



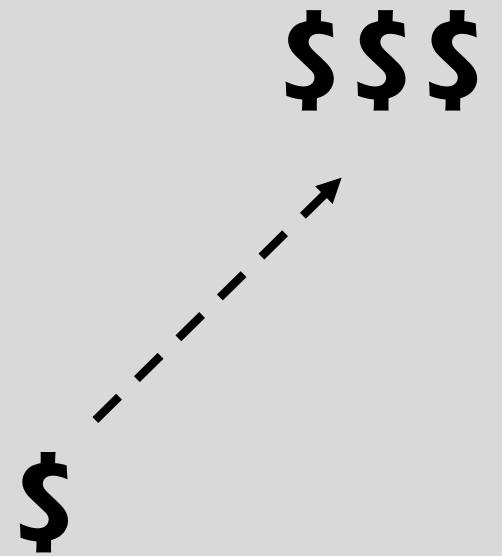
# **Finance for Startups**

## **Introduction**

Steve Ahn  
Professor of K-School  
KAIST

# Why Finance?

- Startup: Input \$, output \$\$\$
- How to find \$.
- How to use \$ in the best way.
- How to monitor the startup's progress.
- How to predict the future (\$\$\$).



You need to understand finance.

# Funding

Founder(s) should make sure that the startup is adequately funded.

Financial planning

Funding

Valuation

# Financial Statements

Study of finance should start with **understanding financial statements.**

Gives perspectives on the health of a business:

Balance sheet

Assets, liabilities & equity

Income statement

Profitability

Cash flow statement

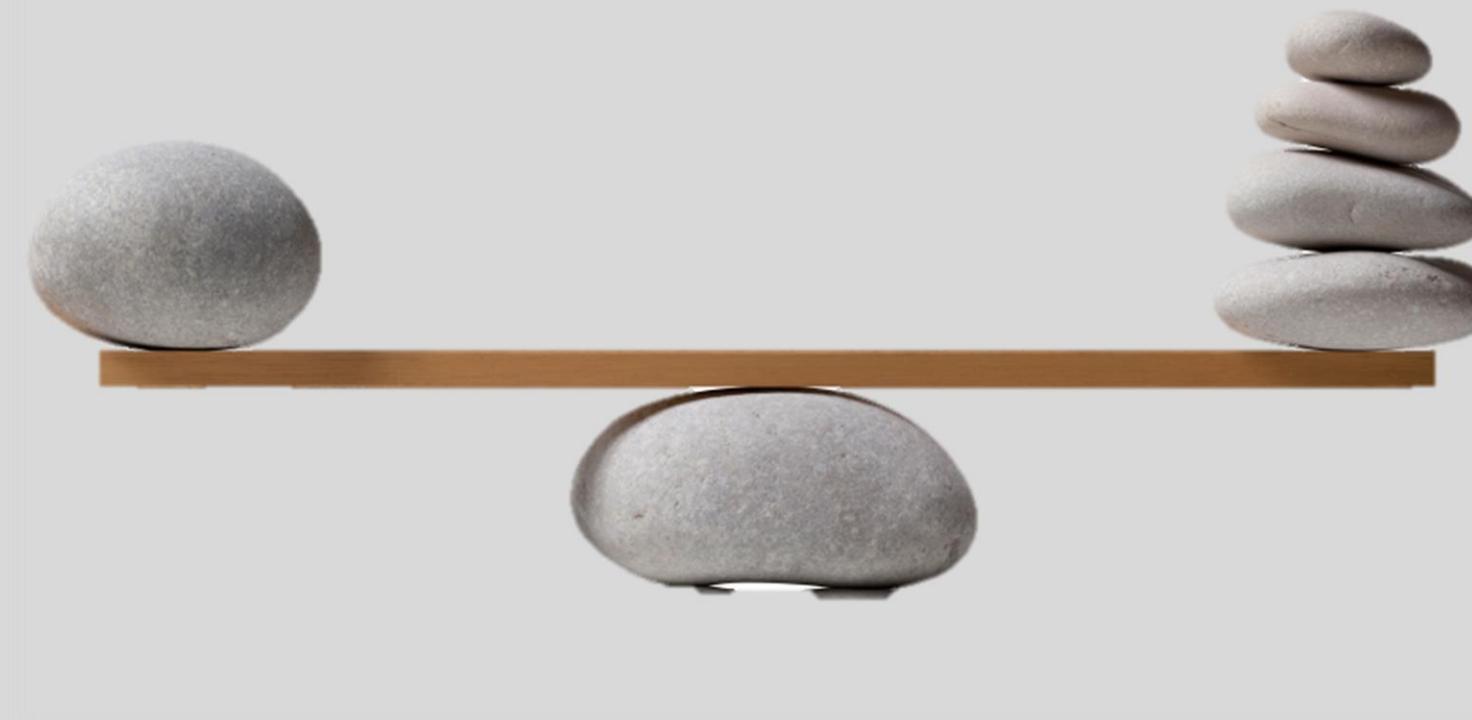
Cash movements

# Course Schedule

Week	Introduction	Balance sheet	Income statement
1	Introduction	Balance sheet	Income statement
2	Cash flow statement		Financial ratios
3	Financial planning		Funding
4	VC term sheet		Valuation



# What is a Balance Sheet?



# Accounting Equation

What a company has

Assets	Liabilities
	Owners' equity

What a company owes  
Company's net worth

$$\text{Assets} - \text{Liabilities} = \text{Owners' equity}$$

$$\text{Assets} = \text{Liabilities} + \text{Owners' equity}$$

# Why a Balance Sheet Balances

Assets	Liabilities & Owners' equity	
Cash	Equity	Receive investment
Cash	Loan	Borrow money
Less cash		Buy equipment
Equipment		
More cash or Account receivable	Retained earning	Generate profit

# Meaning of the Balance Sheet

Right side:

How the company is funded

Left side:

How the company uses the money  
and  
what resources the company has

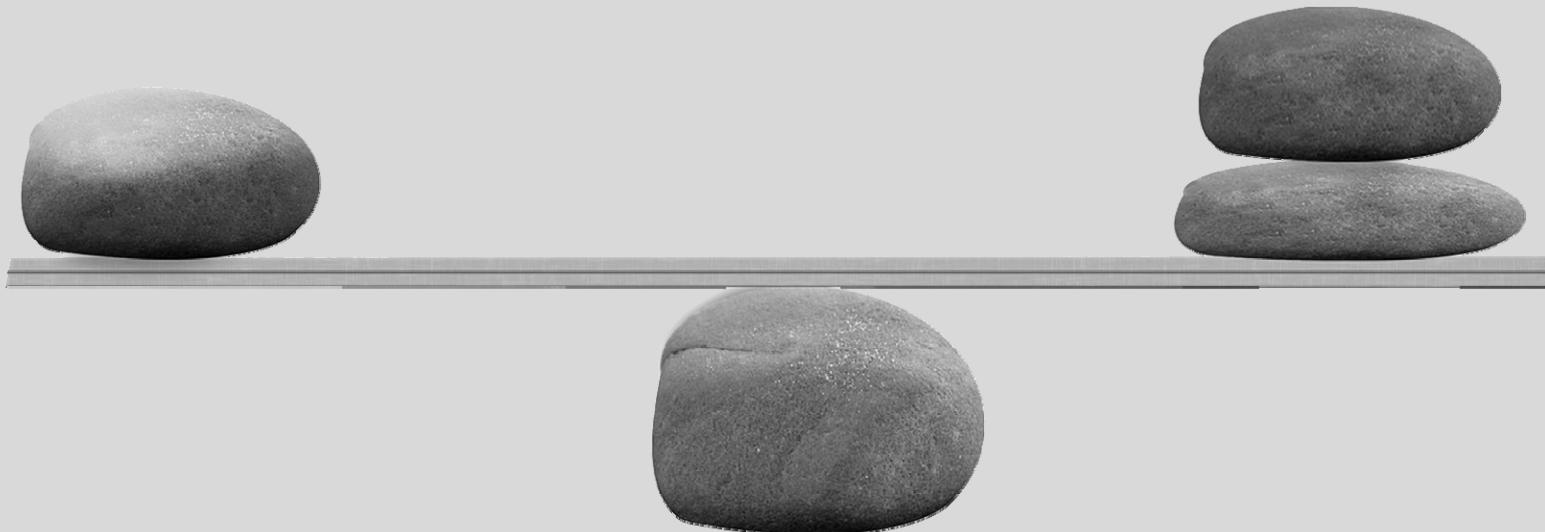
Asset	Liability
	Owner's Equity

# Summary

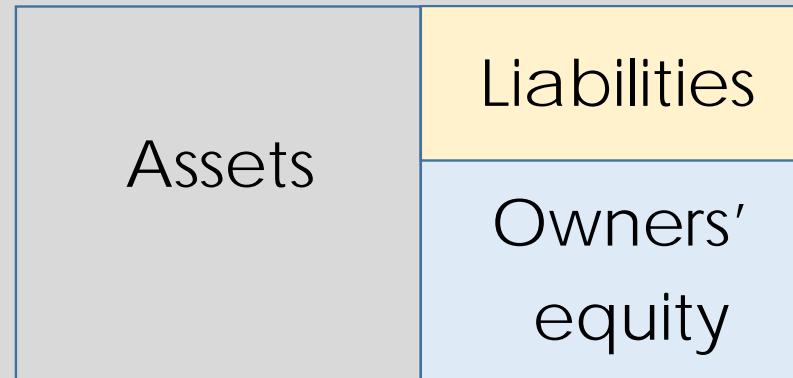
- Assets = Liabilities + Owners' equity
- Balance sheet
  - Right: How the company is funded
  - Left: How the company uses the money



# Left Side of a Balance Sheet



# Balance Sheet



# Balance Sheet

## Assets

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### Current assets

Cash and cash equivalents  
Accounts receivable (AR)  
Inventories  
Pre-paid assets

### Non-current assets

Property, Plant & Equipment (PP&E)  
Intangible assets  
Goodwill

## Liabilities

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### Current liabilities

Accounts payable (AP)  
Short-term loans  
Current portion of long-term debt  
Accrued liabilities

### Long-term liabilities

## Owners' equity

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Preferred stock  
Common stock  
Additional paid-in capital  
Retained earnings

# Current Assets

- Can be converted to cash within 1 year.
- Cash and cash equivalents (liquid assets)  
Money in the bank, publicly traded stocks and bonds
- Accounts Receivable  
The amount customers owe the company  
Like a loan from the company to its customers

# Inventories

- Raw-materials
  - Work-in-process (WIP): Inventory under production
  - Finished-goods inventory: Products ready to be sold
- 
- All inventory costs money
  - Reducing inventory improves the cash level

# Prepaid Assets

- Rent for a factory: \$60,000 for one year, paid in Jan.
- In Jan., put \$5,000 on the income statement for rent.
- The remaining \$55,000: prepaid asset on balance sheet

	Jan.	Feb.	...	Dec
Prepaid assets	55,000	50,000	...	0

# PP&E (Property, Plant and Equipment)

Buildings, machinery, computers and other physical asset

- Record at purchase price

By the principle of conservatism

“Let's use what we know, which is the cost of acquiring those assets”

- Accumulated depreciation is subtracted

No depreciation for land

# Intangible Assets

- A new drug which is protected by a 20-year patent.
- The patent will generate revenue. This is considered an intangible asset.
- Should be amortized over the life of the revenue stream they generate.
- Not on the balance sheet: Employees, know-how, brand name, reputation, strategic strength, ...

# Goodwill

= Price paid for the acquired company – Net assets

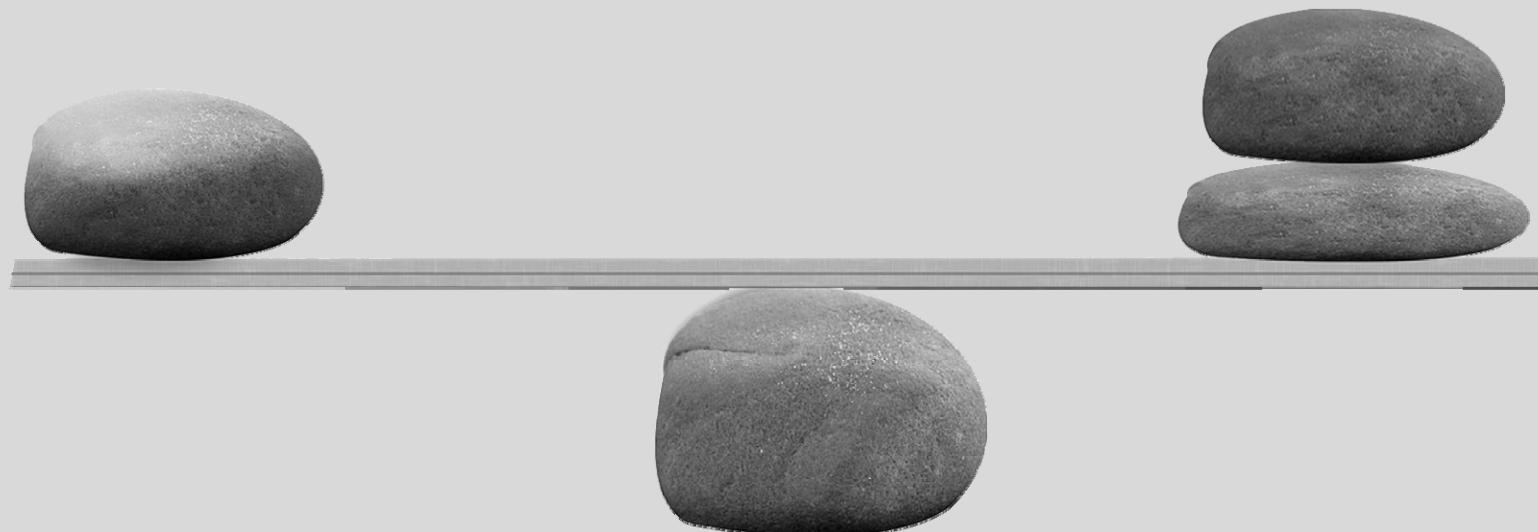
- Company X is bought for \$5M. The value of the company (buildings, inventories, ... minus liabilities) is \$2M
- For the brand power, customers, employees... : Intangibles (worth \$3M): This is goodwill

# Summary

- Current assets can be converted to cash within 1 year.
- PP&E
  - Depreciation
- Intangible assets: Patents for example
- Goodwill



# Right Side of a Balance Sheet



# Balance Sheet

Current liabilities:  
Those that have  
to be paid in less  
than a year

## Liabilities

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### Current liabilities

- Accounts payable (AP)
- Short-term loans
- Current portion of long-term debt
- Accrued liabilities

### Long-term liabilities

## Owners' equity

---

- Preferred stock
- Common stock
- Additional paid-in capital
- Retained earnings

# Accounts Payable

- The company receives goods and services from suppliers.
- But doesn't pay the bill for 30 days or longer.
- The vendors, in effect, have loaned the company money.

# Current Portion of Long-Term Debt

\$100,000 long-term loan from a bank

\$10,000 of it due this year

\$90,000: Long-term liabilities.

# Accrued expenses

- Tax to be paid in the next year.
- Everything else the company owes.

# Owners' Equity

- Capital provided by investors
- Profits retained by the company over time
- Other names
  - Shareholders' equity
  - Stockholders' equity

# Common & Preferred Shares

- Common shares
  - Voting rights
  - Founders
- Preferred shares
  - Have preference on liquidation, dividends, etc.
  - VC(Venture Capital)

# Additional Paid-In Capital

- The amount over the par value that investors initially paid for the stock
- Paid \$5 for a stock of \$1 par value, additional paid-in capital is \$4.

# Owners' Equity

Is this what shareholders would receive if the company were sold?

No!

- Market value  $\neq$  Book value
- Intangible assets like brand name, customer list don't show up on the balance sheet
- Land price: Recorded at purchase price

# Market Value

- Market cap of a public company  
= Number of shares outstanding x share price
- Well run company:  
Market cap > Owners' equity
- Private company: There are many valuation methods.

# Company's Goal

To increase **profitability** and **equity**.

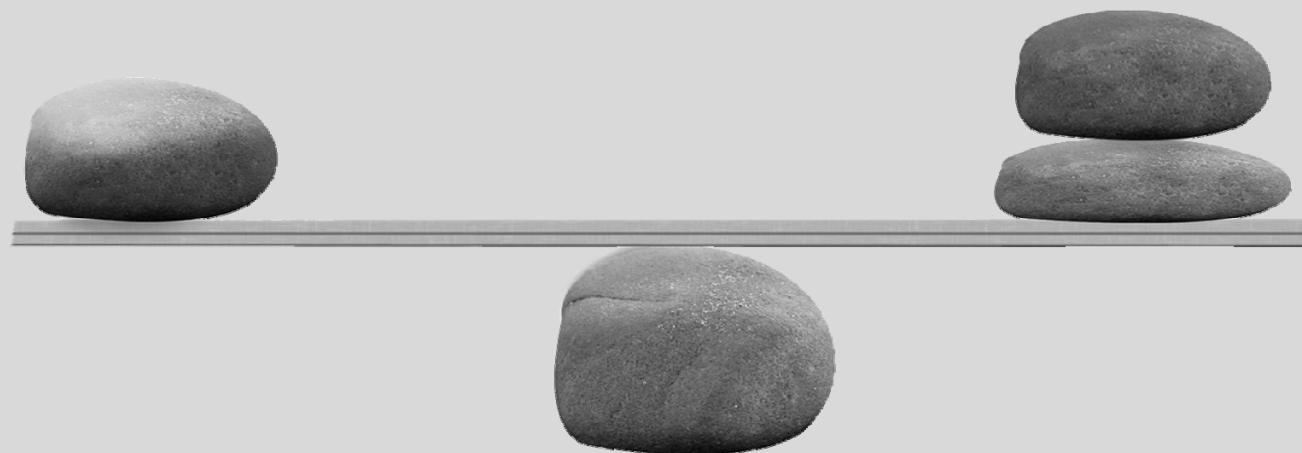
Equity = Capital + Profits – Dividends

# Summary

- Current liabilities
- Long-term liabilities
- Common & preferred stocks
- Retained earnings



# Construction of a Balance Sheet



# PEN Company, Year 1 [1]

Action 1: An entrepreneur starts PEN Company with \$3,000 cash and \$4,000 in loan.

Action 2: She purchases a production equipment with a cash of \$4,000.

Action 3: She purchases raw materials for \$3,000 on credit.

Action 4: She converts \$2,000 worth of raw materials into products. Labor costs are \$500.

## PEN Company, Year 1 [2]

Action 5: She sells all the products for \$5,000, one-half for cash and one-half on credit.

Action 6: She pays all the accounts payable and the interest (10%) on the loan.

Action 7: She pays herself a salary of \$1,000.

Action 8: At the end of the year, she depreciates the production equipment by 20%

Action 1: An entrepreneur starts PEN Company with \$3,000 cash and \$4,000 in loan.

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Action	Cash	Accounts Receivable	Material Inventory	Finished Goods Inventory	Equipment	Loan	Accounts Payable	Owners' equity
1	7,000	0	0	0	0	4,000	0	3,000

Action 2: She purchases a production equipment with a cash of \$4,000.

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Action	Cash	Accounts Receivable	Material Inventory	Finished Goods Inventory	Equipment	Loan	Accounts Payable	Owners' equity
1	7,000	0	0	0	0	4,000	0	3,000
2	(4,000)				4,000			
	3,000	0	0	0	4,000	4,000	0	3,000

Action 3: She purchases raw materials for \$3,000 on credit.

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Action	Cash	Accounts Receivable	Material Inventory	Finished Goods Inventory	Equipment	(\\$)	Loan	Accounts Payable	Owners' equity
1	7,000	0	0	0	0		4,000	0	3,000
2	(4,000)				4,000				
	3,000	0	0	0	4,000		4,000	0	3,000
3			3,000					3,000	
	3,000	0	3,000	0	4,000		4,000	3,000	3,000

Action 4: She converts \$2,000 worth of raw materials into products. Labor costs are \$500.

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Action	Cash	Accounts Receivable	Material Inventory	Finished Goods Inventory	Equipment		Loan	Accounts Payable	Owners' equity
						(\\$)			
1	7,000	0	0	0	0		4,000	0	3,000
2	(4,000)				4,000				
	3,000	0	0	0	4,000		4,000	0	3,000
3			3,000					3,000	
	3,000	0	3,000	0	4,000		4,000	3,000	3,000
4	(500)		(2,000)	2,500					
	2,500	0	1,000	2,500	4,000		4,000	3,000	3,000

Action 5: She sells all the products for \$5,000, one-half for cash and one-half on credit.

Action	Cash	Accounts Receivable	Material Inventory	Finished Goods Inventory	Equipment	
1	7,000	0	0	0	0	
2	(4,000)				4,000	
	3,000	0	0	0	4,000	
3			3,000			
	3,000	0	3,000	0	4,000	
4	(500)		(2,000)	2,500		
	2,500	0	1,000	2,500	4,000	
5						

Action 5: She sells all the products for \$5,000, one-half for cash and one-half on credit.

Action	Cash	Accounts Receivable	Material Inventory	Finished Goods Inventory	Equipment		Loan	Accounts Payable	Owners' equity	(\\$)
1	7,000	0	0	0	0		4,000	0	3,000	
2	(4,000)					4,000				
	3,000	0	0	0	4,000		4,000	0	3,000	
3			3,000					3,000		
	3,000	0	3,000	0	4,000		4,000	3,000	3,000	
4	(500)		(2,000)	2,500						
	2,500	0	1,000	2,500	4,000		4,000	3,000	3,000	
5	2,500	2,500		(2,500)					2,500	
	5,000	2,500	1,000	0	4,000		4,000	3,000	5,500	

Action 6: She pays all the accounts payable and the interest (10%) on the loan.

Action	Cash	Accounts Receivable	Material Inventory	Finished Goods Inventory	Equipment	
1	7,000	0	0	0	0	
2	(4,000)				4,000	
	3,000	0	0	0	4,000	
3			3,000			
	3,000	0	3,000	0	4,000	
4	(500)		(2,000)	2,500		
	2,500	0	1,000	2,500	4,000	
5	2,500	2,500		(2,500)		
	5,000	2,500	1,000	0	4,000	
6						

Action 6: She pays all the accounts payable and the interest (10%) on the loan.

Action	Cash	Accounts Receivable	Material Inventory	Finished Goods Inventory	Equipment	Loan	Accounts Payable	Owners' equity
1	7,000	0	0	0	0	4,000	0	3,000
2	(4,000)				4,000	4,000	0	3,000
	3,000	0	0	0	4,000		3,000	
3			3,000			4,000	3,000	3,000
	3,000	0	3,000	0	4,000		3,000	3,000
4	(500)		(2,000)	2,500		4,000	3,000	3,000
	2,500	0	1,000	2,500	4,000		3,000	3,000
5	2,500	2,500		(2,500)		4,000	3,000	2,500
	5,000	2,500	1,000	0	4,000		3,000	5,500
6	(3,400)					4,000	(3,000)	(400)
	1,600	2,500	1,000	0	4,000		0	5,100

Action 7: She pays herself a salary of \$1,000.

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Action	Cash	Accounts Receivable	Material Inventory	Finished Goods Inventory	Equipment		Loan	Accounts Payable	Owners' equity
						(\\$)			
1	7,000	0	0	0	0		4,000	0	3,000
2	(4,000)								
	3,000	0	0	0	4,000		4,000	0	3,000
3			3,000					3,000	
	3,000	0	3,000	0	4,000		4,000	3,000	3,000
4	(500)		(2,000)	2,500					
	2,500	0	1,000	2,500	4,000		4,000	3,000	3,000
5	2,500	2,500		(2,500)					2,500
	5,000	2,500	1,000	0	4,000		4,000	3,000	5,500
6	(3,400)							(3,000)	(400)
	1,600	2,500	1,000	0	4,000		4,000	0	5,100
7	(1,000)								(1,000)
	600	2,500	1,000	0	4,000		4,000	0	4,100

Action 8: At the end of the year, she depreciates the production equipment by 20%.

(\\$)

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(\\$)

Action	Cash	Accounts Receivable	Material Inventory	Finished Goods Inventory	Equipment		Loan	Accounts Payable	Owners' equity
1	7,000	0	0	0	0		4,000	0	3,000
2	(4,000)				4,000				
	3,000	0	0	0	4,000		4,000	0	3,000
3			3,000					3,000	
	3,000	0	3,000	0	4,000		4,000	3,000	3,000
4	(500)		(2,000)	2,500					
	2,500	0	1,000	2,500	4,000		4,000	3,000	3,000
5	2,500	2,500		(2,500)					2,500
	5,000	2,500	1,000	0	4,000		4,000	3,000	5,500
6	(3,400)							(3,000)	(400)
	1,600	2,500	1,000	0	4,000		4,000	0	5,100
7	(1,000)								(1,000)
	600	2,500	1,000	0	4,000		4,000	0	4,100
8					(800)				(800)
	600	2,500	1,000	0	3,200		4,000	0	3,300

# Balance Sheet

(PEN Company at the end of Year 1)

(\\$)

## Assets

### Current assets

Cash	600	
Acc. receivables	2,500	
Mat'l Inventory	1,000	4,100

### Fixed assets

Equipment	4,000	
Depreciation	(800)	3,200
		<u>7,300</u>

## Liabilities

Loan	4,000
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## Owner's Equity

Equity	3,000
Retained profit	300

7,300

# Summary

- Balance sheet shows a company's financial state at a certain moment.
- Balance sheet always balances.



# **What is an Income Statement?**

# Financial Statements

Give perspectives on the health of a business:

Balance sheet

Assets, liabilities & equity

**Income statement**

**Profitability**

Cash flow statement

Cash movements

Are the products (services) of the company profitable during a given time period?

# Income Statement

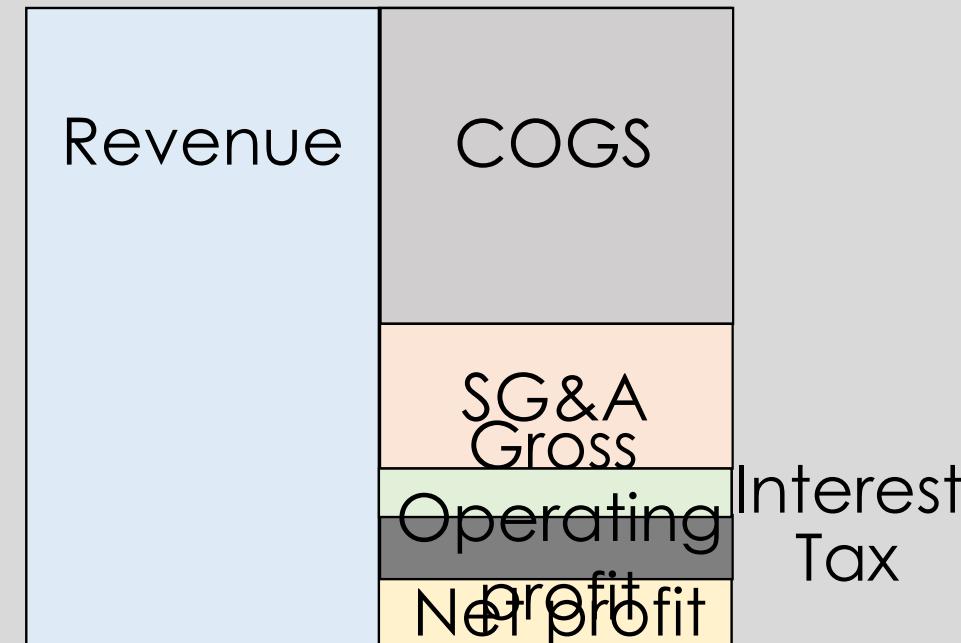
Best efforts to show

Sales (Revenue)

Costs (Costs Of Goods Sold)

Expenses (Sales General & Administration)

Profits (Losses)



For a certain period (month, quarter, year)

# Income Statement ( $\times \$1,000$ )

*for the period x through y*

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<sup>1</sup> Revenue	100
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2
<hr/>

1-2=3
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4
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5
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6
---

---

4+5+6=7
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3-7=8
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9
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10
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8-9-10=11
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# Income Statement (x \$1,000)

*for the period x through y*

---

<sup>1</sup> Revenue	100
<sup>2</sup> Cost of Goods Sold (COGS)	50
<sup>1-2=3</sup> Gross Profit	50
4	
5	
6	
<hr/> <sup>4+5+6=7</sup>	
3-7=8	
9	
10	
<hr/> <sup>8-9-10=11</sup>	
<hr/> <hr/>	

# Income Statement (x \$1,000)

*for the period x through y*

---

<sup>1</sup> Revenue	100
<sup>2</sup> Cost of Goods Sold (COGS)	50
<sup>1-2=3</sup> Gross Profit	50
<sup>4</sup> Sales & Marketing	15
<sup>5</sup> Research & Development	10
<sup>6</sup> General & Administrative	5
<sup>4+5+6=7</sup> Operating Expenses (SG&A)	30
3-7=8	
9	
10	
8-9-10=11	

---

---

# Income Statement (x \$1,000)

*for the period x through y*

---

<sup>1</sup> Revenue	100
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<sup>4+5+6=7</sup> Operating Expenses (SG&A)	30
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9	
10	
8-9-10=11	

---

# Income Statement (x \$1,000)

*for the period x through y*

<sup>1</sup> Revenue	100
<sup>2</sup> Cost of Goods Sold (COGS)	50
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<sup>4+5+6=7</sup> Operating Expenses (SG&A)	30
<sup>3-7=8</sup> Operating Profit	20
<sup>9</sup> Interest Expense	0
<sup>10</sup> Income Taxes	5
<sup>8-9-10=11</sup> Net Profit	15

# Income Statement ( $\times \$1,000$ )

*for the period x through y*

## Top line

<sup>1</sup> Revenue	100
<sup>2</sup> Cost of Goods Sold (COGS)	50
<sup>1-2=3</sup> Gross Profit	50
<sup>4</sup> Sales & Marketing	15
<sup>5</sup> Research & Development	10
<sup>6</sup> General & Administrative	5
<sup>4+5+6=7</sup> Operating Expenses	30
<sup>3-7=8</sup> Operating Profit	20
<sup>9</sup> Interest Expense	0
<sup>10</sup> Income Taxes	5
<sup>8-9-10=11</sup> Net Profit	15

## Bottom line

# Revenue Recognition

A company can recognize a sale when it **delivers a product or service to a customer**

Revenue ≠ Cash

# Cash vs Accrual Accounting

Accounting Method	Revenues Recognized	Expenses Recognized
Cash	When cash is received from the customer	When cash is paid to the supplier
Accrual	When the product is shipped and the invoice is mailed	When the invoice is received from the supplier

# Cash vs Accrual Accounting

- A company sold \$1M worth of products
- Received payment for \$600,000
- Cost & expenses \$500,000 and paid \$400,000

	Cash
Revenues	600,000
Cost & expenses	400,000
Profit before tax	200,000
Tax (30%)	60,000
Profit after tax	140,000

# Why Accrual Accounting?

- Company buys materials for production for 6 month (\$40k x 6)
- Other monthly cost for production: \$10k

	Accrual	
	Jan	Feb
Revenue	100	100
COGS	50	50
SG&A	20	20
Operating Profit	30	30

# Why Accrual Accounting?

- Shows more complete picture of the company's financial condition
- Public companies want to show increased revenue and profit
- In the US, accrual method is required for
  - Annual revenue > \$10M
  - Business with heavy inventories (auto dealership, grocery wholesalers)

# Summary

- Revenue – (Cost + Expenses) = Profit
- Top line & bottom line
- Revenue  $\neq$  Cash
- In accrual accounting, revenue is recognized when the product (service) is delivered.



# **Cost, Expenses & Inventories**

# Income Statement

*for the period x through y*

<sup>1</sup> Revenue (Net sales)	100	
<sup>2</sup> Cost of Goods Sold (COGS)	50	<b>Costs</b>
<sup>1-2=3</sup> Gross Profit	50	
<sup>4</sup> Sales & Marketing	15	
<sup>5</sup> Research & Development	10	<b>Expenses</b>
<sup>6</sup> General & Administrative	5	
<sup>4+5+6=7</sup> Operating Expenses (SG&A)	30	
<sup>3-7=8</sup> Operating Profit	20	
<sup>9</sup> Interest Expense	0	
<sup>10</sup> Income Taxes	5	
<sup>8-9-10=11</sup> Net Profit	15	

# COGS (Cost of Goods Sold)

When a product is shipped and a sale is booked,  
the cost is recorded as **cost of goods sold**

COS (Cost of Service) for service companies

All the costs directly involved in producing a product  
or delivering a service

# COGS (Cost of Goods Sold)

Measures all the costs directly associated

For a manufacturing company

- The wages of the people on the manufacturing line
- The cost of the materials to make the product

but not in:

- The cost of supplies used in the office (papers, pens,...)
- The salary of the office manager

# Matching Principle

Match the costs with the associated sale to determine profits in a given period of time

To make 100 products, one needs

Materials: \$100

Labor: \$50.

Then 60 products are sold. COGS?

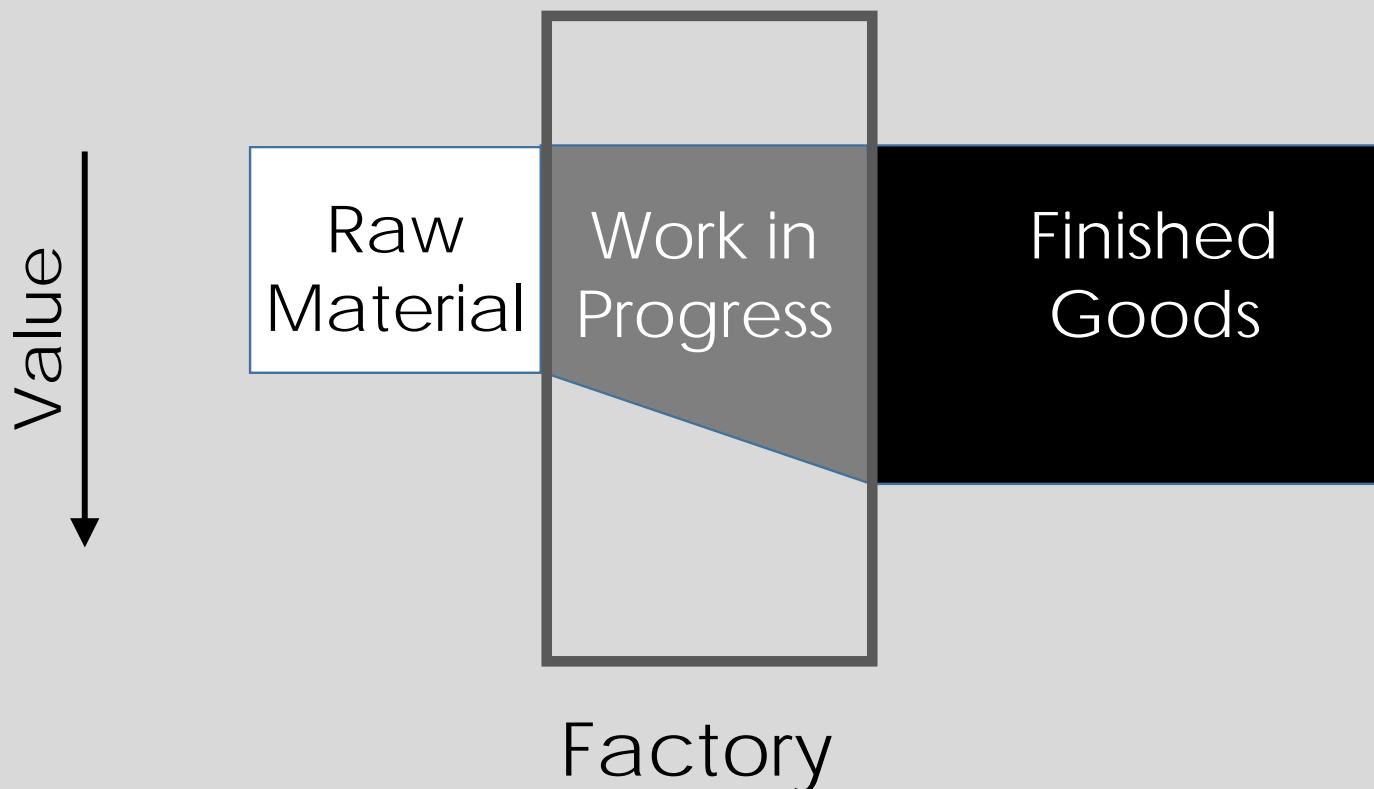
$$(\$100 + \$50) \times (60/100) = \$90$$

\$60 in inventories

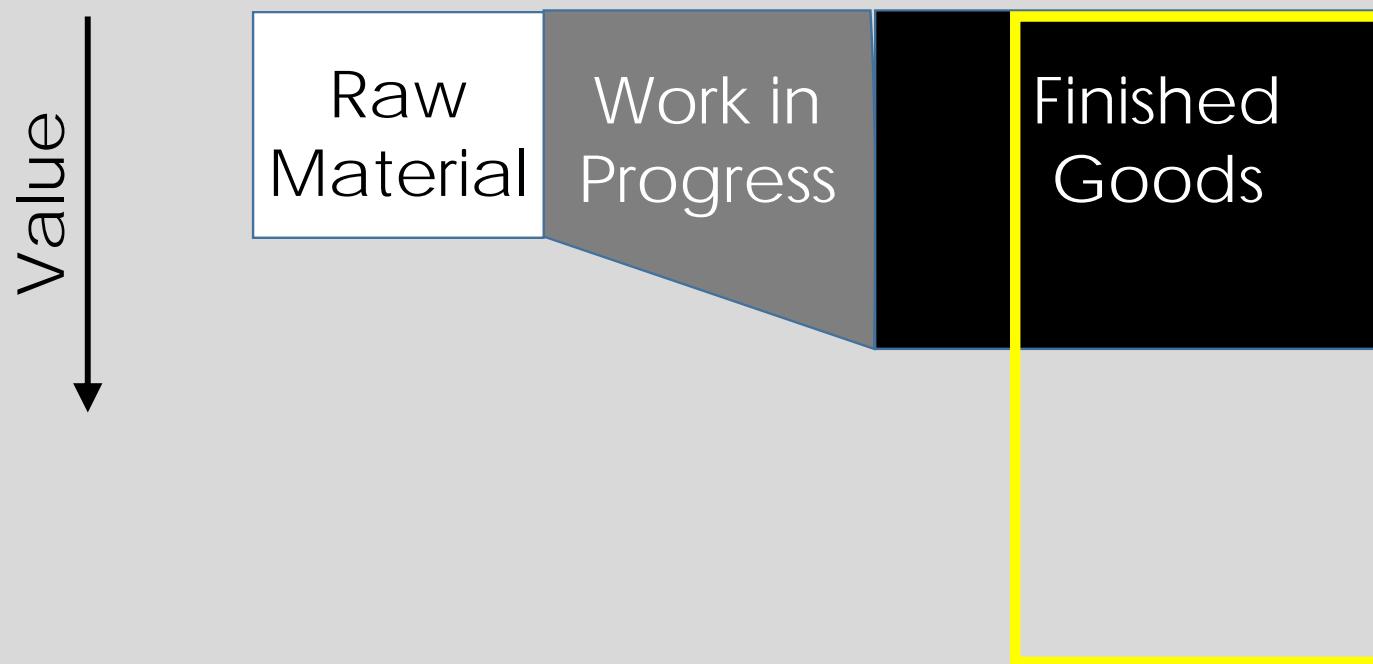
# Inventory

Raw  
Material

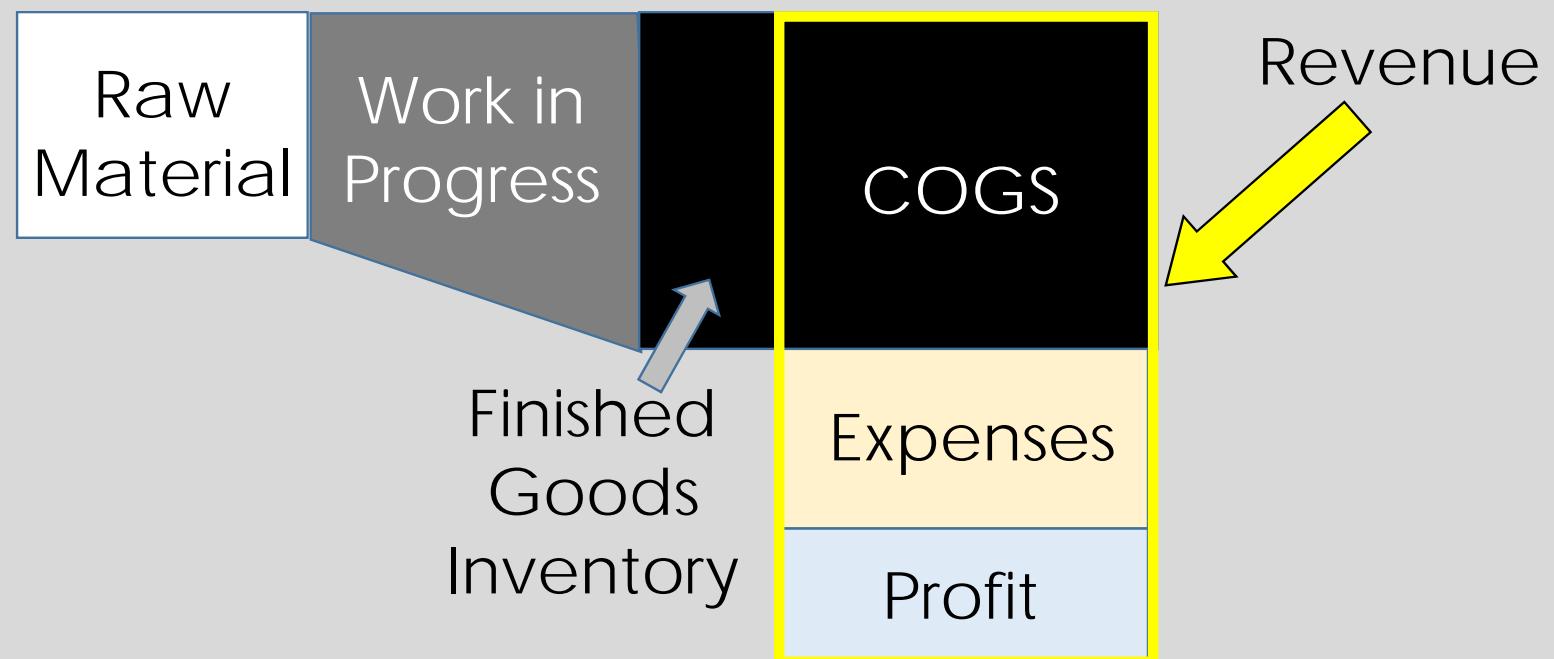
# Inventory after Production



# Products are Sold



# Matching Principle



# Summary

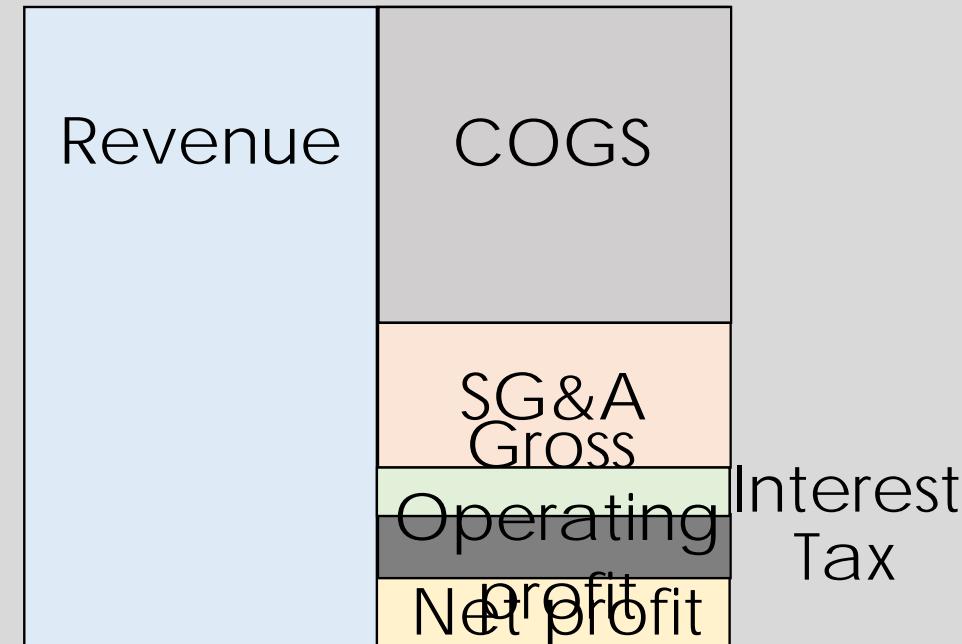
- COGS
- Expenses
- Matching principle



# Profits & Depreciation

# Income Statement

Best efforts to show  
Sales (Revenue)  
Costs and Expenses  
Profits (Losses)



# Gross Profit

= Revenue – COGS

- Key number: Basic profitability of a product or service
- It must be sufficient to cover business's operating expenses, taxes, financing costs, and net profit
- Also called gross margin or manufacturing margin

# Operating Expenses

- Include spendings that are not directly related to making a product or delivering a service
- SG&A: Sales, General and Administrative expenses
- Rent, utilities, telephone, R&D, marketing, management and staff salaries

# Operating Profit

= Gross profit – operating expenses

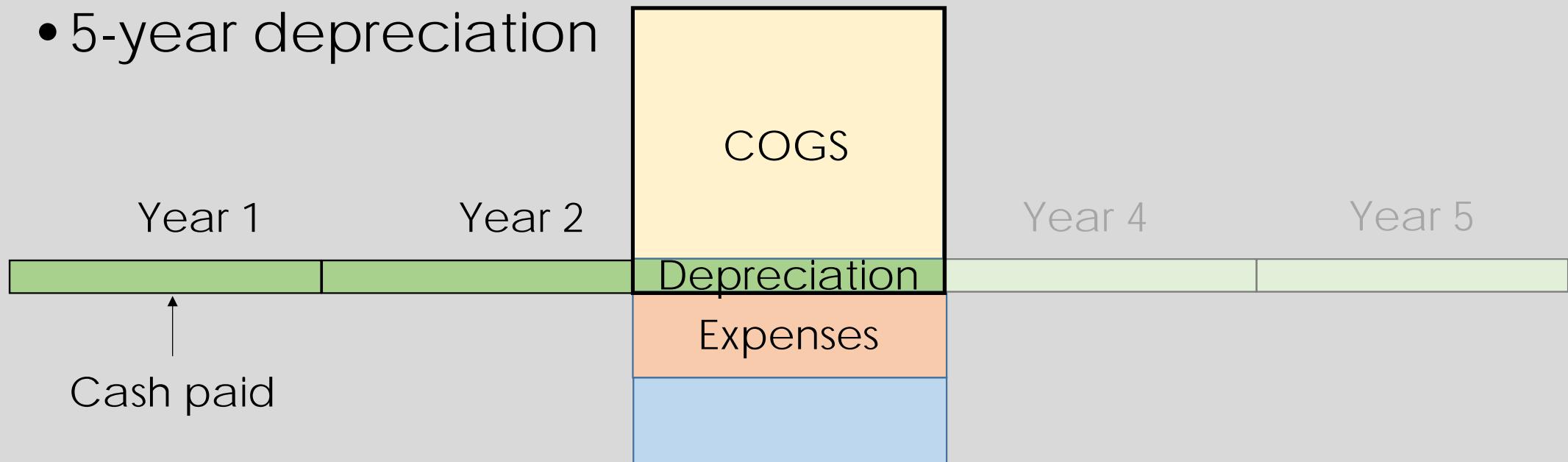
- EBIT (Earnings before Interest and Taxes)
- EBIT measures how well your company is run
- Demand for the company's products or services (revenue)
- Company's efficiency in delivering those products or services (costs & expenses)

# Net Profit

= Operating profit – Interest - Tax  
• Bottom line

# Income Statement & Depreciation

- Bought a production equipment 3 years ago.
- 5-year depreciation



- Depreciation: More about **cost allocation** than about loss of value

# Manipulation with Depreciation

- A delivery company bought trucks for \$1,000,000
- Revenue \$500,000
- Costs & expense(except depreciation) \$350,000

Depreciation	5-Year
Revenues	500,000
Costs & expenses	350,000
Depreciation	200,000
Profit before tax	(50,000)

# License of a Patent

- Expected revenue related to this patent: \$20 million/year  
Net profit: \$6 million/year
- #1: 5% of the revenue (\$1,000,000) or  
#2: 20% of the net profit (\$1,200,000)?
- Which royalty payment method would you choose?  
#1, as one can easily reduce the net profit.

# Summary

- Gross profit = Revenue - COGS
- Operating profit = Gross profit – Operating expenses
- Net profit = Operating profit – Interest - Tax
- Depreciation: Cost allocation



# **Construction of an Income Statement**

# PEN Company, Year 1 [1]

Action 1: An entrepreneur starts PEN Company with \$3,000 cash and \$4,000 in loan.

Action 2: She purchases a production equipment with a cash of \$4,000.

Action 3: She purchases raw materials for \$3,000 on credit.

Action 4: She converts \$2,000 worth of raw materials into products. Labor costs are \$500.

# PEN Company, Year 1 [2]

Action 5: She sells all the products for \$5,000, one-half for cash and one-half on credit.

Action 6: She pays all the accounts payable and the interest (10%) on the loan.

Action 7: She pays herself a salary of \$1,000.

Action 8: At the end of the year, she depreciates the production equipment by 20%

# PEN Company, Year 1 [2]

Action 5: She sells all the products for \$5,000, one-half for cash and one-half on credit. **Revenue: \$5,000**

Action 6: She pays all the accounts payable and the interest (10%) on the loan.

Action 7: She pays herself a salary of \$1,000.

Action 8: At the end of the year, she depreciates the production equipment by 20%

# PEN Company, Year 1 [1]

Action 1: An entrepreneur starts PEN Company with \$3,000 cash and \$4,000 in loans

Action 2: She purchases a production equipment with a cash of \$4,000.

Action 3: She purchases raw materials for \$3,000 on credit.

Action 4: She converts \$2,000 worth of raw materials into products. Labor costs are \$500. **COGS1: \$2,500**

# PEN Company, Year 1 [2]

Action 5: She sells all the products for \$5,000, one-half for cash and one-half on credit. **Revenue: \$5,000**

Action 6: She pays all the accounts payable and the interest (10%) on the loan. **Interest: \$400**

Action 7: She pays herself a salary of \$1,000. **SG&A: \$1,000**

Action 8: At the end of the year, she depreciates the production equipment by 20% **COGS2: \$800**

# Income Statement of PEN Company

	(Year 1)	(\\$)
Revenue		5,000
Raw materials		
Labor		
Depreciation		
COGS		
Gross profit		
SG&A		
Operating profit		
Interest expense		
Profit before tax		

# Income Statement of PEN Company

	(Year 1)	(\\$)
Revenue		5,000
Raw materials	2,000	
Labor	500	
Depreciation	800	
COGS		3,300
Gross profit		1,700
SG&A		
Operating profit		
Interest expense		
Profit before tax		

# Income Statement of PEN Company

	(Year 1)	(\\$)
Revenue		5,000
Raw materials	2,000	
Labor	500	
Depreciation	800	
COGS		3,300
Gross profit		1,700
SG&A		1,000
Operating profit		700
Interest expense		
Profit before tax		

# Income Statement of PEN Company

	(Year 1)	(\\$)
Revenue		5,000
Raw materials	2,000	
Labor	500	
Depreciation	800	
COGS		3,300
Gross profit		1,700
SG&A		1,000
Operating profit		700
Interest expense		400
Profit before tax		300

# Summary

- COGS: Raw materials + Labor + depreciation
- CEO salary: SG&A

# Reading Assignment

- Annual Report (10-K) in 2016 of Costco Wholesale
- Read Business Overview (p.6~1<sup>st</sup> paragraph of p.9, before Intellectual Property).
- Read financial statements, p.37~p.41.  
(When necessary, refer to notes 1~12 in p. 42~64.)
- Read management's discussion and analysis of financial condition and results of operations (p. 21~32).



# Cash Flow



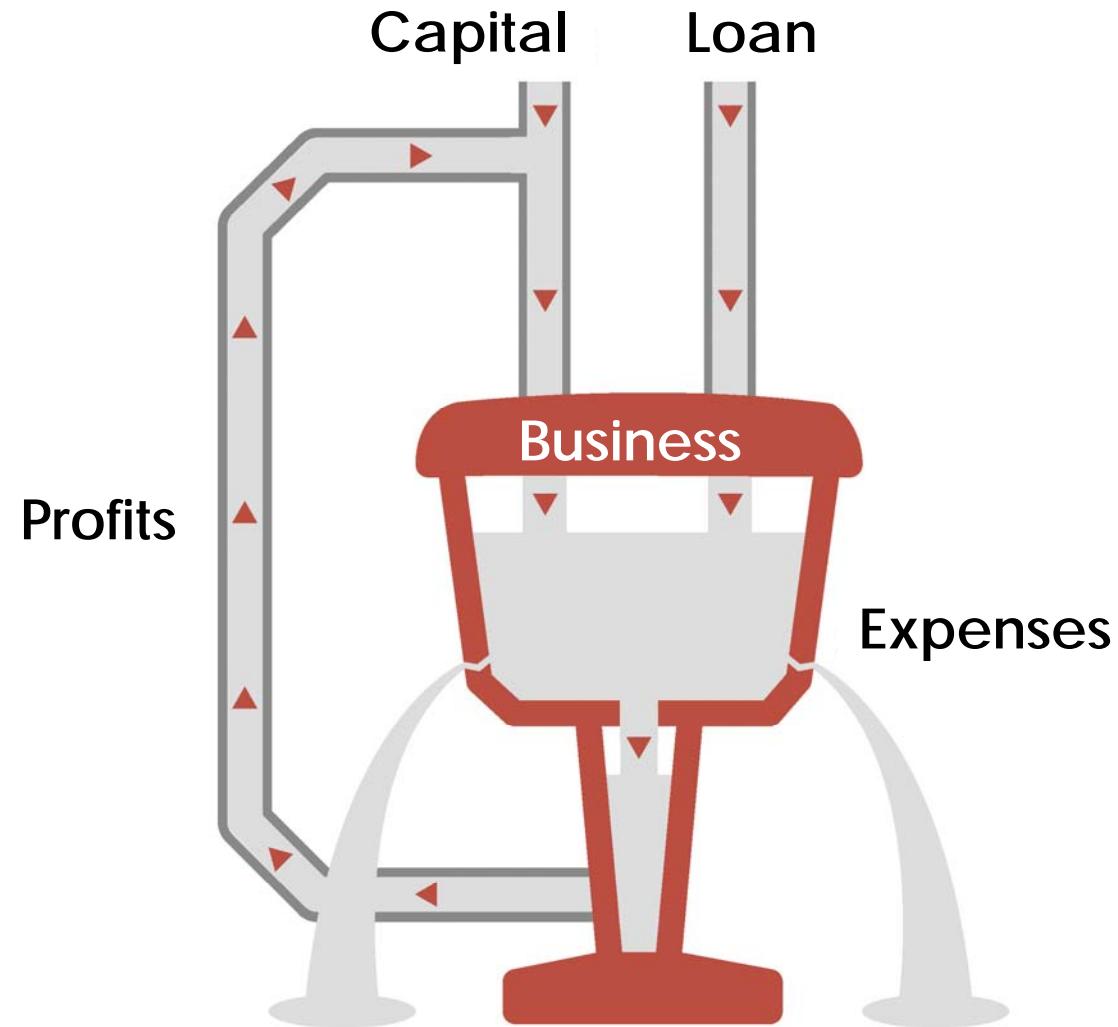
# Course Schedule

Week	Introduction	Balance sheet	Income statement
1	Introduction	Balance sheet	Income statement
2	Cash flow statement		Financial ratios
3	Financial planning		Funding
4	VC term sheet		Valuation

# Cash Flow

- There is one thing that ultimately kills companies:  
They run out of cash
- Two most important measures for an entrepreneur:  
Cash flow and burn rate

# Cash Flow



# Why Cash is King?

- You use cash to run the company: Paying employees salary, rent, etc.
- Cash keeps a company alive, and cash is a critical measure of its financial health.
- Cash flow is the number least affected by “the art of finance”

# Profit is Not the Same as Cash

- Revenue is booked at sale
- Costs are matched to revenue
- Capital expenditures don't count against profit
  - A capital expenditure does not appear on the income statement when it occurs on the balance sheet

# A Delivery Truck

- Bought with a cash of \$20,000
- If its useful life is 10 years
- Depreciation for 10 years
- An expense of \$2,000 appears every year for 10 years

# Free Cash Flow

- Cash generated by operating the business
  - Money invested to keep it running.
- Warren Buffet considers it's an important metric.

# Healthy and Increasing Free Cash Flow

- Your company has options: You can use free cash pay back debt, buy a competitor, or increase salaries.
- Founders can focus on the business, not raising additional funds.

# Types of Cash Flow

Main business

Equipment

Loan  
Funding



# Cash Flow from Operating Activities

- The most important number indicating the health of a business
- A company with healthy operating cash flow:
  - Probably profitable
  - Doing a good job of turning its profit into cash
  - Can finance more of its growth internally

# Cash Flow from Investing Activities

- How much cash the company has spent on investment in the future
- If this category is low:

The owner may be treating the business as a cash cow, not investing in the future growth.
- If the number is high:

The owner has high hopes for the future of the company

# Cash Flow from Financing Activities

- Shows to what extent the company is dependent on outside financing.

Borrowing or paying back loans

Transactions between a company and its shareholders (investment and dividend)

Buy back its own stock

# Summary

- Cash is king!
- Free cash flow
- Cash flow from
  - Operating activities
  - Investing activities
  - Financing activities



# Cash Flow Statement Practice



[Untitled Photograph of Flying Money], Retrieved from <https://flic.kr/p/bH1eiH>

# How Cash Connects with Everything Else

You can calculate a cash flow statement by looking at an income statement and two balance sheets.

Balance sheet  
at the beginning



At the end



Income  
Statement

# PEN Company, Year 1 [1]

Action 1: An entrepreneur starts PEN Company with \$3,000 cash and \$4,000 in loan.

Action 2: She purchases a production equipment with a cash of \$4,000.

Action 3: She purchases raw materials for \$3,000 on credit.

Action 4: She converts \$2,000 worth of raw materials into products. Labor costs are \$500.

# PEN Company, Year 1 [2]

Action 5: She sells all the products for \$5,000, one-half for cash and one-half on credit.

Action 6: She pays all the accounts payable and the interest (10%) on the loan.

Action 7: She pays herself a salary of \$1,000.

Action 8: At the end of the year, she depreciates the production equipment by 20%

# Income Statement of PEN Company

	(Year 1)	(\$)
Revenue		5,000
Raw materials	2,000	
Labor	500	
Depreciation	800	
COGS		3,300
Gross profit		1,700
SG&A		1,000
Operating profit		700
Interest expense		400
Profit before tax		300

# Balance Sheets

	Year 1 beginning	Year 1 end	(\$)
<u>Assets</u>			
Cash	0	600	
Accounts receivable	0	2,500	
Inventory (Materials)	0	1,000	
Equipment	0	3,200	
<u>Total assets</u>	<u>0</u>	<u>7,300</u>	
<u>Liabilities &amp; Shareholders' Equity</u>			
Loan	0	4,000	
Owners' equity			
Original	0	3,000	
Retained profit	0	300	
Total owners' equity	0	3,300	
<u>Total liabilities &amp; equity</u>	<u>0</u>	<u>7,300</u>	

# Estimating Cash Flow from Operation

- Begin with net income(profit)
- Adjust items not related to cash
  - Depreciation (+)
- Items not shown in income statement
  - Increase in inventory (-)
  - Account receivables increase (-)
  - Account payable increase (+)

# Cash Flow Statement

(PEN Company in Year1) (\$)

## From Operations

Profit 300

Depreciation

Increase in inventory

Increase in account receivable

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## From Investment

Purchase of equipment

## From Financing

Capital

Loan

---

---

---

# Balance Sheets

	Year 1 beginning	Year 1 end	(\$)
<u>Assets</u>			
Cash	0	600	
Accounts receivable	0	2,500	
Inventory (Materials)	0	1,000	
Equipment	0	3,200	
<u>Total assets</u>	<u>0</u>	<u>7,300</u>	
<u>Liabilities &amp; Shareholders' Equity</u>			
Loan	0	4,000	
Owners' equity			
Original	0	3,000	
Retained profit	0	300	
Total owners' equity	0	3,300	
<u>Total liabilities &amp; equity</u>	<u>0</u>	<u>7,300</u>	

# Cash Flow Statement

(PEN Company in Year1) (\$)

## From Operations

Profit	300
Depreciation	800
Increase in inventory	(1,000)
Increase in account receivable	(2,500)
	(2,400)

## From Investment

Purchase of equipment	(4,000)
-----------------------	---------

## From Financing

Capital	3,000
Loan	4,000
	7,000
	600

Action	Cash	Acc Receivable	Product Inventory	Materials Inventory	Equipment
1	<b>7,000</b>	0	0		0
2	(4,000)				4,000
	<b>3,000</b>	0	0	0	4,000
3				3,000	
	<b>3,000</b>	0	0	3,000	4,000
4	(500)		2,500	(2,000)	
	<b>2,500</b>	0	2,500	1,000	4,000
5	<b>2,500</b>	2,500	(2,500)		
	<b>5,000</b>	2,500	0	1,000	4,000
6	(3,400)				
	<b>1,600</b>	2,500	0	1,000	4,000
7	(1,000)				
	<b>600</b>	2,500	0	1,000	4,000
8					(800)
	<b>600</b>	2,500	0	1,000	3,200

	Loan	Acc payable	Shareholders' equity
	4,000	0	3,000
	4,000	0	3,000
		3,000	
	4,000	3,000	3,000
	4,000	3,000	3,000
			2,500
	4,000	3,000	5,500
		(3,000)	(400)
	4,000	0	5,100
			(1,000)
	4,000	0	4,100
			(800)
	4,000	0	3,300

# Summary

- Cash flow estimation from income statement and balance sheets



# **Annual Report of Costco**

# Annual Report (Form 10-k)



We will use Costco's annual report  
to practice financial ratios

# How to Read Annual Report

- Letter to shareholders
- Business overview
- Financial statements
- Notes to financial statements
- Management's discussion and analysis of financial condition and results of operations
- (Risk factors and legal proceedings)

# **Costco: Wholesale Club Concept [1]**

- Offering low prices on a limited selection of products
  1. High sales volumes
  2. Rapid inventory turnover

# Concept of Wholesale Club [2]

- Operating efficiencies:
  3. Volume purchasing
  4. Efficient distribution
  5. Reduced handling of merchandise in warehouse facilities



[https://commons.wikimedia.org/wiki/File:BJs\\_Wholesale\\_Club\\_VA.jpg](https://commons.wikimedia.org/wiki/File:BJs_Wholesale_Club_VA.jpg)

# History of Wholesale Clubs

- Price Club opened in San Diego, California in 1975.
- Price Club expanded in California and the West .
- Costco was founded in 1983 in Seattle, Washington.
- Costco expanded in the Pacific Northwest and Canada.
- Costco and Price Club merged in 1993, creating Price/Costco, later simplified its name to Costco.

# Competitors of Costco

Retailers:

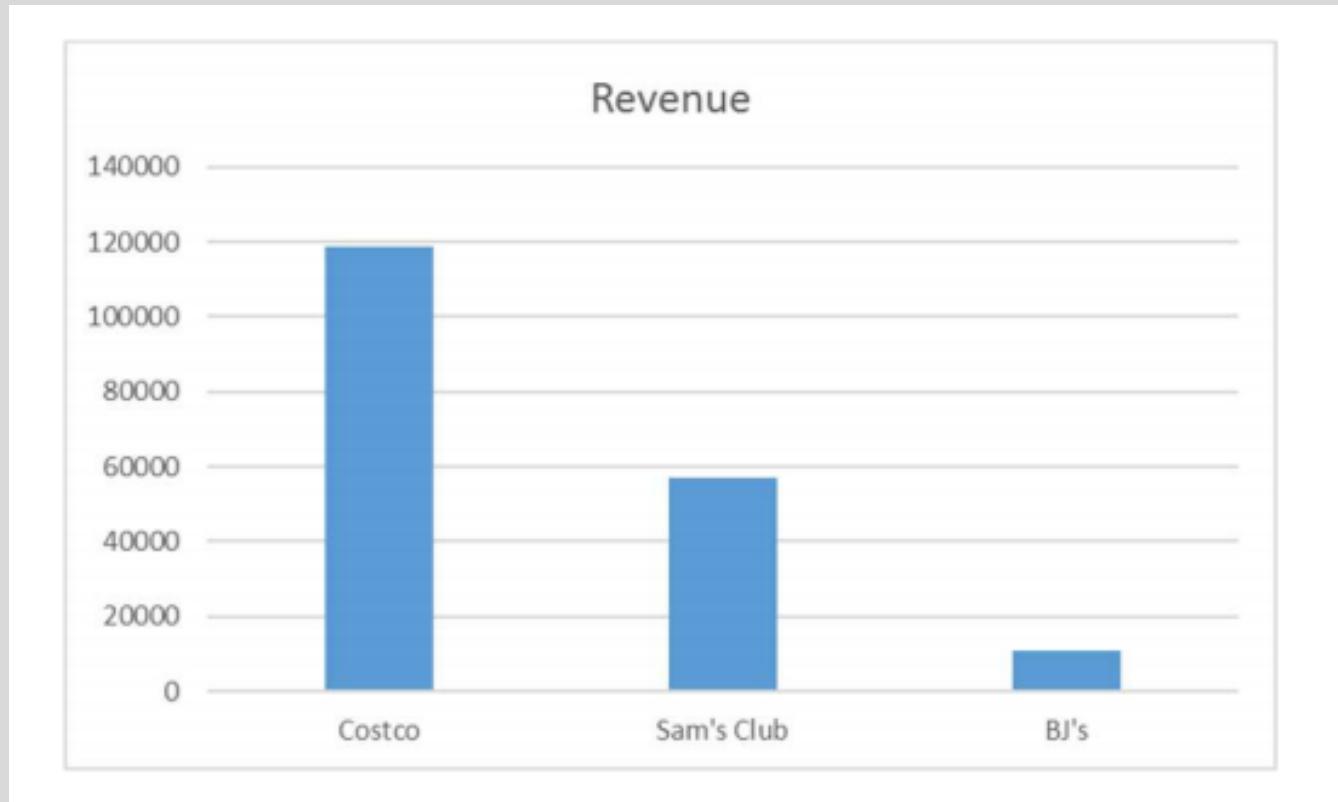
Walmart, Target

Warehouse clubs:

Sam's Club, BJ's

On-line retailer:

Amazon



# Income Statement

(amounts in millions, except per share data)

52 Weeks Ended Aug. 28, 2016

## REVENUE

Net sales	116,073
Membership fees	2,646
Total revenue	118,719

## OPERATING EXPENSES

Merchandise costs	102,901
Selling, general and administrative	12,068
Preopening expenses	78
Operating income	3,672

## OTHER INCOME (EXPENSE)

Interest expense	(133)
Interest income and other, net	80

## INCOME BEFORE INCOME TAXES

Provision for income taxes	1,243
Net income including noncontrolling interests	2,376
Net income attributable to non-controlling interests	(26)

## NET INCOME ATTRIBUTABLE TO COSTCO

2,350
-------

# **Costco vs Walmart: Stock Price**

	<b>Costco</b>	<b>Walmart</b>
Stock price \$	\$151	\$69
Total shares (x 1,000)	441,263	3,217,000
Market cap) (x \$ B)	\$66.6	\$222.0
EPS(Earnings per share) \$	5.33	4.57
P/E ratio	28.3	15.1

As of Oct. 2016

Let's find out why P/E ratios of  
Costco and Walmart  
are so different.



# **Financial Ratios - Profitability**

# Financial Ratios

- The profit of your company was \$1 million  
Is it good?
- Financial statements:  
Raw materials of financial analysis
- Ratios:  
Show financial relationships

Ratios are the key tool for drawing meaning from financial statements.

# Use of Ratios

- History
  - You can compare ratios over time
- Competition
  - Comparing a specific ratio with that of a competitor
- Industry
  - Compare with industry averages
- Projection
  - Compare ratios with what you projected

# Costco vs Walmart: Stock Price

	<b>Costco</b>	<b>Walmart</b>
Stock price \$	\$151	\$69
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EPS(Earnings per share) \$	5.33	4.57
P/E ratio	28.3	15.1

As of Oct. 2016

# 1. Profitability Ratios

Profitability:

A company's ability to generate sales and to control its expenses.

Gross margin

Operating margin

Net margin

ROA (Return on Assets)

ROE (Return on Equity)

# Costco Profit Margin

Gross margin = gross profit / revenue

$$= (118,719 - 102,901) / 118,719 = 13.3\%$$

Operating margin = 3,672 / 118,719 = 3.1%

Net margin = 2,376 / 118,719 = 2.0%

# Annual Membership Fees

Membership fees : \$2,646 millions

Net profit : \$2,350 millions

Membership renewal rate is important. (~90%)

# Return on Assets (ROA)

Return on assets (ROA) = net profit / total assets

Costco: 2,376/33,163 = 7.2%

A very high ROA: may suggest that a company

- is not renewing its asset base for the future
- is not investing in new facilities and equipment

# Return on Equity (ROE)

Return on equity = net profit / shareholders' equity

Costco: 2,376/12,332 = 19.3%

ROE is a key ratio for outside investors.

# Profitability Ratios

<b>Profitability, %</b>	<b>Costco</b>	<b>Walmart</b>
Gross margin	13.3	25.1
Operating margin	3.1	5.0
Net margin	2.0	3.1
ROA	7.2	7.3
ROE	19.3	18.2
ROE (10 year average)	15.4	20.8

# Summary

Gross margin

Operating margin

Net margin

ROA (Return on Assets)

ROE (Return on Equity)



# **Financial Ratios - Efficiency**

# **Costco vs Walmart: Stock Price**

	<b>Costco</b>	<b>Walmart</b>
Stock price \$	\$151	\$69
Total shares (x 1,000)	441,263	3,217,000
Market cap) (x \$ B)	\$66.6	\$222.0
EPS(Earnings per share) \$	5.33	4.57
P/E ratio	28.3	15.1

As of Oct. 2016

## 2. Efficiency Ratios

- How efficiently you are managing key assets and liabilities.
- Founders focus mainly on the income statement, but should manage the balance sheet.
- To improve the company's cash position
  - Reduce inventory
  - Speed up collection of receivables

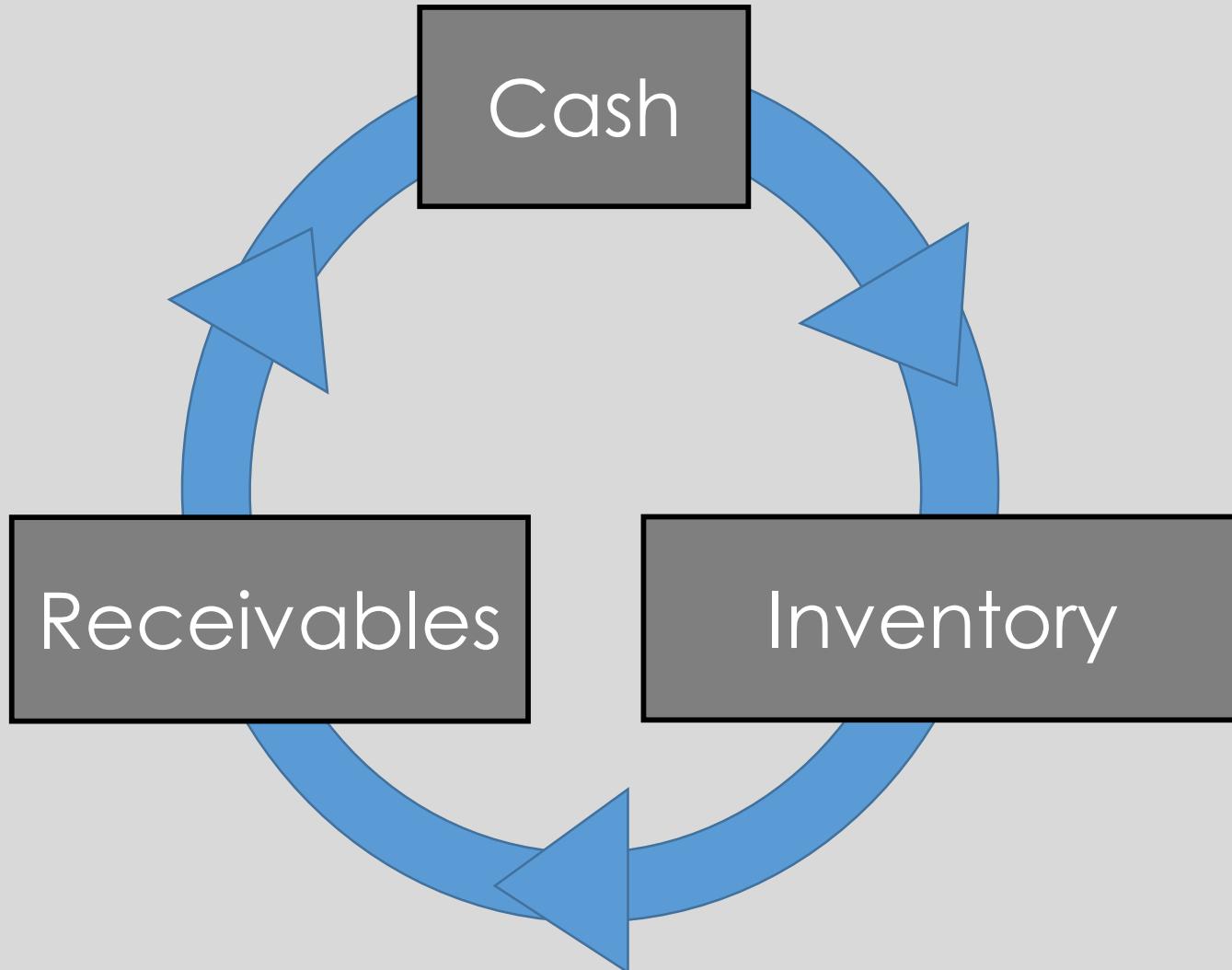
# Working Capital

- Inventory & accounts receivable (AR):  
Company's investments is tied up
- This is reduced with accounts payables (AP)
- Working capital = AR + Inventory - AP

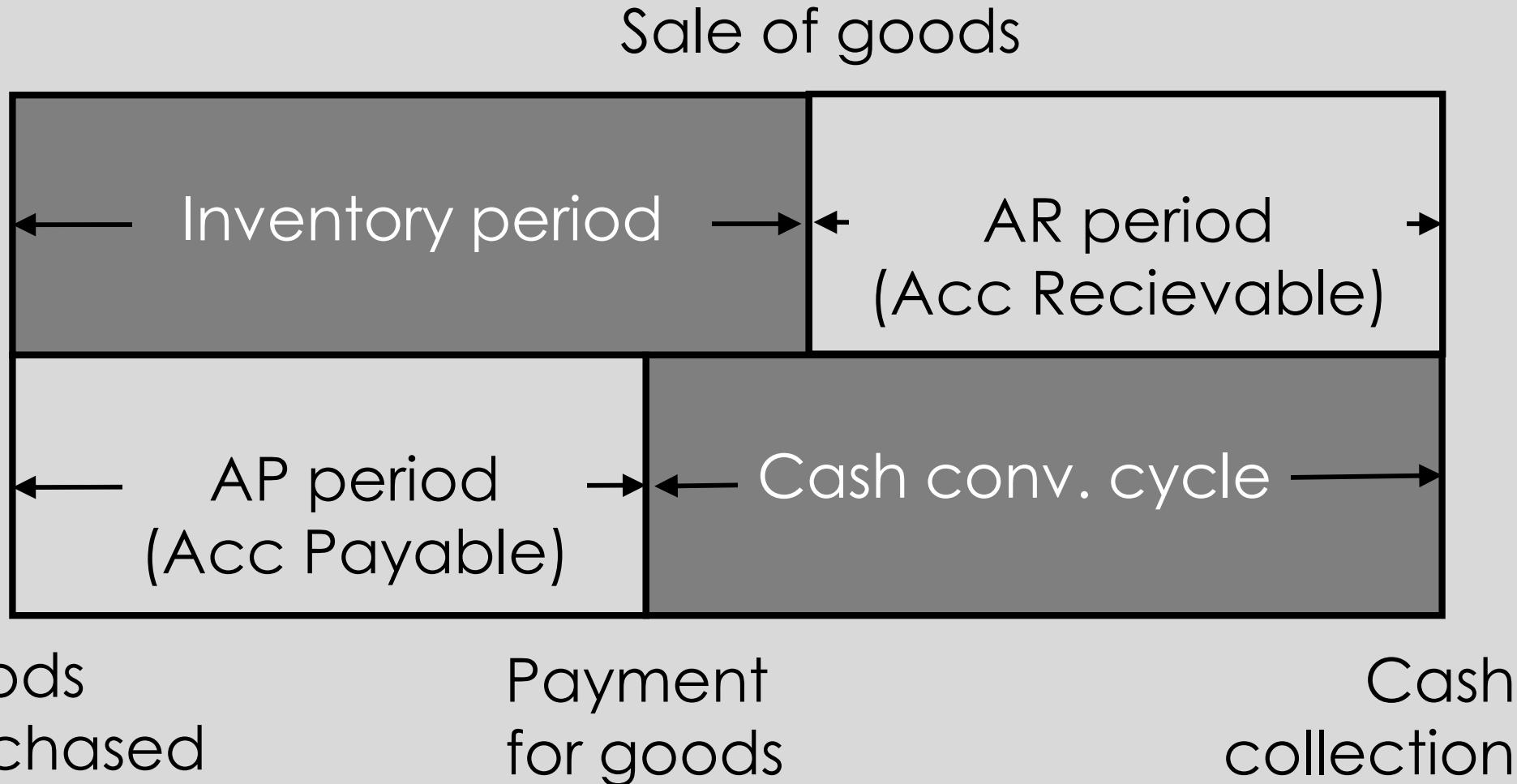
# Costco: Working Capital

- “Costco generally sells inventory before it is required to pay for it.”
- “Inventory is financed through payment terms provided by suppliers rather than by Costco’s working capital.”

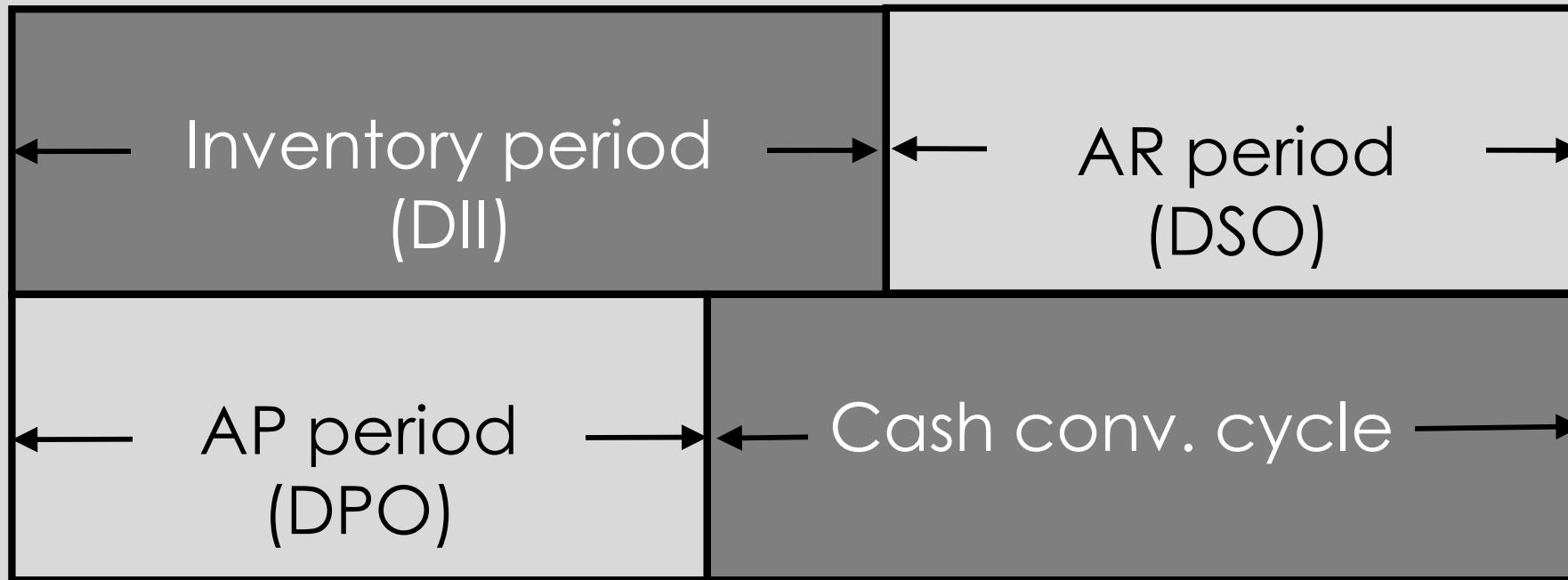
# Working Capital & Operating Cycle



# The Operating Cycle



# The Operating Cycle



Cash conversion cycle = DII + DSO - DPO

# Days in Inventory (DII)

The number of days inventory stays in the system

DII (Inventory days)

= (average inventory) /COGS per day

Costco: DII =  $[(8,969 + 8,908)/2]/(102,901/365)$   
 $= 8,939/282 = 31.7$  days

Inventory turns:  $365/\text{DII} = 11.5$  turns

# Days Sales Outstanding (DSO)

How fast customers pay their bill(also called receivable days)

DSO = (ending accounts receivable) / (revenue/day)

Costco:  $1,252 / (116,073/365) = 3.9$  days

# Days Payable Outstanding (DPO)

DPO = (ending accounts payable)/(COGS/day)

Costco:  $7,612 / (102,901/365) = 27.0$  days

- The higher the DPO, the better a company's cash position, but the less happy its vendors are.
- DPO : a balance between preserving its cash and keeping its vendors happy.

# Cash Conversion Cycle

Cash conversion cycle = DII + DSO - DPO

Costco:  $31.7 + 3.9 - 27.0 = 8.6$  days

- How well you are running your entire business.
- Good indicator of how well you and your managers are doing your jobs.

# Efficiency Ratios

<b>Efficiency</b> (days, turns)	<b>Costco</b>	<b>Walmart</b>
DII	31.7	44.2
Inventory turns	11.5	8.3
DSO	3.9	4.3
DPO	27.0	40.4
Cash conversion cycle	8.6	8.1
Total asset turnover	3.6	2.4



# **Financial Ratios**

## **- Liquidity & Leverage**

# 3. Liquidity Ratios

Can we pay our bills?

- About a company's ability to meet its financial obligations
  - debt, payroll, payments to vendors, taxes, etc.
- These ratios are important for early stage startups

# Current Ratio

Current ratio = current assets / current liabilities

Costco: 15,218 / 15,575 = 0.98

- Are current assets sufficient to pay current liabilities?

# Quick Ratio

Quick ratio

= (current assets – inventory) / current liabilities

Costco:  $(15,218 - 8,969) / 15,575 = 0.40$

More conservative measure of liquidity than the current ratio

- Also called the “acid test”; more stringent (difficult) test
- A quick ratio above 1 is considered good.

# Cash Conversion Cycle

(Days)

Year	2012	2013	2014	2015	2016
DII	28.9	29.8	30.3	31.4	31.7
DSO	3.7	3.9	3.8	3.7	3.9
DPO	29.1	30.1	30.3	31.6	27.0
Cash Conv. Cycle	3.5	3.6	3.8	3.5	8.6

“Inventory is financed through payment terms provided by suppliers rather than by Costco’s working capital.”

“Costco generally sells inventory before it is required to pay for it.”

Costco pays accounts payable after inventories are sold.  
Quick ratio is not important.

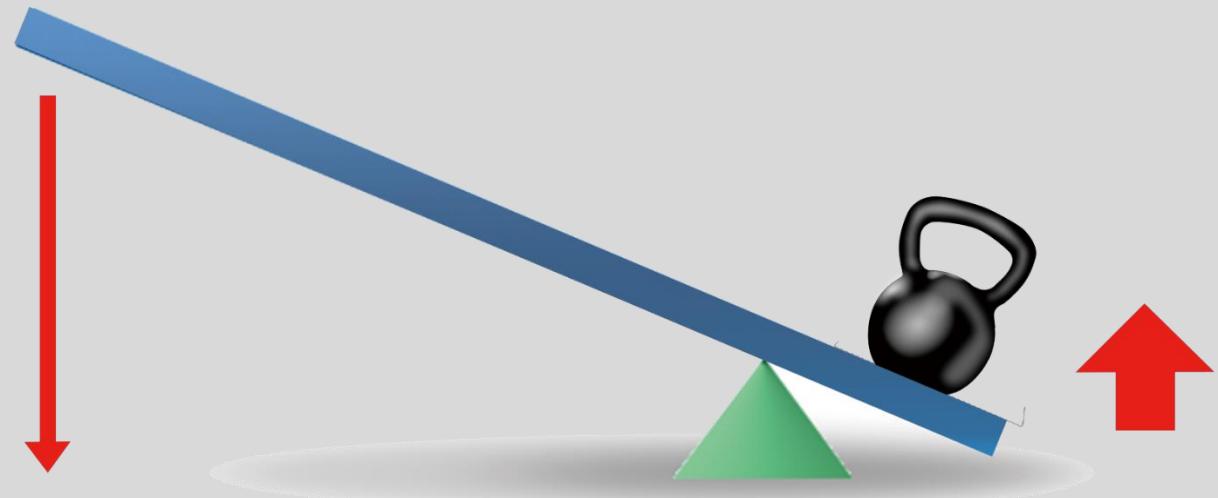
## 4. Leverage Ratios

- Measure how extensively a company is using debt.
- Debt may have a negative image, but
  - It allows a company to grow beyond what invested capital would allow.
  - A company can deduct the interest payments on debt from its taxable income.

# Leverage

In financial world, the word for debt is “leverage”

A business can use a modest amount of capital to build up a larger amount of assets through debt



# Debt-to-Equity Ratio

Debt-to-equity ratio

= (total liabilities )/(shareholders' equity)

Costco:  $(1,100+4,061) / 12,079 = 0.43$

- Shows how much debt a company has relative to its investor equity
- Lenders want a low number

# Interest Coverage

Interest coverage

= (operating profit)/(annual interest charges)

Costco:  $3,672/133 = 27.6$

- Shows the company's interest exposure relative to how much it is making

# Liquidity/Leverage Ratios

Liquidity/Leverage	Costco	Walmart
Current ratio	0.98	0.86
Quick ratio	0.38	0.19
Debt-to-equity ratio	0.43	0.59
Interest coverage	27.61	9.62

# Growth Rates

<b>Growth %</b>	<b>Costco</b>	<b>Walmart</b>
<b>Revenue</b>		
Compared to last year	2.17	0.78
3 year average	4.13	0.67
5 year average	5.95	1.68
10 year average	7.04	3.37
<b>Operating profit</b>		
Compared to last year	1.32	-5.56
3 year average	6.35	-5.38
5 year average	8.53	-3.04
10 year average	8.49	1.05

# Use of Financial Ratios

- Bankers:  
Debt-to-equity, whether a company will be able to pay back a loan
- Founder:  
Gross margin, inventory turn, receivable days,...
- Credit managers (whether to give credit to a new customer):  
Current assets/current liabilities, can a company pay its current liabilities?
- Shareholders and would-be acquirers:  
Price-to-earnings, net income/shareholders' equity

# Summary

Costco and Walmart have adequate liquidity and leverage ratios.

Growth rates may be the reason for Costco's higher P/E ratio.



# **Financial Ratio Practice**

# Company C

Revenue in 2018 is \$10,000,000.

COGS is \$6,500,000 and SG&A is \$1,500,000.

Interest expense is \$200,000.

Corporate tax rate is 20%

Let's construct the income statement in 2018.

# Income Statement of Company C

## Income Statement

In 2018 x\$1,000

Revenue 10,000

COGS

---

Gross profit

SG&A

---

Operating profit

Interest

Tax

---

Net profit

# Income Statement of Company C

## Income Statement

In 2018 x\$1,000

Revenue 10,000

COGS 6,500

---

Gross profit 3,500

SG&A

---

Operating profit

Interest

Tax

---

Net profit

# Income Statement of Company C

## Income Statement

In 2018 x\$1,000

Revenue 10,000

COGS 6,500

Gross profit 3,500

SG&A 1,500

Operating profit 2,000

Interest

Tax

Net profit

# Income Statement of Company C

## Income Statement

In 2018 x\$1,000

Revenue 10,000

COGS 6,500

Gross profit 3,500

SG&A 1,500

Operating profit 2,000

Interest 200

Tax 360

Net profit 1,440

# **Costco Profit Margin**

Gross margin =  $3,500/10,000 = 35\%$

Operating margin =  $2,000/10,000 = 20\%$

Net margin =  $1,440/10,000 = 14.4\%$

# Balance Sheet of Company C

## Balance Sheet

		As of Dec. 31, 2018	x\$1,000
Cash	1,462	Accounts payable	712
Accounts receivable	822	Long-term loan	2,000
Inventory	1,068	Shareholders' equity	2,440
Fixed assets	1,800		
Total assets	5,152	Total debt and equity	5,152

# Liquidity Ratios

Current ratio

$$\begin{aligned} &= \text{current assets} / \text{current liabilities} \\ &= (1,462 + 822 + 1,068) / 712 = 4.71 \end{aligned}$$

**Balance Sheet**

	As of Dec. 31, 2018		x\$1,000
Cash	1,462	Accounts payable	712
Accounts receivable	822	Long-term loan	2,000
Inventory	1,068	Shareholders' equity	2,440
Fixed assets	1,800		
Total assets	5,152	Total debt and equity	5,152

abilities

## Income Statement

	In 2018	x\$1,000
Revenue	10,000	
COGS	6,500	
Gross profit	3,500	
SG&A	1,500	
Operating profit	2,000	
Interest	200	
Tax	360	
Net profit	1,440	

# Leverage Ratios

Debt-to-equity ratio

$$\begin{aligned} &= (\text{total liabilities}) / (\text{shareholders' equity}) \\ &= (712 + 2,000) / 2,440 = 1.11 \end{aligned}$$

## Balance Sheet

As of Dec. 31, 2018

Cash	1,462	Accounts payable	712
Accounts receivable	822	Long-term loan	2,000
Inventory	1,068	Shareholders' equity	2,440
Fixed assets	1,800		
Total assets	5,152	Total debt and equity	5,152

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# Cash Conversion Cycle [1]

Cash conversion cycle = DII + DSO – DPO

DII (Days In Inventory)

$$\begin{aligned} &= (\text{Average inventory}) / \text{COGS per day} \\ &= 1,068 / (6,500 / 365) = 60 \text{ days} \end{aligned}$$

DSO (Days Sales Outstanding)

$$\begin{aligned} &= (\text{Ending acc. receivable}) / (\text{Revenue/day}) \\ &= 822 / (10,000 / 365) = 30 \text{ days} \end{aligned}$$

# Cash Conversion Cycle [2]

DPO (Days Payable Outstanding)

$$\begin{aligned} &= (\text{Ending acc. payable}) / (\text{COGS/day}) \\ &= 712 / (6,500 / 365) = 40 \text{ days} \end{aligned}$$

Cash conversion cycle = DII + DSO - DPO

$$= 60 + 30 - 40 = 50 \text{ days}$$

- This concludes Finance for Startups.
- I hope this course has helped you feel comfortable about financial matters for your startup.
- If you have any questions about the course, please feel free to contact me using my e-mail address here.
- I wish you the very best on your endeavor.



# **Financial Planning**

## **-Cash Flow Statement**

# Course Schedule

Week

1	Introduction	Balance sheet	Income statement
2	Cash flow statement		Financial ratios
3	Financial planning		Funding
4	VC term sheet		Valuation

# Balance Sheet of PEN company in the beginning of Year 2

			(\$)
Cash	600	Loan	4,000
Accounts receivable	2,500	Shareholders' equity	3,300
Materials inventory	1,000		
Finished goods inventory	-		
Equipment	3,200		
Total assets	7,300	Total liabilities and shareholders' equity	7,300

# Assumptions for Year 2 [1]

1 (Q1) Angel funding of \$\_\_\_\_\_.

2

3

4

5

# Assumptions for Year 2 [1]

- 1 (Q1) Angel funding of \$\_\_\_\_\_.
- 2 (Q1) Purchases raw materials worth \$5,000 with cash.
- 3
- 4
- 5

# Assumptions for Year 2 [1]

- 1 (Q1) Angel funding of \$\_\_\_\_\_.
- 2 (Q1) Purchases raw materials worth \$5,000 with cash.
- 3 (Q1) Collects accounts receivable from the last year's revenue.
- 4
- 5

# Assumptions for Year 2 [1]

- 1 (Q1) Angel funding of \$\_\_\_\_\_.
- 2 (Q1) Purchases raw materials worth \$5,000 with cash.
- 3 (Q1) Collects accounts receivable from the last year's revenue.
- 4 (All year) Hires a production worker in the beginning of the year with an annual salary of \$1,200 (\$300/quarter).
- 5

# Assumptions for Year 2 [1]

- 1 (Q1) Angel funding of \$\_\_\_\_\_.
- 2 (Q1) Purchases raw materials worth \$5,000 with cash.
- 3 (Q1) Collects accounts receivable from the last year's revenue.
- 4 (All year) Hires a production worker in the beginning of the year with an annual salary of \$1,200 (\$300/quarter).
- 5 (All year) Produces a total of 12,000 pens. The remaining materials inventory at year end is \$1,200 (See quarterly production).

# Assumptions for Year 2 [2]

6 (All year) CEO's annual salary is \$2,000 (\$500/quarter).

7

8

9

10

# Assumptions for Year 2 [2]

- 6 (All year) CEO's annual salary is \$2,000 (\$500/quarter).
- 7 (All year) Other expenses are \$250/quarter.

8

9

10

# Assumptions for Year 2 [2]

- 6 (All year) CEO's annual salary is \$2,000 (\$500/quarter).
- 7 (All year) Other expenses are \$250/quarter.
- 8 (All year) Sells a total of 10,000 pens with a unit price of \$1. Sales money is collected one quarter later (See quarterly sales).
- 9
- 10

# Assumptions for Year 2 [2]

- 6 (All year) CEO's annual salary is \$2,000 (\$500/quarter).
- 7 (All year) Other expenses are \$250/quarter.
- 8 (All year) Sells a total of 10,000 pens with a unit price of \$1. Sales money is collected one quarter later (See quarterly sales).
- 9 (Q4) 10% interest on the loan is paid.
- 10

# Assumptions for Year 2 [2]

- 6 (All year) CEO's annual salary is \$2,000 (\$500/quarter).
- 7 (All year) Other expenses are \$250/quarter.
- 8 (All year) Sells a total of 10,000 pens with a unit price of \$1. Sales money is collected one quarter later (See quarterly sales).
- 9 (Q4) 10% interest on the loan is paid.
- 10 (Q4) The equipment is depreciated by \$800.

# Sales & Production

Year 2	Q1	Q2	Q3	Q4
Pen sales (units)	2,000	2,000	3,000	3,000
Unit price (\$)	1.0	1.0	1.0	1.0
Production (units)				
Finished goods inventory				

# Sales & Production

Year 2	Q1	Q2	Q3	Q4
Pen sales (units)	2,000	2,000	3,000	3,000
Unit price (\$)	1.0	1.0	1.0	1.0
Production (units)				
Finished goods inventory	1,000	2,000	2,000	2,000

# Sales & Production

Year 2	Q1	Q2	Q3	Q4
Pen sales (units)	2,000	2,000	3,000	3,000
Unit price (\$)	1.0	1.0	1.0	1.0
Production (units)	3,000	3,000	3,000	3,000
Finished goods inventory (units)	1,000	2,000	2,000	2,000

# Cash Flow Statement

(\\$)

		Q1	Q2	Q3	Q4
	Beginning balance	600			
Cash from operation	Revenue collection Raw material Production worker salary CEO salary Expenses Sum				
Cash from investment					
Cash from finance	Angel funding				
	Change in cash				
	Ending balance				

Sales	Q1	Q2	Q3	Q4
Pen sales (units)	2,000	2,000	3,000	3,000
Unit price (\$)	1.0	1.0	1.0	1.0

2 (Q1) Purchase raw materials worth \$5,000 with cash. (\$)

		Q1	Q2	Q3	Q4
	Beginning balance	800			
Cash from operation	Revenue collection	2,500	2,000	2,000	3,000
	Raw material	(5,000)			
	Production worker salary				
	CEO salary				
	Expenses				
	Sum				
Cash from investment					
Cash from finance	Angel funding				
	Change in cash				
	Ending balance				

- 4 (All year) Hires a production worker in the beginning of the year with an annual salary of \$1,200.
- 6 (All year) CEO's annual salary is \$2,000 (\$500/quqrter).
- 7 (All year) Other expenses are \$250/quarter.

		(₱)			
		Q1	Q2	Q3	Q4
	Beginning balance	800			
Cash from operation	Revenue collection	2,500	2,000	2,000	3,000
	Raw material	(5,000)			
	Production worker salary	(300)	(300)	(300)	(300)
	CEO salary	(500)	(500)	(500)	(500)
	Expenses	(250)	(250)	(250)	(250)
	Sum	(3,550)	950	950	1,950
Cash from investment					
Cash from finance	Angel funding				
	Change in cash				
	Ending balance				

# Cash Flow Statement

					(\$)
		Q1	Q2	Q3	Q4
	Beginning balance	600	(2,950)	(2,000)	(1,050)
Cash from operation	Revenue collection	2,500	2,000	2,000	3,000
	Raw material	(5,000)			
	Production worker salary	(300)	(300)	(300)	(300)
	CEO salary	(500)	(500)	(500)	(500)
	Expenses	(250)	(250)	(250)	(250)
	Sum	(3,550)	950	950	1,950
Cash from investment					
Cash from finance	Angel funding				
	Change in cash	(3,550)	950	950	1,950
	Ending balance	(2,950)	(2,000)	(1,050)	900

# Cash Flow Statement

		Q1	Q2	Q3	Q4	(\$)
	Beginning balance	600	2,050	3,000	3,950	
Cash from operation	Revenue collection	2,500	2,000	2,000	3,000	
	Raw material	(5,000)				
	Production worker salary	(300)	(300)	(300)	(300)	
	CEO salary	(500)	(500)	(500)	(500)	
	Expenses	(250)	(250)	(250)	(250)	
	Sum	(3,550)	950	950	1,950	
Cash from investment						
Cash from finance	Angel funding	5,000				
	Change in cash	1,450	950	950	1,950	
	Ending balance	2,050	3,000	3,950	5,900	

# Summary

- Based on the sales plan, plan for inventories, production, hiring and expenses.
- Construct the cash flow statement.
- Determine the amount of funding.



# **Financial Planning**

## **-Balance Sheet**

# Balance Sheet of PEN company in the beginning of Year 2

			(\$)
Cash	600	Loan	4,000
Accounts receivable	2,500	Shareholders' equity	3,300
Materials inventory	1,000		
Finished goods inventory	-		
Equipment	3,200		
Total assets	7,300	Total liabilities and shareholders' equity	7,300

# Balance Sheet Construction

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
Year 2 End							

# 1 Angel funding of \$ 5,000.

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	<b>5,000</b>						<b>5,000</b>
2							
3							
4							
5							
6							
7							
8							
9							
10							
Year 2 End							

## 2 Purchase raw materials worth \$5,000 with cash.

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)			5,000			
3							
4							
5							
6							
7							
8							
9							
10							
Year 2 End							

### 3 Collect accounts receivable from the last year's revenue.

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)		5,000				
3	2,500	(2,500)					
4							
5							
6							
7							
8							
9							
10							
Year 2 End							

- 4 Hires a production worker in the beginning of the year with an annual salary of \$1,200 (\$300/quarter).

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)			5,000			
3	2,500	(2,500)					
4	(1,200)				1,200		
5							
6							
7							
8							
9							
10							
Year 2 End							

5 Produces a total of 12,000 pens. The remaining materials inventory at year end is \$1,200.

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)			5,000			
3	2,500	(2,500)					
4	(1,200)				1,200		
5			(4,800)	4,800			
6							
7							
8							
9							
10							
Year 2 End							

## 6 CEO's annual salary is \$2,000 (\$500/quqrter).

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)			5,000			
3	2,500	(2,500)					
4	(1,200)				1,200		
5				(4,800)	4,800		
6	(2,000)						(2,000)
7							
8							
9							
10							
Year 2 End							

## 7 Other expenses are \$250/quarter.

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)			5,000			
3	2,500	(2,500)					
4	(1,200)				1,200		
5			(4,800)		4,800		
6	(2,000)						(2,000)
7	(1,000)						(1,000)
8							
9							
10							
Year 2 End							

- 8 Sells a total of 10,000 pens with a unit price of \$1.  
 Sales money is collected one quarter later.

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)			5,000			
3	2,500	(2,500)					
4	(1,200)				1,200		
5			(4,800)	4,800			
6	(2,000)						(2,000)
7	(1,000)						(1,000)
8	7,000	3,000		(5,000)			5,000
9							
10							
Year 2 End							

## 9 10% interest on the loan is paid.

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)			5,000			
3	2,500	(2,500)					
4	(1,200)				1,200		
5			(4,800)		4,800		
6	(2,000)						(2,000)
7	(1,000)						(1,000)
8	7,000	3,000		(5,000)			5,000
9	(400)						(400)
10							
Year 2 End							

## 10 The equipment is depreciated by \$800.

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)			5,000			
3	2,500	(2,500)					
4	(1,200)				1,200		
5			(4,800)		4,800		
6	(2,000)						(2,000)
7	(1,000)						(1,000)
8	7,000	3,000		(5,000)			5,000
9	(400)						(400)
10					(800)		(800)
Year 2 End							

# Balance Sheet at the End of Year 2

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)			5,000			
3	2,500	(2,500)					
4	(1,200)				1,200		
5			(4,800)	4,800			
6	(2,000)						(2,000)
7	(1,000)						(1,000)
8	7,000	3,000		(5,000)			5,000
9	(400)						(400)
10					(800)		(800)
Year 2 End	5,500	3,000	1,200	1,000	2,400	4,000	9,100

# Summary

- We constructed the balance sheet of PEN Company at the end of year 2.



# **Financial Planning**

## **-Income Statement**

# Assumptions for Year 2 [1]

- 1 (Q1) Angel funding of \$ 5,000.
- 2 (Q1) Purchases raw materials worth \$5,000 with cash.
- 3 (Q1) Collects accounts receivable from the last year's revenue.
- 4 (All year) Hires a production worker in the beginning of the year with an annual salary of \$1,200 (\$300/quarter).
- 5 (All year) Produces a total of 12,000 pens. The remaining materials inventory at year end is \$1,200 (See quarterly production).

# Assumptions for Year 2 [2]

- 6 (All year) CEO's annual salary is \$2,000 (\$500/quarter).
- 7 (All year) Other expenses are \$250/quarter.
- 8 (All year) Sells a total of 10,000 pens with a unit price of \$1. Sales money is collected one quarter later (See quarterly sales).
- 9 (Q4) 10% interest on the loan is paid.
- 10 (Q4) The equipment is depreciated by \$800.

# Income Statement

Revenue

COGS

Depreciation

Gross profit

SG&A

Operating profit

Interest

Profit before tax

# Revenue

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)			5,000			
3	2,500	(2,500)					
4	(1,200)				1,200		
5			(4,800)	4,800			
6	(2,000)						(2,000)
7	(1,000)						(1,000)
8	→ 7,000	→ 3,000		(5,000)			5,000
9	(400)						(400)
10					(800)		(800)
Year 2 End	5,500	3,000	1,200	1,000	2,400	4,000	9,100

# Income Statement

Revenue	10,000
COGS	
Depreciation	
Gross profit	
SG&A	
Operating profit	
Interest	
Profit before tax	

# COGS

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)		5,000				
3	2,500	(2,500)					
4	(1,200)			1,200			
5			(4,800)	4,800			
6	(2,000)						(2,000)
7	(1,000)						(1,000)
8	7,000	3,000		➡ (5,000)			5,000
9	(400)						(400)
10					(800)		(800)
Year 2 End	5,500	3,000	1,200	1,000	2,400	4,000	9,100

# Income Statement

Revenue	10,000
COGS	5,000
Depreciation	
Gross profit	
SG&A	
Operating profit	
Interest	
Profit before tax	

# Depreciation

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)		5,000				
3	2,500	(2,500)					
4	(1,200)			1,200			
5			(4,800)	4,800			
6	(2,000)						(2,000)
7	(1,000)						(1,000)
8	7,000	3,000		(5,000)			5,000
9	(400)						(400)
10					➡ (800)		(800)
Year 2 End	5,500	3,000	1,200	1,000	2,400	4,000	9,100

# Income Statement

Revenue	10,000
COGS	5,000
Depreciation	800
Gross profit	
SG&A	
Operating profit	
Interest	
Profit before tax	

# SG&A

- 6. CEO's salary
- 7. Other expenses

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)		5,000				
3	2,500	(2,500)					
4	(1,200)			1,200			
5			(4,800)	4,800			
6	➡ (2,000)						(2,000)
7	➡ (1,000)						(1,000)
8	7,000	3,000		(5,000)			5,000
9	(400)						(400)
10					(800)		(800)
Year 2 End	5,500	3,000	1,200	1,000	2,400	4,000	9,100

# Income Statement

Revenue	10,000
COGS	5,000
Depreciation	800
Gross profit	4,200
SG&A	3,000
Operating profit	
Interest	
Profit before tax	

# Interest

Action	Cash	AR	Mtl Inventory	F goods Inventory	Equipment	Loan	Shareholder's equity
Year 2 Beginning	600	2,500	1,000		3,200	4,000	3,300
1	5,000						5,000
2	(5,000)		5,000				
3	2,500	(2,500)					
4	(1,200)			1,200			
5			(4,800)	4,800			
6	(2,000)						(2,000)
7	(1,000)						(1,000)
8	7,000	3,000		(5,000)			5,000
9	➡ (400)						(400)
10					(800)		(800)
Year 2 End	5,500	3,000	1,200	1,000	2,400	4,000	9,100

# Income Statement

Revenue	10,000
COGS	5,000
Depreciation	800
Gross profit	4,200
SG&A	3,000
Operating profit	1,200
Interest	<b>400</b>
Profit before tax	800

# Summary

- We constructed the income statement for PEN Company in year 2.
- Profit before tax: \$800
- Equity at the end of year 2:  
$$\$3,300 \text{ (in the beginning of year 2)} + \$5,000 \text{ (angel investment)} + \$800 \text{ (profit)} = \$9,100$$



# Burn Rate

# Course Schedule

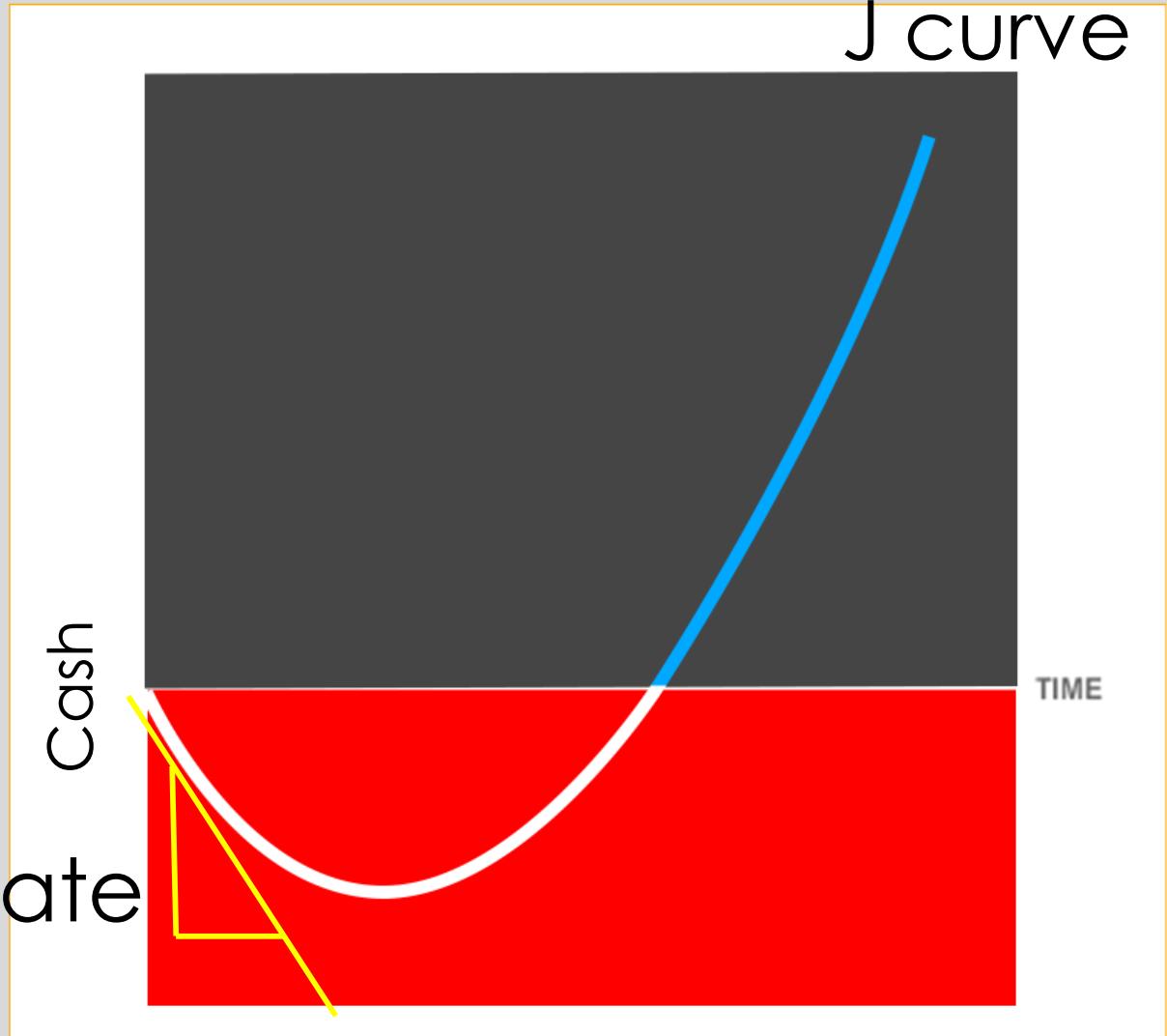
Week

1	Introduction	Balance sheet	Income statement
2	Cash flow statement		Financial ratios
3	Financial planning		Funding
4	VC term sheet		Valuation

# How Much Money Do You Need?



Burn rate



# Burn Rate

- Burn rate = Gross profit – **Operating expenses**
- Allows an estimate of how long you can go before refueling (**runway**).
- Investors check your burn rate to see how efficient you are and your remaining runway.



Kay, S. (1991) Air Force KC-135 [Photograph], Retrieved from [https://commons.wikimedia.org/wiki/File:960424-N-1991K-001\\_Air\\_To\\_Air\\_Refueling.jpg](https://commons.wikimedia.org/wiki/File:960424-N-1991K-001_Air_To_Air_Refueling.jpg)

# Burn Rate

- Investors expect each investment round to last 12 to 18 months.
- Monthly burn rate should be < 10 % of the funding.  
A software startup raising \$250,000 from angel investors better be able to operate on about \$20,000 per month.

# A Founder Should Manage Burn Rate [1]

1. Manage cash flow every day
2. Don't delegate decisions about spending cash
3. Hold off on big expenses

# A Founder Should Manage Burn Rate [2]

4. Be careful in hiring
5. Be quick to pivot and abandon ideas that aren't working.
6. Include buffer when raising money

# In Managing the Cash Burn Rate

- Your goal is not just to spend less money:
  - It is about setting up an efficient and effective process for your startup.

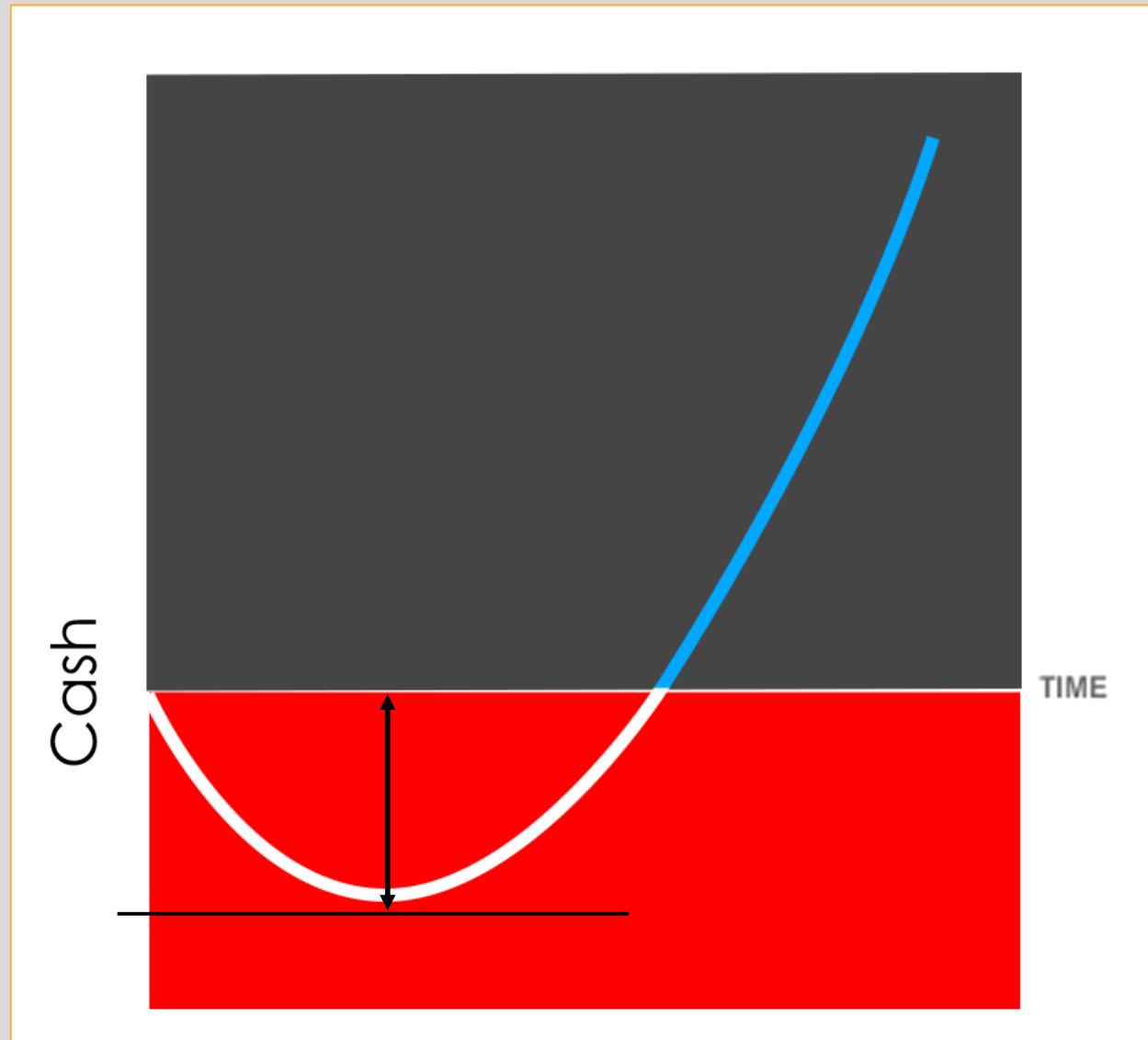
# Summary

- Managing burn rate is one of the most critical things that a founder should do well.

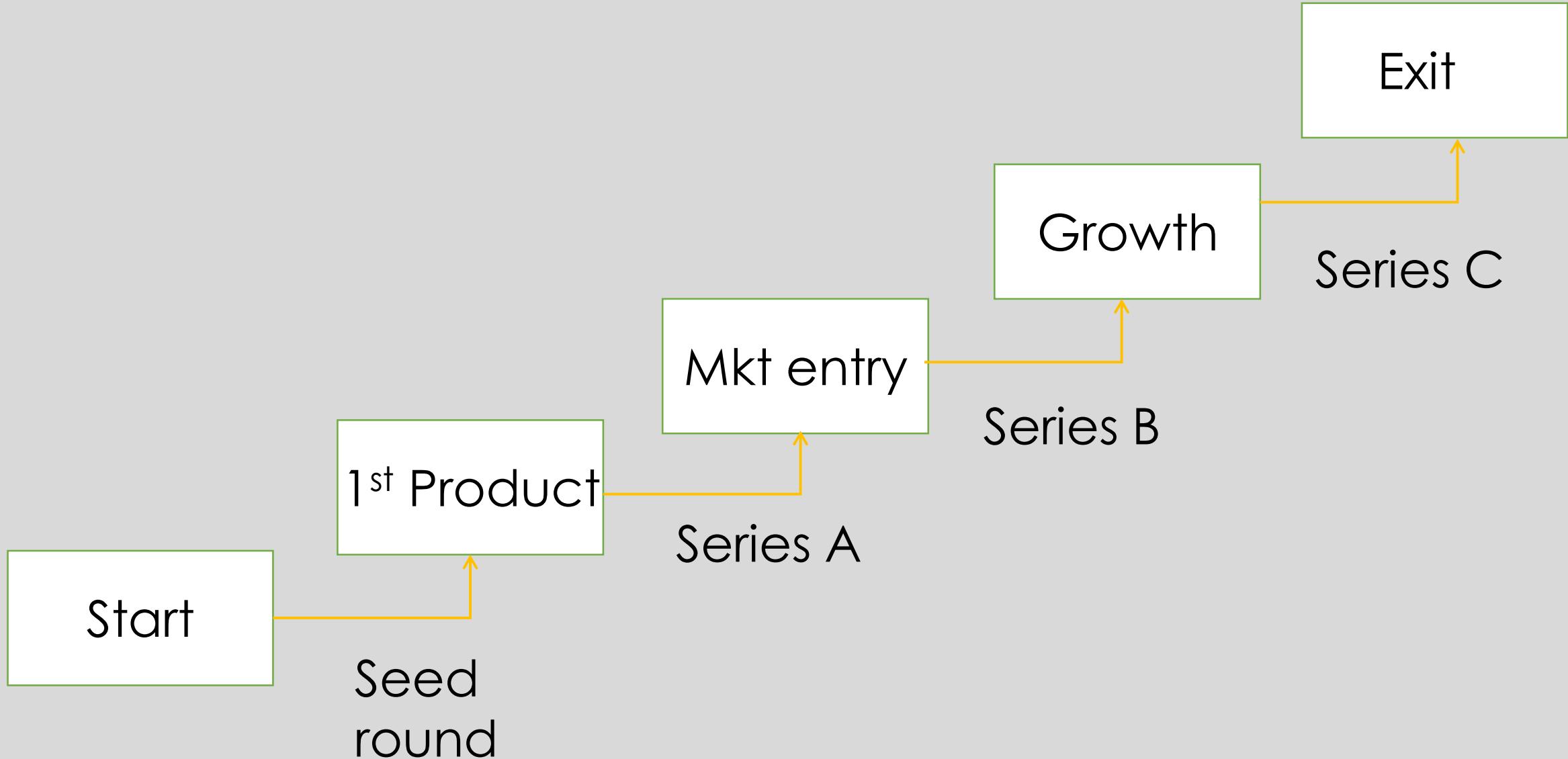


# **Seed Funding**

# How Much Money Do You Need?



# Investments with Milestones



# Funding Size in Silicon Valley

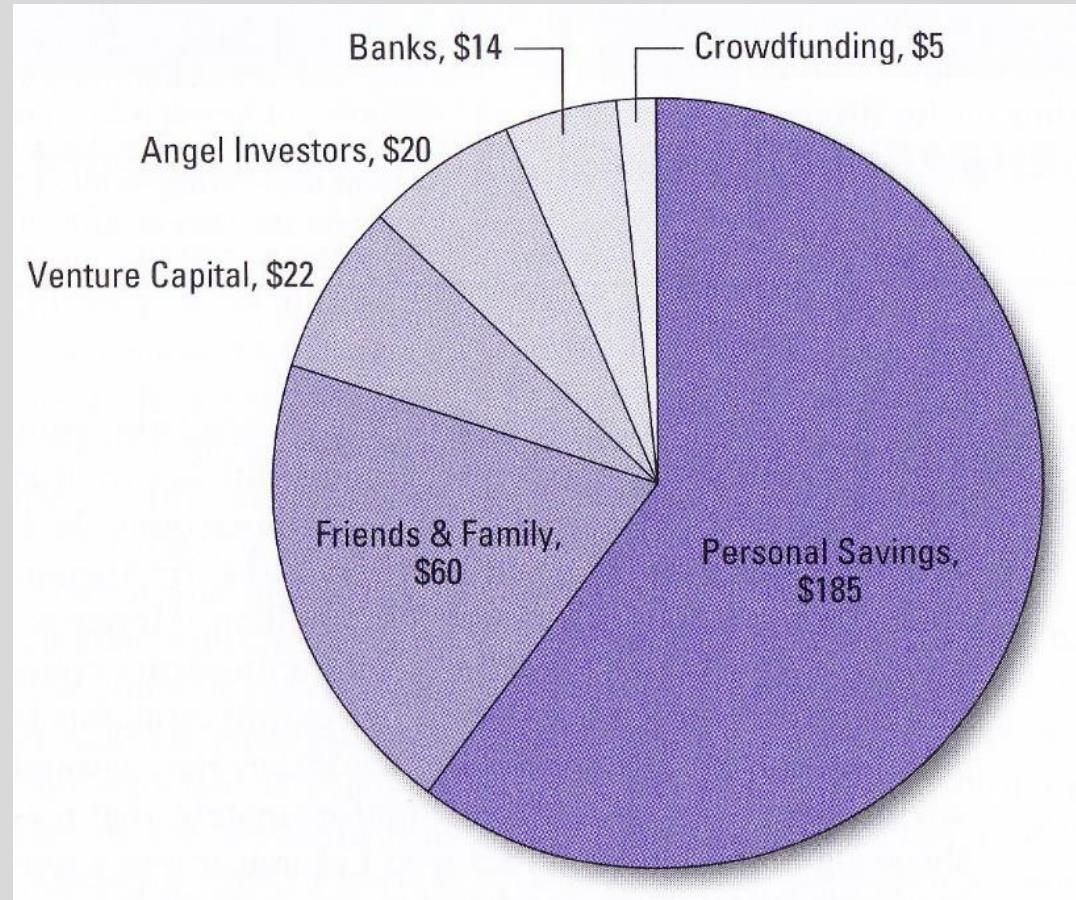
- Angel: \$0.5~1M (3~5 investors)
- VC (Venture Capital):  
\$3~5M Series A for 10~30% share

# Why Investment in Steps?

- Startup
  - Can increase the company value as it hits milestones
- Investors
  - Can reduce risk

# Funding Sources

- Seed round
- Bootstrap
  - 3F's  
Family  
Friends  
Fools
  - Angels



Funding sources for entrepreneurs (B\$)

From "Launching New Ventures" K.R. Allen

# Early Stage Financing Deals

- Seed funding round
  - Convertible debt
  - Sources
    - Family & friends
    - Angels, angel groups
    - Micro VCs

# Convertible Debt

- Often used at the seed stage
- It is debt.
- The debt will convert to preferred equity when another round is raised.
- The conversion usually includes discount on the price to the future round.
- Easier transaction than equity financing.
- No valuation, delayed until next financing.

# Key Features of Convertible Debt

- Conversion rate:  
Discount (20% most common) and caps
- Automatic conversion on qualified financing  
Term (within 6 months), Amount (\$1M), for example
- Interest:  
Converts along with principal. 4~12% with the median of 8%.

# Example of Discount in Convertible Debt

- Seed: \$500,000 convertible debt from angels with 20% discount to the next round.
- 6 months later: A VC offers a Series A round of a \$1M investment at \$1 a share.
- Angels will get 625,000 Series A shares ( $\$500,000/\$0.80$ )
- Discount: Some reward for early investors before the full Series A.

# Summary

- Investments with milestones
- Seed round
- Convertible debt



# Venture Capital Fund

# Series A

- Usually “convertible preferred stock”
- Preferred
  - Preference over common stock on dividends, liquidation, etc.
- Convertible
  - Plus all the benefits of common stock.

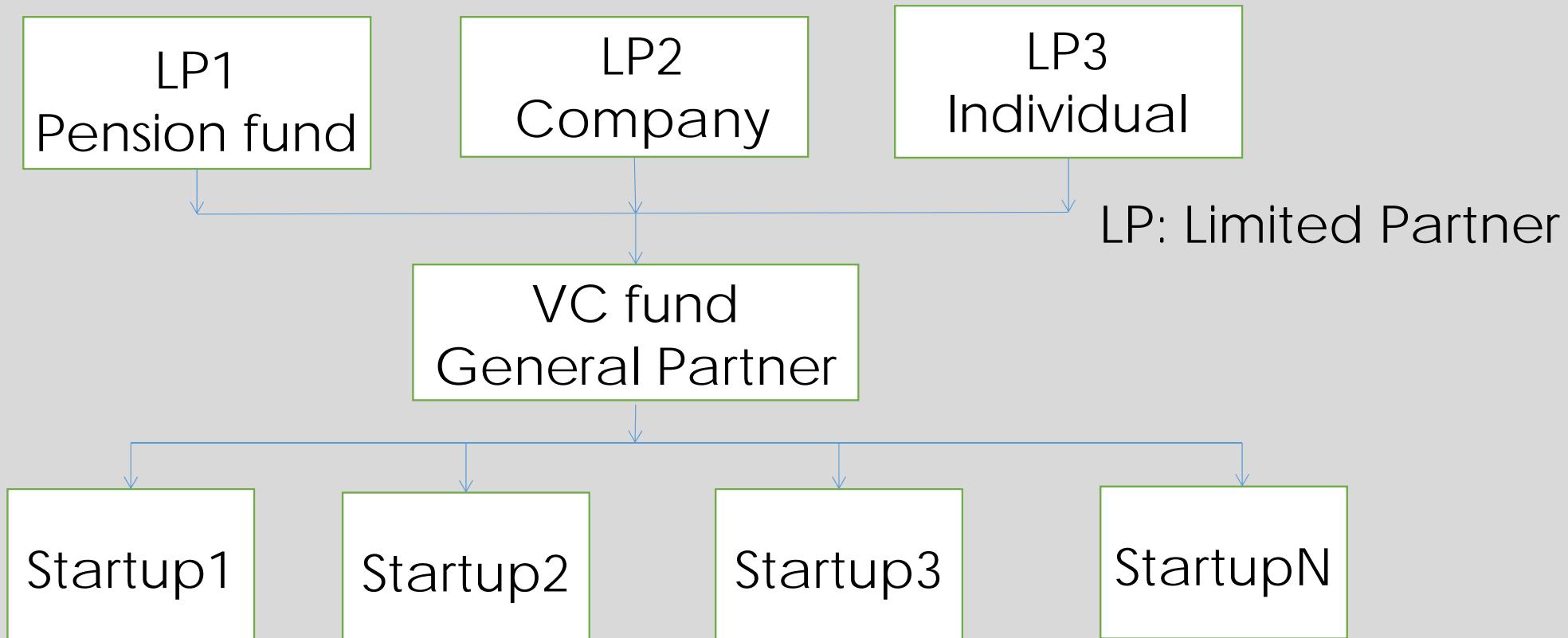
# Venture Capital

- VC funds are set up with investments from funds, companies and individuals
- Fund size: \$ xx M ~ \$ xxx M
- Typically for 10 years
- Compensation
  - Management fee ~2%
  - Performance fee ~20%



[Untitled Photograph of Coins], Retrieved from <https://pixabay.com/photo-2724241/>

# Venture Capital Fund Structure



# Score Card of a Venture Capital Fund

- Average investment: \$4M, Total: \$100M
- Period: 5 years

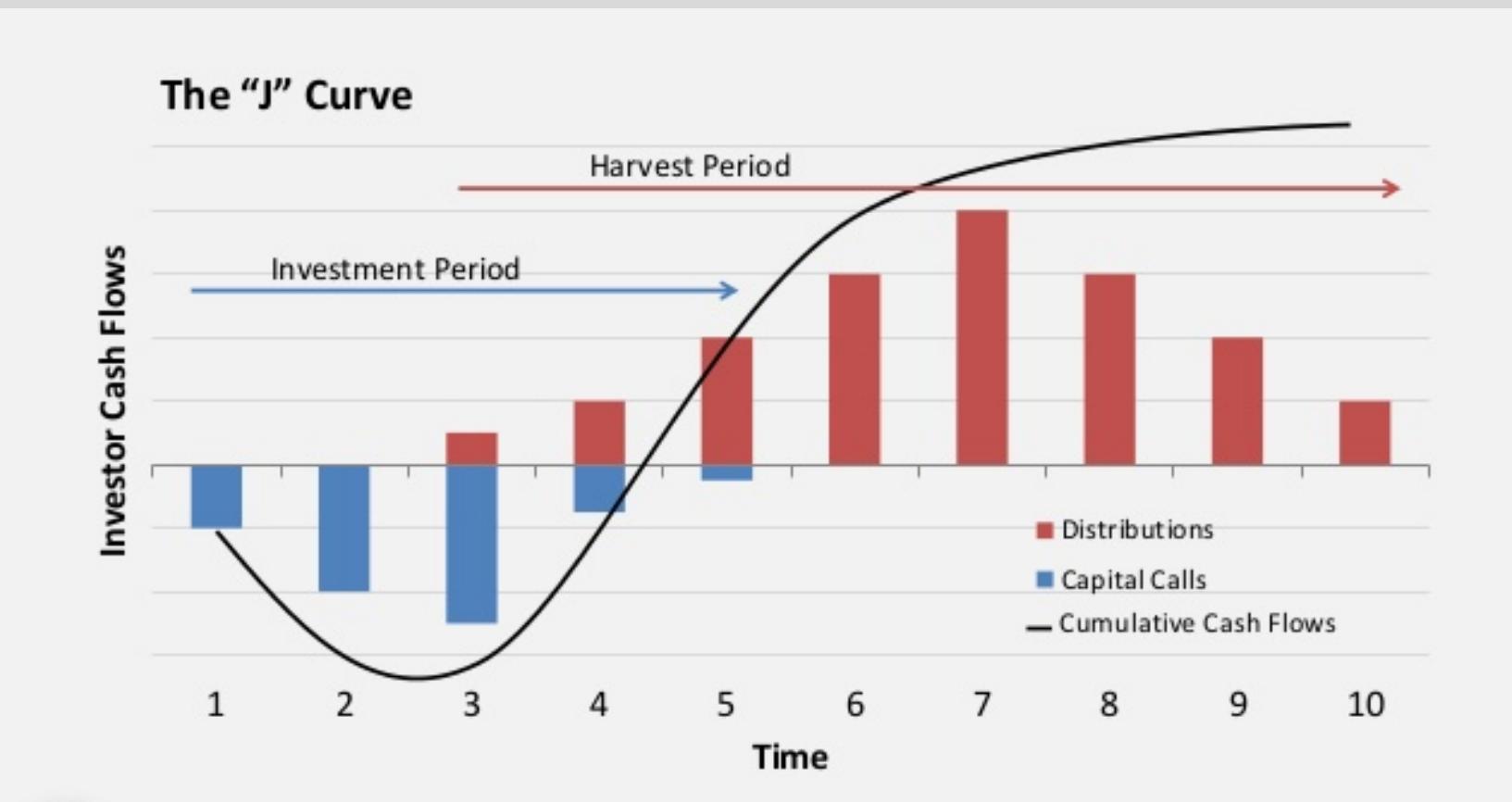
Result	Invest. Money	Return (x)	Return (\$M)	Return/ Year (%)
Bankrupt	60	0.0	0	-100
Breakeven	12	1.0	12	0
Sell cheap	10	1.3	13	5
Unable for IPO	8	1.6	12.8	10
Success (IPO)	6	8.0	48	52
Great success (IPO)	4	40.0	160	109
Total/Average	100	2.5	245	20

Source: Saratoga venture finance

# What VC's are Looking for

1. Market size: Large and fast growing
2. Idea (technology) possible to commercialize
3. Business model with unfair advantage (barrier to entry)
4. A team which can execute the plan
5. Low stock price

# Cash Flow of a VC Fund



Nesheim, J. L. (2000). *High tech start up, revised and updated: The complete handbook for creating successful new high tech companies*. Simon and Schuster.

# Summary

- VCs rely on a small number of big successes
- VC target high return (10~20X) in Series A.



# Advice on VC Fundraising

# How Do You Estimate the Amount?

- Complex financial models will be wrong  
Garbage in garbage out
- Focus on a length of time to get to the next meaningful milestone  
How long will it take  
to ship the 1<sup>st</sup> product or  
to get a certain number of users?

# How Do You Estimate the Amount?

- What is your burn rate that you need to get to this point?  
If you need \$50,000 for 6 months, raise \$500,000.

# Control Your Spending

- A VC said, “The only thing that we know about financial predictions of startups is that 100% of them are wrong.”
- You can't predict your revenue accurately, but you should be able to manage your spending exactly to plan.

# Fundraising Material

- Short description of your business (elevator pitch)  
1~3 paragraphs that describe the product, the team and the business
- Presentation  
Don't overdesign them, focus on the content.
- Send your material that is clear, concise, interesting, easy to understand and stands on its own.

# Due Diligence Materials

- Capitalization tables
- Contracts
- Employment agreements
- Board meeting minutes

Organize all of these documents for quick delivery to investors so you don't slow down the process.

# VCs Will Ask Many Things

- Presentations, projections, target customers, development plan, & competitive analysis.
- You'll go through multiple meetings, e-mails, phone calls, and dinner.
- If a VC decides to invest, the next step is to issue a **term sheet**.



[Untitled Photograph of an Effective Presentation Skills], Retrieved from [https://commons.wikimedia.org/wiki/File:Barry\\_Katz\\_-\\_Effective\\_Presentation\\_Skills\\_-\\_3.JPG](https://commons.wikimedia.org/wiki/File:Barry_Katz_-_Effective_Presentation_Skills_-_3.JPG)

# Choose Your Investors Wisely

- You will be with them for a long time.
- Think about how it positions you for the next round, including issues like reputation of VCs.
- All money is not created equal.

# Your Target in Fundraising

- To get multiple term sheets at the same time

# Summary

- You should be able to manage the spending exactly to plan.
- Choose your investors wisely.
- Target to get multiple terms sheets at the same time.



# Funding Practice

# Series A

I started a company with a seed money of \$ 200,000 from a friend F.

Cap table before Series A

	# of shares	Share (%)
I	50,000	50%
Friend F	20,000	20%
Employees	30,000	30%

We decided to have Series A round with a VC investment money of \$ 2.5 million. The pre-money valuation was \$ 7.5 million and the number of shares I had was 50,000.

Construct the cap (capitalization) table after Series A. What is the share price for the Series A round?

# Valuation & Share

Post-money valuation = \$7.5M + \$2.5M

Share of the VC after Series A

$\$2.5M / (\$7.5M + \$2.5M) = 25\%$

Number of shares for the VC

$X / (100,000 + X) = 25\%$

$X = 33,333$  shares

# Capitalization Table

	After Series A	
	# of shares	Share (%)
I		
Friend F		
Employees		
VC		
Total		

# Capitalization Table

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VC		
Total		

# Capitalization Table

	After Series A	
	# of shares	Share (%)
I	50,000	
Friend F	20,000	
Employees	30,000	
VC	33,333	
Total	133,333	

# Capitalization Table

	After Series A	
	# of shares	Share (%)
I	50,000	37.5%
Friend F	20,000	15.0%
Employees	30,000	22.5%
VC	33,333	25.0%
Total	133,333	100.0%

Series A share price:  
\$ 7,500,000/100,000 = \$ 75



# VC Term Sheet

# Course Schedule

Week	Introduction	Balance sheet	Income statement
1	Introduction	Balance sheet	Income statement
2	Cash flow statement		Financial ratios
3	Financial planning		Funding
4	VC term sheet		Valuation

# Term Sheet

- “Letter of Intent” “Memorandum of Understanding”
- Basic agreement on the terms of transaction
- Not a legally binding agreement subject to
  - Actual documents
  - Due diligence

# Legally Binding Provisions

- Confidentiality  
Company cannot disclose terms or even existence of term sheet.
- No shop  
Company cannot shop deal for 30~60 days.

**VV VENTURE CAPITAL**

**Terms for Proposed Private Placement of  
of Series A Preferred Stock**

**(Valid for acceptance until May 31, 2018)**

**Issuer: ABC Company (the “Company”)**

**OR SERIES A PREFERRED STOCK**

**(Valid for acceptance until May 31, 2018)**

**Issuer: ABC Company (the “Company”)**

**VV Venture Capital**

**By:** \_\_\_\_\_

**Print Name>Title:**

**ABC Company**

**By:** \_\_\_\_\_

**Print Name>Title:**

## **Amount of Financing:**

\$2.5 million, representing a 20% post-closing ownership stake on a fully diluted basis, including shares reserved and unissued for the employee option pool (the “Employee Pool”). The Employee Pool shall be equal to 20% of the post-closing fully-diluted capitalization.

## **Amount of Financing:**

\$2.5 million, representing a 20% post-closing ownership stake on a fully diluted basis, including shares reserved and unissued for the employee option pool (the “Employee Pool”). The Employee Pool shall be equal to 20% of the post-closing fully-diluted capitalization.

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## **Price & Valuation:**

\$ 2.50 per share (the “Purchase Price”).

The Purchase Price represents a fully-diluted pre-money valuation of \$ 10 million and a fully-diluted post-money valuation of \$ 12.5 million.

## **Type of Security:**

Series A Preferred Stock (the “Series A Preferred”).

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## **Board of Directors:**

The size of the Company’s Board of Directors shall be set at Closing at three persons. The holders of Series A Preferred shall be entitled to elect one member of the Company’s Board of Directors, the holders of Common Stock shall be entitled to elect one member and the remaining director will be mutually agreed upon by the Common and Preferred.

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# **TERMS and CONDITIONS of PREFERRED SERIES A STOCK**

Liquidation Preference  
Preferred Stock Conversion  
Anti-dilution Protection  
Protective Provisions  
Employee Pool  
Stock Vesting  
No Shop Agreement  
Confidentiality

# Two Key Things in a Term Sheet

- **Economics and Control**
- Economics
  - Return on investors in a liquidity event (sale, wind down or IPO)
- Control
  - Exercising control over the business
  - Vetoing key decisions the company can make

# Economic Terms of the Term Sheet

- Price per share (valuation & shares outstanding)
- Liquidation preference

# Summary

- Contents of a VC term sheet



# Term Sheet - Share Price

# Economic Terms of the Term Sheet

- Price per share (valuation & shares outstanding)
- Liquidation preference

# Share Price

$$= \frac{\text{Pre-money valuation}}{\text{Pre-money shares outstanding}}$$

- Pre-money valuation
  - What the investor is valuing before investment
- Shares outstanding:  
Shares + Options granted + Options not yet granted

# Share Price

- If a VC says, “I’ll invest \$5M at a valuation of \$20M.”
- You should clarify:

“Do you mean \$20M pre-money?”

- Post-money valuation  
= pre-money valuation + amount invested

# Employee Stock Options (ESO)

- ESO is the right to buy a certain number of shares of company at a pre-set price (grant or exercise price) over a certain period of time (exercise period).

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# Option Pool

- VCs want the company has sufficient stock options reserved to motivate its workforce.
- Option pool (employee pool) is included in the share price calculation.

# Practice 1: Cap Table

- Two founders, X & Y, started ABC company.
- Number of share founders have:
  - X : 2M
  - Y : 1M
- X: 66.7%  
Y: 33.3%

# Company ABC-Series A Funding, case 1

- VC invests \$2.5M with a pre-money valuation of \$10M  
 $\text{VC's share} = (2.5\text{M}) / (10\text{M} + 2.5\text{M}) = 20\%$
- How many shares does the VC get?  
 $x / (3\text{M}+x) = 20\% \quad x=0.75\text{M}$

ABC issues 750,000 shares for the VC

Share price:  $\$10\text{M}/3\text{M} = \$3.33$

- Founders' share reduced to  
X: 53.3%      Y: 26.7%

# Company ABC-Series A Funding, case 2

- VC insists 20% option pool
- Pre- & post-money valuation: \$10M & \$12.5M
- Construct the cap (capitalization) table after Series A

# Company ABC-Series A Funding, case 2

Class	Shares	Preferred price	%
Founder X	2,000		A
Founder Y	1,000		B
Employee pool	C		20%
VC	D	E	20%
Total	F		100%

# Company ABC-Series A Funding, case 2

Class	Shares	Preferred price	%
Founder X	2,000		40%
Founder Y	1,000		20%
Employee pool	1,000		20%
VC	1,000	\$ 2.50	20%
Total	5,000		100%

# Company ABC-Series A Funding, case 2

- Pre-money valuation: \$10M
- Actual pre-money valuation excluding option pool:  
\$7.5M

# Summary

- Economics in a term sheet: Share price



# **Term Sheet**

## **-Liquidation Preference & Others**

# Liquidation Preference

- In liquidity events like M&A, preferred share will receive [x] times the original investment before common share gets anything.

1x was standard, it went up as high as 10x after internet bubble bust in 2000. Now back to 1x.

# Liquidation Preference

- Common shares

After the payment of liquidation preference, the remaining will be distributed to common shares.
- Participation

Preferred shares could participate after conversion
- Type of participation

Full, capped and no participation

# Examples for Liquidation Preference

- If a company has Series A of \$5M at a \$10M pre-money valuation,  
the investors own 33.3% and  
the entrepreneurs 66.7%.
- Cases:  
Case 1: 1x liquidation preference and no participation  
Case 2: 1x liquidation preference and **participation**

# Liquidation Preference

Sale price	Participation	Share value		Common %
		Preferred	Common	
\$ 10,000	No Yes			
\$ 100,000	No Yes			

VC: \$5 M investment with 33.3% share

# Liquidation Preference

- Having a preference is standard, but focus on trying to minimize participation.

# Anti-Dilution

- To protect investors from dilution in a “down round”
- Down round example: \$1/share in Series A and \$0.5/share in Series B. Series A shareholders suffer big dilution.
- Changes the conversion price when preferred stock converts.

# Example of Anti-Dilution

- In Series A, the investor receives 1M shares with \$1/share.
- The company is not doing well and Series B is a down round with \$0.5/share.
- With anti-dilution protection, the Series A investor will convert its 1 preferred share to 2 common shares.

# Other Economics Terms

- Pay-to-play  
Requires a VC to participate in a future round in order to receive anti-dilution protection.
- Vesting  
As a founder, you have to be around for 4 years to own all of your stocks or options.  
One-year vesting cliff and monthly vesting thereafter for 3 years (typical).

# Summary

- Liquidation preference
- Anti-dilution
- Other terms



# **Term Sheet - Control Terms**

# Control Terms of the Term Sheet

VCs usually have less than 50% ownership but have a variety of terms that give them control over the company.

- Board of directors
- Protective provisions

# Board of Directors

- A board establishes policies for corporate management and makes decision on major company issues.
- Board members are responsible for shareholders, not the founders or officers of the company.

# Board of Directors

- It is advisable that both VCs and founders do not control the board of directors:  
Balanced board of VCs and founders
- Early-stage board: Manageable board size with 3~5 board members.

# Board of Directors

- 3-person board  
    Founder/CEO, VC, an outside board member
- 5-person board  
    Founder, CEO, VC, second VC, an outside board member
- Use board observers instead of board seat

# Protective Provisions

- VCs, instead of controlling the board, use protective provisions (veto rights).
- Unless the VC agrees, the company can't:
  - Change the bylaws
  - Change the size of board of directors
  - Pay or declare dividend
  - Borrow money
  - License away the IP of the company
  - Declare bankruptcy

# Summary

- Balanced board of VCs and founders
- Manageable board size with 3~5 board members.
- Protective provisions: Veto rights



# **Term Sheet Practice**

# Practice 1: Vesting

- Vesting
  - As a founder, you have to be around for 4 years to own all of your stocks or options.
  - One-year vesting cliff and monthly vesting thereafter for 3 years.

# Practice 1: Vesting

- Two founders, X & Y, started ABC company.
- Number of share founders have:  
X : 2M (66.7%)      Y : 1M (33.3%)
- Y left ABC company after 18 months. How many shares does Y have?
- Vesting: One-year vesting cliff and monthly vesting thereafter for 3 years

# Practice 1: Vesting

- 1-year vesting cliff: Y has vested 25% after 12 months.
- Monthly vesting for 6 months:  
 $75\% \times (6/36) = 12.5\%$
- Y's share is 33.3%, but Y keeps  
 $33.3\% \times (25\% + 12.5\%) = 12.5\%$  or 375,000 shares

# Practice 2

A VC invested \$ 1million and got 30% share of a company. The terms for the liquidation preference is 1x preference and participation with a cap of 3x.

How much will the VC recover if the company is sold at

- 1) \$ 1 million
- 2) \$ 2 million
- 3) \$ 10 million
- 4) \$ 15 million?

# Practice 2

1) \$ 1M(million):

Liquidation preference (1X): \$1M

2) \$ 2 M

Liquidation preference (1X): \$1M

Participation:  $1M \times 30\% = \$ 0.3M$

$1M + 1M \times 30\% = \$ 1.3M$

3) \$ 10 M

$\$1M + 9M \times 30\% = \$ 3.7M$

# Practice 2

4) \$ 15 M

\$1M: 1X liquidation preference

$\$14M \times 30\% = \$ 4.2M$ : But participation cannot be over 3X (\$3M)

Total: \$1M + \$3M = \$4M

It is better to convert to common shares:

$\$15M \times 30\% = \mathbf{\$4.5M}$



# **Three Core Things in Valuation**

# 3 Core Things to Consider in Valuation

- Cash flow is king
- Time value of money
- Risk premium

# Cash Flow is King

- Future free cash flow:

Cash left over after working capital and investment
- Consider a company as an ATM. How much is it worth?



# Time Value of Money

- \$1 today  $\neq$  \$1 one year from now
- Because of inflation and impatience

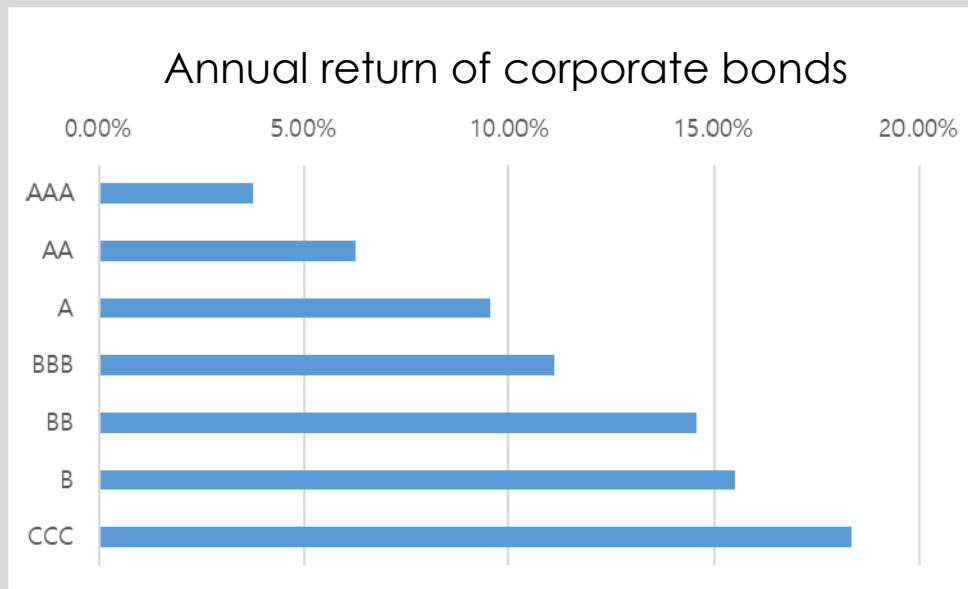
# Time Value of Money

- You helped someone and he wants to give you \$1,000.  
He asks you, “Do you want it today or a year from now?”  
“Today” “Why? There is no inflation here.”
- You might think:  
‘What if he changes his mind? I want to buy something if I  
get \$1,000 today.’

# Time Value of Money

- He could say that,  
“Since you really want it, would you accept \$950 today?”
- If you do, you consider \$950 today more valuable than  
\$1,000 one year from now.

# Risk Premium



Probability of insolvency

Rating	1 Year	10 Year
AAA	0.00%	0.00%
AA	0.00%	0.00%
A	0.00%	0.05%
BBB	0.05%	1.28%
BB	0.39%	5.26%
B	2.78%	5.71%
CCC	11.76%	44.00%

Source: Fitch

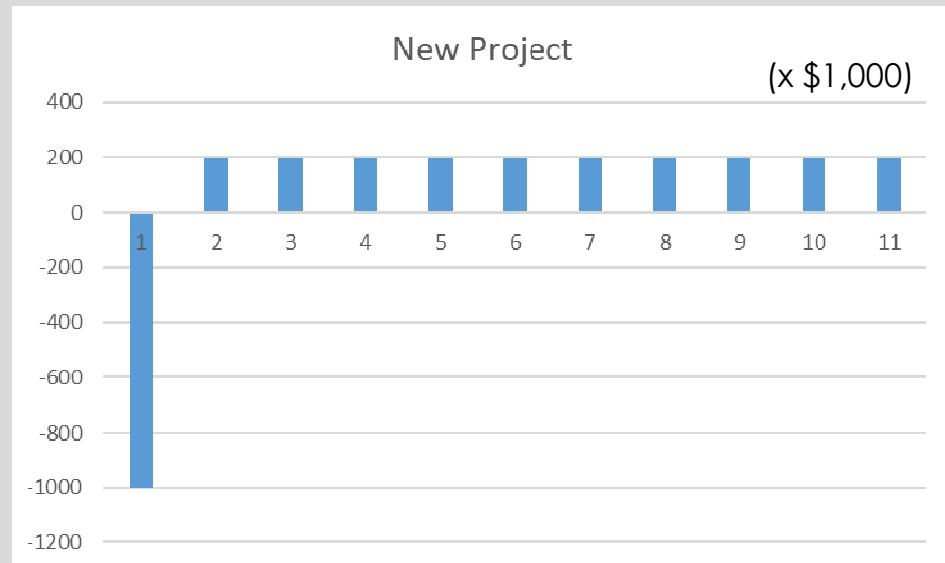
# A New Project

- Initial investment of \$1M now
- Expected annual return of \$200k from the 2<sup>nd</sup> year for 10 years.
- Should you invest?

# Comparison

To invest or not to?

You need to estimate  
the present value of future cash flow.



# Present Value (PV)

To receive \$100 one year from now, how much do you need to deposit? (Interest rate: 3%)

$$D (1+0.03) = 100$$

$$D = 100 / (1 + 0.03)$$

= \$ 97.09 <= This is the present value of  
\$100 one year from now

$1/(1+ 0.03)$  : Discount factor

# PV of Future Cash Flow

$$PV = \frac{C}{(1+d)} + \frac{C}{(1+d)^2} + \frac{C}{(1+d)^3} + \dots + \frac{C}{(1+d)^{10}}$$

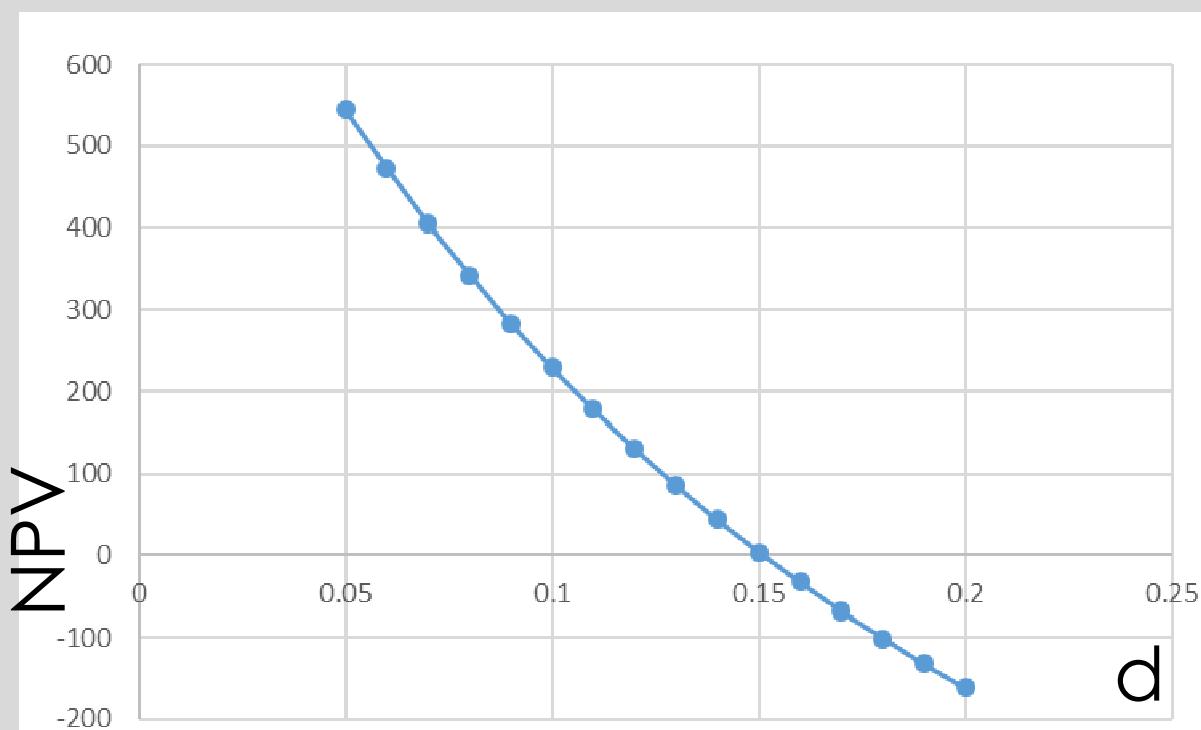
PV: Present value of future cash flow  
d: Discount rate

d: Company has to pay to get  
money (loan or investment)  
**=> Cost of Capital**

# Net Present Value (NPV)

$$NPV = \frac{C}{(1+d)} + \frac{C}{(1+d)^2} + \frac{C}{(1+d)^3} + \dots + \frac{C}{(1+d)^{10}} - C_0$$

$$C = \$200k$$
$$C_0 = \$1M$$



# Summary

Three core things in valuation

- Cash flow is king
- Time value of money
- Risk premium



# Valuation Methods

# GB (Good Beer) Pub

You run a craft beer pub in your hometown.

You have a plan to expand to the capital city.

A customer wants to invest \$100,000.

How much share should you give?



Source: simmsrestaurants

# How to Value GB Pub?

You are thinking:

I invested my own \$ 300k.

I worked hard during the last 2 years with almost no salary.

I could have received a salary of \$200k in the past 2 years.

The value of GB Pub should be at least \$ 500k (300k + 200k).

$$\$100k / (\$500k + \$100k) = 16.7\%$$

# How to Value GB Pub?

You want to be compensated for your hard work.

But why does your customer want to invest?

The investor invests for the future, not interested in compensating for your past hard work.

# Valuation of GB Pub

You need to estimate the future free cash flow of GB pub.

Year	Free cash flow (x \$1,000)
1	0
2	0
3	100
4	300
5	400
6 and afterwards	500

# Discounted Cash Flow (DCF)

Assume: GB Pub's cost of capital is 15% (Unit: \$1,000)

PV = Discounted cash flows in year 1~5 + Residual value

PV of residual value in year 5:

Discounted value of [\$500,000/year perpetually]

# PV of a Perpetual Cash Flow

The present value(PV) of an annual cash flow (C) with a cost of capital (d) is

$$PV = \frac{C}{(1+d)} + \frac{C}{(1+d)^2} + \frac{C}{(1+d)^3} + \frac{C}{(1+d)^4} + \dots \quad (\text{Eq.1})$$

$$(\text{Eq.1}) \times (1+d)$$

$$(1+d) PV = C + \frac{C}{(1+d)} + \frac{C}{(1+d)^2} + \frac{C}{(1+d)^3} + \dots \quad (\text{Eq.2})$$

$$(\text{Eq.2}) - (\text{Eq.1}) \quad d \times PV = C$$

$$PV = \frac{C}{d}$$

# Discounted Cash Flow (DCF)

Assume: GB Pub's cost of capital is 15% (Unit: \$1,000)

PV = Discounted cash flows in year 1~5 + Residual value

Residual value in year 5:

Discounted value of [\$500,000/year perpetually]

$$= 500/0.15 = \$ 3,333,333$$

# Discounted Cash Flow (DCF)

Assume: GB Pub's cost of capital is 15% (Unit: \$1,000)

$$\begin{aligned} PV = & 0 + 0 + 100/(1+0.15)^3 + 300/(1+0.15)^4 + 400/(1+0.15)^5 \\ & + 3,333 / (1+0.15)^5 \end{aligned}$$

$$PV = 66 + 172 + 199 + 1,667 \approx 2,100 \text{ (\$ 2.1M)}$$

$$\text{\$ 100,000 investment: } 1 / (21 + 1) = 4.5\%$$

# Valuation by Multiples

Company	P/E Ratio
Walmart	13.9
Kroger	19.0
SYSCO	20.5
Whole Foods	21.5
Costco	28.0
Average	20.6

A new company in whole sale industry  
\$3/share net profit and 50M shares  
 $\$3 \times 20.6 \times 50M = \$3,090M$

# Valuation by VC's

- VC's target 10~20x return in Series A.
- Can this startup be worth \$500M at exit?
- Comparable companies based on VC experiences
- $\$500M/20 = \$25M$  : Post-money valuation of Series A

# Summary

- Investors invest for the future.
- DCF(Discounted Cash Flow)
- Valuation by multiples
- VC valuation



# Company Valuation Practice

# Practice 1

Company A is considering the acquisition of a smaller competitor Z.

Company Z is expected generate constant perpetual annual cash flows of \$3M from next year onwards.

What price should A pay for the acquisition of Z if the company's discount rate (cost of capital) is 15%?

# Solution for Practice 1

Present value of a perpetual cash flow

$$= \frac{c}{d}$$

c: Annual cash flow

d: Cost of capital

$$\$3M / 0.15 = \$20M$$

Company A should pay less than \$20M when buying company Z.

## Practice 2 [1]

Your company is considering a new project. If you invest \$1M in 2019, the following free cash flow is expected.

Year	2020	2021	2022	2023	2024
Free cash flow	50	100	200	300	400

From 2025, perpetual annual free cash flow of \$400k is expected.

## Practice 2 [2]

Year	2020	2021	2022	2023	2024
Free cash flow	50	100	200	300	400

1. Estimate the residual value after 2025. Assume that the discount rate (cost of capital) is 10%.
2. What is the present value of the future free cash flow?
3. Estimate the net present value.

# Solution for Practice 2

(Unit: \$1,000)

1. Residual value in 2024 =  $400/0.1 = 4,000$

2.  $PV = 50/(1+0.1) + 100/(1+0.1)^2 + 200/(1+0.1)^3$   
 $+ 300/(1+0.1)^4 + 400/(1+0.1)^5 + 4,000 /(1+0.1)^5$   
 $= 45 + 83 + 150 + 205 + 248 + 2,484 = \$3,215,000$

3.  $NPV = \$3,215,000 - \$1,000,000$   
 $= \$2,215,000$

## Practice 3

You are considering buying a startup X. The P/E ratios of public companies in this industry are shown on the right table.

Company	Share Price, \$	EPS	P/E ratio
A	10	0.67	15
B	24	1.20	20
C	8	0.44	18
D	43	1.72	25
E	18	0.95	19
Average			19.4

If the EPS for company X is \$1, what is the adequate share price? If the company X has 1 million shares, how much would you pay for X?

# Solution for Practice 3

Share price:  $\$1 \times 19.4 = \$19.4$

Company value:  $\$19.4 \times 1,000,000 = \$19,400,000$

You could pay less than \$19.4 million.