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COSTS OF DEBT AND EQUITY FUNDS FOR BUSINESS: TRENDS AND PROBLEMS OF MEASUREMENT

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It does not seem feasible at this time to present a paper that will do justice to the title, "Costs of Debt and Equity Funds for Business: Trends and Problems of Measurement." To me this title implies a critical analysis of available data, and concrete proposals for research. The need for such research is great. We have heard a great deal recently about an alleged shortage of equity capital, and we have actually observed that many corporations finance expansion with cash retained from operations or by borrowing. This may mean, as some have argued, that the usual sources of equity capital have dried up, but it may also mean that corporations find selling stock much less attractive, or perhaps more costly, than other methods of financing. How, therefore, do the costs of stock financing compare with the costs of borrowing, or the costs of retentions? When, if ever, do the costs of financing discourage business expansion? And finally, does the tax structure have any effect on the costs of financing?

I shall deal solely with conceptual problems and, in doing this, ruthlessly brush aside the practical details in hope of clarifying the basic issues. Although we have, I believe, a rather rough notion of what we mean by the cost of raising capital, this notion needs to be sharpened before it is applicable for use in actual measurement. Furthermore, the sharpening process indicates that our conceptual groundwork is inadequate to deal with many questions of investment and capital cost. Hence, the formulation of a working definition of capital cost necessitates reformulating a good deal of basic and generally accepted economic theory. But even if we achieve a satisfactory definition of cost and a sound basic theory, the practical problems of actual measurement are going to be tremendous. However, a good theory should enable us to understand these problems much better, even if it does not diminish them appreciably.

That these problems of measuring capital costs are much the same as the problems that arise in trying to appraise the going concern value of a

business enterprise is the general theme of this paper. Almost any method of estimating costs will, I believe, at least imply an evaluation of the common stock of a corporation or the proprietor's interest in an unincorporated business. That is, we can measure the costs of capital about as accurately as we can measure the value of common stock, and any of us who think that stock appraisal is a form of crystal gazing should prepare to include research on the cost of capital in the same category.

Before going on with this argument, I wish to offer a general disclaimer. During the past three months of intermittent work on this paper, I have repeatedly had to revise my opinions, and I expect to have to revise them further in the ensuing three months. I do, of course, expect to stand by two general principles: 1) *Our basic economic theory needs revisions;* 2) *Security appraisal is the key to measuring the cost of capital.* But the details of the argument are, like a timetable, subject to change without notice. This paper is therefore a historical statement of the development of my ideas to date.

Finally, I wish to thank Martin W. Davenport and Wilson F. Payne for contributing a large number of ideas, some of them basic, and for aid in formulating the argument.

I Basic Considerations

A great deal of our economic thinking is derived from a few fundamental notions concerning self-interest. The businessman is supposed to know what is best for him and to act accordingly. From analyzing these self-seeking actions, we hope to derive a theory of economic behavior. This paper is conventional in accepting the principle of self-interest and applying it to the problems of capital cost. If the businessman raises capital to finance a venture, it must be in furtherance of his interests; and any definition of the costs of raising this capital must be consistent with this principle.

This paper is unorthodox, however, in its conception of what actually constitutes a businessman's best interest. Instead of accepting the common dictum that the businessman's interest is to maximize his income, this paper counters with the alternative proposal that the businessman should try to maximize his wealth. This alternative has the advantage of greater flexibility, and for this reason it avoids errors that may result from forcing the principle of maximizing income on situations to which it is strictly inapplicable.

1 *Maximizing Income vs. Maximizing Investment Value*

One can attack the principle of maximizing income simply on the grounds that mankind's motives transcend the pecuniary, and that these motives affect his behavior, even in the market place. But leaving these nonpecu-

niary motives aside, one can also attack the principle of maximizing income on the ground that it is totally meaningless in any world in which income is expected to change. Suppose, for example, that a businessman has two possible ways to operate his business. Operation A promises him an annual return of $6,500 in perpetuity, and Operation B promises him $10,000 in perpetuity. The principle of maximizing income works well in this example. The businessman will certainly choose Operation B with its higher income (since nonpecuniary motives are ruled out).

But suppose this businessman has another alternative – Operation C – which gets under way slowly and thus promises him $7,000 the first year, $9,000 the second year, and $10,500 thereafter. The principle of maximizing income tells us that Operation C is preferable to Operation A because the income from Operation C is certainly larger than that from Operation A. But the principle cannot tell us whether Operation C is also preferable to Operation B. Is the combination of $7,000, $9,000, and $10,500 thereafter greater or less than $10,000 in perpetuity? This difficulty can be readily resolved provided a discount rate or other index of time preference is available, and provided, further, that the principle of maximizing income is appropriately modified.

The table below shows the discounted, or present, value of income under Operations B and C at four arbitrary rates of discount (standard compound interest tables were used). Thus, Operation B is preferable for rates of 10 percent and above, whereas Operation C is preferable for rates of 9 percent and below.

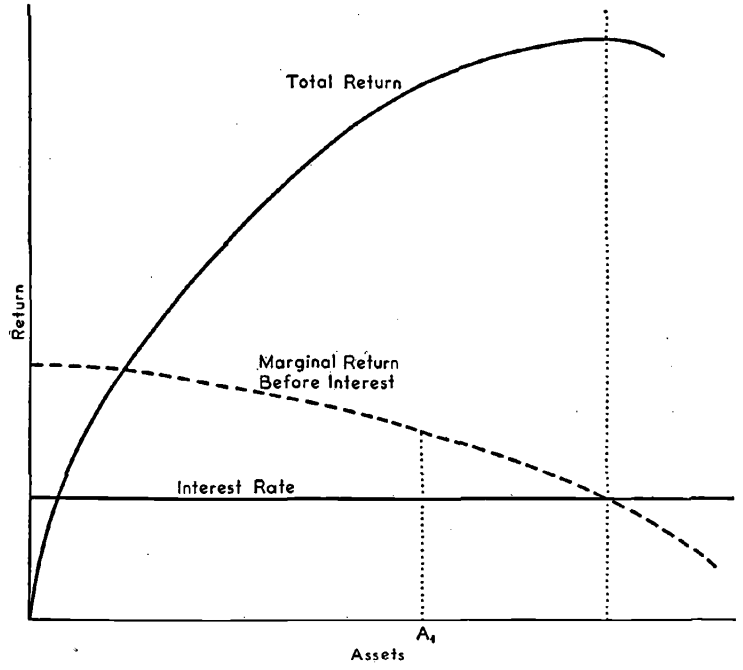
	DISCOUNTED VALUE		
Discount Rate	*Operation B*	*Operation C*	*Difference (Op. C – Op. B)*
7%	$142,857	$144,514	$1,657
8	125,000	125,832	832
9	111,111	111,314	203
10	100,000	99,711	–289

To effect this simple solution, it was necessary to modify the principle of maximizing income. The statement, "The businessman tries to maximize his income," was changed to read, "The businessman tries to maximize the *discounted value of his future income.*" Of course, some variations in terminology are possible within the revised statement; and, in fact, this paper will henceforth use the term "investment value" to mean the discounted value of an expected income stream.[1]

This revision is more than mere verbiage. The shift from maximization of income to maximization of discounted value has important implications

[1] Among the possible alternatives are "going-concern value" and "intrinsic value." Some security analysts specifically think of intrinsic value as a sum of discounted future income payments; others are less specific.

CHART 1



for the measurement of costs and the analysis of investment problems. It emphasizes the basic importance of appraisal and security analysis in molding business decisions. How can the businessman go about maximizing investment value without developing a system of appraisal that is suitable, to him at least?

Economic theory has used the principle of maximizing income to demonstrate that business expansion will proceed until the marginal return on capital equals the rate of interest. A brief resumé of the argument is illustrated in Chart 1. Here the marginal return curve represents the rate of return on successive small increments to a businessman's assets. The curve always slopes downward because the businessman is supposed to make his successive small investments in order of profitability. Since the marginal return represents the net return before interest, the distance between this curve and the horizontal line representing the interest rate is the marginal net return after interest. Thus, if the businessman expands his assets to the point A_1, his total profit is represented by the area between the marginal return curve, the interest line, the vertical axis, and a vertical line through A_1. The maximum possible total profit is attained when assets are expanded to the point where marginal return crosses the interest line.

Table 1

BALANCE SHEET OF THE ABC MANUFACTURING COMPANY

Assets		
Cash	$2,000,000	
Accounts receivable	5,000,000	
Inventory	7,000,000	
Total Current	14,000,000	
Plant and equipment, less depreciation	16,000,000	
TOTAL		$30,000,000
Liabilities		
Accrued items	$1,000,000	
Accounts payable	5,000,000	
Total Current	6,000,000	
Common stock, 1,000,000 shares at $15 per share	15,000,000	
Surplus	9,000,000	
	24,000,000	
TOTAL		$30,000,000

INCOME STATEMENT OF THE ABC MANUFACTURING COMPANY

Sales	$30,000,000	
Cost of goods sold	27,500,000	
Net operating income		2,500,000
Dividends paid		2,000,000
Transferred to Surplus		500,000
Earnings per share		$2.50
Dividends per share		$2.00
Net operating income, current operations	$2,500,000	
Net operating income, proposed operations	800,000	
	3,300,000	
Interest	400,000	
Net income		$2,900,000
Dividends (old rate)		2,000,000
Available for surplus		$900,000

This demonstration is valid if the returns attributable to the successive investment increments (represented by the curve for marginal return) can be assumed to remain constant and certain over time. But if these returns vary from year to year, and if there is an element of uncertainty as well, the treatment must be reformulated. First, the total profit curve should be supplemented by a curve showing the investment (discounted) value of the expected total profit. Second, some adjustment should be made for the risks that will inevitably be incurred by borrowing. But before modifying Chart 1, a digression on risk in business borrowing is appropriate.

Consider the hypothetical balance sheet and income statement contained in Table 1, and assume that these represent the operations of a

closely held, family corporation, so that the stockholders can exert an active and unified influence on the management.[2]

Could such a corporation profitably finance additional plant by issuing $10 million of 4 percent bonds, provided the expansion were expected to earn $800,000 annually, or 8 percent? The estimated income statement after the proposed expansion is shown below.

As a practical matter, the current position of this corporation might discourage the investment bankers from handling the issue – even though net operating income would cover interest twice on the new plant alone and over eight times on the entire corporation. Ordinarily, the net current assets are supposed to be sufficient to cover the long-term debt; but the net current assets in this case are only $8 million – a deficiency of $2 million. Of course, an arrangement might be worked out by requiring that the bonds be paid serially, or that dividends should not be paid as long as the net current assets failed to cover the bond issue. Either of these arrangements might curtail dividends for two or three years.

But if the bond issue could be arranged, would the stockholders consider the transaction attractive? The expansion has the advantage of increasing the prospective earnings from $2.50 a share to $2.90. It also has the disadvantage of increasing the risk because the proposed bond issue is so large that dividends might be curtailed for several years – even if the expected earnings were realized; and the entire financial position of the company might be jeopardized if earnings fell off sharply. Somehow the stockholders must balance the greater return against the greater risk, and they can do this by estimating the investment value of their stock. Will the shares be worth more or less following the expansion?

In practice such appraisals are usually difficult and often involve highly complex intangibles. But if the uncomfortable details are left aside, the principle of the appraisal can be very simply illustrated. Suppose, for example, that 12½ percent, or eight times earnings, is considered a fair capitalization rate as long as the company remains debt free, and that an increase to 15 percent, or six and two-thirds times earnings, is considered an adequate adjustment to compensate for the risk of carrying $10 million in debt. These assumed rates are completely arbitrary. Although several

[2] I have a special reason for specifying such a corporation. The stockholders, who are few in number and relatively well acquainted, are apt to take a more active interest in the corporate affairs; and often the stockholders and the management are the same individuals. This gives the family corporation a peculiar degree of unity. In many ways it is like a proprietorship or partnership except for the legal organization in corporate form. In a widely held corporation, however, the stockholders have no such unity, and the management may represent the interests of a small group of stockholders, probably including the managers themselves.

bases for adjusting capitalization rates to borrowing risks will be discussed in Section II, it is sufficient for the present argument merely to assume that the stockholders consider the rates satisfactory. The necessary stock appraisals can then be made easily, as shown below. These calculations imply that the proposed expansion is inadvisable.

Earnings per share from current operations	$ 2.50
Multiplier	8
Investment value per share	$20.00
Projected earnings after expansion	$ 2.90
Multiplier	6⅔
Investment value	$19.33

Because the stockholders suffer a decline in the investment value of their holdings, the small increase in earnings is not sufficient to compensate for the additional risk.[3]

2 *Required Return*

The preceding example showed that the risks incurred in borrowing may discourage investment, even though the rate of return on the new investment exceeds the interest cost of borrowed money. Specifically, the possibility of earning 8 percent in this example did not justify borrowing at only half that rate. But a still higher rate of return would have justified the investment. The following calculations show how to ascertain a rate that is just high enough to offset the risk. It is assumed that the risk will be just offset if the prospective per share earnings capitalized at 15 percent maintain the value of the common stock at $20.00.

Required value of stock per share	$20.00
Capitalization rate	.15
Required earnings, per share	3.00
Required earnings, 1,000,000 shares	3,000,000
Earnings previously available	2,500,000
Additional earnings required	500,000
Interest charges	400,000
Required earnings before interest	900,000
Rate of required earnings	*9%*

The required rate of earnings — 9 percent for this example — is in a sense the cost to this corporation of borrowing the needed money. Of course, it is not an out-of-pocket cost, but a sort of opportunity cost — the minimum rate that the new investment must earn without being actually disadvantageous to the stockholders. But perhaps this is too broad an interpretation of cost, and the reader is, therefore, free to choose for him-

[3] Of course, a somewhat smaller increase in the capitalization rate would not depreciate the stock. At 13⅓ percent, for example, the stock would be worth seven and one-half times $2.90 or $21.75.

self. Regardless of his decision, he will find the required rate of earnings an important entity because of the emphasis economists currently place on the determinants of investment. If we can ascertain what new investment has to earn in order to be profitable, we will be much wiser, whether we think this constitutes the cost of capital or something else. For the remainder of this paper the required rate of earnings will be referred to as the *required return* and will be abbreviated, *RR*.

Although the *RR* discussed above refers to bond financing, there is also an *RR* when a corporation sells stock, and sometimes even when it finances expansion with cash retained from operations. If the stockholders in the previous example had been deterred from authorizing the proposed expansion because the expected returns were inadequate to justify the inherent risk incurred by bond financing, they might have considered preferred stock, common stock, and perhaps a judicious combination of common stock and bonds. Would the expected return have been sufficient to justify any of these alternatives? And if not, what rate of return would have been sufficient?

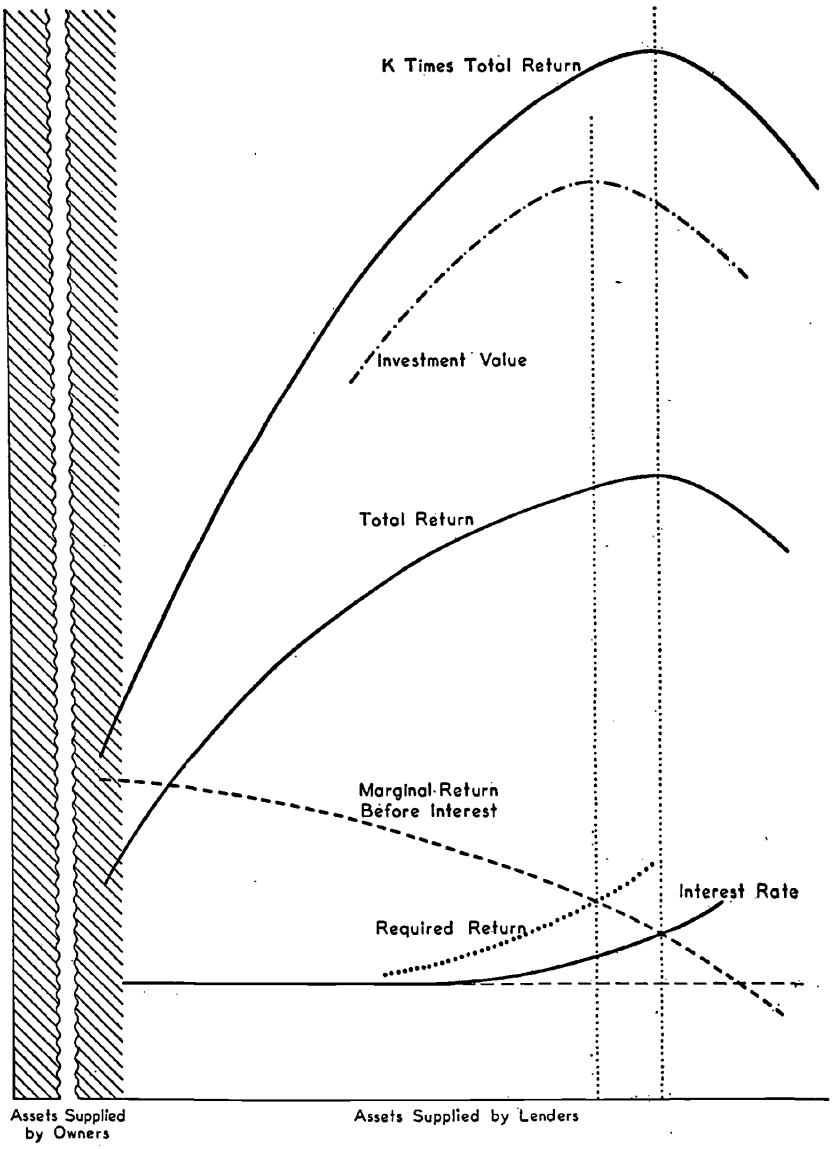
Although this subject will be explored more fully in Section III, a single example may be helpful here. When capital is raised by a common stock issue, the old stockholders will suffer a dilution of earning power and hence a dilution of investment value unless the new investment is capable of earning enough to maintain per share earnings at the old level. The *RR* depends upon the old level of earnings and the price at which the new shares must be sold. If the stockholders of the ABC Company wanted to raise $10 million by selling 500,000 shares on the market at $20.00, the new investment would have to earn $1,250,000 or 12½ percent to avoid dilution of earnings. Hence 12½ percent is the *RR*.

3 *Reformulation of Basic Theory*

A more realistic presentation of Chart 1 is now in order. Like its predecessor, Chart 2 contains curves representing the marginal return on capital, the interest rate, and the total return. But Chart 2 differs in a number of important respects. First, at the left of the chart is a shaded area representing the assets supplied by the owners themselves, which are assumed to remain constant while additional assets are supplied by lenders. Since the owners' assets earn a return, the total return curve is substantially above zero at the point where borrowed assets are zero.

Second, the interest curve is not level, but slopes upward, because a business that borrows heavily will have to pay a higher rate of interest to compensate lenders for bearing additional risk. As drawn, this curve is actually level for a while before turning up, but some readers will undoubt-

CHART 2



edly prefer a curve that slopes upward at all points, even if only slightly. The interest curve shown in Chart 2 might be called a "marginal interest curve." This implies that the rate for each successive borrowing does not affect the rate on previous borrowings. The marginal interest curve is of

such character that the maximum total return occurs when the interest rate equals the marginal return. However, a "total interest curve" is also possible. This implies that all debt must pay the same rate, which increases as the total amount of the debt increases. With the total interest curve, unlike the marginal curve, the maximum total return will occur before the point where the interest rate is equal to the marginal return.[4]

Third, at the very top of the chart is a curve representing the value of the total return when capitalized at a constant rate K. This curve – which would represent investment value if borrowing entailed no risk to the owners of the business – naturally reaches its maximum at the same point where total return reaches its maximum. Somewhat below this K-times-total-return curve is the assumed actual investment value. When there is no borrowing, investment value is K times total return, and the two curves coincide. But as the volume of the borrowing and the attendant risks increase, total return has to be capitalized at a higher and higher rate; therefore investment value falls farther and farther below K times total return. Naturally, investment value reaches its maximum before total return (or K times total return). This is the point of optimum operation. If a business expands beyond this point, it may attain a higher expected future income, but it will have to incur unjustified risks in the process, which means that the market value of the stock will suffer.

The fourth and final feature of the chart is a curve for the RR. As drawn the curve is a marginal curve, that is, it expresses the minimum rate that must be earned by successive small investments financed by bonds in order to maintain the investment value of the common stock. By definition, this curve must cross the marginal return curve at the point of optimum operations; to the left of this point, successive investments earn more than the RR and the investment value is therefore enhanced; to the right, successive investments earn less than the RR, and the investment value is depreciated. On this particular chart, only a small section of the RR curve is shown. The reason for this is that the shape of the RR curve depends upon the method used for capitalizing earnings. With one method, the RR

[4] From the viewpoint of practical finance the total interest curve is probably more accurately descriptive than the marginal curve. The best example is the type of business, like some sales finance companies, that raises large amounts of money through short-term bank loans. Although the first loan may carry a lower rate than the second, and this in turn may carry a lower rate than the third, these early loans will eventually have to be renewed, after which they will no longer enjoy their preferential status; hence, in the long run, all debt will carry the same rate. Probably the nearest approach to the marginal curve occurs when a company issues first mortgage bonds at a low rate, later issues second mortgage bonds at a somewhat higher rate, and finally issues debentures at a still higher rate.

curve coincides with the interest curve at the point of zero borrowing; but with another method, the *RR* curve is always above the interest curve. This interesting dilemma will be elaborated in the next section.

For those with a mathematical turn of mind, it may be interesting to note that the *RR* is expressible in the following equation[5]

$$RR = I + V\frac{dC}{dX}$$

where (I) is the marginal rate of interest, (V) is the investment value, and $\frac{dC}{dX}$ is the rate of change in the capitalization rate (percent) as the debt burden increases. This means that the *RR* is equal to the rate of interest as long as the capitalization rate remains constant; but as soon as the capitalization rate begins to increase, the *RR* exceeds the rate of interest.

II The Problem of Security Appraisal

1 *Two Methods of Capitalizing Earnings*

Any practical application of the principles of the *RR* necessitates a sound, effective, and generally acceptable system of security appraisal. Yet at present no such system exists. Naturally some differences of opinion concerning details may always be expected. But present differences run much

[5] Let the interest rate (I), the total return (P), the investment value (V), and the capitalization rate (C) all be considered functions of X, the amount of money borrowed. Then the equation

$$V = \frac{P}{C}$$

expresses the relation between investment value and total return. After a small increase in (P) resulting from additional borrowing

$$V + \Delta V = \frac{P + \Delta P}{C + \Delta C}$$

To determine the *RR*, it is only necessary to determine the rate of return that will make ΔV vanish. That is

$$\frac{P + \Delta P}{C + \Delta C} = \frac{P}{C}$$

or

$$\frac{P + (\overline{RR} - I)\,\Delta X}{C + \Delta C} = \frac{P}{C}$$

Solving for $\overline{RR}$ gives

$$\overline{RR} = I + \frac{P\Delta C}{(C + \Delta C)\,\Delta X}$$

In the limit this becomes

$$\overline{RR} = I + \frac{P}{C}\,\frac{dC}{dX}$$

and since $\frac{P}{C}$ is equal to (V), the equation given in the text follows immediately.

deeper than details. On the single question of capitalizing earnings, involved in most appraisal methods, there appear to be two systems in current use that arise from fundamentally different assumptions, lead to substantially different results in calculating the *RR*, and have radically different implications for financial policy. An analysis of these two systems will therefore prove illuminating and will further highlight the need of providing a sound conceptual groundwork for research on investment problems and the costs of capital.

Table 2

BALANCE SHEET OF THE PDQ MANUFACTURING COMPANY

Assets		
Cash	$ 3,000,000	
Accounts receivable	5,000,000	
Inventory	7,000,000	
Total Current	15,000,000	
Plant and equipment, less depreciation	15,000,000	
TOTAL		$30,000,000
Liabilities		
Accrued items	$ 1,000,000	
Accounts payable	4,000,000	
Total Current	5,000,000	
Bonded debt, 4 percent debentures	5,000,000	
Common stock, 1,500,000 shares at $10 per share	15,000,000	
Earned surplus	5,000,000	
	20,000,000	
TOTAL		$30,000,000

INCOME STATEMENT OF THE PDQ MANUFACTURING COMPANY

Sales	$30,000,000
Cost of goods sold	28,000,000
Net operating income	2,000,000
Interest	200,000

The accompanying sample balance sheet and income statement contain enough data to illustrate the fundamental difference between the two methods of capitalizing earnings. This hypothetical company is financed partly with bonds, partly with common stock; and the problem at hand is to estimate the value of the common stock on the assumption that the bonds, which are well protected, sell in the market at par. Since the purpose of the illustration is to focus attention on the problem of capitalizing earnings, questions of assets and book value will be neglected entirely, and the important matter of the corporate income tax will be deferred for later treatment.

One approach, hereafter called the NOI Method, capitalizes *net operating income* and subtracts the debt as follows:

Net operating income	$ 2,000,000
Capitalization rate, 10%	. × 10
Total value of company	20,000,000
Total bonded debt	5,000,000
Total value of common stock	15,000,000
Value per share, 1,500,000 shares	$10.00

The essence of this approach is that the total value of all bonds and stock must always be the same – $20 million in this example – regardless of the proportion of bonds and stock.[6] Had there been no bonds at all, for example, the total value of the common stock would have been $20 million, and had there been $2.5 million in bonds, the value would have been $17.5 million. Hereafter, the total value of all stocks and bonds will be called the "total investment value" of the company.

The alternative approach, hereafter called the NI Method, capitalizes *net income* instead of net operating income. The calculations are as follows:

Net operating income	$ 2,000,000
Interest	200,000
Net income	1,800,000
Capitalization rate, 10%	× 10
Total value of common stock	18,000,000
Value per share, 1,500,000 shares	$12.00

Under this method the total investment value does not remain constant, but increases with the proportion of bonds in the capital structure. In the table below, three levels of bond financing are assumed: $5 million, $2.5 million, and no bonds at all. At each level, the value of the stock is

Assumed amount of bonds	None	$ 2,500,000	$ 5,000,000
Value of common stock	$20,000,000	19,000,000	18,000,000
Total investment value	$20,000,000	$21,500,000	$23,000,000

obtained, as above, by capitalizing at 10 percent the residual income after bond interest. The implied relation in this table is that an increase of $2.5 million in bonded debt (total capitalization remaining constant) produces a corresponding increase of $1.5 million in total investment value. However, such a relationship cannot continue indefinitely, as the proponents of the NI Method clearly point out. As the debt burden becomes substantial, the bonds will slip below par, and the stock will cease to be worth ten times earnings.

[6] If the debt burden should be excessive, proponents of the NOI Method might argue that the total value of all bonds and stock would be depressed below $20 million. This argument could be based on the likelihood of insolvency and subsequent forced dissolution of the company.

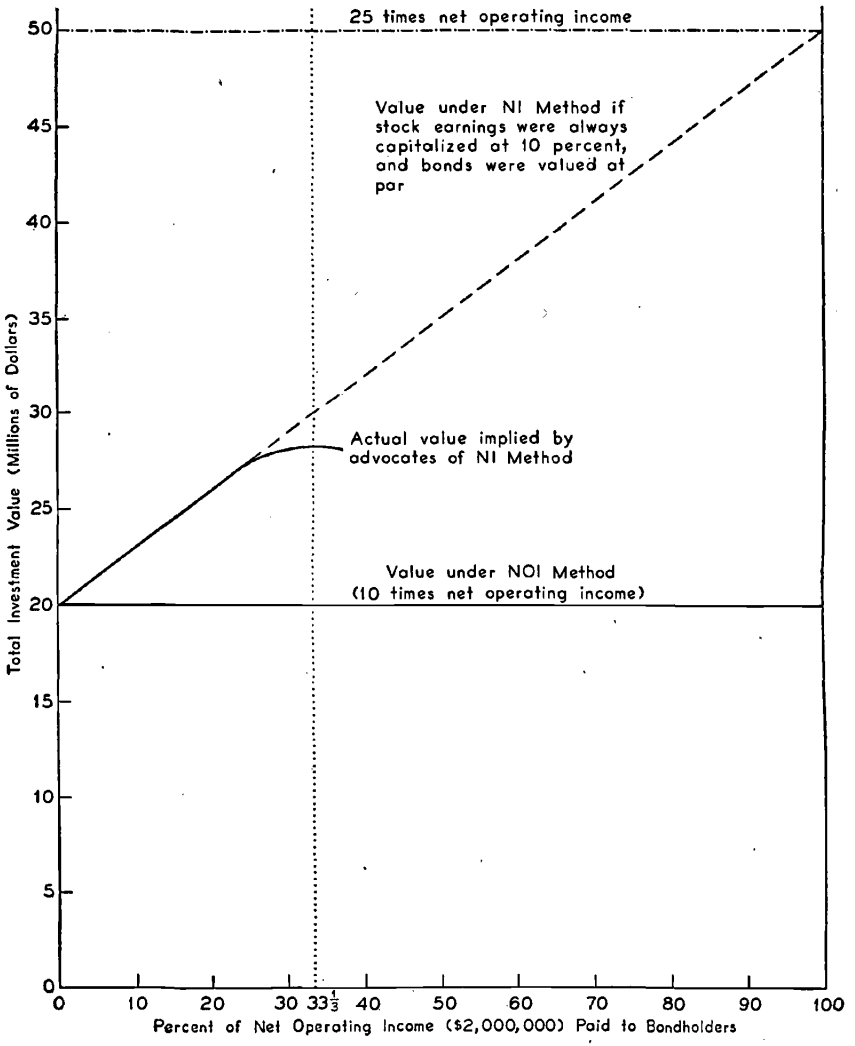
The difference between the two methods is shown graphically in Chart 3. Here the proportion of bonds in the capital structure is indicated by the share of net operating income (always $2 million in this example) that has to be paid to the bondholders. This method has the advantage of showing bond coverage directly; for when 33⅓ percent is paid out in interest (indicated by the dotted line), then the interest coverage is three times. The chart itself contains first a horizontal straight line at $20 million representing the total investment value according to the NOI Method. Second, the chart contains an upward sloping straight line representing the total investment value that would result under the NI Method if the bonds were always valued at par and the stock were always capitalized at 10 percent. Finally, the chart has a curved line showing the total investment value actually implied by the proponents of the NI Method. This curve coincides with the sloping straight line for a considerable distance, but as the proportion of bonds becomes appreciable, the curve falls below the straight line. As drawn here the curve has a definite maximum value, which implies the existence of an optimum capital structure. Naturally, the shape of the total investment value curve and the position of the maximum, near the three-times-interest-coverage point in this chart, are purely conjectural.

The most obvious difference between the two methods is that the NI Method results in a higher total investment value and a higher value for the common stock except for companies capitalized entirely with stock. For such companies the two methods give identical results provided the same capitalization rate is used.[7] This difference alone marks the NI Method as more liberal than the NOI Method, but the distinction between the optimism of the NI Method and the pessimism of the NOI Method will grow sharper as the discussion progresses. The NI Method, it will appear, takes a very sanguine view of the risks incurred in business borrowing; the NOI Method takes a more sober view.

Proponents of the NOI Method argue that the totality of risk incurred by all security holders of a given company cannot be altered by merely changing the capitalization proportions. Such a change could only alter the proportion of the total risk borne by each class of security holder. Thus if the PDQ Company had been capitalized entirely with stock — say 2,000,000 shares instead of 1,500,000 as in Table 1 — the stockholders would have borne all the risk. With $5 million in bonds in lieu of the addi-

[7] Another exception possibly occurs when a business has an excessive debt burden. If the curve for total investment value under the NI Method (Chart 3) were extended, it would meet the level line for the NOI Method at about the point where bond interest is covered 1¾ times, which is considered an excessive debt burden for an industrial corporation.

CHART 3



tional 500,000 shares, the bondholders would have incurred a portion of this risk. But because the bonds are so well protected, this portion would be small – say in the order of 5 or 10 percent. Hence the stockholders would still be bearing most of the risk, and with 25 percent fewer shares the risk per share would be substantially greater.[8]

[8] This proposition can be stated rigorously in terms of mathematical expectation. In brief, the argument runs along the following lines. The future income of a company

The advocates of the NI Method take a position that is somewhat less straightforward. Those who adhere strictly to this method contend: first, that *conservative* increases in bonded debt do not increase the risk borne by the common stockholders; second, that a package of securities containing a *conservative* proportion of bonds will justifiably command a higher market price than a package of common stock alone. The first contention seems to have little merit; it runs counter to the rigorous analysis offered by the advocates of the NOI Method; and it seems to imply that the security holders of a business can raise themselves by their own bootstraps. Clearly, this contention is a somewhat tempered version of the type of analysis described in Chart 1.[9] The second contention appears to be correct, however, and it certainly merits critical analysis.

Since many investors in the modern world are seriously circumscribed in their actions, there is an opportunity to increase the total investment value of an enterprise by effective bond financing. Economic theorists are fond of saying that in a perfectly fluid world one function of the market is to equalize risks on all investments. If the yield differential between two securities should be greater than the apparent risk differential, arbitragers

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has a definite, though perhaps unknown, mathematical expectation. If this income is to be divided up among types of security holder according to some formula, the income of each type will also have a definite mathematical expectation. Finally, the sum of the mathematical expectations for each type will necessarily equal the total for the entire income *no matter how that income is divided up.*

In spite of the logical merits of this proposition, the basic assumption may be objectionable. One of my critics suggests that the totality of risk is increased when a business borrows and that even the NOI Method is optimistic.

[9] The argument illustrated in Chart 1 implies that a business can incur any amount of debt without increasing the proprietors' risk. Recognizing that this is a practical absurdity, the advocates of the NI Method say merely that a business can incur a limited amount of debt without increasing the proprietors' risk.

For example, Benjamin Graham and David L. Dodd, in their book, *Security Analysis* (McGraw-Hill Book Co., second edition, 1940, p. 542), show the effect of indebtedness on earnings by comparing two hypothetical companies. Company A has no bonds at all, and Company B has a conservative bond issue with interest covered more than four times. Because of the leverage imposed by the bond issue, the earnings per common share of Company B fluctuate somewhat more than the earnings per share of Company A. Concerning this, the authors say: "Would it not be fair to assume that the greater sensitivity of Company B to a possible decline in profits is offset by its greater sensitivity to a possible increase?" However, the authors point out that this argument is valid only so long as the indebtedness does not jeopardize the solvency of the company. Should interest be covered only twice (this is an industrial company) the bonds would not be safe and should sell at substantially less than par. The discussion of this point in the third edition of *Security Analysis* (1951, pp. 464 ff.) has been somewhat modified.

would rush into the breach and promptly restore the yield differential to its proper value. But in our world, arbitragers may have insufficient funds to do their job because so many investors are deterred from buying stocks or low-grade bonds, either by law, by personal circumstance, by income taxes, or even by pure prejudice. These restricted investors, including all banks and insurance companies, have to bid for high-grade investments almost without regard to yield differentials or the attractiveness of the lower grade investments. And these restricted investors have sufficient funds to maintain yield differentials well above risk differentials. The result is a sort of super premium for safety; and a corporation management can take advantage of this super premium by issuing as many bonds as it can maintain at a high rating grade.

Therefore, a theoretical compromise between the two methods is entirely feasible. One can agree with the advocates of the NOI Method that the totality of risk inherent in the securities of a single company always remains the same, regardless of the capitalization; and one can agree with the advocates of the NI Method that the market will actually and justifiably pay more for the same totality of risk if the company is judicially capitalized with bonds and stock, and no inconsistency whatsoever will be introduced.

To illustrate this type of compromise, suppose it could be determined that well protected bonds like those of the PDQ Company should be valued at 5 percent if there were no super premium for safety.[10] That is, a 5 percent differential between bonds at 5 percent and stock at 10 percent would just compensate for the risk differential. Suppose further that the demand for bonds by the restricted investors is sufficient to permit floating the 4 percent bonds of the PDQ Company at par. Hence, 1 percent is the super premium that the restricted investors must pay for safety. But since the stockholders of the PDQ Company have no need to pay this premium, they are justified in writing down the value of their bonds to a 5 percent basis. That is, $5 million of 4 percent bonds would be valued at $4 million in estimating the value of the common stock (because a 4 percent bond is worth 80 at 5 percent). The implied calculations are as follows:

Net operating income	$ 2,000,000
Capitalization rate	× 10
	20,000,000
Stockholders' valuation of bonds (5 percent basis)	4,000,000
Value of common stock	16,000,000
Restricted investors' valuation of bonds (4 percent basis)	5,000,000
Total investment value	$21,000,000

If similar calculations are made for other assumed debt loads – say

[10] In making this suggestion, I am not ignoring the practical difficulties of actually estimating this super premium.

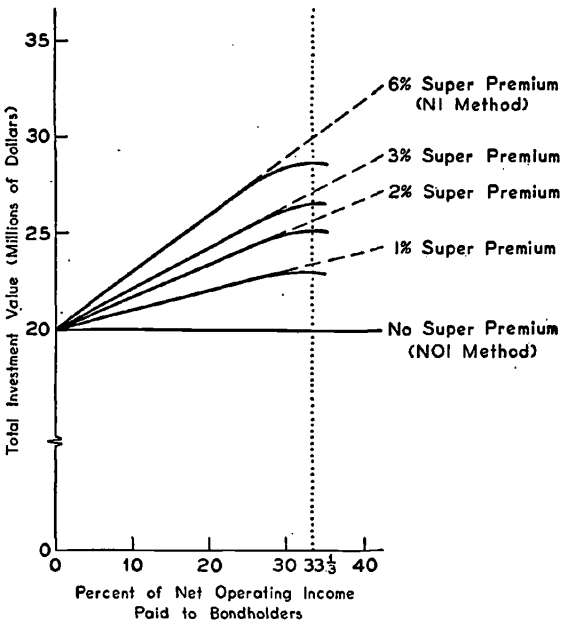
$2 million, $1 million, and no debt at all – the following values for common stock and total investment value will result:

Face value of bonds[11]	None	$ 1,000,000	$ 2,000,000
Value of common stock	$20,000,000	19,200,000	18,400,000
Total investment value	$20,000,000	$20,200,000	$20,400,000

This implies that whenever $1 million in stock is funded into bonds, the total investment value will be increased $200,000 thereby. Naturally, this relation will not continue indefinitely, because the restricted investors and the market will not pay a super premium for safety if the volume of bonds is too high for adequate coverage.

In all of these calculations the amount of the super premium – 1 percent – was arbitrarily assumed, and almost any other amount would have served equally well for illustration. The results, however, would have been different. An increase in the super premium would result in an increase

CHART 4



in the value of the stock and the total investment value. This is illustrated graphically in Chart 4, which contains curves showing the relation between total investment value and debt-load for five different super premiums. It is interesting to note that a super premium of zero implies the NOI

[11] Assumed equal to the restricted investors' valuation, also the market valuation.

Method, and a super premium of 6 percent is equivalent to the NI Method.[12] Thus it appears that the two methods may be regarded as optimistic and pessimistic extremes between which a more realistic compromise probably lies. However, the difference between the extremes is so great – as will become evident in subsequent discussion of the RR – that the choice of a compromise is subject to great leeway.

Further insight into the differences between the NOI Method, the NI Method, and the described set of compromises can be gained by considering the implied capitalization rate for common stock earnings. The NI Method specifies this rate – 10 percent in the previous example – which remains constant just so long as the debt burden is conservative. The NOI Method and the compromise do not specify a capitalization rate for common stock earnings; nevertheless such a rate is implied, and it can be calculated very easily. For the NOI Method the capitalization rate is given by the simple formula[13]

$$\frac{1-P}{10-25P}$$

where (P) is the proportion of NOI required for bond interest, the figure 10 is the reciprocal of the 10 percent rate for net operating income, and the figure 25 is the reciprocal of the 4 percent bond rate. For a compromise appraisal assuming a 1 percent super premium, this fraction becomes

$$\frac{1-P}{10-20P}$$

where the figure 20 is the reciprocal of the assumed 5 percent bond rate that would apply if the bonds did not command a super premium. Curves showing the capitalization rates for three appraisal methods at different levels of bond capitalization appear in Chart 5. The point at which the NI curve starts to turn up and the shape of the curve after this point are, of course, conjectural. The other two curves simply represent the mathematical relationships derived above.

[12] The NI Method does not actually imply a 6 percent super premium. The advocates of the method merely say that conservative borrowing does not increase the stockholders' risk. The idea of the 6 percent super premium implies that the stockholders' risk is increased but that the high super premium – clearly excessive – completely compensates for this risk.

[13] Let (N) be the net operating income and let (B) be the bond interest. Then $10N$ is the total investment value, $25B$ is the value of the bonds, and $10N - 25B$ is the value of the stock. The capitalization rate is determined by dividing the net income $(N - B)$ by the value of the stock, thus

$$\frac{N-B}{10N-25B}$$

This fraction can be transformed into the form appearing in the text by letting $P = \frac{B}{N}$, which is the proportion of net operating income required for bond interest.

2 *Effect of Appraisal Method on Required Return*

If the stockholders (or management) of the PDQ Company should consider raising a moderate amount of new money to finance expansion, they might appropriately ask whether the investment value of their holdings would be enhanced thereby, and they might further ask whether stocks or bonds would offer the more effective medium. If the stockholders should attempt to use the principle of the *RR* to answer either of these questions, they would discover startling differences in the *RR* for bond financing depending upon the appraisal method used, but they would discover no such differences in the *RR* for stock financing.[14] The following table shows the actual results of calculating *RR*'s on the assumption that 4 percent bonds can be sold at par and that additional common stock can be sold on a 10 percent basis.[15]

	Bonds	*Stock*
NI Method	4%	10%
NOI Method	10	10
Compromise, 1 percent super premium	8	10
Compromise, 2 percent super premium	6⅔	10

The reader should note that the *RR*'s in the above table depend only on the bond rate (4 percent), the capitalization rate (10 percent), and, in the case of the compromises, on the adjusted bond rate (5 and 6 percent). The capitalization of the company is not relevant so long as the

[14] I do not wish to imply that all conceivable methods of stock appraisal will result in identical *RR*'s for stock financing. But the NI Method, the NOI Method, and a compromise of the general type described will result in identical *RR*'s.

[15] To illustrate the process, *RR*'s for both stock financing and bond financing under the compromise method will be calculated here. Let s be the number of shares of stock, v the investment value per share, N the net operating income, and B the total bond interest. The total investment value is given by the equation

$$sv = 10N - 20B$$

If an additional share of stock is sold at a price equal to v, and if the proceeds are invested, net operating income will increase by an amount ΔN. The *RR* is obtained from solving the equation

$$(s + 1)\, v = 10\,(N + \Delta N) - 20B$$

or

$$v = 10\,\Delta N$$

This means that the additional share must earn 10 percent on its sale price to justify the expansion.

If, on the other hand, an additional 4 percent bond were sold, the interest expense would increase by an amount ΔB, and the equation for determining the *RR* would become

$$sv = 10\,(N + \Delta N) - 20\,(B + \Delta B)$$

or

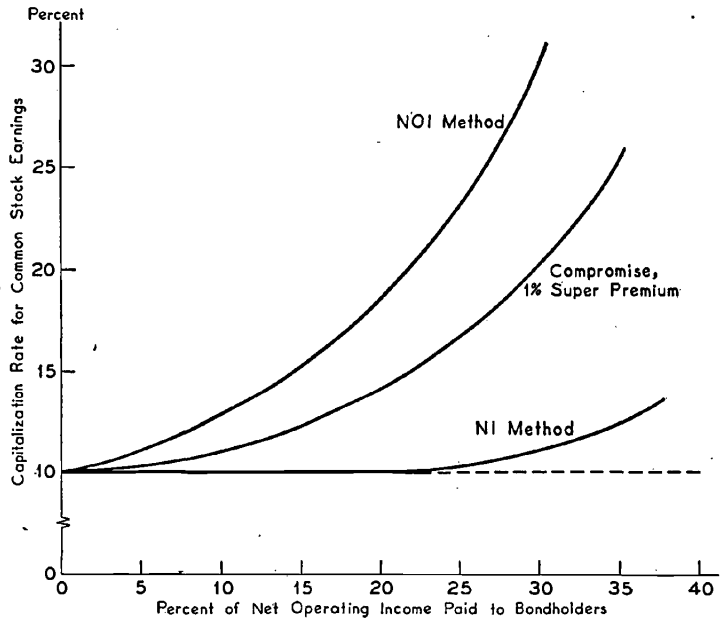
$$0 = 10\,\Delta N - 20\,\Delta B$$

or again

$$\Delta N = 2\,\Delta B$$

This means that the new investment must earn twice the rate of interest, or 8 percent.

CHART 5



amount of bonds is conservative. But if the debt burden should be excessive, the *RR* for bond financing will probably rise above the quoted values, and the *RR* for stock financing will probably fall below the quoted values because additional equity will improve the security behind the bonds and reduce the stockholders' risk.

3 *Effects of the Corporate Income Tax*

To complete the preceding discussion requires at least brief mention of the corporate income tax. Since bond interest is a deductible expense, the corporation can attain definite tax advantages by bond financing. To illustrate, consider the following abbreviated income statement for an assumed debt-free company.

Sales	$30,000,000
Cost of goods sold	26,666,667
Net operating income (taxable)	3,333,333
Income tax at 40 percent[16]	1,333,333
Net income	$ 2,000,000

If the $2 million net is capitalized at 10 percent, as in the previous

[16] For the hypothetical examples in this paper, 40 percent is considered a satisfactory approximation to the 38 percent corporation rate — particularly since 40 percent is actually the rate for consolidated returns.

examples, the result is a total investment value of $20 million, all of which is represented by the common stock. But if a portion of the common stock should be converted into bonds, the income tax would be reduced and the total amount accruing to security holders would be increased; finally, the total investment value would increase – even under the NOI Method of valuation. The following tabulation shows the results that would obtain if the company converted some of its stock into $5 million of 4 percent bonds.

Calculation of net income:	
Net operating income	$ 3,333,333
Interest	200,000
Taxable net income	3,133,333
Income tax at 40 percent	1,253,333
Net income	$ 1,880,000
Total investment value by NOI Method:	
Net income	$ 1,880,000
Interest	200,000
Total claims of security holders	2,080,000
Capitalization factor	10
Total investment value	$20,800,000
Total investment value by NI Method:	
Net income	$ 1,880,000
Capitalization factor	10
Value of common stock	18,800,000
Value of bonds	5,000,000
Total investment value	$23,800,000

The advantages of bond financing under the income tax are further illustrated by the *RR*'s shown in the table below. In a tax-free world there might be some doubt about the advantages of bond financing; if the NOI Method should be accepted rigidly, the *RR* for bond financing would exactly equal that for stock financing. But with the corporate income tax the *RR* for bond financing is less than that for stock financing, regardless of the method of evaluation. Furthermore, it is noteworthy that the income

	No Tax[17]	*40 Percent Tax*[18]
Bond financing, NI Method	4%	4%
Bond financing, NOI Method	10	14
Stock financing, either method	10	16⅔

[17] These are the *RR*'s derived on p. 234.

[18] For bond financing, it is obvious that the *RR* will equal the interest rate under the NI Method. As long as the new investment can earn enough to meet the additional interest burden, the earnings for the common stock will not suffer – taxes or no taxes. It is not quite so obvious that the *RR* for stock financing is equal to 16⅔ percent regardless of appraisal method, but this matter will be amplified further in Section III. Finally, the *RR* for bond financing under the NOI Method will be derived here.

tax has the effect of increasing the discrepancy between the NI Method and the NOI Method. In the real world, therefore, the choice of a proper method of stock appraisal is even more important than in the theoretical world described previously, where income taxes were assumed nonexistent.

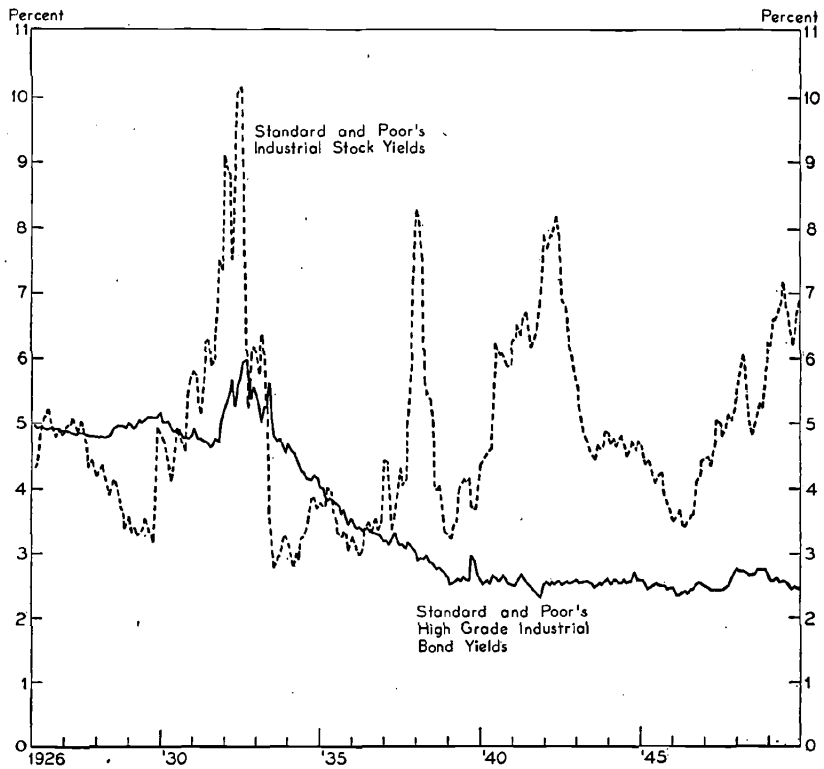
4 *Implications for Research*

The foregoing analysis indicates that significant research in problems involving the cost of capital will be seriously handicapped so long as the conflict between the NI Method and the NOI Method remains unresolved. Of course, limited research can probably be done now on the cost of common stock financing because the importance of the valuation problem is much less with common stock financing. A discussion of this problem will appear in the next section. But some of the more significant financial problems of the day involve cost comparisons between bond financing and equity financing – including both stock flotations and retentions – and attempts to make such comparisons without first solving the problem of valuation will probably prove futile and misleading. If a research worker wants to suggest that stock financing is much more costly than bond financing, he can do so very easily by accepting the NI Method, which necessarily implies that the cost of bond financing is roughly equal to the long-term interest rate and that the cost of stock financing is roughly equal to the earnings-price ratio for common stocks. But in doing this, he will probably incur bitter, and on the whole justified, criticism from those who favor the NOI Method – and possibly from some of those who favor a compromise.

When the hypothetical company is capitalized with $5 million of 4 percent bonds, the total investment value is $20,800,000 as shown, which leaves $15,800,000 for the common stock. If the company sells one more $1,000 bond, the value of the common stock must remain unchanged, and to this end the new investment must earn $140. The following calculations show this.

Value of stock	$15,800,000
Value of bonds after expansion	5,001,000
Total investment value	20,801,000
Required for interest and stock earnings, 10 percent of the above	2,080,100
Bond interest	200,040
Required net income after taxes	1,880,060
Tax	1,253,373
Required taxable income	3,133,433
Interest	200,040
Required net operating income	3,333,473
Net operating income previously available	3,333,333
Additional net operating income required per $1,000	*$140*

CHART 6



As an example, Chart 6 traces the yields of industrial stocks and high-grade industrial bonds from 1926 through 1949.[19] Charts of this type are sometimes used as evidence that the cost of equity capital in relation to debt capital has been substantially higher in the postwar years than in the late twenties. It is true, of course, that this chart is deficient in a number of details: 1) stock yields, which reflect dividends paid, could be adjusted for earnings; 2) stock yields could also be adjusted for the corporate income tax, and 3) both stock and bond yields could be adjusted for flotation expenses. The net effect of all these adjustments would probably increase the apparent cost of equity in the postwar years. But unfortunately, even when these adjustments are made, the chart is still deficient because the basic methodology is not valid unless the NI Method of valuation is wholeheartedly accepted.

[19] The chart was made up from Standard and Poor's stock and bond yields. The actual figures plotted are averages for the middle month of each quarter — that is, February, May, August, and November.

5 *Implications for Business Cycle Theory*

According to some writers on business cycle theory the interest rate plays the strategic role of alternately encouraging and discouraging investment. Furthermore, these writers argue, the central monetary authority can exert a substantial stabilizing influence on business by artificially raising the interest rate in prosperous periods and lowering it in depressed periods. Clearly, the force of this argument depends upon a tacit assumption that the cost of raising capital is approximately equal to the interest rate. This, in turn, necessitates another assumption accepting the NI Method, for only with this method is the cost of borrowing equal to the interest rate. Hence, the rejection of the NI Method in favor of the NOI Method, or even one of the compromises previously discussed, would cast grave doubts upon the strategic force of the interest rate in economic life. In particular, if the NOI Method should be rigidly accepted, the interest rate would lose virtually all its significance, and in place of it the stock rate (earnings-price ratio) would emerge as the number one determinant of investment on the cost side.

The preceding analysis may throw new light on a statement by John Maynard Keynes concerning easy money policy. It was Keynes' opinion that easy money would provide little stimulus to business in depressions because the marginal efficiency of capital is apt to be extremely low at such times.[20] Keynes was probably right, but perhaps for the wrong reason. He may have misjudged the importance of cost as a determinant of investment. If businessmen accept the NOI Method of valuation, either explicitly or subconsciously, the *RR* for new investment will be extremely high during depressions because of low stock prices, and lowering the interest rate will have almost no effect. Possibly, therefore, the high cost of raising capital may discourage new investment during depressions quite as much as the low marginal efficiency of capital. In everyday language, this merely means that businessmen are loath to incur obligations during a depression, and they will not do so, regardless of the interest rate, unless they can expect a return even higher than the one they would expect in a period of prosperity.[21]

[20] See *The General Theory of Employment, Interest, and Money* (Harcourt, Brace and Co., 1936), p. 316. Here Keynes says: "It is this, indeed, which renders the slump so intractable. Later on, a decline in the rate of interest will be a great aid to recovery and, probably, a necessary condition of it. But for the moment, the collapse in the marginal efficiency of capital may be so complete that no practicable reduction in the rate of interest will be enough."

[21] Using Keynes' language, we might say that businessmen have "a propensity not to borrow" during depressions.

III A Brief Analysis of Equity Financing

Viewed as a whole, equity financing includes four general types of transactions: common stock flotations, preferred stock flotations, use of earnings retained from operations, and the conversion of rights or other instruments into common stock. This section, however, will deal only with common stock flotations and the retention of earnings. Furthermore, the treatment is extremely sketchy and serves mainly to amplify and fill in the preceding sections.

1 *Variations in Common Stock Financing*

The technique of common stock financing varies considerably from flotation to flotation. This is due partly to state laws, partly to market conditions, and partly to matters of taste and judgment. Sometimes a whole stock issue is sold directly to a syndicate, which has the sole responsibility for distributing the issue to the public. At the other extreme, an issue is sometimes sold directly to the stockholders through nonmarketable pre-emptive rights with no provision for public sale. More often, however, a combination method is worked out, which may include the issue of marketable pre-emptive rights and the services of an underwriting syndicate to guarantee sale of the entire issue. Since the technique of the flotation may affect costs and *RR*'s, two examples are worked out here: one describing a straight public sale without rights, the other describing a sale to the stockholders through rights, under the assumption that the stockholders exercise their rights.

2 *Stock Flotation by Direct Sale to the Public*

Table 3 contains a hypothetical balance sheet and income statement. Suppose that the stockholders and management of the XYZ Company see an attractive opportunity to buy additional facilities for $5 million. Suppose further that the management opposes depleting the corporate cash reserves and that the stockholders have no available cash themselves; hence it is necessary to sell securities on the open market, and the management elects to sell common stock. Suppose, finally, that the corporation stock is currently selling on the market at 23 and that a syndicate agrees to sell additional stock at 22 (to allow for a bad market), charging a commission of $2.00 a share for the service. The corporation would, therefore, receive $20.00 net for each share sold, and it would have to sell 250,000 new shares to raise the required $5 million. What is the *RR?*

Probably the simplest solution is to calculate a "market capitalization rate" by dividing the market price of 23 into the per share earnings of $3.00. The result is 13.04 percent, or 7.66 times earnings. This provides

Table 3

BALANCE SHEET OF THE XYZ MANUFACTURING COMPANY

Assets		
Cash	$ 6,000,000	
Accounts receivable	5,000,000	
Inventory	4,000,000	
Total Current	15,000,000	
Plant and equipment, less depreciation	15,000,000	
TOTAL		$30,000,000
Liabilities		
Accrued items	$ 1,000,000	
Accounts payable	4,000,000	
Total Current	5,000,000	
Common stock, 1,000,000 shares at $15 per share	15,000,000	
Surplus	10,000,000	
	25,000,000	
TOTAL		$30,000,000

INCOME STATEMENT OF THE XYZ MANUFACTURING COMPANY

Sales	$11,000,000	
Cost of goods sold	6,000,000	
Net operating income		$5,000,000
Income tax		2,000,000
Net Income		3,000,000
Annual dividends		1,000,000
Transfer to Surplus		$2,000,000

a suitable multiplier if: 1) the market appraisal is considered correct; 2) the market is expected to continue to appraise the stock at the same rate after expansion (except possibly for a short period during the offering, when the stock may fall to about 22); 3) the dividend rate can be ignored; and 4) individual differences among stockholders, say tax status, can be ignored. By means of this capitalization rate, the following calculations

ESTIMATED NEW INVESTMENT EARNINGS

Required value per share	$23.00
Capitalization rate	.1304
Required net earnings per share	*$ 3.00*
Total net earnings, 1,250,000 shares	$3,750,000
Income tax at 40 percent[22]	2,500,000
Total required earnings before tax	6,250,000
Previous earnings before tax	5,000,000
Earnings required on new investments	*$1,250,000*

show that the new investment must earn $1,250,000 before taxes — or exactly 25 percent on the additional $5 million — in order to maintain the value of the stock at 23.

[22] For these simple examples 40 percent is a satisfactory approximation to the current 38 percent rate, particularly since 40 percent is actually the rate for consolidated returns.

The above calculations were made in a somewhat roundabout fashion to illustrate an important point: *For debt-free companies selling stock on the open market, the RR will be the same regardless of what capitalization rate is used.* For example, the stockholders might consider that the market undervalued their stock, and they might prefer to capitalize earnings at 10 percent, which would make the stock worth $30.00.[23] The above calculations would have to be changed in two respects only: the required price per share ($30.00) and the capitalization rate (10 percent). These two changes would exactly offset each other, and the required earnings per share would remain $3.00. The subsequent calculations would remain unchanged. All this implies that for debt-free companies selling common stock on the open market, the *RR* is the rate of return required to maintain the original per share earnings – at $3.00 in this example.[24]

This neutral role of the capitalization rate has important practical implications because it considerably simplifies measurement. In actual security appraisal the analyst is ordinarily plagued by two troublesome problems: 1) the estimation of a satisfactory figure for expected earnings, and 2) the choice of a capitalization rate. But if the capitalization rate has no effect on the *RR* for specified types of stock financing, the problem of choosing such a rate can sometimes be sidestepped.

The problem of estimating earnings remains a serious one, however. Actual reported earnings are often not satisfactory because future earnings are more important to stockholders than past earnings. This was brought out dramatically in the early thirties, when many corporations were running deficits and passing dividends; yet their stock was selling substantially above zero on the belief that these corporations had long-run positive earning power. If one should attempt to calculate *RR*'s for the thirties on the basis of the reported deficits, he would obtain perfectly meaningless results. And if he should contemplate estimating the normal, long-run earning power of corporations as it appeared to investors during the thirties – which is the desired figure – he would be facing an almost impossible task.

[23] It is not only possible but quite likely that the stockholders of a company will value their stock at higher than the market price. If they did not put a higher value on their stock, why would they continue to hold it? The reader is apt to ask at this point: "Well, then, why don't they buy more stock in the market and drive the price up to 30"? The answer is simple. The stockholders are limited by the amount of their resources and the need for diversification.

[24] This principle is not strictly true for indebted companies when the NOI Method is used, or for stock flotations with pre-emptive rights. But it appears to be approximately true. I gather this from investigation of two or three examples, which suggest that very large variations in the capitalization rate have a small effect on the calculated *RR* for stock financing in general. This question might bear further investigation.

3 *A Stock Flotation with Pre-emptive Rights*

In the preceding example, the stockholders had inadequate cash reserves, and the new issue had to be sold on the market by a syndicate. In the following example, however, the stockholders are assumed to have sufficient cash to permit buying the issue directly from the company through pre-emptive rights. Suppose that the stockholders are given the right to buy one new share at $21.00 for each four shares held, and that the costs of the flotation are $1.00 a share so that the company again realizes $20.00. This transaction is equivalent to the exchange of $21.00 in cash and four old shares worth $23.00 — total $113.00 — for five new shares. If the stockholders are not to suffer from the exchange, the five new shares must also be worth $113.00 — or $22.60 a share. The necessary calculations for the *RR* are similar to those in the preceding example, except that the required value per share is $22.60 instead of $23.00. The *RR* in this case is $1,141,314 or 22.8 percent. The slightly lower *RR* in this example is due to two factors: 1) the out-of-pocket flotation expenses were assumed to be lower by this method;[25] 2) the opportunity to buy new stock at slightly less than the market price was exercised by the old stockholders, rather than by outsiders, as in the preceding example.

4 *Financing with Cash Earned and Accumulated*

This example serves mainly to show that business retentions should not be regarded as a costless source of capital. Retentions are costless in one sense only: the management incurs no out-of-pocket expenses as it would in floating securities or arranging a loan. But in almost any other sense retentions involve costs like those in other forms of financing. When a management sells stock to the public, it incurs an obligation, through tacit understanding, to invest the proceeds wisely and earn a return for the stockholders. If later the management elects to retain earnings that could be conveniently paid out in dividends, these entail a very clear opportunity cost; for the stockholder loses the opportunity to invest whatever portion of his share of earnings the management chooses to retain. Furthermore, if the management retains earnings and invests them unwisely, the stockholders may incur a very real cost, for the unwise reinvestment of earnings may actually depress the value of the stock.

As presented in Table 3, the XYZ Company earned $3 million, or $3.00 a share, and paid out one-third of this in dividends. What is to be done with the remainder? For the purpose of this discussion, it is assumed

[25] This is not meant to imply that costs of flotation are typically less for issues floated by means of pre-emptive rights. In fact, a worthwhile project would be to compare actual costs incurred in open market flotations as against pre-emptive rights flotations.

that the management has only two choices: 1) to pay an extra dividend of $2.00 a share on one million shares of stock, and 2) to divert this money to purchase $2 million worth of new equipment. Which course is more advantageous to the stockholders, provided it is assumed further that the ample cash balance of the XYZ Company can stand the drain of $2 million without impairing liquidity?

The ensuing discussion rests entirely on the assumption of perfect freedom of choice on the part of the management. Yet in practical affairs managements often do not have such freedom. When a corporation has a low current ratio, its management may have to restrict dividends, even though earned, merely to avoid insolvency. A corporation management may also have to restrict dividends, even though earned, because the terms of a loan agreement or bond indenture stipulate that working capital must be maintained at a specified level. Thus a corporation is sometimes virtually forced to retain earnings. In such instances, it is hardly pertinent to ask which course is more advantageous to the stockholders, and it might be misleading to carry through an estimate of the required return in the manner described below. Clearly this entire question of the costs of retentions is a complicated one, requiring a great deal of thoughtful investigation. The present analysis is merely by way of introduction.

But when there is freedom of choice the management may appropriately consider whether the cash would be worth more converted into plant than it would be as cash in the hands of the stockholders. One factor affecting the decision should be the rate of return earnable on the new investment. If the return is low, the stockholders will be better off to receive the dividends and invest the proceeds in other securities; if the rate is high, they will be better off to have the corporation retain the cash.

Another factor that should affect the decision is the incidence of the personal income tax on stockholders. But taking the personal income tax into account is extremely difficult for two reasons: 1) the great variability in rates between the high income brackets and the low income brackets, and 2) the uncertainty of the eventual tax status of possible capital gains that may arise if the corporation invests its retained cash successfully.[26] Therefore, to obtain an estimate of the *RR* on the new investment requires one arbitrary assumption concerning the income tax bracket to be represented and another concerning the capital gains tax. To make the calculations as simple as possible, it is assumed that the personal income tax on the cash dividend is 50 percent and that the possibility of an eventual capital gains tax may be ignored.

[26] For example, if the typical stockholder holds his stock until death, say twenty years hence, how will his estate be taxed at that time?

If the cash dividend is paid, the typical stockholder will have, say, 100 shares of stock worth $23.00 a share[27] and $100.00 in cash after taxes — a total of $2,400 or $24.00 a share. If the cash is retained, the stockholder will have only his shares, which he hopes will be worth at least $24.00. If the shares are to be worth $24.00, the new investment will have to earn $216,667 or 10.8 percent, as shown below.

Required value per share	$24.00
Capitalization rate	.1304
Required earnings per share	*$ 3.13*
Required earnings, 1,000,000 shares	$3,130,000
Income tax at 40 percent	2,086,667
Required earnings before tax	5,216,667
Income previously available	5,000,000
Additional income required	*$ 216,667*

The *RR* in this example is ever so much lower than in the previous examples, where *RR*'s of over 20 percent resulted. This substantial difference is due mainly to the personal income tax, although the avoidance of out-of-pocket flotation costs is also a factor. If there had been no personal income tax, the stockholders would have enjoyed the entire $2.00 dividend — which, with their stock worth $23.00 a share, would have totaled $25.00. Therefore, the new investment would have to earn $433,333 or 21.6 percent. This is exactly twice as much as the *RR* when the personal income tax is 50 percent. Although it is doubtful whether corporate officials go through these specific calculations in considering use of retained earnings — when choice is possible — they seem to be generally aware that substantial tax savings are possible through the use of retentions.

5 *Equity Financing in Conjunction with Debt Financing*

In all the examples discussed heretofore, *RR*'s were calculated on the supposition that the corporation management had to choose one from among such single possibilities as a bond flotation, a stock flotation, or use of retained earnings. Often, however, financing is a combined process involving both debt and equity in various forms and proportions, and as such it presents an intricate problem in joint costs. What would have been the *RR*, or the cost by any other standard, if the XYZ Company had decided to finance its $5 million plant expansion by 1) using $1 million of its own cash, 2) floating $2 million in bonds, 3) by curtailing dividends until the

[27] Some readers may feel that the previously assumed market price of $23.00 a share should reflect the payment of the $2.00 dividend, and that the stock should be worth less than $23.00 after the dividend, say $22.00. This would involve a recalculation of the *RR* to ascertain what rate of return on the new investment would be required to make the stock worth $23.00.

final $2 million could be retained? Could an *RR* or some other measure of cost be determined for the entire transaction? And could the total cost, however determined, be effectively allocated among the three separate sources of funds? This last question is particularly pertinent to the problem of public utility regulation.

This paper does not propose to discuss joint costs beyond merely mentioning them. The problem clearly exists, and it is probably formidable. With joint costs, as with simple costs for a single form of financing, the solution of the problem certainly hinges upon the valuation of business enterprises.

IV Conclusion

This paper is limited to a single phase of economic behavior – the financing of assets and the costs incurred therein. By means of a few simple examples I have tried to prove the following proposition: *Given a method of security appraisal, the costs of raising capital can be both defined and measured.* At the same time I have tried to show that there is at present no generally accepted system of appraisal; hence there can be no generally accepted system of measuring costs. It would certainly appear that the first step toward the specific problem of measuring costs is to focus more research on the general problem of appraisal.

"But," the reader is apt to ask at this point, "is there no way to sidestep the appraisal problem and deal with costs directly"? Personally, I think not, though I know of no absolutely conclusive proof. However, any research worker who tries to deal directly with costs is in great danger of falling into one of two rather obvious traps. The first is to define costs in an arbitrary fashion that is amenable to statistical research but irrelevant for economic analysis. An example is the definition of cost currently accepted by many accountants, according to which bond interest is a cost while dividends, even cumulative preferred dividends, are not. If one should accept this definition, he will find a plethora of statistics and a relatively easy problem of measurement, but the "costs" he thus measures will not help him explain the volume of asset expansion or the current preference for debt financing.

The second trap awaiting the unwary research worker is to define costs in a fashion that implies some definite method of appraisal. If, for example, he defines common stock cost as the earnings-price ratio (adjusted for flotation expenses) and bond cost as the interest rate (also adjusted for flotation expenses), he implies the NI Method of valuation; furthermore, he probably implies a belief that borrowing does not entail risk to the bor-

rower. How many of those who support this last definition of cost would also support the view that borrowing entails no extra risk?

Research on the problem of business appraisal does not promise to be easy, by any means. The discussion in this paper has laid chief emphasis on the conflict between the NI Method and the NOI Method of capitalizing earnings. Possibly, this created an impression of oversimplification. Actually, I do not believe that either method, strictly interpreted, is adequate or correct, although I definitely lean in the direction of the NOI Method. But if the NOI Method should be accepted in principle, modifications would almost certainly be required. These might include adjustments for working capital, for book value, and for the super premium for safety, any of which would require careful thought and perhaps considerable statistical analysis.

At the present time, the most fertile field for research on the appraisal problem is probably in the organized security markets. A statistical study of security pricing would probably yield valuable clues for a long-range analysis of capital costs, and it would have the immediate advantage of providing technical information for security analysts and financiers. As conceived here, such a study should be concerned with what might be called "market appraisal," and it would cover such questions as the following: How does an underwriting syndicate arrive at a price to bid for a new security issue? How do investors and traders in the market arrive at prices to bid for traded issues? To what extent do security prices in the market exhibit definite relationships to pertinent factors like earnings prospects and interest coverage? Do the observed relationships imply some specific system of appraisal in use by traders and investors and, if so, is the implied system reasonable? Or, perhaps, is there evidence of many systems? To what extent do traders overlook opportunities for arbitrage between securities?

At the same time a general reformulation of basic economic principles would be highly desirable. What we need is a theory that takes better account of the problem of appraising risks incurred in business expansion. If a project for reformulating basic theory could be incorporated into a statistical analysis of security pricing, two desirable results might be achieved: first, the interpretation of the statistical findings would be less liable to error; second, a truly functional theory of business enterprise would be more likely to emerge.

DISCUSSION:

CLAY J. ANDERSON, *Federal Reserve Bank of Philadelphia*

Mr. Durand's paper represents a fresh approach to the problem of measuring the cost of debt and equity financing, and makes some interesting observations. However, I find myself in disagreement with the basic principles presented by the author.

He states, in his preface to the article, that although his opinions were revised as the paper developed, he expects to stand by two general principles: our basic economic theory needs revision; and security appraisal is the key to measuring the cost of capital. I shall limit my remarks to three main topics – the two general principles just noted and a few suggestions for research in this area which might be helpful.

REFORMULATION OF ECONOMIC THEORY

Why does economic theory need revising? If I interpret Mr. Durand's paper correctly, there are two primary reasons. One is that present economic theory proceeds on the assumption that the businessman tries to maximize his income. For example, Mr. Durand states: "Economic theory has used the principle of maximizing income to demonstrate that business expansion will proceed until the marginal return on capital equals the rate of interest." Two major criticisms of this principle are made. In the first place, the principle of maximizing income is "totally meaningless in any world in which income is expected to change." Actually, a businessman planning an investment must compare not only the amount of the additional income expected, but also its time distribution. Since the income from the investment may build up only slowly, the businessman tries "to maximize the discounted value of his future income" instead of maximizing his income.

A second revision is necessary, according to the author, to take account of risk. For example, stockholders considering a bond issue to finance an expansion program must balance the greater return against the greater risk incurred. They can do so by estimating the investment value of their stock. The author then illustrates, by assuming certain per share earnings and the change in the capitalization rate to compensate for the additional risk incurred, how much earnings would have to increase to maintain the investment value of the outstanding stock and therefore to make it worth the stockholders' while to make the additional investment. In short, the illustration really shows how much the per share earnings would have to

increase to compensate for the assumed risk incurred by the additional borrowing.

I would like to point out that economic theory, at least in the writings of some well-known authors, has for many years taken these points concerning time distribution and risk into consideration. Irving Fisher, for example, gave a detailed analysis of them in his book *The Rate of Interest,* published in 1907.[1] His theory incorporating the time and risk elements in investment principles was further refined in his book *The Theory of Interest,* published in 1930.[2]

Fisher starts with the general principle that the decision to invest involves comparing optional income streams. In arriving at a decision, the potential investor asks "what difference it makes" which alternative is chosen – difference in terms of disadvantages incurred (costs) for advantages gained (returns). Fisher states that "by cost is meant the comparative loss from one's income stream at first caused by substituting one use of capital for another, and by return is meant the comparative gain which accrues, usually later, by reason of this same substitution. . . . It applies to every possible cost and every possible return."[3] The first approximation of his investment opportunity principle is developed on the assumption that the income stream flowing from any given investment is both fixed and certain. Under these conditions, he says, there is an inducement to invest if the marginal return over cost at present values is equal to or greater than the rate of interest. Recognizing that these assumed conditions do not exist in the real world, he modifies his investment opportunity principle to take account of both the time shape and risk elements.

In his second approximation to the theory of interest, Fisher introduces the fact that optional income streams may differ in size and time shape.[4] In the third approximation, his theory is modified to take into consideration the risk factor or uncertainty.[5] Finally, he arrives at the principle that through investment opportunities one is afforded optional income streams which "differ in size, time shape, composition, and *risk.*" The potential investor will select the one which has the maximum present value and will tend to push investment to the point where the "marginal rate of *anticipated* return over cost" tends to equal the rate of interest.[6]

[1] Irving Fisher, *The Rate of Interest* (Macmillan, 1907), especially Chapters 7, 8, and 11.

[2] Irving Fisher, *The Theory of Interest* (Macmillan, 1930), especially Chapters 7, 8, and 9.

[3] *The Rate of Interest,* Chapter 7; *The Theory of Interest,* pp. 154-58.

[4] *The Rate of Interest,* Chapter 8; *The Theory of Interest,* Chapter 8.

[5] *The Rate of Interest,* Chapter 11; *The Theory of Interest,* Chapter 9.

[6] *The Theory of Interest,* p. 223. Author's italics.

J. M. Keynes is another well-known writer who incorporated these points into his theory.[7] Keynes stated, for example, that Fisher's "rate of return over cost" was "identical" with his definition of the "marginal efficiency of capital." He also stressed that the marginal efficiency of capital fluctuates greatly during the business cycle, mainly because of swings in expectations.[8]

These few illustrations are in no sense intended, of course, as a complete coverage of the extent to which economic theory deals with the points raised in Mr. Durand's paper. Well-known authors are cited only as evidence that careful attempts have been made to incorporate into economic theory the discounting of anticipated income, the time shape of an expected income stream, and the risk factors.

SECURITY APPRAISAL

What is the importance of this shift from the maximization of income to that of maximizing investment value, i.e., the discounted value of future income? Mr. Durand states: "This revision is more than mere verbiage. The shift from the maximization of income to the maximization of discounted value has important implications for the measurements of costs and the analysis of investment problems. It emphasizes the basic importance of appraisal and security analysis in molding business decisions. How can the businessman go about maximizing investment value without developing a system of appraisal that is suitable, to him at least?"

With respect to this topic, I want to consider briefly two major points: 1) whether determining investment value, as used by Mr. Durand, is an appropriate method of measuring the costs of debt and equity methods of financing, and 2) whether there is really any basic difference between the two methods of security appraisal analyzed by the author in Section II of his paper.

As to the first question, it seems to me that the answer must be no. Economists have long recognized that capital value does not determine net income, but instead net income (returns over cost) and the rate of interest determine capital value.[9] Furthermore, the truth of this statement has been demonstrated in the market place where the fixed assets of a business are valued mainly on the basis of their earning power. It is essential, therefore, to estimate the net anticipated return over cost, before any

[7] John Maynard Keynes, *The General Theory of Employment, Interest, and Money* (Harcourt, Brace and Co., 1936), pp. 140-41.

[8] *Ibid.*, pp. 313-16.

[9] See Fisher, *The Rate of Interest*, p. 15.

reasonable estimate can be made of the effect of a proposed investment on the value of outstanding securities.

Thus, the objective of maximizing the discounted value of future income, instead of maximizing income, does not make security appraisal the key to the problem of measuring cost, as stated by the author. It only introduces time preference – an appraisal of present value as compared to future value.

To derive the investment value of securities by assuming the effect of the new financing on earnings, costs and risk, and then using the investment value to measure costs of the new financing, is circular reasoning. The old theory of regulating public utility rates on the basis of the market value of the securities was discarded for this reason. If the determination of investment value is to be the "key" to measuring financing cost, it must be derived independently. I cannot conceive of any reasonable method of estimating the effects of new financing on the investment value of outstanding securities that does not involve estimating first the additional income expected in relation to the additional costs incurred, including payments for such factors as risk. Maximizing the present value of anticipated net income is the same as maximizing a prudent investment value of the securities, because net income is the primary determinant of prudent investment value.

Mr. Durand's analysis, however, does not arrive at the effect of proposed new financing on the investment value of the securities independently of income and costs. The effects of the proposed new financing on net income and risk are assumed in estimating the new investment value. For example, in one of the illustrations cited the question is raised as to whether the stockholders of a hypothetical corporation "ABC" could profitably borrow $10 million via 4 percent bonds to finance additional plant expected to earn $800,000 annually. It is stated that the expansion would have the advantage of increasing prospective earnings from $2.50 a share to $2.90 a share, but that it also has the disadvantage of increasing the risk because the proposed bond issue is so large that dividends might be curtailed for several years and, if earnings should fall off sharply, the entire financial position of the company might be jeopardized. The author concludes that the assumed increase in per share earnings is not sufficient to compensate for the assumed risk incurred. The illustration is used to make the point that "the risk incurred in borrowing may discourage investment, even though the rate of return on the new investment exceeds the interest cost of borrowed money." The "required return" on a new investment is explained as the amount which must be earned without being actually disadvantageous to the stockholders; in other words, with bond financ-

ing it must leave the stock as valuable as before, and with stock financing it must not dilute the per share earnings or the value of the old stock.

The illustration, however, proves only that the increase in earnings must be sufficient to offset or to compensate for the additional risk. The proposed investment to be financed by a 4 percent bond issue would have been ruled out also under Professor Fisher's principles of investment opportunities. Using his investment opportunity principle, the new financing would not be made because the increase in earnings would not be sufficient to provide any excess of returns over costs, including the payment for risk. The illustrations, given to show that investment value must first be determined before the owners of a business can wisely decide as to whether new financing is desirable, are merely a roundabout way of showing that the increase in returns must be sufficient to cover *all costs*.

The second section of Mr. Durand's paper deals with the problem of security appraisal. He states that the practical application of the principle of the required return and the determination of investment value as a means of measuring costs necessitates "a sound, effective, and generally acceptable system of security appraisal. Yet at present no such system exists." Two systems of security appraisal are discussed – the capitalization of net operating income (NOI) and of net income (NI). These two systems, according to the author, arise "from fundamentally different assumptions . . . and have radically different implications for financial policy."

The net-operating-income and the net-income methods represent the same principle or system of security valuation. Both employ the method of capitalizing the net income available to one or more groups of claimants against the assets of the business. The NOI method, in which there is no deduction of interest on bonds, is merely a means of employing the capitalization principle to determine the value of both the stockholders' and bondholders' interest in the assets of the business. The result is the "investment value" of the entire capital structure of the business – bonds and stocks.

The NI method represents exactly the same principle, but it is used for a different purpose. Interest on bonds is deducted and the resulting net income is capitalized, thus giving the value of the stockholders' interest in the business assets. In other words, capitalizing the income available to the stockholders gives the investment value of the stock, not that of the entire business. The difference is not one of method but merely one of the purpose for which it is used. It would be just as logical to deduct preferred stock dividends from the net income and use the residual for determining the capitalized value of the common stock.

MISCELLANEOUS COMMENTS

My remaining comments will be limited to one aspect of Mr. Durand's analysis of the implications of his paper for business cycle theory and to a few suggestions I have for further research on the cost of equity and debt sources of funds.

Mr. Durand points out that for some writers on business cycle theory the interest rate plays a strategic role by encouraging and discouraging investment; therefore the monetary authorities can exert a stabilizing influence by raising and lowering the interest rate. He states, however, that this "depends upon a tacit assumption that the cost of raising capital is approximately equal to the interest rate." With this latter statement — one which frequently appears in writings on this subject — I must take issue. The effectiveness of a flexible interest rate policy by the monetary authorities does not depend upon the influence the interest rate has on the demand for and the supply of capital funds. The real objective of a flexible interest rate is to permit the central bank to exercise effective control over bank reserves and the money supply. If the monetary authorities really exercise effective control, restraint will result in rising interest rates and vice versa. A fixed interest rate policy, however, means that the central bank must supply all of the funds that are demanded at that level of interest rates. The monetary authorities lose control over the volume of bank reserves and deposits. Thus, a flexible interest rate policy is effective not primarily for its direct influence but rather as a necessary corollary of effective control over bank reserves and the money supply.

Finally, I want to suggest a few types of research on the cost of equity and debt funds which might be helpful. Following the usual methods of indicating the relative cost of equity and debt funds — the yield on bonds as compared to the average dividend yield or price-earnings ratio on stocks — we find that the spread has been unusually large during the postwar period. The long-term trends in these measures of cost are given and the deficiencies of this method are discussed in Mr. Durand's paper. Admitting that these measures of the cost of debt and equity financing have serious limitations, I think they do indicate certain lines of research that might be helpful.

The cost of equity as compared to debt funds has been relatively high during the postwar period. This may reflect either the investors' belief that the risk element in stock ownership is increasing or that investors are demanding more compensation for risk-taking. In the sense of the terms on which equity funds are available, there is some evidence of a shortage of equity capital. But there seems to be no evidence that ability to supply

equity funds has been deficient. Apparently, it is more a problem of willingness than one of ability.

In view of the limited information available and the importance of a steady flow of equity funds for economic progress, further research is desirable. For example, has there been a redistribution of savings among income classes so that the higher income groups are no longer able to supply as large a quantity of equity funds as formerly? What is the attitude of investors toward stocks as an investment and why? Is an increasing proportion of personal savings going into institutions such as life insurance companies and savings and loan associations, and if so, why? Some research has already been done along these lines, but further studies might be fruitful in providing more information on the important factors influencing the supply of equity capital and the terms on which it will be made available.

MARTIN W. DAVENPORT, *New York University*

I would summarize Mr. Durand's argument as follows:

> Businessmen act in what they believe to be their own best interests. Economic theory has presumed that their best interests lie in maximizing income, that the cost of capital is measured by interest rates, and therefore that business expansion requires a marginal rate of return which exceeds the interest rate. This theory must, however, be abandoned for two reasons: 1) the best interests of businessmen consist in maximizing value, not income, and 2) the cost of capital is measured not by the interest rate but by the rate of return on marginal investment necessary to increase the value of the businessman's investment. The key to this approach is a suitable method of appraising investment values of business enterprises and particularly of their common stocks.

I am largely in agreement with Mr. Durand's position, although with certain differences of detail and emphasis. One of these bears upon the use of the words "cost of capital." What really concerns us, I believe, is not the *cost* of raising capital but rather the *effect* of raising capital on investment value. In the accounting sense of the word, at least, there is no cost unless there is some obligation to pay interest; in this sense, retention of net income involves no cost; and yet the effect of retaining earnings on investment value, for better or for worse, may be tremendous.

Mr. Durand has shown that a proposed expansion may promise to raise the income of the owners of an enterprise and yet appear inadvisable because it seems likely to reduce the value of their investment. The standard explanation is that to borrow additional capital increases the "risk" to

the junior equity. On purely theoretical grounds, it might seem that the increased danger of loss if things went badly would be counterbalanced by the chances of increased gain if things went well.

However persuasive this argument may appear, it is a fact that the market pays a premium for safety and exacts a discount for risk. Among financial analysts, it is common knowledge that a "leveraged" common stock will sell at a lower multiple of earnings than an "unleveraged" stock of the same company. Nor does this observation apply to these precarious times alone, except in the unusual degree to which it is evident today. I know of no time since 1929 when it has not been generally true that a prior claim to a senior segment of a company's earnings was more valuable than a residual equity to a junior segment of similar amount.

For a very brief period at the top of the 1929 stock market boom, many common stocks sold at a higher ratio to current earnings than did bonds in relation to their claims to interest, but the abnormality was short-lived and was due, I believe, to a degree of optimism as to future increase in earnings so extreme that it could not long face reality. In any case, the relationship that prevailed briefly in 1929 was unusual in the past and may be considered unlikely to prevail in the future.

One of the few portions of this broad field which I have explored involves the relationship between capitalization leverage and the valuation of common stock earnings. For public utility companies, which are peculiarly adaptable to this purpose because of the stability of utility earnings and the availability of a sizable sample of homogeneous companies, my studies showed that even a relatively slight amount of debt or preferred stock would noticeably raise the rate of capitalization of the earnings applicable to the common stock.

If the promise of a return on additional capital sufficient to bring about an increase in common stock *earnings* is unreliable as an indication of the desirability of the transaction for the common stockholders, what test shall we substitute in its place? We need to know the rate of return which will be sufficient to result in an increase in the *market value* of the common stock. Mr. Durand calls it the "required return."

In essence, the required return is that rate of earnings on additional capital which will raise the total market value of the enterprise by an amount at least equal to the market value of the securities issued in order to obtain the new capital. It is a function of the over-all rate of capitalization of the company's total earnings before interest charges, that is, of the relationship between the total market value of the enterprise and the total earnings which are the basis of that value.

Obviously, a theory that depends on a calculation of the effect of a

capital addition and its financing on the value of an enterprise requires a method of valuing the enterprise and its securities. Assuming a reasonably reliable estimate of the probable rate of return on additional capital investment – which would be equally necessary under the superseded theory of maximizing income, and which the owners of the enterprise are probably capable of making – all that we need further is the over-all rate of capitalization at which the company's earnings, or the earnings of a similar company, tend to sell in the market place, and a method for determining what portion of this value is assignable to the company's additional securities issued. If we can be content with a reasonably narrow range of rates of capitalization of earnings, and I think we can, then there is no insurmountable obstacle.

In discussing security valuation, Mr. Durand has made much of the alleged conflict between the alternative methods of capitalizing net income or net operating income. In my opinion, he has exaggerated the seriousness of this problem. Because analysts generally understand that the relative amount of leverage senior to a common stock is one of the primary determinants of the rate of capitalization of common stock earnings, I think it would be difficult to find one who in practice uses the pure "net income" method of appraising common stocks.

On the other hand, the "net operating income" method must be made flexible enough to allow for the fact that the type of capital structure has an effect on the total market value of the enterprise. As Mr. Durand has so clearly pointed out, the "institutionalization" of savings in banks, insurance companies and the like, which are wholly or partially restricted in their choice of investments to certain classes of fixed interest-bearing obligations, tends to create a "super premium" for high-grade bonds that provides an opportunity to maximize the total investment value of a company by effective bond financing.

Another important factor is, of course, the corporation income tax. In pure theory, a company financed entirely by interest-bearing debt would be worth 61 percent more than an all-stock company, assuming a 38 percent income tax rate, and the higher the rate, the greater the differential. In practice, of course, all-debt capital structures are financially impracticable and would be disallowed by the Bureau of Internal Revenue. Nevertheless, a considerable amount of debt is entirely feasible for most companies, and its existence raises the total market value of the enterprise, both absolutely and in relation to earnings.

Capital structure probably has other, less obvious, effects on going-concern values. Debt compels, and preferred stock encourages, distributions which might not be made if the capital structure consisted entirely

of common stock. From the viewpoint of total investment value, such distribution may be desirable or undesirable, depending on the profitability of available opportunities for reinvestment of earnings in the business. On the other hand, excessive amounts of debt, or even of preferred stock, pose the threat of possible eventual interference with the management or even with operations of the business as a result of transfer of voting control or receivership.

After allowing for these and possibly other factors, there appears to be, for each company, an "optimum" capital structure containing that amount of debt which will maximize the total value of the enterprise. I say "debt" rather than preferred stock because, for reasons relating to income taxes and the "super premium," a reasonable amount of debt tends to maximize the going-concern value of an enterprise, while preferred stock, lacking these advantages, does not. It makes no sense for a strong company like DuPont to sell preferred stock when it could safely and easily sell bonds. I think there is a good chance that statistical research in this area would yield interesting and valuable results.

Assuming, then, that we agree to employ a "net operating income" method of valuation, with appropriate allowance for income taxes, super premium and perhaps other relevant considerations, there are alternative approaches to the problem of determining whether a given method of financing is advantageous to the common stockholders of an enterprise.

By far the simpler alternative, and one designed to show whether the transaction is likely to appear beneficial in the near future, is the method based on current market appraisal of current earnings. If market prices are available for the company's securities, it is fairly simple to determine the approximate over-all rate of capitalization of the current earnings, assuming that the current rate of earnings is known with reasonable accuracy. Underwriters perform such calculations as a matter of routine.

The second method is more complicated and requires a considerably larger element of judgment, since it requires an estimate of what constitutes a "normal" rate of capitalization of earnings for the company. Evidence of what constitutes a normal rate of capitalization can be derived from comparisons of past prices and earnings of the company in question, and of other companies similar to it; but since these relationships vary, conclusion from such data will usually take the form of a median or mode or other average with some margin of error implicit.

At first glance it would appear that the two methods are likely to vary widely in their results, since current rates of capitalization of earnings are generally much higher than any "normal" rate that would be derived from

the experience of past years prior to 1947. On further study, however, this difficulty tends to vanish.

There has always, except in 1929, been a tendency for earnings to be capitalized at high rates when earnings were historically high, and conversely. Common stocks and entire enterprises are probably selling low in relation to current earnings because the earnings are widely believed to be abnormally high. It seems safe to predict that rates of capitalization will eventually decline toward what we used to consider normal, either because the earnings drop or because the current levels become accepted as normal.

The comments above may become clearer if I illustrate the point in terms of an actual company — Sears, Roebuck. Its capital structure consists solely of common stock. During the past five years, Sears has expanded tremendously by reinvesting about $275 million of undistributed net income. Its major competitor, Montgomery Ward, which is of comparable size and similar as to nature of business, has totally refrained from new capital expenditures. Ward therefore furnishes a convenient standard by which to measure the effects of Sears' expansion on its sales and earnings.

Since 1945, the year before Sears began to expand aggressively, Ward's sales have risen from $654,779,000 to an annual rate of about $1,033,-500,000 this year, a gain of about 58 percent. We may assume that if Sears had not expanded it would also have increased its sales in approximately the same proportion, or from $1,045,259,000 in 1945 to an annual rate of some $1,650,000,000 this year. In actual fact, however, Sears' sales are now running at an annual rate of about $2,330,000,000, and the difference of some $680 million seems a reasonable estimate of the effect on sales of Sears' reinvestment of $275 million of additional capital. I do not know how closely this figure corresponds with the original projections of the Sears management at the time when the expansion program was considered and decided upon. For purposes of illustration, let us assume that their forecasts were closely realized in practice.

During the postwar period, Sears has been able to realize a profit margin of close to 10 percent of sales, before federal income taxes. After allowing for such taxes at the rate of 38 percent, this profit margin applied to sales of $680 million would indicate an addition to net income of $42,160,000 or 15.3 percent of the $275 million of additional capital. The prewar earnings record suggests, however, that a pretax profit margin of 8 percent would be a much safer guide to the longer term future, and such a margin, with the same $680 million of sales and 38 percent income tax rate, would mean additional net income of $33,728,000 or 12.3 percent of the capital reinvested during the past five years.

What rate of return is required to make this achievement profitable to the company's stockholders in terms of its effect on the market value of their stock? During the postwar years 1946-49, when the stock's earnings were ranging between $4.24 and $5.80 a share and averaging $4.80, the stock sold in the market between a high of 49⅝ and a low of 30⅛, averaging a little less than 40. Earnings of $4.80 on a price of 40 represent a capitalization rate of 12 percent. At the present time, with earnings apparently running at an annual rate of roughly $5.50 a share, the stock is selling around 45 or at a rate of about 12 percent. Comparison of these rates of capitalization with the estimated 15 percent current rate of return on capital reinvested during the past five years indicates that such reinvestment was advantageous to the stockholders.

In the prewar years 1939-40 (omitting the 1938 depression and the stock market collapse accompanying our gradual entry into the war in 1941-42) Sears sold at between 22 and 15, or at an average price of around 18½; in these years it earned $1.65 and $1.58 per share. (All of these figures have been adjusted to reflect the 4-for-1 stock split in 1945.) These earnings were then being capitalized at around 8.7 percent. The 12.3 percent return on invested capital computed on the basis of an 8 percent normal profit margin would clearly justify the company's expansion program. Even a profit margin as low as 6 percent, which would provide a 9.2 percent return on additional capital, would make the reinvestment of earnings appear advantageous, assuming that we can accept 8.7 percent as a "normal" rate of capitalization of earnings for this company.

Sears could, of course, have financed part or all of this expansion by borrowing. Mainly because of the income tax advantage of the interest deduction, this apparently would have been still more favorable in terms of effect on the value of the stock. To provide a 12 percent return on the stock after providing for 38 percent income taxes would have required a return of 19.33 percent before taxes. Assuming that Sears could have raised long-term capital at an interest rate of 2½ percent, a return of 17.83 percent before taxes would have produced a 12 percent return after taxes. The higher the interest rate, the greater the differential between the two required returns before taxes.

The lower rate of return (before income taxes) on additional capital necessary to justify debt financing as compared with equity financing is no doubt an important reason for the relatively minor role of new common stock issues as a source of corporate funds in the postwar period. Out of $23 billion of long-term capital raised by sales of securities during the years 1946-49 inclusive, $18 billion consisted of bonds, mort-

gages and long-term bank loans, while only $5 billion arose from net new issues of common and preferred stock, and of this only $3 billion was common. Of course, some portion of the $18 billion consisted of convertible bonds, mainly public utility, which may be considered indirect equity financing, in that they are issued with the expectation, or at least the possibility, of eventual conversion into common stock. Even so, the preponderance of debt is striking.

There is only one kind of equity financing that has amounted to much in recent years, and that is retention of earnings, which in 1946-49 amounted to nearly $40 billion, not including some $21 billion of allowances for depreciation. The contrast between the $40 billion of retained earnings and the $3 billion raised from the sale of common stock demands explanation.

Does retention of earnings have any real and substantial advantages over sale of common stock from the standpoint of effect on the value of the stockholders' investment? Obviously it has. To the extent that the corporation would realize less than the current market price – because of selling and underwriting expenses, or because a large issue of common stock might have to be priced appreciably below the market in order to sell – there is a real, though probably in most cases not decisive, advantage to be gained by retaining earnings instead of selling common stock.

There is also, theoretically, a tax advantage, since if instead of reinvesting earnings the corporation first distributed them in dividends and then tried to get them back in payment for stock, the amount that the stockholders could reinvest in the business would be reduced by their personal income taxes on dividends received. But since the company's stockholders would in any case buy only a limited proportion of the new stock, most of the force of this argument evaporates.

These factors no doubt go far to explain the overwhelming preference of corporations for retention of earnings as against sale of common stock. But there is another possible explanation, and it has nothing to do with the best interests of the stockholders. It may be that earnings have been retained and reinvested in the business merely because they were available, without the necessity either of demonstrating the wisdom of their intended use or of facing the verdict that the market would render were additional stock offered for sale.

After all, the interests of management are distinguishable from those of stockholders and may be in conflict with them, in that management has incentives to increase the size of a corporation and to build up its working capital beyond the point to which such actions represent profitable use of stockholders' capital. This line of reasoning, if shown to be

valid, would tend to discredit both the old thesis that business expansion will proceed until the marginal return on capital equals the interest rate and Mr. Durand's proposed substitute that expansion will continue until the marginal return on capital equals the "required return."

What is now indicated, in my opinion, is a thorough study to determine to what extent expansion plans of corporations have been based on stockholders' best interests, as measured by probable effect on the value of their stock, and to what extent this expansion and its chosen method of financing have been beneficial or detrimental to their interests. Integral parts of such a survey would be a series of individual studies designed to show what net operating income tends to sell for and what capital tends to earn in various industries, what is the effect of dividend policy on valuation, and what is the optimum capital structure in each industry.

Another approach that might yield interesting conclusions would be a series of interviews with managements of carefully selected enterprises, designed to disclose the reasons behind certain policies and actions which, on the basis of our theory of maximizing value, seem particularly difficult to explain.

There is no doubt in my mind that comprehensive and thorough research in this field would yield data of great value to students of business finance. There is also a good chance that such studies might shed considerable light on the reasons for the fluctuations in business capital expenditures that are so important a determinant of the business cycle.