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DEBT VERSUS EQUITY

by

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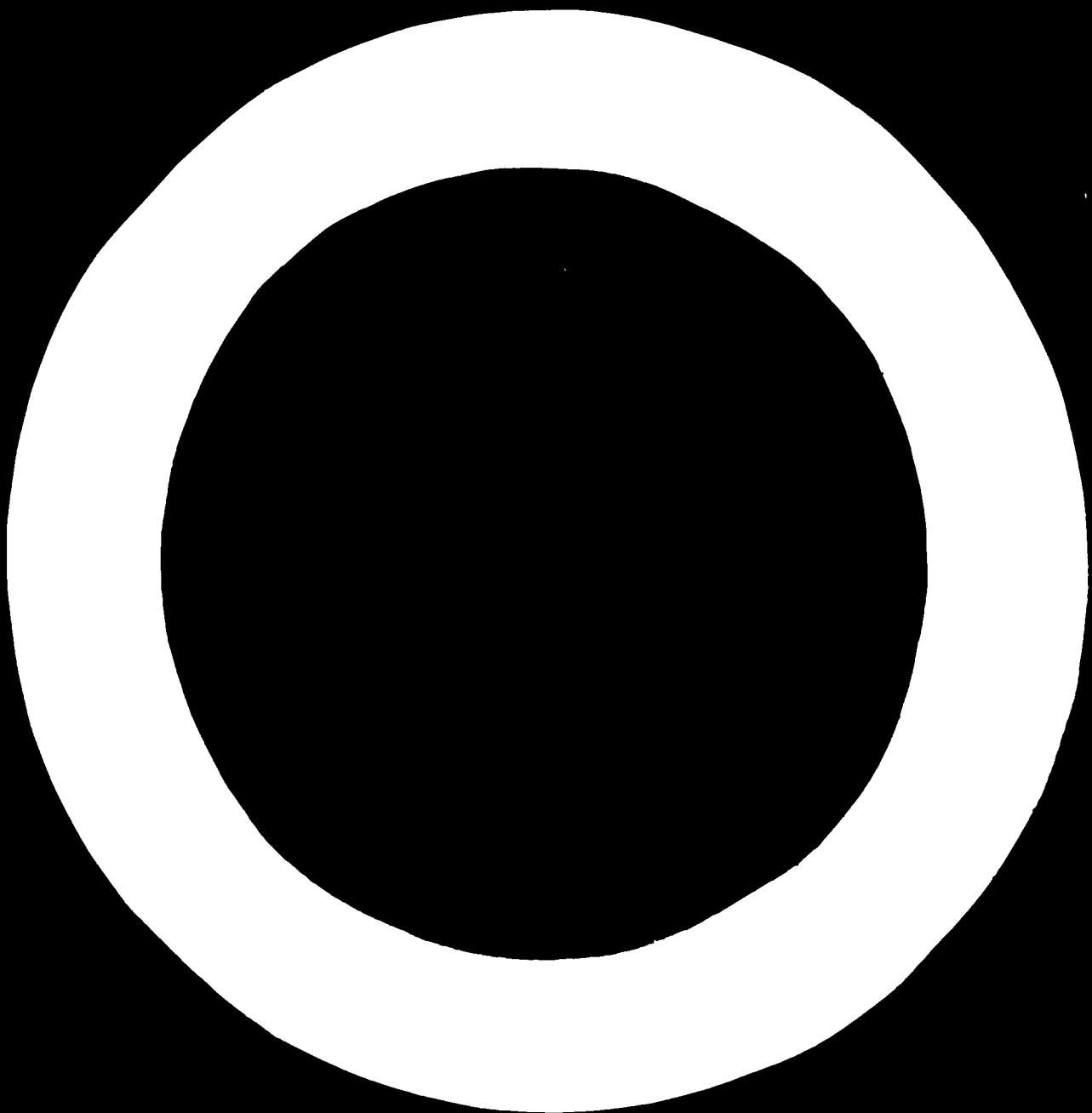

Perhaps the first question we should face in considering the debt vs. equity problem is how and why the problem arises. Basically, a company will face this problem whenever it anticipates that its proposed uses of funds will at any time exceed its internally generated sources of funds. There may even be occasions when the company may wish to obtain outside financing although its internally generated sources are adequate.

A company that foresees greater uses of funds than sources which are available internally must reach a decision as to what type of external financing it will choose. This article will attempt to define the issues involved in making this choice, and to provide a general framework for reaching decisions.

There are four general issues which must be considered in the external financing decision. Each will be discussed at some length. It is a traditional maxim that a business should seek to maximize its earnings consistent with a reasonable degree of risk. The decision areas we are about to discuss will show how the various forms of external financing fit into the maxim.

I. EARNINGS

In order to see what the effects on earnings are of each of the two basic types of capital, straight equity and straight debt, let us consider the following example.

Company A presently has earnings before interest and taxes of $46,028,000. It pays $1,123,000 interest on its existing debt capital. The company ascertains that it needs $30,000,000 of new capital for purposes of expansion. The company could obtain the $30,000,000 in straight debt form (sold at par), and pay interest at the rate of 4.25%. The final maturity of this debt would be in 20 years. On the other hand the company could float an equity issue of 400,000 shares of common stock whose net proceeds to the company would be $75 per share. Outstanding are 6,585,000 shares of common stock. Table No. 1 shows how the two basic types of external financing affect the level of earnings per share. It is assumed that the level of earnings before interest and taxes after the injection of new capital will be $52,328,000.

If we were to look at a number of number of possible earnings levels after the same injection of $30,000,000 of new capital, we would get a picture somewhat like that displayed in Chart No. 1.

From Chart and Table No. 1 it appears that from an earnings point of view debt is superior to equity. However, we should not forget that with debt there are not only interest charges but also required principal repayments. Principal repayments must come from undistributed earnings. As such, principal repayments have an opportunity cost since the earnings necessary to repay the bond holders could have been reinvested in the company.

So, if we look at the earnings of the company that are really available to the common stock after that portion of the earnings which is committed to principal repayment is deducted, we see that the uncommitted earnings per share is greater with common than with debt. Please see Graph and Tables No. 2. Here we assume that the annual sinking fund requirement on the company's existing debt capital is $2,250,000. Now, if the company issues $30,000,000 of bonds repayable over 20 years the annual additional sinking fund requirement would be $1,500,000. The total sinking requirements with the new bond issue will be $3, $750,000. Chart and table No. 2 show the affects on uncommitted earnings per share of the two basic types of external capital.

We can make two points to summarize the effect on earnings of the debt vs. equity decision:

1. If we look at earnings per share alone it would appear that debt is a more favorable route.
2. However, if we concentrate on that portion of the earnings that could actually find its way into the stockholder's pocket, we conclude that, everything else being the same, common equity is a more favorable route.

II. RISK

In deciding the debt vs. equity problem we must not consider earnings to the exclusion of risk.

There are two basic forms of risk: The risk of cash inadequacy, and the risk of cash insolvency. The risk of cash inadequacy is the risk that the company might

not have enough cash to cover both required cash outflows and those cash outflows which management desires to preserve. The latter category of outflows might include dividends, capital expenditures, and so forth.

The second form of risk is the risk of cash insolvency; that is, the risk that a company might not have enough cash to meet its legal obligations. The risk of cash insolvency is clearly the more dire from of risk, and is the risk usually associated with the debt vs. equity decision. As a company acquires debt in its capitalization, it binds itself through the debt indenture to specified, certain, cash outflows. The risk of cash insolvency is the possibility that the uncertain cash inflows of the future may not be adequate to meet the certain cash outflows of the future.

Of course, the debt vs. equity decision is not simply a question of risk vs. no risk. Even without debt in its capital structure, a company has some fixed cash outflows. The debt vs. equity decision, as it focuses upon risk, involves a choice of more or less risk, not a choice of risk or no risk. However, for any given amount of debt there are certain measures which can be taken to minimize the accompanying risk.

1. The company can attempt to reduce the annual level of contractual cash outflows by extending the maturity of the loan.
2. Or, just the reverse, the company can seek to shorten the repayment period in order to avoid the uncertainty associated with future cash inflows.
3. The company could attempt to weaken the restrictive covenants in the indenture.

It is clear that one of the principal decision areas a company's management must consider in the debt vs. equity decision is that of the relationship of risk and earnings. If management is to follow the maxim of maximizing earnings consistant with a reasonable degree of risk, it must at the same point decide what is a reasonable and proper degree of risk for it to assume. How management selects the appropriate level of risk is our next topic.

A company has two choices in selecting what is a reasonable and proper level of risk It may consider the opinion of outside experts, for example: rating agencies, lendir

institutions, and other similar corporations' practices. On the other hand, the company may make its own independent appraisal of the level of risk it can sustain. In choosing the former method the company relies exclusively on the capital market to evaluate its risk. By relying on the capital market, the company will surely obtain a "proper" level of risk, but not necessarily a reasonable level. An external evaluation will usually determine how much risk a company should assume.

That any company has a certain level of debt which it cannot safely exceed is theoretically clear. Of course we are assuming a certain future. However, in the face of an uncertain future, it is a complex task to determine the amount of debt the company could service.

If a company decides to rely upon external authorities to select its level of debt it may follow any one of the following paths.

1. Borrow as much as possible so long as the interest rate does not exceed X percent. Or, borrow as much as possible so long as the company keeps a certain rating.

The borrower probably feels that the lender will err on the side of conservatism in evaluating his risk. However, the risk for the lender is not the same as the risk to the borrower. To the lender an individual loan is only part of a portfolio. The risk to the borrower is a risk of its very existence.

2. Do what comparable companies do in selecting their debt levels.

Of course, it is obvious that the comparable companies might not have employed a deliberate and rational policy in selecting their debt levels.

3. Employ some arbitrary rule such as "borrow up to X percent of total capitalization".

A detailed analysis of the cash inflows and cash outflows of the company is required in order to determine the reasonable and proper level of debt the company could service. There is no doubt that this job could best be done by people familiar with the entire financial scheme of the company. One author has proposed a framework for determining the maximum amount of debt a company could have without the risks of cash insolvency and cash inadequacy.

The determination begins by asking "what are the chances of running out of cash in the future, and how are these chances affected by the addition of X dollars of interest and sinking fund payments?". The company then calculates from the perspective of histroical fact what the most adverse net of cash inflows and cash outflows during times of recession would be. The company then constructs a maximum adverse net cash flow. If this maximum adverse net cash flow is positive, then this amount is the amount of incremental cash charges which the firm could assume without the threat of cash insolvency.

So far, we have explored the relationship of earnings and risk. That is, we have outlined the issues which must be considered in arriving at an optimal combination of the two. We have seen how the two basic forms of external financing affect the earnings that accrue to the company's equity base. We have seen how the element of risk can be approached, and most importantly, we have seen how risk and earnings are so closely and complexly inter-related.

However, the earnings-risk area is not the only decision area which should be considered by the company when deciding the debt vs. equity question. The question of cost cannot be avoided; and theoretically each form of capital has its cost.

III. COST

Cost of capital is such a complex and disputed subject that we are limited in this article to outlining only some of the present thinking in this area. One of the least disputed areas in cost of capital is the cost of straight debt capital. When a company decides to go the debt route, it is in effect using tomorrow's retained earnings today. Now, the cost associated with striaght debt is simply what the company has to pay for the use of debt, namely the interest cost. The before tax cost of debt capital, k_i, is the effective interest cost of the debt to the borrower. For example, if a company borrows $100 for one year and pays six dollars in interest the effective cost of the debt is 6%.

Calculating the cost of equity capital is much more complex, and there is considerable disagreement as to the appropriate method. Basically, however, when we discuss the cost of striaght equity capital, k_e, we are not thinking of a cost

in the accounting sense. What we are thinking about is a basis for setting the rate of return that would be required to justify the use of additional equity funds. In one word, we are concerned about dilution or earnings per share.

Let us examine one theory of the cost of equity capital. Theory A has the following variables:

E_b Total earnings before the new issue.
E_a Total earnings after the issue.
R_b Total market value of common shares before the issue.
B_a Total market value of common shares after the issue.

Theory A simply states that in order not to dilute the present shareholders' interest, an issue of new equity must promise a rate of return to the new total group of shareholders (existing shareholders plus new shareholders resulting from the equity issue) at least equal to the present rate of return to the existing shareholders. Using the symbols, theory A requires that:

$$\frac{E_a}{B_a} \quad \frac{E_b}{B_b}$$

In other words E/P (where P represents the price per share and E represents the earnings per share over the price per share is the least return acceptable without dilution. We can say that: $k_e = E/P$. It is difficult to see how k_e so defined is a cost. As a step in clarifying this we might say that k_e is a rate of return a company must earn on the projects financed with the new equity issue in order not to dilute the existing shareholders' interest.

A second theory, Theory B, also takes into account the company's expected growth pattern. It assumes that a company's total market price, V, is the discounted aggregate stream of all future dividends. Moreover the theory assumes that those earnings not paid out as dividends will be reinvested and grow at an annual rate g. g can also be defined as being equals br where b is the fraction of the earnings retained and r is the rate of return on reinvested earnings. $g = br$ is then the rate at which the dividend stream (assumed proportional to the earnings stream) is

expected to grow. Theory B then states that $k_e = \frac{D}{V} + g$. The letter D stands for dividend.

$\frac{D}{V}$ = the rate at which the market has discounted the stream of dividend return.=

$\frac{D}{V}$ may then be considered to be the minimum rate the company must earn on its new

new equity money if there is going to be no dilution of equity. Theory B, in addition, says that g must be added to $\frac{D}{V}$ to give a true picture of the rate that the company must earn on the new money. The factor g, covers the situation when a company is experiencing growth, that is, an increase in return on reinvested earnings. When a company is in a growth situation the present stockholders expect the company to earn more and more on the reinvested retained earnings.

k_i as we have defined it is a before tax cost. However, k_e since we have considered it on an earnings per share and divided basis is an after tax cost. To make the two comparable it is necessary to put both on a before tax or after tax basis.

We have so far delved somewhat into the theory of the cost of equity capital. If we assume that we are able to obtain theoretically satisfactory costs of straight equity and straight debt capital, k_e and k_i, we can approach a blended "cost of capital" which is the general cost to the company of its capital. The blended cost of capital is simply the weighted cost of the two simple costs, k_e and k_i.

$$k_o = w_i \times k_i + w_e \times k_e$$

where w_i is the fraction of debt already in the company's capitalization and w_e is the fraction of equity already in the company's capitalization.

The weighted cost of capital is not in itself too good an aid in deciding the debt vs. equity question. However, the theory behind it does define the cost decision area. In actual practice k_e works out to be substantially larger than k_i, so that debt is usually considered cheaper financing than equity.

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Of course the inclination to secure a new financing via the debt route inasmuch-as debt is less costly must be tempered with the caution that loading on further or new debt will increase the risks involved.

To summarize what we have covered so far, let us say that since earnings, risk, and cost are so closely interrelated we cannot solve the debt vs. equity problem merely by considering one of these decision areas in isolation. We can evaluate each area individually, but we must then have a method to weigh each one and through some exceedingly complex process to crank out a result-answer.

IV. FORWARD PLANNING

There remains yet one more decision area to be explored. This area is the non-technical area of forward planning. In a very real sense the debt indenture covenants restrict managements forward planning. In essence, these covenants circumscribe some of managements control. The lender thus has received a degree of control over the management of the company's operations. The key question is "is management willing to operate under some specific degree of restriction?"

So, in addition to earnings, risk, and cost we should add control as a decision area. The area of control is more physoological and less measurable than the other areas, but it must be considered in any evaluation.

It goes almost without saying that in this article we have looked at the debt vs. equity problem primarily from an insider's point of view. When we talked about management we assumed that management is responsible for the shareholder's interests Yet it is certain that outsiders, mainly the lender, will view it quite differently.

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Table 1

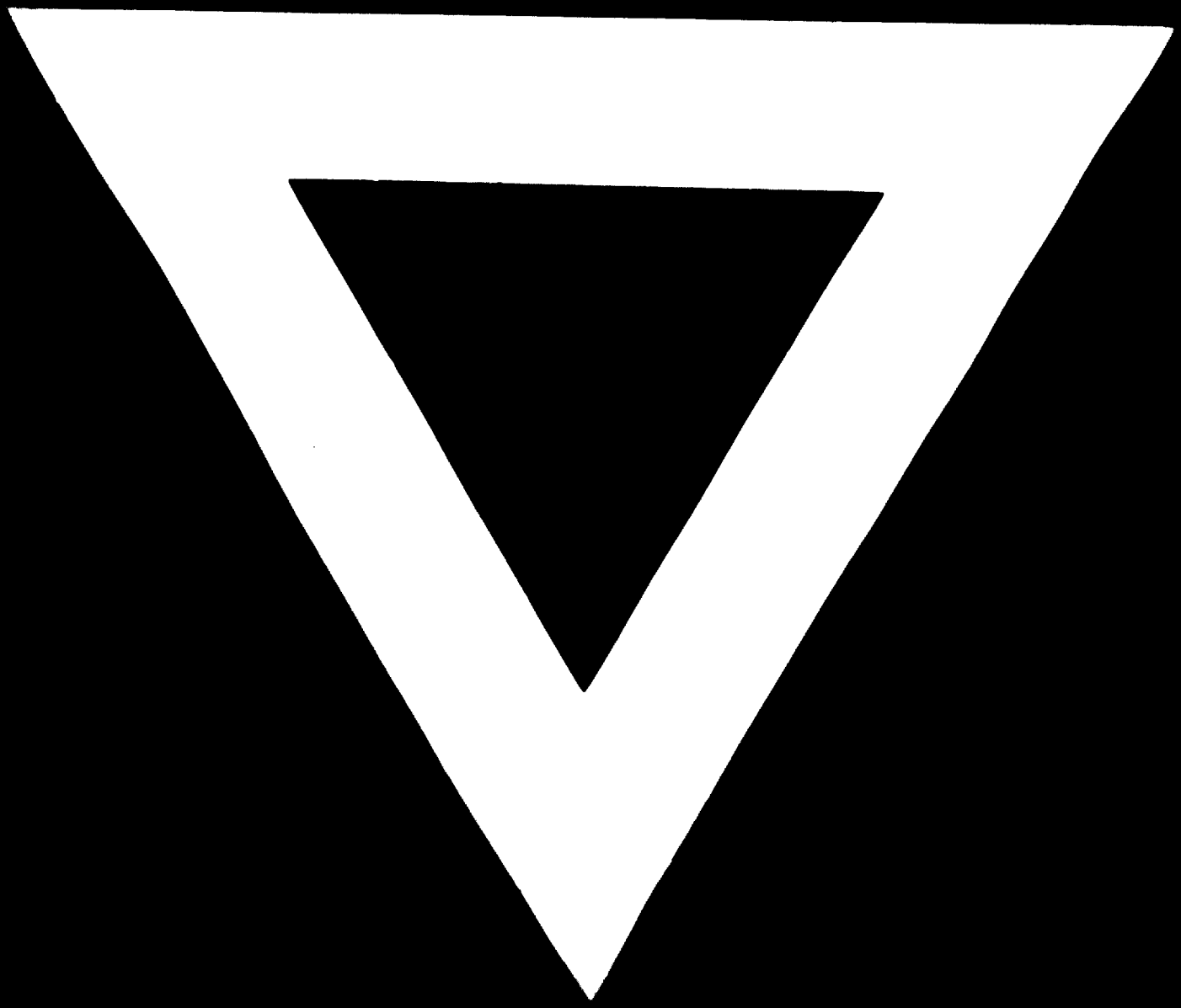
(Dollar Figures in Thousands)

	1966 Capital Structure and Earnings	1967 Earnings Assuming $30 Mill Expansion Financed by	
		Bonds	Common Stk.
Earnings before interest and taxes	$46,028	$52,328	$52,328
Interest on debt	1,123	2,398	1,123
	$44,905	$49,930	$51,205
U.S. federal income tax @ 48%	21,554	23,966	24,578
Net profit after taxes	$23,351	$25,964	$26,627
Preferred dividends	700	700	700
Net earnings on common stock	$22,651	$25,264	$25,927
Number of common shares outstanding (in thousands)	6,585	6,585	6,985
Earnings per share	$ 3.44	$ 3.84	$ 3.71
Chart 1 reference point		(3)	(1)

Table 2

(Dollar Figures in Thousands)

	1966 Capital Structure and Earnings	1967 Earnings Assuming $30 Million Expansion Financed by:	
		Bonds	Common
Net earnings on common stock (Table 1)	$22,651	$25,264	$25,927
Sinking fund requirements on bonds	2,250	3,750	2,250
Uncommitted earnings on common stock	$20,401	$21,514	$23,677
Uncommitted earnings per share	$ 3.10	$ 3.27	$ 3.39
Chart 2 reference point		(3)	(4)



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