

Fig. 1 — Business Valuation Model Using Discounted Cash Flow Analysis Accrual Basis Of Accounting (\$000)

Performance variables									
1 Growth	10%								
2 Operating income as % of revenue	10%								
3 Equity needed for working capital as % of revenue	20%								
Income statement		1986	1987	1988	1992	1993	1994	1995	1996
4 Revenue		\$1,000	\$1,100	\$1,210	\$1,772	\$1,949	\$2,144	\$2,358	\$2,358
5 Operating expenses		900	990	1,089	1,594	1,754	1,929	2,122	2,122
6 Operating income		100	110	121	177	195	214	236	236
7 Profit sharing	3%	3	3	4	5	6	6	7	7
8 Profit before bonus		97	107	117	172	189	208	229	229
9 Performance bonus	40%	39	43	47	69	76	84	92	92
10 Pretax income		58	64	70	102	113	124	136	136
11 Actual cash taxes		6	6	7	10	11	12	29	29
12 Net income		52	57	63	92	101	112	107	107
13 Dividends		32	35	39	57	62	69	107	107
14 Increase in equity for working capital		20	22	24	35	39	43	0	0
15 Equity (beginning year)		200	220	242	354	390	429	472	472
Return analysis									
Cash flows to corporation									
16 Increase retained earnings		20	22	24	35	39	43	0	0
17 Increase in equity for working capital		(20)	(22)	(24)	(35)	(39)	(43)	(0)	(0)
18 Depreciation		20	20	20	20	20	20	20	20
19 Capital outlay		(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)
20 Free cash to corporation		0	0	0	0	0	0	0	0
Cash flows to shareholder									
21 Dividends		32	35	39	57	62	69	107	107
22 Cash flow to shareholders		32	35	39	57	62	69	107	107
23 Net present value		278					Terminal value	537	
							Total	644	
24 Discount rate	20%								
Stock turnover analysis									
25 Value of business		278	302	327	441	472	504	537	
26 Performance bonus		39	43	47	69	76	84	92	
27 Performance bonus after tax	65%	25	28	31	45	50	55	60	
28 Available for equity purchase	50%	13	14	15	23	25	27	30	
29 Stock turnover (value of business/available for purchase)		5%	5%	5%	5%	5%	5%	6%	
30 Accumulated turnover		5%	9%	14%	34%	39%	44%	50%	

erating income to a profit-sharing plan (line 7) and pays out substantial performance bonuses (line 9).

Bonus considerations

Every firm has its own approach to determining the relative size of individual bonuses, but bonuses are paid for two principal reasons: to reward good performance and to provide returns to owners. In most instances, however, bonuses are determined subjectively by management.

Ambiguity is helpful to avoid the tax problems associated with distributing dividends as bonuses. But ambiguity stands squarely in the way of completing the financial analysis necessary to make an economic decision about the stock's value. Some assumptions must be made about how bonuses are distributed.

Our example assumes that about 40 percent of income before bonuses is paid out each year as a performance bonus (line 9). Also, management has decided to pay to its shareholders in the form of a dividend all excess cash not needed to operate the firm (line 13).

Few NE firms actually pay dividends; instead they distribute larger bonuses to owners. However, in this example, for valuation purposes dividends are paid to identify clearly the cash flow to shareholders, although corporate taxes are due on the earnings used to pay dividends. To determine how much cash is available for dividends, an estimate has been made of the amount of working capital required to support the business's growth (lines 3, 14, and 15). This shows that only enough earnings are left in the firm to support the working capital needs and that the remainder is paid as a dividend. Unes 16 through 20 demonstrate that no excess is accumulated in the corporation.

Value and Profits

The firm's value is determined by counting only cash flow to shareholders (line 22). To determine the present value, estimated future cash flows need to be discounted because they are not guaranteed and will be received in future years. A dollar today is worth more than a dollar next year. A guaranteed payment is worth more than a risky payment.

The discount factor is the return that shareholders expect to receive on their investments. There should be a positive relationship between the risk and liquidity of an investment and its return. Investments in closely-held engineering firms are relatively risky and nonliquid.

For many firms, profits vary between 0 and 15 percent, as demand for engineering services is cyclical. Most stockholders in closely-held engineering companies cannot sell their investments easily. In many firms, shareholders can only sell shares in

the event of death, disability, or retirement. Given the risk and lack of liquidity of this type of investment, I believe that a fair return on a closely-held engineering company is about 20 percent per year (line 24).

The financial horizon of this model is 10 years and for each of these years detailed assumptions are made about the business's operating performance. To determine the value of the business beyond the model's horizon, some simple assumptions are made about the long-term future beyond 10 years. An estimate of the firm's value 10 years from today is called the terminal value and is \$537,000 in our example. The terminal value is discounted, along with the annual cash flows between 1985 and 1994, to yield a net present value of \$278,000 (line 23). This is the

Transfer

“Given the risk and lack of liquidity. . . a fair return on a closely-held. . . company is about 20 percent per year.”

amount that buyers would be willing to pay for the entire engineering business today if they expected a 20 percent rate of return on their investment and assumed that they could manage the firm to meet the forecasted operating performance.

Evaluations Compared

Let's compare this result to some of the more common approaches used to evaluate engineering businesses. Fig. 2 compares the results of this model with other approaches. The firm in our example is valued at a price earnings ratio of 2.9. In this case, earnings are profit before bonuses (line 8). Profit before bonuses is used because it is the best indicator of the firm's earning

Fig. 2 – Discounted Cash Flow vs Other Approaches

Business value using discounted cash flow	\$278,000
Earnings (profit before bonuses)	97,000
Revenues	1,000,000
Price/earnings ratio	2.9
Value as percent of revenues	27.8%
Book value of equity	\$200,000
Good will (business value minus book value)	\$78,000
Good will divided by book value	39.0%

- Create a market for the firm's stock that guarantees retirement funding.
- Reward owners for their financial investment in the firm.
- Motivate managers to commit themselves to the firm.
- Provide a process for the identification and development of future leaders.

It is possible for plans to be complete and yet not meet these objectives. This occurs when a plan does not recognize one of the key principles behind ownership transfer. There are principles that I believe are fundamental to the successful management of this process.

Win-Win Is Best

Every successful business deal requires that both sides are winners and transferring ownership of an NE firm is no exception. For the buyer of stock in a closely-held firm, a good deal means that the purchase must be right professionally and personally. In most NE firms, the economic benefits of stock ownership are unclear. Young buyers can expect to hold their stock for 20 years or more and probably associate little value with buy-out provisions upon retirement. Most firms pay annual bonuses, but there is seldom any explicit relationship between bonuses and stock ownership. This is a particular concern for new owners because they frequently are minority shareholders and have no say in determining bonus distributions.

Most buyers are interested in what they will get for their investments and yet most firms' compensation policies make it difficult for buyers to identify the likely economic implications of stock purchases. With returns unclear, it is difficult for buyers to make decisions on an economic basis. Frequently, the status associated with stock ownership is the only clearly perceived benefit of the investment. Investing in opportunities with unclear returns is not good business practice and certainly not the kind of decision-making you want to encourage in your firm's future leaders. Because of these uncertainties, buyers generally are not willing to pay more than accrued equity value or book value, even if a substantially higher value is justified by the firm's earnings.

An Approach To Valuation

How should buyer and seller think about the returns and value of a closely-held engineering company? I recommend that firms use the same approach used by financial analysts in valuing publicly-held companies. The principles of financial analysis, cash flow forecasting, and discounted cash flow are well established financial approaches, but these principles are seldom applied to closely-held firms.

There is no magic behind financial analysis. It is a detailed forecast of the firm's future cash flow and an assessment of the risks associated with it. This future cash flow then is discounted to determine a present value. The present value of a firm is the amount that an individual would pay now for the opportunity to participate in the firm's future cash distributions. These distributions are dependent on the firm's earnings performance and its management's policies for distributing these earnings. The trick to financial analysis of closely-held engineering firms is accurate modeling of the expected cash flow to shareholders.

The discounted cash flow approach to valuation lends insight into answering a number of difficult questions. It identifies:

- A fair exchange price for the firm's stock.
- How expected business performance supports this valuation-
- How prospective purchasers will be able to afford to buy the stock.
- How long it will take to transfer ownership into the hands of new managers.

This approach demonstrates that in an internal ownership transfer, the value of a firm and its bonus policy are interrelated. This is because the buyers of the business cannot pay more than they can afford. And what they can afford generally depends on what they make over and above their base salaries in bonuses or other compensation.

The model also demonstrates that the two most important factors in determining a business's value are the expected income performance of the business and the time horizon over which the firm's major shareholders want to sell their shares.

Discounted Cash Flow Analysis

An example of discounted cash flow analysis in a closely-held NE firm with \$1 million in revenue is shown in Fig. 1. The analysis extends 10 years into the future and forecasts the firm's operating performance: its revenues, expenses, profits, bonus distributions, and cash flow to shareholders.

When using discounted cash flow analysis, the firm's value is based only on the cash flow to shareholders. In a closely-held business, share holders also are employees. For stock valuation purposes, only the cash that is paid to shareholders because they are shareholders is counted. Performance bonuses and salaries are not included in the stock's valuation.

The analysis begins by projecting future operating performance. In our example, the firm is expected to maintain a modest growth rate of 10 percent per year (line 1) and have an income before profit sharing, bonuses, and taxes of 10 percent a year (line 2). The firm contributes three percent of its op-

potential; all bonuses are paid at the discretion of management.

Using the discounted cash flow approach, the value of the business is determined to be 39 percent above the firm's accrual-based book value of \$200,000. Most firms are bought and sold on accrual-based book value because it is an approach that is easy to use and well understood by the accounting profession. However, the discounted cash flow approach shows that accrual-based book value may be significantly less than the firm's value based on reasonable projections of future earnings.

The Constraint of Internal Transfer

Our experience has been that some 90 percent of engineering principals desire to transfer their firms

Transfer

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internally, yet in my assessment only about 40 per cent recognize the implications of this decision in the area of compensation. Internal transfer adds an additional constraint on financial management that is not present for firms hoping to be acquired. Not only does the stock need to be priced fairly in the internal transfer, but the employees of the firm need to be able to afford it at whatever price. The sources of cash for most employees are their salaries and their bonuses. Almost the only source that can be counted on for reinvestment in the stock of a closely-held engineering firm is the bonus money. To guarantee adequate funds for reinvestment each year, the firm needs to distribute bonuses, making sure that enough goes into the hands of managers who are likely to want to purchase additional stock. Employees receiving these bonuses must pay income tax and can only reinvest the amount that remains after tax. Also, not all the money that is paid out as performance bonuses will be reinvested in the firm. The cash flow analysis in Table 1 assumes that most employees are in the 35 percent marginal tax bracket (line 27) and that only about 50 percent of the after-tax performance bonuses will be available for reinvestment in the firm's stock (line 28). As a result, each year about 5 percent of the firm can be purchased with the reinvested performance bonuses (line 29). Cumulatively, this means that about 50

percent of the firm can be sold over a 10-year period (line 30).

If owners want to transfer more than 50 percent of the ownership to new managers over the 10 year period, they must look for other sources of capital besides bonuses for investment. The only other option would be to increase the amount paid out as performance bonuses and lower the price of the stock. This would allow the turnover to be accomplished in a shorter period of time.

Meeting Transfer Objectives

There appear to be two basic approaches to ownership transfer planning that work. One is for principals to draw high salaries throughout their careers and upon retirement to sell the company at book value or less. Employees generally do not participate in the ownership of the firm for at least five to seven years while they "earn their way in." In essence, compensation is held back during this period of their careers.

The second approach to ownership transfer encourages firms to recognize and reward performance wherever they find it and not to withhold rewards for a prescribed time. These firms must be careful to manage compensation so that potential buyers receive enough of the total distributions so that their after-tax compensation is adequate to make the necessary stock purchases.

Firms using the second approach tend to sell their stock at a significant premium above book value, usually through an earnings formula that determines the firms' value. Retiring stockholders receive proceeds from the sale of their stock; they have taken home their performance compensation and dividends throughout the period they were not using them for stock purchases.

Rewarding Performance Pays

The most striking feature of this approach is that it rewards performance. A firm that can monitor and reward performance adequately is likely to be more successful than one that does not. In a firm with performance orientation, long-standing loyalties are frequently called into question whenever compensation and performance are out of balance.

A firm that has this management culture has a long-term competitive advantage. It uses compensation to motivate its managers and requires a significant financial commitment from its stockholders. Employees tend to be informed of the company's financial situation and understand how it is in their best economic interests to contribute to the firm's success. I advocate that more firms move toward this approach and incorporate discounted cash flow analysis as a tool in financial planning for ownership transfers.