



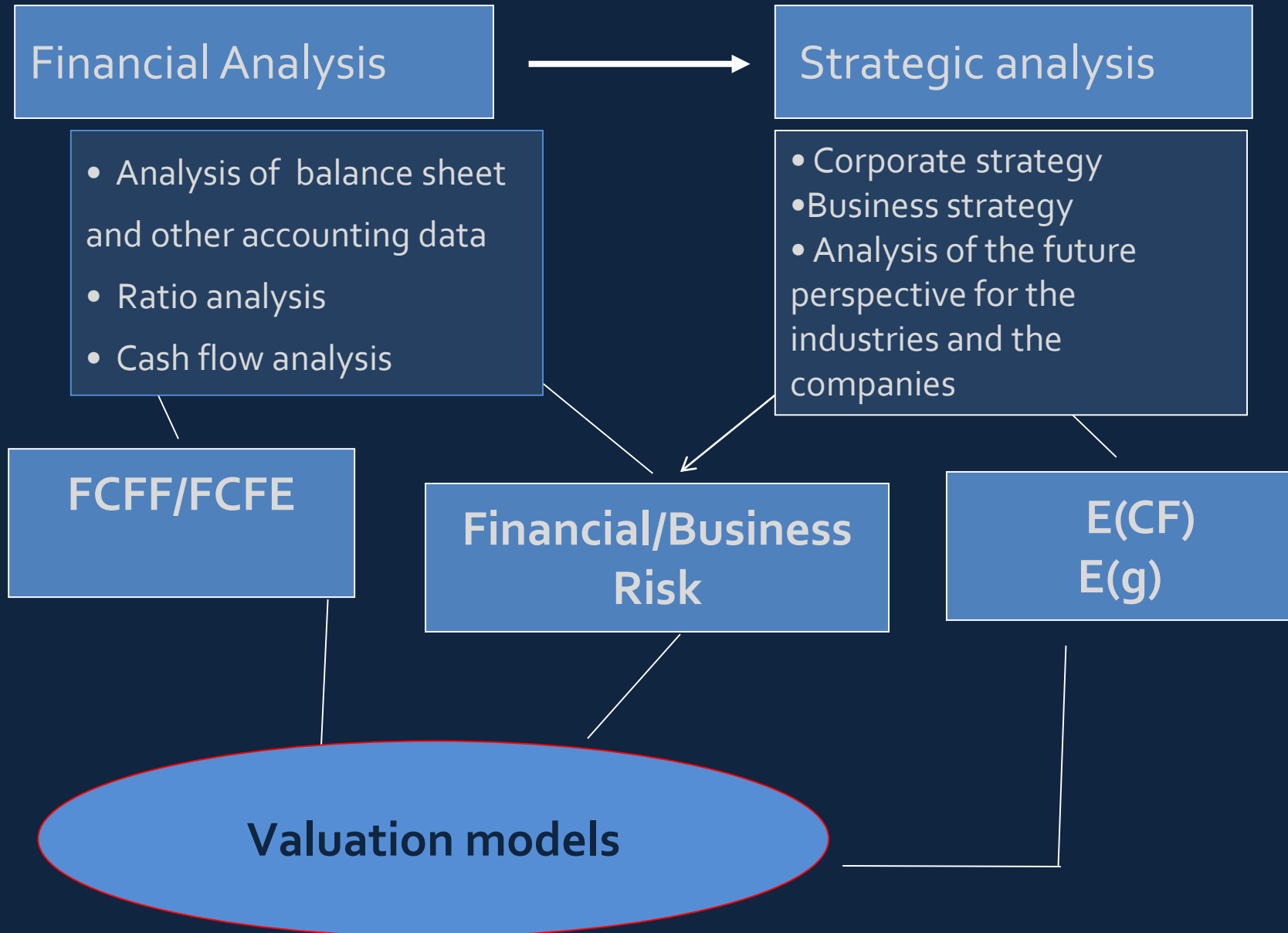
# Agenda

- Financial analysis: aims and tools
- Review of Financial Statements
- Financial Analysis: Case
- Conclusive remarks

# Aims

- Evaluate FCFF, FCFE
- Provide useful elements to estimate firm's risk: financial (solvency, lever, economic (operating leverage)
- Identify firm's financial strengths and weaknesses (and red flag)
- Integrate information with business (strategic analysis)

# Course at a glance



# Statement of Cash Flows

- The income statement provides a measure of the firm's profit over a given time period.
- However, **it does not indicate** the amount of cash the firm has generated.
- There are two reasons that net income does not correspond to cash earned:
  - there are non-cash entries on the income statement, such as depreciation and amortization.
  - certain uses of cash, such as the purchase of a building or expenditures on inventory, are not reported on the income statement.

# Statement of Cash Flows

- The firm's statement of cash flows utilizes the information from the income statement and balance sheet to determine how much cash the firm has generated, and how that cash has been allocated, during a set period.
- As we will see, from the perspective of an investor attempting to value the firm, the statement of cash flows provides what may be the most important information of the four financial statements.
- The statement of cash flows is divided into three sections: operating activities, investment activities, and financing activities.

# Statement of Cash Flows

- Three Sections
  - **Operating Activities** (net income from the income statement. It then adjusts this number by adding back all non-cash entries related to the firm's operating activities)
  - **Investment Activities** (lists the cash used for investment)
  - **Financing Activities** (shows the flow of cash between the firm and its investors)

# Statement of Cash Flows

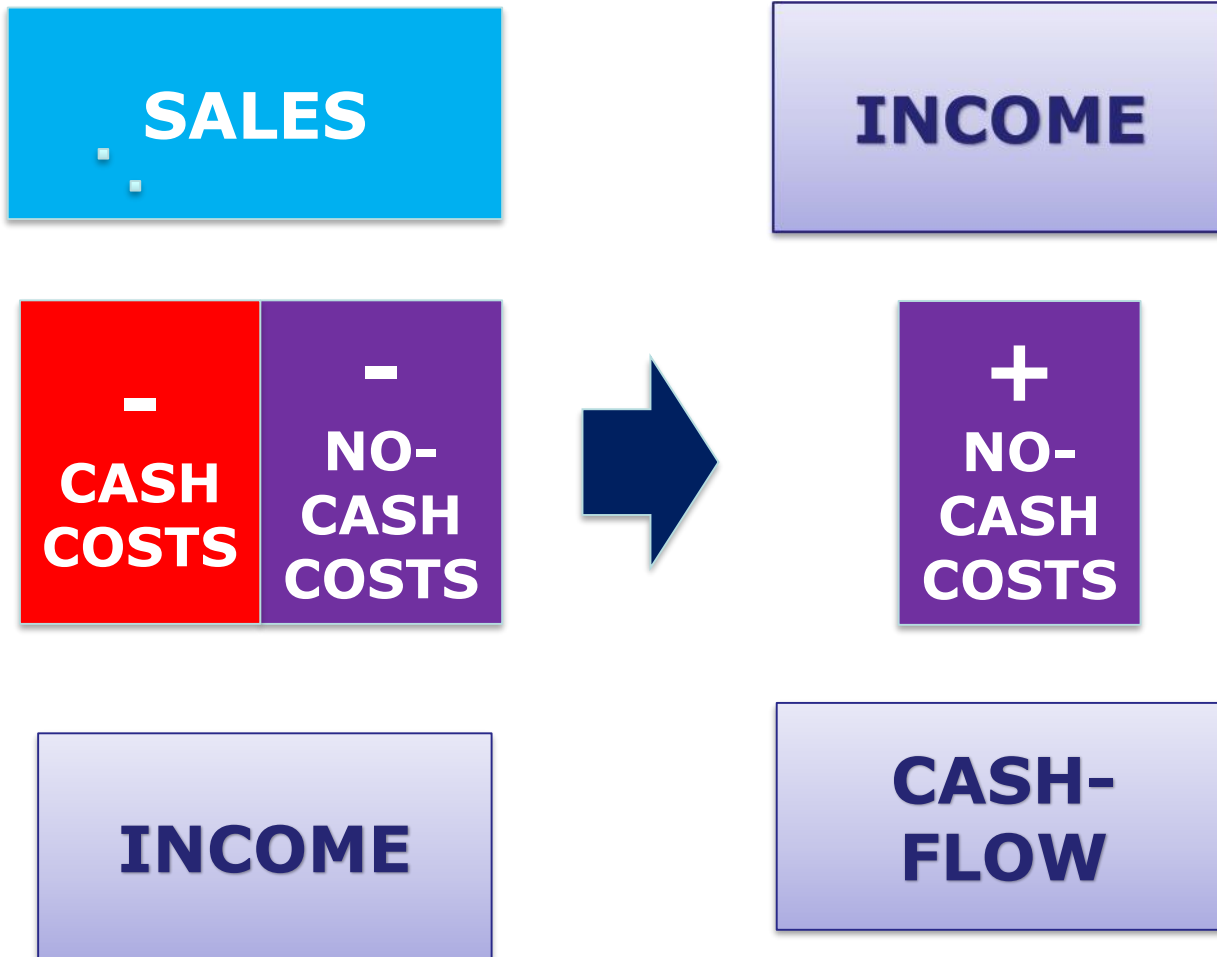
- **Operating Activities**

For instance, depreciation is deducted when computing net income, but it is not an actual cash outflow.

Thus, we add it back to net income when determining the amount of cash the firm has generated. Similarly, we add back any other non-cash expenses (for example, deferred taxes or expenses related to stock-based compensation).

# Statement of Cash Flows

- **Operating Activities**



# Statement of Cash Flows

- **Operating Activities**

Adjusts net income by all non-cash items related to operating activities and changes in net working capital

- Accounts Receivable – deduct the increases
- Accounts Payable – add the increases
- Inventories – deduct the increases

# Statement of Cash Flows

- Next, we adjust for changes to net working capital that arise from changes to accounts receivable, accounts payable, or inventory.
- When a firm sells a product, it records the revenue as income even though it may not receive the cash from that sale immediately.
- Instead, it may grant the customer credit and let the customer pay in the future. The customer's obligation adds to the firm's accounts receivable.
- We use the following guidelines to adjust for changes in working capital:

# Statement of Cash Flows

- 1. *Accounts Receivable*

When a sale is recorded as part of net income, but the cash has not yet been received from the customer, we must adjust the cash flows by deducting the increases in accounts receivable. This increase represents additional lending by the firm to its customers, and it reduces the cash available to the firm.

- 2. *Accounts Payable*

Conversely, we add increases in accounts payable. Accounts payable represents borrowing by the firm from its suppliers. This borrowing increases the cash available to the firm.

- 3. *Inventory*

Finally, we deduct increases to inventory. Increases to inventory are not recorded as an expense and do not contribute to net income (the cost of the goods are only included in net income when the goods are actually sold). However, the cost of increasing inventory is a cash expense for the firm and must be deducted.

# Statement of Cash Flows

- **Investing Activities**

- *E.g. Capital Expenditures or Buying or Selling Marketable Securities*
- Purchases of new property, plant, and equipment are referred to as capital expenditures.
- Recall that capital expenditures do not appear immediately as expenses on the income statement.
- Instead, firms recognize these expenditures over time as depreciation expenses.
- To determine the firm's cash flow, we already added back depreciation because it is not an actual cash outflow.
- Now, we subtract the actual capital expenditure that the firm made.

# Statement of Cash Flows

- **Financing Activities**

- E.g. Payment of Dividends, Changes in Borrowings
- The last section of the statement of cash flows shows the cash flows from financing activities.
- Dividends paid to shareholders are a cash outflow. Global paid \$1 million to its shareholders as dividends in 2012.
- The difference between a firm's net income and the amount it spends on dividends is referred to as the firm's retained earnings for that year:
  - Retained Earnings = Net Income - Dividends

## Table 2.3 Global Conglomerate Corporation Statement of Cash Flows for 2012 and 2011

GLOBAL CONGLOMERATE CORPORATION		
Statement of Cash Flows		
Year Ended December 31 (in \$ million)		
	2012	2011
Operating activities		
Net income	2.0	1.9
Depreciation and amortization	1.2	1.1
Other non-cash items	(2.8)	(1.0)
Cash effect of changes in		
Accounts receivable	(5.3)	(0.3)
Accounts payable	4.7	(0.5)
Inventory	(1.0)	(1.0)
<b>Cash from operating activities</b>	<b>(1.2)</b>	<b>0.2</b>
Investment activities		
Capital expenditures	(14.0)	(4.0)
Acquisitions and other investing activity	(7.0)	(2.0)
<b>Cash from investing activities</b>	<b>(21.0)</b>	<b>(6.0)</b>
Financing activities		
Dividends paid	(1.0)	(1.0)
Sale (or purchase) of stock	—	—
Increase in borrowing	24.9	5.5
<b>Cash from financing activities</b>	<b>23.9</b>	<b>4.5</b>
<b>Change in cash and cash equivalents</b>	<b>1.7</b>	<b>(1.3)</b>

# Textbook Example 2.2

## The Impact of Depreciation on Cash Flow

### Problem

Suppose Global had an additional \$1 million depreciation expense in 2012. If Global's tax rate on pretax income is 26%, what would be the impact of this expense on Global's earnings? How would it impact Global's cash balance at the end of the year?

# Textbook Example 2.2 (cont'd)

## Solution

Depreciation is an operating expense, so Global's operating income, EBIT, and pretax income would fall by \$1 million. This decrease in pretax income would reduce Global's tax bill by  $26\% \times \$1 \text{ million} = \$0.26 \text{ million}$ . Therefore, net income would fall by  $1 - 0.26 = \$0.74 \text{ million}$ .

On the statement of cash flows, net income would fall by \$0.74 million, but we would add back the additional depreciation of \$1 million because it is not a cash expense. Thus, cash from operating activities would rise by  $-0.74 + 1 = \$0.26 \text{ million}$ . Thus, Global's cash balance at the end of the year would increase by \$0.26 million, the amount of the tax savings that resulted from the additional depreciation expense.

# Cash flows as valuation inputs: FCFF

- All the money going out of the “fence”



# Cash flows as valuation inputs:

## FCFF

- Free cash flow to the firm is:

FCFF = Net income available to common shareholders

Plus: Net Non-Cash Charges

Plus: Interest Expense times  $(1 - \text{Tax rate})$

Less: Investment in Fixed Capital

Less: Investment in Working Capital

# From FCFF to FCFE

FCFE = Free cash flow to the firm

Less: Interest Expense \* (1 – tax rate)

Plus: Net Borrowing

Or

$FCFE = FCFF - \text{Int} * (1 - \text{Tax rate}) + \text{Net borrowing}$

# Using Net Income to Determine FCFF

$$\text{FCFF} = \text{NI} + \text{NCC} + \text{Int}(1 - \text{Tax rate}) - \text{FCInv} - \text{WCInv}$$

# Using EBIT and EBITDA to Determine FCFF

$$\text{FCFF} = \text{EBIT} (1 - \text{Tax rate}) + \text{Dep} - \text{FCInv} - \text{WCInv}$$

$$\text{FCFF} = \text{EBITDA} (1 - \text{Tax rate}) + \text{Dep} (\text{Tax rate}) - \text{FCInv} - \text{WCInv}$$

# Using Cash Flow from Operations to Determine FCFF

$$\text{FCFF} = \text{CFO} + \text{Int} (1 - \text{Tax rate}) - \text{FCInv}$$

# Calculating FCFE from FCFF, Net Income, and CFO

FCFE from net income (NI) and FCFF:

$$\text{FCFF} = \text{NI} + \text{NCC} + \text{Int}(1 - \text{Tax rate}) - \text{FCInv} - \text{WCInv}$$

$$\text{FCFE} = \text{NI} = \text{NCC} - \text{FCInv} - \text{WCInv} + \text{Net borrowing}$$

FCFE from CFO and FCFF:

$$\text{FCFF} = \text{CFO} + \text{Int}(1 - \text{Tax rate}) - \text{FCInv}$$

$$\text{FCFE} = \text{CFO} - \text{FCInv} + \text{Net borrowing}$$

# FCFE and FCFF on a Uses-of-FCF-Basis

$FCFF = \Delta \text{ Cash balance} + \text{Net payments to debtholders} + \text{Net payments to stockholders},$

$FCFE = \Delta \text{ Cash balance} + \text{Net payments to stockholders}$

Where  $\text{Net payments to debtholders} = \text{Int}(1 - \text{Tax rate}) + \text{Debt repayments} - \text{Debt issuances}$

Where  $\text{Net payments to stockholders} = \text{Cash dividends} + \text{Share repurchases} - \text{Stock issuances}$

# Example: Calculating FCFF

EBITDA	\$1,000
Depreciation expense	\$400
Interest expense	\$150
Tax rate	30%
Purchases of fixed assets	\$500
Change in working capital	\$50
Net borrowing	\$80
Common dividends	\$200

# Example: Calculating FCFF from Net Income

$$\text{NI} = (\text{EBITDA} - \text{Dep} - \text{Int})(1 - \text{Tax rate})$$

$$\text{NI} = (\$1000 - \$400 - \$150)(1 - 0.30) = \$315$$

$$\text{FCFF} = \text{NI} + \text{NCC} + \text{Int}(1 - \text{Tax rate}) - \text{FCInv} - \text{WCInv}$$

$$\text{FCFF} = \$315 + \$400 + \$150(1 - 0.30) - \$500 - \$50 = \$270$$

# Example: Calculating FCFF from EBIT and EBITDA

$$\text{EBIT} = \text{EBITDA} - \text{Dep} = \$1000 - \$400 = \$600$$

$$\text{FCFF} = \text{EBIT}(1 - \text{Tax rate}) + \text{Dep} - \text{FCInv} - \text{WCInv}$$

$$\text{FCFF} = \$600(1 - 0.30) + \$400 - \$500 - \$50 = \$270$$

$$\text{FCFF} = \text{EBITDA}(1 - \text{Tax rate}) + \text{Dep}(\text{Tax rate}) - \text{FCInv} - \text{WCInv}$$

$$\text{FCFF} = \$1000(1 - 0.30) + \$400(0.30) - \$500 - \$50 = \$270$$

# Example: Calculating FCFF from CFO

$$\text{CFO} = \text{NI} + \text{Dep} - \text{WCInv}$$

$$\text{CFO} = \$315 + \$400 - \$50 = \$665$$

$$\text{FCFF} = \text{CFO} + \text{Int}(1 - \text{Tax rate}) - \text{FCInv}$$

$$\text{FCFF} = \$665 + \$150(1 - 0.30) - \$500 = \$270$$

# Example: Calculating FCFE from FCFF, Net Income, and CFO

$$\begin{aligned}\text{FCFE} &= \text{FCFF} - \text{Int}(1 - \text{Tax rate}) + \text{Net borrowing} \\ \text{FCFE} &= \$270 - \$150(1 - 0.30) + \$80 = \$245\end{aligned}$$

$$\begin{aligned}\text{FCFE} &= \text{NI} + \text{NCC} - \text{FCInv} - \text{WCInv} + \text{Net borrowing} \\ \text{FCFE} &= \$315 + \$400 - \$500 - \$50 + \$80 = \$245\end{aligned}$$

$$\begin{aligned}\text{FCFE} &= \text{CFO} - \text{FCInv} + \text{Net borrowing} \\ \text{FCFE} &= \$665 - \$500 + \$80 = \$245\end{aligned}$$

# Example: Calculating FCFE and FCFF on a Uses Basis

Net payments to debtholders =  $\text{Int}(1 - \text{Tax rate}) + \text{Debt repayments} - \text{Debt issuances}$

Net payments to debtholders =  $\$150(1 - 0.30) + \$0 - \$80 = \$25$

Net payments to stockholders =  $\text{Cash dividends} + \text{Share repurchases} - \text{Stock issuances}$

Net payments to stockholders =  $\$200 + \$0 - \$0 = \$200$

$\Delta\text{Cash Balance} = \text{CFO} \pm \text{Cash from investing activities} \pm \text{Cash from financing activities}$

$\Delta\text{Cash Balance} = \$665 - \$500 + \$80 - \$200 = \$45$

$\text{FCFF} = \$45 + \$25 + \$200 = \$270$

$\text{FCFE} = \$45 + \$200 = \$245$

# Forecasting FCFF and FCFE

$$\text{FCFF} = \text{EBIT}(1 - \text{Tax rate}) - \Delta \text{Capital expenditures} - \Delta \text{WCInv}$$

$$\text{FCFE} = \text{NI} - (1 - \text{DR})(\text{FCInv} - \text{Dep}) - (1 - \text{DR})(\text{WCInv})$$

# Example: Forecasting FCFF and FCFE

Sales	\$4,000
Sales growth	\$200
EBIT	\$600
Tax rate	30%
Purchases of fixed assets	\$800
Depreciation expense	\$700
Change in working capital	\$50
Net income margin	10%
Debt ratio	40%

# Example: Forecasting FCFF and FCFE

$$\text{Sales growth} = \$200 / \$4000 = 5\%$$

$$\text{EBIT margin} = \$600 / \$4000 = 15\%$$

$$\text{Incremental FC/Sales growth} = \frac{(\$800 - \$700)}{\$200} = 50\%$$

$$\text{Incremental WC/Sales growth} = \frac{\$50}{\$200} = 25\%$$

# Example: Forecasting FCFF

$$\text{Sales} = \$200 + \$4000 = \$4200$$

$$\text{EBIT} = \$4200 \times 15\% = \$630$$

$$\text{EBIT}(1 - \text{Tax rate}) = \$630 \times (1 - 30\%) = \$441$$

$$\text{Incremental FC} = \$200 \times 50\% = \$100$$

$$\text{Incremental WC} = \$200 \times 25\% = \$50$$

$$\text{FCFF} = \text{EBIT}(1 - \text{Tax rate}) - \Delta\text{Capital expenditures} - \Delta\text{WCInv}$$

$$\text{FCFF} = \$441 - \$100 - \$50 = \$291$$

# Example: Forecasting FCFE

$$\text{Sales} = \$200 + \$4000 = \$4200$$

$$\text{Net income} = \$4200 \times 10\% = \$420$$

$$\text{Incremental FC} = \$200 \times 50\% = \$100$$

$$\text{Incremental WC} = \$200 \times 25\% = \$50$$

$$\text{FCFE} = \text{NI} - (1 - \text{DR})(\text{FCInv} - \text{Dep}) - (1 - \text{DR})(\text{WCInv})$$

$$\text{FCFE} = \$420 - (1 - 0.40)(\$100) - (1 - 0.40)(\$50) = \$330$$

# Issues in FCF Analysis

Financial Statement Discrepancies

Dividends vs. FCFE

Effect of Shareholder Cash Flows and Leverage

FCFF and FCFE vs. EBITDA and Net Income

Country Adjustments

Sensitivity Analysis

Nonoperating Assets