INTRODUCTION TO STOCK EXCHANGE INVESTMENT

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Janette Rutterford

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To my father and mother, without whom
I would never have finished this book

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Preface

Aim of the book

The desire to write this book arose from the lack of a good textbook suitable for my third-year undergraduate course on Stock Exchange investment. The books available fell into two main categories. The first category consisted of US texts which described the US stock markets and were thus of only indirect interest to UK-based students. The second category was aimed at the UK market but the books were either simple, factual texts which described rather than attempted to value securities, or 'how to make a million' books which were strong on recommendations but weak on theory.

This book therefore aims not only to provide an introduction to the world of investment, describing how the Stock Exchange works, the types of security quoted on it and the main types of investor, but also to explain the *principles* underlying Stock Exchange investment. The book concentrates on the two main characteristics of any security, risk and return, and, using these characteristics, shows how securities such as equities, gilts and options and overseas investments can be compared and valued. The book also explains how to approach the design of an investment portfolio and discusses alternative investment strategies, both those advocated in theory and those used in practice in the stock market.

Structure of the book

The book is divided into three main parts, with an introductory chapter which explains the role of the Stock Exchange and how it works, and a concluding chapter. Part I begins with Chapter 2, which shows how any

quoted security can be evaluated according to its risk and return and how risk and return can be measured. Chapters 3–6 show how these measures can be derived for the different types of security quoted on the Stock Exchange – fixed interest securities, shares and options on shares.

Part II concentrates not on how to value and compare individual securities but on how to *combine* securities into portfolios. Portfolio theory and the capital asset pricing model, described in Chapters 7 and 8, show how substantial diversification can lead to portfolios with better risk and return characteristics than portfolios consisting of only a few securities. Chapter 9 contrasts an investment strategy based on these models, where the emphasis is on diversification and on the expectation of a ‘fair return’ for the risk level of the portfolio, with the more common investment strategy where only a few securities are held in the expectation that these securities will produce ‘abnormal’ returns for the risk involved.

Part III is devoted to two somewhat peripheral subjects which are nevertheless of increasing importance to UK investors. The first subject, covered in Chapter 10, is that of international investment, which has traditionally been of greater importance to UK investors than, say, to their US counterparts, and which has become of even greater significance with the relaxation of exchange controls. The second subject, discussed in Chapter 11, is that of the investing institutions, which is again perhaps of greater significance in the UK stock market than in other major stock markets. The impact of the investing institutions on the UK Stock Exchange has been major, both as a result of their dominance as security-holders and their importance as traders in securities.

Chapter 12, the concluding chapter, considers the general objectives of the investor and the factors which should be taken into account when determining those objectives. The chapter also describes the alternative investment strategies available to the investor. By the time Chapter 12 has been reached, the reader should be clear as to which type of policy he or she prefers. The chapter finishes by describing performance measures which investors can use to evaluate their or other investors’ investment performance.

Readership

The book thus attempts to put a theoretical framework, based on the quantifying of risk and return, on the subject of Stock Exchange investment. This should be of interest both to students of Stock Exchange investment and to individuals who come into contact with

Stock Exchange investment, such as bankers, accountants, analysts, actuaries and, of course, investors, because the book is not confined to a student readership, the aim has been to keep the maths to a minimum, concentrating on explaining concepts by the use of examples rather than equations. Most of the calculations shown in this book can be carried out on a simple, hand-held calculator. The exceptions are valuing options and finding optimal portfolios; these require small computer programs which can be run on a micro-computer.

One point which I must make. Throughout the book I have referred to the investor as 'he'. I obviously expect a female as well as male readership, especially since the author is female, but I felt that to change constantly from 'he' to 'she' throughout the book would disturb the reader's concentration more than would be gained by striking a blow for equality of the sexes.

Acknowledgements

My thanks to the *Financial Times*, the Stock Exchange and the London Business School for permission to reproduce extracts from their publications. These extracts are crucial to the book, since one of its aims was to show how published financial data, in particular that provided in the *Financial Times*, can be used in investment decision-making.

Finally, I would like to thank all those who helped me to start *and* to finish this book. In particular, my thanks go to my father, who was the only person who had the courage to comment on the whole book. My thanks also go to colleagues who commented on various sections of the book and encouraged me, including Professor Harold Edey, Swee Ung, Steve Lumby, Nandan Choudhury, Martin Walker, Christopher Napier and Professors Susan Dev and Bryan Carsberg, and to Vivien Hope, who, with the help and hindrance of the word processor and my handwriting, converted the text into something worth looking at. My editor, John Winckler, must also be mentioned as the person who really convinced me to finish the book by the promise of a 'free' lunch. Finally, the person who suffered the most was my husband, Sebastian Wakefield, who bore with me during the eighteen months I took to write this book.

July 1983

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Glossary of terms used

<i>ACT</i>	Advance corporation tax
<i>AM</i>	Arithmetic mean
β	Beta risk of a security (derived from the capital asset pricing model)
$\beta_i^2 S_m^2$	Market risk of a security
<i>C</i>	Value of call option
<i>CORR_{AB}</i>	Correlation coefficient of returns of securities <i>A</i> and <i>B</i>
<i>COV_{AB}</i>	Covariance of returns of securities <i>A</i> and <i>B</i>
<i>CULS</i>	Convertible unsecured loan stock
<i>CT</i>	Corporation tax
<i>D</i>	Duration (measure of volatility of gilt to changes in interest rates)
<i>D_i</i>	Dividend or income to be paid on a security in period <i>i</i>
<i>dps</i>	Dividend per share
<i>e</i>	Exponential function
<i>E(infl)</i>	Expected annual rate of inflation
$\epsilon_{j,t} + 1$	Excess return on security <i>j</i> in period <i>t</i> + 1
<i>eps</i>	Earnings per share
<i>E(R)</i>	Expected return on a security
<i>E(R_m)</i>	Expected return on the market (all risky, marketable assets)
<i>E(R_m) - R_F</i>	Market premium for taking on risk
<i>E(R_p)</i>	Expected return on a portfolio
$e^{-R_{Fi}}$	The present value of £1 invested risk-free for a period <i>t</i> where the interest payments are continuously compounded
<i>E(U(W))</i>	Expected utility of wealth
<i>i_{fj}</i>	Forward interest rate for loans from year <i>i</i> to year <i>j</i>
Φ_t	Information on a security known in period <i>t</i>
<i>g</i>	Constant growth rate of dividends
<i>GM</i>	Geometric mean

HPR	Holding period return
k_i	Proportion of earnings paid out as dividends for security i
n	General term for the number of years, securities, etc.
$N(d_i)$	The value of the cumulative normal probability distribution (with a mean of 0 and an area under the curve of 1) evaluated at d_i
P	Value of put option
P_0	Current market price or value of a security (sometimes abbreviated to P)
P_1	Value of a security at the end of period 1
PE	Price-earnings ratio
p_i	Probability of state i occurring
$PV(X)$	Present value of a future cash flow X
R or r	Holding period return or annual return on a security
$R_{\$}$	Return expressed in dollar terms
R_F	Return on a risk-free security
r_i	Spot rate in year i , i.e. the annual rate of interest required for lending for n years starting now
$R_{j,t+1}$	Return on security j in period $t + 1$
ROI	Return on investment
$R_{£}$	Return expressed in sterling terms
S or S_1	Current share price used for option valuation
S_A	Standard deviation of returns of security A (sometimes the subscript is omitted)
S_p	Standard deviation of returns of portfolio
$S^2(e_i)$	Specific or diversifiable risk of security i
Σ	Summation sign
t	Time period
$TWROR$	Time-weighted rate of return
$U(W)$	Utility of wealth
V_A	Variance of returns of security A (square of standard deviation)
V_p	Variance of returns of portfolio
X	Exercise price of option
x	General term used for an unknown variable
X_0	Spot exchange rate
X_1	Spot exchange rate at the end of period 1
X_f	Forward exchange rate