

Share Buy Back versus Debt Pay Down

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Summary

This article provides a quantitative framework to help CFOs answer the question, “If I have excess cash, would it be more EPS accretive to buy back shares or to pay down debt?” Conceptually, buying back shares increases EPS by lowering the number of shares outstanding, while paying down debt raises EPS by reducing interest expense, which in turn improves earnings.

The framework we have developed will guide this managerial decision using eight variables. The result is an equation for a break even stock price, P, below which the company should buy back shares, above which they should pay down debt. While there are other uses of cash besides paying down debt and buying back shares as well as other factors that go into a buy back program besides EPS accretion, the focus of this article is solely related to the financial considerations of these two uses of cash on the current year’s EPS. It is unknown whether this formula has previously been developed.

Input Variables

The eight variables used for this analysis are listed below.

c = Cash available for debt pay down or share buy back (\$ in Millions)

s = Shares outstanding (average number of shares outstanding in Millions)

NI = Forecasted net income (\$ in Millions)

r = Annual interest rate on debt (%)

t = Tax rate (%)

f = Fraction of year decision will be implemented (%). (Jan 1 = 100%, mid-year = 50%, etc)

x = Cost to implement share buy-back program (\$ in Millions)

P = Stock price (\$/share)

This analysis assumes there is no transaction cost associated with using the excess cash to pay down debt. If there is a debt pay down cost, simply set x equal to the difference in costs between starting a share buy back program and increasing the company’s debt pay down program.

Share Buy Back Formula

There is a baseline EPS formula which is calculated as $EPS = \frac{Earnings}{Share} = \frac{NI}{s}$

When a share buy back program is implemented the number of shares (s) decreases, which in turn raises EPS. The number of shares that can be bought back is equal to the cash available (c) less any cost associated with implementing the share buy back program (x) all divided by the stock price (P).

The shares available to buy back can be expressed as: $\frac{(c - x)}{P}$

Since the share buy back program may be implemented over a fraction of a year (f), the average share count needs to take the partial year into account.

Adjusting for the partial year buy back, the weighted shares that can be bought back is: $\frac{(c - x) * f}{P}$

The baseline EPS formula can now be adjusted by lowering the share count by the weighted shares bought back.

The revised EPS under a buy back program can be expressed as $= \frac{NI}{s - \frac{[(c - x) * f]}{P}}$

Debt Pay Down Formula

While the share buy back program impacted the EPS denominator, paying down debt changes the numerator. With a debt pay down program, Net Income (NI) increases because the interest expense paid on the debt with excess cash is decreased.

Conceptually, the interest expense avoided through a debt pay down program is calculated by multiplying the excess cash (c) by the interest rate on debt (r) then adjusting for tax (1-t).

Shown as an equation, the full year interest expense that can be paid using excess cash is $= (c * r * (1 - t))$

As with the share buy back program, a debt pay down plan may not take place over the full year. As such, the fraction of the year (f) in which the program is implemented needs to be contemplated.

This partial year interest expense avoided is then expressed as $= (c * r * (1 - t) * f)$

The baseline EPS formula can now be adjusted by increasing the Net Income by the interest expense avoided.

The revised EPS under a debt pay down program can be expressed as $= \frac{NI + [c * r * (1 - t) * f]}{s}$

Example

The example below will help illustrate the differences between paying down debt and buying back shares. Let,

NI = \$200 Million

s = 40 Million shares

c = \$110 Million

x = \$10 Million

f = 50% (implement mid-year)

P = \$50/share

t = 35%

r = 7%

The Initial EPS is \$5.00 which is calculated by dividing the \$200 Million of Net Income by the 40 Million average shares.

To determine the EPS under a share buy back program, plug in the example inputs to the share buy back formula that was derived above:

$$\frac{NI}{s - \frac{[(c-x)*f]}{P}}$$

$$\text{The revised EPS under a buy back program} = \frac{NI}{s - \frac{[(c-x)*f]}{P}} = \frac{\$200}{40 - \frac{[(\$110 - \$10)*.5]}{\$50}} = \$5.13$$

To calculate the revised EPS under a debt pay down program, plug in the example inputs to the debt pay down formula: $\frac{NI + [c * r * (1-t) * f]}{s}$. This is the same mechanics as were done with the share buy back program.

$$\text{The debt pay down EPS is} = \frac{NI + [c * r * (1-t) * f]}{s} = \frac{\$200 + \$110 * .07 * (1 - .35) * .5}{40} = \$5.06$$

Therefore, using this example the best financial decision is to buy back shares since EPS rises by \$0.13 versus only \$0.06 from paying down debt.

Breakeven Stock Price

The example above showed that under those specific inputs, buying back shares was more EPS accretive since the stock price was below a certain level. If we set the buy back formula equal to the debt pay down formula, then we can find the inflection stock price below which it makes sense to buy back shares, above which to pay down debt.

$$\frac{NI}{s - \frac{[(c-x)*f]}{P}} = \frac{NI + [c * r * (1-t) * f]}{s}$$

Using algebra to solve for P, we obtain the following formula:

$$P = \frac{(c-x) * [NI + c * r * (1-t) * f]}{s * c * r * (1-t)}$$

If we used the same example as above, the breakeven price would be:

$$P = \frac{(\$110 - \$10) * [\$200 + \$110 * .07 * (1 - .35) * .5]}{40 * \$110 * .07 * (1 - .35)} = \$101$$

Therefore, in our example the stock would need to double in value from \$50/share to \$101/share in order for a debt pay down program to be more EPS accretive in the current year than buying back shares. Intuitively, this result lines up with our example where the buy back impact of \$0.13 was double the debt pay down impact of \$0.06.

Note, once you set the equations equal to each other, then you can also solve for a breakeven Net Income, tax rate or any other input variable.

Conclusion

Using this framework, CFO's can make more informed decisions on whether to pay down debt or to buy back shares. In addition, external analysts can look at these managerial decisions with increased scrutiny. Putting this type of financial rigor around this problem will help everyone make more informed, fact based decisions.