

EQUILIBRIUM IN A CAPITAL ASSET MARKET¹

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This paper investigates the properties of a market for risky assets on the basis of a simple model of general equilibrium of exchange, where individual investors seek to maximize preference functions over expected yield and variance of yield on their portfolios. A theory of market risk premiums is outlined, and it is shown that general equilibrium implies the existence of a so-called "market line," relating per dollar expected yield and standard deviation of yield. The concept of price of risk is discussed in terms of the slope of this line.

1. INTRODUCTION

IN RECENT YEARS several studies have been made of the problem of selecting optimal portfolios of risky assets ([6, 8], and others). In these models the investor is assumed to possess a preference ordering over all possible portfolios and to maximize the value of this preference ordering subject to a budget restraint, taking the prices and probability distributions of yield for the various available assets as given data.

From the point of view of positive economics, such decision rules can, of course, be postulated as implicitly describing the individual's demand schedules for the different assets at varying prices. It would then be a natural next step to enquire into the characteristics of the whole market for such assets when the individual demands are interacting to determine the prices and the allocation of the existing supply of assets among individuals.

These problems have been discussed, among others, by Allais [1], Arrow [2], Borch [3], Sharpe [7], and also to some extent by Brownlee and Scott [5].

Allais' model represents in certain respects a generalization relative to the model to be discussed here. In particular, Allais does not assume general risk aversion. This generalization requires, on the other hand, certain other assumptions that we shall not need in order to lead to definite results.

Arrow's brief but important paper is also on a very general and even abstract level. He uses a much more general preference structure than we do here and also allows differences in individual perceptions of probability distributions. He then proves that under certain assumptions there exists a competitive equilibrium which is also Pareto optimal.

Borch has investigated the problem with special reference to a reinsurance

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