DIVIDENDS, STOCK REPURCHASES AND VALUE OF THE FIRM

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Firms that wish to distribute excess cash relative to profitable investment opportunities, choose between paying large dividends and stock repurchase. The latter can also be debt financed thus increasing the financial leverage of the firm. Both actions have an impact on the stock price, and by implication, on the value of the firm. This paper examines both the dividend option and the repurchase option. Therefore this research also demonstrates that: (a) Under a stable tax regime, investors prefer stock repurchases to large dividends and (b) Under a debt financed stock repurchase, a minimum amount of stock must be repurchased to avoid a drop in the stock price.

Keywords: Dividend; stock repurchase; stock price; value of the firm.

INTRODUCTION

There is considerable debate on how dividends affect the value of the firm. Some researchers believe that dividends increase wealth of shareholders (Gordon, 1959). Others believe that dividends are irrelevant (Miller and Scholes, 1979; Miller and Modigliani, 1961); while others believe that dividends decrease shareholder wealth (Litzenberger and Ramaswamy, 1979). This debate has remained unresolved and dividend policy is still generating exciting studies in corporate finance. For example, Bhattacharya (1979; 1980) argues that firms pay dividends because they signal private information of managers that will help market participants to value the firm. John and Williams (1985), predict a positive association between dividends and stock prices. Miller and Rock (1985), on their part, argue that once the investment decision of the firm is made, unanticipated dividends signal change in earnings and
cash flow with a corresponding effect on the value of the firm. Brook, Charton and Hendershott (1998), who argue that investors interpret the dividend changes as signals about future profitability supported this view.

Stock repurchase, which is sometimes called stock *buy back*, has become an increasing phenomenon in many public companies. Corporate managers quite often indicate that the major reason for repurchases is the divergence of the market price of their stock from its true value (Stewart, 1976). The validity of this reason is brought to question by the fact that it is not possible to detect and profitably exploit such divergence. Further, numerous studies have presented evidence that securities markets are reasonably efficient, thus showing that market prices are a representative of the underlying values.

The other often cited motive for repurchase is a defense against take over. Stulz (1988), and Persons (1994), argue that by eliminating those shareholders that assign a relatively low personal valuation to the stock, they make takeovers more expensive. This comes as a result of the stock price increment that the raider has to pay to obtain majority shares. In effect therefore, repurchases consolidate majority shares in the hands of some loyal shareholders and will increase management's voting power.

Considered together, it can be deduced that both dividends and repurchases have the ability of signaling the value of the firm. (Benartzi, Michaely, and Thaler, 1997; Sant and Cowan, 1994; Lakonishok and Vermaelen, 1990; Persons, 1994). The major distinguishing factor is that, whereas a stable dividend can be sustained for a relatively long period, regular and dependable repurchases may not be feasible mainly because of uncertainties in tax treatment and the number of shares to be repurchased (Brigham and Gapenski, 1996).

Most studies about dividend and stock repurchases have tended to launch their investigations from the firm’s perspective (Persons 1994, Brook, Carlton and Hendershott 1998). This paper attempts to examine this topic from both the shareholders' and the firms' perspectives. In view of that, we will try to answer the following questions: (1) given the choice between dividends and stock repurchase what would the investors prefer? (2) If the debt financed repurchase option is taken, what is the minimum amount of shares to be repurchased in order to avoid a decline in the stock price?

The rest of this paper is structured as follows: A comparison of dividends and stock repurchases options is presented in section 2. Determinants of dividend are described in section 3. The effects of repurchase are dealt with in section 4. The demonstration of Talmor and Titman's (1990), and Kare and Wiggins's (1987) models is shown in section 5. Section 6 concludes this paper.

DIVIDENDS AND STOCK REPURCHASES - A COMPARISON

The table below shows a comparison between dividend and stock repurchase considered under several aspects like cash flow, taxation, number of
share outstanding, choice, transferability, and effect on the capital structure.

Through the table below, we can examine the advantages and disadvantages on investor's side and on management's viewpoint. It looks that dividends and stock repurchase have both advantages and disadvantages for both sides, in taxation aspect for example, investor would prefer stock repurchase to dividends payments if tax rate for ordinary income is higher than for capital gain. Furthermore, investors could defer their realization of capital gain in the right time. From management's viewpoint, stock repurchase in conjunction with the restructuring efforts, provide availability of additional funds with lower cost if they are required in the future through resold the treasury stock (stock that has been repurchased by a firm) when interest rate is high. Conversely, if the stock repurchase is financed by debt, the new stockholders have to accept higher risk, because the debts item in the capital structure increases. Consequently, there is possibility that the stock market price will go down and allow the wealth transfer from stockholders to debtholders and trigger agency cost.

**TABLE 1**

A comparison between dividends and stock repurchase

<table>
<thead>
<tr>
<th>Dividends</th>
<th>Repurchases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cash flow</strong></td>
<td>Cash outflow from the firm</td>
</tr>
<tr>
<td><strong>Shares outstanding</strong></td>
<td>Shares outstanding remain unchanged after dividends are paid</td>
</tr>
<tr>
<td><strong>Taxation</strong></td>
<td>Taxed as ordinary income</td>
</tr>
<tr>
<td><strong>Investor's choice</strong></td>
<td>Involuntary, each share is assigned a specific amount once dividends are declared</td>
</tr>
<tr>
<td><strong>Transferability</strong></td>
<td>Dividends are received by all share holders without exception</td>
</tr>
<tr>
<td><strong>Capital structure effect</strong></td>
<td>Dividends do not cause an imbalance in the capital structure</td>
</tr>
</tbody>
</table>
DETERMINANTS OF DIVIDENDS

Black (1976) is on record for having said that the harder we look at the dividend picture, the more it seems like a puzzle with pieces that just don't fit together. That probably explains why there are no generally accepted factors that influence the dividend policy. This however has not stopped companies from paying dividends. Empirical studies (e.g. Holder, Langrehr, and Hexter, 1998, Benartzi, Michaely, and Thaler, 1997) indicate that rather than cut dividends, firms would increase their dividend payout ratio, other things held constant.

Some factors that are frequently cited by researchers and corporate managers are presented below:

3.1. Investor preference for dividends

Gordon, (1962) and Lintner, (1962), claim that investors prefer current dividends to reinvestment because current dividends are perceived less risky than future dividends arising out of reinvestment. Brennan (1970), however demonstrates that such an analysis confuses investment policy and dividend policy. Increased cash dividend is also supported by Long's (1978) study of investor preference. Closely related to this, Keane (1974) argues that investors will prefer cash dividend because they help to reduce agency costs. This is because the higher the pay out, the more the external financing is required and therefore the watchful eye of the capital markets, bond traders and creditors will instill a sense of discipline in management. As a result, the agency costs reduce (Partington, 1989).

3.2. Profitability level

The firm’s capacity to pay dividends is a function of profits. Empirical evidence by Lintner (1956) supports this view. Legal tradition also holds that dividends are a distribution of profits and may not be paid out of capital. Efforts to challenge this view by Brittain (1966) did not succeed, as a substitution of cash flow variable (net profit plus depreciation) for the profit variable significantly improved the robustness of Lintners model.

3.3. Number of shareholders

Holder, Langrehr, and Hexter, (1998), found a positive correlation between the number of shareholders and the payout ratio. This shows that firms, whose ownership is dispersed (large number), tend to have high pay out ratios compared to high insider ownership (small number). This is consistent with the agency costs theory and Keane's (1974) argument that high payout ratio forces the firm to search for external financing and in the process, increase the level of capital markets scrutiny there by reducing. The agency costs
other things held constant therefore, firms with a large number of shareholders set their pay out ratio high and the reverse is true.

3.4. Cash availability

It is a common practice to pay dividend with cash although stock dividends have also been recorded. The importance of availability of cash in determining the dividend level was supported by Brittain (1966), Partington (1989) among others. Cash flow affects the firm’s ability to pay dividends without recourse to either issuing new securities, or selling operating assets. It is a generally accepted idea that, when a firm is facing financial constraints (lack enough money), managers may limit the growth of dividends.

3.5. Information signaling

Extensive investigation of the share price reaction to the dividend announcements suggests that, dividend payments convey information to investors that cannot be conveyed costlessly and credibly in other ways (Sant and Cowan, 1994; Graffin, 1976). In essence therefore, investors value the status of the firm from the information content delivered via dividend policy. An investigation by Healy and Palepu (1988), on the impact of dividend initiation and omissions on the stock prices supports this view. They proved that dividend initiations are associated with positive stock price reactions and omissions (though rare) are associated with negative stock price reaction. This implies that if a firm wants to signal to the market that it is in good financial condition, it will announce an increase in the dividend pay out, and decrease will signal that the firm is in trouble.

3.6. Investment opportunities

Asset expansion and attractiveness of new investment opportunities have the potential of influencing the dividend level (Partington, 1989). This is consistent with the residual dividend model (Brigham and Gapenski, 1996) that states that good investment opportunities must be financed first before dividends are paid. This view is supported by empirical studies conducted by Dhrymes and Kurtz (1967), who conclude that there is interdependence between dividends and investment. A survey of financial managers conducted by Partington (1985) revealed that a financing constraint forces the interdependence between dividends and investment.

This implies that dividend pay out ratio is inversely related to availability of good investment opportunities.

3.7. Power of control

Power of control is vested in the hands of shareholders that own the
majority shares. If paying high dividends entails turning to external sources for funding or issuing new securities, the power of control may shift. Management will therefore tend to limit the dividend payout ratio within the affordable levels so that it does not have to resort to new security issues.

3.8. Preferred stock restrictions

Preferred stock restrictions dictate that before common stock dividends are paid, the preferred dividends must be given priority including arrearages if any exist. This sets the limit of dividend beyond which management can not exceed (Brigham and Gapenski, 1996).

3.9. Dividend and earnings stability

Lintner (1956) provided empirical evidence that the firm’s dividend payment do exhibit stability. Smith (1971) also shows that there is a strong tendency for firms to avoid cutting dividends. Managers may therefore consider dividend payment important and may only cut dividends in exceptional circumstances like when there is a sustained decline in profits.

In the same vein, earnings stability is important because it reduces the risk that a sudden profit reversal may force management to cut dividends (Partington, 1989). In essence therefore, firms with earnings stability can set their pay out levels with confidence, and signal the quality of their earnings by adopting more generous pay out ratios than firms with unstable earnings.

3.10. Tax considerations

Brigham and Gapenski (1996), argue that some firms deliberately keep their dividend payout ratios low, in order to assist stockholders to avoid personal tax. However, in a move to curtail that practice, the tax code provides for a special surtax on improperly accumulated income. Once it is discovered that firms are deliberately holding down the dividend payout ratio in order to avoid personal taxes, heavy penalties are imposed on that firm. Management therefore considers these aspects while setting the dividend policy.

EFFECTS OF STOCK REPURCHASES

Each year, many companies buy back some of their own stock. They repurchase it in lieu of paying regular cash dividends, or they have limited investment opportunities and want to return cash to stockholders. Others are debt financed. Repurchases are also used as a defense against hostile takeovers.

Whatever the reason for the repurchase, there are various effects on companies and or stockholders as shown below.
4.1. Dividend tax Avoidance.

In accordance with taxation guidelines, the income received on stock repurchase may be taxed as a capital gain rather than ordinary income. Owing to the fact that capital gains attract a lower tax rate compared to ordinary income, stockholders may prefer repurchase to large dividend as a way of avoiding high personal tax.

4.2. Information or Signaling.

A company's willingness to distribute cash to its stockholders may be interpreted as a signal in two ways: (a). The company expects future cash flows to increase or (b). It has no profitable investment projects. Persons (1994), contend that a firm may repurchase its stock to signal that it is undervalued. Stewart (1996) and Masulis (1980) supported this view among others.

4.3. Bond holder wealth expropriation.

If a stock repurchase reduces a firm's asset base, and then fewer assets will be available to distribute to bondholders, so the company's wealth might transfer from bondholders to stockholders. In effect, some stockholders will get first priority in the distribution of company assets (Kare and Wiggins, 1987).

4.4. Temporary excess cash flow

When management has reason to believe that the excess cash flow it has is only temporary, it will choose a repurchase option against dividend. This is motivated by the stable dividend hypothesis (Mantripragada, 1976). And as Brigham and Gapenski (1996) argue, dividends tend to be sticky and management is not always in favor of cutting dividends because of its devastating impact on the stock price. Repurchase therefore becomes a superior alternative in a situation of temporary excess cash flow.

4.5. Restructurisation.

When a major restructuring exercise such as a large asset sale or an increase in the debt ratio is undertaken, stock repurchase emerge as a viable option in which such money can be channeled.

4.6. Uses of Treasury Stock

The repurchased (treasury) stock has various benefits to the firm. Apart from being sold on the open market to obtain additional funding if required, they can also be used for acquisitions. Furthermore, treasury stock can be released when stock options, warrants and convertibles are converted.
This stand out as a superior alternative compared to newly issued stocks that have the effect of diluting the earning per share (Brigham and Gappenski, 1996).

4.7. Leverage effect.

When stock repurchase is debt financed, the firm's leverage will change. Two effects are associated with this change: The firm will seem more risky to investors, so its market value may go down, but there may be can offsetting effects in that dividends and earnings per share may increase with a positive effect on the stock price (Kare and Wiggins, 1987).

In all therefore, it is generally agreed that traditionally, companies have used on going buy back programs for such mundane purposes as providing stock for executive stock options and employee ownership plans. They were also carried out when a company's stock price was considered low and also as good use of excess cash. However, with the recent proliferation of mergers, acquisitions, and take over maniac, corporate managers buy back their stock as a takeover defense even if it entails using debt.


This section deals with the investor's choice of the means of excess cash distribution. Examining the investor's terminal wealth under both alternatives does this. A general formulation is adopted from Talmor and Titman, (1990) which assumes (a). Personal tax which applies to capital gains as well as dividends is constant over time, (b). No transaction costs are involved. For ease of interpretation, a simple calculation is included.

Let's say that $X = $ 10,000 is cash to be distributed, $V_1$ (value of the firm after distribution) is $40,000, $N$ (the number of shares outstanding) is 4,000 and $P_{1D}$ (price of the stock when dividends are issued) is $10 which is obtained from:

$$P_{1D} = \frac{V_1}{N} = $10$$

Repurchase :

$$P_1 = \frac{V_1}{(N - M)}$$

where:

$P_1$ = Stock price in the repurchase option.
$N$ = Number of shares outstanding
M = Number of stocks repurchased

To determine \( P_1 \) and \( M \), assume that repurchase is carried out at the market price so that

\[ MP_1 = X = $10,000 \]

But \( P_1 = P_{1D} + D = \text{market price} \)

And \( D = \frac{X}{N} = \frac{10,000}{4000} = $2.5 \)

Therefore \( P_1 = 10 + 2.5 \)

Then \( 12.5 \cdot M = 10,000 \)

\( M = 800 \)

Let return on equity, \( r_e = 20\% \)

\( V_2 = \text{value of the firm in Period 2} \)

\[ = V_1 \cdot (1 + r_e) \]

\[ = $40,000 \cdot (1 + 0.2) \]

\[ = $48,000. \]

\[ P_{2D} = \frac{V_2}{N} = P_{1D} \cdot (1 + r_e) \]

\[ = \frac{48,000}{4,000} \cdot 10 \cdot (1 + 0.2) \]

\[ = 12 \]

\[ P_2 = \frac{V_2}{N - M} = \text{Stock price on repurchase} \]

\[ = \frac{48,000}{4,000 - 800} \]

\[ = 15 \]

The stock price on repurchase therefore is higher than on dividend, implying that other things held constant, repurchase increases the value of the firm. Shareholders terminal wealth on dividend.
\[ W_D = nD(1 - Tp)[1 + rp(1 - Tp)] - n(P_1 - D)(1 + re)(1 - Tp) + nP_0 T_p \]

Where:

- \( WD \) = Wealth on dividend
- \( nD \) = Shareholder's share of dividend
- \( Tp \) = Personal Tax
- \( rp \) = before tax yield
- \( Po \) = Original stock price

Assume:

- \( Tp = 30\% \)
- \( rp = 20\% \)
- \( Po = $6 \)
- \( N = 400 \)

\[ WD = 1,000(1 - 0.3)[1 + 0.2(1 - 0.3)] + 400(12.5 - 2.5)(1 + 0.2)(1 - 0.3) + (400)(6)(0.3) \]

\[ = $4,178 \]

Shareholders terminal wealth on Repurchase

\[ W_R = m[P_1(1 - Tp) + P_0 T_p][1 + rp(1 - Tp)] + (n - m)P_1(1 + re)(1 - Tp) + P_0 T_p \]

Where:

- \( m = \frac{nD}{P_1} = \frac{400 \times 25}{12.5} = 80 \)

  = Stock tendered for repurchase

\[ W_R = 80[12.5(1 - 0.3) + 6 \times 0.3][1 + 0.2(1 - 0.3)] + (400 - 80)[12.5(1 + 0.2)(1 - 0.3) + 6 \times 0.3] \]

\[ = $4,898.6 \]

\(^1\) For derivation of 1 and 2, see Telmor and Titman (1990)
Since WR > WD, investors may opt for stock repurchase as against payment of large dividend because investors will prefer an alternative that maximizes his wealth.

5.1. Amounts of stock to be repurchase

It should be noted that a minimum amount of stock must be repurchased to avoid a decline in the stock price where debt is used to repurchase stock. Most companies buy limited amount of stock but this can lead to increased risk arising from heavier debt that might out weigh the additional earnings per share.

The model proposed by Kare and Wiggins (1997), presents an estimate of leverage effect of buying back stock in the open market before the repurchase takes place. It is used to calculate the minimum percentage of stock to be repurchased that will prevent a drop in the stock price.

\[
\text{MRP} = \left( \frac{dI}{EBT} \right) \left[ 1 + \left( \frac{R.P}{D.Y} \right) \right]
\]

Where:
- MRP = Minimum Repurchase Percentage
- \(dI\) = change in Interest
- EBT = Earnings before tax
- R.P = Risk Premium
- D.Y = Dividend Yield.

Numerical example:
The following data pertains to JFK Company

- EBT = $10 million
- Annual Interest rate = 12%
- Market Value of common stock = $80 million
- Beta = 0.62

Step 1. Calculate change in interest rate.

If 1% of JFK stock is repurchased, the additional debt required is:

\[
\begin{align*}
\text{dI} & = \text{Market Value of common stock} \times \text{Beta} \\
& = \$80,000,000 \times 0.01 \\
& = \$800,000
\end{align*}
\]

\[
\frac{dI}{EBT} = \frac{\$800,000}{\$10m} = 0.08
\]

\[
\text{Step 2. Calculate change in interest rate.}
\]

\[
\begin{align*}
\text{Additional Debt} & = \text{EBT} \times \text{Beta} \\
& = \$10,000,000 \times 0.01 \\
& = \$100,000
\end{align*}
\]

\[
\frac{\text{Additional Debt}}{\text{EBT}} = \frac{\$100,000}{\$10m} = 0.1
\]

\[
\text{Step 3. Calculate return on equity.}
\]

\[
\begin{align*}
\text{ROE} & = \frac{\text{EBT} - \text{Interest}}{\text{Capital}} \\
\text{Interest} & = \text{EBT} \times \text{Beta} \\
& = \$10,000,000 \times 0.12 \\
& = \$1,200,000
\end{align*}
\]

\[
\begin{align*}
\text{ROE} & = \frac{\$8,800,000}{\$12,000,000} \\
& = 0.7333
\end{align*}
\]

\[
\text{Step 4. Calculate the minimum percentage of stock to be repurchased.}
\]

\[
\begin{align*}
\text{MRP} & = \left( \frac{dI}{EBT} \right) \left[ 1 + \left( \frac{R.P}{D.Y} \right) \right] \\
& = \left( \frac{\$800,000}{\$10,000,000} \right) \left[ 1 + \left( \frac{0.12}{0.08} \right) \right] \\
& = 0.08 \left[ 1 + 1.5 \right] \\
& = 0.8 \times 2.5 \\
& = 2
\end{align*}
\]
Step 2. Calculate \( \frac{R.P}{D.Y} \)

\[ R.P = (R_m - R_f) \times b \]

Assume:
- \( R_m = 15\% \) - Average market risk
- \( R_f = 5\% \) - Risk free
- \( R.P = (15 - 5) \times 0.62 \)
- \( R.P = 6.2\% \)

\[ D.Y = \frac{\text{Dividend}}{\text{Stock Price}} \]

\[
\begin{align*}
\text{Dividend} &= 2 \\
\text{Stock price} &= 80 \\
D.Y &= \frac{2}{80} = 2.5\% \\
R.P &= 6.2 \\
\frac{D.Y}{R.P} &= \frac{2.5}{6.2} = 2.48
\end{align*}
\]


\[ 0.96 [1 + 2.48] = 3.34\% \]

JFK company therefore would have to repurchase a minimum of \$80 m \times 3.34\% = \$2.67 m worth of shares. Any repurchase below this figure may lead to a fall in the stock price.

5.2. The other sides of stock repurchase

Despite the good side of repurchases as portrayed in the previous presentation, some buyback critics' charge that the practice does more harms than good. They contend that buybacks are a misuse of corporate cash, diverting capital from productive investments in personnel and in upgrading equipment. It is also argued that, when they are debt financed, they raise the debt to equity ratio, and if large enough, they adversely affect the credit rating and raise the cost of capital. And instead of making takeovers difficult, critics in-
sist, buybacks make them easier by concentrating the stock in fewer hands. This is particularly true if a potentially hostile party already owns a large block of stock. This means that a buy back will lower the number of shares outstanding and automatically increase the percentage of the raider's holdings without costing him an extra penny.

Brigham and Gapenski (1996), argue that repurchases may raise the price of the stock to the disadvantage of the remaining (non-tendering shareholders). If shares are inactively traded, the price will fall below equilibrium price after the firm ceases its repurchase operations.

**CONCLUSION**

This paper analyzes dividend and stock repurchases as means of distributing excess cash to shareholders. Repurchases financed by debt are also considered. We show that under a stable tax system, investors may prefer repurchases to large dividends. This is evidenced by investor's large terminal wealth under the repurchase scheme as compared to the one under the dividend scheme. Further, we demonstrate that if repurchase system is undertaken using debt, a minimum amount of shares must be repurchased in order to prevent a slide in the stock price. It has also been shown that stock repurchases offer tax deferral advantages over dividends to stockholders. The biggest problem with repurchases is that they may not be maintained on a regular and dependable basis where as dividends may be stable for a relatively long period.

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