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UNCERTAINTY**

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PROJECT SELECTION
UNDER UNCERTAINTY
Dynamically Allocating Resources
to Maximize Value

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Preface

This book is the result of a five-year research program on the selection of projects in New Product Development (NPD). Part of the material is based on the first author's Ph.D. thesis research.

Portfolio selection is an unsolved problem in the sense that no overarching theory exists that addresses all relevant issues, which include strategy, differing mental models and social interactions of the players involved, in addition to the need to produce quantitative prioritization criteria. This book is rooted in the mathematical theory of resource-constrained optimization with the goal of maximizing quantitative returns – this is, in our view, the most comprehensive body of applicable theory. While we do not explicitly address multi-dimensional choice criteria (e.g., analytical hierarchy process), a limiting budget forces the multiple criteria back to optimization of a quantitative “composite goal”.

At the same time, the book attempts to broaden the portfolio discussion in two ways. First, we offer simplified models appropriate for the NPD context, where the lack of precise data is typical. Second, we discuss not only the annual portfolio review, but also what should be done with ideas as they emerge, and how projects should be prioritized once they are funded and ongoing. We attempt to develop qualitative decision rules and robust principles that are more easily applicable in practice than complex mathematical programming models. We hope that the reader sees some value in this undertaking.

Atlanta and Fontainebleau, November 2003.

STYLIANOS (STELIOS) KAVADIAS

CHRISTOPH H. LOCH

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Parts of our analysis have undergone the scrutiny of the academic review process, which helped us improve and extend our results, as well as clarify the message we want to convey. We thank the anonymous reviewers for providing us with their insightful comments and suggestions.

Finally, our research ideas benefited from useful discussions conducted with colleagues and friends. In particular, Laurens Debo (CMU), and Jose-Miguel Gaspar (ESSEC) provided sounding boards for ideas that later transformed into actual models.