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Robert A. Jarrow

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THE RELATIONSHIP BETWEEN YIELD, RISK, AND RETURN OF CORPORATE BONDS

ROBERT A. JARROW*

A COMMON STATISTIC for a bond is its market yield or internal rate of return. Numerous articles have been written utilizing the internal rate of return to examine the price volatility of bonds [9], [14], [21]. However, all these studies have two factors in common. One, they are nonstochastic and two, they involve Macaulay's duration. This paper, by introducing uncertainty, derives the general relationship between the expected return on a bond and its market yield. The derivation is for risky corporate as well as for default free government bonds. The relationship is nonlinear and involves an expression which is an approximation to the duration of a bond.

As a corollary to the above methodology, an alternate expression for the systematic risk of a bond is discovered. The expression involves only the market yield and the approximation to a bond's duration. This corollary generalizes the previous work of Boquist, Racette, and Schalarbaum [6] in two respects. First, this paper's formulation is for *any* type of a bond, while Boquist, et al. examined only default free securities. Second, the single period capital asset pricing model (CAPM) is replaced by its intertemporal counterpart as formulated by Merton [15].

An outline for the paper is as follows. Section I derives the relationship between a bond's market yield and expected return. Section II examines the systematic risk of a bond, while Section III concludes the paper.

I. BOND RETURN DYNAMICS

The market yield or internal rate of return[1] is not a good measure for a bond's expected return. It has serious drawbacks which have been discussed in detail elsewhere.[2] This section derives the exact relationship between these two concepts by utilizing the one-to-one correspondence between a bond's price and its internal rate of return. The internal rate of return, r, is defined for an arbitrary bond by expression (1).

$$P(t) = \sum^{T-t} \quad \text{where} \qquad (1)$$

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