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## Decision Models for the Acquisition of Treasury Stock

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*Corporate treasury stock can serve many purposes: to fulfill employee stock option plans, to retire equity, as a substitute for cash in acquisitions. But which is best: issuing new stock or buying back old for these purposes? Here are some —*

## **DECISION MODELS FOR THE ACQUISITION OF TREASURY STOCK**

*by Edward J. Mock, George Washington University  
and Donald Hart Shuckett, Whittaker Corporation*

**T**HE RISING TREND of interest rates over the last few years has made it costly to hold idle cash.<sup>1</sup> As a result, corporate financial managers have come under increasing pressure to manage their funds more effectively.<sup>2</sup>

Corporate treasurers can invest their cash either externally or internally. Generally, external investment involves the purchase of marketable securities or investment in other companies offering opportunities for growth. Internal investment takes many forms. In the past, the primary emphasis in allocating

funds has been on accounts receivable, inventories, and fixed assets. This article will examine another use for these funds, investment in treasury stock.

Treasury stock is used primarily to acquire stock to fulfill stock option plans within a company, to retire equity to increase the rate of return, and, externally, as a scrip for corporate acquisitions. We have formulated decision models for each of these situations. The last section of this article deals with the ethical problems involved in a re-acquisition.

### **Stock options**

Stock options are given to employees as additional tax-favored compensation or incentive. An option allows an employee to purchase a specified number of shares from the company at a specific price within a specified period of time. Any increase in the market price of the optioned stock results in greater after tax take-home pay, if the gain on the option qualifies as a capital gain, than if the equivalent were given to the employee as a pay increase taxable as ordinary income.<sup>3</sup>

The company may obtain stock to meet option requirements either by issuing authorized but unissued shares or by reacquiring stock. When the options are to be exercised, the option price will be below the market price of the stock, and the funds received by the company will be considerably less than if these shares were sold on the open market. Issuing new shares may thus dilute their value. However, if treasury stock is used, funds must be provided to obtain this stock.

The decision rule is formulated thus: Is it more profitable to issue authorized but unissued shares or to buy treasury stock? We must examine the effect on the stockholder, where:

- EAT = earnings after tax and before option
- ROI = return on investment after tax
- k = cost of capital after tax
- Po = stock option price
- Pm = market price of option shares
- T = marginal tax rate of the average stockholder
- N = number of shares outstanding prior to the option
- n = number of shares in the option

The effect on earnings per share if new stock is issued is:

$$\frac{EAT + (ROI) (Po) (n)}{N + n}$$

Earnings of the corporation will be increased by (ROI) (Po) (n) as the proceeds from the option stock sale are invested within the company. These increased earnings will be distributed over the original number of shares plus the newly issued option shares (N + n).

The effect on earnings per share if treasury stock is purchased is:

$$\frac{EAT - (k) (Pm - Po) (n)}{N}$$

Earnings of the corporation will be decreased by (k) (Pm - Po) (n) as funds earning the return open to the corporation are given up to ac-

quire treasury stock. Only part of these funds (Po) will be recovered.

The alternative which yields the best return to the stockholder should be undertaken. Treasury stock should be used if:

$$\frac{EAT + (ROI) (Po) (n)}{N + n} > \frac{EAT - (k) (Pm - Po) (n)}{N}$$

Since return on investment is inversely proportionate to the cut-off price of the option, the higher the term (ROI) the lower will be the price (Po). This assumes that proceeds from the optioned stock would be invested at a high rate of return. With a growth stock, this emphasizes the fact that most alternative investments would be more profitable than stock repurchases.

*Example*—Assume that options for 200,000 shares are coming due at a price of \$16 per share. Stock currently sells at \$20 per share and 2 million shares are outstanding. Also assume that the cost of cash is lost opportunity cost, or cost of capital.

$$\begin{aligned} EAT &= \$4,400,000 \\ ROI &= 7\% \\ k &= 6\% \\ Po &= \$16 \end{aligned}$$



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$$\begin{aligned} Pm &= \$20 \\ T &= 30\% \\ N &= 2,000,000 \\ n &= 200,000 \end{aligned}$$

The decision is to purchase treasury stock if:

$$\frac{EAT + (ROI) (Po) (n)}{N + n} > \frac{EAT - (k) (Pm - Po) (n)}{N}$$

$$\frac{\$4,400,000 + (.07) (\$16) (200,000)}{2,000,000 + 200,000}$$

is less than

$$\frac{\$4,400,000 - (.06) (\$20 - \$16) (200,000)}{2,000,000}$$

$$\begin{aligned} \$2.10 & & \$2.18 \end{aligned}$$

Since \$2.10 is less than \$2.18, treasury stock should be purchased to meet the stock option requirements.

If retained earnings are available to reacquire the treasury stock, some cost must be assigned to these funds. This will be the shareholders' lost opportunity cost, since retained earnings are owned by the stockholder. The cost is:

Earnings after Tax x (1 - marginal tax rate of the average shareholder)

– Market value of shares outstanding

$$\text{or } \frac{EAT (1-T)}{Pm (N)}$$

If the treasury stock is purchased with funds supplied through retained earnings, the effect on earnings per share will be:

$$\frac{EAT - \frac{EAT (1-T)}{Pm (N)} (Pm - Po) (n)}{N}$$

The decision is to purchase treasury stock if:

$$\frac{EAT + (ROI) (Po) (n)}{N + n}$$

$$\frac{EAT - \frac{EAT (1-T)}{Pm (N)} (Pm - Po) (n)}{N}$$

Example—Using the same data as that of the first example, the decision is to purchase treasury stock if:

$$\frac{EAT + ROI (P_o) (n)}{N + n} < \frac{EAT \left[ \frac{EAT (1-T)}{P_m (N)} \right] [(P_m - P_o) (n)]}{N}$$

$$\frac{\$4,400,000 + (.07)(\$16)(200,000)}{2,000,000 + 200,000}$$

is less than

$$\frac{\$4,400,000(1-.3)}{\$20(2,000,000)}$$

$$\frac{[(\$20 - \$16)(200,000)]}{2,000,000}$$

divided by

$$\$2.10 < \$2.17$$

Since \$2.10 is less than \$2.17, treasury stock should be purchased to meet the stock option requirements.

**Corporate acquisitions**

Once the decision has been made to acquire a corporation, it must

be determined whether it is better to acquire it with cash or stock. A tax advantage can be given to the seller of a company, through deferment of the capital gains tax, if stock is used to acquire either stock or assets under Section 368(a) 1 of the Internal Revenue Code, 1954. This may work to the advantage of the acquiring company if it reduces the amount of funds which would otherwise be required to make the offer attractive to the seller. The first decision, then, is to decide between cash and stock.

Company A wishes to acquire Company B. Assume the owners of B wish to net \$1,000,000 from the sale of their company. They must receive \$1,333,333 cash in order to net \$1,000,000.

Let:

C<sub>s</sub> = cost if stock were used in the acquisition

C<sub>c</sub> = cost if cash were used in the acquisition

X = cash payment in excess of tax cost base

Thus:

$$X - .25X = \$1,000,000$$

$$X = \$1,333,333$$

the company is acquired with cash, an additional 33% per cent will have to be paid to cover the seller's capital gains tax. If stock were used, there would be a deferment of the capital gains tax. The \$1,000,000 of stock would be equivalent to \$1,333,333 cash, to the seller.

The decision is to acquire with stock if:

$$(C_c) (.25) > C_s$$

It will be more profitable for the acquiring company to purchase with stock if the capital gains tax to the seller is more than the costs incurred to acquire this stock. This emphasizes that stock may be used as a form of scrip, whose value differs because of tax considerations.

If it is decided that it is better to issue stock rather than use cash, a second decision must be made. What type of shares should be used, treasury or unissued shares?

EAT = earnings after tax before acquisition

ROI = return on acquired company after tax

k = cost of capital after tax



Certain tax advantages go to the seller of a company if the acquisition is made with stock rather than cash. This in turn may make the purchase price which the acquiring company must pay lower, since the I.R.S. doesn't take so large a share.

- Pm = market price of acquiring company's shares
- N = number of shares outstanding prior to any transaction
- n = number of shares to be issued in the acquisition

If new stock is issued, the effect on earnings per share is:

$$\frac{EAT + (ROI) (Pm) (n)}{N + n}$$

Earnings of the corporation will be increased by (ROI) (Pm) (n) when shares which could be sold on the market for (Pm) are used to acquire a company earning a return on investment of (ROI).

If treasury stock is purchased, the effect on earnings per share is:

$$\frac{EAT - (k) (Pm) (n)}{N}$$

Earnings of the corporation will be decreased by (k) (Pm) (n) as funds earning the return open to the corporation are given up to acquire treasury stock.

The alternative which yields the best return to the stockholders should be undertaken. Treasury stock should be used if:

$$\frac{EAT + (ROI) (Pm) (n)}{N + n} < \frac{EAT - (k) (Pm) (n)}{N}$$

*Example*—Using the same data as that of the first sample, the decision is to purchase treasury stock if:

$$\frac{EAT + (ROI) (Pm) (n)}{N + n} < \frac{EAT - (k) (Pm) (n)}{N}$$

$$\frac{\$4,400,000 + (.07) (\$20) (200,000)}{2,000,000 + 200,000}$$

is less than

$$\frac{\$4,400,000 - (.06) (\$20) (200,000)}{2,000,000}$$

$$\$2.13 > \$2.08$$

Since \$2.13 is greater than \$2.08, new treasury stock should be issued to make the acquisition.

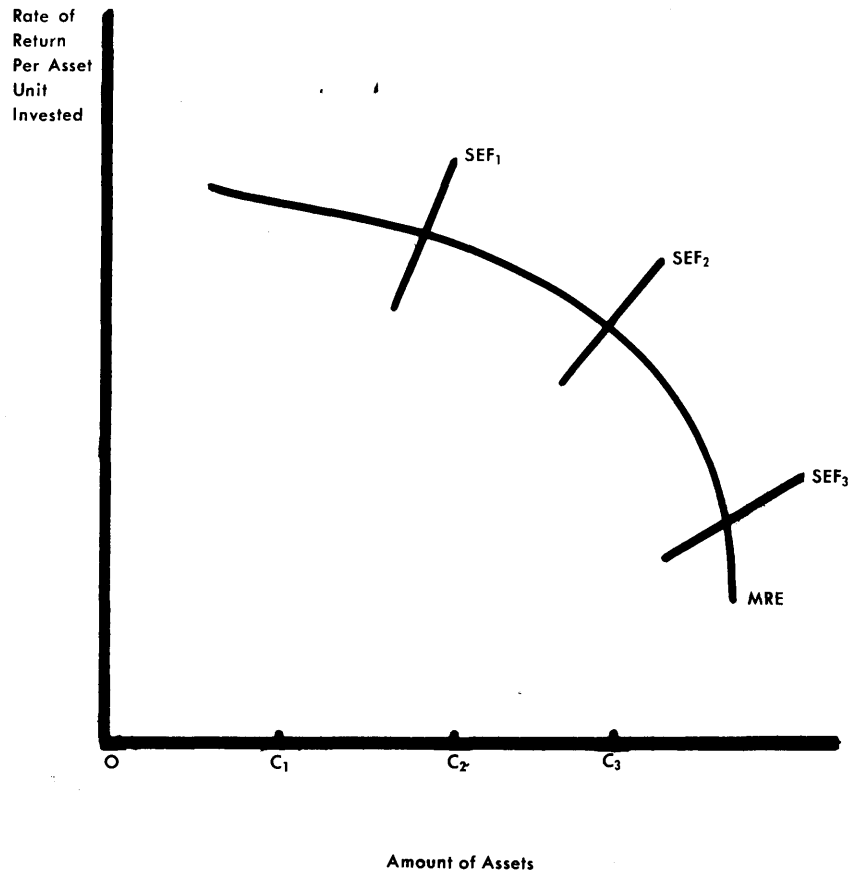
*Retire Equity.* The effect of a reduction in equity capital can be shown in the chart shown in Exhibit 1 on this page.

Various amounts of ownership capital (OC) are represented along the horizontal axis by the distances OC<sub>1</sub>, OC<sub>2</sub>, OC<sub>3</sub>. For each specific capital structure there is a supply curve of external funds (SEF). These curves are SEF<sub>1</sub>, SEF<sub>2</sub>, and SEF<sub>3</sub>. If a company reduces its equity base by contracting from OC<sub>2</sub> down to OC<sub>1</sub>, the supply of external funds also shifts to SEF<sub>1</sub>. The supply of external funds also becomes more inelastic because of the increasing proportion of debt, and thus of risk, in the capital structure.

The downward-sloping marginal rate of earnings curve (MRE) assumes physical or competitive difficulties which makes it difficult for additional assets to continually earn the same rate of return. The purchase of treasury stock will move a company farther up the MRE curve. This is partially because of increased leverage (since debt is constant but equity is reduced) and partially because of the elimination of assets earning a rate of return lower than that earned by investing in one's own stock.

A growth company should not acquire treasury stock because its earnings are low in relation to their market price and it is able to earn more from other investments. However, companies no longer experiencing growth are faced with the choice among investing in low-yield negotiable securities, purchasing

EXHIBIT I



Source: Eli Schwartz, "Theory of the Capital Structure of the Firm," from Edward J. Mock, *Readings in Financial Management*, International Textbook Company, Scranton, Pa., 1964, p. 244. Reproduced, with permission, from *Readings in Financial Management*, copyright 1964, International Textbook Company.

treasury stock, paying out large dividends, or just accumulating vast amounts of funds. Their decision should be based upon the effect on the common stockholder.

$$\begin{aligned} & \$4,400,000 - (.06) (\$20) (200,000) \\ & \div 2,000,000 - 200,000 \\ & \qquad \qquad \qquad \$2.22 \qquad < \qquad \$2.31 \end{aligned}$$

Since \$2.22 is less than \$2.31, treasury stock is the preferable investment.

The practice of buying treasury stock to reduce capitalization and increase book value, earnings per share, and return on investment is gaining favor among corporations. In the recent stock market decline, the dividend yield on some company's shares was significantly greater than the yields in the bond market. In many cases companies intentionally reduced their outstanding shares as a means of using excess funds and/or marketable securities to enhance the earnings and market price of their stock. In effect these monies were passed on to the shareholders as capital gains. If the total dollar amount of dividend payment is reduced more than the interest income received from marketable securities, any excess cash or marketable securities a company may use to purchase its own shares may save a great amount of money, since interest received on marketable (U. S. Government) securities is taxable while a company pays no tax on the dividends saved by buying its own stock.

After Brown Shoe sold its G. R. Kinney Corporation subsidiary for \$45 million in 1963, it found that it had more cash than could normally be invested. In October, 1963, Brown made a tender offer to buy 300,000 of its own shares. Shareholders actually tendered 157,000 shares, and Brown Shoe bought another 110,000 in 1964 on the open market and in private transactions. Brown's profit in the fiscal year ended October 31, 1964 increased .5 per cent from fiscal 1963, but per share earnings increased 12 per cent.<sup>4</sup>

Somewhat spectacular in this respect is the action in 1950 of Colt Manufacturing Company. The effect of reducing its stock and sur-

plus by almost 50 per cent may be seen in the analysis of the company's capital structure<sup>5</sup> presented in Exhibit 2 on page 54.

The decision whether to invest available funds in treasury stock or whether to pay them out as dividends depends on the effect on the stockholder. Where:

- EAT = earnings after taxes
- E = earnings per share before treasury stock acquisition
- Δ E = change in earnings per share due to treasury stock purchase
- F = funds available
- T = marginal tax rate of the average stockholder
- T/2 = capital gains tax rate<sup>6</sup>
- Pm = market price per share
- N = number of shares outstanding
- P/E = price earnings ratio

Treasury stock should be purchased if:

$$\left(\frac{F}{N}\right) (1-T) < (\Delta E) (P/E) \left(1 - \frac{T}{2}\right)$$

In order to make treasury stock purchases attractive, the return of the dividend must be less than the gain on increased stock price, after taxes.

*Example*

Assume the following:

- EAT = \$4,000,000
- E = \$2.00
- F = \$4,800,000, with which to buy 200,000 shares
- Pm = \$24
- T = 30 per cent
- N = \$2,000,000
- P/E = 12

Earnings per share after treasury stock acquisition =

$$\frac{\$4,000,000}{1,800,000} = \$2.22.$$

Change in earnings per share: (Δ E) = \$2.22 - \$2.00 = \$.22.

- EAT = earnings after tax
- ROI = return on investment after tax
- k = cost of capital after tax
- Pm = market price paid for stock
- N = number of shares outstanding
- nt = number of shares purchased by treasury

Treasury stock should be purchased if:

$$\begin{aligned} & EAT + (ROI) (nt) (Pm) - (k) \\ & \qquad \qquad \qquad (Pm) (nt) - N \\ & < \frac{EAT - (k)(Pm)(nt)}{N-nt} \end{aligned}$$

This equation indicates that to make the treasury stock purchases attractive, earnings per share on re-invested funds must be less than the earnings per share on the reduced equity base.

*Example*—Assume that the company has a choice of buying 200,000 shares at the market price of \$20 per share or earning a return on other investments of 7 per cent. Also assume that the cost of cash is lost opportunity cost, or cost of capital.

- EAT = \$4,400,000
- ROI = 7%
- k = 6%
- Pm = \$20
- N = \$2,000,000
- nt = \$200,000

The decision is to purchase treasury stock if:

$$\begin{aligned} & EAT + (ROI) (Pm) (nt) - (k) \\ & \qquad \qquad \qquad (Pm) (nt) \div N \\ & < \frac{EAT - (k)(Pm)(nt)}{N-nt} \end{aligned}$$

$$\begin{aligned} & \$4,400,000 + (.07)(\$20)(200,000) - \\ & \qquad \qquad \qquad (.06)(\$20)(200,000) \\ & \div 2,000,000 \qquad < \end{aligned}$$

Therefore:

$$\left(\frac{F}{N}\right) (1-T) < (\Delta E)(P/E) \left(\frac{1-T}{2}\right)$$

$$\left(\frac{\$4,800,000}{2,000,000}\right) (1-.3) <$$

$$(\$ .22) (12) \left(\frac{1-.3}{2}\right)$$

$$\$1.68 < \$2.24$$

In this case the acquisition of treasury stock is more attractive to the common shareholders than the payment of a dividend.

Somewhat spectacular in this respect is the example of Paramount Pictures, which used a 15-year reacquisition program to maintain its \$2 annual dividend rate. This seemed unlikely in 1949, when the old Paramount Pictures, Inc. left the new company with 33 million shares outstanding but only the movie-producing half of its former business. The company decided to reacquire stock to maintain the \$2 dividend. Through several tender offers and an open market purchase program, Paramount reduced its outstanding shares by 1964, to about 1,560,000, and maintained the dividend.<sup>7</sup>

There are many alternative methods for acquiring stock: block

purchases of stock from individual shareholders, purchase in the open market, or tender offers.<sup>8</sup> The opportunities available to buy large blocks are rare, and even rarer is the coincidence of availability at the specific time the purchase is to be made. For the purchase of large blocks of shares, tender offers are less costly, more flexible, and less risky than purchase on the open market. Open market purchases may tend to bid up the price of the stock, especially if large numbers of shares are to be acquired. The tender offer hedges the purchase because its exercise is contingent on the corporation's receiving the number of shares sought. It is also faster, since purchases do not have to be arranged in a time pattern so as not to disturb the market.

### Ethical considerations

Whenever a corporation becomes involved in a program of treasury stock reacquisitions, ethical and legal problems arise. With the separation of management and ownership, conflicts may arise between their respective goals. In a reacquisition, management will attempt to buy the stock at the lowest

price, while stockholders seek to sell at the highest. The problems which may arise revolve around insider information and its effect on the investing public.

The Securities and Exchange Commission has established legal restrictions which apply to treasury stock transactions. These laws say little about stock promotions. The main thrust of what they do say is against stock promotion that either might affect the sales of securities in a public offering or is blatantly dishonest.

The SEC restrictions emphasize the effects of treasury stock reacquisitions on the public's investment decisions, viz., whether to acquire, dispose of, or retain stock. Any question of impropriety is usually based on the dissemination of less than complete truths to induce unsuspecting investors to buy, or stockholders to sell, too soon.

### Disclosure requirement

The Cady, Roberts and Company decision in 1961 emphasized both the materiality of the information and the effect of disclosure, or lack of it, on a reasonable man's investment decision. In a reacquisition, the following type of data should be presented: information which a prudent investor ought to have before purchasing the security, information which would materially affect the decisions of the other party, and information which might be expected to have an effect on the market.<sup>9</sup> These guidelines transcend the basic goals of the corporation—maximization of stockholder wealth. It is the effect of a treasury stock acquisition on the public at large and on present stockholders that must be considered. The Cady, Roberts and Company verdict also held that the non-disclosure of material information, when insiders or their privies took advantage of it, unwittingly or otherwise, was a violation, and subject to prosecution.<sup>10</sup>

Problems of this sort can be avoided by proper disclosure. The

## EXHIBIT 2

Change in Capital Structure of Colt Manufacturing Company, 1949—1950:

Item	1949	1950
Capital stock (par \$25)	\$ 5,000,000	\$ 5,000,000
Surplus before earnings for year	7,762,726	7,874,833
Earnings for year after tax	519,497	944,117
Total net worth	13,282,223	13,818,950
Less reacquired stock at cost	109,174	6,653,174
Net stock and surplus	\$13,173,049	\$ 7,165,776
Number of shares outstanding	195,900	71,073
Book value per share	\$ 67.24	\$ 100.82
Earnings per share	\$ 2.65	\$ 13.28
Market price high	\$ 44.50	\$ 66.75
low	\$ 33.75	\$ 39.75
Moody's 125 Industrial Common Stock Average:		
high	\$ 52.28	\$ 64.46
average	\$ 46.88	\$ 57.83
low	\$ 43.46	\$ 52.58



## Mock and Shuckett: Decision Models for the Acquisition of Treasury Stock

stockholder who sells, and the individual who buys, must still have done so at that price even if they had known that the corporation were the purchaser, and if they had been in possession of all material information. It is quite difficult for the corporation to know whether it is in possession of material information not generally known to its shareholders, since a corporation will inevitably be better informed of its affairs and future prospects than its public shareholders. On the other hand, it may be unwise to make this information public for competitive reasons. However, it is advisable that if significant developments are pending that could affect the price of the stock, purchases of the stock should be held in abeyance until after a public announcement is made.

### Conclusion

The substantial fund flows of the

past decade have led many corporations to alter their capital structure by eliminating debt and preferred stock. More recently we have witnessed large acquisitions of treasury stock by major corporations. If maximization of shareholder wealth is one of the major goals of management, the acquisition of treasury stock, although often overlooked, can be a flexible and powerful way to help accomplish this goal.

Treasury stock acquisition can require substantial commitments of corporate funds and should be studied and analyzed as is any other large capital investment. Retiring common stock is not as simple a routine as retiring debt or preferred. The acquiring company is dealing with its owners rather than creditors, and equitable treatment must replace the philosophy of "caveat emptor." However, the problems are usually not nearly so great if the action is properly planned.

<sup>1</sup> For further information on the trend between 1954 and 1963, see Leo Guthart, "More Companies Are Buying Back Their Stock," *Harvard Business Review*, March-April, 1965.

<sup>2</sup> For a further discussion, see Mock and Shuckett, "Increasing the Velocity of Corporate Funds," *Management Services*, July-August, 1966.

<sup>3</sup> Assuming the market price was the same as the option price at the time of issuance.

<sup>4</sup> "Investing in Yourself," *Wall Street Journal*, June 30, 1965, Page 8.

<sup>5</sup> *Moody's Industrial Manual*, 1951, Page 701.

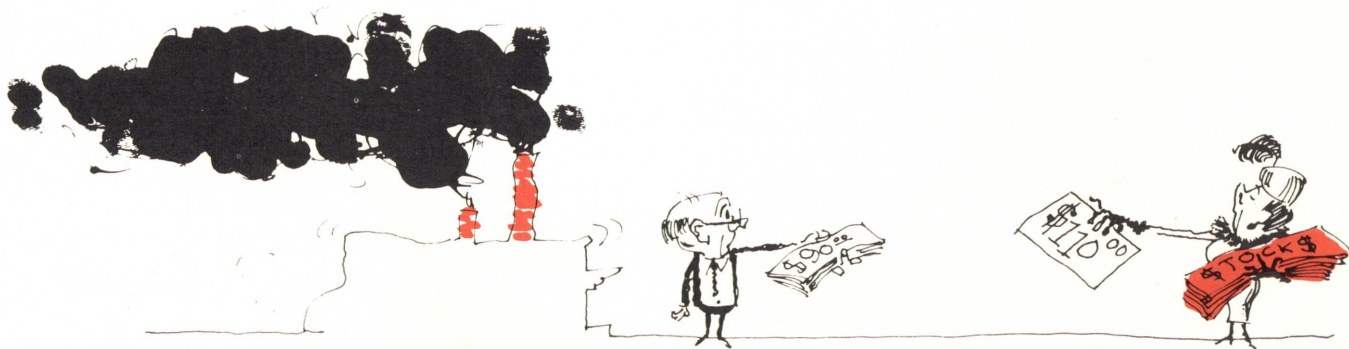
<sup>6</sup> For individuals filing a separate return of income, up to \$26,000; for those filing a joint return, income up to \$52,000; and for heads of households, incomes up to \$38,000.

<sup>7</sup> "Investing in Yourself," *Wall Street Journal*, June 30, 1965, Page 8.

<sup>8</sup> For a further discussion on tender offers, see Samuel L. Hayes, III, and Russell A. Taussig, "Tactics of Cash Takeover Bids," *Harvard Business Review*, March-April, 1967.

<sup>9</sup> Richard L. Baker, "Non Dilutive Stock Benefits," *Business Lawyer*, January, 1967, Page 441.

<sup>10</sup> *Ibid.* Page 440.



A growth company should not acquire its own stock; earnings will be low in comparison with the market price the stock commands; the company can earn more from other investments.