

## Operational Risk Management (ORM)

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**Abstract:** This article discusses the management process of operational risk in financial institutions. While risk management has always been an integral part of financial activity, the 1990s has seen risk management establish itself as a key function within banks and other financial institutions. With greater emphasis on ensuring that money is not lost through adverse market conditions, counterparty failure or inappropriate controls, systems or people, risk management has become a discipline in its own right within financial markets. In this paper, we first review the different steps of the risk management process with respect to operational risk in the banking industry: the definition of operational risk, quantitative and qualitative methods for measuring operational risk, and risk management methods with respect to operational risk. In this study, we focus on the particular difficulties that arise with operational risk and argue that these steps cannot be treated separately as opposed to the management process of market or credit risk.

**Key words:** Financial markets, Risk, Operational risk, Risk management, Managing operational risk

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### INTRODUCTION

The financial markets industry has undergone tremendous changes over the past few years. The main drivers for change have been, and continue to be, globalization, advances in information technology and telecommunication. With the current trends in mergers and acquisitions creating larger and larger institutions and the developments in technology, the pace of change within the industry is accelerating. The resulting competitive and challenging Environment makes it imperative that financial institutions understand the risk that they are facing and have effective controls and procedures, systems and skills in place to deal with them.

The developments in technology provide financial institutions the ability to analyze and react to market information much more quickly. The continued development in data management and data analysis techniques and capabilities along with changes in communication technology mean that market data and rate movements are available to all institutions almost instantaneously across the globe. The ability to receive, assimilate, analyze and react to this flow of information will provide the key competitive advantage to an institution. While market and credit remain the key focus of risk management, the importance of operational risk in this volatile, high volume, and high technology environment is also enhanced. Organizational structure and culture along with technical infrastructure and staff commitment and skills play an increasingly important role. In this environment, the presence of a strong and an effective risk management infrastructure is of paramount importance to a financial institution. This not only requires the development of robust models for monitoring market and credit risk but also new approaches for understanding and managing operational risk. The nature of operational risk is that it does not easily lend itself to quantitative measurements and analysis. Therefore, in developing risk management infrastructure, institutions need to adopt a pragmatic approach that utilizes the best available tools and technology as well as common sense.

The purpose of this paper is to outline what is important in terms of risk management and to focus on operational risk as a key activity in managing risk on an enterprise-wide basis.

#### *Financial Markets:*

In economics, a financial market is a mechanism that allows people to buy and sell (trade) financial securities (such as stocks and bonds), commodities (such as precious metals or agricultural goods), and other fungible items of value at low transaction costs and at prices that reflect the efficient-market hypothesis.

Both general markets (where many commodities are traded) and specialized markets (where only one commodity is traded) exist. Markets work by placing many interested buyers and sellers in one "place", thus making it easier for them to find each other. An economy which relies primarily on interactions between buyers and sellers to allocate resources is known as a market economy in contrast either to a command economy or to a non-market economy such as a gift economy (Campbell et al., 1997). In finance, financial markets facilitate:

- The raising of capital (in the capital markets)
- The transfer of risk (in the derivatives markets)
- The transfer of liquidity (in the money markets)
- International trade (in the currency markets)

***Risk:***

The many inconsistent and ambiguous meanings attached to "risk" lead to widespread confusion and also mean that very different approaches to risk management are taken in different fields (Douglas, 2009). For example:

The ISO 31000 (2009) /ISO Guide 73 definition of risk is the 'effect of uncertainty on objectives'. In this definition, uncertainties include events (which may or not happen) and uncertainties caused by a lack of information or ambiguity. This definition also includes both negative and positive impacts on objectives.

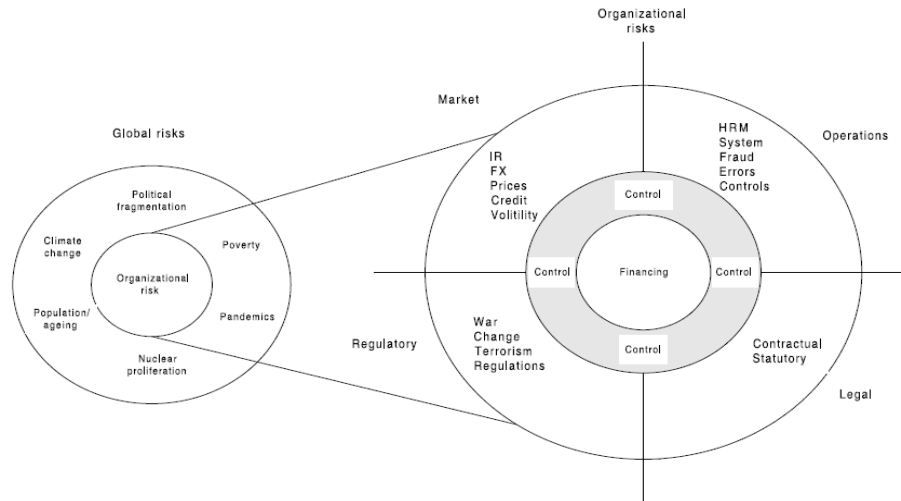
Another definition is that risks are future problems that can be avoided or mitigated, rather than current ones that must be immediately addressed (Hainan, 2010). Risk can be seen as relating to the Probability of uncertain future events (Jones, 2006). For example, according to Factor Analysis of Information Risk, risk is: the probable frequency and probable magnitude of future loss. In computer science this definition is used by The Open Group. OHSAS (Occupational Health & Safety Advisory Services) defines risk as the product of the probability of a hazard resulting in an adverse event, times the severity of the event. In information security risk is defined as "the potential that a given threat will exploit vulnerabilities of an asset or group of assets and thereby cause harm to the organization".

Financial risk is often defined as the unexpected variability or volatility of returns and thus includes both potential worse-than-expected as well as better-than-expected returns. References to negative risk below should be read as applying to positive impacts or opportunity (e.g., for "loss" read "loss or gain") unless the context precludes this interpretation.

***A. Risk in finance:***

In finance, risk is the probability that an investment's actual return will be different than expected. This includes the possibility of losing some or all of the original investment. In a view advocated by Damodaran, risk includes not only "downside risk" but also "upside risk" (returns that exceed expectations) (Damodaran, 2003). Some regard a calculation of the standard deviation of the historical returns or average returns of a specific investment as providing some historical measure of risk; see modern portfolio theory. Financial risk may be market-dependent, determined by numerous market factors, or operational, resulting from fraudulent behavior (e.g. Bernard Madoff). Recent studies suggest that testosterone level plays a major role in risk taking during financial decisions (Sapienza et al., 2003). In finance, risk has no one definition, but some theorists, notably Ron Dembo, have defined quite general methods to assess risk as an expected after-the-fact level of regret. Such methods have been uniquely successful in limiting interest rate risk in financial markets. Financial markets are considered to be a proving ground for general methods of risk assessment. However, these methods are also hard to understand. The mathematical difficulties interfere with other social goods such as disclosure, valuation and transparency. In particular, it is not always obvious if such financial instruments are "hedging" (purchasing/selling a financial instrument specifically to reduce or cancel out the risk in another investment) or "speculation" (increasing measurable risk and exposing the investor to catastrophic loss in pursuit of very high windfalls that increase expected value). As regret measures rarely reflect actual human risk-aversion, it is difficult to determine if the outcomes of such transactions will be satisfactory. Risk seeking describes an individual whose utility function's second derivative is positive. Such an individual would willingly (actually pay a premium to) assume all risk in the economy and is hence not likely to exist.

In financial markets, one may need to measure credit risk, information timing and source risk, probability model risk, and legal risk if there are regulatory or civil actions taken as a result of some "investor's regret". Knowing one's risk appetite in conjunction with one's financial well-being is most crucial. A fundamental idea in finance is the relationship between risk and return (see modern portfolio theory). The greater the potential return one might seek, the greater the risk that one generally assumes. A free market reflects this principle in the pricing of an instrument: strong demand for a safer instrument drives its price higher (and its return proportionately lower), while weak demand for a riskier instrument drives its price lower (and its potential return thereby higher). "For example, a US Treasury bond is considered to be one of the safest investments and, when compared to a corporate bond, provides a lower rate of return. The reason for this is that a corporation is much more likely to go bankrupt than the U.S. government. Because the risk of investing in a corporate bond is higher, investors are offered a higher rate of return." The total spectrum of risks is shown in figure 1; it includes both global risks and organizational risks (Apicella and Adreber, 2008).



**Fig. 1:** The total spectrum of risks

**A. Risk categories:**

There are three main categories of risk that an organization experiences when operating in financial markets. These categories are market risk, credit risk and operational risk (Hussain, 2000) .

**-Market risk:**

Market risk refers to the risk to an institution resulting from movements in market prices, in particular, changes in interest rates, foreign exchange rates, and equity and commodity prices. Market risk is often propagated by other forms of financial risk such as credit and market-liquidity risks. For example, a downgrading of the credit standing of an issuer could lead to a drop in the market value of securities issued by that issuer. Likewise, a major sale of a relatively illiquid security by another holder of the same security could depress the price of the security. The market risk factors cited above are not exhaustive. Depending on the instruments traded by an institution, exposure to other factors may also arise. The institution’s consideration of market risk should capture all risk factors that it is exposed to, and it must manage these risks soundly. It includes: a-price risk b-interest rate risk c-currency risk.

**-Credit risk:**

Broadly defined, credit risk is the risk that counterparty will fail to perform on an obligation to the financial institution. It involves both settlement and pre-settlement credit risk for customers across all products. On settlement day, the exposure to counterparty default may equal the full value of any cash flows or securities the institution is to receive. Prior to settlement, credit risk is measured as the sum of the replacement cost of the position, plus an estimate of the bank’s potential future exposure from the instrument as a result of market changes. Credit risk includes: a-Direct credit risk b-Credit equivalent exposure c-Settlement risk.

**-Operational risk:**

Operational risk is by far the most extensive risk category. At its broadest, it is defined as everything that is not market and credit. It can range from a natural disaster, which can cause the loss of a primary trading site, to a difference in the payment conventions on a foreign exchange transaction. It includes such matters as inappropriate organizational structure, inadequate systems, failure to properly supervise, defective controls, fraud, legal and regulatory issues and human error. The difference between operational risk and operations risk also becomes apparent when defining the total constituent categories of operational risk. Operational risk includes: Portfolio risk; Organizational risk; Strategic risk, personnel risk; change management risk; Operations risk; Currency risk; Country risk; Shift in credit rating; Reputation risk; Taxation risk; Legal risk; Business continuity risk; and regulatory or compliance risk.

**A.measuring operational risk:**

There has been a lot of work done in defining operational risk and ways of managing it. While techniques for measuring market and credit risk are well established and understood, the development of financial measures for operational risk are still at early stages. Because of its complex nature, operational risk does not easily lend itself to financial quantification. The industry has not developed any standard measurement techniques. The regulatory and supervisory community is actively thinking about capital charge for operational risk based on

yet-to-be defined standard measures of an institution's exposure to this type of risk. The nature of operational risk makes quantitative assessment very difficult and providing financial estimates of its exposure requires a complex combination of people, processes, technology and other internal and external events. Whether a standard methodology can be developed for measuring such a disparate array of influences and events will remain the subject of passionate debate for the foreseeable future. However, institutions have begun to attempt various techniques for measuring operational risk exposure. These techniques include fixed or proportional charge based on operational costs, using statistical models based on historic information about losses and loss events and process models where each core process is analyzed to determine the potential cause of each loss event.

Whatever measurement methodology organizations develop, effective management of operational risk requires an integrated approach to the development of staff skills and training, optimization of the business processes, development of a risk aware culture and a technological infrastructure that allows the organization to process, monitor and manage the business.

***A. why manage operational risk?:***

Most financial institutions have taken some measures to address operational risks. However, they generally take such actions reactively to remedy a specific issue that has already surfaced. Very few companies have adopted integrated, proactive programmes for managing operational risk. The following are a few reasons why a more integrated approach should be adopted.

- a) Recurring operating losses
- b) Growing complexity of the trading environment
- c) Client demand
- d) Need for integrated risk management

***A. managing operational risk:***

Risk managers usually have a large set of management methods available out of which the optimal combination should be selected with the aim of maximizing business value. Those methods include loss reduction, insurance within and outside of the company, or hedging. In the following, we discuss the potentials of those management practices with respect to operational risk. Operational loss prevention aims at reducing the frequency and/or severity of events leading to operational losses. Such activities include internal auditing, penalties, rewards, or duplication of processes and seem applicable when dealing with fraud, crime, mis-pricing, or system failure. Capital allocation against operational losses provides a means of self-insurance. The adequacy of the capital amount to be allocated relies on the validity of both the risk measure – the mapping between the loss distribution and the capital amount – and the underlying statistical analysis. Hence, this risk management method seems only applicable in the context of high frequency events such as transaction failure, credit card fraud, or accounting irregularities. As most losses due to operational risk are bank-specific and thus almost uncorrelated across different banks, insurance provides an excellent means of pooling and diversifying those risks across the industry. In fact, insurance products based on operational risks have been available for decades such as single-peril coverage for Directors and Officers Liability or Professional Indemnity. Only recently, events like unauthorized trading or computer crime have been included into multi-peril policies such as the FIORI-product (financial institutions operational risk insurance) launched by Aon and Swiss Re. However, both ex-ante and ex-post moral hazard issues may give rise to high premiums and renegotiation costs. Not only may operational risk be managed more negligent if insurance is in place (ex-ante), but also the difficulty in measuring actual losses may cause biased reporting (ex-post). Hedging provides another channel of reducing risk exposures. The existence of an instrument (e.g. financial derivative) whose value depends to some extent on the fundamental exposure of a corporation is crucial for reducing the overall risk exposure through hedging. This idea has not only lead to the search for existing hedging opportunities but also to the creation of new instruments as a response to growing concerns about the consequences of certain risk types. Particularly after major natural catastrophes in the nineties – Hurricane Andrew, the Northridge and Kobe earthquakes – risk securitization appeared in the form of exchange-traded and OTC financial instruments. Examples of these contracts include Catastrophe Futures and Options that were traded at the Chicago Board of Trade and Catastrophe Bonds that are traded as OTC derivatives. Following this development, it has been suggested to create financial instruments to deal with operational risk. However, the experience with securitization of catastrophic risk has shown that such a market can only be successful if these instruments are designed in a way as to overcome problems arising from moral hazard issues, basis risk, and non-transparent valuation mechanisms. These problems seem very apparent in the context of operational risk as most operational losses are due to bank-specific, internal events. The market for tax derivatives, however, represents an exception to the issues mentioned above. Risk prevention and reduction thus seems to be the most appropriate management device with respect to operational risk. The implementation of such internal management mechanisms is immensely powerful particularly during times in which underlying risk patterns have not been thoroughly

understood, sound risk models have not been developed, and large databases have not been constructed yet (Muermann and oktem, 2002).

**A. Operational Risk Management Process:**

There are the following six-step “Operational Risk Management” (ORM) processes for financial institutions. Figure 2 illustrates the process:

**Step 1: Identify the Hazard:**

A hazard is defined as any real or potential condition that can cause degradation, injury, illness, death or damage to or loss of equipment or property. Experience, common sense, and specific analytical tools help identify risks.

**Step 2: Assess the Risk:**

The assessment step is the application of quantitative and qualitative measures to determine the level of risk associated with specific hazards. This process defines the probability and severity of an accident that could result from the hazards based upon the exposure of humans or assets to the hazards.

**Step 3: Analyze Risk Control Measures:**

Investigate specific strategies and tools that reduce, mitigate, or eliminate the risk. All risks have three components: probability of occurrence, severity of the hazard, and the exposure of people and equipment to the risk. Effective control measures reduce or eliminate at least one of these. The analysis must take into account the overall costs and benefits of remedial actions, providing alternative choices if possible.

**Step 4: Make Control Decisions:**

Identify the appropriate decision-maker. That decision-maker must choose the best control or combination of controls, based on the analysis of step 3.

**Step 5: Implement Risk Controls:**

Management must formulate a plan for applying the controls that have been selected, and then provide the time, materials and personnel needed to put these measures in place.

*Step 6: Supervise and Review*

Once controls are in place, the process must be periodically reevaluated to ensure their effectiveness. Workers and managers at every level must fulfill their respective roles to assure that the controls are maintained over time. The risk management process continues throughout the life cycle of the system, mission or activity.



**Fig. 2:** ORM’s 6 process steps

**Discussion and Conclusions:**

Operational risk management provides a logical and systematic means of identifying and controlling risk. Operational risk management is not a complex process, but does require individuals to support and implement the basic principles on a continuing basis. Operational risk management offers individuals and organizations a powerful tool for increasing effectiveness and reducing accidents. The ORM process is accessible to and usable by everyone in every conceivable setting or scenario. Historically, ORM has taken a back seat to the management of the other major risks, which are often defined as market, credit, insurance and strategic risk and sometimes include liquidity, legal and reputation risk. This is largely because operational risk is often confused

with operations risk. This has not only caused operational risk to be underestimated, but has also obscured the underlying causes of many of the most significant financial losses.

Financial firms have spent millions of dollars on ORM, but with limited success, since they have generally taken a traditional audit-based approach (Traditional ORM). In the United States, the broad principles underlying this general approach have been incorporated into a set of enterprise risk management standards that are referred to as COSO ERM. Most major accounting firms and numerous consulting firms, rating agencies, industry bodies and independent experts advocate using this approach or a customized version thereof. A majority of national and international bank regulators have also at least tacitly endorsed this approach. Finally, a large number of corporate CFOs believe that Traditional ORM represents the standard for best practices. Consequently, virtually every organization that has implemented an ORM program has based the underlying framework on the principles of Traditional ORM.

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