MAKING CAPITAL INVESTMENT DECISIONS

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Reference Material: Chapter 10 of Textbook

KEY CONCEPTS

1. Project Cash Flows
2. Incremental Cash Flows
3. Pro Forma Financial Statements
4. Depreciation
5. Alternative definitions of OCF

PROJECT CASH FLOWS

CAPITAL BUDGETING

- We learned how to evaluate projects given expected future cash flows. Where do these cash flows come from?
  - Learn how to "spread the numbers"
  - Work with financial statements to estimate FCF
  - What info is relevant.
  - Care about *changes* in FCF

RELEVANT CASH FLOWS

The incremental cash flows for project evaluation consists of any and all changes in the firm's future cash flows that are a direct consequence of taking the project.

- You should always ask yourself "Will this cash flow occur ONLY if we accept the project?"
  - If the answer is "yes," it should be included in the analysis because it is incremental
  - If the answer is "no," it should not be included in the analysis because it will occur anyway
  - If the answer is "part of it," then we should include the part that occurs because of the project

STAND-ALONE PRINCIPLE

The assumption that evaluation of a project may be based on the project's incremental cash flows.

- Can view incremental cash flows as "minifirm"
- Compare cash flows of minifirm to "cost of acquiring it"

INCREMENTAL CASH FLOWS: PITFALLS

1. Sunk Costs
2. Opportunity Costs
3. Side Effects
4. Net Working Capital
5. Financing Costs

SUNK COST:SCENARIOS

1. You just spent $1,000 on a ticket for a ski trip in Northern California, but soon after found a better ski trip in Colorado for $500 and bought a ticket for this trip too. You just found out the trip is the same weekend, which trip do you go on?

SUNK COST:SCENARIOS

1. You just spent $1,000 on a ticket for a ski trip in Northern California, but soon after found a better ski trip in Colorado for $500 and bought a ticket for this trip too. You just found out the trip is the same weekend, which trip do you go on?
2. Imagine you go see a movie which costs $10 for a ticket. When you open your wallet or purse you realize you've lost a $10 bill. Would you still buy a ticket?

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2. Imagine you go see a movie which costs $10 for a ticket. When you open your wallet or purse you realize you've lost a $10 bill. Would you still buy a ticket?
3. Now, imagine you go to see the movie and pay $10 for a ticket, but right before you hand it over to get inside you realize you've lost it. Would you go back and buy another ticket?

SUNK COST

A cost that has already been incurred and cannot be removed and therefore should not be considered in an investment decision.

SUNK COST: EXAMPLES

- The firm hires a consultant to evaluate their marketing campaign. Should you consider the cost in deciding to pursue the campaign?
- You have tickets to the Rams game on Sunday. At halftime it is 50-0 and raining and you are miserable. You are thinking of staying because "I've paid for the tickets"
- You are really hungry and order a 20 oz steak. Halfway through you are full and can't eat anymore. You try to push through because you already paid for it.
- I'm going to keep dating "Bob" because I've already invested so much time and effort into relationship.
- Basically any mobile game...

OPPORTUNITY COSTS

The most valuable alternative that is given up if a particular investment is undertaken.

- Do not confuse with sunk costs
- You own an abandoned factory that you purchased for a million dollars. You are thinking of converting it into hipster heaven with lofts and shops. What is the sunk cost? Opportunity cost? Is the factory "free"?

SIDE EFFECTS: EROSION

The cash flows of a new project that come at the expense of a firm's existing projects.

- Benefits can be positive or negative.
- When Apple comes out with a new iphone it cannibalizes sales from existing iphone. Need to adjust expected future cash flows for decrease in sales.
- Adding a Starbucks to Target's store front. Consider increase in Target sales due to Starbucks.
- If I own two burger restaurants and decide to open a third location. Potential side effects?

NET WORKING CAPITAL

New projects often require incremental investments in current assets

- Early on you may "invest" in inventories, accounts receivable, accounts payable
- Firm supplies "the balance"
- As project winds down NWC recovered
- Resembles a loan

FINANCING COSTS

- DO NOT include interest paid in analyzing proposed investment
- Or any other financing cost
- Financing costs are reflected in the discount rate.

OTHER ISSUES

1. Use cash flows NOT accounting numbers. Occurs not accrues
2. Always use *after tax* cash flows

PRO FORMA FINANCIAL STATEMENTS

PRO FORMA

Financial statements projecting future years' operations

- Latin for "for the sake of form"
- Complex in real life
- Many ways to construct
- Most important and difficult part of capital budgeting

STEPS

1. Treat Project as mini-firm
2. Determine project costs and returns: sales projections, fixed/variable costs, capital requirements
3. Create Pro-forma balance sheet and income statement (NO INTEREST)
4. Calculate project (mini-firm) cash flows (Bring back Chapter 2 skills)
5. Tabulate total cash flows and value(Chapter 9 skills)

EXAMPLE (FROM BOOK)

- Sales: 50,000 cans of shark attractant per year, 4 dollars per can
- $2.50 per can to produce
- Product has a three year life
- Require 20% return
- FC 12,000/year
- 90,000 initial investment in manufacturing
- 100% depreciated over three-years (equal)
- 20,000 initial investment in NWC
- 34% tax rate

PROJECTED INCOME STATEMENT

Sales (50,000 units at 4/unit)	200,000
Variable Costs (2.50/unit)	125,000
Fixed Costs	12,000
Depreciation (90,000/3)	30,000
EBIT	33,000
Taxes (34%)	11,220
Net Income	21,780

PROJECTED CAPITAL REQUIREMENTS (BALANCE SHEET)

	Year			
	0	1	2	3
Net Working Capital	20,000	20,000	20,000	20,000
Net Fixed Assets	90,000	60,000	30,000	0
Total Investment	110,000	80,000	50,000	20,000

PROJECTED CAPITAL REQUIREMENTS (BALANCE SHEET)

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	0	1	2	3
Net Working Capital	20,000	20,000	20,000	20,000
Net Fixed Assets	90,000	60,000	30,000	0
Total Investment	110,000	80,000	50,000	20,000

Notice: Book/Accounting Values NOT Cash Flows (Remember Chapter 2)

PROJECTED CASH FLOWS

$$OCF = EBIT + Depreciation$$
$$OCF = 33,000 + 30,000 - 11,220$$

	Year			
	0	1	2	3
Operating Cash Flow		51,780	51,780	51,780
Changes in NWC	-20,000			+20,000
Capital Spending	90,000			
Total Cash Flow	-110,000	51,780	51,780	71,780

NPV @ 20% = 10,648 IRR =25.8%

MORE ABOUT PROJECT CASH FLOWS

1. Net Working Capital
2. Depreciation (under old tax law)

NET WORKING CAPITAL

General idea: Need to consider cash flows that aren't reflected on income statement.

- Sales might be on credit
- Costs may not have been paid yet
- Cash flows have not yet occurred
- Important to consider in CF calculations

NWC: EXAMPLE

Sales	500
Costs	310
Net Income	190

	Beginning of Year	End of Year	Change
Accounts Receivable	880	910	+30
Accounts Payable	550	605	55
Net Working Capital	330	305	-25

Total cash flow = 190-(-25)-0

Total cash flow = 215

NWC: ALTERNATIVE VIEW

What were cash revenues and costs for the year?

Change in Accounts Receivable shows 30 of sales have not been received yet

Sales	500	-30	=470

Change in Accounts Payable shows 55 of costs have not been paid yet

Costs	310	-55	255

Cash flow = Inflow - Outflow

Cash flow = 470 - 255 = 215

DEPRECIATION

- MARCS: Modified Accelerated cost recovery system
- Asset class establishes"tax life"
- Table determined depreciation allowance by year

MARCS TABLE

	Property Class		
Year	Three-Year	Five-Year	Seven-Year
1	33.33%	20.00%	14.29%
2	44.45	32.00	24.49
3	14.81	19.20	17.49
4	7.41	11.52	12.49
5		11.52	8.93
6		5.76	8.92
7			8.93
8			4.46

DEPRECIATION: EXAMPLE

What is the annual depreciation for a 12,000 asset in the five-year class.

Year	Beginning Book Value	Depreciation	Ending Book Value
1	$12,000.00	$2,400.00	$9,600.00
2	9,600.00	3,840.00	5,760.00
3	5,760.00	2,304.00	3,456.00
4	3,456.00	1,382.40	2,073.60
5	2,073.60	1,382.40	691.20
6	691.20	691.20	.00

ASSET SALES

Tax considerations to selling assets. Account for book vs market value.

What if I sold the asset in the previous example for 3,000 in year 5?
3,000-691.21=2,308.80

2,308.80*0.34=784.99

After-tax Salvage value = Salvage value +/- Taxes from Salvage Value

After-tax Salvage value (cash flow) = 3,000-784.99

What if I sold the asset in the previous example for 500 in year 5?
500-691.21=-191.21

-191.21*0.34=-65.01

After-tax Salvage value = 500+65.01

Adjust for paying too much or too little in taxes.

ALTERNATIVE OCF DEFINITIONS

1. Bottom-up: OCF=Net Income+Depreciation
2. Top-down: OCF=Sales-Costs-Taxes
3. Tax Shield: OCF=(Sales-Costs)(1-T)+Depreciation*T

All measures are dollars in - dollars out.

ALTERNATIVE OCF: EXAMPLE

Sales 1500;Costs 700; Depreciation 600
EBIT=200; Taxes=68
OCF= 200+600-68=732
BU=132+600=732
TD=1500-700-68=732
TS=(1500-700)*(1-.34)+600*.34=732

MEGA EXAMPLE

Your company is thinking about a new product line. The product will sell for $120 per unit for the first 3 years and $110 per unit afterwards. Upfront NWC is $20,000, yearly NWC is 15% of sales. Variable costs are $60/unit and fixed costs are $25,000/year. New equipment will cost $800,000 and depreciate over seven-years following MACRS. Salvage value is 20% of cost. The tax rate is 34% and required return is 15 percent. Should you pursue this new product?

Projected Unit Sales

Year	1	2	3	4	5	6	7	8
Unit Sales	3,000	5,000	6,000	6,500	6,000	5,000	4,000	3,000

KEY LEARNING OUTCOMES

- Identify relevant/incremental cash flows and understand:
  - Sunk costs
  - Opportunity costs
  - Side Effects
  - NWC
  - Financing Costs
- Calculate Pro Forma Financial Statements
  - Estimate expected future cash flows
  - Role of NWC
  - Depreciation
- Alternative ways to calculate OCF