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Review  
Article

# BANKING RISK MANAGEMENT ACCORDING TO THE REQUIREMENTS OF THE BASEL AGREEMENTS

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## **Keywords**

*Risk;  
Banking risks;  
Bank risk management;  
Basel I, II, III agreements*

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## **JEL Classification**

*G21,G28*

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## **Abstract**

*Risk management has attracted the interest of financial and banking institutions recently. The financial industry has experienced financial problems and crises which lead to heavy losses and bankruptcy. The global intertwining of banking institutions, globalization of financial services, the growth of the bank credit market and its diversification have increased these risks. Therefore new efficient methods and tools need to be developed. The main purpose of this article is to provide a critical review of the concept of bank risk management; in addition, the Basel principles developed over time will be focused on (Basel I, Basel II, Basel III). This paper summarizes the results of the previous studies with a view to helping bank managers understand the banking risk management process and providing guidance for future research.*

## INTRODUCTION

Bank industry is based on the art of risk management. When the bank deals with higher risk, it will succeed in achieving greater profits (Pyle, 1999). Banks today strive to achieve two main goals: to generate profit and to maintain their business. This requires an administration capable of running banking risks by using an integrated scientific approach based on the design and implementation of measures aimed at reducing the possibility of loss or bad financial impact to the minimum. (Ghosh et al., 2003) Banking risk management and the principles of the Basel Committee have received a large share of the research and studies presented in international conferences and organizations in different languages of the world. These extensive activities reflect their great importance in the banking sector and its applications. From this point of view, *the objectives of this study* are to identify the concepts of risk, risks faced by the banking industry and risk management. The following steps include the tracking of the risk management process, the review of related literature of Basel most important principles and the requirements for reducing bank risks, and the development of this topic to date. This paper is a theoretical model based on extensive research on secondary (literature) review of multifaceted selected worldwide sources/authors such as books, journal articles, internet sources, etc.

## DEFINITIONS

This study has divided the literature into two main segments; the first part discusses definitions of the related terms and concepts (risk, banking risk, types of risks in the banking sector, and of course bank risk management). The second part revolves around risk management process, and gives a brief review on Basel principles of risk management (Basel I, Basel II, Basel III),

**Risk** has been studied in the last years, and it is one of the concepts that does not have a universal definition. Every author has a different approach to risk. The word risk originates from the Latin term «Rescas» which indicates a great difference between what was expected and what actually occurred (Covello & Mumpower, 1985).

Risk is present in everyday life and it is inevitable in any public and private organization (Pearson & Mitroff, 1993).

Raghavan (2003) defines risk as not knowing what will happen in the future, the difference between ideal performance and actual performance as a result of unexpected interventions outside the will of the institution or person. Eklund et al. (2001) summarized the loss in two ways: the possibility of financial loss or the reputation/ image loss.

## RISK IN BANKING BUSINESS

Since the early 1970s, the banking sector has witnessed an important phase of ongoing developments, which are expected to continue for many years to come. The results of these developments have had a distinct impact on the size and extent of the risks commercial banks may face (Barlow, 1993). Furthermore, the competition has increased not only for domestic banks but also for foreign banks. (Boyd & De Nicolo, 2005). Consequently, if we define financial risk in banking organizations, it refers to the exposure of banks to unforeseen and unplanned loss or fluctuation of the expected return of a particular investment (Laeven & Majnoni, 2003). Thus, bank risk is the material or moral loss incurred by the bank as a result of it being engaged in a particular activity, which is characterized by irregularity and fluctuating returns due to uncertainty (Milojević, 2016). Those interactions in the financial market usually face different types of risks. However, banks are prudent enough to identify and measure risks in an ongoing attempt process to control and avoid them. Many researchers have tried to identify the risks banks face; we summarize the most important risks in Figure 1 based on previous studies of Saunders et al. (2006), Ahmed and Khan (2007) and Varotto (2011).

### Taxonomy of Risk

As we previously mentioned, banks may face a new type of risk on a daily basis. These risks differ in terms of their causes and sources. In Table 1 we will present three risk classifications that reflect the most important bank risks that banks have faced over three different periods. As shown in Table 1, before 1999 there were five types of risks:

1. Credit risk,
2. Liquidity risk,
3. Interest rate risk,
4. Foreign exchange risk,
5. Market risk.

Operational risk was largely a category that is difficult to measure (Power, 2003). The 'Basel II' was published in 2004 and was a set of banking regulations for the management of operational risks and capital adequacy risks; they were later added to the list of risks (Chong, 2004). Each year these risks (Compliance risk, Open Banking risks, Reputational risk, Systemic risk, Moral hazard, and Strategic risk) have increased because of less intervention and deregulation due to economic globalization (Knudson, 2018). Moreover, one of the core reasons for the increase in risk is the rapid development of the banking sector and its services. Banks have launched several new and innovative products, such as Mobile banking, ATMs, Credit Cards, Internet banking, digital banking etc. (Danisman & Demirel, 2018).

**Risk management** is a scientific approach dealing with pure risks by anticipating potential losses and designing and implementing measures that will reduce the occurrence of such losses (Kaplan & Mikes, 2012). Dionne (2013) defines it as the organization of life with the expectation of future events that may bring about undesirable effects. The activity of any bank implies risk management and banks will always face risks. From this point of view, managing these risks does not mean removing them permanently, but managing them intelligently and working to increase the return which is ultimately the true measure of success (Tufano, 1996).

The definition of **Bank risk management** according to Bessis (2015) is identifying, analyzing and controlling the economic risks that threaten the financial assets of the institution or the investor. In addition, risk management is the identification, measurement, follow-up, and management of various threats. It can also be defined as the process by which risks are identified, monitored and measured, with the intent to ensure that they are fully understood and are within the acceptable limits and framework approved by the Bank's Board of Directors for risk (Ghosh, 2012).

All in all, we concluded that risk management encompasses the administrative arrangements aimed at protecting the bank's assets and profits by reducing the chances of expected losses to minimum, whether they be due to natural causes, human error or legal provisions.

Risk management is not a new phenomenon but its importance has grown enormously now after many financial crises. The latest global financial crisis has made regulatory authorities and international supervisory authorities search for new ways to reach a well-structured risk management system. Although risk management methods and approaches vary from one financial institution to another, risk management objectives are almost the same for everyone.

**The main objectives (Hopkin, 2018) can be listed as follows:**

1. Stability of profits or returns: Risk management contributes to reducing the income variances which result from risk-related losses to the lowest possible level. In addition, reducing income variability can help maximize tax deductions for losses and reduce taxes on profits.
2. Growth Continuity: When growth is an essential organizational goal, risk prevention becomes one of the most critical objectives of risk management.
3. Maximizing the Value of the bank: Risk management decisions contribute to maximizing the market value of the bank. Maximizing the

value is the ultimate objective of the organization and it is a reasonable criterion for assessing institutional decisions.

Banks must use a logical scientific process to achieve these objectives.

## **RISK MANAGEMENT PROCESS**

In this section, two risk management models are described and the steps and the results for both models are summarized. Risk management is a scientific approach the organization uses when dealing with problems and it consists of a series of logical steps. Although this paper shows each of these steps separately they merge with each other in practice. The model presentation starts with the model suggested by *Michel Crouhy, Dan Galai, and Robert Mark (2006)* in their book "The essentials of risk management" (Figure 2). This model identifies and measures the risks, finds the instruments to shift or trade risks, assesses the effects of the risk, assesses the costs of the instruments, establishes a risk mitigation strategy, and finally evaluates the performance with the view to maintaining the same strategy if it succeeds in reducing the risk or choosing another strategy in case of deviation. Some of the risk mitigation strategies are as follows:

- Banks avoid risk if they do not have the means to bear these risks but they will lose the profits from this banking process.
- The second strategy is to keep or accept risks if the expected return is greater than the expected risk, and the bank is able to manage the risks appropriately.
- Banks have developed various techniques to mitigate credit risk, such as bond insurance, marking to market, or linking the prices of banking services and their risks.
- The last option or strategy available to the bank is to transfer the loss to a second party by incurring the cost of it on that party by purchasing a policy or government guarantees or obtaining guarantees.

*The second model (Figure 3) was developed by Narayana and Mahadeva (2016)* in their empirical study about risk management in the banking sector. This model is almost identical to the previous one but in this model, new procedures have been added. After identifying, assessing and measuring the risk, banks have to control its cost as well as the techniques used to face it. The risk mitigation strategy includes reporting on progress, compliance with regulations, choosing the optimal alternative and evaluation (Balancing of risk against return).

## BASEL I, II, III - A BRIEF REVIEW

Bank risks are caused either by internal factors (its activity and the management of the bank itself) or are linked to external factors arising from changes in the circumstances or environment in which it operates (Al-Tamimi & Hussein, 2010). This created the necessity for establishing new mechanisms to deal with these risks and for entrusting a joint body of the central banks in the world with their coordination and control.

In 1974, the Central Bank Governors of the Group of Ten Great Countries (G-10) formed the Basel Committee on Banking Supervision under the auspices of the Bank for International Settlements, in Basel, Switzerland. The Commission was formed by representatives of banking supervision bodies and central banks in Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States of America (Kobrak & Troege, 2015). The Commission developed a number of principles that comprehensively cover the necessary conditions to increase the efficiency of risk management and ensure the control of bank risks. Over time, they issued many guidance documents on banking risk management (Basel I - III) based on the global financial crises that have taken place.

**Basel I** (1988). After the foreign debt crisis in developing countries in 1982, and in response to the liquidation of some European and American banks, the Basel Committee decided to adopt a unified standard for capital adequacy in banks in 1988 (ElBannan, 2017). So, Basel Committee 1 reduced the volume of risks in banks, especially those engaged in international banking activities. Their principles were focused on five key aspects (Goodhart, 2011)

1. The committee focused on the credit risk, represented by the counterparty (the debtor) by repaying the debt, where it aims to calculate the required minimum capital ratio mainly considering credit risk, as well as taking into account the country's risk. Other risks addressed by the Committee include liquidity risk, investment risk, interest rate risk, and exchange rate risk.

2. Capital adequacy measurement: In 1988, the Basel Committee adopted a unified standard for capital adequacy in all banks operating in the banking industry as an international standard to indicate the financial position of the banks. They called for a minimum ratio of capital to risk-weighted assets of 8%. This ratio is known as cooke named after Peter Cooke, Bank of England (the chairman of the Basel committee). The calculation of regulatory minimum capital requirements ratio (MCR):

$$MCR = \frac{\text{The amount of capital}}{\text{Total risk-weighted assets}} \geq 8\%$$

3. Risk weight categories: The weighted percentage varies according to the variation of the asset itself as well as the difference between the obligor or the debtor. The credit risk was divided into 5 categories, and the risk weight is applied to each on-balance-sheet asset according to its risk (e.g. 0% to cash and govt. bonds; 20% to claims in OECD banks; 50% to residential mortgages; 100% to corporate loans, corporate bonds, etc.). Commercial loans, for example, were assigned to the 100% risk weight category.

4. They divided all the countries into two groups in terms of the credit risk weight:

- the low-risk countries, which include the member countries of the Organization for Economic Co-operation and Development (OCDE), as well as Switzerland, Saudi Arabia, Australia, Norway, Austria, Portugal, New Zealand, Finland, Iceland, Denmark, Greece, Turkey.

- the high-risk countries which include all the other countries which are not mentioned before.

5. Development of bank capital adequacy components (Core & Supplementary Capital). The capital adequacy ratio (CAR)=

$$\text{Core Capital} + \text{Supplementary Capital}$$

where

- $\text{Core Capital} = \text{Paid Up Capital} + \text{Disclosed Reserves (General and Legal Reserves)}$

- $\text{Supplementary Capital} = \text{General Loan-loss Provisions} + \text{Undisclosed Reserves} + \text{Asset Revaluation Reserves} + \text{Subordinated Term Debt (5+ years maturity)} + \text{Hybrid (debt/equity) instruments}$

**Basel II** (2004). In light of the economic developments and the progress in the global banking markets, the Committee was convinced that amendments made at 1988 Convention (Basel I), had to be revised and adapted to these market changes. The review on the criteria for private funds in the field of banks includes more accurate decisions to control the adequacy required to address risks, control the levels of private funds, and analyze banking risk categories.

The preparation of these amendments began in 1999 and was concluded in June 2004 when a decision of the Committee containing Basel II standards was issued. (Chernobai et al., 2008)

Basel II three pillars (Figure 4):

1. Minimum capital requirements for credit risk, market risk and operational risk – expanding the 1988 Accord.

2. Supervisory review of an institution's capital adequacy and international assessment process.

3. Effective use of market discipline as a lever to strengthen disclosure and encourage safe and sound banking practices.

BASEL II - Minimum Capital Requirement (MCR) Calculation

$$\frac{\text{Capital}}{\text{Credit risk} + \text{Market risk} + \text{Operatioal risk}} \geq 8\%$$

**Basel III** (2010). Basel III is an update on Basel I and Basel II principles, originally published in December 2010 in response to the global financial crisis, especially after the bankruptcy of many banks and the failure of Basel II standards to protect them and not to comply with them. According to Dermine (2015), Basel III includes a range of reforms aimed at strengthening laws, controlling, risk management, governance and transparency in the banking sector:

1. Higher requirements of capital and better quality. The Basel Committee proposes that the minimum common equity tier (CET) of risk-weighted assets (RWAs), which is the highest form of capital that can absorb losses, should be raised from 2% to 4.5%. This ratio is calculated as follows:

$$\frac{\text{CET1}}{\text{RWAs}} \geq 4.5\%$$

Tier 1 capital requirements that include equity and certain other eligible financial instruments will be raised from 4% to 6%. The reforms have led to the appearance of a new type of capital, additional hedge funds, held by banks at a rate of 2.5% plus the minimum which under current regulations is required to consist of shareholders' equity.

Thus, the minimum required capital Tier 1 will be 8.5% (6% for Tier 1 capital and 2.5% for Capital Protection). The ratio of total capital requirements after implementation of proposed reforms will be 10.5% (That is security or protection capital) compared to 8% in previous agreements.

2. Add Leverage Ratio  
Basel III added a leverage ratio for the first time; to make sure that banks have ample liquidity during financial stress and to protect them from disproportionate borrowing, an upper limit of 3% was introduced for the leverage ratio.

$$\frac{\text{Tier 1 Capital}}{\text{Total exp o sure}} \geq 3\%$$

3. Improved Liquidity Ratios  
The global financial crisis of 2008 showed that the issue of liquidity plays an important role in the functioning of the global financial and banking

system and the entire markets. This is what the Basel Committee did by demonstrating its willingness to reach a global liquidity standard, where two ratios were proposed:

- The first is the Liquidity Coverage Ratio (LCR). It is calculated by assigning the high liquidity assets held by the bank to 30 days of its cash flow. This ratio is intended to make the bank self-sufficient to meet liquidity needs in the event of a crisis.

$$\frac{\text{High quality liquid assets}}{\text{Total net liquidity outflows over 30 days}} \geq 100\%$$

- The second ratio is the Net Stable Funding Ratio (NSFR). It measures the structural liquidity in the medium and long term. The aim is to provide the bank with stable funding sources for its activities. It can be calculated by dividing the total available stable funding (ASF) by the total required stable funding (RSF) :

$$\frac{\text{ASF}}{\text{RSF}} \geq 100\%$$

4. Countercyclical Measures: Basel III introduced new requirements concerning capital provisions for large banks in order to mitigate cyclical changes in their balance sheet. Banks have to allocate additional capital during a credit expansion, while during a credit recession capital requirements can be reduced (King & Tarbert, 2011).

**Based on Penikas (2015) study the general objectives of the Basel Committee can be summarized as follows:**

1. Helping to strengthen the stability of the global banking system, especially after the crisis of foreign indebtedness of developing countries. During the 1970s, international banks expanded significantly in granting their loans to these countries, which led to an increase in the volume and proportion of doubtful debts and the failure of some of these banks, which greatly weakened their financial positions.

2. Trying to achieve justice in competition and to promote equality and balance in competition between banks. The equality of regulations and legislations and non-conflict between political objectives and general objectives.

3. Eliminating an important source of unfair competition between banks, which arises from differences in national control requirements for bank capital.

4. Creating mechanisms to adapt to global banking changes, particularly financial globalization, which stems from financial liberalization, and the liberalization of money

markets of banks, including legislation, regulations and constraints that limit the expansion and deepening of banking activity across the world under the technological revolution.

5. Provide a more comprehensive approach to risk management by integrating several risks - which were not previously included - and facilitate the circulation of information about these methods among various monetary authorities.

### CONCLUSIONS

Banking risk management has received considerable attention from researchers and those interested in banking because it is considered the key to the development and sustainability of banks, especially after the crises that have plagued the global banking system; hence this theoretical study, in which we attempted to define the subject of banking risk management, and we addressed the most important Basel International Standards for measuring and managing bank risks. The safety of the financial and banking sector depends on the enactment of laws and regulations that limit risks, stemming from systemic crises that result from the failure of banks and other financial institutions (especially after the increasing trend towards liberalization and banking globalization, which has led to a significant increase in the types and magnitude of risks facing the financial and banking sector). From this point of view, managing these risks does not mean removing them permanently, but controlling them intelligently and working to increase profits, or at least minimize potential loss to the maximum extent possible.

The International Financial Institutions and Basel Committee for Banking Supervision, in particular, have played an important role in their efforts to achieve financial stability at the global level. Various regulatory authorities in many countries have been striving to implement the Basel Committee's guidelines on risk management and capital adequacy in commercial banks.

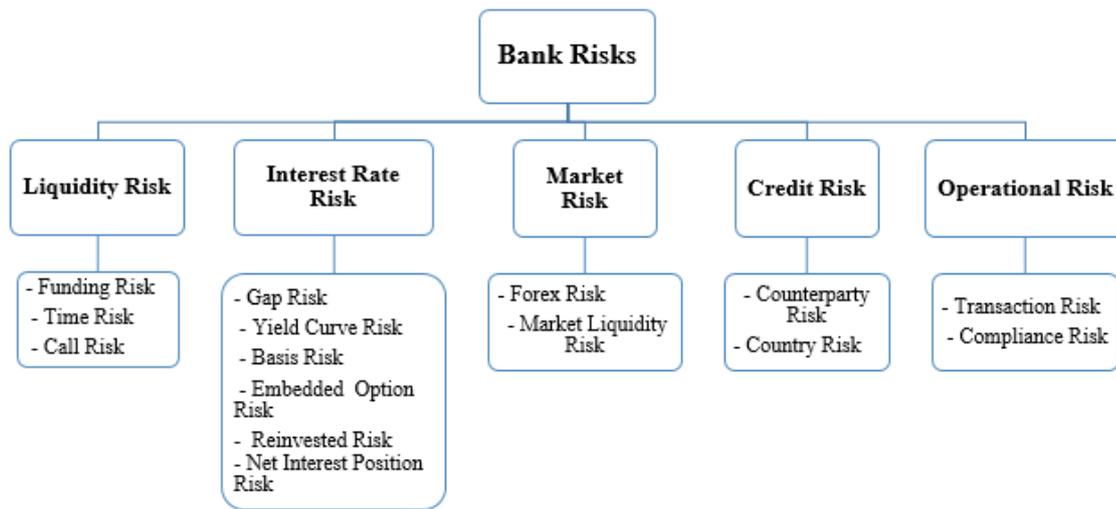
On the other hand, the recurrence of the crises has pointed out the failure of the control procedures and the failure of the decisions of the Basel Committee for developments in the banking industry. It has been said that the Basel Committee does not make any changes until it is too late. In 1997, the committee made the first amendment by introducing market risk within the capital account requirements and issuing the framework Basel II after the crisis of Southeast Asian countries; Basel III was established in response to the financial crisis 2007–2008 (the mortgage crisis), such delayed actions pointed to its weaknesses.

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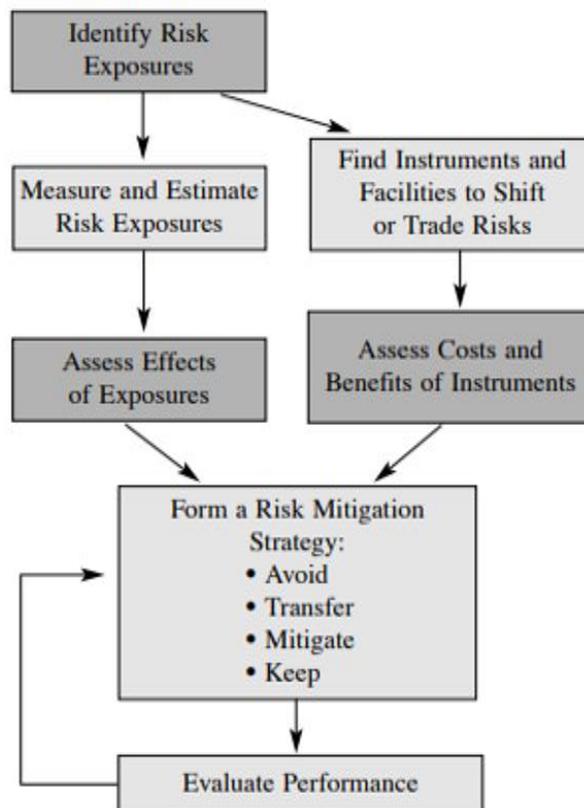
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**APPENDICES**



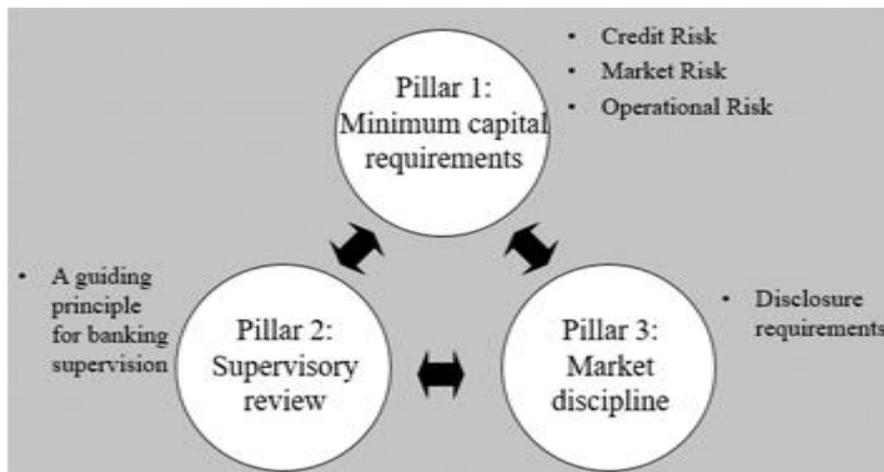
*Figure 1:* The major type of ‘Banking Risks’  
Sources: own editing



*Figure 2:* The risk management process  
Source: from Crouhy, Galaiand Mark (2006)



*Figure 3:* Risk management process  
Source: own editing



*Figure 4:* Basel II framework  
Source: own editing

**Table. 1**  
*Bank risk classification*

<b>The classical classification before 1999</b>	<b>Classification in 2004</b>	<b>Classification in 2018</b>
<b>1. Credit risk</b>	<i>1. Credit risk</i>	<i>1. Credit risk</i>
<b>2. Liquidity risk</b>	<i>2. Liquidity risk</i>	<i>2. Liquidity risk</i>
<b>3. Interest rate risk</b>	<i>3. Interest rate risk</i>	<i>3. Interest rate risk</i>
<b>4. Foreign exchange risk.</b>	<i>4. Foreign exchange risk.</i>	<i>4. Foreign exchange risk.</i>
<b>5. Market risk</b>	<i>5. Market risk</i>	<i>5. Market risk</i>
	<b>6. Operational risk</b>	<i>6. Operational risk</i>
	<b>7. Capital adequacy risk</b>	<i>7. Capital adequacy risk</i>
		<b>8. Compliance risk</b>
		<b>9. Open Banking risks</b>
		<b>10. Reputational risk</b>
		<b>11. Systemic risk</b>
		<b>12. Moral hazard</b>
		<b>13. Strategic risk</b>

Sources: own editing