

wrong to assume that one could materially affect the revenue streams of corporations without affecting the rate of return a corporation is able or expected to earn.

Although final consumer price was the question at issue in the several court and regulatory cases mentioned above, attention was directed toward rates of return in regulated industries. Questions of "adequacy," "excessiveness," and "equity" of final price were answered by examination of profit. Under assumptions of profit maximizing behavior questions of adequacy, excessiveness, and even equity are evaluated in terms of the rate of return and risk environment.

In studying adequacy and excessiveness of rates of return and risks, the courts and agencies have generally found that the government is not free to change merely the rates of return of the industries whose prices it seeks to establish. Unless the government is willing to make certain guarantees of minimum returns to these new "semiregulated" industries, it will leave the risk environment unchanged, while usually lowering the rate of return by lower product prices. Such action would result in a marked reduction in the flow of capital to these corporations and, therefore, in a necessary curtailment of the normal flow of goods and services to the public.

In summary then, any discussion of prices and excessiveness of prices in the pharmaceutical industry should be focused on the underlying issues of profitability of this industry, and even more importantly on the relation of this industry's profit level to the risks inherent in its operation. If prices are to be challenged or if suggestions are to be made by the Government for new price mechanism, the industry should be in a position to deal with such matters on grounds that are truly pertinent. What follows in this report is a theoretical and statistical development of risk/return relationships in American industry which can be used to place the entire issue of possible price regulation for drugs in the perspective of:

- (1) the Pharmaceutical Industry's position in our economy; and
- (2) the relationship of its profit level to its risk environment.

III. PROPOSED THEORY OF RISK AND RETURN³

Our objective in general terms has been to determine the relationship, if any, between the levels of profitability and varying degrees of risk experienced in American industry. The first variable, rate of profitability (or return) is relatively easy to measure conceptually. As will be explained in Section IV, we have used a number of book value and market value financial statistics to measure it. Problems of insuring inter-company accounting comparability were minimized by our use of the Compustat data, in whose preparation pains were taken to insure comparability.

The concept of risk, however, is a more troublesome problem involving semantics. Risk is basically a subjective phenomenon and not as susceptible to precise or direct measures. What we have done, therefore is to theorize that certain objectively measurable concepts are related to, and to some extent describe, risk. Our next step was, by statistical techniques, to correlate rates of return with these objective risk measures.⁴

Two types of problems can arise. First of all, because of some logical error or assumption contrary to fact, there may be no correspondence between the concept of risk and our objective measures. Our sole technique for dealing with this possibility has been to express as explicitly as we can the steps in our logic and our assumptions so that they may be critically examined.

The second type of problem is that we can find a relationship which turns out to be spurious, i.e., some statistical fluke. This type of problem is easier to deal with, at least conceptually. It is discussed in our analysis of the statistical results below.

The basic unit of concern in our risk/return analysis must be the individual corporation. It is within the individual corporation that the balance between

³ Parts of this section are based on the illustrations given by Paul Cootner and Daniel Holland in their study of Risk and Return for the American Telephone and Telegraph Company (M.I.T. DSR Project No. 9565).

⁴ Economists and financial analysts have long proclaimed the existence of a "risk premium." By this phrase they usually mean that prospective investors must be offered above average expectations of return (premium returns) in order to induce them to invest in projects having above average uncertainty (risk). Hence, the higher yield on a corporate debenture than on a government bond is believed to be caused by adding the appropriate risk premium to the government's (riskless) interest rate.