



Financial Risk and Financial Risk Management Technology

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ABSTRACT

Financial firms are coming up with creative ways to use sophisticated technological applications in managing risk in a practical way to protect themselves as awareness of these applications grows. Improvements in Risk Management Technologies include the latest model developments, hardware and software developments, and market data tracking. All three phases of risk management—identification, measuring, and formulation of financial risk control strategies—have been affected by these developments. Advances in five RMT domains—communication software, OOPS, neural nets, parallel computation, and artificial intelligence—is covered in this article. Systems built on any one of these fundamentals can benefit a company's operations. An analysis of company-related linkages demonstrates how the usefulness of developed systems can be used.

INTRODUCTION

There is a long history back the idea of risk management and risk assessments. The Athenians demonstrated their ability to weigh risk before choosing options over two centuries ago. But as a scientific field, risk assessment and management are relatively new—they have only been around for 30 to 40 years. The earliest scientific journals, papers, conferences, while papers addressing the fundamental principles and concepts of risk assessment and management date approximately from this time. These concepts and tenets still serve as the foundation of the risk evaluation and management practices that have been in place since the beginning of the twentieth century, and they still strongly influence the field today. But while then, the field has advanced significantly. The vast majority of societal sectors now use risk analysis tools and methods, which have been developed into new along with more advanced techniques.

To demonstrate this, take a look at the variety of specialty groups that the Society for Risk Analysis offers, including: "Health and Safety in the Workplace, Risk Policy and Law, Dose Response, Ecological Risk Evaluation Emerging The nanoscale and Materials, Engineering and Technology and Infrastructure, which took place Exposure Assessment, The microbial Risk Analysis, and Protection and Defence". Recent years have also seen advancements in the field's fundamental issues, which are particularly interesting because they are general and could have an impact on a wide range of applications. The scope of this paper is these advances.

The field of risk has two main tasks: (I) carrying out unrelated risk studies and developments related to ideas, concepts, frameworks, approaches, principles, methods, and models to understand, assess, characterize, converse, and (in a broad sense) manage/govern risk; and (ii) using risk assessments and management techniques to study and treat the hazards of specific activities.

The principles and management and assessment instruments needed for the particular management and assessment issues in (I) are provided in the generic section (II). In a nutshell, the field of risk studies how the world works (with regard to risk) and the ways we may and ought to evaluate, analyse, and control it.

One could argue that the variety of definitions leads to tension. Integrative thinking, on the other conjunction, encourages the pursuit of viewpoints that go in addition to these definitions; it makes use of the opposing concepts to arrive at a deeper comprehension. The upcoming examination will address trends observed in the threat research and suggest additional studies in this area.

Contributions that, by definition, demonstrate a strong "ability to face productively the conflicts of opposing ideas along with instead of determining one to the detriment from the other, generate an original resolution of the power source tension at the form about an entirely novel concept which combines elements of both competing concepts but is more effective to each" will receive special attention. Consider how risk is conceptualized, for instance.

OBJECTIVES OF THE STUDY

*The current paper's goal is to review recent developments in the risk domain, with an emphasis on the core concepts and methods .

*To understand about the principals and techniques of risk management

*Role of information technology for assessing risk

* Study of risk management systems

*Developed techniques to manage risk and neural networks usage.

REVIEW OF LITERATURE

1. Hansson and Aven: Risk science is largely defined by generic risk research. On the other hand, applications of this kind could also be considered scientific if the research produces fresh insights, like a better grasp of the practical application of a particular risk assessment method. There aren't many publications on this subject that address the connections between risk and risk fields and science and scientific criteria.
2. Hollnagel— However, a number of basic discussions on this subject have surfaced recently. These have helped to make the scientific foundation as well as the subject of the threat field more clear. This understanding is consistent with a viewpoint on science that argues science is the discipline that gives us the most epistemically sound conclusions currently available on topics addressed by an array of knowledge disciplines.
3. Davarzani, Fahimnia Tang - There is no clear demarcation between levels I and II. To varying degrees, the second stage of studies and development is applicable to the risk field. There are many certificates of generality, but some works are genuinely generic in the meaning of how they apply to all kinds of applications. While the scope of some research may be limited to one or a few application areas, it is however essential for all application types in those industries.
4. Brandenburg et al. - demonstrate the field of management of supply chain risks, which has just in recent weeks grown from being a newly discovered subject to a burgeoning area of study. In addition to reviewing quantitative and qualitative approaches for managing risks in supply chains, the work by identifies creating areas of inquiry that have contributed fundamental ideas, theories, equipment, and methodologies to the field.
5. Tang - focuses on understanding those hazards that are most important to the supply chain sector. Despite not focusing on a particular system, it makes more sense to classify the research under (I) compared to (II) assigned the work's relatively narrow relevance to non-supply supply chain administration domains. A further instance demonstrates an array about circumstances ranging from (I) to (II). Tang and Musa draw attention to the fact that one studying challenge in management of supply chains is defining risk.
6. Aven and and Goerlandt and Montewka - This is a problem that faces all kinds of applications: it is hard to transfer knowledge and experience between domains, and we frequently observe that various fields create custom concepts that are out of date in comparison to innovations in the wider security field. This displays the need for greater impact and visibility for generic risk research. On the flip side, limited research especially in certain fields can frequently inspire and have an impact on general risk research. Issues educated by the author of this paper's offshore danger assessment applications led to general risk investigations regarding risk conceptualization.

RESEARCH METHODOLOGY

Analysis is done on secondary information from a range of sources, such as blogs, websites, articles, and so on. This investigation is speculative in nature and is based on secondary data.

>Principles and techniques of risk management

It is beneficial to examine two widely recognized the foundations of risk control before delving into the latest developments in basic risks management concepts and methods: (a) the variety of main approaches to risk management and (b) the framework of the risk control procedure.

There are three principal methods that are often used when handling risk based on risk, cautionary, and verbal methods. A different term for the cautionary approach is a strong and resilient tactics. The most effective strategy for proceeding usually entails bringing together each of these strategies.

The term "risk-aware tactics" describes how risk is addressed using either an absolute or a comparative risk evaluation approach to risk avoidance, a decrease, transfer, and preservation. The precautionary look points out features that include protection, the creation of alternatives, safety considerations, redundancy in the design of safety devices, defense system developing, expansion of techniques for achieving comparable or identical targets, adaptable reactions in system development, and enhanced control of emergencies and systems adaptation conditions. Being capable to accurately recognizing communications and the earliest indications of major events will be critical in this particular scenario. In order to address the ambiguities, risks, and possible surprises, each of the risk regulations depends on the aforementioned ideas with a certain extent.

Techniques for developing resiliency are vital for tackling risk, uncertainty, and unanticipated circumstances. The capability of an organization or system to continue functioning or exchange to its fundamental duties after an adverse event is an important sign of its adaptability

*React to regular and sporadic dangers in an aggressive yet responsive way.

*Keep an eye on every aspect, which includes its own effectiveness.

*Anticipate potential hazards and possibilities

*Get understanding via expertise.

How Should Risk Management Systems Be Chosen?

Before reviewing risk oversight systems, executives must determine what they need and project requirements in the future. With these details, an evaluation of the costs and benefits of different apps and the information feeds they require are able to be done.

The tasks listed below have been what we suggest:

1. The various hazards that the company faces: To ascertain when the RMS under focus will assist in managing a company's risk, it is critical to identify the business risk.
2. Enumerate every goal as utilizing an RMS: Typically, oversight chooses an RMS alongside specific goals in mind. To facilitate comparison, a list of all such goals is necessary. An RMS may be employed to project foreign exchange patterns or identify data errors.
3. Compile all of expenses corresponding to an RMS: identify both the variable and fixed expenses for each.
4. Create an organization value linkage diagram to illustrate how the RMS has affected the following: Determine which intermediate in nature procedures for manufacturing for each RMS will be impacted by the system's use.
5. Determine the RMS's total direct and indirect value to the company outputs: Each intermediate production manager is required to submit an estimate of the business value outputs, such as operating cost savings, value added through greater risk control, etc. Estimate the one-time income that using the system may bring in as well. The total of these advantages—direct and indirect—also delivers an estimate of the possible costs resulting from not utilizing the RMS.
6. Decide on the system with the biggest indicated ratio of cost to benefit.

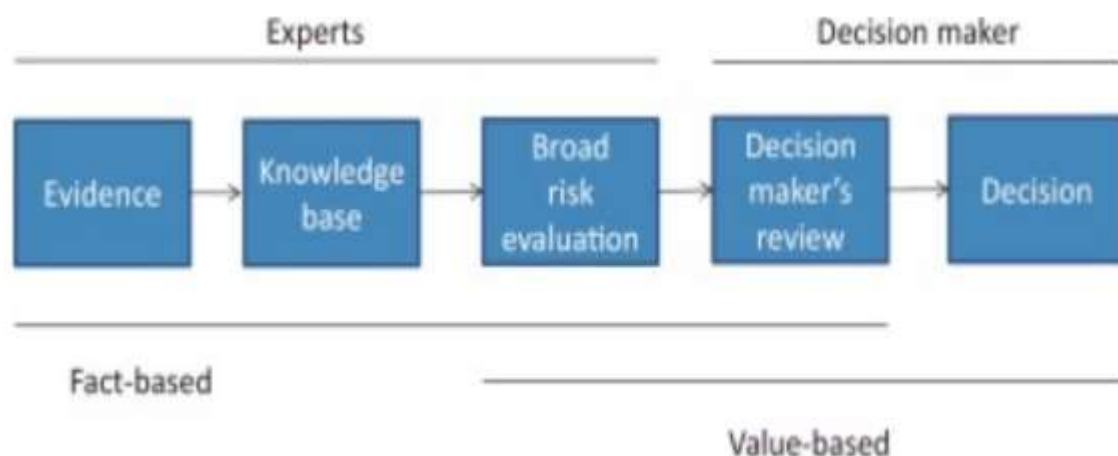


Fig: various stages in the risk informed decision-making

>TECHNICAL RISK MANAGEMENT IMPROVEMENTS

The ongoing advances in the demand for new ITS are resulting in a surge in the potential advantages associated with risk management procedures carried out by financial services and brokerage organizations. Five of the most important and important developments will be looked at here: neural nets, based on objects and distributed development, artificial intelligence, parallel processing alongside computer systems, and conversation software.

>Information Technology's Place in Risk Management

Trade operations have become heavily programmed via the use of technological innovations. Businesses and portfolio managers are also aided through systems that offer information about the markets and shifts, which includes Merrill Lynch - According to Bloomberg, to monitor the fixed-income market. Despite a number traditional ITS and techniques are still in usage, such as mainframe systems data bases and manually keeping track of crucial market metrics, financial companies have begun a significant shift toward more sophisticated, revolutionary technologies like intelligent machines, neural nets, and concurrent processing. Major investment banks are using these ITS to obtain a competitive edge in managing their strategic costs.

The recognition that IT is essential to defining the groundwork of a number of fresh approaches for conducting financial market trading transactions lies at the root of these advancements. The sole limitation of developing novel financial goods that have important risk profiles that benefit both the participants to a transaction as well as the intermediary organizations participating is the organization's a readiness to learn about the possible advantages of

technological advances that promotes these developments. The rising capacity to instantaneously and centralized oversee the risks attached with overseas investments is a further indicator.

INFORMATION TECHNOLOGY USED FOR PROBLEMS WITH RISK MANAGEMENT

The following three primary components make up RMT:

- (1) computer equipment for gathering, mixing, and checking new information about shifting risk
- (2) software for the computer to deploy analytical models
- (3) data detailing historical as well as currently conditions of the market.

1.1 Recognizing Dangerous Occurrences

Today, a lot of corporations use IT to discover possible dangers for their financial investments who may increase their susceptibility to market risk. Financial databases, for examples, are employed to recognize shifting investments standing risks. Early notification of major alterations that might affect that company is necessary. Sometimes this can be accomplished with the assist of the trading system computerization, and that gathers digital signals related to market indicators and looks at them to see if they alter the risk profile of assets that are currently being considered or made.

1.2 Sorting and Assessing Monetary Risk

It's critical that financial risk metrics are established so that managers can create risk tracking and evaluation initiatives. By implementing these steps, they are going to able to develop policies who will assist divisional traders, functioning divisions, along with the enterprise as a whole in being within the authorized, set up bounds. Acquiring knowledge of the variables that influence risk is the first step (for market risk, this can be the prior prices of finance devices; for credit risk, it can be the likelihood of insolvency). After that, it is possible to compute the overnight average price volatility as well as the range of deviations from their mean values. During the observation period, the volatility measurement establishes how risky the financial instrument is.

Fig:Risk management elements

1.3 Developing Techniques to Manage Risk

The risks can be assessed using standard units following the time they have been precisely measured. Based on a recent request accepted by Mark [23], risk must be expressed as euros at risk.

cash that will be at risk within an exchange, is defined using its actual value and its chance that a loss will result. The projected worth of assets that are at risk, for for example, is \$10,000 if an one million-dollar expenditures has been subjected to a 1% loss threat.

A large number of monetary instruments demonstrate price swings in adaptation to turns in risk-influencing variables.

> Neural Network and Adaptive Risk Prediction

A further advancement that's being studied for application in the field of risk management is neural networks .Systems of computers with internal architectures represented after real brain systems are called neural systems. Neural net investigation currently attempts to mimic two key human acts: that imitates adaptive actions and replicating rapid learning. In the banking and finance industry, neural nets are being investigated in a variety of scenarios, among which are asset price forecast and bankruptcies prediction, anticipating prepayment rates for mortgage-backed securities (also known as MBS) portfolios, and and classification of consumers to enhance new service targeting. The neural nets are utilized instead of specialist systems in scenarios where clearly analytical structures are not easily able to adequately represent what is going on.

Risk Management Systems: The Economic and Benefit Consequences of Implementing Firms

RMT-based risk mitigation systems (RMS) are usually costly. The price range for complex, large-scale risk management systems is from a couple of thousand to several billion dollars. The upper levels needs to consider the difficult matter of their payback in light of the high costs.

Management must first assess the cost-benefit ratio and hyperlink all of the advantages of a system to manage risks to its expenditures in order justify investments. The majority of the positive outcomes of such an apparatus are not material or unpredictable, making it tough to translate them into quantifiable cash flows, so that conventional discounted cash flow study is unable to capture their true value.

CONCLUSION:

Financial risk can be identified, measured, and monitored with the use of advanced information technologies. The development of advanced computing technology has made it easier to track and monitor investments made in other countries. Artificial intelligence is currently being used to help risk managers identify risky events. Machine learning. intelligence has been successfully applied in many financial applications. Thanks to parallel computing structures, financial risk under a variety of investment scenarios are now possible to determine in a matter of a second.

The distribution of tasks for multiple broad locations and integration of results with object-oriented database management systems and advanced communication technologies have simplified the task of monitoring global investment portfolios. Lastly, it has been showed that neural networks are helpful when determining to what extent which hazardous situations can affect.

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