Income and Cash Flow Statments

Goals

- Make what you learned about taxes and depreciation understandable to others.
- Use accounting conventions to convey your cash flow projections.

Background

- We will be focusing on the cash flow effects of some investment.
- We will not be looking at the whole business, just the thing that changed.
- We are looking at a counter-factual, "How would cash flow change?"

The Example Counter-factual

- How would cash flow change if we purchased a new inventory management system that reduces our need for inventory?
- How would cash flow change if we purchased a new delivery truck with a loan?
- Is cash flow better than without the loan?

Sign Convention

We will be working through sign conventions using an example \$20,000 investment that is purchased in year zero and sold in year one.

Sign Conventions: Revenue

Income Statement

	Year 0	Year 1	Note
Operating Revenue	100	(500)	
Operating Expenses			
Interest			
Depreciation			
Taxable Income			
Tax			
Net Income			

More revenue than current plan in year zero and less revenue than current plan in year one.

Sign Conventions: Expenses

Income Statement

	Year 0	Year 1	Note
Operating Revenue	100	(500)	
Operating Expenses	50	(700)	
Interest			
Depreciation			
Taxable Income			
Tax			
Net Income			

More expenses than current plan in year zero and fewer expenses than current plan in year one.

Sign Conventions: Interest

Income Statement

	Year 0	Year 1	Note
Operating Revenue	100	(500)	
Operating Expenses	50	(700)	
Interest		300	
Depreciation			
Taxable Income			
Tax			
Net Income			

Our example did not include a loan. This is included just to show the sign convention.

Increase in interest expense, relative to current plan, in year 1. Note that this is just the interest expense, not a full loan payment.

Sign Conventions: Depreciation

Income Statement

	Year 0	Year 1	Note
Operating Revenue	100	(500)	
Operating Expenses	50	(700)	
Interest		300	
Depreciation	4000	1600	
Taxable Income			
Tax			
Net Income			

If you replaced an asset with one that cost less, and had less depreciation in years zero and one, then you would see negative values. Note that we have half the usual depreciation because we are selling the asset in year 1.

Sign Conventions: Taxable Income

Subtract your expenses from your revenue.

Income Statement

	Year 0	Year 1	Note
Operating Revenue	100	(500)	
Operating Expenses	50	(700)	
Interest		300	
Depreciation	4000	1600	
Taxable Income	(3950)	(1700)	
Tax			
Net Income			

Year 0 Taxable Income = 100 -50 - 4000

Year 1 Taxable Income = -500 - (-700) -300 - 3200/2

Sign Conventions: Tax

Apply your tax rate (40%) to the Taxable Income. Note that increases in taxes are positive but decreases in taxes are shown as a negative.

Income Statement

	Year 0	Year 1	Note
Operating Revenue	100	(500)	
Operating Expenses	50	(700)	
Interest		300	
Depreciation	4000	1600	
Taxable Income	(3950)	(1700)	
Tax	(1580)	(680)	
Net Income			

This says that your taxes will be *lower* because of the action you are taking.

Sign Conventions: Net Income

Subtract Tax from Taxable Income to get Net Income, i.e., profits.

Income Statement

	Year 0	Year 1	Note
Operating Revenue	100	(500)	
Operating Expenses	50	(700)	
Interest		300	
Depreciation	4000	1600	
Taxable Income	(3950)	(1700)	
Tax	(1580)	(680)	
Net Income	(2370)	(1020)	

This says that our profits are lower than they would be otherwise.

Cash Flow

Cash from operations is just copied from the income statement

Cash Flow Statement

	Year 0	Year 1	Note
Operations			
Net Income	(2370)	(1020)	
Depreciation	4000	1600	
Investments			
Working Capital			
Gains Tax			
Finance			
Net Cash Flow			

Keep in mind that the convention is cash inflows are positive and cash outflows are negative.

Sign Conventions: Asset Purchase

The Asset is a 20K, 5-Year Asset

Cash Flow Statement

	Year 0	Year 1	Note
Operations			
Net Income	(2370)	(1020)	
Depreciation	4000	1600	
Investments			
The Asset	(20000)		
Working Capital			
Gains Tax			
Finance			
Net Cash Flow			

Outflows of cash are negative. Note depreciation reflects sale in year 1.

Sign Conventions: Asset Sale

Sell the asset in year 1 for 19000

Cash Flow Statement

	Year 0	Year 1	Note
Operations			
Net Income	(2370)	(1020)	
Depreciation	4000	1600	
Investments			
The Asset	(20000)	19000	
Working Capital			
Gains Tax			
Finance			
Net Cash Flow			

Inflows of cash are positive.

Sign Conventions: Asset Sale

Gains tax has opposite sign convention. Positive means pay.

Cash Flow Statement

	Year 0	Year 1	Note
Operations			
Net Income	(2370)	(1020)	
Depreciation	4000	1600	
Investments			
The Asset	(20000)	19000	
Working Capital			
Gains Tax			
Finance			
Net Cash Flow			

Book Value = 20000 - 4000 - 3200/2 = 14400

Sign Conventions: Gains Tax

Gains tax has opposite sign convention. Positive means pay.

Cash Flow Statement

	Year 0	Year 1	Note
Operations			
Net Income	(2370)	(1020)	
Depreciation	4000	1600	
Investments			
The Asset	(20000)	19000	
Working Capital			
Gains Tax		1840	
Finance			
Net Cash Flow			

$$Gains\ Tax = (Salvage - Book\ Value)Tax\ Rate =$$

Sign Conventions: Net Cash Flow

Add up cash but remember gains tax must be subtracted.

Cash Flow Statement

	Year 0	Year 1	Note
Operations			
Net Income	(2370)	(1020)	
Depreciation	4000	1600	
Investments			
The Asset	(20000)	19000	
Working Capital			
Gains Tax		1840	
Finance			
Net Cash Flow	(18370)	13,240	

Two More Conventions

We still need to show how to treat loans and working capital.

- Loans
  - Funding recorded on cash flow
  - Payments are split into interest expense (Income Statement) and principal payment (Cash Flow Statement)
- Working Capital Changes
  - Changes in inventory level and changes in average accounts receivable.
  - Record how the level changes from period to period.

From the Loans Slides

This is the amortization table for a \$10,000, 10% per year loan with three annual payments.

Payment Number	Payment	Interest	Principal	Balance
0				10,000
1	4,021	1,000	3,021	6,979
2	4,021	698	3,323	3,656
3	4,021	366	3,656	1.2e-11

- Payments are given by $10000(A|P, i = .1, 3) = 4,021.15$
- Interest expense is the balance remaining times the effective interest rate per payment period.
- Principal payment is the payment less the interest expense.
- Balance remaining is the previous balance remaining less then principal payment.

From the Loans Slides

Payment Number	Payment	Interest	Principal	Balance
0				10,000
1	4,021	1,000	3,021	6,979
2	4,021	698	3,323	3,656
3	4,021	366	3,656	1.2e-11

- Loan funding shows in the cash flow statement under finance as a positive number.
- Interest expenses are shown on the income statement as a positive number.
- Principal payments are show on the cash flow statement as a negative number.

In the Income and Cash Flow Statement

Income Statement

	Year 0	Year 1	Year 2	Year 3
Operating Revenue				
Operating Expenses				
Interest		1000	698	366
Depreciation				
Taxable Income	0	(1000)	(698)	(366)
Tax	0	(400)	(279.2)	(146.4)
Net Income	0	(600)	(418.8)	(219.6)

Cash Flow Statement

	Year 0	Year 1	Year 2	Year 3
Operations				
Net Income	0	(600)	(418.8)	(219.6)
Depreciation				
Investments				
Finance				
Loan	10000			
Loan Payments		(3021)	(3323)	(3656)
Net Cash Flow	10000	(3621)	(3741.8)	(3875.6)

Working Capital Changes

These are common:

- Increases in sales necessitates a larger inventory (Working Capital)
- More sales mean greater average invoices outstanding.

The logic is tricky only in the sense that you are showing the changes in these levels as cash flows.

Example Inventory Changes

This shows what happens with average inventory changes from year-to-year.

Year	1	2	3	4	5
Inventory	1000	1200	900	900	800
Working Capital	0	-200	300	0	100

- Increases in inventory require more cash, outflows.
- Decreases free up cash, inflows.
- Gets complicated when the current plan has inventory levels changing. We will not do this (Difference in the differences).

Summary

- This is just a way of presenting the things that you have already done using accounting conventions.
- Understandable by everyone that knows the conventions.
- Only a few transactions that I mix and match:
  - Increase/Decrease in revenue
  - Increase/Decrease in sales
  - Asset purchase/sale with gains tax
  - Loan and loan repayment.
  - Working Capital Changes.
- Worked Examples http://ec314-pdx-edu.wikidot.com/q4:income-and-cash-flow-statements