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TYPES OF RISKS AND METHODS FOR ASSESING THEM BASED ON INTERNATIONAL EXPERIENCES

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Abstract: This article explores the types of risks and methods for assessing them based on international experiences. Specifically, it examines the assessment methods corresponding to each type of risk, as well as their advantages, disadvantages, and benefits.
The main findings presented in the article have theoretical significance and can be widely applied in financial mathematics. Additionally, the types of financial risks and methods for assessing them based on international experiences can be useful for students in higher education, particularly those studying economics, for calculating specific financial operations.
Keywords: Risk, financial risk, liquidity risk, credit risk, market risk, currency risk, operational risk, inflation risk, legal and regulatory risk.

INTRODUCTION

Financial risks refer to the negative economic and financial consequences faced by companies, individuals, or countries. These risks can arise due to various factors and generally pose a threat to financial stability. Some of the main types of financial risks include:

-**Credit Risk**: This risk arises when there is a possibility that a borrower will be unable to repay the loan. This can occur if a company or individual fails to repay their debt to a bank or another lending institution on time.

- **Liquidity Risk**: Liquidity risk is associated with an organization or individual not having enough cash to meet their financial obligations quickly and without incurring a loss. In other words, it refers to the risk of being unable to raise the necessary funds in time to fulfill payments.

-**Market Risk**: Market risk refers to the risk arising from fluctuations in the prices of assets. This includes changes in stock, bond, currency, or commodity market prices. It can potentially lead to financial losses in an investor's portfolio.

-**Currency Risk (Currency Exposure)**: This risk arises from changes in exchange rates. It is particularly significant in international trade or when borrowing in foreign currencies. If exchange rates fluctuate, it can negatively impact a company's costs or revenues.

- **Inflation Risk**: This risk refers to the loss of purchasing power due to changes in inflation rates. For example, it can negatively affect long-term investments or pension funds.

- **Operational Risk**: This risk is associated with a company's internal processes, systems, or human errors. Examples include technical malfunctions, mistakes made by employees, or internal fraud.

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- **Legal and Regulatory Risk**: This risk arises from legal changes or new laws that can negatively affect a company's financial situation. Such risks may stem from new taxes, restrictions, or regulatory requirements.

To manage financial risks, companies use various methods, such as insurance, diversification, hedging (risk mitigation), and implementing precautionary measures.

LITERATURE REVIEW ON THE RESEARCH TOPIC

Philippe Jorion's another important work, *"Value at Risk: The New Benchmark for Managing Financial Risk"*, explains the widely used Value at Risk (VaR) model in detail, which has become one of the most popular methods for measuring financial risk. This book is extremely useful for those who wish to study the VaR model. It provides examples illustrating the principles of how VaR works and emphasizes its significance in managing financial risks.

Steve L. Allen's *"Financial Risk Management: A Practitioner's Guide to Managing Market and Credit Risk"* is highly regarded as a practical guide to managing market and credit risks. Allen's work covers various areas of financial risk management, analyzing each risk type individually and offering practical approaches to managing them. This book can be considered beneficial for financial professionals and risk managers.

There are many significant works in the field of financial risk management, which present different methods, analytical methodologies, and strategies for managing risks. These literatures provide the necessary knowledge to understand and tackle financial risks. Works by authors like Hull, Taleb, Jorion, and Allen serve as a solid foundation for those seeking to explore both the theoretical and practical aspects of risk management.

RESULTS AND DISCUSSION

In calculating financial risks, various methods and formulas are used, which differ depending on the type of risk and the situation. Below are the most commonly used mathematical formulas and methods:

1. **Standard Deviation (Volatility)**: The most common method for measuring financial risk is the standard deviation (volatility). This method measures the variation in market values or asset prices using the following formula:

$$\sigma = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}\left(r_i - \bar{r}\right)^2}$$

σ – Standard deviation (volatility).

r_i – the profitability (return) of an asset in the i-th period.

$\bar{r}$ –averageprofitability (return).

n – numberofperiods.

2.VaR (Value at Risk): VaR is a widely used risk measure in investment protection. It indicates the maximum potential loss of an asset at a given point in time, i.e., the risk of price changes of the asset within a specific time interval.

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$$VaR = \mu - Z_a \cdot \sigma$$

μ –average return of the asset.

σ – standard deviation (volatility).

Z_a –Z-value corresponding to the selected confidence interval (for example, 1.65 for a 95% confidence level).

a– risk level (typically 1% or 5%).

Example: If the 1-day VaR is calculated with 95% confidence, the Z-value will be 1.65, and this is evaluated with the probability that the asset's loss will not exceed this value at the 95% risk level.

The formulas used in calculating financial risks vary depending on the type of risk. Each formula takes into account the specific method of measuring risk, as well as the characteristics of debt, the market, or the asset in question. These methods are essential tools for companies or investors when making decisions.

There are recognized and widely used methods for calculating international financial risks.

The methods we will discuss in this article are implemented in accordance with international financial standards, particularly the regulations developed by the Basel Committee (Basel III). Below, we present the key calculation methods that are widely recognized and applied on an international scale.

1.Value at Risk (VaR): Value at Risk (VaR) is one of the most popular and internationally used risk measures. VaR is used to measure the potential loss of investment portfolios, and this method is adopted by several international organizations, including the Basel Committee and other financial institutions.

International Recognition: VaR is used by many large banks and financial institutions for risk management. For example, under the Basel II and Basel III regulations, banks are required to calculate their capital based on VaR.

Application: VaR is used by investors and banks to determine the maximum potential loss over a specified time period, at a certain confidence level (for example, 95% or 99%).

2. **Stress Tests:** Stress tests are a methodological approach conducted by financial institutions to assess the resilience of a financial system or portfolio under extreme economic conditions, such as an economic crisis or political instability.

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International Recognition: Stress tests are mandated by international regulators, such as the Basel Committee and the European Central Bank (ECB). These tests are utilized to assess credit risk, liquidity risk, and market risk.

Application Banks and financial institutions conduct stress tests to evaluate their systems against potential economic crises or other extreme conditions, helping to determine their overall stability.

3. Credit Risk (Credit Spread): Credit risk measures, specifically credit spreads, are used to assess the risk associated with debt instruments in international financial markets. This method is widely applied by major investment banks and other financial institutions in credit risk evaluation.

International Recognition: Credit spreads are a widely accepted method in the international financial system, particularly in the context of capital maintenance requirements under Basel III regulations.

Application: Credit spreads are used for assessing the risk level of debt instruments and bonds, aiding in decision-making related to significant credit risks.

4. **Expected Shortfall (ES)** Expected Shortfall (ES), also known as Conditional VaR, is a more advanced risk assessment method that accounts for extreme losses beyond Value at Risk (VaR). This approach is particularly effective in evaluating high-risk scenarios or catastrophic events.

International Recognition: ES is recommended by some experts as a replacement for VaR in advanced risk calculations. In certain cases, Basel III regulations consider the application of the ES method.

Application: ES is primarily used by financial markets and banks to assess potential large-scale losses. Compared to VaR, this method provides a more accurate representation of the tail risk, particularly in extreme loss scenarios.

5. Capital Adequacy Ratio (CAR) The Capital Adequacy Ratio (CAR) is a key indicator that measures a bank's capital in relation to its total financial obligations. This ratio is established by international regulators, particularly the Basel Committee.

International Recognition: CAR is used in the international financial system to ensure the financial stability of major banks. In accordance with Basel II and Basel III regulations, banks must maintain sufficient capital to withstand risks.

Application: This ratio is used to assess the adequacy of a bank's capital and its financial stability. A lower CAR indicates a reduced ability of the bank to withstand financial risks.

6. Risk-Adjusted Return on Capital (RAROC). RAROC is a methodology for measuring returns relative to capital while accounting for risk. This approach is used by financial institutions to manage risk and optimize profitability.

International Recognition. RAROC is widely used by banks and financial institutions globally, particularly as a risk management tool under Basel III regulations.

Application: Banks and investment firms use RAROC to assess portfolio and investment risks while maximizing returns relative to capital.

ADVANTAGES AND LIMITATIONS OF FINANCIAL RISK ASSESSMENT METHODS

The selection of effective methods for financial risk assessment primarily depends on the type of risks you intend to evaluate and the conditions in which you operate. Each method has its own advantages and limitations. Let's analyze their effectiveness:

1. Standard Deviation (Volatility) ***Effectiveness:***

- Advantages:

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- Simple and intuitively understandable.
- Measures market price fluctuations, helping investors assess market risk.
- Effectively aids in portfolio diversification, as diversification reduces portfolio volatility.

- **Limitations:**
  - Based on historical data, which may not fully reflect future risks.
  - Less effective for non-normal distributions (e.g., catastrophic events).

Effectiveness: If you need a general understanding of market volatility, this method works well, but it only measures volatility and does not account for other risk factors.

2. VaR (Value at Risk). Effectiveness

- **Advantages:**

- Provides a clear and precise risk measure, allowing the calculation of maximum potential loss (VaR) at a given confidence level (e.g., 95% or 99%).
- Widely used across institutions, investment firms, banks, and other financial organizations.

- **Limitations:**

- Based on historical data and assumes a normal distribution, making it less effective in accounting for extreme events.
- One major limitation of the VaR method is that it only provides the probability of a loss occurring but does not indicate the magnitude of extreme or catastrophic losses.

3. Sharpe Ratio. Effectiveness:

- **Advantages:**
  - Highly useful for comparing portfolio performance and risk, as it accounts for both return and risk.
  - Widely used for evaluating and comparing the risk-return ratio of different investment strategies.
- **Limitations:**

- Effective for comparing low-risk and high-return investments, but it only considers average return and volatility, ignoring other market characteristics (e.g., correlation, idiosyncratic risks).
- The ratio may fluctuate if the portfolio includes correlation effects or diversification strategies.

4. Credit Risk (Credit Risk). Effectiveness

- **Advantages:**

- Effective for measuring credit risk, particularly in assessing the risk of bonds and debt instruments.
- Helps analyze credit risk by using credit spreads, as a higher spread indicates a higher risk of default.

- **Limitations:**

- Limited to analyzing credit-related instruments only.
- Does not account for other types of risks, such as market risk or liquidity risk.

5. **Liquidity Risk. Effectiveness:**

- **Advantages:**

- Liquidity risk assessment is crucial for managing cash flow for both companies and individuals.
- Helps determine the ability to meet short-term obligations on time.

Limitations:

- Liquidity risk assessment focuses only on short-term obligations and current assets, ignoring long-term or market-related risks.

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Effectiveness: Each method is effective depending on your specific objective:

- **If you want to measure market volatility**, standard deviation is a good tool.
- **If you need to quantify a specific level of risk (e.g., 1% probability of loss)**, VaR is effective.
- **If you want to evaluate portfolio efficiency and risk**, the Sharpe Ratio is highly useful.
- **If you're assessing credit-based assets**, credit spreads are effective.
- **If your goal is to measure liquidity risk**, liquidity ratios help.

Using these methods together provides a more comprehensive risk assessment.

Global Recognition of Financial Risk Assessment Methods: The above methods are widely adopted by international regulators and financial institutions to ensure financial system stability:

- **VaR and Expected Shortfall** are used for measuring market and credit risks.
- **Stress tests** reveal strengths and weaknesses of banks and institutions.
- **Credit spreads** help evaluate credit risk.
- **CAR** assesses banks' capital stability.

These methods establish standardized risk management practices for financial institutions, helping to maintain overall financial stability.

CONCLUSION

Financial risk management is a crucial process for organizations and investors, ensuring their successful operations. Risks can arise in various forms and from different sources, requiring multiple approaches for assessment and management. It is essential to thoroughly understand each type of risk and implement effective mitigation strategies. International best practices and assessment methodologies play a significant role in this process. Below is a general analysis of different types of risks and their evaluation methods based on global standards. **Financial risks** encompass all factors that can negatively impact an investor's or company's financial position. These risks are often associated with markets, credit, liquidity, and other financial instruments. Financial risks can take various forms, such as **market risk**, which refers to the potential losses arising from changes in the prices of securities, currencies, interest rates, commodities, or other financial instruments. For instance, a sharp decline in stock or bond prices or fluctuations in exchange rates can lead to financial losses for investors.

Credit risk, on the other hand, represents the risk that a borrower may be unable to fulfill their obligations, leading to potential financial losses for lenders or investors. This risk is associated with the inability to repay loans or debts on time, as well as the possibility of only partial repayment. The most effective methods for assessing and managing risks are based on several international best practices. Advanced methodologies for measuring risks are widely used in global financial systems.

Stress Testing: Stress tests help evaluate an organization's financial stability during economic crises or other unexpected events. The goal of this method is to determine how a company responds to various adverse conditions. Through stress testing, organizations can identify potential significant losses and weaknesses within the system.

Credit Risk Models: Effective methods for assessing credit risk include volatility analysis, credit ratings, and evaluating borrowers' repayment capacity. Credit risk models are used to estimate potential losses associated with borrowers' creditworthiness. The management and evaluation of credit risks primarily rely on statistical and mathematical models.

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Monte Carlo Simulation: This method is employed to model the behavior of complex systems and account for various probabilities. Monte Carlo simulation is widely used in financial risk assessment, particularly for evaluating risks related to private sector investments and other financial assets.

Financial risk management remains a crucial factor in ensuring the successful operations of companies and investors. International practices and assessment methods facilitate the effective identification, analysis, and management of risks. Methods such as Value at Risk (VaR), stress testing, credit risk models, and Monte Carlo simulation serve as key tools in financial risk management. Additionally, international organizations and regulatory frameworks continue to develop effective approaches to risk management. The evolution of risk management approaches creates significant opportunities for markets and organizations; however, this process also introduces new risks and uncertainties.

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