

# Chapter 8

## Innovative Methods in Financial Risk Management

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### ABSTRACT

*The regulations that emerged from the global financial crisis of 2008 and fines that were imposed afterwards triggered a wave of changes in how risk is managed. Innovative methods for risk management became more important as the standards for compliance and management tightened. Institutions also invested in strengthening their risk cultures and involved their boards more closely in key risk decisions. This chapter discusses major risk factors for financial institutions and the innovative solutions that they introduced to manage risk better. Innovative solutions in risk management are not limited to advances in technology such as machine learning and data mining, but also include new regulations, better monitoring, and stricter auditing. Financial institutions improved boards' oversight of risk, created new committees for risk assessment and monitoring, and developed new methodologies for risk management.*

### INTRODUCTION

For most financial firms, failures of 2008 clearly showed the vulnerabilities often caused by excessively large leverage levels. Unsuccessful risk assessment of their positions and immediate reduction in accessibility to secured funding options exposed their dependencies. Some improvements have been made since then but establishing innovative improvements in risk management remained a key priority for financial institutions. (Risk Management Lessons from the Global Banking Crisis of 2008, 2009)

In 2007, it was not possible to see that risk management could have changed as much as they did in the last decade. The regulations that were created after the global financial crisis of 2008 and fines that were imposed later triggered a number of changes in how risk is managed. These changes included more detailed and challenging capital, funding and liquidity requirements, as well as tighter controls for reporting risk, such as Dodd-Frank, Basel III, BCBS 239. Innovative methods for risk management became more important as standards for compliance and management tightened. Stress testing became a popular tool, in parallel to more detailed risk-appetite statements from financial institutions. Institutions

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also toughened their risk cultures and involved their boards more closely in key risk decisions. Because of the size of these changes, most risk management entities in financial institutions are still planning and performing transformations that respond to these increased demands. (Härle, Havas, & Samandari, 2017)

Financial institutions continued to adopt technology solutions to manage risk better. Innovative solutions in risk management are directly linked to technology-driven innovation. Also, use of technology and its implications are not limited to financial institutions. Regulators have been rapidly adopting a wide range of data gathering and analytical tools, too. They are trying to learn more about individual institutions' activities and overall world-wide trends. Procedures and data requests through stress tests, asset quality reviews and enhanced reporting requirements coming out of key regulators around the globe are examples of these trends. (Courbe, 2017) Using sophisticated analytical tools on large volumes of data, regulators can compare scenarios and address potential issues before they become full-scale market problems.

This chapter discusses major risk factors for financial institutions and the innovative solutions that they introduced recently to manage risk better. Innovative solutions in risk management are not limited to advances in technology, but also include new regulations, better monitoring and stricter auditing. The chapter shows how financial institutions benefit from recent technological advances such as advanced data mining techniques and biometrics and combine them with new regulations for better risk managements. These solutions can be analyzed in a few categories.

## **LITERATURE SURVEY**

(Daianu & Lungu, 2008) considered the factors that are responsible for the failure in the financial markets, and eventually contributed to the economic crisis in 2008. Newly created complex financial products; inappropriate regulations in the financial markets; and poor risk management practices at financial institutions are among these factors. (Stultz, 2008) mentions about five major factors that led to the collapse of the risk management and assessment systems in major financial institutions. Some of those factors are using inappropriate risk metrics, lack of communication of risks and transparency with the top management and failure to use risk assessment and monitoring systems. Both (Stultz, 2008) and (Daianu & Lungu, 2008) recommends an Integrated Risk Management (IRM) system for financial institutions where all risk results are accumulated in a coordinated framework.

There has been a number of studies suggesting and offering innovative methods in risk management. Some of those studies focus on the recent technological advances and discuss how they can be effectively used in financial risk management. (Hammond, 2018) discusses how new technologies can be adapted to financial institutions' existing risk and resiliency framework. New regulations such as Markets in Financial Instruments Directive (MIFID II) and GDPR make this transformation more challenging than ever. Big data and analytics have been used by the financial companies for predict trends and prescribe actions in risk management; (Werther, 2016) shows how multi-structured data can be used for financial risk management.

Management of risk requires risk analysis methods that involve certain qualities to answer different questions. (Ansell & F, 1992), (Halman & Keizer, 1994) and (Chapman & Ward, 1997) discuss some of these qualities that are essential to major risk analysis and management methods.

In their white paper, (Harreis, et al., 2017) summarize how the new regulations such as BCBS 239 impact the risk analysis techniques used by the financial institutions. They discuss that despite the data

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