



Cash, Marketable Securities and Equity Options

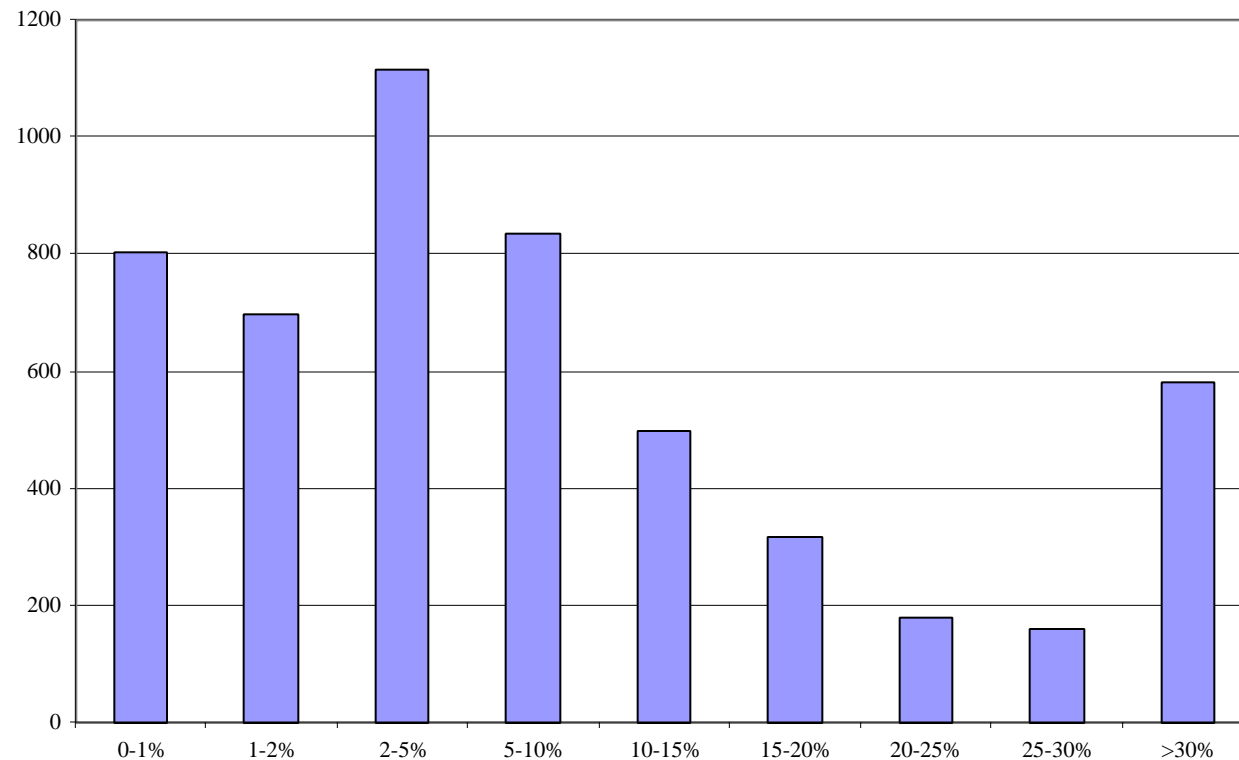
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Dealing with Cash and Marketable Securities

- The simplest and most direct way of dealing with cash and marketable securities is to keep it out of the valuation - the cash flows should be before interest income from cash and securities, and the discount rate should not be contaminated by the inclusion of cash. (Use betas of the operating assets alone to estimate the cost of equity).
- Once the firm has been valued, add back the value of cash and marketable securities.
 - If you have a particularly incompetent management, with a history of overpaying on acquisitions, markets may discount the value of this cash.

How much cash is too much cash?

Cash as % of Firm Value: July 2000



The Value of Cash

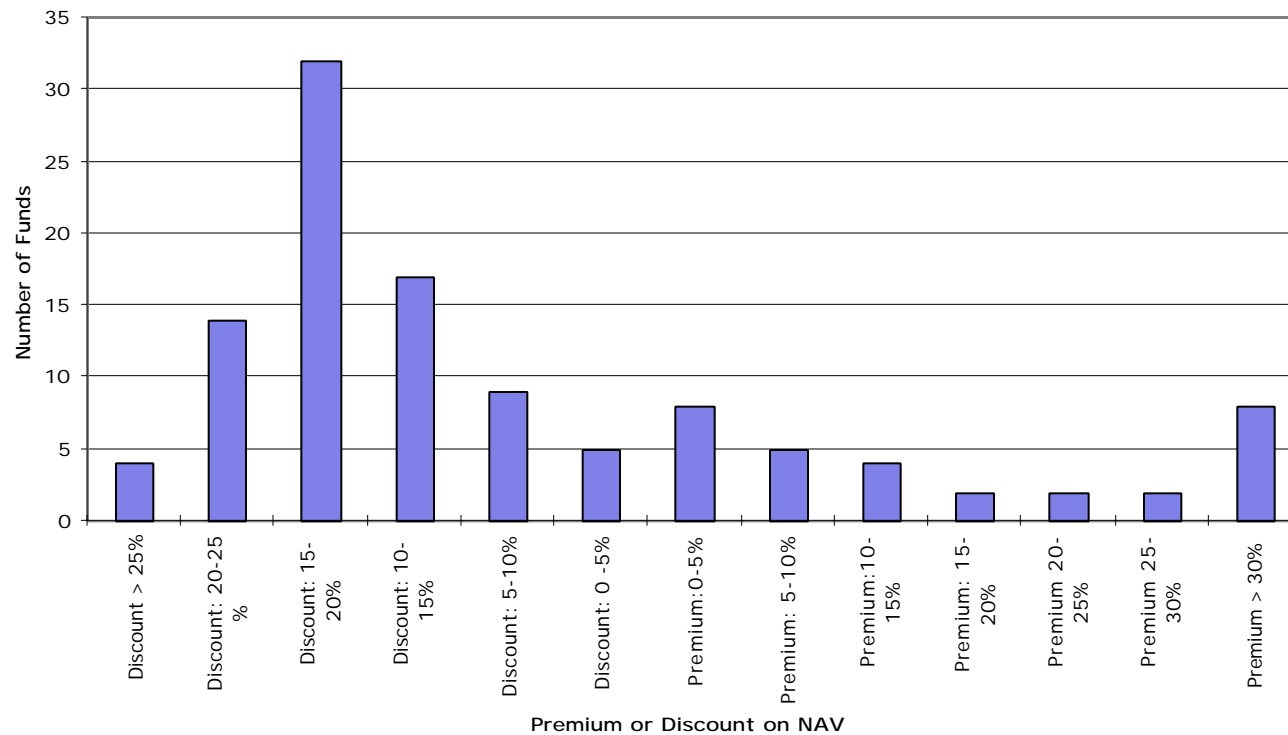
- Implicitly, we are assuming here that the market will value cash at face value. Assume now that you are buying a firm whose only asset is marketable securities worth \$ 100 million. Can you ever consider a scenario where you would not be willing to pay \$ 100 million for this firm?
 - Yes
 - No
 - What is or are the scenario(s)?

The Case of Closed End Funds

- Closed end funds are mutual funds, with a fixed number of shares. Unlike regular mutual funds, where the shares have to trade at net asset value (which is the value of the securities in the fund), closed end funds shares can and often do trade at prices which are different from the net asset value.
- The average closed end fund has always traded at a discount on net asset value (of between 10 and 20%) in the United States.

Closed End Funds: Price and NAV

Closed End Equity Funds: December 31, 1997



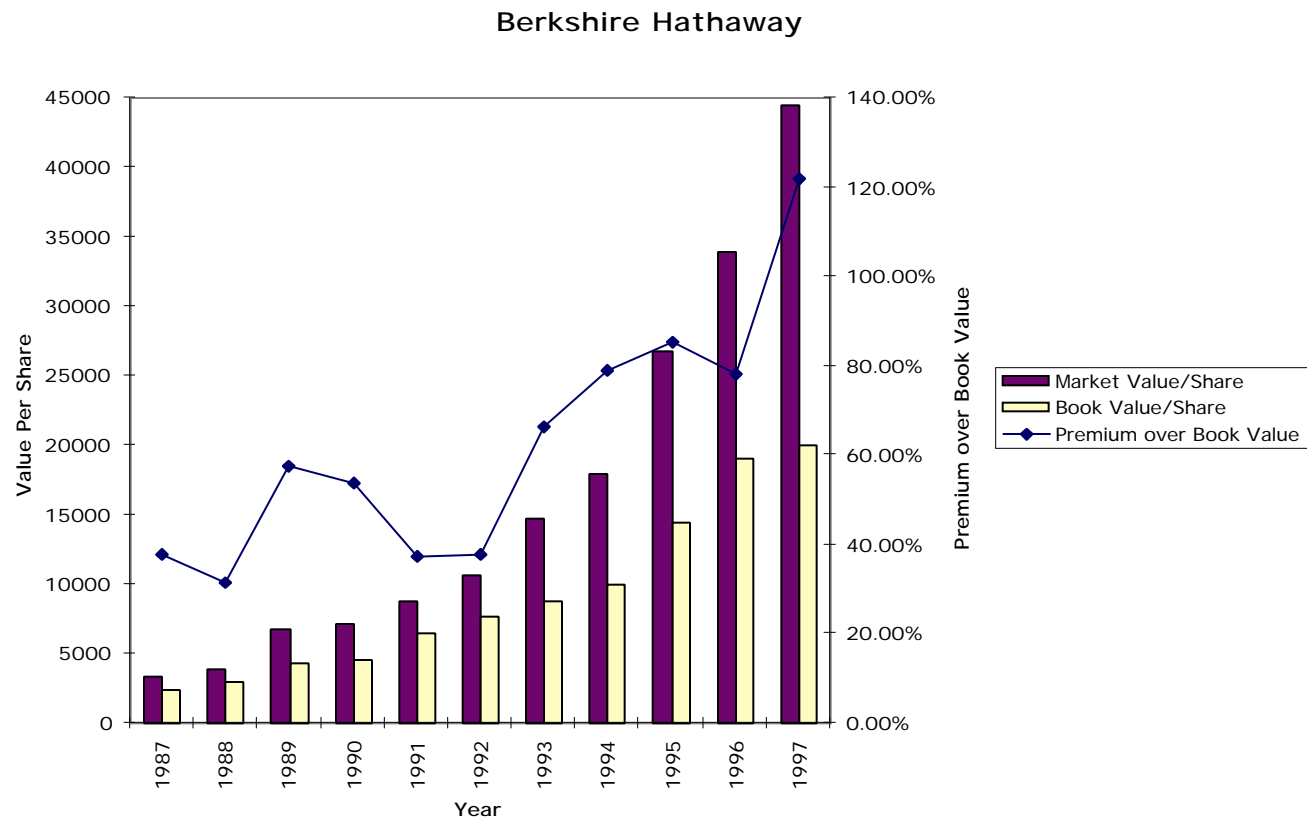
A Simple Explanation for the Closed End Discount

- Assume that you have a closed-end fund that invests in ‘average risk’ stocks. Assume also that you expect the market (average risk investments) to make 11.5% annually over the long term. If the closed end fund underperforms the market by 0.50%, estimate the discount on the fund.

A Premium for Marketable Securities

- Some closed end funds trade at a premium on net asset value. For instance, the Thai closed end funds were trading at a premium of roughly 40% on net asset value and the Indonesian fund at a premium of 80%+ on NAV on December 31, 1997. Why might an investor be willing to pay a premium over the value of the marketable securities in the fund?

Berkshire Hathaway



Dealing with Holdings in Other firms

- Holdings in other firms can be categorized into
 - Minority passive holdings, in which case only the dividend from the holdings is shown in the balance sheet
 - Minority active holdings, in which case the share of equity income is shown in the income statements
 - Majority active holdings, in which case the financial statements are consolidated.

How to value holdings in other firms

| <i>Fin Statement</i> | <i>Valuing</i> | <i>What to do...</i> |
|----------------------|----------------|---|
| Not consolidated | Equity | Value equity in subsidiary and take share of holding. |
| Not consolidated | Firm | Value subsidiary as a firm and add portion of firm value. Add portion of debt in subsidiary to the debt in estimating equity value. |
| Consolidated | Firm | Strip operating income of subsidiary and value subsidiary separately. Add portion of this value to value of parent firm. |

How some deal with subsidiaries...

- When financial statements are consolidated, some analysts value the firm with the consolidated operating income and then subtract minority interests from the firm value to arrive at the value of the equity in the firm. What is wrong with this approach?

Equity Value and Per Share Value: A Test

- Assume that you have done an equity valuation of Microsoft. The total value for equity is estimated to be \$ 400 billion and there are 5 billion shares outstanding. What is the value per share?

An added fact

- In 1999, Microsoft had 500 million options outstanding, granted to employees over time. These options had an average exercise price of \$ 20 (the current stock price is \$ 80). Estimate the value per share.

Equity Value and Per Share Value

- The conventional way of getting from equity value to per share value is to divide the equity value by the number of shares outstanding. This approach assumes, however, that common stock is the only equity claim on the firm.
- In many firms, there are other equity claims as well including:
 - warrants, that are publicly traded
 - management and employee options, that have been granted, but do not trade
 - conversion options in convertible bonds
 - contingent value rights, that are also publicly traded.
- The value of these non-stock equity claims has to be subtracted from the value of equity before dividing by the number of shares outstanding.

Warrants

- A warrant is a security issued by a company that provides the holder with the right to buy a share of stock in the company at a fixed price during the life of the warrant.
- A warrant is therefore a long term call option on the equity of the firm and can be valued using option pricing models.
- Warrants and other equity options issued by the firm are claims on the equity of the firm and have to be treated as equity, which has relevance for:
 - estimating debt and equity for the leverage calculation
 - estimating per share value from total equity value

Convertible Bonds

- A convertible bond is a bond that can be converted into a pre-determined number of shares, at the option of the bond holder.
- While it generally does not pay to convert at the time of the bond issue, conversion becomes a more attractive option as stock prices increase.
- A convertible bond can be considered to be made up of two securities - a straight bond and a conversion option.
- Firms generally add conversions options to bonds to lower the interest rate paid on the bonds.

The Straight Bond Component

- Embedded in every convertible bond is a straight bond component.
- The easiest way to value the straight bond component is to act as if the conversion option does not exist and value the bond. This can be accomplished as follows:
 - Step 1: Obtain the coupon rate on the convertible bond (which will generally be low because of the conversion option)
 - Step 2: Estimate the interest rate that the company would have had to pay if it had issued a straight bond. This can be obtained either from other bonds that the company has outstanding or from its bond rating.
 - Step 3: Using the maturity of the convertible bond, the coupon rate and the market interest rate, estimate the value of the bond as:
Value of Bond = PV of coupons at market interest rate + PV of face value of bond at market interest rate
- The straight bond component is clearly debt.

Factors in Using Option Pricing Models to Value Convertibles and Warrants

- Option pricing models can be used to value the conversion option with three caveats –
 - conversion options are long term, making the assumptions about constant variance and constant dividend yields much shakier,
 - conversion options result in stock dilution, and
 - conversion options are often exercised before expiration, making it dangerous to use European option pricing models.
- These problems can be partially alleviated by using a binomial option pricing model, allowing for shifts in variance and early exercise, and factoring in the dilution effect

Steps in Getting to Value Per Share

- Step 1: Value the firm, using discounted cash flow or other valuation models.
- Step 2: Subtract out the value of the outstanding debt to arrive at the value of equity. Alternatively, skip step 1 and estimate the value of equity directly.
- Step 3: Subtract out the market value (or estimated market value) of other equity claims:
 - Value of Warrants = Market Price per Warrant * Number of Warrants :
Alternatively estimate the value using option pricing model
 - Value of Conversion Option = Market Value of Convertible Bonds -
Value of Straight Debt Portion of Convertible Bonds
- Step 4: Divide the remaining value of equity by the number of shares outstanding to get value per share.

An Example: Valuing Sterling Software

- The equity in Sterling Software was valued at \$2,036 million, based upon projected cash flows
- The firm has two equity options outstanding:
 - The firm has 115,000 bonds outstanding, each of which can be converted into 20 shares of stock. The market price of each convertible bond is \$1,522 and the face value is \$ 1000; coupon rate of 5.75%; expires in 8 years; Bond Rating is A-; Interest rate on comparable debt = 7.50%;
 - The firm has 1.8 million warrants outstanding, with a strike price of \$ 55 per share; these are trading at \$ 30 per share

Estimating the Value of Options

- Convertible Debt has market value of \$ 175 million; face value of \$ 115 million; coupon rate of 5.75%; expires in 8 years;
 - Bond Rating is A-; Interest rate on comparable debt = 7.50%;
 - Coupon on Convertible Debt = $.0575 * 115 \text{ million} = \$ 6.6125 \text{ million}$
 - Value of Straight Debt Portion of Convertible Debt = $\$ 6.6125 \text{ (PV of Annuity, 7.5\%, 8 years)} + \$ 115 \text{ million} / 1.075^8 = \$ 103.21 \text{ million}$
 - Value of Conversion Option in Debt = Market Value of Convertible Debt - Straight Debt Portion = $\$ 175 - \$ 103 = \$ 72 \text{ million}$:Equity
- Value of Warrants = Number of warrants * Warrant Price = 1.8 million warrants * \$ 30 = \$ 54 million

Value Per Share: Sterling Software

| | |
|---------------------------------------|--------------------|
| Value of Equity | = \$2,036 million |
| - Value of Equity in Convertible Debt | = \$ 72 million |
| - Value of Equity in Warrants | = \$ 54 million |
| Value of Equity in Common Stock | = \$ 1,910 million |
| / Number of Shares outstanding | = 25.50 million |
| Value per Share | = \$ 74.90 |

A Comparison to Other Approaches

- The Conservative Approach: Estimate the total number of shares outstanding, including those in the options.

$$\begin{aligned}\text{Value of Equity per share} &= \text{Value of Equity} / \text{Fully diluted \# of shares} \\ &= \$ 2,036 / (25.50 + 2.3 + 1.8) = \$ 68.78\end{aligned}$$

- The Treasury Stock Approach: Add the expected proceeds from exercise to the numerator before dividing by the number of shares outstanding:

$$\begin{aligned}\text{Value of Equity per share} &= (\text{Value of Equity} + \text{Proceeds from Exercise}) / \\ &\text{Fully diluted number of shares} \\ &= (2036 + 115 + 1.8 * 55) / (25.5 + 2.3 + 1.8) = \$ 76.01\end{aligned}$$