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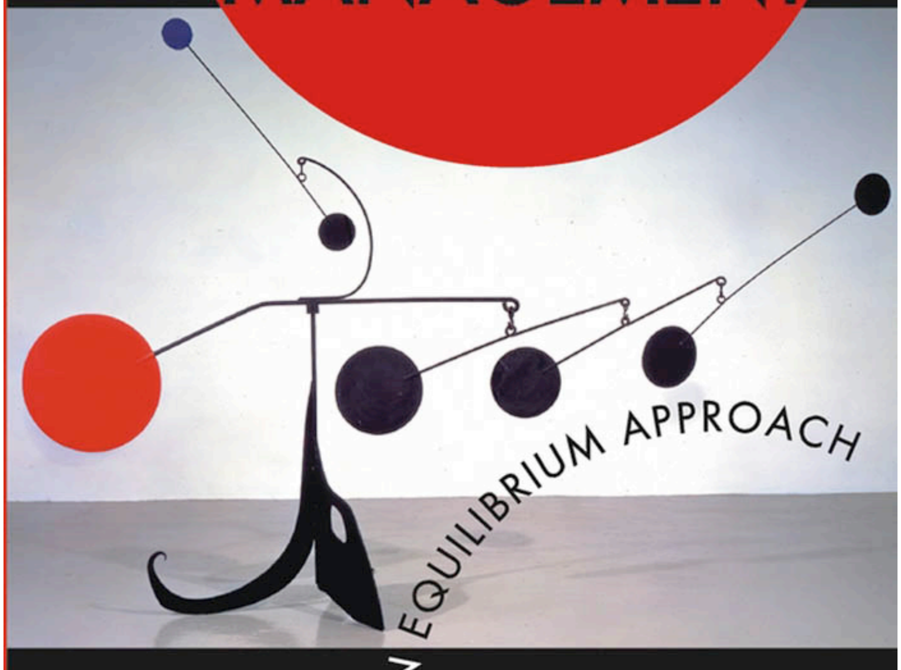

## AN EQUILIBRIUM APPROACH

**Bob Litterman and the Quantitative Resources Group**

**Goldman Sachs Asset Management**

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—Bob Litzenberger
Emeritus Professor, Wharton
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# MODERN INVESTMENT MANAGEMENT

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# Preface

A potential reader of this book with a cynical bent might well ask an obvious question: "If those folks at Goldman Sachs who wrote this book really knew anything worthwhile about investing, why would they put it together in a book where all of their competitors could find it?"

It's a good question, because it leads naturally to the kind of thought process this book is really all about. The question might be rephrased in a way that makes our motivation for writing the book a little more clear: "Why, in equilibrium, would a successful investment manager write a book about investment management?" By "in equilibrium" we mean in an investment world that is largely efficient and in which investors are fairly compensated for risks and opportunities understood and well taken. Suppose there is wealth to be created from careful and diligent pursuit of certain rules of investing. Suppose further that one were to write those rules down and publish them for everyone to follow. In equilibrium, wouldn't those sources of success disappear? Somehow it doesn't seem to make sense for good investment managers to write books about their craft. Indeed, many sources of investment success, in particular those with limited capacity, would eventually disappear with increased competition. What we have tried to do in this book is to focus on other types of phenomena, those with a capacity consistent with the equilibrium demand for them. In equilibrium these types of phenomena would remain.

Consider an example of a phenomenon with limited capacity. Suppose it were the case that looking at publicly available information one could easily identify certain stocks (for example, those with small capitalization) that would regularly outperform other stocks to a degree not consistent with their risk characteristics. We would expect that if such a strategy were published and widely recognized, then the prices of such stocks would be bid up to the point where the costs of implementing such a strategy just about offset any remaining excess returns. In other words, we would expect such a phenomenon to disappear.

Now consider a phenomenon in the equilibrium camp. Suppose a rule of portfolio construction, for example a rule suggesting increased global diversification, were published that allows an investor to achieve a higher level of return for the same level of portfolio risk. The actions of investors following this suggestion will increase their expected wealth, but their implementation does not in any way reduce the strategy's effectiveness. Even though other investors might implement the change (in equilibrium all investors will), it will nonetheless remain a rule that makes sense for each investor individually. In this book we write about the latter class of phenomena, not the former. In equilibrium this is what a reader should expect us to do.

Despite this equilibrium approach, our view is that the world is clearly not perfectly efficient, whatever that might mean. There might be a little bit of extra reward for those armed with the most thorough, efficient, and disciplined investment processes, even though competition will certainly quickly eliminate most such opportunities. In equilibrium, markets will be relatively efficient, and to the extent that there are limited opportunities left to create excess returns, why would any profit-seeking investor put such proprietary insights into print? The answer is, of course, that in truth they would not. Let's be honest: To the best of our ability we have tried not to include any proprietary information; there are no secret insights buried in this book about how to beat the market, and no descriptions of the exact factors that enter our quantitative return generating models. Clearly some of the anomalies we rely on to actively manage assets are not equilibrium phenomena, and the process of inviting too many competitors to fish in our pond would diminish our ability to create excess returns in the future.

We do believe, though, that the material we have written here is worthwhile. What we have tried to do is to describe what happens when markets are in equilibrium, and how investors, trying to maximize their investment return, should behave. We also address the question of how investors might, as we do, try to identify and look to take advantage of deviations from equilibrium.

Enough about equilibrium theory. The authors of this book are all market professionals and what we have written is designed to be a practical guide. Although we spend a few chapters in the beginning developing a simple, one-period version of a global equilibrium model, the main body of the text is concerned with what it takes to be a serious investor in the world today. The basics of being a smart investor involve understanding risk management, asset allocation, the principles of portfolio construction, and capital asset pricing. The latter refers to being able to identify the return premiums that are justified by the risk characteristics of different securities, and therefore understanding the basis for being able to identify opportunities.

We have chapters focused on the traditional equity and fixed income asset classes as well as on alternative assets such as hedge funds and private equities. We believe that active management can be productive, and we discuss how to build a portfolio of active managers. We understand, though, that not everyone can outperform the average and that in equilibrium it has to be extremely difficult for a portfolio manager to be consistently successful at the active management game. We have a core focus on the problems faced by institutional funds, but also several chapters on the special issues faced by taxable investors. We hope the book fills a gap by tying together the academic theories developed over the past 50 years with the practicalities of investment management in the twenty-first century.

Finally, we provide here a few words on who we are, and a few words of thanks to those to whom we are indebted. We are the Quantitative Resources Group, a part of Goldman Sachs Asset Management (GSAM). Our group has a number of functions. We manage money using quantitative models, we build financial and risk models, we act as fiduciaries and advisors to institutional funds, and we produce research and market outlooks.

Our debts are many, though clearly our deepest is to Fischer Black, our intellectual leader, a cherished colleague, and the first head of quantitative research in GSAM. Fischer was a great believer in the practical value of the insights provided by equilibrium modeling and he inspired our pursuit of this approach. We also wish to thank our clients whose challenges and questions have sponsored all of the activ-

ities we sometimes call "work." Next in line are our colleagues, those in the firm, in our industry, and in academia, who have shared their ideas, suggestions, and feedback freely and are clearly reflected on many of these pages. Many thanks to Goldman Sachs, which supported this project throughout and whose culture of teamwork and putting clients' interests first is embraced by us all. Thanks to Bill Falloon, our editor at Wiley, who suggested we write this book, then waited patiently for several years as the ideas gelled, and finally managed to cajole us into putting thoughts on paper.

And finally, a huge thank-you to our families who most of the time live with the short end of the "balance" that Goldman Sachs affectionately promotes between work and family—and who have contributed even further patience in putting up with our efforts to produce this book. Our domestic accounts are, as usual, hopelessly overdrawn.

ROBERT LITTERMAN

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*June 2003*

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