suffered, but from the perspective of low-probability but high-severity potential scenarios. For example, the Central Bank of Hungary conducted a survey of the scenarios analysed by major Hungarian banks, as a result of which it was established that half of the banks regularly analysed the pandemic as a potential operational risk. As a result, the central bank formulated a general requirement for supervised institutions that use scenario analysis to evaluate the scenario of the risk of an epidemic disease on an annual basis (MNB, 2021a).

In Hungary, *Zsuzsanna Tamásné Vőneki* published a study for the first time on the operational risk aspects of the pandemic, in which she focused on the role of crisis management and the change in the operational risk profile. The approach to the pandemic from this point of view is based on the fact that the pandemic - in terms of its impact and probability - can be considered a crisis situation, which shall primarily be handled with crisis management tools (*Tamásné, 2020*).

The literature also distinguishes in which phase of the crisis the analysis of losses linked to the pandemic can be considered relevant. *Alpaslan et al. (2009)* divide the crisis into two phases, a preparatory phase and a response phase, while *Bundy et al. (2016)*, after the preparatory (pre-crisis) phase, and also define the course of the crisis and a post-crisis phase. From the point of view of operational risk losses, the stage of the course of the crisis and its aftermath is relevant, since the losses arising in this period can be clearly linked to the actual root cause of the risk.

In addition to immediate interventions, the literature also draws attention to the long-term impact of the pandemic, which can be measured in significant changes in the operational risk profile. The risk.net portal publishes the top 10 operational risks of the banking sector every year, the change in which clearly illustrates the change in the risk profile. Among the elements of the list published for 2020, the impact of the pandemic is present in many respects: organizational, geopolitical, fraud, data protection risks - and recently - resilience risks have also increased as a result of the pandemic. The latter means how flexible credit institutions are, i.e. to what extent they are able to adapt to the changed external environment (*risk.net, 2020*).

Regulatory authorities and, in addition to scientific approaches, international data consortia also dealt with the practical implementation of the collection of loss data related to the pandemic. The approaches of the data consortia also had an attitude-shaping effect in the constantly changing environment, since the credit institutions that provide data to an international data consortium shall meet the requirements set by the consortium, as well. A good example of this is the general definition of operational risk losses related to the coronavirus by the international data consortium ORX: „would they have experienced the loss effect

even without the onset of the pandemic? If the answer is no, include it in operational risk reports” (ORX, 2021).

Since we have not found any example of a quantitative analysis of realized losses in the Hungarian and international literature, we will use the data collected for the domestic credit institution sector to present a numerical analysis of the impact of the pandemic in terms of operational risks. However, for this, it is essential to learn about the process elements of the treatment of the pandemic, in order to put the analysed losses into context and to create the background necessary for the interpretation of the revealed connections.

### 1.3 Changes in banking processes

The changed external circumstances related to the pandemic also brought about many process changes in the operation of credit institutions, some of which had to be implemented immediately, others in the longer term. As part of the annual ICAAP review of credit institutions<sup>4</sup>, the Central Bank of Hungary collected information about the background of process changes in interviews on the topic of operational risk management, which supported the qualitative approaches of the research conducted on the topic.

The immediate measures necessary at the beginning of the epidemic situation tied up significant bank resources, the purpose of which was typically to ensure the continuity of business, which was successful overall for all institutions examined by the Central Bank of Hungary. In addition to employees working from home, customer service was typically strengthened through alternative channels (tele-banking and internet banking). Taking into account the guidelines of the parent companies of international banking groups, the EBA and the domestic supervisory authority, the credit institutions developed their own internal procedures and operated according to the principles set out therein. In addition, regularly meeting crisis management committees and working groups were formed, which made it possible to react immediately in the rapidly changing external environment.

The changed banking processes brought about new types of operation and risks. Due to the waves of the epidemic and the closures taking place in several phases, the institutions had to move flexibly between physical and virtual presence and operation in the longer term, and will continue to do so in the future. It can be a challenge to identify the potential risks of working from home, and to assess in

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<sup>4</sup> The National Bank of Hungary annually reviews the internal capital adequacy assessment process (ICAAP) of domestic credit institutions, which also includes the adequacy of the assessment of material banking risks.

what form (flexible or rotational) it works effectively in the long term. In addition to working from home, another challenge is whether the performance of the basic IT system is sufficient to support digital banking, payment, activity on trading platforms and the growing virtual traffic of other systems in the long term. With a stronger virtual presence, cyber security and the protection of customer data become increasingly important, on which a bank's reputation may depend.

## **2 OPERATIONAL RISK LOSSES RELATED TO THE EPIDEMIC SITUATION**

### **2.1 Characteristics of the losses included in the analysis**

Before the publication of the international and Hungarian guidelines, it was a challenge for credit institutions to identify and collect losses related to the epidemic situation. Several banks collected data in a separate database at the beginning of the epidemic situation, so that later they could select the losses that actually belong to the pandemic. In the case of foreign-owned institutions, the losses were classified in accordance with the parent company's guidelines, but at the same time, in order to be able to accurately quantify the damages related to the entire epidemic situation, it is necessary to take several aspects into account. The questions had to be asked as to whether the given cost would have been incurred if there was no epidemic situation; whether the given cost was necessary for the banking operations to return to the normal situation; the cost item would continue even after the end of the epidemic situation; and what risk category each loss needed to be classified into.

The Hungarian and international supervisory guidelines helped to answer the aforementioned questions, which separated the operational risk losses from the other social and economic effects of the pandemic, and also regulated the time from which an expense can be considered a pandemic loss. Based on the EBA guidelines applicable in the member states of the European Union, which we also apply in our country, we do not consider the costs that are integrated into the operation and will continue to arise in the future to be operational risk losses. These include, for example, the costs of regular wages or IT developments beyond recovery. The savings realized during the pandemic (for example, the operating costs of closed bank branches) cannot be taken into account when quantifying the damages either, as they cannot reduce the operational risk losses that have occurred. In addition to the above, significant interest losses and forgone profits realized due to the credit moratorium in many countries cannot be considered operational risk losses. At the same time, for example, damages, compensations and official

finances resulting from non-compliance with the rules related to the credit moratorium increase the level of operational risk losses (EBA, 2021).

In accordance with the previously mentioned EBA guidelines, the Central Bank of Hungary communicated the classification rules for loss data for the purposes of providing information and guidance through the Hungarian Banking Association to the players of the sector, illustrating the individual loss categories with examples and applying them to the Hungarian credit institution sector. The main purpose of the management letter sent to the Banking Association was to enable Hungarian institutions to identify damage related to the COVID-19 pandemic in a timely and comprehensive manner (MNB, 2021b).

As a result, the credit institutions classified all direct losses - based on the aforementioned management letter by the Central Bank of Hungary - into 7+1 categories:

- prevention and defence costs,
- the costs of setting up remote working,
- additional human resource costs,
- extraordinary building investment and operating costs,
- costs related to cancelled trips and events,
- additionally paid consultancy fees,
- costs related to crisis management,
- other costs.

Under human resource costs, we took into account those additional costs - typically wages and contributions - that can be linked to extra work due to the epidemic situation. As for prevention costs, we took into account the material costs related to cleaning and disinfection, as well as the costs of the measures taken to protect the health of the workers. The additional costs not included in the annual business plan, which were related to laptop purchases, the creation of VPN licenses and other IT equipment costs were included in the costs of establishing telework. The extraordinary operating expenses category typically includes the costs of the glass walls and screens installed in the bank's buildings. We have created a separate category for non-reimbursable costs related to trips and events cancelled as a result of the epidemic restrictions. In addition to these, additional consulting fees and costs related to crisis management were a separate category. The losses that we cannot classify in the above-mentioned types were taken into account in the „other” category.

In addition to the conceptual definitions above, it is essential for the statistical analysis of losses to have comprehensive, reliable losses produced according to

a specific structure, which required individual data provision from the supervised institutions. For the investigation of operational risk losses related to the epidemic situation, the Central Bank of Hungary has developed a unique data service, which includes the loss events related to the epidemic situation that arose and were detected in the business year of 2020. In addition to the description of the event, the institutions sent the pandemic-related gross loss and recoveries, as well as the date fields necessary to identify the event (occurrence, discovery, entry, booking date) to the Central Bank of Hungary.

In addition to the individual data requests, we also used the regular supervisory data services<sup>5</sup> of the Central Bank of Hungary and the data requests of the ICAAP reviews for the analysis. As a result, the analyses include the group-level<sup>6</sup> data of the 15 domestic credit institutions that – based on the Central Bank of Hungary’s own classification based on institution size – are subject to a complex ICAAP review.

Before analysing the losses related to the coronavirus, we defined the objectives of the analysis. The main goal was to determine the extent to which the banking sector was burdened by the pandemic: Was there a significant increase in the amount of losses compared to previous years? Did the operational risk capital requirement cover the newly identified risks? In addition to the extent of the losses, the analysis of their distribution was also focused on: how the volume of the loss is distributed between the individual loss categories, and whether any correlation can be identified between the size of the institution, the applied capital calculation method and the extent of the loss. Since operational risks are inherently heterogeneous, we also aimed to identify and analyse individual institutional characteristics in the course of our research.

## **2.2 Evolution of sector-level annual losses**

Based on surveillance data services, in 2020, the loss increased in only almost half of the institutions compared to the average of the previous three years. At the same time, losses related to the epidemic situation account for 49% of the 2020 loss data. In the case of several institutions, the costs related to the epidemic situ-

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5 The surveillance data sources used are the following: COREP reports, which include capital requirement and loss data, and FINREP reports, which include income statement and balance sheet data.

6 The institutional groups included in the analysis are the following: Budapest Bank, CIB, Erste, Fundamenta, Gránit, K&H, Magnet, MKB, OTP, Polgári, Raffeisen, Sber, Sopron, Takarékszövetkezet, UniCredit



ation account for a large proportion of the total operational risk loss, but at the same time the total operational risk loss is lower compared to previous periods. The low level of annual loss volume is also supported by comparing operational risk losses to the level of the balance sheet total, as we do not see a significant deterioration in this ratio compared to previous periods, therefore at sectorial level, although there were large individual losses, even along with the largest losses, the operation of specific institutions remained stable.

The fact that the amount of losses did not increase significantly at certain institutions in 2020, despite the new losses, is mostly due to the fact that the ratio of certain previous types of losses decreased as a result of the restrictive measures put into effect by the state, as well as the credit moratorium. The amount of annual operational risk loss is typically a volatile value in time, a small number of individual operational risk events account for a large proportion of the amount of loss, therefore even a few events can cause a significant difference in the value of the annual amount of loss in a business year. In the 2020 loss values, we found that during the loan repayment moratorium, the losses related to credit risks, which previously accounted for a large proportion of the total operating risk losses, decreased significantly.

However, looking at individual bank data, we see a colourful picture. In addition to the fact that the annual loss was reduced in almost half of the institutions, there were also entities where, compared to the previous year, the amount of losses in 2020 was 3 times, 4 times or even 5 times larger compared to previous periods, which is clearly related to the losses attributable to the epidemic situation. In the later part of the study, we will present the unique factors that determined the losses of each bank.

Based on the provided bank data, we performed an analysis of the amount of losses by type, which required significant capacity in the analysis due to the heterogeneity of the data provision. The data supply by several institutions clearly indicated the appropriate category related to the amount of damage, but there were cases where the type of loss was not clearly revealed even in the description of the event; therefore its definition required further consultation. For those losses where several categories were affected based on the description field, we segmented the amount of loss based on the description, thus ensuring non-overlapping grouping according to the individual criteria. The ratio of loss events at sector level is shown in the *Table 1* below.

**Table 1**  
**Distribution of losses reported by individual banks by type (%)**

Type	Sector-level ratio	Ratio by individual institutions	
		the lowest	the highest
<b>Prevention cost</b>	66.59	7.57	100.00
<b>Remote working</b>	16.31	0	44.71
<b>Human resources</b>	3.63	0	19.28
<b>Extraordinary operation</b>	7.34	0	29.29
<b>Cancelled trips</b>	1.32	0	24.32
<b>Consulting fees</b>	1.04	0	25.64
<b>Crisis management</b>	1.13	0	17.97
<b>Other</b>	2.64	0	52.08

Source: Central Bank of Hungary

We also examined the number of losses reported by the institutions, but due to the different but acceptable and justifiable recording solutions, we could not draw sector-level conclusions. There was a practice where the institution recorded each item as a separate loss in the ledger in the loss database. There were other cases where the main losses were displayed on a monthly basis, and there was also an example where in the year 2020 one loss was recorded aggregated within each main category type. Regardless of the method of recording the data sent, we consider it a good practice if the given Institution provides the loss data related to the epidemic situation in the database with a uniform linked event identifier and takes into account the total amount of losses suffered up to that point in management and other committee meetings. As long as this connection takes place, all of the above procedures are acceptable on the part of the MNB.

Based on the table above, within the losses related to the COVID-19 epidemic, prevention costs accounted for the largest proportion (HUF 6.3 billion), but the cost of establishing telework (HUF 1.5 billion) and extraordinary investment costs were also significant. Costs related to cancelled trips, consulting fees and crisis management make up a minimal 1 percent of total losses respectively. The ratio of prevention costs is significant, but at the same time there are material differences between the individual ratios. The ratio varies between 100% and 8% between the individual institutions.

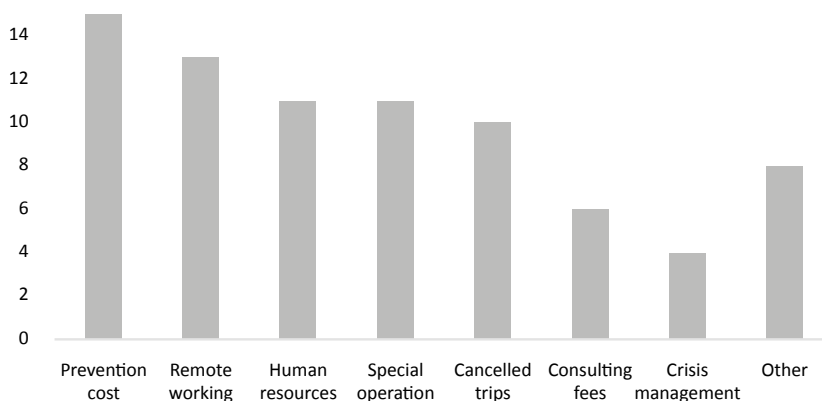
In addition to the above ratios, we note that the real costs of establishing remote work may be higher than what the institutions have identified as operational risk losses. During the local ICAAP review interviews, several institutions indicated

that they only considered those IT-related costs as operational risk losses that were not planned for a given financial year. The cost items that were „brought forward” due to the epidemic situation (e.g. the purchase of new laptops, if they planned to buy them in the near future anyway) were not considered operational risk losses.

The table above also revealed that not all institutions reported all types of losses. If we examine how many institutions reported each type in their data, we see a picture similar to the severity ratios. The most common type of loss was the cost of prevention. All examined banks reported this type of loss, and most institutions had costs related to the establishment of telework. Recording of consulting fees (by a total of 6 institutions) and „other” types of losses (by a total of 8 institutions) was less common. In order to deal with process changes, in several cases, various working groups and committees dealing with crisis management were formed, but these did not represent extra expenses. A total of 4 institutions reported this type of cost.

### Diagram 1

#### The number of institutions reporting the individual types of loss



Source: Central Bank of Hungary

The graph above shows that there is a high concentration in the distribution by type at sector level, 82.9% of the amount of loss can be linked to the costs of establishing telework and prevention costs, while 66.59% of the total value is only prevention costs. This raises the question of whether additional subcategories could be created within this category, but at the same time we saw that the further breakdown these types of costs (masks, disinfectants, cleaning costs, PCR tests, etc.) would not provide additional information for the analysis of loss data according to operational risk management aspects.

### 2.3 The relationship between losses and institution size

Using previous data, we analysed both large and small<sup>7</sup> banks in order to reveal whether the size of the institution and the operational risk framework used – related to the chosen capital calculation method – had an effect on the extent of the losses suffered.

For this analysis, we created two peer groups: the group of credit institutions with a balance sheet total of HUF 1,000 billion or more, which we call large banks, and the group of banks with a balance sheet total of less than HUF 1,000 billion, which we call small banks in the study. This breakdown is justified by the fact that the operational risk management practices of small and large banks differ significantly, as detailed in a previous study (Kozma, 2020) as follows:

**Table 2**  
**Different risk management practices of small and large banks**

Features	Large institution	Small institution
<b>Consciousness of operational risk management</b>	conscious, independent of other risks	less conscious, integrated with other risks
<b>Organizational features</b>	they have an independent operational risk management organization	they do not have independent operational risk management
<b>Diversity of applied risk management methods</b>	they typically cover the entire spectrum of the operational risk toolkit	they focus on the damage that has occurred through the collection of loss data
<b>The „driving force” of operational risk management</b>	identified risks derived from the risk profile	advantages arising from organizational size
<b>A way to reduce risks</b>	proactive and reactive (through the incurred losses and the identified risks)	reactive (exclusively through the incurred losses)

Source: Kozma (2020)

The analysis was carried out from two aspects: we examined whether there was a significant difference between large and small banks in terms of the distribution of the amount of loss according to institution size, and with regard to the amount

<sup>7</sup> The Central Bank of Hungary considers credit institutions with a balance sheet total of less than HUF 1,000 billion as small institutions from concerning this analysis.

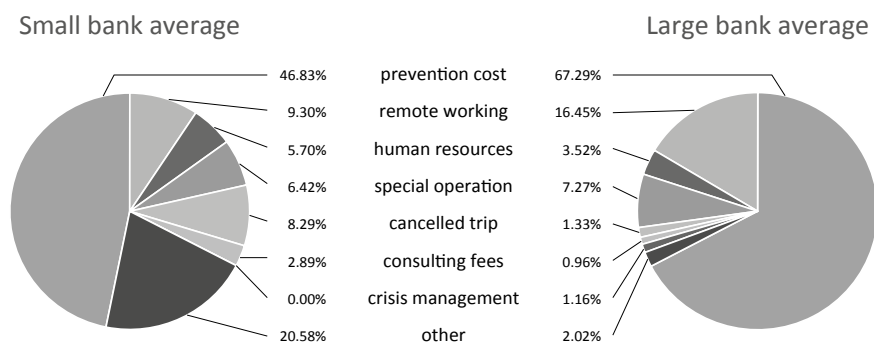
of loss relative to assets and capital. This analysis also looked for the answer to whether the framework related to simpler capital calculation methods – typically used by small institutions – resulted in a different magnitude of losses compared to large institutions.

### 2.3.1 Distribution of the amount of loss by institution size

The analysis of the distribution of the amount of loss was carried out using the same principles and methods that were presented during the sector-level analysis, i.e. based on the categories defined by the Central Bank of Hungary; we examined how the amount of loss reported by the banks was distributed among the individual loss types. The difference between small and large banks is illustrated in *Diagrams 1 and 2*:

#### Diagram 2

#### The distribution of losses in small and large institutions



Source: Central Bank of Hungary

Analysing the diagrams, we can conclude that prevention costs dominated in both peer groups, but while in the case of small banks, this accounted for 46.83% of the total loss, in the case of large banks, it accounted for 67.29% of the losses. The reason for this is that large banks have a higher number of employees, usually more locations and a more extensive branch network compared to small banks, which significantly increased the proportion of costs spent on prevention.

The same applies to the costs of setting up remote working. The costs necessary for employees to work from home office amounted to 16.45% of the costs in the case of large banks, while, in the case of small banks, to 9.3% of the losses. The difference can be explained by the fact that the conditions for telework were pre-

viously only limited and partially available in larger banks, therefore the mass transition required significant hardware and software capacity expansion. In the case of small banks, previous software use and the higher proportion of laptop use made the transition easier. In the course of the analysis, we found that at those institutions where digitalization was more advanced, the transition was implemented at lower costs.

A significant difference could also be identified in the category of other loss, which accounted for 20.58% of the total loss in the case of small banks, and only for 2.02% in the case of large banks. Based on the above, in the case of small banks, many unique features generated costs that did not appear in the operation of large banks. There was a small-sized institution that cancelled its ongoing lending campaign, which caused the institution to pay a penalty. Another bank needed data warehouse development, some banks reduced the number of their employees, and another bank informed its customers about the changed opening hours due to the pandemic by letter.

Overall, it can be stated that the distribution of the losses of small and large banks by type shows a similar pattern, but the size of the categories is different in each peer group. This is due to the fact that the human resources and infrastructural conditions differ between small and large institutions, including the number of employees, the IT structure, the size of the branch network and the earlier establishment of flexible working conditions.

### **2.3.2 The amount of losses in proportion to capital and assets**

The high nominal loss due to the pandemic meant unplanned damage for commercial banks. When examining the shock tolerance of banks, both individually and at sectorial level, it is crucial to analyse whether the pandemic resulted in a significant loss of assets, i.e. what percentage of the available assets was eroded by the loss. In addition, a key question is whether the qualified operational risk capital provided cover for the unexpected losses realized due to the pandemic, i.e. whether it was sufficient to cover the losses.

We used relative indices to measure the above two factors, since relative indices take into account the size of the bank and also create comparability between small and large institutions. In addition to the size of the banks, we also examined the relationship between the chosen capital calculation method and the losses suffered. Currently, banks can choose from three methods, which have different requirements for credit institutions:

- *Basic indicator approach (BIA)*: it determines the size of the minimum capital to be kept at 15 percent of the three-year average of the bank's income-based

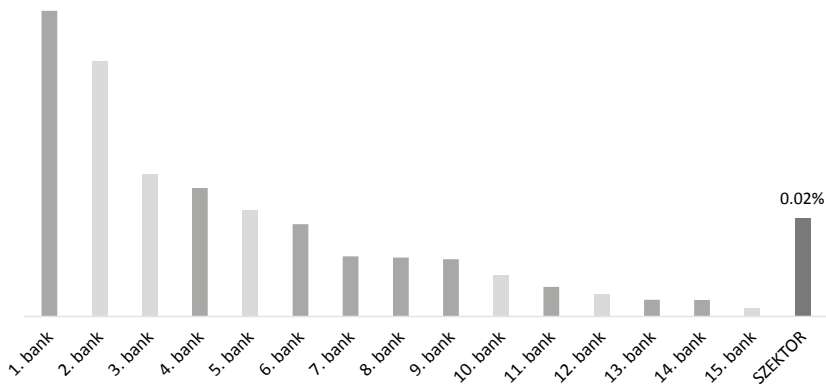
indicator. The methodology has no organizational or methodological requirements.

- *Standardised approach* (standardized approach, TSA): it defines the capital requirement as the aggregate value of 12–18 percent of the three-year average (depending on the line of business) of the guiding indicator for each line of business. The use of the method is subject to a supervisory license. In addition to the breakdown of income by business sector, it is mandatory to collect the operational risk losses that have occurred. The aforementioned activities require the creation of spheres of influence and responsibility, as well as organizational frameworks. Within the method, the *alternative standardized approach* (ASA) is also distinguished, which is relevant for banks with the prevalence of retail and commercial banking business.
- *Advanced measurement approach* (AMA): it calculates the capital requirement based on the institution's own mathematical-statistical model using four mandatory input factors (internal and external loss data, scenarios, business environment and internal control factors). The introduction of the method is subject to a supervisory license, the issue of which is preceded by the validation of the model. The application of the method requires the fulfilment of strict qualitative requirements, which include the expected level of the organization's risk awareness, the creation of an independent risk management function and the application of risk management principles in daily practice (Kozma, 2019).

When investigating the relationship between the scale of the pandemic loss and capital calculation, we assumed that the more advanced capital calculation method a credit institution uses, the more advanced its risk identification and management practices are, therefore it suffers a smaller loss when an unexpected risk arises.

To determine the asset-proportional loss, the direct operational risk losses suffered by the given institution during 2020 related to the pandemic were proportional to the consolidated balance sheet total on 31 December 2020. The following figure clearly shows the loss relative to assets of the 15 domestic credit institutions included in the investigation. In *Diagram 3*, large banks are marked with dark columns, small banks with light colour.

**Diagram 3**  
**Asset-proportional operating risk losses**  
**for the credit institutions included in the investigation**



Source: Central Bank of Hungary

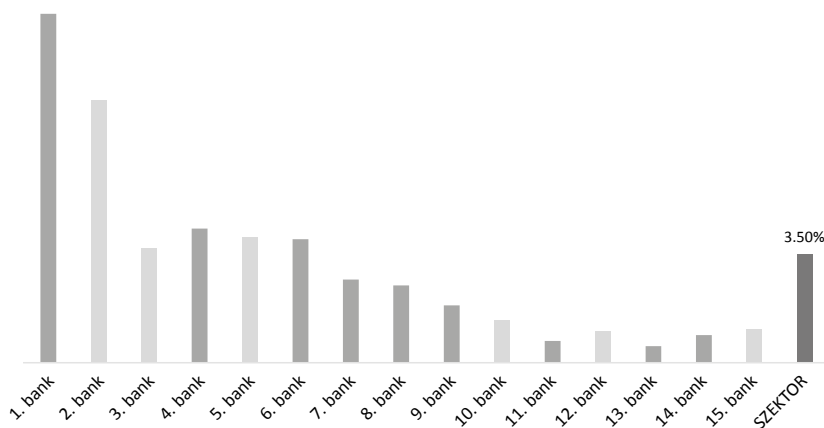
As the diagram above shows, the total balance sheet total loss at sectorial level is 0.02%, i.e. the pandemic did not cause a significant loss of assets at the institutions. However, the variance between the individual institutions is strong. There are institutions among small and large banks where the rate of loss is higher than 0.05%, while for some institutions it does not even approach 1 thousandth.

No regularity can be revealed between the location of the light columns indicating small banks and the dark columns indicating large banks, which shows that the size of the institution did not influence the ratio of loss to assets. Among big banks and the small banks, there are institutions which realised a small amount of loss compared to their assets, and there are those which realised a larger amount of loss.

We get a somewhat different picture if we compare the losses suffered to the volume of the operating risk capital. To determine capital-proportional loss, the direct operational risk losses suffered by the given institution during 2020 related to the pandemic were proportionated to the operational risk capital requirement calculated for the reference date of 31 December 2020. In Diagram 4 – using the previously used anonymous names – we can see the capital loss of the 15 domestic credit institutions included in the investigation. As before, large banks are marked with dark columns and small banks with light colours.



**Diagram 4**  
**The operational risk loss in proportion to capital**  
**for the credit institutions included in the study**



Source: Central Bank of Hungary

As the diagram above shows, the capital loss at sectorial level is 3.5%, i.e. the unexpected operational risk losses caused by the pandemic were amply covered by the operational risk capital formed by the institutions. Similar to the loss in proportion to assets, there is also a large variation here between the individual institutions. While there are institutions among small and large banks where the ratio of losses is higher than 5%, for some institutions it does not even reach 1%.

Here too, we can confirm that no regularity can be detected between the location of the light columns indicating small banks and the dark columns indicating large banks, which shows that the size of the institution did not influence the ratio of loss to capital. Among big banks and small banks, there are institutions that have realised small loss compared to their capital, while others have realised larger loss.

Among the banks in the diagram above, the institutions with serial numbers 4, 7, 11, 13, and 14 use the advanced measurement approach to determine the operational risk capital requirement, while the other banks use the less complicated simple index approach or the standardized approach. Based on the graphs, we can see that there is no correlation between the capital calculation method used and the relative volume of the losses suffered.

As a result of the analysis, it can be concluded that the ratio of operational risk losses related to the epidemic situation can be considered low (typically below

10%) compared to the capital requirement levels. According to the current advanced measurement approach, a greater loss than the current capital requirement level is possible once every thousand years (the 99.9% percentile of the annual loss distribution is the AMA capital requirement), therefore this approach (along with the basic indicator approach and standardised approach) expects a conservative capital level that adequately covered operational risk losses due to the epidemic situation.

#### **2.4 Individual institutional characteristics of risk identification and management**

As we mentioned earlier, there are significant differences in the ratio of losses in individual cases compared to the sector-level average, which can mostly be traced back to the size of the institution and the development of the operational risk framework, as well as the specific management strategy of the given bank for the epidemic situation. At those institutions where all the hardware and software conditions for operating in the virtual space were already available, and the internal banking instructions containing the detailed rules for employees to work from home were already in force, there were little additional costs for establishing teleworking. Typically, prevention costs dominated at these institutions. In view of the above, it can be said that the banks that were at the forefront of digitalization due to their strategy suffered fewer losses than their competitors.

The size of the branch network also had a significant impact on the volume of the loss suffered. In the case of those banks that have a large branch network and regularly tested colleagues working in the branch network, the testing costs further increased the proportion of the prevention costs category. In addition, the larger volume of investment and operating costs is evident in the case of the extensive branch network.

At the same time, in the course of our study, we found that some institutions were not prepared to transfer the total number of employees to telework, which resulted in significant IT-related costs, which far exceeded the losses related to prevention costs. In relation to IT costs, in addition to VPN licenses and laptop purchases, it was a challenge to prepare the basic systems to deal with the moratorium in the case of institutions where the given basic system was already outdated and difficult to configure.

In the case of certain institutions, we classified a significant amount of loss in the „other” category. In some of these institutions, special emphasis was placed on providing regular and accurate information for customers, therefore extra customer communication costs arose in the marketing area. There were also ex-

amples in the sector of downsizing and branch closures related to the pandemic, where the amount of severance payments and possible penalties to be paid were also considered losses related to the epidemic situation.

In the case of credit institutions with a foreign-owned parent company, the guidelines of the parent company were also taken into account during the loss data collection. For this reason some Hungarian banks - in addition to the guidelines of the EBA and the Central Bank of Hungary - quantified the direct costs beyond the direct costs, as well as the lost profits resulting from the declining business activity due to the pandemic, the amount of which significantly exceeded the level of direct costs, however, we did not examine these items in detail.

On the basis of the aforementioned special losses and the loss management methods applied by the banks, it can be said that the treatment of the pandemic was unique and special, with the exception of certain homogeneous elements, which is reflected by the size and composition of the losses suffered.

### 3 SUMMARY

The COVID-19 pandemic caused special operations and new, previously unidentified losses for the banking sector in 2020, which was characterized by quick decisions and new, changed operations. The losses due to the epidemic appeared in banking operations in different forms, some of which were classified as operational risk losses.

Our study presented the results of the quantitative and qualitative analysis of the operational risk losses of Hungarian banks linked to the pandemic, with the main conclusion that despite the high nominal losses, the operation of the banking sector remained stable, and the capital allocated by the credit institutions for operational risks provided sufficient coverage for unexpected losses.

The focus of the analysis on small and large banks showed that it was not the size of the institution and the capital calculation method, but the immediate decisions made to deal with the pandemic, as well as the infrastructural background, that determined the size of the realized losses. In addition, it can be established that these individual items significantly influence the size and composition of the loss suffered.

The qualitative part of the analysis showed that the sector reacted flexibly to the suddenly changed operating environment, as a result of which digitisation accelerated, which was also reflected by the development of electronic channels, the transition to telework, and electronic document management. As a result of the

pandemic, banks have reconsidered their processes and operating models. The banking operation will not return to its previous form.

Although the pandemic is not over yet, a significant part of the direct losses has already been identified by the credit institution sector. However, as a consequence of the payment moratorium, operational risk losses related to credit risk which can be linked to the pandemic may have remained hidden. The mapping, display, minimisation and management of such risks will be the joint future task of both credit institutions and supervisory authorities.

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