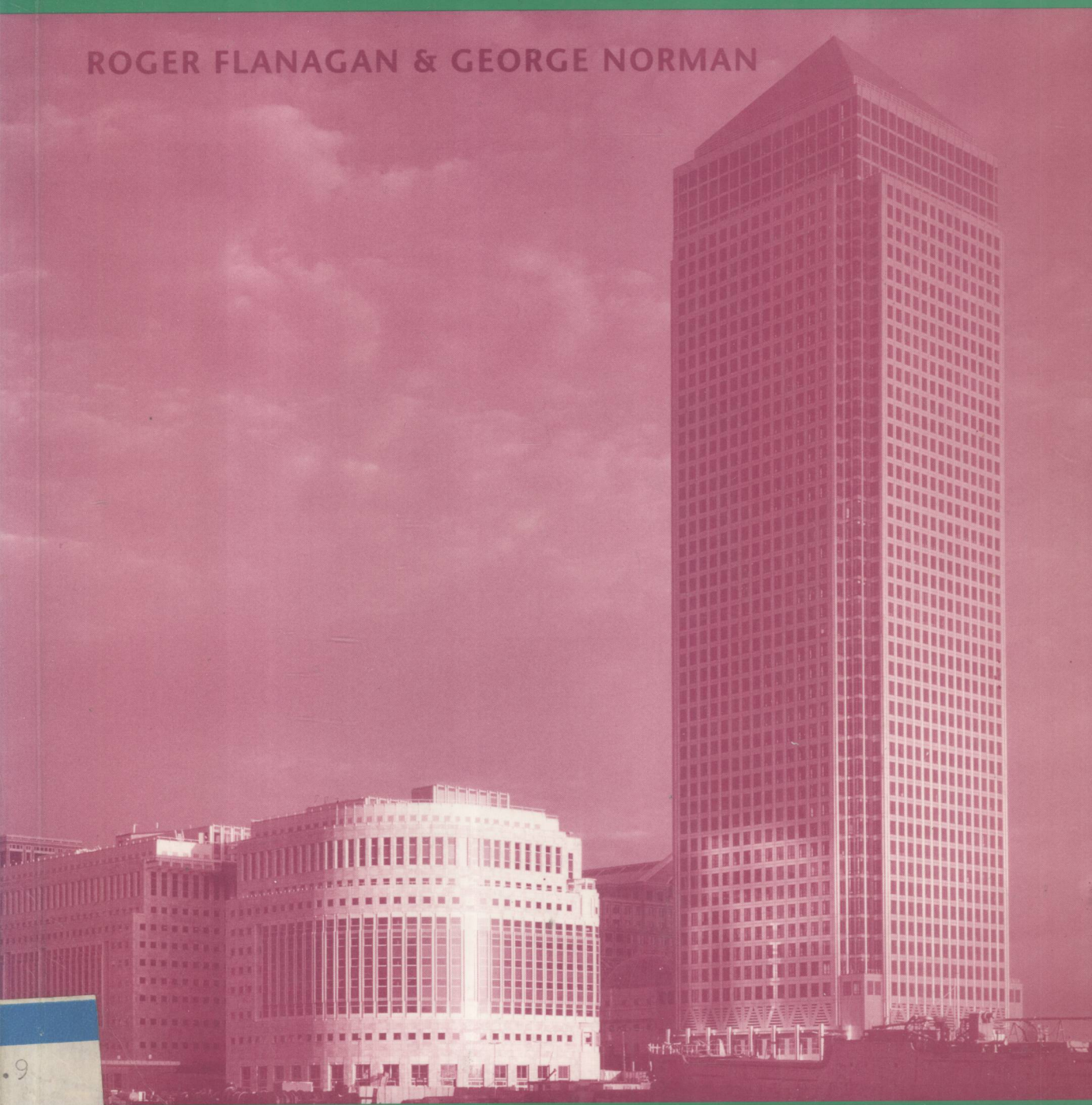
RISK MANAGEMENT AND CONSTRUCTION

ROGER FLANAGAN & GEORGE NORMAN



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RISK MANAGEMENT
AND CONSTRUCTION

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Blackwell Scientific Publications
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Other Editorial Offices:
Librairie Arnette SA
2, rue Casimir-Delavigne
France

Blackwell Wissenschafts-Verlag GmbH
Meinekestrasse 4
D-1000 Berlin 15
Germany

Blackwell MZV
Feldgasse 13
A-1238 Wien
Austria

First published 1993

Printed and bound in Great Britain by the University Press, Cambridge

DISTRIBUTORS

Marston Book Services Ltd
PO Box 87
Oxford OX2 0DT
(*Orders:* Tel: 0865 791155
Fax: 0865 791927
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USA
Blackwell Scientific Publications, Inc.
238 Main Street
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Canada
Oxford University Press
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(*Orders:* Tel: 416 441-2941)

Australia
Blackwell Scientific Publications Pty Ltd
54 University Street
Carlton, Victoria 3053
(*Orders:* Tel: 03 347-5552)

British Library
Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

ISBN 0-632-02816-5

Library of Congress
Cataloging in Publication Data

Flanagan, Roger.
Risk management and construction/
Roger Flanagan and George Norman.
p. cm.
Includes bibliographical references and index.
ISBN 0-632-02816-5
1. Risk management. 2. Construction industry. I. Norman, George.
II. Title.
HD61.F53 1993
624'.068'4—dc20 93-20446
CIP

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FOREWORD

INTRODUCTION

We would like to acknowledge the support of The Education Trust of The Royal Institution of Chartered Surveyors who generously supported work in the area of risk management for construction. Our thanks go to the Steering Group who provided advice, enthusiasm and help in structuring the work.

There are many people to thank for their time and assistance when preparing a book. Everybody we approached was always objective, helpful, and enthusiastic. Space prohibits us from listing everyone, but we convey our thanks to the large number of people who gave us their time and helped to formulate ideas. We are grateful to Euro Log Ltd of Teddington for their enduring assistance and for allowing us to use the Case Study in Chapter 10. Our thanks also to John and Carol Jewell for their help in the production of this book.

All the shortcomings, omissions and errors are totally ours.

Risk management will continue to develop and every publication takes the subject a stage nearer a better understanding of the construction process. There is still a long way to go - there will always be risk in construction.

THE AIM OF THE BOOK

The aim of this book is threefold:

- ❑ to give a broad overview of what is meant by risk and the way in which it influences decisions made in the construction industry;
- ❑ to describe some of the tools and techniques used in risk management in a broad range of industries;
- ❑ to describe systems and techniques that could be used by the design and construction team in the management of risk on construction projects.

Chapters 1 and 2 give the background to risk and uncertainty and deal with some of the theoretical aspects of risk. Chapter 3 describes a framework for a risk management system. Chapters 4 and 5 look at the tools and techniques and the later chapters consider the application of risk management.

It is hoped that the readership will include, clients, architects, surveyors, engineers, contractors and other professionals; hence when referring to a person making a decision, the term' decision-maker' has been used.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1

PUTTING RISK INTO PERSPECTIVE

INTRODUCTION

Risk! Construction projects have an abundance of it, contractors cope with it and owners pay for it. The construction industry is subject to more risk and uncertainty than many other industries. The process of taking a project from initial investment appraisal to completion and into use is complex, generally bespoke, and entails time-consuming design and production processes. It requires a multitude of people with different skills and interests and the co-ordination of a wide range of disparate, yet interrelated, activities. Such complexity moreover, is compounded by many external, uncontrollable factors.

In view of the inherent risks in construction, it is surprising that the managerial techniques used to identify, analyse and respond to risk have been applied in the industry only during the last decade. Most people would agree that risk plays a crucial role in business decision-making: the risk of loss tempers the pursuit of return. There is less agreement about what constitutes risk. It is well-publicised and much talked about, and yet intangible. Risk can manifest itself in numerous ways, varying over time and across activities. Essentially, it stems from uncertainty, which in turn is caused by a lack of information.

Numerous texts are available which deal with the underlying theoretical concepts of risk and with techniques which identify and manage it. There is a gap between the theory and the techniques proposed to manage risk, and what people do in practice. Intuition, expert skill, and judgement will always influence decision-making, but a set of tools is now needed which will enable risk management techniques to be put into practice in the construction industry. This book is intended to be a first step in this direction.

RISK AND REWARD GO HAND IN HAND

Most people, asked to name a situation which involves risk, would perhaps think first of physically dangerous sports, such as sky diving or motor racing. Others might cite gambling, whether in poker games or the stock market. Behavioural scientists would also include risk-taking enterprises which the public would not readily identify as such, for example, getting married.

Thus, the concept of risk can be applied to nearly every human decision-making action of which the consequences are uncertain. This uncertainty arises because an essential characteristic of decision-making is its orientation towards the future - a future which by its very nature is uncertain. Time is therefore a central variable to be considered when dealing with risk. We can take risks or we can be at risk. We can speak of *the* or *a* risk and we can consider ourselves as risking something.

Risk

The word risk is quite modern, it entered the English language in the mid 17th century, coming from the French word *risqué*. In the second quarter of the 18th century the Anglicised spelling began to appear in insurance transactions.

In a manufacturing or commercial context, risk is endemic to all investment decisions. Each investor, faced with investments characterised by very different risk/return profiles, will have an individual attitude to risk. At one extreme, the investor can opt for a relatively risk free investment by purchasing government short term treasury bills issued at a fixed rate of return. At the other extreme the investor can decide upon ordinary shares; the high risk involved was demonstrated in the October 1987 (known as Black Monday) share market crash around the world.

Obviously some decisions are more important than others. Take for example the individual faced with two decisions: whether or not to take an umbrella to work and whether to invest millions of pounds in developing and building a hotel. The process of decision-making can be intuitive, pragmatic or dogmatic, or it can be rational and scientific, depending on the importance of the consequence. If he fails to take an umbrella and it rains, he will get wet and might catch a cold; if he fails to get a sufficient return from his hotel investment, the result is financial disaster and possible ruin.

Investors in financial markets recognise that risk plays an important role in their allocation of assets across different investments. In a climate of economic uncertainty, with increasing volatility in the financial

markets and on the foreign exchanges, investment decisions by management have become more demanding. Estimates of expected profits or returns, which are based upon the percentage return on investment or the internal rate of return, will not provide the company or the investor with sufficient information on which to base a sound decision. The investor needs some indication of the possible deviations from the expected profit or returns if there is a downturn in the economic conditions, and of the sensitivity of the investment to changes in the market. Simply put, the investor needs to know his or her risk exposure.

The two most important questions are whether the returns on the project justify the risks, and the extent of the loss if everything goes wrong. Clearly, the decision-maker's perception of risk is more likely to be influenced by the probability of a loss and the amount of that loss than by a variance in the gamble. Thus the techniques for quantifying risk as an aid to decision-making have become more important. These techniques must be based on a proper understanding, both of the terms involved and of other basic concepts such as why, given exactly the same situation and information concerning a proposal, two people may come to different decisions.

Risk and construction

It might be argued that these considerations apply to investment in financial markets but have little to do with the apparently more 'real' environment of the construction industry. Nothing could be further from the truth. The individuals involved in the industry form two groups: 'principals' who commission construction and 'agents' who undertake the various activities that produce buildings, roads, bridges etc. These groups are, of course, heterogeneous. A principal can be anyone from a government department or a major development company to an individual householder. Agents include professionals such as architects, engineers, surveyors, general contractors, and a wide range of specialist sub-contractors and suppliers.

It is easy for the principals to see the relevance of risk management. A principal, in using the construction industry, is making an investment decision: the decision to commission a prestigious office building or a new garage. The capital committed could, instead, be invested in government bonds or some market portfolio of financial assets. The decision to invest in a building must, therefore, provide a risk/return profile which is competitive with the best that the financial markets can provide.

For the agents, the argument is not so straightforward but is equally valid. An agent bidding for the relevant part of a building project is committing resources - labour and capital - that have other potential uses. Money may have to be borrowed, or reserves used, to cover a gap between income and expenditure, while profit, if it is made, will arise at some time in the future. With regard to the agent's own financial resources being