BASEL PROJECT WORK

REPORT

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Operational Risk Management & Capital Adequacy Measurement

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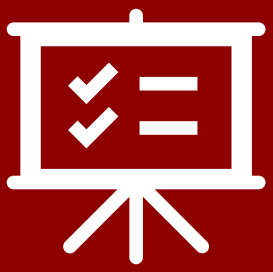
INTRODUCTION



Before getting into the crux of the project, it is crucial to have a clear understanding of the topic and defining the objectives to be achieved. Throughout the process, these serve as a reminder of what our final learning goal. Not only that, but they also help us evaluate our performance once the project is completed. So, let us get some context first.

We have recently been appointed as the Operational Risk Management Head of a bank. Based on our evaluation, we have identified that the bank can adopt the Advanced Measurement Approach ('AMA') to measure their operational risk. To ensure robust understanding about the AMA methodology and a smooth implementation of the same, we are given the responsibility to present a detailed plan explaining the AMA approach for modelling operational risk and its effective implementation. We are specifically asked to document the following aspects:

- What is the Advanced Measurement Approach for measurement of operational risk capital requirement?
- What are its advantages and drawbacks over the existing operational risk management approaches?
- What are the possible techniques of quantitatively modelling various types of operational risks?

We have noted the requirement. This report shall cover the above-mentioned aspects in detail and provide the bank with a thorough understanding of the AMA approach along an implementation strategy and tips.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OPERATIONAL RISK & ITS MEASUREMENT

What is Operational Risk?

Operational Risk is defined by the Basel Committee on Banking Supervision as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk but excludes strategic and reputational risk. This definition is based on the underlying causes of operational risk. It seeks to identify why a loss happened and at the broadest level includes the breakdown by four causes: people, processes, systems and external factors.

Various approaches are used by banks and financial institutions across the globe to measure operational risk and computing capital for operational risk. The approaches can be divided into 3 categories:

- **The Basic Indicator Approach:** The Basic Indicator approach is the simplest and the most basic of all approaches to compute operational risk and capital adequacy under it. Under the Basic Indicator Approach, banks must hold capital for operational risk equal to the average over the previous three years of a fixed percentage of a single indicator, which has currently been proposed to be 'gross income'. In India, as per the directives of The Reserve Bank of India, all banks must adopt the Basic Indicator Approach while computing capital for operational risk, irrespective of their level of sophistication.

- **The Standardized Approach:** In comparison to the Basic Indicator Approach, The Standardized Approach is an advanced method for computing capital requirement under operational risk. Under this approach, the bank's business line is sub-divided into 8 sub-categories, namely – Corporate Finance, Trading and Sales, Payment and Settlement, Agency Services, Asset Management, Retail Brokerage, Retail Banking, and Commercial Banking. These business lines are then assigned a relevant indicator, which is the gross income for that business line. Banks adopting this approach, must apply it at a solo bank level as well as across the entire banking group, except insurance business.

- **The Advanced Measurement Approach:** The AMA adopts an internal model generated by the bank to measure the capital requirement for the operational losses. Under this approach, the capital requirement will equal the risk measure generated by the bank's internal operational risk management model created using numerous quantitative and qualitative criteria. We shall discuss this approach in further detail in the upcoming sections of this report. However, one must bear in mind that the use of the Advanced Measurement Approach is subject to regulatory approval and timely checks by the regulator.

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WHAT IS THE ADVANCED MEASUREMENT APPROACH?

In the previous section, we acquainted ourselves with the concept of operational risk and the various methods for computing capital requirement for operational losses. In this section, we will understand the Advanced Measurement Approach in further detail.

What is The Advanced Measurement Approach?

As we have previously understood, the AMA adopts an internal model generated by the bank to measure the capital requirement for the operational losses. Under this approach, the capital requirement will equal the risk measure generated by the bank's internal operational risk management model created using numerous quantitative and qualitative criteria. The implementation and usage of the model generated under this approach is strictly subject to the approval of the regulatory authority.

Minimum Standards of The Advanced Measurement Approach?

A bank must satisfy certain minimum requirement standards to even qualify to use the AMA. The minimum standards are as follows:

- The Board of Directors and Senior Management are actively involved in the formation and oversight of the Operational Risk Management Framework of the bank
- The bank has a conceptually sound operational risk management framework and system that is implemented with integrity
- The bank has sufficient resources in the use of the AMA in major business lines as well as the control and audit areas

The bank must note that its AMA will be under a period of initial monitoring by the regulatory authority. The authority, during this supervisory period, shall determine whether the AMA adopted by the bank is credible and appropriate. In evaluating the model, the supervisor shall check if a bank's internal model is able to estimate unexpected loss accurately, scenario analysis and different internal and external control factors. The AMA should also be able to allocate economic capital efficiently for operational risk across the business lines.

Having understood the minimum requirements, let us briefly understand the qualitative and quantitative standards that the AMA of the bank shall meet.

Qualitative Standards of The Advanced Measurement Approach

Qualitative standards are certain thresholds which cannot be measured quantitatively or in units, but in terms of subjective or conditional thresholds. A bank must meet the following minimum qualitative standards prior to the use of The Advanced Measurement Approach for computation of operational risk capital:

- The bank must have an independent operational risk management function that is responsible for the design and implementation of the bank's operational risk management framework.

- The bank's internal operational risk measurement system must be closely integrated into the day-to-day risk management processes of the bank. Its output must be an integral part of the process of monitoring and controlling the bank's operational risk profile.
- There must be regular reporting of operational risk exposures and loss experience to business unit management, senior management, and to the board of directors. Proper dissemination of information is must.
- The bank's operational risk management system must be well documented.
- Regular reviews of the operational risk management processes and measurement systems by internal and/or external auditors.
- Validation of operational risk measurement system by external auditors and/or regulatory authorities.

Quantitative standards are those standards which can be measured in units. A bank must meet the following minimum quantitative standards prior to the use of The Advanced Measurement Approach for computation of operational risk capital:

- A bank must be able to demonstrate that its approach captures potentially severe "tail" loss events. Whatever approach is used, a bank must demonstrate that its operational risk measure meets a soundness standard.
- Banks must have and maintain rigorous procedures for operational risk model development and independent model validation.
- Risk measures for different operational risk estimates must be added for purposes of calculating the regulatory minimum capital requirement.
- The operational risk measurement system must include the use of internal data, relevant external data, scenario analysis and factors reflecting the business environment and internal control systems.
- A bank needs to have a credible, transparent, well-documented and verifiable approach for weighting fundamental elements in its overall operational risk measurement system.
- Banks must effectively track internal loss data.
- A bank's operational risk measurement system must use relevant external data.
- A bank must use scenario analysis in conjunction with external data to evaluate its exposure to high-severity events

A green signal to adopt the AMA is subject to the meeting of the above-mentioned qualitative and quantitative standards. Not only that, but the bank must also adhere to these standards as it helps them to capture their operational risk losses and compute adequate capital effectively and accurately for the same.

While the AMA is advanced and slightly complicated, it offers numerous advantages to the banks over the current approaches. Let us look at the advantages and drawbacks of the current approaches employed by banks in the next section.

ADVANTAGES AND DRAWBACKS OVER CURRENT APPROACHES

Advantages and Disadvantages of The Advanced Measurement Approach

As discussed in the previous sections, the methods employed by the banks currently to compute operational risk and capital adequacy under it are 'The Basic Indicator Approach' and 'The Standardized Approach'. However, off lately, the banks have shifted to adopt The Advanced Measurement Approach due to its numerous benefits over the other two approaches. Let us evaluate the various benefits of adopting The Advanced Measurement Approach over 'The Basic Indicator Approach' and 'The Standardized Approach':

- Portrayal of a solid and sound risk management system to all the stakeholders. Adopting The Advanced Measurement Approach, which is complex in nature, sends a positive message amongst the stakeholders that the bank possesses the required expertise to implement a sophisticated and advanced risk management approach.
- Use of internal models developed under the AMA reduces regulatory and economic capital requirement.
- Implementation of the AMA leads to improved risk management processes and more sophisticated risk measurement mechanisms.
- Improved relations between the risk personnel of banks and the regulatory authority. It also leads to obtainment of guidance from the regulatory authorities.
- As AMA matures and gains both the support and the confidence of management, it is becoming increasingly valuable to the business. Perceived initially to be mere risk measurement techniques, its elements can be leveraged and aligned with business performance management.
- AMA enables an organization to identify, measure, monitor, and control its inherent risk exposures of the business at all levels.
- AMA grants banks and financial institutions flexibility.
- AMA promotes the analytical and data management efforts of the business and the operational risk team to develop reporting protocols that serve both the individual business and the central management team.

While the AMA has its set of benefits, it also entails certain major shortcomings as compared to the previous approaches. The disadvantages of the AMA over the past approaches are:

- Adherence to minimum general, qualitative, and quantitative standards.
- Implementation subject to the approval of regulators.
- Prior approval required from the Board of Directors and Senior Management.
- The building and implementation of internal models requires skilled human resources, which entails a substantial cost.
- Internal models developed under the AMA requires sufficient empirical data. Sometimes, the bank does not possess this data.
- Segregation of responsibility for implementation and day-to-day monitoring of the models.
- The AMA is complex as compared to the Basic Indicator and Standardized Approach.

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QUANTITATIVE TECHNIQUES OF MODELLING TYPES OF OPERATIONAL RISKS

In this section, we shall cover the various quantitative techniques used for modelling various types of operational risks.

1. **Value-at-Risk, Tail-VaR, and Expected Shortfall** are some of the techniques to model the operational risks of the banks.
2. **Monte Carlo Simulations**.
3. **Scenario and Stress Testing**: Banks compute operational risk and various scenarios such as internal theft by employees, or by conducting stress testing on different variables. This testing the organization in view of its survival and further activities should the losses occur.
4. **Copulas:** Banks use this technique to efficiently compute the risk in tails i.e., the possibility of extreme losses occurring.
5. **The Basic Indicator Approach:** Explained in section 1 hereinabove
6. **The Standardized Approach:** Explained in section 1 hereinabove
7. **The Standardized Measurement Approach:** This is the latest method to compute capital adequacy for operational risk introduced under Basel III. This methodology shall replace the Basic Indicator, Standardized and Advanced Measurement Approach.
8. **Extreme Value Theory Methods**: Banks can also implement this technique to assess the occurrence of extreme events.
9. **Bayes Nets:** The Bayes approach solves the problem of the lack of data considering the distribution of losses in the so called 'thick tails'. This approach combines the qualitative, quantitative, outside data and key risk indicators.
10. **Six Sigma Methods:** Six Sigma is a rigorous and disciplined methodology that uses data and statistical analysis to measure and improve a company's operational performance by identifying and eliminating 'defects' in processes.

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CONCLUSION

We hope that this report provided an overview of The Advanced Measurement Approach to compute capital under operational risk, its advantages and disadvantages compared to the other methodologies, and some possible techniques of qualitatively modelling various types of operational risks. We must bear in mind that operational risk management is crucial and there must be a sound risk management implemented by banks and financial institutions to deal with it effectively and efficiently!

THANK YOU!