

Selecting strategies that create shareholder value

Accounting-oriented statements may not provide the best criteria for analyzing your business plans

Alfred Rappaport

Although accounting ratios such as earnings per share and return on investment continue to enjoy great popularity for evaluating company strategy, such measures fall short in basic ways, says this author. Since the ultimate test of a corporate plan is whether it creates value for shareholders, what is needed is a reliable index for assessing plans by this criterion. With discounted cash flow analysis as a basis, the shareholder value approach uses readily available data to determine the value-creating prospects for alternative strategies at the business unit and corporate levels.

Mr. Rappaport is the Leonard Spacek Professor of Accounting and Information Systems and direc-

tor of the Accounting Research Center at the J.L. Kellogg Graduate School of Management, Northwestern University. His last article for HBR was "Strategic Analysis for More Profitable Acquisitions" (July-August 1979).

In today's fast-changing, often bewildering business environment, formal systems for strategic planning have become one of top management's principal tools for evaluating and coping with uncertainty. Corporate board members are also showing increasing interest in ensuring that the company has adequate strategies and that these are tested against actual results. While the organizational dynamics and the sophistication of the strategic planning process vary widely among companies, the process almost invariably culminates in projected (commonly five-year) financial statements.

This accounting format enables top managers and the board to review and approve strategic plans in the same terms that the company reports its performance to shareholders and the financial community. Under current practice the projected financial statements, particularly projected earnings per share performance, commonly serve as the basis for judging the attractiveness of the strategic or long-term corporate plan.

The conventional accounting-oriented approach for evaluating the strategic plan does not, however, provide reliable answers to such basic questions as:

- > Will the corporate plan create value for shareholders? If so, how much?
- > Which business units are creating value and which are not?
- > How would alternative strategic plans affect shareholder value?

My chief objective here is to provide top management and board members with a theoretically

Exhibit I
**EPS growth rates versus rates of return to shareholders
 for Standard & Poor's 400 industrial companies**

	1976-1979	1975-1979‡	1974-1979
Companies with annual EPS growth of 10% or greater*			
Total	259 (100%)	268 (100%)	232 (100%)
Negative rates of return to shareholders	32 (12%)	7 (3%)	39 (17%)
Rates of return inadequate to compensate shareholders for inflation†	65 (25%)	36 (13%)	89 (38%)
Companies with annual EPS growth of 15% or greater*			
Total	191 (100%)	205 (100%)	172 (100%)
Negative rates of return to shareholders	14 (7%)	2 (1%)	27 (16%)
Rates of return inadequate to compensate shareholders for inflation†	33 (17%)	20 (10%)	60 (35%)

*Restated primary EPS excluding extraordinary items and discontinued operations.

Note: EPS growth and rate-of-return calculations prepared by CompuServe, Inc. using Standard & Poor's Compustat data base.

†The annual growth rates in the consumer price index for 1976-1979, 1975-1979, and 1974-1979 are 7.7%, 7.6%, and 8%, respectively.

‡The small number of companies with negative rates of return to shareholders for this period is due to low level of market at the end of 1974. Standard & Poor's stock index at the close of 1974 was 76.47 and, in subsequent years, 100.88, 119.46, 104.71, 107.21, and 121.02.

sound, practical approach for assessing the contributions of strategic business unit (SBU) plans and overall corporate strategic plans toward creating economic value for shareholders.

Limitations of EPS

A principal objective of corporate strategic planning is to create value for shareholders. By focusing systematically on strategic decision making, such planning helps management allocate corporate resources to their most productive and profitable use. It is commonly assumed that if the strategic plan provides for "satisfactory" growth in EPS, then the market value of the company's shares will increase as the plan materializes, thus creating value for shareholders. Unfortunately, EPS growth does not necessarily lead to an increase in the market value of the stock. This phenomenon can be observed

empirically and explained on theoretical grounds as well.

Of the Standard & Poor's 400 industrial companies, 172 achieved compounded EPS growth rates of 15% or better during 1974-1979. In 27, or 16%, of these companies stockholders realized *negative* rates of return from dividends plus capital losses. For 60, or 35%, of the 172 companies, stockholders' returns were inadequate to compensate them just for inflation. The returns provided no compensation for risk. *Exhibit I* gives a more complete set of statistics. Additional evidence of the uncertain relationship between EPS growth and returns to shareholders is offered by the 1980 *Fortune* "500" survey of the largest industrial corporations. Forty-eight, or almost 10%, of the companies achieved positive EPS growth rates, while their stockholders realized negative rates of return for the 1969-1979 period. Thirteen of these companies had EPS growth rates in excess of 10% during this period.

EPS and related accounting ratios, such as return on investment and return on equity, have shortcomings as financial standards by which to evaluate corporate strategy for the following six reasons:

1. Alternative and equally acceptable determinations are possible for the EPS figure. Prominent examples are the differences that arise from LIFO and FIFO approaches to computing cost of sales and various methods of computing depreciation.

2. Earnings figures do not reflect differences in risk among strategies and SBUs. Risk is conditioned both by the nature of the business investment and by the relative proportions of debt and equity used to finance investments.

3. Earnings do not take into account the working capital and fixed investment needed for anticipated sales growth.

4. While projected earnings, of course, incorporate estimates of future revenues and expenses, they ignore potential changes in a company's cost of capital both because of inflation and because of shifting business and financial risk.

5. The EPS approach to strategy ignores dividend policy. If the objective were to maximize EPS, one could argue that the company should never pay any dividends as long as it expected to achieve a positive return on new investment. But we know that if the company invested shareholders' funds at below the minimum acceptable market rate, the value of the company would be bound to decrease.

6. The EPS approach does not specify a time preference rate for the EPS stream, i.e., it does not establish the value of a dollar of EPS this year compared with a year from now, two years from now, etc.

Shareholder value approach

The economic value of any investment is simply the anticipated cash flow discounted by the cost of capital. An essential feature of the discounted cash flow technique, of course, is that it takes into account that a dollar of cash received today is worth more than a dollar received a year from now, because today's dollar can be invested to earn a return during the intervening time.

While many companies employ the shareholder value approach using DCF analysis in capital budgeting, they use it more often at the project level than at the corporate strategy level. Thus, we sometimes see a situation where capital projects regularly exceed the minimum acceptable rate of return, while the business unit itself is a "problem" and creates little or no value for shareholders. The DCF criterion can be applied not only to internal investments such as additions to existing capacity but also is useful in analysis of opportunities for external growth such as corporate mergers and acquisitions.

Companies can usefully extend this approach from piecemeal applications to the entire strategic plan. An SBU is commonly defined as the smallest organizational unit for which integrated strategic planning, related to a distinct product that serves a well-defined market, is feasible. A strategy for an SBU may then be seen as a collection of product-market-related investments and the company itself may be characterized as a portfolio of these investment-requiring strategies. By estimating the future cash flows associated with each strategy, a company can assess the economic value to shareholders of alternative strategies at the business unit and corporate levels.

Steps in analysis

The analysis for a shareholder value approach to strategic planning involves the following sequential steps:

> Estimation for each business unit and the corporation of the minimum pretax operating return on incremental sales needed to create value for shareholders.

> Comparison of minimum acceptable rates of return on incremental sales with rates realized during the past five years and initial projections for the next year and the five-year plan.

> Estimation of the contribution to shareholder value of alternative strategies at the business unit and corporate levels.

Exhibit II Strategic overview of Econoval's lines of business

Business unit	Product life cycle stage	Strategy	Risk	Current year's sales in \$ millions
Semi-conductors	Embryonic	Invest aggressively to achieve dominant market position	High	\$ 50
Energy	Expanding	Invest to improve market position	Medium	75
Automotive parts	Mature	Maintain market position	Low	125

> Evaluation of the corporate plan to determine whether the projected growth is financially feasible in light of anticipated return on sales, investment requirements per dollar of sales, target capital structure, and dividend policy.

> A financial self-evaluation at the business unit and corporate levels.

(Before proceeding to the case illustration in the next section, the reader may wish to refer to the *Appendix* to examine the basis for estimating the minimum pretax operating return on incremental sales needed to increase shareholder value, as well as the calculation of the absolute shareholder value contributed by various strategies.)

Case of Econoval

Econoval, a diversified manufacturing company, divides its operations into three lines of business—semiconductors, energy, and automotive parts (see *Exhibit II*).

Before beginning their detailed analysis, Econoval managers must choose appropriate time horizons for calculating the value contributed by each business unit's strategy. The product life cycle stages of the various units will ordinarily determine this choice. If we were to measure value creation for all businesses arbitrarily in a common time horizon, say 5 years, then embryonic businesses with large capital requirements in early years and large payoffs in later years would be viewed as poor prospects even if they were expected to yield exceptional value over the life cycle. Therefore, in this case, I have extended the projections for the semiconductor unit to 10 years and have limited projections for the energy and auto parts units to 5 years in the company's long-term financial plan.

Exhibit III
Minimum pretax operating return on incremental sales
based on initial planning projections

Business unit	Investment requirements per dollar of sales increase		Cost of capital	Minimum return on incremental sales
	Capital expenditures	Working capital		
Semiconductors	.40	.20	.15	.145
Energy	.20	.20	.14	.091
Automotive parts	.15	.20	.13	.075

Exhibit IV
Econoval's rates of return on incremental sales

Business unit	Historical		Minimum acceptable	Initial forecast
	Last year	Past five years		
Semiconductors	.115	.110	.145	.155
Energy	.100	.120	.091	.110
Automotive parts	.070	.080	.075	.080

Step 1—Estimation of minimum return on incremental sales needed to create value for shareholders.

The basis for calculating the minimum acceptable return on incremental sales appears as Equation (4) in the *Appendix*. For each business unit, four parameters need to be estimated: capital expenditures per dollar of sales increase, cash required for working capital per dollar of sales increase, the income tax rate, and the weighted average cost of capital. *Exhibit III* summarizes the results.

Before proceeding, I should comment on how to estimate these variables. To estimate the recent values for capital investment required per dollar of sales increase, one simply takes the sum of all capital expenditures less depreciation over the preceding 5 or 10 years and divides this amount by the sales increase during the period. Note that if a business continues to replace existing facilities in kind and if the prices of these facilities remain constant, then the numerator (i.e., capital expenditures less depreciation) approximates the cost of real growth in productive capacity.

However, the costs for capital expenditures usually rise each year owing to inflationary forces and regulatory requirements such as environmental control. These cost increases may be partially offset by advances in technology. Thus the numerator reflects not only the cost of real growth but price

changes in facilities as well as the impact of product mix changes, regulation, and technological improvements. Whether the historical value of this variable is a reasonable basis for the projection period depends significantly on how quickly and to what extent the company can offset increased fixed capital costs by higher future selling prices, given the competitive structure of the industry.

The increase in required working capital should reflect the cash flow consequences of changes in (1) minimum required cash balance, (2) accounts receivable, (3) inventory, and (4) accounts payable and accruals.

The appropriate rate for discounting the company's cash flow stream is the weighted average of the costs of debt and equity capital. For example, suppose a company's aftertax cost of debt is 6% and its estimated cost of equity 16%. Further, it plans to raise capital in the following proportion—20% by way of debt and 80% by equity. It computes the average cost of capital at 14% as follows:

	Weight	Cost	Weighted cost
Debt	.20	.06	.012
Equity	.80	.16	.128
Average cost of capital			.140

Is the company's cost of capital the appropriate rate for discounting the cash flow projections of individual business units? The use of a single discount rate for all parts of the company is valid only in the unlikely event that they are identically risky.

Executives who use a single discount rate companywide are likely to have a consistent bias in favor of funding higher-risk businesses at the expense of less risky businesses. To provide a consistent framework for dealing with different investment risks and thereby increasing shareholder value, management should allocate funds to business units on a risk-adjusted return basis.

The process of estimating a business unit's cost of capital inevitably involves a substantial degree of executive judgment. Unlike the company as a whole, ordinarily the business unit has no posted market price that would enable the analyst to estimate systematic or market-related risk. Moreover, it is often difficult to assign future financing (debt and equity) weights to individual business units.

One approach to estimating a business unit's cost of equity is to identify publicly traded stocks in the same line of business that might be expected to have about the same degree of systematic or market risk

Exhibit V
Semiconductor unit's planning projections for various scenarios

	Year									
	1	2	3	4	5	6	7	8	9	10
Conservative										
Sales growth rate	.25	.25	.20	.20	.18	.18	.18	.18	.18	.18
EBIT/sales	.115	.12	.125	.13	.135	.135	.135	.135	.135	.135
Working capital per dollar of sales increase	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20
Capital expenditures per dollar of sales increase	.42	.42	.42	.40	.40	.35	.35	.35	.35	.35
Cash income tax rate	.41	.41	.41	.41	.41	.41	.41	.41	.41	.41
Most likely										
Sales growth rate	.30	.28	.25	.22	.20	.20	.20	.20	.20	.20
EBIT/sales	.12	.125	.13	.135	.14	.145	.15	.15	.15	.145
Working capital per dollar of sales increase	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20
Capital expenditures per dollar of sales increase	.45	.45	.44	.42	.42	.40	.38	.38	.35	.35
Cash income tax rate	.40	.40	.40	.40	.40	.40	.40	.40	.40	.40
Optimistic										
Sales growth rate	.32	.30	.30	.25	.25	.25	.25	.25	.25	.25
EBIT/sales	.125	.13	.14	.145	.15	.15	.15	.15	.15	.15
Working capital per dollar of sales increase	.18	.18	.18	.18	.18	.18	.18	.18	.18	.18
Capital expenditures per dollar of sales increase	.40	.38	.38	.36	.36	.35	.35	.35	.35	.35
Cash income tax rate	.39	.39	.39	.39	.39	.39	.39	.39	.39	.39

as the business unit. After establishing the cost of equity and cost of debt, the analyst can calculate a weighted-average cost of capital for the business unit in the same fashion as for the company.

The cost of equity or minimum return expected by investors is the risk-free rate (including the expected long-term rate of inflation) as reflected in current yields available in long-term government bonds plus a premium for accepting equity risk. The overall market risk premium for the last 40 years has averaged 5.7%.¹ The risk premium for an individual security can be estimated as the product of the market risk premium and the individual security's systematic risk, or beta coefficient.²

Following is the estimate for Econoval's semiconductor unit's cost of equity:

Risk-free rate + average beta coefficient for selected similarly financed semiconductor companies × market risk premium for equity investments = cost of equity

$$9.25\% + 1.5 (5.7\%) = \underline{17.8\%}$$

Assuming an aftertax cost of debt of 6.5% and financing proportions of 25% debt and 75% equity,

the semiconductor unit's risk-adjusted cost of capital is estimated to be 15%. Risk-adjusted rates for the energy and auto parts units are 14% and 13%, respectively.

Step 2—Comparison of minimum acceptable rates of return on incremental sales with recently realized rates and initial planning projections.

Having developed some preliminary estimates of minimum return on incremental sales, Econoval now wishes to compare those rates with past and initially projected rates for each business unit's planning period. This comparison (*Exhibit IV*) provides both a reasonable check on the projections and insights into the potential of the various business units for creating shareholder value.

From *Exhibit IV*, we can determine that the semiconductor unit is projecting substantial improve-

1. Roger G. Ibbotson and Rex A. Sinquefeld, "Stocks, Bonds, Bills and Inflation: Updates," *Financial Analysts Journal*, July-August 1979, p. 40.

2. For a method of predicting beta, see Barr Rosenberg and James Guy, "Prediction of Beta from Investment Fundamentals," *Financial Analysts Journal*, May-June 1976, p. 60 and July-August 1976, p. 62.

Exhibit VI
Semiconductor unit's shareholder value contribution for different scenarios and discount rates
 in \$ millions

Scenario	Discount rate				
	.140	.145	.150	.155	.160
Conservative	\$ 9.30	\$ 6.96	\$ 4.87	\$ 2.99	\$ 1.30
Most likely	16.92	13.59	10.60	7.91	5.48
Optimistic	39.64	34.53	29.93	25.79	22.05

ment over historical margins on the basis of a continuing product mix shift toward higher-margin proprietary items and substantial R&D expenditures to maintain competitiveness in the learning curve race.

If the planned margins materialize, the semiconductor unit will contribute to shareholder value. At this initial stage, the company is concerned with the reasonableness of the projections and the small distance between projected and minimum acceptable margins. The energy unit is projecting a rate of return on incremental sales in line with its recent experience, and this 11% rate is comfortably over the 9.1% minimum acceptable rate.

The problem business unit is the automotive parts division. Margins have been eroding steadily, and the projected five-year margin is just above the acceptable minimum. Econoval managers are thus committed to investigating a full range of strategic alternatives for the automotive unit.

Step 3—Estimation of shareholder value contribution for alternative strategies at the business unit and corporate levels.

Once the company has developed and analyzed its initial planning projections, SBU managers and the corporate planning group can prepare more detailed analyses for evaluating alternative planning scenarios. *Exhibit V* shows the semiconductor unit's planning parameters for conservative, most likely, and optimistic scenarios.

The worst case or conservative scenario assumes significant market penetration by Japanese producers via major technological advances coupled with aggressive price cutting. The most likely scenario assumes the semiconductor group's continued dominance in the metal-oxide-semiconductor (MOS) market, substantial R&D expenditures to enable the semiconductor group to maintain its competitiveness in the learning curve race, and gradual Japanese technological parity, which will place pres-

sure on sales margins. The optimistic scenario projects more rapid industry growth and great success in the unit's effort to carve out high-margin proprietary niches.

Exhibit VI presents the shareholder value contribution for each of these three scenarios and for a range of discount rates.

Econoval expects the semiconductor unit's 10-year plan for the most likely scenario to contribute \$10.60 million to shareholder value. The range of shareholder values from conservative to optimistic scenarios is from \$4.87 million to \$29.93 million for the estimated cost of capital or discount rate of 15%.

An assessment of the likelihood of each scenario will provide further insight into the relative riskiness of business unit investment strategies. For example, if all three scenarios are equally likely, the situation would be riskier than if the most likely scenario is 60% probable and the other two are each 20% probable.

Econoval performed similar analyses for the energy and automotive parts units. *Exhibit VII* summarizes the results for most likely scenarios. To ensure consistency in comparing or consolidating scenarios of various business units, it is important that the corporate planning group establish that such scenarios share common assumptions about critical environmental factors such as inflation and energy prices.

On closer inspection, we see that the analysis in *Exhibit VII* provides support for management's concern about the automotive unit's performance. While the unit now accounts for 50% of Econoval's sales, the company expects it to contribute only \$3.57 million, or about 15% of the total increase in shareholder value.

On the basis of traditional criteria such as sales and earnings growth rates, the semiconductor unit clearly emerges as the star performer. However, its high investment requirements and risk vis-à-vis its sales margins combine to limit its value-creating potential. Despite the fact that the semiconductor unit's sales and earnings growth rates are substantially greater than those of the energy unit, the semiconductor unit is expected to contribute only marginally more shareholder value in 10 years than the energy unit in 5 years.

The shareholder value increase per discounted dollar of investment provides management with important information about where it is realizing the greatest benefits per dollar of investment. Indeed, this *value* return on investment (VROI), rather than the traditional accounting ROI, enables

Exhibit VII
Shareholder value, sales growth, and earnings growth rates by business unit for most likely scenarios

Business unit	Years in plan	Shareholder value increase			Growth rates	
		\$ millions	Per dis- counted \$ of sales increase	Per dis- counted \$ of investment	Sales	Earnings
Semiconductors	10	10.60	.077	.128	22.4 %	26.1 %
Energy	5	8.79	.175	.438	15	17.7
Automotive parts	5	3.57	.068	.194	10	11.9
Consolidated		22.96				

Exhibit VIII
Maximum dividend payout rate analysis

Sales growth	Investment requirements per dollar of sales increase									
	.431			.481			.531			
	Debt/equity			Debt/equity			Debt/equity			
	.393	.443	.493	.393	.443	.493	.393	.443	.493	
.145										
EBIT/sales	.086	-9.6 %	10.1 %	28.5 %	-20.8 %	-0.7 %	18.1 %	-31.9 %	-11.5 %	7.6 %
	.096	3.8	21.2	37.4	-6.1	11.7	28.2	-15.9	2.2	19.0
	.106	14.4	29.9	44.4	5.6	21.4	36.2	-3.2	12.9	28.0
.155										
EBIT/sales	.086	-15.1	4.7	23.1	-26.9	-6.7	12.1	-38.7	-18.1	1.1
	.096	-1.0	16.4	32.6	-11.4	6.3	22.9	-21.9	-3.7	13.2
	.106	10.1	25.7	40.2	0.7	16.6	31.5	-8.6	7.6	22.8
.165										
EBIT/sales	.086	-20.4	-0.6	17.8	-32.8	-12.6	6.2	-45.3	-24.7	-5.4
	.096	-5.7	11.7	28.0	-16.7	1.1	17.7	-27.7	-9.5	7.5
	.106	5.8	21.4	36.0	-4.0	11.9	26.8	-13.8	2.4	17.6

Book tax rate = .460, cash tax rate = .422

Current debt/equity = .452

Current equity = \$53.550 million

management to rank various business units on the basis of a substantive economic criterion.

The numerator of the VROI is simply the shareholder value increase of a strategy and the denominator, the present cost or investment. When the VROI ratio is equal to zero, the strategy yields exactly the risk-adjusted cost of capital, and when VROI is positive, the strategy yields a rate greater than its cost of capital. Note that the semiconductor unit ranks last, even behind the auto parts unit, in this all-important performance measure.

Ranking units on the basis of VROI can be particularly helpful to corporate headquarters in capital-rationing situations where the various parts of

the business are competing for scarce funds. In the final analysis, however, corporate resources should be allocated to units so as to maximize the shareholder value of the company's total product-market portfolio.

Step 4—Evaluation of the financial feasibility of the strategic plan.

Once the company has established a preliminary plan, it should test its financial feasibility and whether it is fundable. This involves integrating the company's planned investment growth strategies with its dividend and financing policies. A particu-

larly effective starting point is to estimate the company's maximum affordable dividend payout rate and its sensitivity to varying assumptions underlying the strategic plan.

To illustrate, Econoval calculates the maximum dividend payout for the first year of the five-year plan. On a consolidated basis, Econoval projects sales growth of 15.5%, earnings before interest and taxes (EBIT) to sales of 9.56%, an investment of \$.481 per dollar of incremental sales, a cash income tax rate of 42.2%, and a current and target debt-to-equity ratio of 45.2% and 44.3%, respectively. Econoval can pay out no more than 6.3% of its net income as dividends. At the 6.3% payout rate, the earnings retained, plus added debt capacity, are just equal to the investment dollars required to support the 15.5% growth in sales from \$250 million to \$288.75 million.

It is easy to demonstrate this result. At \$.481 per dollar of incremental sales, investment requirements (net of depreciation) on the projected \$38.75 million sales increase will total \$18.63 million. This amount will be financed as follows:

Aftertax earnings on sales of \$288.75 million	\$13.34 million
Less 6.3% dividend payout	.84
Earnings retained, i.e., increase in equity	12.50
Added debt capacity	5.08
Increase in deferred taxes	1.05
	\$18.63 million

The maximum affordable dividend payout rate table (*Exhibit VIII*) shows how sensitive this rate is to changes in growth, profitability, investment intensity, and financial leverage. Note, for example, that if sales growth is increased from 15.5% to 16.5%, the maximum affordable dividend payout rate decreases from 6.3% to 1.1%, while a 1% increase in EBIT/sales raises the maximum affordable rate from 6.3% to 16.6%.

Exhibit IX presents Econoval's strategic funds statement for its five-year planning period. The cash required for investment in working capital and fixed capital exceeds the cash sources from operations in each year. This difference is reflected in the "net cash required" line. Another source of funds is, of course, debt financing.

The increase in debt capacity is established by reference to the target debt-to-equity ratios of Econoval's three principal businesses. Adding the increase in debt capacity to the net cash required provides the maximum affordable dividend, which, as

seen earlier, is \$.84 million or 6.3% in the first year and rises annually to 22.3% in the fifth year.

In *Exhibit X*, strategic funds statements for each of Econoval's main lines of business provide improved insights into product portfolio balancing opportunities. The semiconductor group places a substantial burden on corporate funds. Over the next five years it will require more than \$26 million of cash while the energy and auto parts units will throw off about \$7 million in cash. Even after taking into account the estimated debt capacity contribution of semiconductors, corporate headquarters will still have to transfer \$11 million to the unit.

After some further analysis, Econoval managers concluded that the strategic plan was financially feasible. The analysis did, however, raise two concerns. First, Econoval had a low affordable dividend payout rate and was vulnerable to sales margins lower than those projected. Of immediate concern was that the current year's dividend is larger than next year's projected affordable dividend.

Also, the strategic funds statement underscored the risk associated with the semiconductor group's aggressive competitive positioning and the related high level of investment requirements. This group's large cash requirements, coupled with its modest VROI, prompted Econoval managers to launch a study of alternative product portfolio strategies.

Step 5—A financial self-evaluation at the business unit and corporate levels.

Increasingly, companies are adding financial self-evaluation to their strategic financial planning process.³ A financial evaluation poses two fundamental questions: How much are the company and each of its major lines of business worth? How much would each of several plausible scenarios involving various combinations of future environments and management strategies affect the value of the company and its business units?

The following types of companies would especially benefit from conducting a financial evaluation:

- > Companies that wish to sell and need to establish a minimum acceptable selling price for their shares.
- > Companies that are potential takeover targets.
- > Companies considering selective divestments.
- > Companies evaluating the attractiveness of repurchasing their own shares.

3. For a more detailed description of how to conduct a corporate financial self-evaluation, see my article, "Do You Know the Value of Your Company?" *Mergers & Acquisitions*, Spring 1979.

> Private companies wanting to establish the proper price at which to go public.

> Acquisition-minded companies wanting to assess the advantages of a cash versus a stock offer.

The present equity or shareholder value of any business unit, or the entire company, is the sum of the estimated shareholder value contribution from its strategic plan and the current cash flow level discounted at the risk-adjusted cost of capital less the market value of outstanding debt. *Exhibit XI* summarizes these values for Econoval and its three major business units. For example, the semiconductor unit's current cash flow perpetuity level is \$2.97 million, which, when discounted at its risk-adjusted rate of 15%, produces a value of \$19.8 million. Subtracting the \$5 million of debt outstanding provides the \$14.8 million prestrategy equity value. To obtain the total equity or shareholder value of \$25.40 million for the semiconductor unit, simply add the \$10.60 million value contributed by the strategic plan.

The sum of the three business unit values is \$83.79 million. Combining the cash flows of the individual businesses and discounting them at the 14% risk-adjusted corporate cost of capital yields a value of \$87.57 million. In this case, the difference between the value of the whole and the sum of the parts is minor. However, this may not always be true.

Aggregating the values of the company's business units is consistent with the assumption that the riskiness of each unit must be considered separately. If, however, the company's entry into unrelated businesses reduces the overall variability of its cash flows, then the lower expected probability of bankruptcy can decrease its cost of debt and increase its debt capacity.

What happens to the company's overall cost of capital naturally depends on any changes in the cost of equity capital as well as on the cost of debt. Analysis of the impact of business units on the total risk of the company is at best extremely difficult and subjective.

A more attractive alternative is to (1) assume risk independence in establishing cost of capital for business units and (2) interpret the difference between the value of the company and the aggregate value of its individual businesses as a broad approximation of the benefits or costs associated with the company's product portfolio balancing activities.

Econoval's corporate financial evaluation gave management not only an improved understanding of the relative contribution to shareholder value

Exhibit IX
Econoval strategic funds statement for five-year planning period
in \$ millions

	Year					Total
	1	2	3	4	5	
Net income	13.34	15.74	18.54	21.75	25.44	94.81
Depreciation	3.84	4.74	5.82	7.03	8.32	29.74
Increase in deferred taxes	1.05	1.29	1.56	1.88	2.23	8.02
Sources of funds	18.23	21.77	25.92	30.66	35.99	132.57
Capital expenditures	14.71	17.58	20.22	22.55	25.66	100.72
Increase in working capital	7.76	8.97	10.16	11.33	12.66	50.88
Uses of funds	22.47	26.55	30.38	33.88	38.32	151.60
Net cash provided (required)	(4.24)	(4.78)	(4.46)	(3.22)	(2.33)	(19.03)
Increase in debt capacity	5.08	5.89	6.60	7.20	8.02	32.79
Maximum affordable dividend	0.84	1.11	2.14	3.98	5.69	13.76
Maximum affordable dividend payout rate	6.3%	7.1%	11.5%	18.3%	22.3%	14.5%

Exhibit X
Strategic funds statement for five-year planning period by business units
in \$ millions

	Semiconductors	Energy	Automotive parts	Consolidated
Net income	\$ 34.53	\$ 30.92	\$ 29.36	\$ 94.81
Depreciation	17.95	6.07	5.72	29.74
Increase in deferred income taxes	4.21	2.55	1.26	8.02
	56.69	39.54	36.34	132.57
Capital expenditures	62.31	21.24	17.17	100.72
Increase in working capital	20.45	15.17	15.26	50.88
	82.76	36.41	32.43	151.60
Net cash provided (required)	(26.07)	3.13	3.91	(19.03)
Increase in debt capacity	15.05	9.26	8.48	32.79
Maximum affordable dividend	(\$ 11.02)	\$ 12.39	\$ 12.39	\$ 13.76

Exhibit XI
Business unit and corporate financial evaluation
summary—for most likely scenario
 in \$ millions

	Semicon- ductors	Energy	Auto- motive parts	Con- solidated
Risk-adjusted pre- strategy equity value	\$ 14.80	\$ 20.93	\$ 25.10	\$ 60.83
Shareholder value contribution from strategic plan (see Exhibit VII)	10.60	8.79	3.57	22.96
Total equity value	\$ 25.40	\$ 29.72	\$ 28.67	\$ 83.79
Percent of total equity value	30.3 %	35.5 %	34.2 %	
Econoval equity value at corporate cost of capital of 14 %				\$ 87.57

coming from each business but also the basis for structuring the purchase of an acquisition currently being negotiated. Econoval's market value was then about 25% less than its own estimate of value. Because the cash and exchange-of-shares price demanded by the selling shareholders was not materially different, Econoval management decided to offer cash rather than what it believed to be its undervalued shares.

Meeting the fiduciary duty

A fundamental fiduciary responsibility of corporate managers and boards of directors is to create economic value for their shareholders. Despite increasing sophistication in strategic planning applications, companies almost invariably evaluate the final product, the strategic plan, in terms of earnings per share or other accounting ratios such as return on investment or return on equity.

Surprisingly, the conventional accounting-oriented approach persists despite compelling theoretical and empirical evidence of the failings of accounting numbers as a reliable index for estimating changes in economic value. How should the board member of a company that has reported a decade of 15% annual EPS growth and no increase in its stock price respond when asked to approve yet another five-year business plan with projected EPS growth of 15%? The shareholder value approach to strategic planning would enable the board to recognize that despite impressive earnings growth projections, the company's increasing cost of capital,

rising investment requirements per dollar of sales, and lower margins on sales are clear signs of value erosion.

A number of major companies are now using the shareholder value approach to strategic planning. The method requires virtually no data not already developed under current financial planning systems; moreover, an interactive computer program such as the "strategy valuator" (used in preparing the numerical illustrations) can help implement all of the steps I have outlined. Use of this approach should improve companies' prospects of creating value for their shareholders and thereby contribute to the long-run interests of the companies and of the economy.

Appendix: Calculation of value contributed by strategy

The present value of a business is defined simply as the anticipated aftertax operating cash flows discounted by the weighted average cost of capital. The present value of the equity claims or shareholder value is then the value of the company (or business unit) less the market value of currently outstanding debt. The value of equity for a business that expects no further real sales growth and also expects annual cost increases to be offset by selling price increases is given by the following formula:

$$E_t = \frac{p(1-T)S}{k} - D_t \quad (1)$$

where:

E_t = value of the equity at time t

p = earnings before interest and taxes divided by sales

T = income tax rate

S = sales

k = weighted average cost of capital

D_t = market value of debt outstanding at time t

The change in shareholder value (ΔE) for a given level of sales increase (ΔS) is then:

$$\Delta E_t = \frac{p'(1-T)\Delta S_t}{k} - \frac{(f+w_t)\Delta S_t}{(1+k)} \quad (2)$$

where:

p' = $\Delta EBIT/\Delta$ sales, i.e., incremental operating margin on incremental sales

f = capital expenditures minus depreciation per dollar of sales increase

w = cash required for net working capital per dollar of sales increase

The change in equity or shareholder value is the difference between the aftertax operating cash flow perpetuity and the required investment outlay for fixed and working capital. Since all cash flows are assumed to occur at the end of the period, the outlays for working capital and fixed

assets are discounted by $(1+k)$ to obtain the present value. There is neither an increase nor a decrease in shareholder value for a specified sales increase whenever the value of the inflows and outflows is identical. Specifically, when

$$\frac{p'(1-T)}{k} = \frac{(f+w_t)}{(1+k)} \quad (3)$$

From Equation (3) the break-even operating return on sales or the minimum pretax operating return on incremental sales (p'_{min}) needed to create value for shareholders is derived as:

$$p'_{min} = \frac{(f+w)k}{(1-T)(1+k)} \quad (4)$$

Minimum acceptable returns on incremental sales for a range of investment requirements per dollar of sales and costs of capital are presented below.

Minimum pretax operating return on incremental sales to create value for shareholders*

Cost of capital	Investment requirements per dollar of incremental sales						
	.20	.30	.40	.50	.60	.70	.80
.12	.040	.059	.079	.099	.119	.139	.159
.14	.045	.068	.091	.114	.136	.159	.182
.16	.051	.077	.102	.128	.153	.179	.204
.18	.056	.085	.113	.141	.169	.198	.226
.20	.062	.093	.123	.154	.185	.216	.247

*Assumed income tax rate, 46%.

The shareholder value contributed by any strategy can be estimated by taking the capitalized value of the difference between the projected and the minimum acceptable operating return on incremental sales. More specifically, the change in shareholder value for time t is given by the following equation, which assumes book and cash income tax rates are identical. If they are not, another term must be added.

$$\Delta E_t = \frac{(p'_t - p'_{t,min})(1-T_t)\Delta S_t}{k(1+k)^{t-1}} \quad (5)$$

To illustrate, consider a business with sales of \$50 million for its most recent year and the following assumptions for its five-year plan: sales growth rate = 15%; pretax operating margins on incremental sales = 13.5% for the first two years and 14.5% for the remaining three years; book and cash tax rate = 46%; working capital per dollar of sales = .20; capital expenditures per dollar of sales = .35; and cost of capital = 14%. Applying equation (4) for the minimum return on incremental sales (p'_{min}), we obtain 12.5%. A summary of the shareholder value contributed by the five-year plan is presented below.

Shareholder value contributed by five-year plan (in \$ millions)

	Years					Total
	1	2	3	4	5	
Sales	\$ 57.50	\$ 66.12	\$ 76.04	\$ 87.45	\$ 100.57	\$ 387.68
Sales increase	7.50	8.62	9.92	11.41	13.12	50.57
Projected return on incremental sales minus minimum return	.01	.01	.02	.02	.02	
Shareholder present value increase*	\$.29	\$.29	\$.59	\$.59	\$.60	\$ 2.36

*Computed by using equation (5).

Note: The present value of the five-year plan is \$2.36 million.

Harvard Business Review and Harvard Business School Publishing content on EBSCOhost is licensed for the individual use of authorized EBSCOhost patrons at this institution and is not intended for use as assigned course material. Harvard Business School Publishing is pleased to grant permission to make this work available through "electronic reserves" or other means of digital access or transmission to students enrolled in a course. For rates and authorization regarding such course usage, contact permissions@hbsp.harvard.edu