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INTERNATIONAL EXPERIMENTS IN OPERATIONAL RISK ASSESSMENT IN INVESTMENT ACTIVITIES OF COMMERCIAL BANKS

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Abstract: Operational risk remains a significant concern in the investment operations of commercial banks globally. This paper explores international experiments and methodologies in operational risk assessment related to investment activities. By analyzing case studies from leading economies and financial institutions, we identify emerging best practices and challenges. The findings highlight the growing importance of integrated frameworks that combine regulatory compliance, data analytics, and ESG considerations in modern risk management strategies.
Keywords: operational risk, investment activities, commercial banks, Basel III, risk assessment models, international banking, ESG risk, AI in banking.

INTRODUCTION

Operational risk in commercial banking, especially in investment activities, has become increasingly complex due to globalization, technological advancements, and regulatory shifts. Unlike credit or market risk, operational risk originates from internal processes, people, systems, or external events. These risks can result in significant financial losses and reputational damage. Internationally, banks and regulators have been experimenting with frameworks to assess and manage operational risk, particularly in investment domains where risk exposure is multifaceted. This study investigates the nature and outcomes of such experiments in various jurisdictions. The goal is to understand how commercial banks worldwide are adapting their operational risk assessment mechanisms in investment contexts, and what lessons can be drawn from international experiences.

REVIEW OF LITERATURE

Operational risk has gained significant academic and regulatory attention since the early 2000s, especially following high-profile banking failures attributed to internal process failures, misconduct, and IT breakdowns. The evolution of operational risk management (ORM) frameworks has been driven by regulatory reforms, particularly from the Basel Committee on Banking Supervision, as well as technological advances in data analytics and financial modeling.

According to Cruz (2002), operational risk differs from credit and market risk in its origin—it stems from inadequate or failed internal processes, people, systems, or external events. The Basel II and Basel III accords provided formal definitions and capital requirements for operational risk, pushing banks to develop more robust assessment tools. Alexander (2003) emphasized the need for qualitative as well as quantitative approaches to capture low-frequency, high-impact risk events in investment operations.

Studies by Moosa (2007) and Jobst (2010) discuss the adoption of Advanced Measurement Approaches (AMA), which allowed banks to build internal models based on loss event data, scenario analysis, and business environment indicators. However, the complexity and lack of comparability led to a shift toward the Standardized Measurement Approach (SMA) under Basel III (BCBS, 2017), which sought to streamline operational risk capital requirements globally.

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Recent literature (Doff, 2020; KPMG, 2022) explores how banks are integrating machine learning and artificial intelligence to improve the predictive accuracy of operational risk models, especially in high-volume investment transactions. These tools enable real-time monitoring of system performance, trade anomalies, and regulatory compliance.

Comparative studies reveal distinct national approaches to operational risk management in investment activities. For instance, Llewellyn (2018) compared the U.S. and European models, noting that U.S. banks tend to rely more on quantitative modeling, whereas European banks incorporate broader governance and ethical considerations. A study by Tanaka and Kim (2021) examined East Asian banks, finding that operational risk assessment in investment activities often emphasizes cultural compliance, regulatory adherence, and internal audit mechanisms.

Emerging literature connects ESG (Environmental, Social, Governance) risks to operational risk categories, especially in investment banking. According to reports by the OECD (2021) and McKinsey & Company (2023), poor ESG integration can lead to reputational damage, legal challenges, and compliance breaches—each of which constitutes operational risk. Studies such as those by Bianchini et al. (2022) propose embedding ESG metrics within operational risk dashboards used by banks' investment divisions.

The role of fintech, blockchain, and regulatory technology (RegTech) is increasingly prominent in recent literature. Research by Arner et al. (2017) highlights the potential of blockchain to reduce operational risk in investment transactions by increasing transparency, auditability, and efficiency. Meanwhile, PwC (2022) underscores the use of cloud-based risk management platforms in integrating data across investment units.

While substantial literature exists on operational risk management, fewer studies focus specifically on its application within investment activities of commercial banks. Moreover, there is a need for cross-country empirical comparisons and a deeper understanding of how emerging technologies and ESG criteria are reshaping operational risk frameworks globally.

RESEARCH METHODOLOGY

This research is based on a qualitative comparative analysis of international case studies and regulatory reports from 2015 to 2024. Data sources include:

- reports from the basel committee on banking supervision (bcbs);
- case studies from commercial banks in the eu, united states, and east asia;
- peer-reviewed journal articles on operational risk in banking;
- internal risk assessment methodologies disclosed in financial statements.

Each case was analyzed based on three dimensions:

- the operational risk assessment model used (e.g., ama, standardized approach);
- integration of investment-specific risks (e.g., trading desk errors, compliance failures);
- role of regulatory frameworks and technological tools (ai, blockchain, etc.).

ANALYSIS AND RESULTS

Europe: Scenario Analysis and Internal Models. European banks, under the Capital Requirements Directive (CRD IV), have implemented advanced measurement approaches (AMA) that incorporate scenario analysis and loss event data. Banks like Deutsche Bank and BNP Paribas have piloted integrated platforms to simulate investment risks related to algorithmic trading and cross-border asset flows. In the U.S., operational risk assessment in investment activities is heavily data-oriented, encouraged by both regulatory guidance and industry innovation.

- JPMorgan Chase uses real-time surveillance tools to monitor investment activities, focusing on algorithmic trading errors and unauthorized transactions.

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- Citibank integrates AI and machine learning into its risk analytics platforms to predict and prevent operational disruptions in portfolio management and trade execution.
- The Federal Reserve supports innovation under regulatory sandboxes, allowing controlled experimentation with risk modeling.

Strong use of AI to preempt operational errors in investment banking, supported by robust internal audit systems.

United States: Emphasis on Quantitative Tools. U.S. commercial banks, such as JPMorgan Chase and Citibank, focus on quantifying operational risk through large-scale data analytics. The Federal Reserve encourages the use of machine learning tools to detect anomalies in investment operations, such as unauthorized trades or mispricing of complex derivatives.

In the United States, operational risk assessment within investment activities of commercial banks is heavily characterized by the use of advanced quantitative techniques and real-time data analysis. Regulatory authorities, particularly the Federal Reserve and the Office of the Comptroller of the Currency (OCC), promote the integration of data-driven approaches into risk management frameworks.

Leading financial institutions, including JPMorgan Chase, Citibank, and Bank of America, have developed proprietary systems that combine big data analytics, predictive modeling, and artificial intelligence (AI) to measure and mitigate operational risks in investment processes.

Key components of these systems include:

- Anomaly detection algorithms used to identify irregularities in high-frequency trading platforms, such as unauthorized trades or abnormal market behavior.
- Model-based risk scoring of operational failures in derivative pricing and settlement processes.
- Automated compliance engines that flag potential violations of investment-related regulations (e.g., Volcker Rule compliance in proprietary trading).

The Federal Reserve has encouraged the responsible use of machine learning models, particularly in monitoring complex products like collateralized debt obligations (CDOs) and exotic derivatives. Additionally, regulatory sandboxes allow banks to pilot these tools under supervised conditions.

A strong reliance on real-time data and AI-based quantitative tools to proactively detect and manage operational risks inherent in investment banking, supported by both institutional innovation and federal regulatory alignment.

East Asia: Regulatory and Cultural Adaptation. In Japan and South Korea, operational risk models have been adapted to align with local regulatory expectations. Banks focus on internal controls, often emphasizing staff training and culture-based risk awareness. Investment risk is monitored closely via strict post-trade reconciliation processes and digital audit trails.

Japanese commercial banks take a conservative and culturally embedded approach to operational risk in investment activities.

- Mitsubishi UFJ Financial Group emphasizes internal compliance, detailed documentation, and a low-risk investment culture.
- Post-trade verification processes and manual reconciliation remain strong, especially in foreign investment portfolios and syndicated loans.

High emphasis on internal compliance and personnel reliability in risk management.

South Korea's financial institutions are advancing rapidly in operational risk assessment, aided by strong digital infrastructure.

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- KB Financial Group and Shinhan Bank have implemented real-time monitoring systems to detect anomalies in investment processes, particularly in cross-border digital transactions.
- The Financial Services Commission (FSC) mandates detailed reporting of operational failures, especially in fintech-based investment products.

Digital-first monitoring combined with proactive regulatory enforcement.

The reviewed experiments reveal several key trends:

- Shift toward Standardized Measurement Approaches (SMA): Following Basel III reforms, many banks are moving away from AMA to SMA, which standardizes operational risk capital requirements. While this simplifies compliance, it may underrepresent risks specific to investment operations.
- Role of Technology: Artificial intelligence and machine learning are transforming operational risk detection. Technologies such as blockchain enhance transparency in investment transactions, reducing fraud and error rates.
- Integration of ESG and Cyber Risk: New international models increasingly integrate ESG-related operational risks and cyber threats. For example, investment in high-emission industries may pose reputational risks, which are now being quantified as part of operational risk frameworks.
- Regulatory Coordination: International convergence in operational risk assessment is increasing but remains uneven. Harmonization efforts, particularly under the Basel framework, are essential to ensuring consistency across borders.

CONCLUSION

International experiments in operational risk assessment have significantly contributed to strengthening the resilience and adaptability of commercial banks' investment activities. Across jurisdictions, banks have implemented diverse strategies—from advanced analytics and AI-driven monitoring in the United States to scenario-based frameworks in Europe and culturally rooted risk controls in East Asia. These experiments have not only improved the detection and mitigation of operational risks but have also supported banks in navigating increasingly complex financial instruments and regulatory landscapes.

Despite these advancements, several persistent challenges remain. One of the most pressing is the difficulty of adapting global risk models to national and institutional contexts, where differences in regulatory expectations, market structures, and risk cultures can hinder the implementation of standardized frameworks. Furthermore, the dynamic nature of investment-related operational risk—driven by innovations in financial technology, growing exposure to cyber threats, and rising stakeholder expectations around ESG performance—demands more agile and integrated risk management systems.

Additionally, while the Basel III reforms have brought greater consistency to operational risk capital requirements, many banks still struggle to balance regulatory compliance with operational efficiency and innovation. Overly rigid frameworks may inhibit banks from experimenting with new investment models or technologies, particularly in markets with fast-paced development.

Looking forward, the future of operational risk assessment in investment banking lies in the development of dynamic, real-time, and data-rich models. These must be capable of identifying and responding to both traditional and emerging risk drivers—including those related to environmental sustainability, social accountability, and governance ethics. Enhanced collaboration between regulators, financial institutions, and technology providers will be

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essential to designing systems that are not only compliant but also anticipatory, adaptive, and transparent.

In conclusion, international experimentation in operational risk assessment represents a critical step toward a more secure and responsible investment banking environment. However, the evolution of these frameworks must remain ongoing—continuously learning from cross-border experiences, embracing technological advancement, and aligning with broader societal goals to manage operational risk in an increasingly interconnected global economy.

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