

An index of riskiness

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Abstract:

We develop an index of riskiness of an investment or gamble. The well-known and widely applied indices of Arrow and Pratt measure risk AVERSION -- absolute and relative -- but not riskiness as such. We think of riskiness as arising from a comparison of potential gains to possible losses; roughly, the larger -- and more likely -- the potential gains relative to the possible losses, the less risky the gamble. On the whole, one may expect a more risk averse individual to reject riskier gambles, and to accept less risky ones. The index that we propose is "objective;" it does not depend on any specific utility function, but only on the distribution of gains and losses.

Such an index is of considerable practical importance. Much is said and written about risky investments; for example, a front-page article in the New York Times in March of 2004 reported that managers of (and consultants for) state operated pension funds often invest in (or recommend) investments that are "too risky." What exactly does this mean?

To be sure, the index we propose applies, in the first instance, only to gambles in which the probabilities are numerically known. In applications, say to investments, a major practical problem is that these probabilities are difficult to assess. However, we first wish to develop an appropriate definition of "riskiness" in principle, when the probabilities ARE known. Once such an index is developed, one can think about how to apply it to practical problems.