Graphic Tests of Equity in Financing Corporate Combinations

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Compensating stockholders of merging companies poses problems since the companies may vary in earnings potential as well as assets. This article outlines tests for measuring the fairness of distribution plans.

GRAPHIC TESTS OF EQUITY IN FINANCING CORPORATE COMBINATIONS

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A GROWING number of companies are turning to mergers and acquisitions as a way of attaining rapid growth. The preliminary financial appraisal of an acquisition is relatively simple if the acquired company is to be operated as an entity without any consolidation of operations (or if it is to be liquidated to provide a tax loss). In these circumstances the financial appraisal consists essentially of a unilateral estimate of the new affiliate's aggregate net asset value.

If operations of the two companies are to be merged, however, each company must be analyzed, and the analysis must include relative earning capacities as well as assets contributed. Such an analysis is an important part of the acquiring company's planning if, as is commonly the case, the purpose of the merger is to enhance the earning power of both constituents. It is also an essential step in assuring fairness to all if there is to be continuity of interest in the combination on the part of both groups of stockholders.

This type of analysis is relatively complex, for it requires balancing subjective evaluations and projec-

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tions made by various interest groups and integrating them into a mutually acceptable plan. In this article we examine some of the more significant influences in the development of such plans, with stress on the question of equity to stockholder groups rather than on management planning. Tests for determining the relative equity of the original stockholder interest groups in the earnings of the combined company are described, and a graphic analytical technique for comparing security distribution plans is presented.

Unweighted Income Comparison		
	Net Income	
Year	Company X	Company Y
1961	$ 30,000	$ 10,000
1962	50,000	10,000
1963	80,000	20,000
1964	70,000	40,000
1965	50,000	70,000
	$280,000	$150,000
Five-year average	$ 56,000	$ 30,000

TABLE I

Analysis is relatively complex; it requires balancing subjective evaluations and projections made by various interest groups and integrating them into a mutually acceptable plan.

Basic considerations

When both groups of stockholders continue to retain a financial interest in the combined company, fundamental problems of equity exist. The key question is how relative allocations of future earnings compare with precombination distributions. To preserve the relative equities of the two groups in the new or surviving entity, the contributions of each company to the postcombination earnings must be estimated.

Frequently the past earnings history of each constituent company is used to project its contribution to future earnings. This history may or may not be a reliable indicator. Differing trends in the earnings of the two companies may upset the relationship between them, or existing trends may be reversed. In making projections, the analyst must take into account such factors as the economic maturity of the relevant industry, evidences of technological obsolescence and its implications, and the state of organization and degree of ferment in the labor force.

The assets transferred to the new or surviving corporation are also relevant, although consideration of these values ranks behind earnings. In evaluating net tangible assets, market values are preferred to book values because they are more closely related to earning capacity. Such intangible elements as managerial efficiency, competi-

tive market conditions, and restrictive tariffs and other restraints determine the additional value generated by efficient application of the tangible assets; this value is implicitly provided for in the estimate of contributed future earnings.

Projection of earnings

The use of historical net income data in estimating earnings potentials is illustrated by the following example:

In a proposed combination of Company X and Company Y the average net incomes of both constituents for the past five years will be used in predicting earnings. As indicators of earnings potentials, these reported data may require certain adjustments. Adjustments should be made, for example, for unusual economic events that distort a single period's net income. Or if the net incomes for individual years are to be weighted in some manner in order to emphasize trend, an analysis and interperiod allocation of certain data (e.g., depreciation expense) may be required.

The net incomes of the two companies should always, of course, be measured in terms of the same accounting criteria. This may require adjustment of such items as inventory costing assumptions, depreciation methods, and such classificational distinctions as that be-

tween capital and revenue expendi-
tures. In Table 1 on page 22 identi-
cal or equivalent measuring stan-
dards are assumed.

The unweighted averages of the
net incomes of Company X and
Company Y, as calculated in Table
1, may provide a reasonably ac-
curate estimate of future earnings
if the earnings of the two consti-
tuents remain relatively stable. If
either company or both have shown
significant progressive (or regres-
sive) earnings trends during the
period selected for study, the pro-
jection may be distorted. For this
reason it may be wise to use an
arbitrary weighting factor that
gives increased weight to the net
incomes of more recent years; this
accents the directional trend of
earnings.[1]

A weighted income comparison
is illustrated in Table 2 on this
page. The chosen weights are not
predicated on specific trend values,
yet they do allow for trends by
emphasizing the most recent years'
earnings. The data of Table 2 in-
dicate a relatively more favorable
earnings projection for Company
Y, as compared to Company X,
than did the unweighted computa-
tion used in Table 1.

Foundation of a plan

To extend this illustrative ex-
ample, let us assume that the
weighted averages as determined
in Table 2 are the best available
estimates of the net income poten-
tials of each constituent. Let us
further assume that the net assets
contributed by each company, at
appraised market valuation, are as
follows: Company X, $500,000,
and Company Y, $200,000. Using
these assumptions, Table 3 on this
page summarizes the earnings pro-
jections and net asset contribu-
tions of the companies. These data

provide a quantitative foundation
on which to base an equitable plan
of distributing securities and/or
assets.

Securities distribution formulas

The stockholders of the merging
companies may be compensated for
their contributions to the amalga-
mation by a variety of means, in-
cluding cash, senior securities,
common stock, and combinations
of these. The choice in a given in-
stance will depend on the under-
lying objectives of the combining
companies. Cash and senior securi-
ties (bonds and nonparticipating
preferred stock) are frequently se-
lected as the primary means of
payment when one company is
buying the other; residual equity
shares, with or without an initial
preference, are more often empha-
sized in cases of merger, when a
bona fide continuity of stockholder
interests is intended.[2]

Ideally, the relative interests im-
plicit in the current earnings po-
tential of each company should be
recognized by distributing equiva-
lent relative interests in postcombi-
nation earnings. On this basis,
utilizing the data in Table 2, an
equitable allocation would seem to
call for future earnings to be dis-
tributed 60 per cent ($60,000

divided by $100,000) to the former
stockholders of Company X and
40 per cent ($40,000 divided by
$100,000) to the former stock-
holders of Company Y.

If the earnings contribution is
the only criterion, equity can be
achieved by issuing common stock
in this ratio. However, it also may
be desirable to issue senior securi-
ties to acknowledge the differing
contributions of net tangible assets.
These securities will provide a
stable, minimal return in the post-
combination period so long as "nor-
mal" profits are realized.

As the data in Table 3 show, the
net assets contributed by Com-
panies X and Y are in the ratio of
5:2, which is not the same as the
ratio of their contributed earnings
potentials of 6:4. It is evident,
therefore, that to be equitable the
plan of securities distribution must
blend several types of securities or

TABLE 2

Weighted Income Comparison

| Year | Company X | | | Company Y | | |
	Net Income	Weighting Factor	Weighted Net Income	Net Income	Weighting Factor	Weighted Net Income
1961	$30,000	1	$ 30,000	$10,000	1	$ 10,000
1962	50,000	2	100,000	10,000	2	20,000
1963	80,000	3	240,000	20,000	3	60,000
1964	70,000	4	280,000	40,000	4	160,000
1965	50,000	5	250,000	70,000	5	350,000
		15	$900,000		15	$600,000
Five-year weighted average			$ 60,000			$ 40,000

TABLE 3

Assets and Earnings Summary

	Company X	Company Y
Tangible net assets	$500,000	$200,000
Potential earnings (based on weighted average—Table 2	$ 60,000	$ 40,000
Estimated rate of return on net tangible assets	12%	20%

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[1] This method is suggested by Clarence
I. Drayton, Jr., Craig Emerson, John D.
Griswold, and G. Richard Young, *Mer-
gers and Acquisitions: Planning and
Action,* Financial Executives Research
Foundation, Inc., New York, 1963, pp.
86-88.

[2] If preferred stock that carries a vot-
ing right is used as a method of pay-
ment, the general conditions for a "tax
free" reorganization are usually not vio-
lated.

November-December, 1965

Equity Implications of Distribution Plans in Table 4

FIGURE 1

Equity Implications of Distribution Plans in Table 5

FIGURE 2

whose earnings reward will depend upon the extent to which the intangibles implicit in earnings potential actually lead to increased profits.
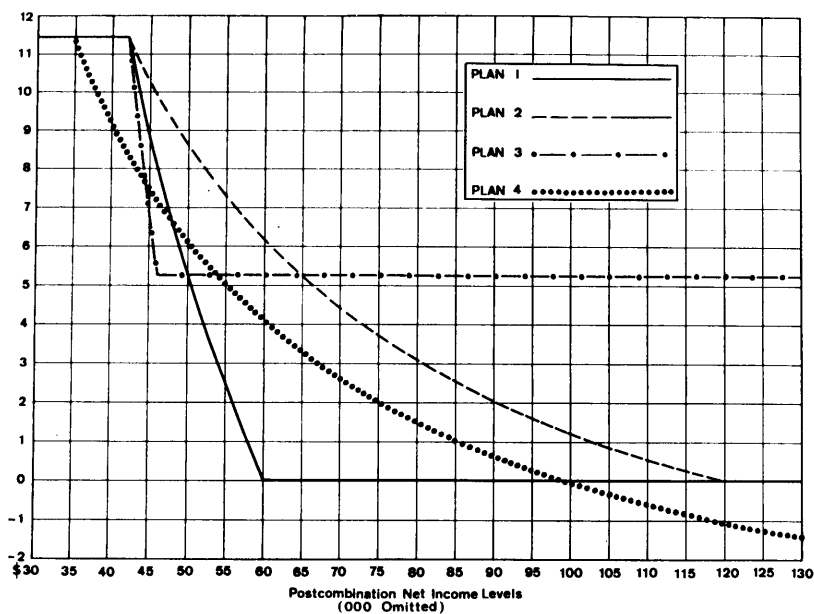
Testing distribution plans

The first step in creating an equitable distribution is to determine the type of senior security to be issued for the net tangible assets contributed by each company in the merger. The capitalization of the combination company will then consist of these shares plus additional shares of common stock to be issued for the capitalized value of expected future earnings in excess of a "normal" return on the contributed net tangible assets.

The number of common shares to be issued depends to a substantial extent upon the capitalization rate, or rates, selected. The validity of these choices can be checked by comparing the allocation ratio of postconsolidation earnings with the ratio of total estimated earnings potentials contributed by each company.

The effect of these alternative choices may be outlined and emphasized by a graphic representation of the variations in the relative advantage (or disadvantage) of each stockholder interest group at various levels of postcombination earnings over a relevant range of earnings. For example, if Company X contributes estimated earnings that are 60 per cent of the total present earnings potential of the combined company, a distribution plan that allocates to Company X 65 per cent of the net income of the new entity at a specified level of postcombination earnings obviously results in a 5 per cent advantage to the former stockholders of Company X and a 5 per cent disadvantage to the former stockholders of Company Y.

Figures 1 and 2 on this page graphically represent eight different distribution plans making use of various capitalization rates and various types of senior securities. Table 4 on page 25 presents the
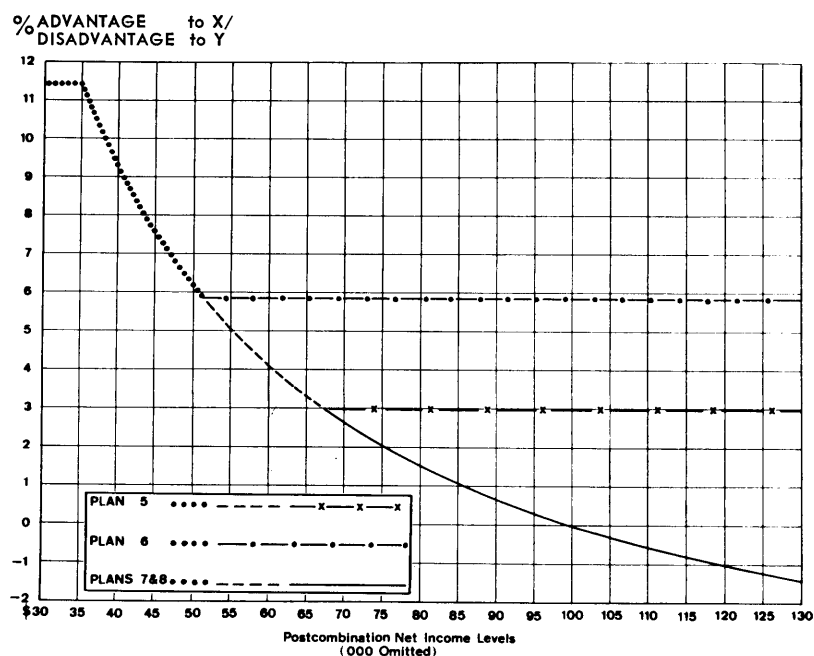
provide for payment partially in assets to the former stockholders of the merged companies.

If securities only are to be distributed, an apparently feasible solution is to issue bonds and/or preferred stock for the value of contributed net tangible assets and to issue shares of common stock for the excess (or above normal)

earnings potentials of the merging companies. A securities distribution formula of this type first compensates for the contribution of net tangible assets by assigning a priority claim on postcombination net income with a reasonable assurance of a normal return thereon. It also compensates for earning capacity through common shares,

Potential Distribution Plans
(using different rates for capitalizing normal and excess earnings)
and Formulas for Relative Allocations of Future Earnings

	5% Cumulative, Participating Preferred Stock and Common Stock				5% Bonds and Common Stock			
	Plan 5		Plan 6		Plan 7		Plan 8	
	X	Y	X	Y	X	Y	X	Y
Normal Return Rate	5%		5%		5%		5%	
Capitalization Rate	10%		20%		10%		20%	
Calculation of Excess Earnings:								
Estimate of future earnings	$ 60,000	$ 40,000	$ 60,000	$ 40,000	$ 60,000	$ 40,000	$ 60,000	$ 40,000
Normal return on tangible net assets	25,000	10,000	25,000	10,000	25,000	10,000	25,000	10,000
Estimated return on intangible assets (excess earnings)	$ 35,000	$ 30,000	$ 35,000	$ 30,000	$ 35,000	$ 30,000	$ 35,000	$ 30,000
Securities Distribution Plan:								
Senior security issued for net assets (as described above)	$500,000	$200,000	$500,000	$200,000	$500,000	$200,000	$500,000	$200,000
Common stock for capitalized excess earnings potential	350,000	300,000	175,000	150,000	350,000	300,000	175,000	150,000
Total stated or par value of securities	$850,000	$500,000	$675,000	$350,000	$850,000	$500,000	$675,000	$350,000
	Plan 5		Plan 6		Plan 7		Plan 8	

Formulas for Relative Allocations of Future Earnings:

Letting z = total postcombination earnings (before bond interest where appropriate). Relative advantage to X, disadvantage to Y =	Plan 5	Plan 6	Plan 7	Plan 8
	11.43% for $z < \$35,000$ $$\frac{\$400,000 - 4z}{65z} \text{ for}$$ $\$35,000 < z < \$67,500$ 2.96% for $z > \$67,500$	11.43% for $z < \$35,000$ $$\frac{\$400,000 - 4z}{65z} \text{ for}$$ $\$35,000 < z < \$51,250$ 5.85% for $z > \$51,250$	Same as Plan 4 (Table 4)	Same as Plan 4 (Table 4)

TABLE 5

centage is based upon a comparison of the relative interest of each company in postcombination earnings (as enumerated in Table 6) with the relative interest of each in the estimate of contributed earnings potentials (Company X: 60 per cent; Company Y: 40 per cent) as previously defined. Thus, the relative equity implicit at this level of postcombination net income is computed for each of the four plans.

It is easier, however, to calculate these values by using the formulas suggested in Table 4:

Plan	Advantage to Company X/ Disadvantage to Company Y
1	0.00%, since $z > \$60,000$.
2	$\dfrac{\$480,000 - 4(\$80,000)}{65(\$80,000)} = 3.08\%$.
3	5.22%, since $z > \$46,000$.
4	$\dfrac{\$400,000 - 4(\$80,000)}{65(\$80,000)} = 1.54\%$.

With these formulas sufficient values may be calculated to complete the graphic representation of Figure 1. The four indexes of relative equity in the preceding example may be confirmed by noting the points at which the $80,000 postcombination earnings ordinate is intersected by each of the curves. The numeric data in Table 5 are translated into the graph of Figure 2 in the same manner.

The graphic presentation and the calculation by formulas produce equivalent results for any potential postcombination net income level. However, because the graph accents the relative advantage/disadvantage relationship more vividly, it might be preferred for a presentation to management.

The reader will note in Figure

1 that in the postcombination earnings range of $30,000 to $35,-000, all plans yield an 11.43 per cent advantage to Company X and a corresponding disadvantage to Company Y. As earnings increase, the conditions of relative inequity change. For example, in the case of Plan 1, equity (the zero abscissa on the graph) is established at the $60,000 earnings ordinate, and it is evident that all postcombination earnings in excess of $60,000 preserve this equity. For Plans 2 and 4, equity is achieved at the $120,-000 and $100,000 earnings levels, respectively. However, while in Plan 2 the equity index stabilizes at $120,000, in Plan 4 earnings in excess of $100,000 generate a new inequity with the advantage/disadvantage relationship reversed. A condition of equity is never achieved in Plan 3, although the inequity percentage ultimately stabilizes at 5.22 per cent.

For Plans 5 and 6 (in Figure 2), a stable condition of inequity is reached. The advantage to Company X and disadvantage to Company Y is 2.95 per cent in Plan 5; 5.85 per cent in Plan 6. Plans 7 and 8 have identical characteristics and are plotted as the same curve in Figure 2. There equity is achieved at the $100,000 earnings ordinate. Earnings in excess of this amount, however, produce a condition of inequity, with the advantage accruing to Company Y.

Comment

From these graphic presentations several conclusions can be drawn:

1. Since the ratio of the net tangible assets contributed by the two participants in the combination is different from the ratio of their earnings potentials, it is impossible to issue a single type of security for distribution to the two groups and still preserve equitable interests in postcombination net income over the entire relevant range of postcombination earnings. For example, a distribution of common shares only would be depicted

Calculation of Advantage/Disadvantage

Plan	Equity in Earnings		Percentage Interest in Earnings		Advantage to Company X/ Disadvantage to Company Y
	Company X	Company Y	Company X	Company Y	
1	$48,000	$32,000	60.00%	40.00%	0.00%
2	50,462	29,538	63.08	36.92	3.08
3	52,174	27,826	65.22	34.78	5.22
4	49,231	30,769	61.54	38.46	1.54

TABLE 6

graphically as a straight line. If this type of security were issued in the ratio of contributed earnings potentials, the two companies' contributions of net tangible assets would not be compensated equitably. If, on the other hand, common shares were issued in some other ratio, a permanent (and constant) net income advantage would accrue to one of the former stockholder groups.

2. As Figure 1 demonstrates, any meaningful definition of "equity" must be related to a specific post-combination net income level. It is evident that equity may be attained at different net income levels with different plans. Commonly applied tests of equity often fail to take into account the significance of the relevant range of post-combination earnings.

3. It is possible to conclude from Figure 2 that the use of different rates for capitalizing normal and excess earnings will not necessarily yield a stable equity relationship such as was ultimately achieved under Plans 1 and 2. Failure to attain equity is a result of the fact that the ratio of earnings on net tangible assets may not coincide with the ratio of earnings on the unrecorded intangibles which are determined (created) in the process of capitalizing excess earnings.

4. It is obvious that the use of bonds (or of nonparticipating preferred stock, which functions in the same way for purposes of this type of analysis) will not result in an equitable distribution plan over

the relevant range of postcombination earnings, although it may produce equity at a single level of earnings. Plans 4, 7, and 8 also indicate that the capitalization rate is not an especially critical element when bonds are issued for net assets. On the other hand, the preference rate of return assigned to the bonds or nonparticipating preferred stock will materially affect the degree of inequity of such a plan at different levels of post-combination net income.

Conclusion

Rules that rigidly prescribe the security types and the capitalization rate limits to be used in a securities distribution plan for participants in a corporate combination may result in inequity for one group or the other. For a meaningful appraisal of the equity or inequity of alternative arrangements, the effect of the plans on distribution of postcombination net income must be studied. Conclusions should be reached concerning the degree of risk that must be accepted by various stockholder groups if the advantages from combination are to be realized.

The implications of alternative courses of action may be analyzed mathematically and accented by graphic presentation. A graphic analysis of the type illustrated in this article should be especially useful in highlighting the effects of postcombination earnings distributions upon the equity of the various stockholder interests.