

II. THE MODEL

Assume that firms maximize not profits, but expected utility, and let $U(P+W)$ be the firm's utility function.⁶ Utility is a function only of earnings, P (a random variable), and net worth, W . The risk premium, $R(P, W)$, is that amount required to make the entrepreneur indifferent between the expected value of the uncertain earnings, $E(P+W)$, and the certain amount $E(P+W) - R(P, W)$, corresponding to the expected utility of the uncertain earnings (Refs. 8, 26).

Earnings distributions and utility functions are not important per se; it is their interaction that determines the risk component of profits. Suppose that both the probability distribution of potential earnings and the firm's utility function are known (illustrated in Fig 1(b) for a risk-averse firm).⁷ Assume the probability distribution is curve (1). Both the probability distribution of utility, shown as (1) in (a), and its expected value, $E(U_1)$ are easily derived. Note that, although the probability distribution of earnings is symmetric about the expected value, $E(P)$, the distribution of utilities is skewed to the left. This occurs because the utility function is concave, resulting in a non-linear transformation from earnings into utility. The expected value of the utility distribution, $E(U_1)$, is less than the utility of expected earnings, $U(E(P+W))$, and the difference, translated into monetary terms, is the risk premium $E(P) - P^*$.

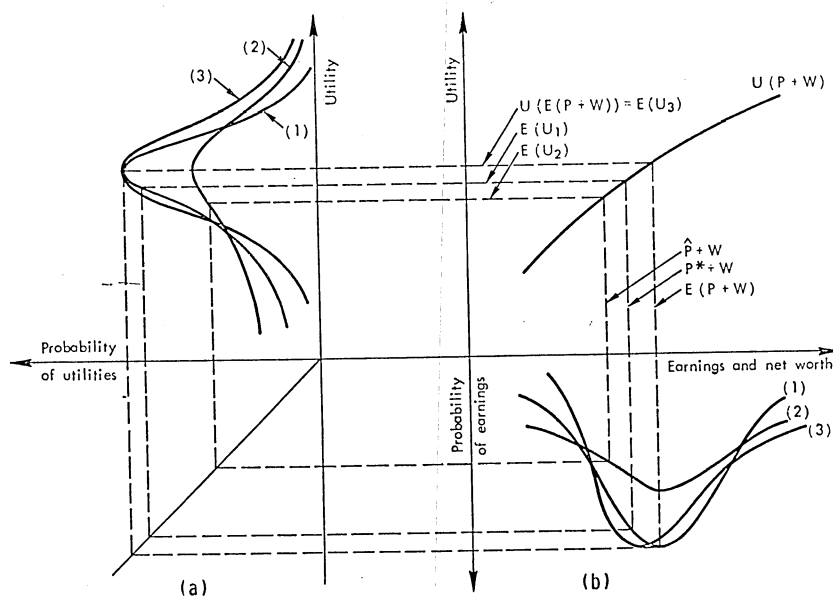


Fig. 1—Effect of dispersion and skewness on risk premium

Now suppose that the probability distribution is not curve (1) but curve (2). This distribution is also symmetric about the mean, but the variance is larger. The distribution of utilities is curve (2) in (a) and, as before, it is not symmetric

⁶ Here P refers to profits in the sense of increments to net worth, rather than the profit rate.

The question of "whose" utility function is moot. There are various candidates, e.g., managers, stockholders, the chief executive officer, as well as others (Ref. 10). It is assumed that each entrepreneur (management) is interested in maximizing the expected utility of the net worth of the firm on the basis of his judgments about stockholders' preferences. Such an assumption permits us to explore the relationship of uncertainty to earnings without having to deal with the complexities of adding stockholders' utility functions, or the Modigliani-Miller view that stockholders can lever portfolios to offset corporate management decisions about risk (Refs. 22, 24. See also Ref. 6).

⁷ If the firm is averse toward risk, the utility function is concave. This requires that $U' > 0$ and $U'' < 0$, or that utility increase with earnings and net worth, but at a decreasing rate.