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OPERATIONAL RISKS: ASSESSMENT AND WAYS OF MITIGATION

Goal: This research has pursued the goal to develop the methodology for quantification of operational risk profiles and find effective ways of their mitigation. **Methodology:** To address this kind of challenges the research has used scientific research and special methods of economic research, in particular: a system-wide approach and rational decision-making methods. **Outcomes:** The research has analysed the bank operational risks and created risk profiles for the following areas: technological risk, service provider risk, corporate risk, innovative risk, strategic risk and reputational risk. The research highlights the key elements of the operational risk management and the features of applying them in modern business conditions (at the time of recession). The document proposes the areas for improvement in terms of research and methodological approach to operational risk management subject to specific factors of internal bank operating environment. **Scientific novelty.** Defined the main directions of evaluation and reduction of operational risks in banking institutions. **Practical relevance:** The use of the methodology proposed in this paper will help risk managers identify and mitigate operational risks of banks both under normal conditions and at times of financial uncertainty.

Key words: operational risks; bank; assessment; management; bank operational risk profile.

Rationale of the research

In modern practice of banking considerable attention is given to the assessment and management of operational risks. This interest can be explained by constant expansion of bank products that involves operational risks and thus contributes to the impact of internal bank operating environment on the quality and structure of assets and liabilities, capital, profit, liquidity, payment capacity and financial standing of the bank, that is on the level of its economic security.

Analysis of previous research studies

The problem of operational risk management has been studied by S. Bratanovic, Van Greuning, V. Kovalenko, O. Krykliy, R. Pashkov, Joseph F. Sinkey, Y. Tyshchenko, V. Chaplyha and R. Chapman [1-8].

Although there are many research studies of operational risks it is worth noting that specific

nature of operational risks, their place in the risk management system of banks as well as their essence have not been fully explored and addressed. Each specialist proposes his/her own vision and understanding of operational risks which leads to confusion and inconsistency in approaches to risk assessment and management.

Goal

The key goal of the research is to study the available methodologies for the assessment of bank operational risks and provide recommendations on risk mitigation.

Body of the research

In contrast to the methodology for assessing credit, market and liquidity risks it is only recently that consideration has been given to approaches to operational risks identification and assessment.

According to the methodology of the National Bank of Ukraine the operational risk assessment factors include [9]:

- availability of an adequate and efficient legal framework regulating operational risk management system (provisions, procedures, etc.) that has been communicated to the service providers and has been approved by the supervisory board or the board of directors;
- the number of transactions and complexity of transaction processing compared with the level of development of the operational and control systems and their capacity ;
- probability of technical and operational failures, power abuse by staff, deficiencies in the previous transaction analysis during the decision-making process as well as lack of monitoring or registration of transactions with the clients or contracting parties;
- availability of transaction technological mapping and compliance of banks with the technological maps;
- the presence, number, reasons and nature of violations of administrative and accounting control procedures;
- the potential for financial losses as a result of: a) inadequacy of existing information systems; b) mistakes made by service providers or fraud; c) low operational competitiveness of the bank; d) incomplete information about the contracting party or the transaction; e) operational and technical disruptions or failures;
- the volume and adequacy of control over the bank software and its maintenance as well as other services provided with the engagement of third parties (outsourcing);
- existence of proper mechanisms of control for monitoring the information accuracy, and proper accounting approaches and compliance with the laws and regulations;
- the level of knowledge and skills of managers and employees.

In the context of contemporary measurement methodologies for calculating operational risk capital charges Basel II provides three approaches [10]:

1. *The Basic Indicator Approach (BIA)*. Under this approach the charge may be expressed according to formula 1:

$$K = \frac{\sum GI_{1..n}}{n} \times \alpha \quad (1)$$

where K - certain operational risk capital charge;

GI - average annual gross income, where positive, over the previous three years (gross income is understood as net interest income plus net non-interest income as defined by national supervisors and/or national accounting standards);

α - fixed percentage "alpha" which is set at the level of 15%;

n - number of the previous years for which gross income was positive.

2. *The Standardised Approach (SA)*. In the Standardised Approach, bank's activities are divided into certain business lines. The Basel Committee assigns betas according to these business lines.

The total capital charge is calculated under formula 2:

$$K = \frac{\sum_{i=1}^3 \sum_{k=1}^8 \max(GI_{ik} \times \beta_k; 0)}{3} \quad (2)$$

where K - certain operational risk capital charge;

GI_{ik} - annual gross income in the i year, for k business line (if $GI_{ik} < 0$, which shows an annual loss then GI_{ik} equals to 0);

β_k - "beta" from 12 to 18% for each business line.

Due to this business line mapping the Standardised Approach is a more accurate method of operational risk capital charge measurement compared with the Basic Indicator Approach.

3. *Advanced Measurement Approaches (AMA)*. In contrast to the Standardized Approach, under AMA the betas are established by the bank itself, not by the Basel Committee.

The main disadvantage of the above mentioned approaches is the use of gross income as the basis for the calculation of operational risk as this kind of "link" does not encourage banks to improve their financial performance. In addition, at the time of financial recession most banks have negative financial results (losses).

This is the reason why domestic banks develop their own methods for calculating operational risk capital charges. Basel II recommends to include the following elements in case of development of own operational risk measurement methods [10]:

Internal data. Under the Basel agreement internally generated operational risk measures used for regulatory capital purposes must be based on a

minimum five-year observation period of internal loss data.

For operational risk assessment which is based on internal data it is important to have an efficient data collection system and reliable operation loss database in place. In this case the quality of risk assessment will depend on the sample period and the data reliability.

We believe that the key reporting document for the assessment based on internal data should be the log of operational risk losses. Its purpose is to provide the management with the information about the losses with breakdown by certain operational risk elements which can be subject to quantification.

The log of operational risk losses must include the following parameters:

- name of the bank unit (e.g: statistics department);
- reference to the business rules, procedures (e.g: creation of data file on statistics report for the National Bank of Ukraine);
- description of error (e.g: omission of certain parameters);
- cause of error (e.g: personnel error);

- those responsible (position and name of the service provider);

- measures that will help avoid errors in the future (e.g: development of software)
- amount of potential losses (e.g: the amount of fine for provision of false information).

External data. Operational losses measurements based on the external data rely on the information about the operational losses of other banks. This information can be obtained through the participation in consortium, or via the exchange of information with other banks or from the databases compiled by special agencies or it can be taken from public domain sources, etc.

The information from external sources must be structured according to the classification of operational losses approved by the bank. In addition, when calculating the scale of losses on the basis of external data the operational losses must be adjusted subject to the differences in the nature and scale of losses and the control systems.

In addition to the methods for calculating operational risks that are proposed by the Basel Committee some banks also use the measurement tools described in Table 1.

Table 1
Comparison of different approaches to operational risk management Source developed by the authors

Approach	Advantages	Disadvantages
Indicative assessment	Takes into account particular features of the bank transactions and processes; is characterised by high level of accuracy	Is not very effective for the assessment of force majeure circumstances; labor intensive and time consuming process of data collection
Expert assessment	Enables to engage operational managers; is based on the experience and qualifications of experts; can be applied to the assessment of force majeure circumstances; this is the method which is ahead of others	Contains a subjective element; the tendency to understate risks; a possibility to face inconsistent assessments
Combined approach	Uses the advantages of all methods	It can be challenging to implement and integrate it

The Indicative method for calculating operational risks is based on the following indicators:

- current activity indicator: it is used to assess the aspects of the main bank operations (e.g.: the number of errors during a transaction, number of client complaints, staff turnover, etc.).
- control efficiency indicator: it is used to assess the system of internal control (e.g.: number of errors revealed by the internal audit);
- indicator of certain operational risk exposure which is expressed according to formula 3:

$$I_{opr1} = \frac{CR}{K} \quad (3)$$

where I_{opr1} - the Index of certain operational risk exposure;

CR - expenses related to the operational risk exposure (for example: exposure to fines, penalties and punitive damages as a result of mistakes during the registration and processing of transactions; direct losses as a result of external or internal fraud);

K - bank capital.

- indicator of operational risk mitigation (management) which is calculated under formula 4:

$$I_{opr2} = \frac{CO}{\sum C} \quad (4)$$

where I_{opr2} - Index of operational risk mitigation (management);

CO - expenses related to operational risk mitigation (management) (for example: expenses connected with improvement of the information system security); expenses on bank staff advanced training, etc.);

$\sum C$ - overall bank expenses.

Following the operational risk assessment the respondents are provided with the list of possible negative events and are asked to assess them under two parameters: probability of risk occurring (frequency) and total loss if risk occurs (scale of losses). The outcome evaluations of the frequency and scale of loss are calculated as weighted expert assessments of all the respondents. This method is used to identify the events that can have serious or

catastrophic consequences (force majeure circumstances) for the bank.

The idea of the combined approach is to assess the potential losses resulted from operational risk exposure on the basis of statistics analysis of internal and external data as well as on the basis of expert conclusions.

In order to improve the efficiency of operational risk assessment conducted on the basis of the above mentioned methods it is necessary to create an operational risk profile which will ensure more efficient risk management. The operational risks profile can be developed by using own resources (risk management unit or internal audit department) or with the help of external auditors and consultants. An example of an operational risk profile is given in Table 2.

Table 2

Bank operational risk profile

Operational risk elements	Nature of risk (example)
Technological risk	
System-based risk	Information system security breaches, computer malfunction, computer viruses, communication network failures, faulty operation of alarm systems or power failures.
IT risk	Software errors, violation at a subsystem level or improper interface interaction, failure in the operation of the processing centre, absence of system-wide approach to software design and development, use of non-licensed software, outsourcing risk.
Risk of processing and presenting the information	Mistakes in the submitted documents and financial reports, loss of documents (including e-documents), failure to submit reports at due time, provision of incomplete or false reports on the transactions.
Service provider risk	
Risk of making mistakes during transaction registration	Late and incomplete transaction registration, late notification of the tax authorities about the account opening for the clients, mistakes arising in the process of completing contracts or side agreements, etc.
Risk of making mistakes during transaction processing	Failure to comply with the functional responsibilities during the transaction, late delivery of contractual obligations, late crediting or debiting of funds to the clients' accounts, incorrect money transfer, uncoordinated actions during the transactions.
Unauthorised actions	Failure to disclose a financial transaction, unauthorized transactions, non-deliberate disclosure of confidential information, violation of the established limits, unauthorised provision of information, non-authorized employees providing information to the clients.
Responsibility risk	Non-compliance with or ignorance of the applicable laws by the bank employees, ambiguous interpretation of laws and regulatory acts, non-compliance with the agreements and established rules and ethical codes.
Corporate risk	
Relations with employees and work management	Failure of the bank to comply with the requirements of the labour law, risk of inefficient bank policy, non-compliance with H&S requirements.
Improper way of doing business	Lack of mechanisms that can help prevent a conflict of interest, failure of senior managers to comply with their functional responsibilities, absence of clear distribution of functional responsibilities between the bank units, inefficient organizational structure of the bank, absence of clear division between the business processes.
Risk of internal control system	Late and incomplete control over the external audit of bank transactions, inefficient back office control, inefficient control over the compliance with the agreements be-

	tween the clients and the bank and inadequate bank customer due diligence procedures.
Innovation risk	
Risks at the stage of the development of a new bank product (improvement of the existing product).	Mistake in presenting the idea (thoughts) about the new product, inadequate procedures for the selection of methods for satisfying the needs of clients, mistakes in the calculations of innovation project profitability; inadequate hardware and software at the stage of product development.
Risk of new bank product introduction	Lack of demand for the new bank product, poorly qualified staff, inadequate hardware and software at the stage of product introduction, violation of applicable laws, including anti-monopoly laws.
Strategic risk	
Risk of formulating and implementing the mission, goals and development strategy	Mistakes made during the identification of the mission and goals of the bank, lack of the respective resources for the implementation of the development strategy, failure to comply with the bank strategic plans and budgets.
Risk of competitiveness	Low competitiveness of bank products, failure to meet the bank's plan for introduction of new products or services, relatively weak market position of the bank, low level of bank diversification in terms of products, geography and clients.
Reputational risk	
Market perception risk	Low level of services provided by the bank, negative media coverage about the bank employees, large clients as well as affiliated companies, conflict situations with engagement of employees, bank owners and its large clients.
Risk of perception by the state authorities	A high number of transactions with the high risk countries, late payments to the budgets, significant violation of regulations, regulatory acts, instructions and other documents of the state authorities regulating bank activity.

It is important to note that the ways of mitigating the risks are the most efficient when they are based on the risk elements, in particular:

1. Ways to reduce technological risk:

- conduct ongoing monitoring, update and test information systems, communication channels, etc.;

- develop IT service restoration plans;

- introduce the archive and bank data storage systems;

- distribute the functions between the units that are engaged in the development of software processing, IT system maintenance, etc.

2. Ways to mitigate service provider risk:

- develop and introduce the code of conduct for bank employees;

- keep improving the standards of service and provide regular monitoring of the quality of services provided to the clients;

- introduce the system of incentives for employees;

- measure the timing of banking service delivery processes;

- ensure ongoing monitoring of employee knowledge of laws and their compliance with these laws;

- analyse HR management indicators (staff turnover, number of trained employees, etc.).

3. Ways to mitigate corporate risk:

- ensure equal treatment of the shareholders independent of the number of shares they own;

- introduce the principles of independent internal control;

- introduce the procedures for identifying the affiliated persons of the bank as well as the control over the transactions with the affiliated persons;

- develop and introduce the system for measuring the impact of management decisions on the bank financial performance;

- ensure clear distribution of functions and duties of the bank units;

- identify and describe the business processes applied by the financial institution;

- ensure that financial information is provided in full volume and in a timely manner.

4. Ways to mitigate innovation risk:

- introduce the system which will help identify the priorities for the development of the new bank products (subject to risks);

- establish the quality standards for the new and improved bank products (technological map);

- provide all bank institutions with the necessary regulatory documents, hardware and software, promotion materials;

- conduct staff training;

- do a trial sale of the new product to loyal clients;

- develop an effective advertising campaign to boost sales.

5. Ways to mitigate strategic risk:

- develop the plan for bank reorganization of (e.g.: merger or consolidation);

- conduct periodic monitoring of the competing banks;

- introduce the system of control over the quality of implementation of bank goals (implementation of strategic plans and budgets);

- develop the plan for improving the bank market position (diversification of products, geography span and the client base);

- conduct marketing research.

6. Ways to mitigate reputational risk:

- introduce effective control over the reputation of bank clients in order to avoid contacts with the clients with a bad reputation that can negatively affect the bank reputation;

- provide ongoing monitoring of mass media which can place information about the employees, bank owners, big clients of the bank as well as the affiliated companies;

- ensure constant control over the compliance with the regulations, provisions, instructions and other documents of the authorities regulating bank activity;

The process of operational risk management shall be run by the following ad hoc agencies and departments of the bank:

1. Bank Council. Members of the Bank Council shall be responsible for corporate risk management (first of all in the part relating to the way of doing business).

2. Bank Board of Directors. This agency shall be also responsible for corporate risk (relations with employees and work management, risk of internal control system) and partially for technological risk.

3. Banking technology automation department. This department shall be first of all responsible for

system-based risks, IT risks and risk of identification of transactions with the signs of external or internal fraud.

4. Other bank departments (responsibility centres). The heads of responsibility centres shall take care of the risk of processing and presenting the information, risk of making mistakes during the registration and processing transactions, detection of unauthorised actions performed by the unit employees.

5. Risk management executive department of the bank. This department shall be responsible for the following aspects in the operational risk management process:

- conduct general quantitative measurement of operational risks;

- control the operational risk identification process;

- provide recommendations on operational risk management improvement;

- keep the log of losses incurred as a result of operational risks;

- control the mechanism for renewing the operational capacity of the computer systems.

Conclusions

By using the system for operational risk assessment and management the bank can mitigate the losses once the risk is triggered. To reduce operational risks banks should be more active in the development and implementation of own operational risk analysis models. The losses identified with the help of such models should be taken into account in the bank development strategy.

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ОПЕРАЦІЙНІ РИЗИКИ БАНКУ: ОЦІНКА ТА ШЛЯХИ ЗМЕНШЕННЯ

Мета. Робота присвячена удосконаленню методичного підходу щодо кількісного визначення операційних ризиків банку та визначенні ефективних шляхів зменшення їх обсягу. **Методика.** Для вирішення задач такого класу в роботі використано загальнонаукові й спеціальні методи економічної науки, а саме: системний підхід та методи раціонального вирішення проблем. **Результати.** У роботі розкрито сутність операційних ризиків банку, надано їх каталог за такими напрямками: технологічний ризик, ризик виконавця, корпоративний ризик, інноваційний ризик, стратегічний ризик, ризик репутації. Розглянуто основні елементи управління операційними ризиками та особливості їх застосування в сучасних умовах господарювання (в умовах кризи). Запропоновано напрямки вдосконалення науково-методичних підходів щодо оцінки та управління операційними ризиками з урахуванням окремих чинників внутрішнього операційного середовища банку. **Наукова новизна.** Визначено основні напрями оцінки та зменшення обсягів операційних ризиків у банківських установах. **Практична значимість.** Використання наведеного методичного підходу дозволить ризик-менеджерам ефективно визначати та зменшувати розміри операційних ризиків банку як в ординарних умовах, так і в умовах фінансової невизначеності.

Ключові слова: операційні ризики; банк; оцінка; управління; каталог операційних ризиків банку

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ОПЕРАЦИОННЫЕ РИСКИ БАНКА: ОЦЕНКА И ПУТИ УМЕНЬШЕНИЯ

Цель. Работа посвящена усовершенствованию методического подхода количественного определения операционных рисков банка и определению эффективных путей уменьшения их объема. **Методика.** Для решения задач такого класса в работе использованы общенаучные и специальные методы экономической науки, а именно: системный подход и методы рационального решения проблем. **Результаты.** В работе изучена сущность операционных рисков банка, раскрыт их каталог по следующим направлениям: технологический риск, риск исполнителя, корпоративный риск, инновационный риск, стратегический риск, риск репутации. Рассмотрены основные элементы управления операционными рисками и особенности их использования в современных условиях хозяйствования (в условиях кризиса). Предложены направления усовершенствования научно-методических подходов к оценке и управлению операционными рисками с учетом отдельных факторов внутренней операционной среды банка. **Научная новизна.** Определены основные направления оценки и уменьшения объемов операционных рисков в банковских учреждениях. **Практическая значимость.** Использование приведенного методического подхода позволит риск-менеджерам эффективно определять и уменьшать размеры операционных рисков банка как в ординарных условиях, так и в условиях финансовой неопределенности.

Ключевые слова: операционные риски; банк; оценка; управление; каталог операционных рисков банка

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