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OPERATIONAL RISK IN BANKS – REVOLUTION OR REGULATORY EVOLUTION

RYZYKO OPERACYJNE W BANKACH – REWOLUCJA CZY EWOLUCJA REGULACYJNA

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Summary: The aim of the article is to compare the methods of calculating capital requirement for operational risk in the banks with the new approach announced by the Basel Committee in December 2017. The analysis also demonstrated that the new rules are a genuine revolution in the field of comparability of capital requirements between all banks and evolution in the methodology of its calculation. Introduction of a single method of calculation of capital requirements for all banks instead of four methods and five variants of their combination applied so far will provide real comparability of capital requirements between banks for all stockholders. Considerable discretion of bank supervision, which allowed for unfounded interference with the method used by the bank, will also be eliminated. What is important, the new method – as compared to most of the methods used so far – will take into account data reflecting real bank exposure to operational losses.

Keywords: banks, operational risk, Basel Committee, capital requirements.

Streszczenie: Celem artykułu jest porównanie obecnie stosowanych metod wyznaczania wymogu kapitałowego z tytułu ryzyka operacyjnego w bankach z nowym podejściem ogłoszonym przez Komitet Bazylejski w grudniu 2017 r. Analiza pozwoliła wykazać, że nowe zasady są rewolucją w zakresie porównywalności wymogów kapitałowych pomiędzy wszystkimi bankami oraz ewolucją w zakresie samej metodologii ich obliczania. Wprowadzenie jednej metody obliczania wymogu dla wszystkich banków zamiast dotychczasowych czterech metod oraz pięciu wariantów możliwości ich łączenia stworzy rzeczywistą porównywalność wyznaczonego wymogu pomiędzy bankami dla wszystkich interesariuszy. Wyeliminowana zostanie także dotychczasowa uznaniowość ze strony nadzoru bankowego, która powodowała możliwość niemerytorycznej ingerencji w stosowaną przez bank metodę. Co ważne, nowa metoda w porównaniu z większością obecnie stosowanych metod umożliwi wreszcie uwzględnienie danych o rzeczywistej ekspozycji banku na straty operacyjne.

Słowa kluczowe: banki, ryzyko operacyjne, Komitet Bazylejski, wymogi kapitałowe.

1. Introduction

Introduction of capital requirements for operational risk into the capital adequacy of banks by the Basel Committee on Banking Supervision in Basel II document in 2004 was a genuine revolution. Operational risk defined as risk of loss resulting from inappropriate or unreliable internal processes, people or systems or from external circumstances (this definition also includes legal risk) – along with credit and market risks – was considered to be one of the fundamental threats to bank solvency [Basel Committee on Banking Supervision 2006]. The real causes of significant bank losses very often have operational background, although they were initially associated with credit or market risk. Therefore, operational risk, due to its comprehensive character, has a considerable impact on the activity and financial standing of the banks. This is because its source – apart from the environment and external circumstances (including the economic cycle) – lies in the bank organization itself [Wagner, Mizgier, Papageorgiou 2017]. The concept of capital requirements for operational risk calculation proposed in 2004 was revolutionary also in terms of its structure, which introduced a variety of calculation methods, including the advanced models developed by the banks [Peña et al. 2018]. It was this variety of methods and huge discrepancy between the simplicity of some methods and complexity of others which turned into the greatest disadvantage of the whole concept and encouraged the Basel Committee – after the global financial crisis which broke out in 2008 – to seek a new approach to the capital requirements for operational risk [Feria-Domínguez, Jiménez-Rodríguez, Sholarin 2015]. This task turned out to be extremely complicated: it was possible to reach an agreement on so important issues as capital buffers or liquidity standards only after a few years of work while a consensus on the new rules of capital requirements for operational risk was achieved in December 2017.

The aim of this article is to compare the present methods of establishing capital requirements for operational risk with the new approach announced by the Basel Committee in 2017 and to demonstrate that the new rules brought about a revolution in the comparability of capital requirements between banks and evolution of the methodology of its calculation.

2. Weaknesses of the present rules of calculating capital requirements for operational risk

In the EU Member States regulations concerning calculation of capital requirements for operational risk have been in force since 2008, when the solutions adopted in this area by the Basel Committee in Basel II document were implemented in Members States' legislation (by implementing the relevant EU directive). These rules did not change in 2013 when all the capital requirement standards were transferred from the

directive to a regulation. Also, establishment of banking union in the Eurozone in 2014 did not change these rules but only made the European Central Bank an institution responsible for their supervision (in most banks – through the national banking supervisory authority) [Zaleska (ed.) 2015]. In non-EU countries which belong to the Basel Committee, the rules of calculating capital requirements for operational risk included in Basel II were implemented by September 2011 (except for Argentine) [Basel Committee on Banking Supervision 2011].

Undoubtedly, the greatest weakness of the present rules of calculating capital requirements for operational risk is the fact that there are three main methods of defining the risk (Basic Indicator Approach – BIA, Standardised Approach – SA, Advanced Measurement Approaches – AMA), and one of them (SA) has an alternative (Alternative Standardised Approach – ASA). Moreover, the methods may be combined by the banks and applied on a parallel basis. Although the banks may apply a combination of different methods provided they obtain relevant permission from the competent banking supervisory authority and sometimes they are allowed to do so only in the transitional period, there are as many as five possible combinations of the methods (Table 1).

Table 1. Possible combinations of methods of calculating capital requirements for operational risk

Variant of methods combination				
I	II	III	IV	V
Advanced Measurement Approaches			Basic Indicator Approach	
Basic Indicator Approach	Standardised Approach	Alternative Standardised Approach		Standardised Approach

Source: own study based on [Regulation (EU) No 575/2013].

Banks applying the Standardised Approach, as a rule, may not return to the Basic Indicator Approach. Likewise, banks which apply Advanced Measurement Approaches may not return to the Standardised Approach nor to the Basic Indicator Approach. A bank may return to a less advanced method only when it obtains relevant permission from the competent supervisory authority. This permission will be issued only if the bank is able to prove that the use of less advanced method is not aimed at lowering the capital requirements for operational risk nor will it have an adverse impact on its solvency but it is necessary due to the character and complexity of the bank. This last condition, however, contradicts the adopted rule that it is the bank which chooses the method it is going to apply. As far as the BIA and SA methods are concerned, the bank can make a choice at its own discretion, although in the case of the SA method, it must meet additional conditions. Only if the bank wishes to apply the ASA or AMA method, it must not only meet additional requirements but also obtain permission from the competent banking supervisory authority. To sum up, the key criterion which banks will take into consideration when choosing a method of calculating capital requirement for operational risk will

be the amount of the requirement calculated by means of this method. Only in the case of the AMA method, an additional factor is the fact whether a bank can afford to develop and implement this method and whether a given model is applied in the whole group to which the bank belongs.

Taking into account the possibility of the bank to choose a method and to combine different methods, we should be aware of the main differences which make it practically impossible to compare the results obtained by means of some of them. According to the BIA method, capital requirement for capital risk is calculated by means of formula (1).

$$CRO = \frac{\sum_{i=0}^{2} \max\{RI_i; 0\}}{n} \times 15\%, \tag{1}$$

where: RI_i – relevant indicator in the i-th year; n – number of years in which $RI_i > 0$; $i = 0$ – financial year in which calculation is made; $i = 1, 2$ – two subsequent years preceding the financial year in which calculation is made.

In the case of this method, it is therefore essential to calculate correctly the relevant indicator which is calculated as a sum of selected items on the profit and loss account and the losses incurred by the bank (cf. Table 5). Therefore, its structure does not reflect exposure of the bank to operational losses nor it encourages the bank to improve its operational risk management. The situation is similar when a bank applies the SA method. In this case, the bank must also determine the relevant indicator but before doing so, it must divide its activity into business lines. There are eight business lines, and the division must comply with the categories used with regard to the credit and market risk and also must undergo an independent audit (Table 2).

Table 2. Business lines and beta factor (β) values

Beta factor β (%)	Business line
18	corporate finance
	trading and sales
	payment and settlement
15	agency services
	commercial banking
12	retail banking
	retail brokerage
	asset management

Source: [Regulation (EU) No 575/2013].

Then, the bank calculates capital requirement for operational risk for all business lines as an average of three years for the sum of annual requirements for all business lines. The annual requirement for each business line is the product of the relevant

beta factor (as per Table 2) and part of relevant indicator (calculated according to the same rules as in the Basic Indicator Approach) mapped into a given business line. If the sum of requirements in all business lines in a given year is negative, the bank adopts "0" value for this year. Therefore, capital requirement for operational risk in the Standardised Approach, is determined by means of formula (2).

$$CRO = \frac{\sum_{i=0}^{2} \max\left\{\sum_{j=1}^{8} RI_{ij} \times \beta; 0\right\}}{3}, \tag{2}$$

where: RI_{ij} – relevant indicator in the i-th year for j-th business line; β_j – beta factor defined for the j-th business line; $i = 1, 2$ – two subsequent years preceding the financial year in which calculation is made.

However, a bank which intends to use the Standardised Approach must meet a series of criteria, of which the most important are to:

- implement of an operational risk assessment system and manage the system with a clearly defined scope of responsibilities, ensuring that it is periodically overhauled;
- identify exposure to operational risk and run a register of important data concerning this type of risk (including data of important losses);
- connect the operational risk assessment system with risk management processes;
- implement a reporting system concerning operational risk to provide relevant reports to top level managers and establish action procedures in accordance with the information given in the reports.

As we mentioned above, the SA method has a variant called ASA, which requires permission from the competent supervisory authority. In order to obtain such permission, a bank must demonstrate that:

- its retail and commercial banking activity generates at least 90% of its income;
- significant part of its retail or commercial banking activity is connected with loans with high probability of default;
- the Alternative Standardised Approach provides the required basis to calculate capital requirement for operational risk.

However, it should be noted that the ASA method differs from the SA method only in the area of two business lines, i.e. retail banking and commercial banking, for which a relevant indicator is replaced with a normalised income indicator equal to the nominal amount of loans and advances multiplied by 0.035. This does not change the fact that also this method does not reflect exposure of the bank to operational loss nor does it encourage to improve operational risk management.

In comparison with the first two methods, the Advanced Measurement Approaches are significantly different as they enable a bank to apply its own operational risk measurement systems after obtaining permission from the competent authorities. This permission may be obtained only when a series of qualitative and quantitative standards is met (Table 3).

Table 3. The most important qualitative and quantitative standards in AMA

Qualitative standards	Quantitative Standards
• An institution's internal operational risk measurement system shall be closely integrated into its day-to-day risk management processes • An institution shall have an independent risk management function for operational risk • An institution shall have in place regular reporting of operational risk exposures and loss experience and shall have in place procedures for taking appropriate corrective action	• An institution shall calculate its own funds requirement as comprising both expected loss and unexpected loss • The operational risk measure shall capture potentially severe tail events, achieving a soundness standard comparable to a 99.9% confidence interval over a one year period • An institution shall be able to map their historical internal loss data into the business lines

Source: [Regulation (EU) No 575/2013].

While the procedure of calculating capital requirements for operational risk by means of the BIA, SA and ASA is quite simple, the rules of the AMA enable banks to create complicated models whose details are known only by the bank. Thus, the other stockholders of the bank, including even the banking supervisory authority, are not able to determine whether the capital requirement calculated in this way effectively protects the bank against operational risk it is exposed to. Lack of transparency is also confirmed by obligatory reports concerning capital adequacy published by Polish banks applying the AMA. Only PKO BP SA discloses the formula of capital requirement calculation it applies (formula (3)) [PKO Bank Polski 2017, p. 35] while other banks only announce that using the AMA they take into account internal and external losses as well as results of scenario analysis and key risk index values [Bank Pekao 2017, p. 16]. Interestingly, PKO BP SA combines the AMA with BIA, which it applies in its activity in Germany.

$$CRO = \left(LDA + AS\right) \cdot \left(1 + KW\right) + KK, \tag{3}$$

where: *LDA* – Loss Distribution Approach; *AS* – result of scenario analysis; *KW* – correction resulting from changes in the quality of internal functional control; *KK* – managerial correction.

3. New rules of calculating capital requirements for operational risk according to Basel III as compared with the present methods

In December 2017 the Basel Committee on Banking Supervision completed its 7-year work on a package of regulations prepared in response to the last global financial crisis. The package, known as Basel III, was developed gradually and completed with a document which among others introduces a totally new method of

calculating capital requirement for operational risk. The revolutionary change is the fact that the Standardised Measurement Approach (SMA) will replace all the methods applied so far. The new method will resemble the current Standardised Approach, but apart from the scale of bank operation (including sources of income) it will also take into consideration the actual losses incurred due to operational risk over the last 10 years. Calculation of the capital requirement for operational risk according to this method will be carried out in four stages. At stage I, the bank will have to identify three elements: the interest, leases and dividend component (ILDC); the services component (SC), and the financial component (FC), and then sum them up in order to obtain the Business Indicator (BI). It is worth noting that all the three components mentioned above will be calculated as an average of values obtained over the previous three years according to the following formulae:

$$ILDC = Min\left[\overline{Abs\left(Interest\ Income - Interest\ Expense\right)};\ 2.25\%\overline{Interest\ Earning\ Assets}\right] + \overline{Divident\ Income.} \tag{4}$$

$$SC = Max\left[\overline{Other\ Operating\ Income};\overline{Other\ Operating\ Expense}\right] + Max\left[\overline{Fee\ Income};\overline{Fee\ Expense}\right]. \tag{5}$$

$$FC = \overline{Abs\left(Net\ P\&L\ Trading\ Book\right)} + \overline{Abs\left(Net\ P\&L\ Banking\ Book\right)}. \tag{6}$$

$$BI = ILDC + SC + FC. \tag{7}$$

At stage II, the bank will define the Business Indicator Component (BIC), which is calculated by multiplying the BI by a set of regulatory determined marginal coefficients (α_i):

$$BIC = \alpha_i BI. \tag{8}$$

The value of marginal coefficients will depend on the value of BI calculated at stage one (Table 4).

Table 4. Business Indicator ranges and marginal coefficients

Bucket	*BI* range (in € billon)	*BI* marginal coefficients (α_i)
1	≤ 1	12%
2	$1 < BI \leq 1$	15%
3	> 30	18%

Source: [Basel Committee on Banking Supervision 2017a, p. 129].

At stage III, the bank will have to determine the value of Internal Loss Multiplier (*ILM*) which reflects exposure of the bank to operational losses, according to formula 9.

$$ILM = Ln\left(\exp(1) - 1 + \left(\frac{LC}{BIC}\right)^{0.8}\right), \tag{9}$$

where: *LC* – 15 times average annual operational risk losses incurred over the previous 10 years.

At the last stage IV, the bank will calculate the capital requirements for operational risk (*CRO*) as the product of *BIC* and *ILM* (formula (10)).

$$CRO = BIC \cdot ILM. \tag{10}$$

It is also worth noting that in comparison with the methods applied at present, the BIA, SA and ASA in the new SMA method, the number of items of profit and loss account and losses incurred by the bank was significantly increased and selected balance sheet items started to be applied (Table 5).

Table 5. P&L or balance sheet items used in calculation of capital requirement for operational risk in accordance with the BIA, SA, ASA and SMA methods

BIA, SA, ASA methods	SMA
• Interest receivable and similar income • Interest payable and similar charges • Income from shares and other variable/fixed-yield securities • Commissions/fees receivable • Commissions/fees payable • Net profit or net loss on financial operations • Other operating income	• Interest income from all financial assets and other interest income • Interest expenses from all financial liabilities and other interest expenses • Total gross outstanding loans, advances, interest bearing securities, and lease assets measured at the end of each financial year • Dividend income from investments in stocks and funds not consolidated in the bank's financial statements • Income received from providing advice and services • Expenses paid for receiving advice and services • Net profit/loss on trading assets and trading liabilities • Net profit/loss from hedge accounting and from exchange differences • Realised gains/losses on financial assets and liabilities not measured at fair value through profit and loss

Source: own study based on [Regulation (EU) No 575/2013; Basel Committee on Banking Supervision 2017a, pp. 134, 135].

The Basel Committee working on the structure of the SMA method carried out a quantitative analysis which showed what impact will the new method have on the size of capital requirement in the global banking system. Traditionally, the Basel Committee divided banks into two groups: Group 1 – banks which have Tier 1 capital of more than €3 billion and are internationally active (including the banks

identified by the Financial Stability Board as G-SIBs) and Group 2 – other banks. The analysis took into account the method currently used by a given bank. Interestingly, the results in global scale showed that on average the G-SIBs banks – which mostly now use the AMA – will achieve the biggest advantage. In the group of smaller banks, on average the capital requirement will slightly grow although this group also included banks which experienced a decrease of requirements by over two thirds (Table 6).

Table 6. Changes in capital requirements for operational risk when the SMA is applied

Banks	Change in capital requirements for operational risk (%)			Number of banks migrating from	
	weighted average	min	max	AMA	other approach
Group 1	–25.0	–66.1	296.0	42	43
Of which: G-SIBs	–30.2	–66.1	222.0	19	9
Group 2	6.9	–67.3	238.3	5	62

Source: [Basel Committee on Banking Supervision, 2017b, pp. 26, 38].

4. Conclusions

To sum up the above comparison of the rules applied to calculate capital requirements for operational risk according to Basel II and Basel III, we can firmly conclude that – as stated at the beginning – the new rules are a revolution in the field of comparability of capital requirements between all banks and evolution in the methodology of their calculation.

Introduction of a single method of capital requirement calculation for all banks instead of the four approaches and five combination variants used so far will ensure real comparability of the requirement between the banks for all stockholders. Also, it will eliminate discretionary decisions of banking supervision, which so far allowed for unfounded interference with the method adopted by a bank (Table 7).

Changes in capital requirement calculation methodology are an element of evolution. The simple methods used so far (BIA, SA and ASA) were based on elements of financial statements of a bank without taking into account data reflecting real bank exposure to operational loss while the AMA method took into consideration internal and external losses and also results of scenario analysis and values of key risk indexes. The new SMA method is an intermediary solution inasmuch as it is based on extended elements of bank's financial statements with additional correction talking into account data of real bank exposure to operational losses. Naturally, as compared with AMA, it is a kind of step backward but it will be possible for the banks to use the elements used in this approach in internal risk management sys-

Table 7. Comparison of the rules of determining capital requirements for operational risk according to Basel II and Basel III

	Rules of determining capital requirements for operational risk	
	Basel II	Basel III
Disadvantages	• Lack of transparency (four calculation methods and possibility to apply their combination) • Lack of comparability of the capital requirement between banks • Discretionary decisions made by supervisory authority with regard to application of some methods (ASA, AMA) • Excessive complexity of AMA • Excessive simplicity of BIA	• Lower sensitivity as compared to AMA
Advantages	• Possible integration of AMA with operational risk management system used by a bank	• Transparency (single approach for all banks) • Comparability of the capital requirement between banks • Lack of discretionary decisions made by the banking supervisory authority • Greater sensitivity to risk as compared with BIA, SA and ASA

Source: own study.

tems without direct impact on the amount of the capital requirement. To sum up, the new approach to calculating capital requirements for operational risk adopted by the Basel Committee in December 2017 is a positive step and therefore it is a pity that it will come into force only on 1 January 2022.

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