Share Buyback Valuation

Stock Options

(Part 3)

by

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A company has previously issued stock options which are now to be exercised.

Should the company buy back shares to offset the diluting impact?

Value to Eternal Shareholders

... is the potential for dividend payouts; that is, the excess cash plus present value of future earnings available for dividend payouts:

$$v = Excess\ Cash + \sum_{t=1}^{\infty} \frac{Earnings_t}{(1+d)^t}$$

$$V = \frac{v \cdot (1 - TaxDividend)}{Shares}$$

Value WITHOUT Share Buyback

- Stock options are exercised and the cash received by the company is paid out as dividends to all shareholders.
- The exercised stock options cause dilution because shares are not bought back.

$$V_{Exercise} = \frac{(v + Options \cdot ExercisePrice) \cdot (1 - TaxDividend)}{Shares + Options}$$

Value WITH Share Buyback

- A share buyback reduces the cash available for dividends.
- ... and reduces the number of shares.

$$W_{Exercise} = \left(v + Options \cdot (ExercisePrice - SharePrice)\right) \cdot \frac{1 - TaxDividend}{Shares}$$

Relative Value

... of making a share buyback or having the dilutive effect of the exercised stock options:

$$\frac{W_{Exercise}}{V_{Exercise}} = \frac{\left(v + Options \cdot (ExercisePrice - SharePrice)\right) \cdot \left(1 + \frac{Options}{Shares}\right)}{v + Options \cdot ExercisePrice}$$

Equilibrium

... is where the value to eternal shareholders is the same whether there is dilution from the exercised stock options or a share buyback is made:

$$W_{Exercise} > V_{Exercise} \Leftrightarrow$$

$$MarketCap < \frac{v + Options \cdot ExercisePrice}{1 + \frac{Options}{Shares}}$$

Value WITHOUT Share Buyback (Acme Corp.)

Assume: $v = \$100m, Shares = 8m,$

$$Options = 1.5m, ExercisePrice = \$7$$

$$V_{Exercise}$$
$$= \frac{(v + Options \cdot ExercisePrice) \cdot (1 - TaxDividend)}{Shares + Options}$$
$$= \frac{(\$100m + 1.5m \cdot \$7) \cdot (1 - TaxDividend)}{8m + 1.5m}$$
$$\simeq \$11.63 \cdot (1 - TaxDividend)$$

Value WITH Share Buyback (Acme Corp.)

Assume: $SharePrice = \$15,$

$$MarketCap = Shares \cdot SharePrice = 8m \cdot \$15 = \$120m$$

$$W_{Exercise} = \left(v + Options \cdot (ExercisePrice - SharePrice)\right) \cdot \frac{1 - TaxDividend}{Shares}$$

$$= \left(\$100m + 1.5m \cdot (\$7 - \$15)\right) \cdot \frac{1 - TaxDividend}{8m}$$

$$= \$11 \cdot (1 - TaxDividend)$$

Relative Value (Acme Corp.)

Relative value calculated from above results:

$$\frac{W_{Exercise}}{V_{Exercise}} \simeq \frac{\$11 \cdot (1 - TaxDividend)}{\$11.63 \cdot (1 - TaxDividend)} \simeq 94.6\%$$

Relative value calculated using formula:

$$\frac{W_{Exercise}}{V_{Exercise}}$$

$$= \frac{\left(v + Options \cdot (ExercisePrice - SharePrice)\right) \cdot \left(1 + \frac{Options}{Shares}\right)}{v + Options \cdot ExercisePrice}$$

$$= \frac{\left(\$100m + 1.5m \cdot (\$7 - \$15)\right) \cdot \left(1 + \frac{1.5m}{8m}\right)}{\$100m + 1.5m \cdot \$7} \simeq 94.6\%$$

Equilibrium (Acme Corp.)

$$W_{Exercise} > V_{Exercise}$$

$$\Leftrightarrow MarketCap < \frac{v + Options \cdot ExercisePrice}{1 + \frac{Options}{Shares}}$$

$$\Leftrightarrow MarketCap < \frac{\$100m + 1.5m \cdot \$7}{1 + \frac{1.5m}{8m}} \simeq \$93m$$

$$\Leftrightarrow SharePrice < \frac{\$93m}{8m} \simeq \$11.63$$

Summary

- Stock options cause dilution when exercised.
- Shares can be bought back to offset dilution.
- Shares should only be bought back when the share-price is below the equilibrium; otherwise shareholder value is decreased.

Further Reading

This lecture is based on:

- **[The Value of Share Buybacks]**

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Available on the internet:

www.Hvass-Labs.Org