



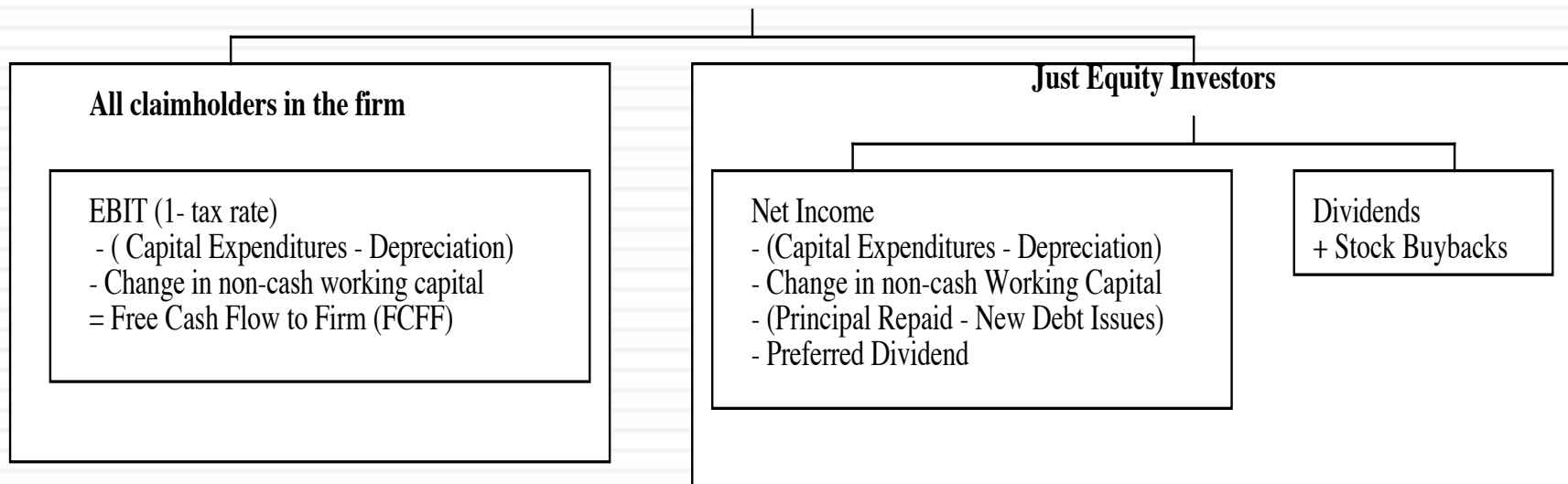
SESSION 7: ESTIMATING CASH FLOWS

Aswath Damodaran

Defining Cashflow

2

Cash flows can be measured to



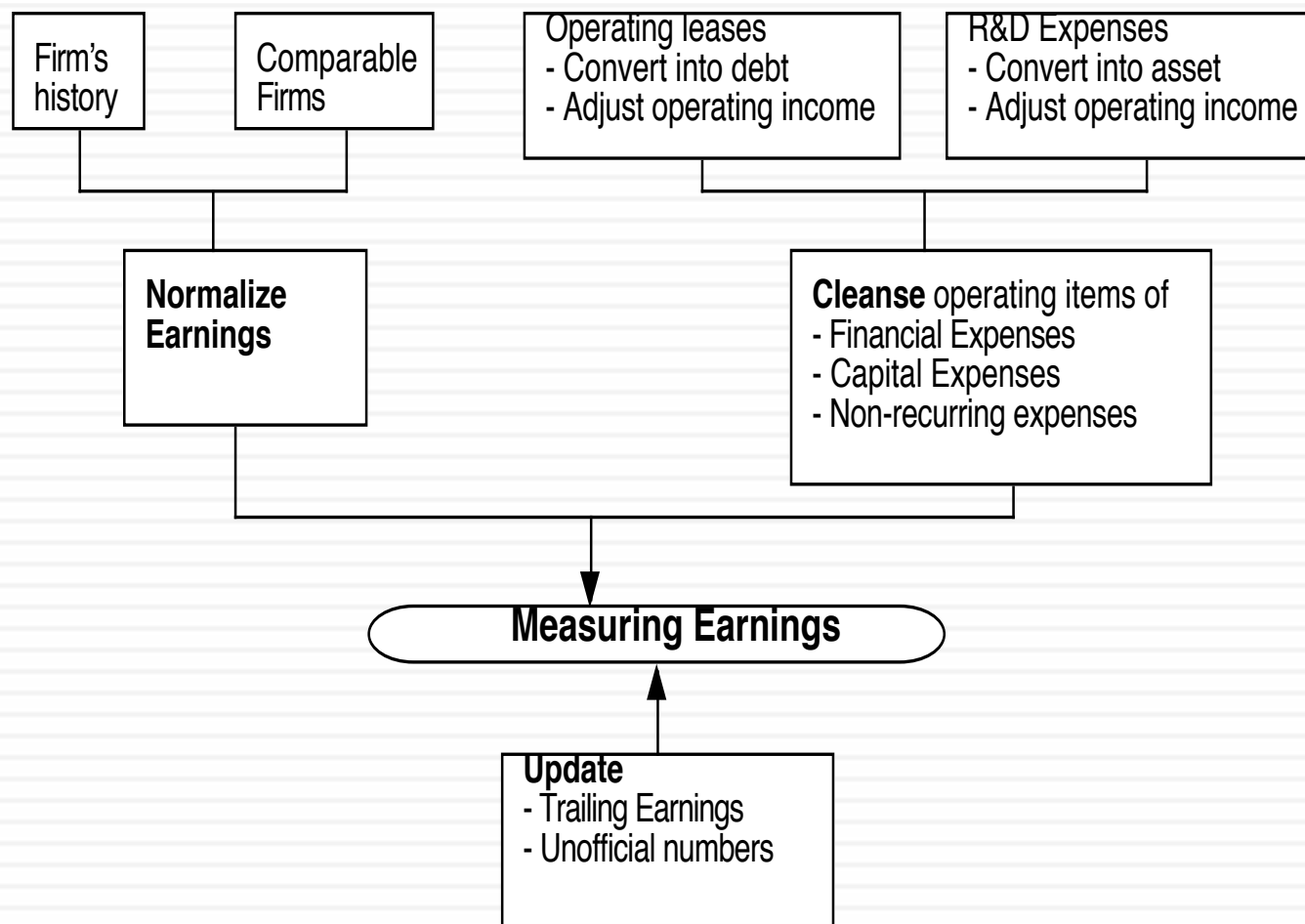
The basic ingredients for free cash flows..

3

- Estimate the current earnings of the firm
 - ▣ If looking at cash flows to equity, look at earnings after interest expenses - i.e. net income
 - ▣ If looking at cash flows to the firm, look at operating earnings after taxes
- Consider how much the firm invested to create future growth
 - ▣ If the investment is not expensed, it will be categorized as capital expenditures. To the extent that depreciation provides a cash flow, it will cover some of these expenditures.
 - ▣ Increasing working capital needs are also investments for future growth
- If looking at cash flows to equity, consider the cash flows from net debt issues (debt issued - debt repaid)

Step 1: Get your earnings “right”

4



Dealing with Operating Lease Expenses

5

- Operating Lease Expenses are treated as operating expenses in computing operating income. In reality, operating lease expenses should be treated as financing expenses, with the following adjustments to earnings and capital:
Debt Value of Operating Leases = Present value of Operating Lease Commitments at the pre-tax cost of debt
- When you convert operating leases into debt, you also create an asset to counter it of exactly the same value. That asset then has to be depreciated.
- Adjusted Operating Earnings
 - Adjusted Operating Earnings = Operating Earnings + Operating Lease Expenses - Depreciation on Leased Asset
 - As an approximation, this works:
 - Adjusted Operating Earnings = Operating Earnings + Pre-tax cost of Debt * PV of Operating Leases.

Operating Leases at The Gap in 2003

- The Gap has conventional debt of about \$ 1.97 billion on its balance sheet and its pre-tax cost of debt is about 6%. Its operating lease payments in the 2003 were \$978 million and its commitments for the future are below:

Year	Commitment (millions)	Present Value (at 6%)
1	\$899.00	\$848.11
2	\$846.00	\$752.94
3	\$738.00	\$619.64
4	\$598.00	\$473.67
5	\$477.00	\$356.44
6&7	\$982.50 each year	\$1,346.04

- Debt Value of leases = \$4,396.85 (Also value of leased asset)
- Debt outstanding at The Gap = \$1,970 m + \$4,397 m = \$6,367 m
- Adjusted Operating Income = Stated OI + OL exp this year - Deprec' n
= \$1,012 m + 978 m - 4397 m / 7 = \$1,362 million (7 year life for assets)
- Approximate OI = \$1,012 m + \$ 4397 m (.06) = \$1,276 m

The Collateral Effects of Treating Operating Leases as Debt

<i>Conventional Accounting</i>	<i>Operating Leases Treated as Debt</i>				
<p><i>Income Statement</i></p> <p>EBIT& Leases = 1,990 - Op Leases = 978 EBIT = 1,012</p>	<p><i>Income Statement</i></p> <p>EBIT& Leases = 1,990 - Deprecn: OL= 628 EBIT = 1,362</p> <p>Interest expense will rise to reflect the conversion of operating leases as debt. Net income should not change.</p>				
<p><i>Balance Sheet</i></p> <p>Off balance sheet (Not shown as debt or as an asset). Only the conventional debt of \$1,970 million shows up on balance sheet</p>	<p><i>Balance Sheet</i></p> <table> <tr> <td>Asset</td> <td>Liability</td> </tr> <tr> <td>OL Asset 4397</td> <td>OL Debt 4397</td> </tr> </table> <p>Total debt = 4397 + 1970 = \$6,367 million</p>	Asset	Liability	OL Asset 4397	OL Debt 4397
Asset	Liability				
OL Asset 4397	OL Debt 4397				
<p>Cost of capital = $8.20\%(7350/9320) + 4\%(1970/9320) = 7.31\%$</p> <p>Cost of equity for The Gap = 8.20%</p> <p>After-tax cost of debt = 4%</p> <p>Market value of equity = 7350</p>	<p>Cost of capital = $8.20\%(7350/13717) + 4\%(6367/13717) = 6.25\%$</p>				
<p>Return on capital = $1012(1-.35)/(3130+1970) = 12.90\%$</p>	<p>Return on capital = $1362(1-.35)/(3130+6367) = 9.30\%$</p>				

R&D Expenses: Operating or Capital Expenses

8

- Accounting standards require us to consider R&D as an operating expense even though it is designed to generate future growth. It is more logical to treat it as capital expenditures.
- To capitalize R&D,
 - Specify an amortizable life for R&D (2 - 10 years)
 - Collect past R&D expenses for as long as the amortizable life
 - Sum up the unamortized R&D over the period. (Thus, if the amortizable life is 5 years, the research asset can be obtained by adding up 1/5th of the R&D expense from five years ago, 2/5th of the R&D expense from four years ago...:

Capitalizing R&D Expenses: SAP

- R & D was assumed to have a 5-year life.

Year	R&D Expense	Unamortized	Amortization this year
Current	1020.02	1.00	1020.02
-1	993.99	0.80	795.19 € 198.80
-2	909.39	0.60	545.63 € 181.88
-3	898.25	0.40	359.30 € 179.65
-4	969.38	0.20	193.88 € 193.88
-5	744.67	0.00	0.00 € 148.93
Value of research asset =			€ 2,914 million
Amortization of research asset in 2004 =			€ 903 million
Increase in Operating Income = 1020 - 903 =			€ 117 million

The Effect of Capitalizing R&D at SAP

<i>Conventional Accounting</i>	<i>R&D treated as capital expenditure</i>						
<p><i>Income Statement</i></p> <p>EBIT& R&D = 3045 - R&D = 1020 EBIT = 2025 EBIT (1-t) = 1285 m</p>	<p><i>Income Statement</i></p> <p>EBIT& R&D = 3045 - Amort: R&D = 903 EBIT = 2142 (Increase of 117 m) EBIT (1-t) = 1359 m</p> <p>Ignored tax benefit = $(1020-903)(.3654) = 43$ Adjusted EBIT (1-t) = $1359+43 = 1402$ m (Increase of 117 million) Net Income will also increase by 117 million</p>						
<p><i>Balance Sheet</i></p> <p>Off balance sheet asset. Book value of equity at 3,768 million Euros is understated because biggest asset is off the books.</p>	<p><i>Balance Sheet</i></p> <table> <tr> <td>Asset</td> <td>Liability</td> </tr> <tr> <td>R&D Asset 2914</td> <td>Book Equity +2914</td> </tr> <tr> <td colspan="2">Total Book Equity = $3768+2914= 6782$ mil</td> </tr> </table>	Asset	Liability	R&D Asset 2914	Book Equity +2914	Total Book Equity = $3768+2914= 6782$ mil	
Asset	Liability						
R&D Asset 2914	Book Equity +2914						
Total Book Equity = $3768+2914= 6782$ mil							
<p><i>Capital Expenditures</i></p> <p>Conventional net cap ex of 2 million Euros</p>	<p><i>Capital Expenditures</i></p> <p>Net Cap ex = $2+ 1020 - 903 = 119$ mil</p>						
<p><i>Cash Flows</i></p> <p>EBIT (1-t) = 1285 - Net Cap Ex = 2 FCFF = 1283</p>	<p><i>Cash Flows</i></p> <p>EBIT (1-t) = 1402 - Net Cap Ex = 119 FCFF = 1283 m</p>						
<p>Return on capital = $1285/(3768+530)$</p>	<p>Return on capital = $1402/(6782+530)$</p>						

And the consequences...

11

$$\text{Reinvestment Rate}_{\text{R \& D Adjusted}} = \frac{\text{Cap Ex} - \text{Depreciation} + \Delta \text{WC} + \text{R \& D Expense} - \text{Amortization of Research Asset}}{\text{EBIT}(1 - t) + \text{R \& D Expense} - \text{Amortization of Research Asset}}$$

	No R&D adjustment	R&D adjustment
EBIT	\$5,071	\$7,336
Invested Capital	\$25,277	\$33,173
ROIC	14.58%	18.26%
Reinvestment Rate	115.68%	106.98%
Value of firm	\$58,617	\$95,497
Value of equity	\$50,346	\$87,226
Value/share	\$42.73	\$74.33

$$\text{ROC}_{\text{R \& D Adjusted}} = \frac{\text{EBIT}(1 - t) + \text{R \& D Expense} - \text{Amortization of Research Asset}}{(\text{BV of Capital} + \text{Research Asset})}$$

Step 2: Consider the effect of taxes...

12

- Your earnings and cash flows should be after corporate taxes. With cash flow to equity, you start with net income, which is already after taxes. So, you are set.
- When you do free cash flow to the firm, you are computing your cash flows “as if you had no debt”. That is why it is called an unlevered cash flow.
- Consequently, you have to compute the tax you would have paid on your operating income, as if it were taxable income.
- For the short term, you can use the effective tax rate, since it is the tax rate you paid on average on your taxable income. Over time, though, you would expect this tax rate to climb towards your marginal tax rate.

Step 3: Define reinvestment broadly

For long term assets...

13

- Research and development expenses, once they have been re-categorized as capital expenses. The adjusted net cap ex will be
 - $\text{Adjusted Net Capital Expenditures} = \text{Net Capital Expenditures} + \text{Current year's R\&D expenses} - \text{Amortization of Research Asset}$
- Acquisitions of other firms, since these are like capital expenditures. The adjusted net cap ex will be
 - $\text{Adjusted Net Cap Ex} = \text{Net Capital Expenditures} + \text{Acquisitions of other firms} - \text{Amortization of such acquisitions}$
 - Two caveats:
 1. Most firms do not do acquisitions every year. Hence, a normalized measure of acquisitions (looking at an average over time) should be used
 2. The best place to find acquisitions is in the statement of cash flows, usually categorized under other investment activities

And short term assets

14

- In accounting terms, the working capital is the difference between current assets (inventory, cash and accounts receivable) and current liabilities (accounts payables, short term debt and debt due within the next year)
- A cleaner definition of working capital from a cash flow perspective is the difference between non-cash current assets (inventory and accounts receivable) and non-debt current liabilities (accounts payable)
- Any investment in this measure of working capital ties up cash. Therefore, any increases (decreases) in working capital will reduce (increase) cash flows in that period.
- When forecasting future growth, it is important to forecast the effects of such growth on working capital needs, and building these effects into the cash flows.

Step 4: To get from FCFF to FCFE, consider debt cash flows....

15

- In the strictest sense, the only cash flow that an investor will receive from an equity investment in a publicly traded firm is the dividend that will be paid on the stock.
- Actual dividends, however, are set by the managers of the firm and may be much lower than the potential dividends (that could have been paid out)
 - ▣ managers are conservative and try to smooth out dividends
 - ▣ managers like to hold on to cash to meet unforeseen future contingencies and investment opportunities
- The potential dividends of a firm are the cash flows left over after the firm has made any “investments” it needs to make to create future growth and net debt repayments (debt repayments - new debt issues):
 - Net Income
 - (Capital Expenditures - Depreciation)
 - Changes in non-cash Working Capital
 - (Principal Repayments - New Debt Issues)
 - = Free Cash flow to Equity