BAUER
COLLEGE OF BUSINESS
UNIVERSITY of HOUSTON

Balance Sheet & Enterprise Value

Professor Zack Liu

zliu@bauer.uh.edu

CONTENTS

1. Review of accounting statements, market value vs. book value
2. Overview of next few weeks with a simple example– calculating value of asset(s).
   A. Infer from market value of debt and equity, OR
   B. Use expected cash flows and appropriate discount rate

BAUER
COLLEGE OF BUSINESS
UNIVERSITY of HOUSTON

Balance Sheet Review

Overview

1. Market value balance sheet
   a. Book values versus market values
   b. Enterprise value
2. Discounted Cash Flow (DCF)
   a. Computing enterprise value
   b. Getting to the market value of equity

Measuring Value

- Broadly, there are 2 ways to measure a company's value
- Historical value (Book value)
  - Backward looking – "How much did we pay?"
  - Used by accountants to produce financial statements
- Market value
  - Forward looking – "How much are the future cash flows worth?"
  - What we in finance are interested in

The Balance Sheet

- The balance sheet gives a measure of firm value

- The balance sheet identity:

  Assets = Liabilities + Shareholder's Equity

- Holds true for both book and market values

Simple Example

- Company A was created last year.
- It initially sold $5,000 of bonds and $5,000 of common stock.
- It purchased machinery worth $9,000
- This year's cash flows were $4,000
- Company A paid a $3,000 dividend and $1,000 in interest payments
- What does Company A's book value balance sheet look like?

Book Value Balance Sheet Example

Book Value Balance Sheet (Company A)			
Assets	**$10,000**	**Liabilities**	**$5,000**
Cash	$1,000	Bonds	$5,000
Operating Assets	$9,000		
		Equity	**$5,000**
		Common Stock	$5,000
Book Value	**$10,000**	**Book Value**	**$10,000**

Is $5,000 a good estimate of firm value? What are we missing?

BAUER COLLEGE OF BUSINESS UNIVERSITY of HOUSTON

Market Value Balance Sheet

What we want is a market value balance sheet

Market Value Balance Sheet	
Assets	**Liabilities**
"Excess" Cash	Total Debt
"Operating" Assets	Other non-equity claims
"Non-operating" Assets	**Equity**
	Common stock
	Other equity claims
Market (or Firm) Value	**Market (or Firm) Value**

Example MV Balance Sheet

- Assume Company A expects to have cash flows of $4,000 a year, to pay a $3,000 dividend each year, and make $1,000 interest payments every year forever
- Assume the bonds have a YTM of 10%, and the expected stock return is 18.75%
- Create a MV balance sheet for Company A

Value the Debt

- The debt is described as a perpetuity (for simplicity)
  - Coupon = $1000
  - YTM = 10%

$$D = \frac{\$1{,}000}{0.10} = \$10{,}000$$

VALUE THE EQUITY

- We're also treating future dividends as a perpetuity
  - Dividends = $3,000
  - Discount rate = 18.75%

$$E = \frac{\$3{,}000}{0.1875} = \$16{,}000$$

BALANCE SHEET IDENTITY

- Remember:

Assets = Debt + Equity

- Also:

Assets = Excess Cash + Operating Assets + Non-operating Assets

- We have cash ($1,000) and operating assets

$$Operating\ Assets = D + E - Cash$$

$$OA = \$10{,}000 + \$16{,}000 - \$1{,}000 = \$25{,}000$$

MV Balance Sheet

Market Value Balance Sheet (Company A)			
Cash	$1,000	Debt	$10,000
Operating Assets	$25,000	Equity	$16,000
Firm Value	**$26,000**	**Firm Value**	**$26,000**

- So equity value could be $16,000, even if book value only $5,000

Enterprise Value

- Enterprise value is a measure of the firm's value creation
- It answers the question, "How much money would we get if we sold the line of business?"
- Enterprise value is the sum of the market values of the firm's operating and non-operating assets, or:

Enterprise Value= MV of Equity + MV of Debt
+ MV all other claims -Excess Cash

FINDING ENTERPRISE VALUE

Market Value Balance Sheet (Company A)			
Cash	$1,000	Debt	$10,000
Operating Assets	$25,000	Equity	$16,000
Firm Value	**$26,000**	**Firm Value**	**$26,000**

- OK, so we calculated the market value of the firm's equity and debt, then computed the value of the operating assets as:

$$Enterprise\ Value = MV\ Equity + MV\ Debt - Excess\ Cash = \$25{,}000$$

…Same thing as A=D+E

BAUER COLLEGE OF BUSINESS UNIVERSITY of HOUSTON

FINDING ENTERPRISE VALUE

- BUT, sometimes the market value of a firm's debt and equity doesn't help us, or we may not know their value
  - Individual projects won't have a market price
  - Private firms won't have market data

- We want to value the assets using
  1. Cash flows
  2. Discount rate

We've spent a lot of time thinking about NPV, and now we'll apply it to the corporate setting (this is corporate finance after all…)

This approach is called the **Discounted Cash Flow (DCF) method**

Discounted Cash Flow

- We compute enterprise value using Discounted Cash Flow (DCF) valuation
- We will focus on two methods
  1. The weighted average cost of capital (WACC) method
  2. The adjusted present value (APV) method
- Both methods
  - Begin with discounting future cash flows to find enterprise value
  - Then back equity market value out of the enterprise value equation

FINDING ENTERPRISE VALUE

- In our example, what are the cash flows of the machine?
- What is the discount rate we should use for the machine?

Enterprise Value Example

- For now assume the correct discount rate for the firm's assets is 16%
  - We'll cover how to compute this rate later
- Remember, Company A has $4,000 cash flows each year forever
  - The company still intends to pay $1,000 per year in interest on debt and the YTM on debt is 10%.
- Suppose now the company is a private firm, so we don't know the dividend payment and equity discount rate.
- What is the Enterprise Value and the Market Value of Equity for this company?

ENTERPRISE VALUE

$$Enterprise\ Value = \frac{\$4{,}000}{0.16}$$

$$Enterprise\ Value = \$25{,}000$$

- To back out the market value of equity:

$$MVE = EV + Cash - MVD$$

$$MVE = \$25{,}000 + \$1{,}000 - \$10{,}000$$

$$MVE = \$16{,}000$$

WHERE DID DISCOUNT RATE COME FROM?

- The discount rate for the machine can be computed from the cost of equity and debt
  - We know that the discount rate for debt is 10%, and the discount rate for equity is 18.75%
  - Further, total firm value is 26,000; 10,000 from debt and 16,000 from equity

$$Firm\ discount\ rate = \frac{10}{26} * 0.1 + \frac{16}{26} * 0.1875 = 15.38\%$$

*This is the firm's total cost of capital. This is equal to the expected returns on all the firm's assets

BUT the firm is 1/26 cash, which has a discount rate of 0, so:

$$Firm\ discount\ rate = .1538 = \frac{1}{26} * 0 + \frac{25}{26} * Machine\ discount\ rate$$

$$\Rightarrow Machine\ discount\ rate = 16\%$$

Everything circles back to A=L+E

BAUER COLLEGE OF BUSINESS UNIVERSITY of HOUSTON

FINDING ENTERPRISE VALUE

- So we know the machine gives cash flows of $4,000 in perpetuity, and the discount rate of these cash flows is 16%
- Therefore, the enterprise value of the firm is:

$$\frac{4000}{0.16} = \$25{,}000$$

This is not a coincidence!

PLAN GOING FORWARD

- This simple example showed that you can value a firm's operations and projects by estimating its cash flows, and then discounting by the appropriate rate
- We'll now discuss calculating the cash flows of a project
- Later in the course, we'll discuss estimating the appropriate discount rate
- The end result is a valuation method for firms known as the discounted cash flow (DCF) model