Intro to Investment Analysis

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Purpose

- Select investment candidates
- You will do this by means of:
  - Intrinsic Value using:
    - FCFF
    - Discounted Earnings
    - Dividend Discount Model
  - Comparative Analysis
  - Estimating Earnings

Valuation

- A cynic is one "who knows the price of every thing, but the value of nothing."

  Oscar Wilde

Valuation

- Greater Fool Theory
- Sound Investing – Do not pay more for an investment than it is worth
- Beauty may be in the eye of the beholder….not value

Valuation - Myths

- Valuation is objective
- A hard earned valuation is immune to the ravages of time
- Valuation is precise
- The more quantitative the better
- Valuation assumes markets are inefficient
- The end result, not the process, is key

Valuation – the role it plays

Fundamental Analysis –true value of the firm. It is used in:

- Uncovering corporate value
- Portfolio Management
- Acquisitions
- Credit Applications

Valuation

Three approaches:

- Discounted Cash Flow
- Relative valuation
- Contingent claims (options)

Compounding

Concept of adding accumulated interest back to the principal, so that interest is earned on interest

Holding Period Return

- Ending value divided by beginning value
- $220/$200 HPR = 1.10
- Annual HPR = $HPR^{1/n}$
- Assume 6 months
- 1.10^{2} = 1.21 or 21%

Holding Period Yield

Holding period yield – HPR – 1

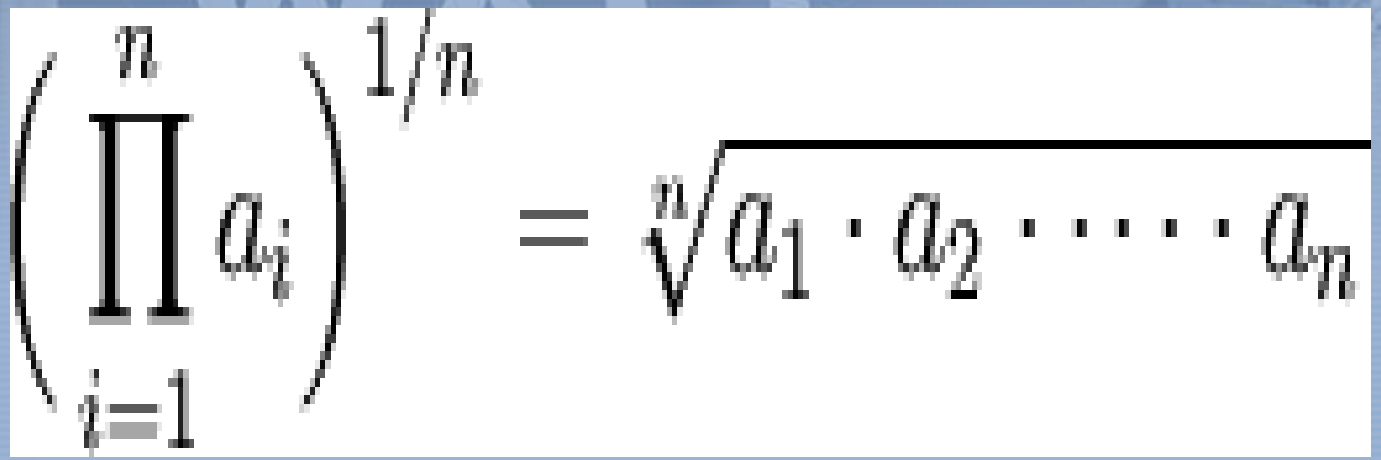
HPR = 1.10

HPY = 1.10 – 1 = .10 or 10 percent

Arithmetic and Geometric Mean

- Arithmetic Mean - generally referred as an average. Add up all the numbers and divide
- Geometric Mean - nth root of all the holding period returns multiplied

Geometric Mean



$$\left(\prod_{i=1}^{n} a_i\right)^{1/n} = \sqrt[n]{a_1 \cdot a_2 \cdot \cdots \cdot a_n}$$

CAGR

Compound Annual Growth Rate – CAGR

The year-over-year growth rate of an investment over a specified period of time.

The compound annual growth rate is calculated by taking the nth root of the total percentage growth rate, where n is the number of years in the period being considered.

CAGR

$$CAGR = \left(\frac{\text{Ending Value}}{\text{Beginning Value}} \right)^{\left(\frac{1}{\text{\# of years}} \right)} - 1$$

Valuation

- Discounted Cash Flow
- The foundation of most approaches to valuation
- Based on the concept of present value

Valuation – Present Value

- **Present Value** - an amount today that is equivalent to a future payment, or series of payments, that has been discounted by an appropriate interest rate.

Valuation – Present Value cont.

- Money has time value – Therefore, the present value of a promised future payment is worth less the longer you have to wait to receive it.
- The difference depends on the time periods for compounding and the interest or discount rate.

Valuation – Present Value cont.

The relationship between the present value and future value can be expressed as:

$$PV = FV/(1 + i)^n$$

PV = present value FV = future value

i = interest rate per period

n = number of periods

Valuation – Present Value cont.

- For example, someone contracts to pay you $100 in one year. What is it worth right now?
- Assume the going interest rate is 5%

Valuation – Present Value cont.

$$PV = FV/(1 + i)^n$$

$$PV = \$100/(1.05)^1$$

$$= \$95.23$$

Valuation – Present Value cont.

- Now assume someone contracts to pay you $100 in ten years. What is it worth today?
- The going interest rate is still 5%

Valuation – Present Value cont.

$PV = FV/(1 + i)^n$

$PV = \$100/(1.05)^{10}$

$= 100/1.62889$

$= \$61.39$

Valuation – Present Value cont.

The previous examples assume interest is paid once a year at the end of the year.

Suppose interest is paid more than once a year

Valuation – Present Value cont.

- *At interest compounded q times a year:*
- $PV = FV/(1 + r/q)^{nq}$
- Or in the same example but compounding monthly (q = 12)
- $P = 100{,}000/(1 + 0.05/12)^{120} = 100{,}000/1.64701 = 60716$

Valuation – Present Value cont.

- For example, if interest is compounded monthly: q = 12
- $PV = FV/(1 + r/q)^{nq}$
- $P = \$100{,}000/(1 + 0.05/12)^{120}$
  $= \$100{,}000/1.64701 = \$60{,}716$

Valuation – Present Value cont.

- Up until now we have discussed a single payment with a single interest rate payable after a set period of time.
- Next consider multiple payments
- For example a payment after one year
- A payment after the second year
- A payment after the nth year

Valuation – Present Value cont.

- Present value over multiple periods
- PV= $\sum_{t=1}^{n} FV_t /(1+r)^t$
- PV= $\sum_{t=1}^{n} CF_t /(1+r)^t$

Valuation – Relative Valuation

- Majority of Valuations are relative in nature
- Example – Using an industry standard P/E ratio to value a firm
- Assumes market reliability
- Individual stocks are valued incorrectly

Accounting Statements – Balance Sheet

- Assets

  Current – Short life span

  Fixed - Long Lived Real Assets

  Financial Investments

  Intangible

Accounting Statements – Balance Sheet

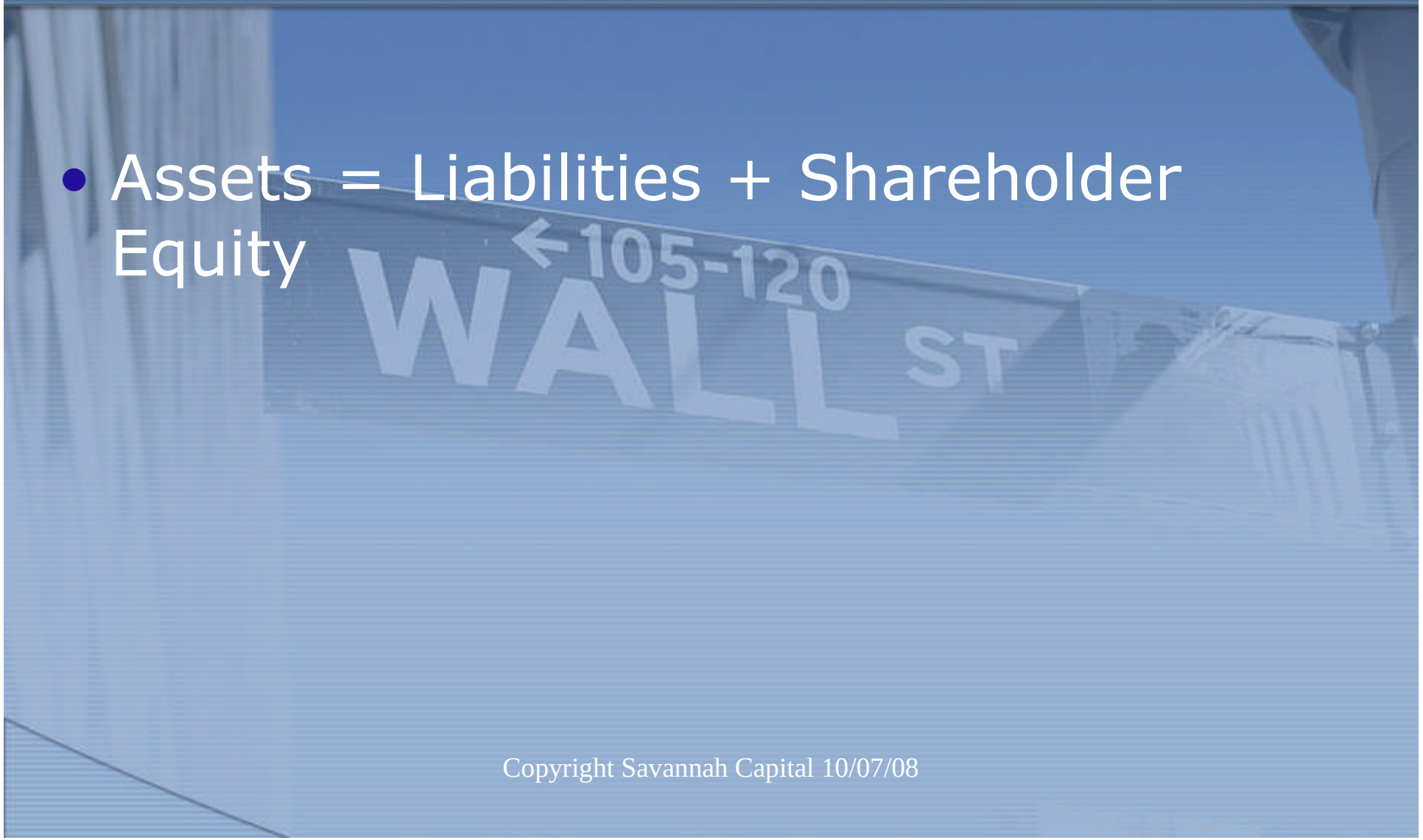
- Liabilities
  - Current – Short-term liabilities
  - Debt – Long term obligations
  - Other – Other long term obligations

Accounting Statements

- Shareholder Equity

  - Common Stock
  - Additional Paid in Capital
  - Retained Earnings

Accounting Statements

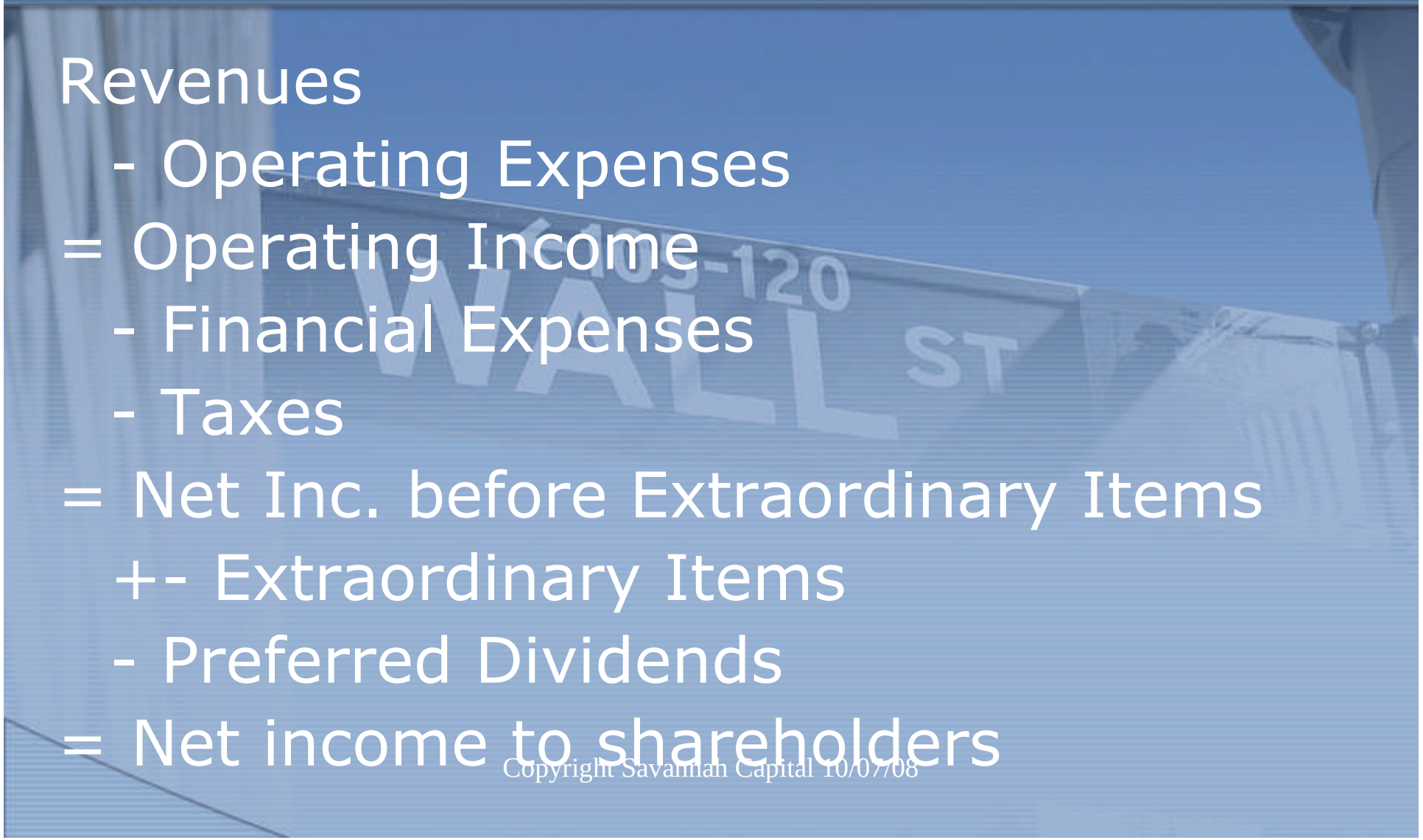


- Assets = Liabilities + Shareholder Equity

Accounting Statements

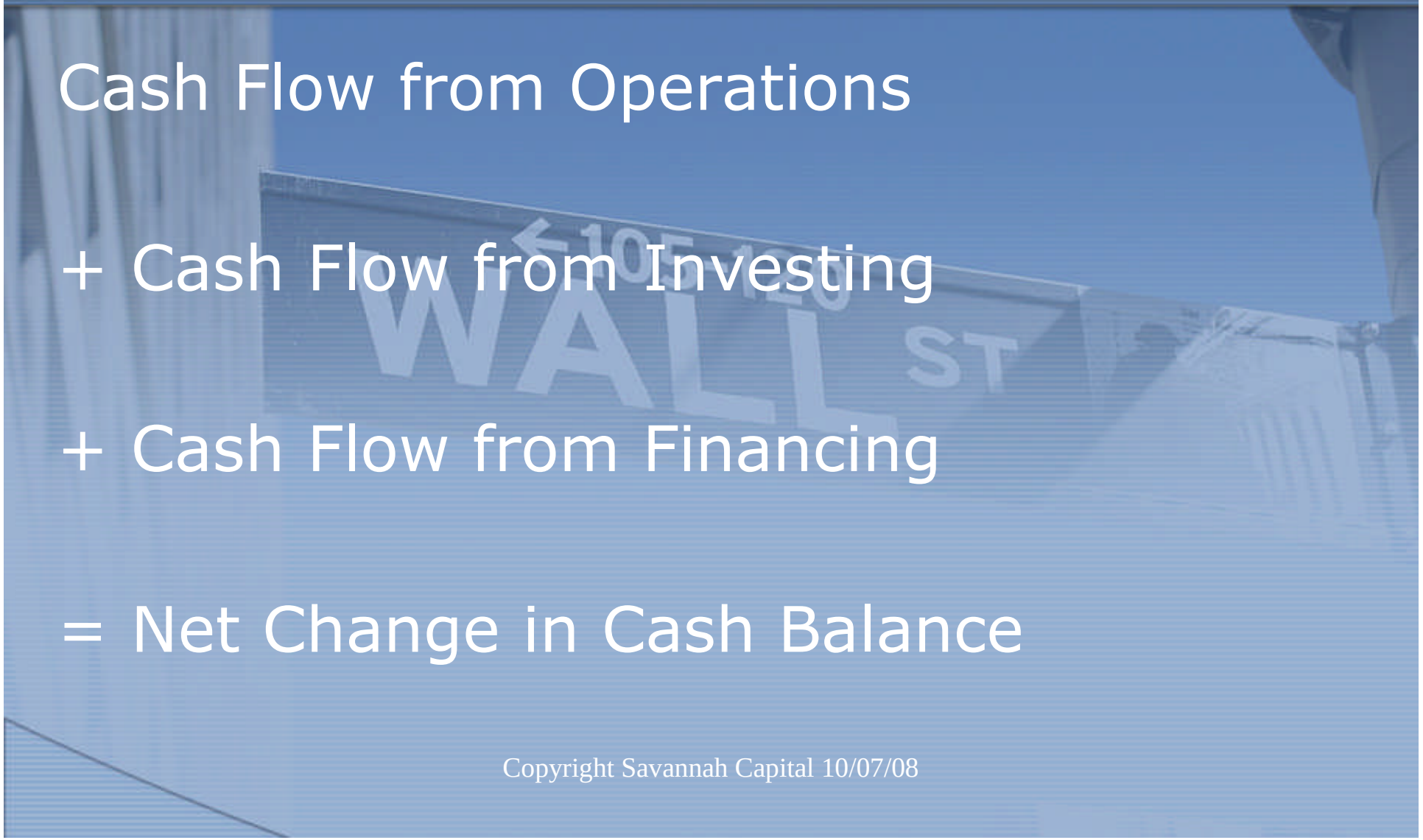
Assets		Liabilities
Cash		Short-term debt
Accounts receivable		Customer advances
Inventory		Accounts payable
Other current assets		Accrued liabilities
		Interest payable
		Taxes payable
		Dividends payable
= Current Assets		= Current Liabilities
		Bonds payable (L.T. Debt)
Investments		
Goodwill		Common stock
Plant, Property & Equipment		Add'l paid-in capital
Other long-term assets		Retained earnings
= Long-term Assets		= Stockholders' Equity
Total Assets	=	Total Liabilities & Equity
(i.e., Current Asssets + Lomg-term assets)		(Current Liabilities + Long-Term Debt + Equity)

Accounting Statements – Income Statement



Revenues
- Operating Expenses
= Operating Income
- Financial Expenses
- Taxes
= Net Inc. before Extraordinary Items
+- Extraordinary Items
- Preferred Dividends
= Net income to shareholders

Accounting Statements - Cash Flow



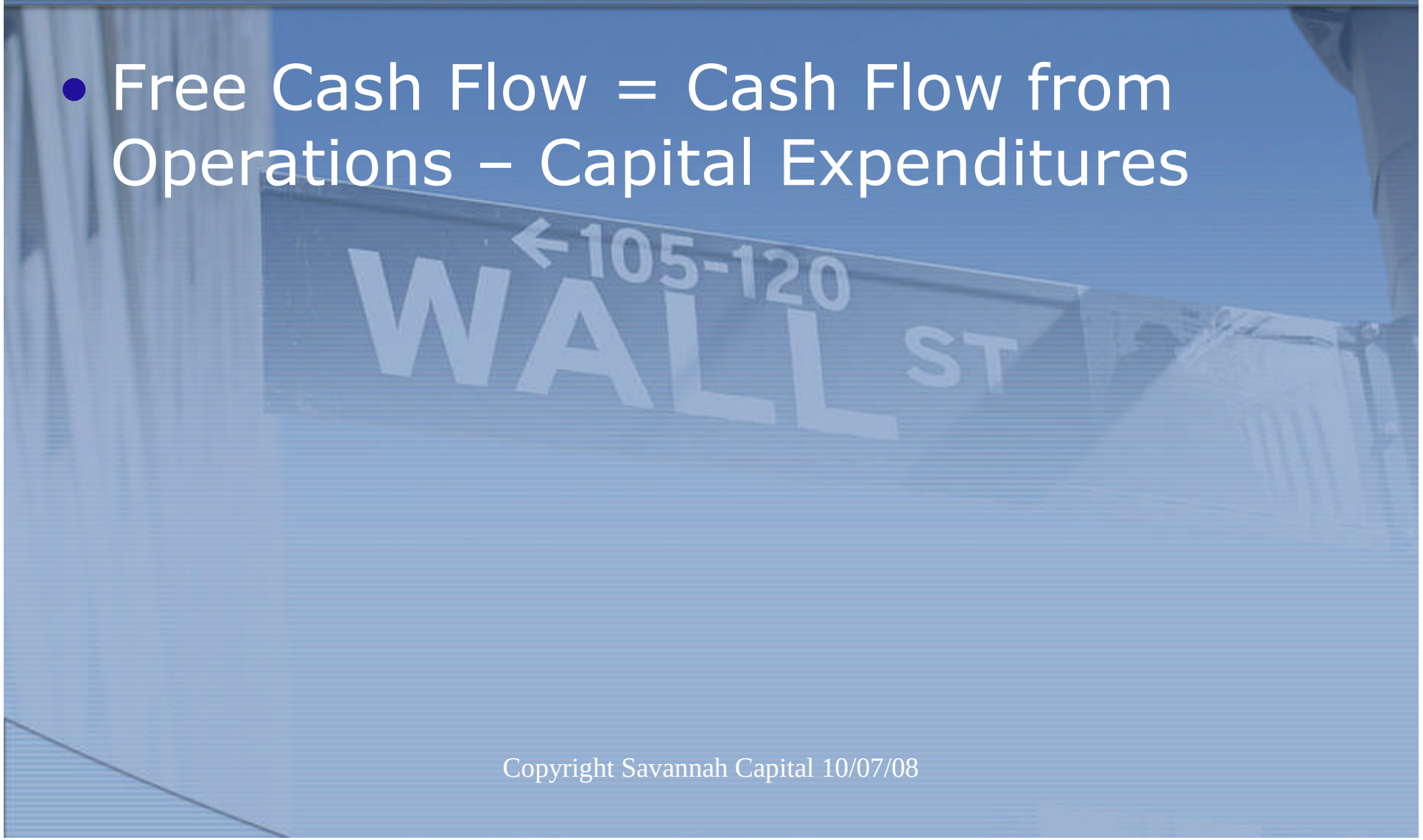
Cash Flow from Operations

+ Cash Flow from Investing

+ Cash Flow from Financing

= Net Change in Cash Balance

Accounting Statements - Free Cash Flow



- Free Cash Flow = Cash Flow from Operations – Capital Expenditures

Accounting Statements - FCFF

- Free Cash Flow to the Firm

FCFF =
Net Operating Profit (NOP)
- Taxes
-Net Investment
-Net change in working capital

TABLE 12.9 SUMMARY OF FINANCIAL RATIOS FOR WALGREEN, S&P RETAIL DRUG STORES, S&P 400 INDEX: 1995–1997

	1997			1996			1995		
	Walgreen	Drug Stores	S&P 400	Walgreen	Drug Stores	S&P 400	Walgreen	Drug Stores	S&P 400
Internal Liquidity									
Current ratio	1.62	1.55	1.36	1.71	1.89	1.33	1.68	1.87	1.38
Quick ratio	0.31	0.23	0.93	0.25	0.37	0.92	0.25	0.31	0.94
Cash ratio	0.05	0.06	0.19	0.01	0.12	0.19	0.02	0.04	0.18
Receivables turnover	40.25	37.13	4.36	44.06	31.77	4.31	47.25	35.79	4.35
Average collection period	9.07	9.83	83.80	8.28	11.49	84.73	7.73	10.20	84.00
Working capital/sales	0.07	0.09	0.11	0.07	0.12	0.11	0.07	0.09	0.12
Operating Performance									
Total asset turnover	3.41	2.38	0.93	3.42	2.34	0.96	3.37	2.82	0.99
Inventory turnover (sales)[a]	7.94	5.74	10.26	7.63	5.81	10.01	8.49	6.65	9.81
Working capital turnover	15.07	11.46	9.13	14.07	8.19	9.03	14.14	10.70	8.59
Net fixed asset turnover	8.35	7.78	2.63	8.73	6.84	2.79	8.91	7.58	2.93
Equity turnover	6.05	5.18	3.00	6.14	4.95	3.11	6.18	5.67	3.27
Profitability									
Gross profit margin	27.55	—	—	27.71	—	—	28.02	—	—
Operating profit margin	5.30	7.06	17.04	5.13	6.80	16.07	5.00	6.51	15.47
Net profit margin[b]	3.26	1.96	6.13	3.16	3.26	5.93	3.09	2.84	5.32
Return on total capital[b]	11.17	7.33	10.65	10.96	11.75	10.66	10.45	12.59	10.04
Return on owners' equity[b]	19.75	10.36	18.76	19.38	16.14	18.80	19.06	16.14	17.76
Financial Risk									
Debt–equity ratio[c]	16.65	40.38	79.52	19.97	49.87	76.53	21.31	38.09	77.33
Long-term debt/long-term capital[c]	14.27	28.77	47.83	16.64	33.28	46.63	17.56	27.58	46.70
Total debt/total capital[c]	43.60	54.46	132.25	43.80	53.99	133.98	44.90	50.78	136.00
Interest coverage[b]	357.00	7.37	5.63	304.50	11.99	5.57	441.12	13.20	5.00
Cash flow/long-term debt[b,c]	144.00	42.19	44.82	128.00	41.13	45.21	119.00	61.55	42.96
Cash flow/total debt[b,c]	31.00	14.25	16.21	32.80	17.48	15.73	31.20	22.72	14.75
Growth Analysis[d]									
Retention rate[b]	0.73	0.59	0.62	0.71	0.71	0.62	0.70	0.66	0.61
Return on equity[b]	18.35	10.16	18.06	18.20	16.13	17.63	17.90	16.14	16.72
Total asset turnover	3.41	2.38	0.93	3.42	2.34	0.96	3.37	2.82	0.99
Total assets/equity	1.77	2.18	3.27	1.78	2.17	3.20	1.81	2.03	3.25
Net profit margin[b]	3.26	1.96	6.13	3.16	3.26	5.93	3.09	2.84	5.32
Sustainable growth rate[b]	13.40	5.99	11.17	12.86	11.45	10.95	12.53	10.65	10.14

[a]Computed using sales since cost of sales not available for industry and S&P 400.
[b]Calculated using operating income after taxes.

Beta

- **Capital Asset Pricing Model**
- r = Rf + beta x (Km - Rf) where:

  r = the expected rate return rate on a security

  Rf = the rate of a "risk-free" investment

  Km = the return rate of the appropriate asset class

  Beta measures the volatility of the security, relative to the asset class.

Beta

- The asset class for our purposes is the market itself.
- For calculation purposes we will use the S&P 500 index
- The historical return on the S&P 500 is 11%

Beta

- The risk free rate is defined as a 10 year Treasury whose rate we will assume to be 5%

Beta

- r = Rf + beta x (Km - Rf)

Therefore

r = 5 + beta x (11-5)

r = 5 + beta x 6

Beta

- Therefore:

  - if a security is just as risky as the overall market, investors would demand a return of 11 percent.

  - If a security is twice as risky as the overall market, investors would demand a return of 17 percent.

Beta

- Do not try to calculate a stock's beta
- Betas are published by Merrill Lynch, Value Line, S&P among others.

Economic Value Added (EVA)

- Shows the true economic profit of a company
- Originated by Stern Stewart and Co.

Economic Value Added (EVA)

"Until a company reports a profit that is greater than its cost of capital, it operates at a loss." Peter Drucker

EVA was created to recognize that when a company uses capital it must pay for it like any other cost.

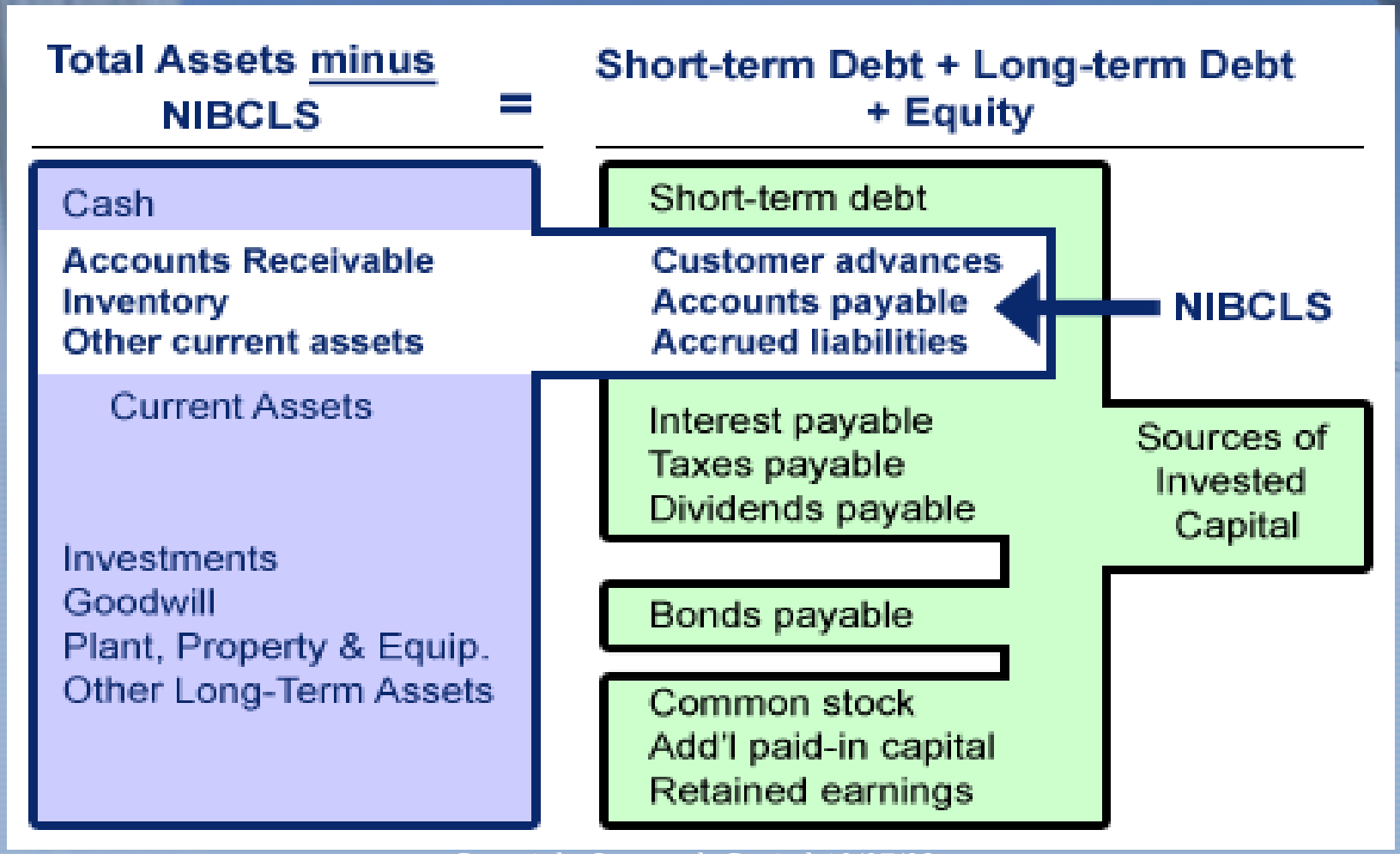
Economic Value Added (EVA)

- EVA = NOPAT (net operating profit after taxes) – capital x cost of capital
- Assume shareholders demand a 10% return
- Their share of NOPAT must exceed 10% of the company's equity capital

Economic Value Added (EVA)

- Calculating Invested Capital
- Need to eliminate Non interest bearing current liabilities (NIBCL)
- You can go from either side of the balance sheet

Economic Value Added (EVA)



Economic Value Added (EVA)

Walt Disney Co (Ticker:DIS)
Balance Sheet, End of Fiscal Year 2004

Current Assets		Current Liabilities	
Cash		Accounts payable	5,623
Net Receivables		Other Current Liabilities	1.343
Inventory		Short-Term Debt	4,093
Other current assets		Total Current Liabilities	11,059
Total Current Assets			
		Long-Term Debt	9,396
Long-Term Assets		Other Liabilities	3,619
Long-Term Investments		Deferred Income tax	2,950
Fixed Assets		Minority Interest	798
Goodwill		Total Liabilities	27,821
Intangible Assets			
Other Assets		Shareholders' Equity	26,081
Total Assets	53,902	Total Liabilities & Equity	53,902

Disney's Invested Book Capital:

Total Assets - NIBCLS = 53,902 - (5,623 + 1,343)
=46,936

Economic Value Added (EVA)

- *Cost of Debt*

  The cost of debt can be found in the company's 10K

- *Cost of Equity*

  Use the capital asset pricing model

Economic Value Added (EVA)

- Pretax cost of debt x (1-tax rate) = After tax rate
- 5% x (1-.32)= 3.4%
- Cost of equity = 4% + 4% x 1.15 = 8.6%

Economic Value Added (EVA)

- Weighted Cost of Capital

3.40% x 23% = 0.79%
8.60% x 77% = 6.61%

WACC = 7.40%

Economic Value Added (EVA)

- Disney 2004 ($ millions)

NOPAT	3,597
Invested Capital	46,936
	x7.4%

Capital Charge	3,473

EVA 3,597 – 3,473 = 124

Enterprise Value

- Market Capitalization = Shares outstanding x share price
- Enterprise Value = Market Cap + Long term debt – Cash & Investments