

Advanced Topics in CFE Module

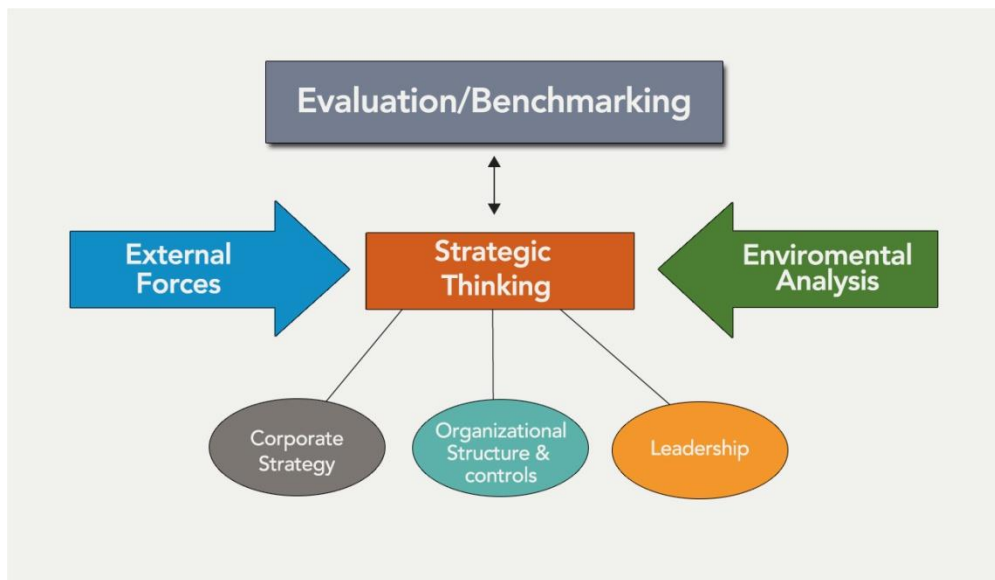
SECTION 1: MODULE OVERVIEW

Introduction

Advanced topics in CFE can include a broad range of concepts, which vary in their degree of complexity. This module will cover three concepts which can be directly applied within a company's ERM framework. Section 2 will cover Extreme Value Theory (EVT). EVT is a process to quantify risk in the tail of a loss distribution. At the core of the theory is the fact that in most cases, regardless of the underlying probability distribution, values above a large threshold approximately follow a Pareto distribution. Over the course of this module you will cover three applications of EVT to put the theory to work in a business context.

Strategic Thinking

Section 3 will switch gears and introduce the concept of strategic thinking. The graphic below shows a set of components that can explain the concept of strategic thinking:



As you work your way through this section you will learn about the factors that affect strategic thinking (external forces, environmental analysis), the organizational characteristics that

influence strategic decision-making (strategy, structure, controls, leadership) and how senior management uses these to evaluate and benchmark progress toward strategic goals.

Section 4 will illustrate, through a case study, the strategic planning process for Zoolander, Inc. You will work through a 10-year strategic planning exercise while applying opportunity engineering (OE) concepts to help senior management at Zoolander make strategic decisions regarding a new product they would like to introduce to the market.

Module Objectives

By the end of the module, you will be able to:

- Understand heavy tailed, medium tailed and light tailed risks
- Evaluate a risk loss study
- Explain limitations of EVT
- Estimate Parameters for an EVT model
- Construct a high level risk model
- Apply the use of EVT tools
- Evaluate EVT in the use with operational risk
- Explain limitations regarding pooling of operational risk
- Understanding what is meant by strategic thinking
- Determine strategic questions
- Evaluate scenarios
- Analyze financial statements and evaluate the impact on a strategic plan
- Interpret the results of environmental scanning and assess the opportunities
- Develop a 10-year strategic plan
 - How best to use scarce capital resources
- Evaluate when the strategic plan needs to be revised

Module Sections

The Advanced Topics in CFE Module consists of five sections:

- Section 1: Module Overview (You are here now)
- Section 2: Elements of Extreme Value Theory
- Section 3: Understanding Strategic Thinking
- Section 4: Strategic Planning
- Section 5: Conclusion

In addition, this module contains an End-of-Module Test and End-of-Module Exercise.

SECTION 2: ELEMENTS OF EXTREME VALUE THEORY

Introduction and Objectives

Extreme Value Theory (EVT) is a branch of statistics that has been around for many decades but is relatively new to actuarial work. Perhaps one reason for the lack of enthusiasm to date is that even successful applications of EVT often have some subjective elements, which can make the conclusions somewhat controversial.

While EVT may not be a perfect technical tool (which one is?), there are areas where it can add both quantitative and qualitative insight into risk issues. Three specific applications considered here are the quantification of operational risk, the aggregation of heavy-tailed risks and the distribution of maxima.

After completing Section 2, you will be able to:

- Understand heavy tailed, medium tailed and light tailed risks
- Evaluate a risk loss study
- Explain limitations of EVT
- Estimate Parameters for an EVT model
- Construct a high level risk model
- Apply the use of EVT tools
- Evaluate EVT in the use with operational risk
- Explain limitations regarding pooling of operational risk

SECTION 3: UNDERSTANDING STRATEGIC THINKING

Introduction and Objectives

The prior section focused on EVT to address specific loss events that a company might want to further examine. The remaining sections of this module will take a step back from detailed calculations and theoretical formulas to introduce you to higher-level concepts of strategic thinking and planning. Senior leaders use strategic thinking and planning to evaluate the competitiveness of the company and what business decisions need to be made. Strategic thinking involves creating company value by looking at the internal (company) and external (competitors and regulators) environments to evaluate the best allocation of resources. Resources include both human and financial capital. Failure to take a comprehensive view of the business will eventually lead to diseconomies of scale, competitive issues and in extreme cases company insolvency.

After completing Section 3, you will be able to:

- Understanding what is meant by strategic thinking
- Determine strategic questions
- Evaluate scenarios

SECTION 4: STRATEGIC PLANNING

Introduction and Objectives

Strategic planning takes the concepts learned in Section 3 and applies them in the everyday course of business. Strategic planning activities take place each year as companies evaluate how well they are executing the current strategic plan, react to changes in the competitive and regulatory environments and determine whether the current strategy needs to be modified. There are many lenses that strategic planning can be viewed through. Short-term planning covers 1-3 years. Medium-term planning covers a 3-5 year timeframe, while long-term strategic planning will span 5 or more years. The longer the time horizon, the more thorough the strategic planning exercise.

The typical approach to strategic planning starts off with senior management identifying long-term goals for the firm (i.e., long-term strategic planning). In order to meet the long-term goals, intermediate (or medium-term) goals need to be identified as checkpoints for the company to benchmark progress against. Once intermediate strategic plans have been made, short-term strategic goals can be established to drive the company towards the overall strategic direction.

After completing Section 4, you will be able to:

- Analyze financial statements and evaluate the impact on a strategic plan
- Interpret the results of environmental scanning and assess the opportunities
- Develop a 10-year strategic plan
 - How best to use scarce capital resources
- Evaluate when the strategic plan needs to be revised

SECTION 5: CONCLUSION

Introduction and Objectives

Before completing this module, you may have had little knowledge about extreme value theory, strategic thinking or strategic planning. You should now have a better understanding of these concepts and how they can be applied. It is important to understand the theoretical concepts behind what you have learned while being able to apply those concepts given the practical limitations in a business context.

EVT, as presented in this module, provided a method to approximate the distribution of losses above a large threshold using the Pareto distribution. Risk measures such as VaR and CTE can then be derived to provide the basis for quantitative information to be presented to management for informed decision making.

Strategic thinking and planning are essential tools for senior management. There are many decisions that need to be made, re-evaluated, and at times changed, based on the general environment and in the face of regulatory and/or competitive pressure. Being able to understand the concepts presented here will help you provide strategic insight and direction for your company in the years to come.

After completing this module you should be able to answer the questions below:

- What are common risk measures that can be calculated from all EVT Pareto Distributions?
- What are the components to strategic thinking and how do companies use these to drive strategic planning?
- Why is strategic planning a continual process?
- What types of issues do companies face when building and executing strategic plans?

END-OF-MODULE TEST

END-OF-MODULE EXERCISE