FINANCE FOR NON-FINANCE PROFESSIONALS

Week 3: Measuring Cash Creation and Flow

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CASH IS KING!

- Review the financial statements
- Measure cash creation
- Free cash flow measures
- Taxes
- Terminal/salvage values
- DCF valuation

MEASURING CASH CREATION AND FLOW

Brief Overview of the Financial Statements

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THE MAIN FINANCIAL STATEMENTS

Balance Sheet

Income Statement (P&L)

Cash Flow Statement

BALANCE SHEET

- What does the firm own?
- How was it paid for?
- Assets = Liabilities + Owner's Equity

ASSETS ON THE BALANCE SHEET

- Current Assets
  - Cash and marketable securities
  - Accounts receivable
  - Inventories
- Property, Plant, and Equipment
  - Land, buildings
  - Machinery
  - Accumulated depreciation
- Other Assets (e.g. Intangibles)

THE OTHER SIDE OF THE BALANCE SHEET

- Liabilities
  - Short-term (payables, current debt, etc.)
  - Long-term (deferred taxes, long-term debt)
- Shareholders equity
  - Preferred and common stock (par value)
  - Retained earnings

INCOME STATEMENT

Net Sales (Revenue)

minus Cost of goods sold

minus SG&A expense

= **EBITDA**

minus Depreciation and Amortization

= **EBIT** ("pre-tax operating profit")

minus Interest expense

= Taxable income

minus Income tax

minus Dividends (if any) =

Net Income (Profit or "earnings")

STATEMENT OF CASH FLOWS

- Accrual method of accounting
- Reports on cash movements across activities:
  - Operating (net income, depreciation)
  - Investing (capital expenditures, sale of assets)
  - Financing (dividends, new debt)
- Reconciles balance sheet/income statement

SUMMARY: ACCOUNTING STATEMENTS

- Report the financial condition
  - Balance Sheet
  - Income Statement
  - Statement of Cash Flows
- Apples-to-apples
- GAAP rules
- Treasure map for real cash!

MEASURING CASH CREATION AND FLOW

Hunting for Cash Creation

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HUNTING FOR CASH

- Earnings ≠ 

- Accruals ≠ 

- Book value ≠ market value

- Accounting cost ≠ economic cost

ACCOUNTING EARNINGS

- You cannot spend earnings
- Noncash expenses
- Extraordinary items
- Balance sheet changes
- We must find cash flow!

CASH IS KING!

- Only cash matters in the end
- Not all cash is paid out
- Need a measure of cash creation
- Consistent over time and across firms
- Free Cash Flow (FCF)

FREE CASH FLOW (FCF)

- Working capital
- Depreciation (non-cash)
- Capital expenditures
- Asset sales (salvage, terminal)
- Taxes

FREE CASH FLOW (FCF)

FCF = Operating Profit (after tax)

– Increase in WC

+ Depreciation

– Capital expenditure

+ After-tax salvage value

SUMMARY

- NPV, IRR, etc. based on cash
- Cash creation will drive valuation
- Measuring FCF is paramount

WEEK 3: MEASURING CASH CREATION AND FLOW

Working Capital Adjustments

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WORKING CAPITAL

- WC = Current Assets – Current Liabilities
- Operating liquidity
- Opportunity cost
  - WC cannot be deployed elsewhere
- Not included as an expense!

CURRENT LIABILITIES

- Liabilities to be settled < 1 year
- Accounts payable
- Current portion of debt due
- Increase in CL is a cash source
- Decrease in CL is a cash drain

CURRENT ASSETS

- Sold, consumed, or exhausted in 1 year
- Accounts receivable
- Inventory
- Increase in CA is a cash drain
- Decrease in CA is a cash source

WORKING CAPITAL: EXAMPLE

	0	1	2	3
Assets				
Current	100	125	135	100
Long-term Assets	150	150	150	150
Total Assets	250	275	285	250
Liabilities				
Current	75	65	65	100
Long-term Liabilities	80	80	80	80
Total Liabilities	155	145	145	180
Net Worth (Equity)	95	130	140	70
Working Capital	25	60	70	0
Change in WC	25	35	10	-70

FREE CASH FLOW (FCF)

FCF = Operating Profit (after tax)

– Increase in WC

\+ Depreciation

– Capital expenditure

\+ After-tax salvage value

SUMMARY

- Working capital is an opp. cost
- Increases in WC are a cash drain
- Not reflected in earnings
- FCF needs to account for WC changes

MEASURING CASH CREATION AND FLOW

Depreciation and Capital Expenditures

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DEPRECIATION AND AMORTIZATION

- Wear and Tear
- Loss of value
- Non-cash expense
- Amortization for intangibles
- Included in earnings!

CAPITAL EXPENDITURES

- Buying/ replacing long-term assets
- Property, plant, equipment
- This spending not reported in earnings
- Need to be subtracted for FCF

FREE CASH FLOW (FCF)

$$
\begin{aligned}
\text{FCF} = &\ \text{Operating Profit (after tax)} \\
&- \text{Increase in WC} \\
&+ \text{Depreciation} \\
&- \text{Capital expenditure} \\
&+ \text{After-tax salvage value}
\end{aligned}
$$

SUMMARY

- D&A is noncash reflected in earnings
- Add D&A back for FCF
- CAPX is cash not reflected in earnings
- FCF needs to account for CAPX

MEASURING CASH CREATION AND FLOW

Salvage and Terminal Values

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SALVAGE AND TERMINAL VALUES

- CAPX is spending cash
- Selling assets generates cash
- Asset sales go into FCF

THE END OF THE PROJECT

- The balance sheet is real
- PP&E cannot vanish
- Balance sheet must "sweep clean"
- We have to sell off anything on the books!

TERMINAL/SALVAGE VALUES

Projected Balance Sheet	0	1	2
Cash and Marketable Sec.	$75	$75	$200
Other Current Assets	$0	$100	$75
Fixed Assets			
At cost	$500	$500	$500
Accumulated Depreciation	$0	$100	$200
Net Fixed Assets	$500	$400	$300
Total Assets	$575	$575	$575
Current liabilities	$75	$75	$75
LT Debt	$250	$250	$250
Total liabilities	$325	$325	$325
Stock and acc. ret. earnings	$250	$250	$250
Total liabilities and equity	$575	$575	$575

WHAT IF WE DON'T SELL THE ASSETS?

- Assets are an opportunity cost
- Moving assets has a cost
- Each project is separate
- Transfer pricing
- Best practice always sweeps clean

TERMINAL/SALVAGE VALUES

FCF = Operating Profit (after tax)

– Increase in WC

+ Depreciation

– Capital expenditure

+ After-tax salvage value

SUMMARY

- Assets sales must be included in FCF
- Balance sheet must always sweep clean
- Each project must stand alone
- Opportunity costs are key

MEASURING CASH CREATION AND FLOW

Taxes

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FREE CASH FLOW AND TAXES

- Taxes are a real cash flow
- Expenses shield revenue from tax
- Tax forecasting is tricky

FREE CASH FLOW AND TAXES

- Assume taxes paid at marginal rate
- Can make use of all shields
- Ignore tax loss and carryforward
- A whole world of tax accounting!
- Our treatment is simplified

SUMMARY

- Taxes are real cash
- Can be difficult to forecast
- Often drive financial decisions
- Full scope beyond this course

MEASURING CASH CREATION AND FLOW

Calculating Free Cash Flow

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FREE CASH FLOW

$$
\begin{aligned}
\text{FCF} = \; & \text{Operating Profit (after tax)} \\
- \; & \text{Increase in WC} \\
+ \; & \text{Depreciation} \\
- \; & \text{Capital expenditure} \\
+ \; & \text{After-tax salvage value}
\end{aligned}
$$

LET'S WALK THROUGH A SIMPLE EXAMPLE

Year	0	1	2	3
Revenue		$500	$500	$500
Total costs		$300	$300	$300
Depreciation		$100	$100	$100
EBIT		$100	$100	$100
Taxes (30%)		$30	$30	$30
NOPAT		$70	$70	$70
Capital Spending	$500	$0	$0	$0
Net PP&E	$500	$400	$300	$200
Cash from operations	$0	$170	$170	$170
Working Capital	$150	$100	$50	$0
Terminal (Asset Sales)	$0	$0	$0	$200
Free Cash Flow	**-$650**	**$220**	**$220**	**$420**

MEASURING CASH CREATION AND FLOW

Using Capital Budgeting Tools

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FREE CASH FLOW

FCF = Operating Profit (after tax)

– Increase in WC

\+ Depreciation

– Capital expenditure

\+ After-tax salvage value

NPV

IRR

Payback

ROIC