Introduction to Finance

Sébastien Laffitte
CY Paris Cergy University

Last week

- The fundamental role of Finance.
- The Four Axioms of Finance:

Last week

- The fundamental role of Finance.
- The Four Axioms of Finance:
  - Investors prefer more to less.
  - Inverstors are risk-averse.
  - Investors prefer money today to money tomorrow.
  - No arbitrage is possible

Last week

- The fundamental role of Finance.
- The Four Axioms of Finance:
  - Investors prefer more to less.
  - Inverstors are risk-averse.
  - Investors prefer money today to money tomorrow.
  - No arbitrage is possible
- **Note for next sessions: please bring a calculator**

Today

- The objective of the firm in Finance
- Analysis of Financial Statements

The objective of the firm

- What's the ultimate goal of a company?

The objective of the firm

- What's the ultimate goal of a company?
- Intermediary goals:
  - Satisfy customers.
  - Produce quality.
  - etc.
- In today's financial capitalism, the ultimate goal is seen to be maximizing owner's wealth.
- Recent pushback.
  - Firms' should also provide social benefits: sustainability, ESG goals, etc.
- The objective of the firm varies depending on the stakeholder.

The objective of the firm

Firms' stakeholders

- Shareholders: exercise control over management (board of directors, annual meetings).

The objective of the firm

Firms' stakeholders

- Shareholders: exercise control over management (board of directors, annual meetings).
- Banks and bondholders: Had to be pay and can restrict corporate actions.

The objective of the firm

Firms' stakeholders

- Shareholders: exercise control over management (board of directors, annual meetings).
- Banks and bondholders: Had to be pay and can restrict corporate actions.
- Corporate managers: make financial and operating decisions.

The objective of the firm

Firms' stakeholders

- Shareholders: exercise control over management (board of directors, annual meetings).
- Banks and bondholders: Had to be pay and can restrict corporate actions.
- Corporate managers: make financial and operating decisions.
- Competitors.

The objective of the firm

Firms’ stakeholders

- Shareholders: exercise control over management (board of directors, annual meetings).
- Banks and bondholders: Had to be pay and can restrict corporate actions.
- Corporate managers: make financial and operating decisions.
- Competitors.
- Employees.

The objective of the firm

Firms' stakeholders

- Shareholders: exercise control over management (board of directors, annual meetings).
- Banks and bondholders: Had to be pay and can restrict corporate actions.
- Corporate managers: make financial and operating decisions.
- Competitors.
- Employees.
- Customers.

The objective of the firm

Firms' stakeholders

- Shareholders: exercise control over management (board of directors, annual meetings).
- Banks and bondholders: Had to be pay and can restrict corporate actions.
- Corporate managers: make financial and operating decisions.
- Competitors.
- Employees.
- Customers.
- Society: receive side benefits and bear side costs.

The objective of the firm

Firms' stakeholders

- Shareholders: exercise control over management (board of directors, annual meetings).
- Banks and bondholders: Had to be pay and can restrict corporate actions.
- Corporate managers: make financial and operating decisions.
- Competitors.
- Employees.
- Customers.
- Society: receive side benefits and bear side costs.

$\Longrightarrow$ Which one is given primacy?

The objective of the firm

- In traditional corporate finance, the objective in decision making is to maximize the value of the firm.
- A narrower objective is to maximize stockholder wealth. When the stock is traded and markets are viewed to be efficient, the objective is to maximize the stock price.
- To do so, a firm has to take decisions.
  - Investing decision: which project or asset to pick? (*real assets*)
  - Financing decision: given a project or asset, how to finance it? (*financial assets*)
- Relevant for firms but also to investors, governments, etc.

The objective of the firm

Investing and financing decisions

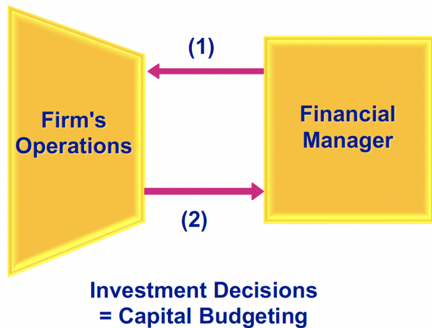
Company (revenue in billions for 2008)	Recent Investment Decision	Recent Financing Decision
Boeing ($61 billion)	Began production of its 787 Dreamliner aircraft, at a forecasted cost of more than $10 billion.	The cash flow from Boeing's operations allowed it to repay some of its debt and repurchase $2.8 billion of stock.
Royal Dutch Shell ($458 billion)	Invested in a $1.5 billion deepwater oil and gas field in the Gulf of Mexico.	In 2008 returned $13.1 billion of cash to its stockholders by buying back their shares.
Toyota (¥26,289 billion)	In 2008 opened new engineering and safety testing facilities in Michigan.	Returned ¥431 billion to shareholders in the form of dividends.
GlaxoSmithKline (£24 billion)	Spent £3.7 billion in 2008 on research and development of new drugs.	Financed R&D expenditures largely with reinvested cash flow generated by sales of pharmaceutical products.
Wal-Mart ($406 billion)	In 2008 announced plans to invest over a billion dollars in 90 new stores in Brazil.	In 2008 raised $2.5 billion by an issue of 5-year and 30-year bonds.
Union Pacific ($18 billion)	Acquired 315 new locomotives in 2007.	Largely financed its investment in locomotives by long-term leases.
Wells Fargo ($52 billion)	Acquired Wachovia Bank in 2008 for $15.1 billion.	Financed the acquisition by an exchange of shares.
LVMH (€17 billion)	Acquired the Spanish winery Bodega Numanthia Termes.	Issued a six-year bond in 2007, raising 300 million Swiss francs.
Lenovo ($16 billion)	Expanded its chain of retail stores to cover over 2,000 cities.	Borrowed $400 million for 5 years from a group of banks.

The objective of the firm

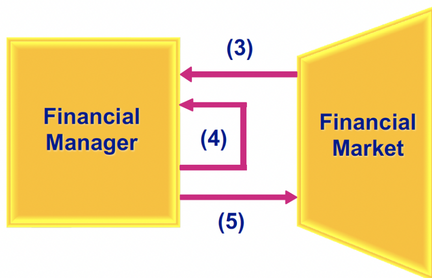
Investing and financing decisions

- A corporation can raise money from lenders or shareholders.
  - Lenders contribute the cash and get paid the debt plus a fixed interest rate.
  - Shareholders put up the cash, but get no fixed return. They hold a *residual* right on future cash-flows and profits.
- The choice between both is the choice of the capital structure.
- A lender has a lot of different choices: if a firm decides to borrow, does it do it through a bank or through bonds? For 1 year or 20 years? Does it negociate the right to pay of early if interest rates fall? *etc.*
- Equity financing can also be used, either through new shares, or by reinvesting past earnings (owned by shareholders).

The objective of the firm



The objective of the firm

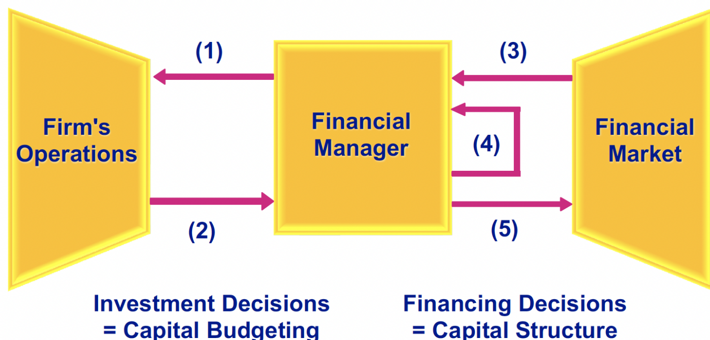


(3) Cash raised from investors (external finance)

(4) Cash reinvested (internal finance)

(5) Cash returned to investors

The objective of the firm



(1) Cash invested by firm

(2) Cash generated by operations

(3) Cash raised from investors (external finance)

(4) Cash reinvested (internal finance)

(5) Cash returned to investors

The objective of the firm

The opportunity cost of capital

- When making an investment, the CFO has to consider its return.
- Shareholders will only accept a return larger than what they can get by investing themselves the money.
- The minimum acceptable rate *i.e.* for an investment of similar risk, is called the opportunity cost of capital, or the hurdle rate.
- It needs to be estimated!

The objective of the firm

- How should firm’s managers make their choices?
- Some corporations have more than 100000 shareholders: all of them cannot be involved in management.
- Can they have a common objective?

The objective of the firm

- How should firm's managers make their choices?
- Some corporations have more than 100000 shareholders: all of them cannot be involved in management.
- Can they have a common objective?
- Yes! Maximize the market value of their investment i.e their wealth.
  - Is it always true?
  - Exit vs. voice strategy
- This goal is widely accepted in theory and practice.
  - Is it compatible with sustainability?

The objective of the firm

BR Business Roundtable
Policy Perspectives Corporate Initiatives Media About Us Member Portal

FINANCIAL TIMES
HOME WORLD US COMPANIES TECH MARKETS CLIMATE OPINION LEX WORK & CAREERS LIFE & ARTS HTSI
Opinion Corporate culture
The backlash against shareholder value
Many Americans believe corporations must address social and political issues
RANA FOROOHAR + Add to myFT

FINANCIAL TIMES
HOME WORLD US COMPANIES TECH MARKETS CLIMATE OPINION LEX WORK & CAREERS LIFE & ARTS HTSI
Opinion ESG investing
The stakeholder doctrine is flourishing despite attacks on ESG
Corporate leaders realise they can't ignore the social and political context in which they operate
GILLIAN TETT + Add to myFT

Statement on the Purpose of a Corporation

America's CEOs Seek a New Purpose for the Corporation

For more than two decades, the influential Business Roundtable has explicitly put shareholders first. In an atmosphere of widening economic inequality and deepening distrust of business, the powerful group has redefined its mission.

The CEOs of nearly 200 companies just said shareholder value is no longer their main objective

KEY POINTS
- The Business Roundtable, a group of chief executive officers of nearly 200 major U.S. corporations, issues a statement with a new definition of the "purpose of a corporation."
- The reimagined idea of a corporation drops the age-old notion that they function first and foremost to serve their shareholders and maximize profits.
- Investing in employees, delivering value to customers, dealing ethically with suppliers and supporting outside communities are now at the forefront of American business goals.

The objective of the firm

Maximizing shareholder value

- Why not maximizing profits?
  - Which profits? Maximizing current year profits might be compatible with long-term profits
  - A corporation can decrease dividend payments to increase profits: might not be valuable for shareholders.
- What about other stakeholders?
  - It depends on the corporate culture!

The objective of the firm

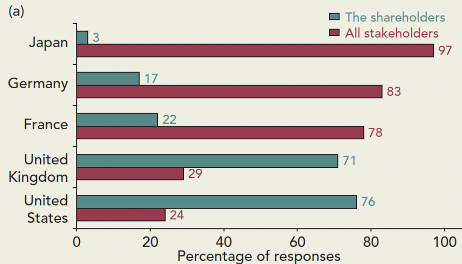
Maximizing shareholder value

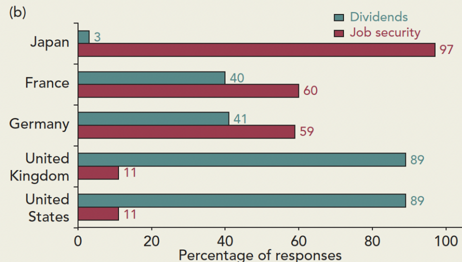
FIGURE 1.3

(*a*) Whose company is it? The views of 378 managers from five countries.

(*b*) Which is more important—job security for employees or shareholder dividends? The views of 399 managers from five countries.

Source: M. Yoshimori, "Whose Company Is It? The Concept of the Corporation in Japan and the West," *Long Range Planning,* 28 (August 1995), pp. 33–44. Copyright © 1995 with permission from Elsevier Science.





The objective of the firm

Agency Problems

- Public corporations **separate ownership and control**.
  - It gives corporations a permanence.
  - The owner cannot control what managers do, except indirectly through the board of directors.
- It is necessary but has dangers because they can follow their own interests.
  - *e.g.* buy private jet for their own business trips, U.S. CEO charging $1 million to the company for his wife's birthday.
  - Do not invest in valuable but risky projects because they are worried by the safety of their jobs.
  - Make short-term profits at the expense of the long-term health of the company.

The objective of the firm

Agency Problems

$\longrightarrow$ Agency problems

The objective of the firm

Agency Problems

$\longrightarrow$ Agency problems

  - Happens when *agents* work for *principals*.
  - Creates additional costs: monitoring costs.

- Need to design institutions to minimize these costs.
- Regulatory requirements, incentives schemes, *etc.*

The objective of the firm

Ensuring good governance

- Legal and regulatory requirements for managers.

The objective of the firm

Ensuring good governance

- Legal and regulatory requirements for managers.
    - *e.g.* Transparency of accounts, no insider trading.

The objective of the firm

Ensuring good governance

- Legal and regulatory requirements for managers.
  - *e.g.* Transparency of accounts, no insider trading.
- Compensation plans.

The objective of the firm

Ensuring good governance

- Legal and regulatory requirements for managers.
    - *e.g.* Transparency of accounts, no insider trading.
- Compensation plans.
    - *e.g.* Stock Options.

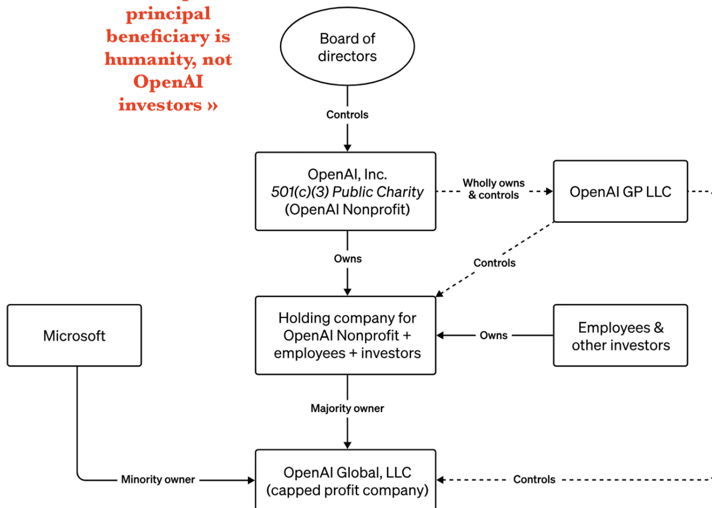
The objective of the firm

Ensuring good governance

- Legal and regulatory requirements for managers.
  - *e.g.* Transparency of accounts, no insider trading.
- Compensation plans.
  - *e.g.* Stock Options.
- Boar of directors.
  - Elected by shareholders to represent them.
- Shareholders pressure.
  - What if shareholder decides to leave?

The objective of the firm

The case of Open AI



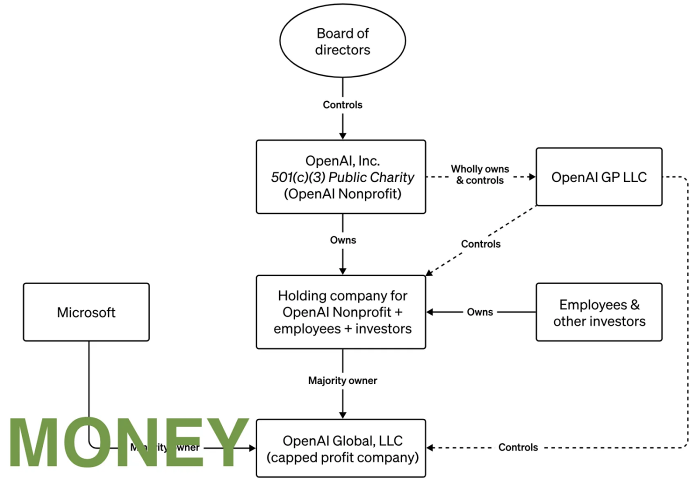
The objective of the firm

The case of Open AI

- Last 17th of November the board fired Sam Altman, the founder of Open AI.
- “he was not consistently candid… with the board.”
- On 20th of November Microsoft announced that they hired Altman + many engineers ar Open AI.
- On November 22 Sam Altman was back as CEO of OpenAI, and all but one director of OpenAI resigned.

The objective of the firm

The case of Open AI



The objective of the firm

- All the choices made by the financial manager will eventually be reflected in the firm's financial statements.
- Three types of statements:
  - Income statement: revenues and income generated over a given period of time based on the accrual concept.
  - Balance sheet: Statement at a point in time of a company's financial position. Assets (on the left) sum to liabilities (on the right).
  - Cash flow statement: Accounting balance sheet $\neq$ Finance balance sheet. Notion of cash flow is very important (more than earnings).

The objective of the firm

- Cash flow statement: Accounting balance sheet $\neq$ Finance balance sheet. Notion of cash flow is very important (more than earnings).
    - Earnings can be different from CF: accounting requires to report transactions as they happen, not as you get paid and because capital expenses are spread over time (depreciation/amortization) as opposed to operating expenses.
    - CF = Earnings + non-cash expenses (depreciation/amortization that lower earnings but are not CF) - capital expenditures (you got to pay for it) - change in non-cash working capital

The income statement

- Revenues and income generated over a given period of time based on the accrual concept
  - i.e. accounted even if there is no cash transaction.
  - e.g. **accounts payable:** employee bonuses that were earned in 2023 but won't be paid until 2024. The 2023 financial statements must reflect the bonus expenses earned by employees in 2023 as well as the bonus liability the company plans to pay out.

The income statement

TABLE 13.4 Income Statements for Walgreens ($ MILLIONS)

	2014	2015
Revenue	$76,392	$103,444
Cost of goods sold	$54,823	$76,520
Selling, general and administrative expenses and depreciation	$17,375	$22,256
Operating income	$4,194	$4,668
Interest expense	$156	0
Other expenses (income)	$481	($643)
Income before taxes	$3,557	$5,311
Income taxes	$1,526	$1,056
Net income	$2,031	$4,255
Earnings per share	$2.03	$4.05

The income statement

- The large increase in revenues comes from a merger with a large European Company (Alliance Boots).
- COGS reflects the costs directly involved in production (raw materials, labor, etc.).
- Other expenses are stable or fixed in nature.
- Depreciation is the decrease in value of a firm's asset due to production (e.g. depreciation of a robot). This is not linked to a cash outflow: non-cash expense.
- Operating income is before interest and taxes (=EBIT).
- Net income: What is available to firm's owners.
- Earnings per share divides net income by the number of shares.

The balance sheet

- Statement at a point in time of a company's financial position. Assets (on the left) sum to liabilities (on the right).
- Assets are what is owned by the firm and liabilities are the claims of creditors and owners.
- The balance sheet reveals a firm's financial structure.
- The balance sheet is always... balanced: Assets = Liabilities + Owner's equity.

The balance sheet

TABLE 13.5 Balance Sheets for Walgreens ($ MILLIONS)

	2014	2015
Cash & Cash equivalents	$2,646	$3,000
Accounts receivable	$3,218	$6,849
Inventories	$6,076	$8,678
Other current assets	$302	$1,130
Total Current Assets	$12,242	$19,657
Net fixed assets	$12,257	$15,068
Other long-term assets	$10,324	$17,685
Goodwill & intangibles	$2,359	$16,372
Total Fixed Assets	$24,940	$49,125
TOTAL ASSETS	$37,182	$68,782
Accounts payable	$4,315	$10,088
Short-term debt	$774	$1,068
Other current liabilities	$3,806	$5,401
Total Current Liabilities	$8,895	$16,557
Long-term debt	$3,736	$13,315
Other liabilities	$4,094	$8,049
TOTAL LIABILITIES	$16,725	$37,921
Preferred equity	$0	$0
Common equity + Retained earnings	$20,457	$30,861
TOTAL STOCKHOLDERS' EQUITY	$20,457	$30,861
TOTAL LIABILITIES & EQUITY	$37,182	$68,782

The balance sheet

Assets

- The most liquid assets are listed first.
- Current assets: assets that will be converted into cash in less than 1 year. This is the working capital needed to carry out the normal operations of business.
- Fixed assets: physical facilities used for the production, storage, display, and distribution of the products (plants and equipment, land).
- It also includes intangible assets.
- Goodwill: difference between a firm's value (e.g. 100 millions) and what another firm may pay to acquire it (e.g. 110 millions). Assets then increase by 110 = 100 (assets) + 10 (goodwill).

The balance sheet

Liabilities

- Liabilities are the debt of a business: direct borrowing, credit, accrual of obligations (wages, income tax).
- Current liabilities are payable within one year.
- All business have owners' equity a way or another. This can correspond to the cash initially used to buy the first machines, real estate or equipment.
- Owners claim are a residual claim, it is always represented by the difference between total assets and total liabilities.
- Main difference between preferred and common stock: preferred stock does not come with a voting right.

The Cash Flow statement

- Contrary to previous accounts, it is not on an accrual basis.
- Divided between operating activities, investing activities, and financing activities.
- Take net income in the income statement.
  - Add depreciation (noncash expense).
  - Add net changes in the assets, liability and equity account.
    - Buying raw materials increases assets but decreases cash flows.
    - Borrowing money from the bank increase cash flows, paying interests decreases it.
  - Add cash dividends.

The Cash Flow statement

TABLE 13.6 Statement of Cash Flows, Walgreens, 2015 ($ millions)

OPERATING ACTIVITIES	
Net income (Loss)	4,255
Other income	24
Depreciation & amortization	1,742
(Increase) Decrease in receivables	–338
(Increase) Decrease in inventories	719
(Increase) Decrease in other current assets	
Increase (Decrease) in payables	268
Increase (Decrease) in other current liabilities	–154
Other adjustments, Net	–852
CASH FROM OPERATIONS	**5,664**
INVESTING ACTIVITIES	
Capital expenditure	–1,251
Acquisitions	–4,018
Sale of property, plant & equipment	
Investments (increase)	–49
Other investing cash flow	1,042
CASH FROM INVESTMENTS	**–4,276**
FINANCING ACTIVITIES	
Issuance of capital stock	–1,226
Net debt increase (decrease)	1,587
Dividends	–1,384
Other cash in (out) flow	108
CASH FROM FINANCING	**–915**
Effect of exchange rates	–119
NET CHANGE IN CASH	**354**

Important ratios

- All these statements help to evaluate the current health of the company.
- But it also helps predicting the firm's future earnings and the risk associated.
- Ratio analysis is generally used to learn about a firm's strengths and weaknesses.
  - It helps standardizing the balance sheet.
- Different types of ratio analysis.
  - Time series analysis, cross-sectional analysis, industry comparative analysis.
  - Liquidity ratios, asset management ratios, financial leverage ratios, profitability ratios, and market value ratios.

Liquidity ratios

- Liquidity is important as it determines the risk of insolvency or default.
- To pay its debt the firm needs cash.
- Liquidity ratios indicate the ability to meet short-term obligations to creditors.
- Whats the relationship between current assets and current liabilities? How quick inventories and receivables turn into cash?

Liquidity ratios

- Current ratio = Current assets / Current Liabilities

Liquidity ratios

- Current ratio = Current assets / Current Liabilities
  - It is 1.38 in 2014 and 1.19 in 2015 for Walgreens.

Liquidity ratios

- Current ratio = Current assets / Current Liabilities
  - It is 1.38 in 2014 and 1.19 in 2015 for Walgreens.
- Quick ratio (or acid test ratio) = (Cash + Marketable securities + accounts receivables) / Current liabilities $\longrightarrow$ excludes inventories that are less liquid.
- A ratio around 1 indicates that liquid assets of the firm cover its liabilities.

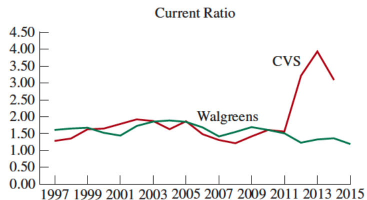
Liquidity ratios

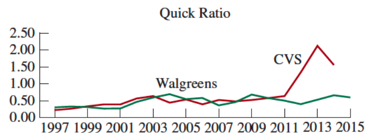
- Current ratio = Current assets / Current Liabilities
  - It is 1.38 in 2014 and 1.19 in 2015 for Walgreens.
- Quick ratio (or acid test ratio) = (Cash + Marketable securities + accounts receivables) / Current liabilities $\longrightarrow$ excludes inventories that are less liquid.
- A ratio around 1 indicates that liquid assets of the firm cover its liabilities.
  - It is 0.66 in 2014 and 0.59 in 2015 for Walgreens.
  - Low but fine for a retailer.
- Average payment period = year-end accounts payable / firm's averages COGS per day

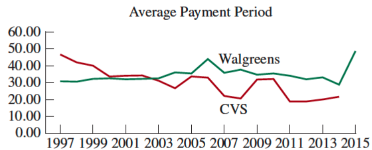
Liquidity ratios

- Current ratio = Current assets / Current Liabilities
  - It is 1.38 in 2014 and 1.19 in 2015 for Walgreens.
- Quick ratio (or acid test ratio) = (Cash + Marketable securities + accounts receivables) / Current liabilities $\longrightarrow$ excludes inventories that are less liquid.
- A ratio around 1 indicates that liquid assets of the firm cover its liabilities.
  - It is 0.66 in 2014 and 0.59 in 2015 for Walgreens.
  - Low but fine for a retailer.
- Average payment period = year-end accounts payable / firm's averages COGS per day
  - How long it takes on average to pay its suppliers.
  - It is 28.7 days in 2014 and 48.1 days in 2015 for Walgreens.
  - High but fine for a retailer.

Liquidity ratios







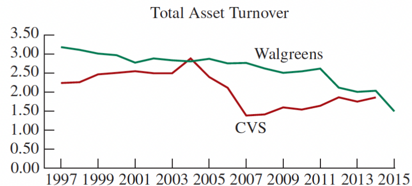
Asset Management Ratios

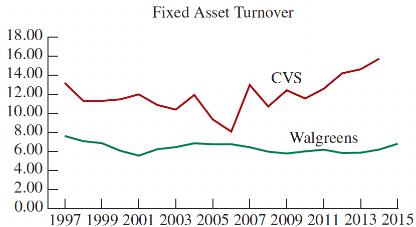
- Indicate the extent to which assets are turned over or used to support sales.
- Total assets turnover ratio = Net Sales / Total Assets.
- Measures how much a dollar of assets create in terms of sales.
- Fixed assets turnover ratio = Net Sales / Net Fixed Assets.
- Same with fixed assets.
    - Careful: A large ratio can indicate that the firm use obsolete and depreciated equipment.

Asset Management Ratios

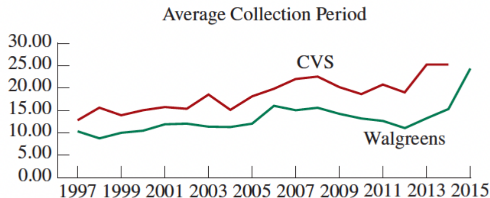
- Average Collection Period: year-end accounts receivables / Average net sales per day.
  - Number of days to collect credit sales made to firm’s customers. A shorter period is preferred.
- Inventory Turnover Ratio: COGS/year-end inventory.
  - How efficiently the inventory is being managed. It has to be compared with industry norms, you don’t want it to be too large, or too small.

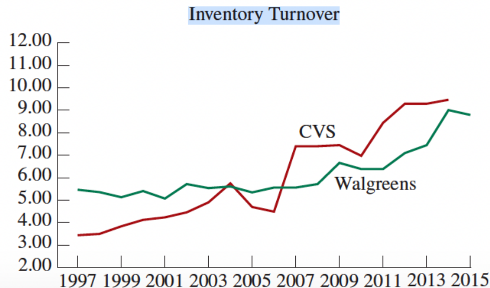
Asset Management Ratios





Asset Management Ratios





Financial Leverage Ratios

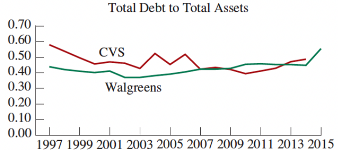
- How much borrowed funds and debt are used to finance assets, and ability of the firm to pay its debt.

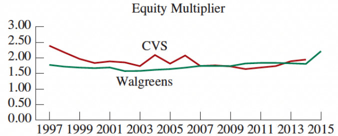
- Debt to total Assets: Total Debt / Total Assets.

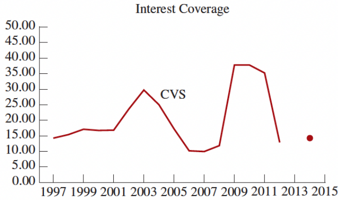
Financial Leverage Ratios

- How much borrowed funds and debt are used to finance assets, and ability of the firm to pay its debt.
- Debt to total Assets: Total Debt / Total Assets.
  - 45% in 2014 and 55% in 2015. The firm took on debt as a result of the merger.
  - Too high: limited ability for additional borrowing. Lenders might ask high rates for the excessive risk of lending to a firm with a lot of debt.
  - Too low: the firm might have a more efficient use of debt.
- Equity Multiplier: Total Assets / Total Equity
  - A higher level of assets relative to equity means a higher level of debt, and then a greater use of leverage.
- Interest Coverage: EBIT / Interest expense
  - Firm's ability to meet its interest and principal repayment obligations.

Asset Management Ratios







Profitability ratios

- Indicate firm's ability to generate returns on its sales, assets and equity.
- Operating Profit Margin: EBIT / Net Sales
  - Ability to control operating expenses relative to sales.
- Net Profit Margin: Net Income / Net Sales
  - Same but it also includes interests and tax obligations.
- Return ratios: Return on assets (Net Income / Net Assets) and Return on Equity (Net Income /Common Equity). This last ratio measures the return investors earned by investing in the firm.

Profitability ratios

The DuPont method

- Note that: Return on assets = Net Profit Margin $\times$ Total Asset Turnover
  - Allows to separate the change in ROA into its two components.
- Similarly the Return on Equity can be decomposed as:
  - Return on Equity = Net Profit Margin $\times$ Totak Asset Turnover $\times$

Profitability ratios

The DuPont method

- Note that: Return on assets = Net Profit Margin $\times$ Total Asset Turnover
  - Allows to separate the change in ROA into its two components.
- Similarly the Return on Equity can be decomposed as:
  - Return on Equity = Net Profit Margin $\times$ Totak Asset Turnover $\times$ Equity multiplier.

Profitability ratios

The DuPont method

- Note that: Return on assets = Net Profit Margin $\times$ Total Asset Turnover
  - Allows to separate the change in ROA into its two components.
- Similarly the Return on Equity can be decomposed as:
  - Return on Equity = Net Profit Margin $\times$ Totak Asset Turnover $\times$ Equity multiplier.
- ROE can change because of net profit margin, total asset turnover, or leverage.
- Represents leverage: if a firm uses relatively more liabilities to finance assets, the equity multiplier will rise and ROE will increase.
- Here: not a greater operating efficiency, only a greater use of debt financing.
- This method is called the DuPont method of ratio analysis.

Market-Value Ratios

- Indicate how investors value the firm compared to its financial values.
- When market are efficient, a firm's profitability, risk, quality of management, and many other factors should be reflected in its stock and security prices.
- Price-earning ratio: stock price / earning per share.
  - Willingness of investors to pay for an additional dollar of EPS.
- Price-to-book value: market value / balance sheet equity.
  - In an efficient market, it reflects investors pessimism or optimism about a company's future.