经济管理学院
The college of Economics and Management

Lecture 2

Financial Statements, Taxes, and Cash Flow

Corporate Finance – Fall 2019

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Prelude

- The purpose of this chapter is to briefly examine financial statement and point out relevant features for financial decisions
  - Our emphasis is not on preparing financial statements
  - Instead, we regard financial statements as a key source of information for financial decisions
- We will see two important differences in this chapter
  - the difference between accounting value and market value
  - the difference between accounting income and cash flow

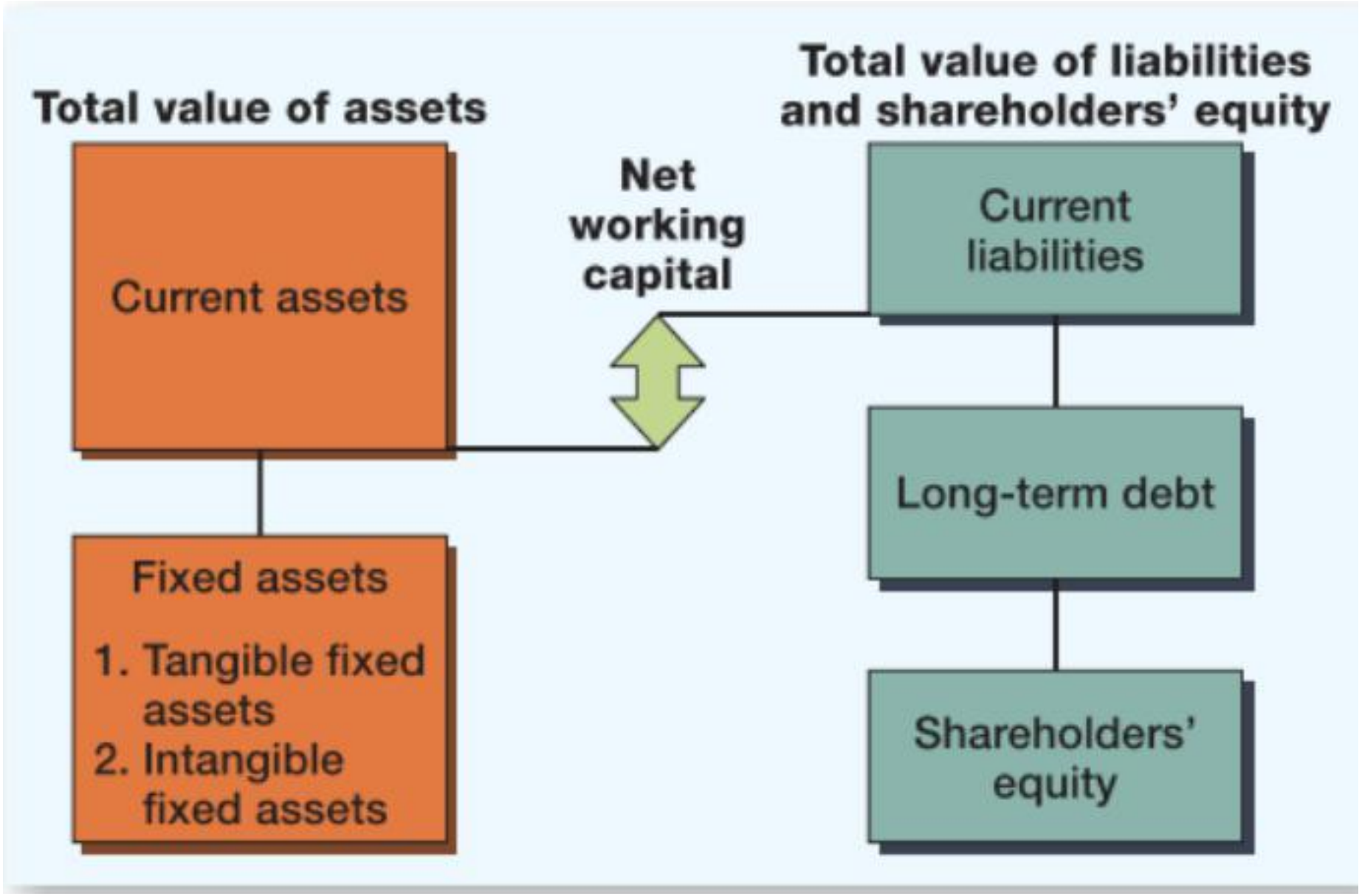
Learning objectives

LO1: the difference between accounting value (or “book” value) and market value.

LO2: The difference between accounting income and cash flow

LO3: The difference between average and marginal tax rates

LO4: how to determine a firm’s cash flow from its financial statements


Total value of assets
Total value of liabilities and shareholders' equity
Current assets
Net working capital
Current liabilities
Long-term debt
Fixed assets
1. Tangible fixed assets
2. Intangible fixed assets
Shareholders' equity

2.1 The Balance Sheet

- BALANCE SHEET: financial statement showing a firm's accounting value on a particular date.

2.1.1 Assets: the left side

- Current assets
  - convert to cash within 12 months
  - e.g. cash, accounts receivable, inventory
- Fixed assets
  - relatively long life
  - tangible assets (e.g. a truck, a computer)
  - intangible assets (e.g. a trademark, a patent)

2.1.2 Liabilities and owners' equity: the right side

- Current liabilities
  - must be paid within the year
  - e.g. accounts payable
- Long-term liabilities
  - a debt that is not due in the coming year
  - e.g. a loan that the firm will pay off in five years
- *bond / bondholders* and *long-term debt / long-term creditors* are interchangeably in this textbook.

- Shareholders equity
  - SHAREHOLDERS EQUITY: the difference between the total value of the assets and the total value of liabilities
    - synonyms: common equity, owners' equity
  - "*intended* to reflect …whatever *residual value remained* would belong to the shareholders."

- **Asset = liabilities + shareholders' equity** (balance sheet identity)
  - the value of the left side always equals that of right side -> The balance sheet "balances"

2.1.3 Net working capital

- NET WORKING CAPITAL: current assets less current liabilities
  - usually positive in a healthy firm
    - Cash that will be available over the next 12 month **>** Cash that must be paid over the next 12 months

EXAMPLE 2.1 Building the Balance Sheet

A firm has current assets of $100, net fixed assets of $500, short-term debt of $70, and long-term debt of $200. What does the balance sheet look like? What is shareholders' equity? What is net working capital?

In this case, total assets are $100 + 500 = $600 and total liabilities are $70 + 200 = $270, so shareholders' equity is the difference: $600 − 270 = $330. The balance sheet would look like this:

Assets		Liabilities and Shareholders' Equity	
Current assets	$100	Current liabilities	$ 70
Net fixed assets	500	Long-term debt	200
		Shareholders' equity	330
Total assets	$600	Total liabilities and shareholders' equity	$600

Net working capital is the difference between current assets and current liabilities, or $100 − 70 = $30.

U.S. CORPORATION
2014 and 2015 Balance Sheets
($ in millions)

Assets	2014	2015	Liabilities and Owners' Equity	2014	2015
Current assets			Current liabilities		
Cash	$ 104	$ 160	Accounts payable	$ 232	$ 266
Accounts receivable	455	688	Notes payable	196	123
Inventory	553	555	Total	$ 428	$ 389
Total	$1,112	$1,403			
Fixed assets					
Net plant and equipment	$1,644	$1,709	Long-term debt	$ 408	$ 454
			Owners' equity		
			Common stock and paid-in surplus	600	640
			Retained earnings	1,320	1,629
			Total	$1,920	$2,269
Total assets	$2,756	$3,112	Total liabilities and owners' equity	$2,756	$3,112

Notice the order of the items

Left side reflects:

- The line of business
- managerial decisions of cash, inventory, credit policy, fixed asset acquisition…

Right side reflects:

- managerial decisions about capital structure and short-term debt

- Three important things in examining a balance sheet
  - liquidity
  - debt versus equity
  - market value versus book value

2.1.4 Liquidity

- LIQUIDITY: the speed and ease with which an asset can be converted to cash
  - a liquidity asset can be quickly sold without a loss of value
  - e.g. gold (liquid asset), a custom manufacturing facility (illiquid asset)
- Assets are normally listed in order of decreasing liquidity
  - e.g. ordinarily, cash > accounts receivable> inventory
- Fixed assets (tangible and intangible) are more illiquid, but won't ordinarily convert to cash
  - they are used in business to generate cash
- Liquidity is valuable
  - a trade-off between advantages of liquidity and potential profits
    - more liquid business -> less likely financial distress
    - more liquid -> less profitable (e.g. cash holdings)

2.1.5 Debt versus equity

Shareholders' equity ≡ assets - liabilities

- Accounting sense: shareholders' equity is such defined
- Economic sense: after selling its assets and paying its debts, whatever cash is left belongs to shareholders

FINANCIAL LEVERAGE: the use of debt in a firm's capital structure

- more debts (% of assets) -> greater degree of financial leverage
- this "lever" magnifies both gains (potential reward to shareholders) and losses (potential for financial distress)

2.1.6 Market value versus book value

- Book values of assets are generally not what they are actually worth
- Accounting rules can affect book values but not market value
  - A change in rules all by itself has no effect on riskiness and cash follows
- Under GAAP, assets are shown at historical cost
  - no matter how long ago they were purchased
  - no matter how much they are worth now
- For current assets, book value and market value might be similar
  - current assets are bought and converted into cash over a short span
- For fixed assets, the two values often differ quite a bit
  - e.g. a railroad owning tracts of land purchased long ago

- The market value of the firm is not on the balance sheet
  - Balance sheet assets are listed at cost, not market value
  - Moreover, many valuable assets don't directly appear on balance sheet (good management, a good reputation, talented employees, etc.)
- shareholders' equity need not to be related to market value of stock
  - See the difference between shareholders' equity and total market value
- The "value" in financial management goal refers to "market value"
  - the accounting value of the stock in not an especially important concern for financial managers
  - the goal of financial management is to maximize the market value of equity per share

Market Value versus Book Value

EXAMPLE 2.2

The Klingon Corporation has net fixed assets with a book value of $700 and an appraised market value of about $1,000. Net working capital is $400 on the books, but approximately $600 would be realized if all the current accounts were liquidated. Klingon has $500 in long-term debt, both book value and market value. What is the book value of the equity? What is the market value?

We can construct two simplified balance sheets, one in accounting (book value) terms and one in economic (market value) terms:

KLINGON CORPORATION
Balance Sheets
Market Value versus Book Value

Assets			Liabilities and Shareholders' Equity		
	Book	Market		Book	Market
Net working capital	$ 400	$ 600	Long-term debt	$ 500	$ 500
Net fixed assets	700	1,000	Shareholders' equity	600	1,100
	$1,100	$1,600		$1,100	$1,600

In this example, shareholders' equity is actually worth almost twice as much as what is shown on the books. The distinction between book and market values is important precisely because book values can be so different from true economic value.

2.2 The Income Statement

- INCOME STATEMENT: Financial statement summarizing a firm's performance over a period of time
  - Balance sheet -> snapshot; income statement -> video
  - Income statement equation: Revenue - Expenses = Income
- BOTTOM LINE: The last item named net income
  - Often expressed on a per-share basis (Earnings per share, EPS)

U.S. CORPORATION 2015 Income Statement ($ in millions)		
Net sales		$1,509
Cost of goods sold		750
Depreciation		65
Earnings before interest and taxes		$ 694
Interest paid		70
Taxable income		$ 624
Taxes (34%)		212
Net income		$ 412
Dividends	$103	
Addition to retained earnings	309	

Suppose 200 million shares outstanding:

Earnings per share= $412/200 = $2.06, Dividend per share= $103/200 = $0.515

- Keep three things in mind when looking at an income statement:
  - GAAP
  - Cash versus noncash items
  - Time and costs

2.2.1 GAAP And The Income Statement

- Under GAAP, revenue is shown when it accrues.
  - the revenue is recognized at the time of sale (not necessarily when the cash comes in)
- Expenses are based on the matching principle.
  - we sell a product (on credit or not) -> both the revenue and the cost associated with the sale will be recognized at the time of sale.
  - the actual cash outflows may have occurred at some different time
- As a result, the figures on the income statement are not representative of the actual cash inflows and outflows

2.2.2 Noncash items

- Income statement contains noncash items -> accounting income differs from cash flow
- NONCASH ITEMS: Expenses charged against revenues that do not directly affect cash flow (such as depreciation)
  - e.g. a firm pays $5,000 for an asset at the time of purchase, and deduct $1,000 as an expense each year over a five-year period.
  - the depreciation deduction is another application of the matching principle.
    - match the expense of purchasing the asset with the benefits produced from owning it
- For financial managers, the actual timing of cash inflows and outflows is critical with market value
  - they need to separate the cash flows from the noncash accounting entries

2.2.3 Time and costs

- Fixed costs vs. variable costs
  - We can separate them in a relatively short time horizon
    - fixed costs must be paid no matter what (e.g. property taxes)
    - variable costs vary with output level (e.g. payments to suppliers)
  - cared by financial managers for decisions, not by accountants
- Product costs vs. period costs
  - cared by accountants to classify items of the income statement
    - product costs (raw materials, direct labor expense, manufacturing overhead) -> costs of goods sold (COGS)
    - period costs (incurred during a particular time period) -> selling, general, and administrative expenses (S,G&A)
    - product costs or period costs can be both fixed or variable

2.3 Taxes

- Taxes can be one of the largest cash outflows
  - See its economic magnitude
- Tax rules are the result of political forces -> no reason to make economic sense

2.3.1 Corporate tax rates

- illustrated using corporate tax rates in effect for 2015 (US)
  - marginal tax rates are not strictly increasing
  - 38% and 39% are surcharges applied on top of the 34% and 35% rates
  - In this section we only discuss federal tax rates.
    - The overall tax rates are more complex

Taxable Income	Tax Rate
$ 0 – 50,000	15%
50,001 – 75,000	25
75,001 – 100,000	34
100,001 – 335,000	39
335,001 – 10,000,000	34
10,000,001 – 15,000,000	35
15,000,001 – 18,333,333	38
18,333,334 +	35

2.3.2 Average versus marginal tax rates

AVERAGE TAX RATE: total taxes paid divided by total taxable income

MARGINAL TAX RATE: amount of tax payable on the next dollar earned

(1) Taxable Income	(2) Marginal Tax Rate	(3) Total Tax	(3)/(1) Average Tax Rate
$ 45,000	15%	$ 6,750	15.00%
70,000	25	12,500	17.86
95,000	34	20,550	21.63
250,000	39	80,750	32.30
1,000,000	34	340,000	34.00
17,500,000	38	6,100,000	34.86
50,000,000	35	17,500,000	35.00
100,000,000	35	35,000,000	35.00

- flat 35% of taxable income after $18.33 million -> large corporations
- flat 34% in between $335,000 to $10,000,000 -> midsize
- We assume the average and marginal tax rates are 35% hereafter

- Tax rates can vary a lot across industries
  - tax deductions and loopholes allowed for certain industries

Industry	Number of Companies	Average Tax Rate
Electric utilities (Eastern U.S.)	24	33.8%
Trucking	33	32.7
Railroad	15	27.4
Securities brokerage	30	20.5
Banking	481	17.5
Medical supplies	264	11.2
Internet	239	5.9
Pharmaceutical	337	5.6
Biotechnology	121	4.5

2.4 Cash Flow

Cash flow is one of the most important pieces of financial information gleaned from financial statements

- here cash flow means the differences between the number of dollars that came in and went out
- no standard financial statement presents this information
  - differs from “statement of cash flows”

Cash flow identity:

Cash flow from assets = cash flow to creditors + cash flow to stockholders

- The cash flow from the firm’s assets is equal to that paid to the suppliers of capital (either creditors or owners)

2.4.1 Cash flow from assets

- CASH FLOW FROM ASSETS: the total of cash flow to creditors and cash flow to stockholders, consisting of the following: operating cash flow, capital spending, and change in net working capital.
- OPERATING CASH FLOW: cash generated from a firm's normal business activities.
  - expenses associated with the firm's financing of its assets are not included
- Some portion of the firm's cash flow is reinvested in the firm
  - Net capital spending: the net spending on fixed assets
    - = purchases of fixed assets less sales of fixed assets
  - Change in net working capital (NWC): the amount spent on NWC
    - Change in NWC = Δ(current assets – current liabilities)

Operating cash flow

- Operating cash flow tells us whether a firm's cash inflows from its business operations are sufficient to cover its everyday cash outflows

U.S. CORPORATION 2015 Operating Cash Flow	
Earnings before interest and taxes	$694
+ Depreciation	65
– Taxes	212
Operating cash flow	$547

- start from EBIT (not deduct interest yet)
- differs from the accounting definition (net income plus depreciation)
  - the accounting definition implicitly consider interest as an operating expenses (see table 3.3)

Capital spending

- cash flow -> fixed assets
- net capital spending is money spent on fixed assets less money received from the sale of fixed assets
  - could be both + and -
- capital expenditure (CAPEX) usually means the same thing

Ending net fixed assets	$1,709
− Beginning net fixed assets	1,644
+ Depreciation	65
Net capital spending	$ 130

Change in net working capital (NWC)

- cash flow -> current assets
- NWC(2015) = $1,403-389 = $1,014, NWC(2014) = $1,112-428 = $684

Ending NWC	$1,014
– Beginning NWC	684
Change in NWC	$ 330

Conclusion

U.S. CORPORATION 2015 Cash Flow from Assets	
Operating cash flow	$547
– Net capital spending	130
– Change in NWC	330
Cash flow from assets	$ 87

- this $87 cash flow from assets equals the sum of cash flow to creditors and that to stockholders
  - Recall the figure of “cash flows to and from the firm” in Lecture 1
- A growing corporation may have a negative cash flow
  - it raises more money than paid out to creditors and stockholders

A note about “Free” cash flow

- sometimes cash flow from assets is named as free cash flow
  - the cash is free to distribute to creditors and stockholders (not needed for working capital or fixed asset investments)
- Free cash flow has several definitions that either mean cash flow from assets or some similar things.

2.4.2 cash flow to creditors and stockholders

- Cash flow to creditors = interest payments - net new borrowing
  - refers to the income statement and the balance sheets, respectively
  - interest $70, Δ(long-term debt) = $454 - 408 = $46
- sometimes called cash flow to bondholders

U.S. CORPORATION 2015 Cash Flow to Creditors	
Interest paid	$70
− Net new borrowing	46
Cash flow to creditors	$24

- Cash flow to stockholders = dividend paid out - net new equity raised
  - refers to the income statement and the balance sheets, respectively
  - dividend $103, Δ(common stock and paid-in surplus) = $640 - 600 = $40

U.S. CORPORATION 2015 Cash Flow to Stockholders	
Dividends paid	$103
– Net new equity raised	40
Cash flow to stockholders	$ 63

- Finally, verify that cash flow from assets = cash flow to creditors and stockholders
  - $87 = $24 + $63 -> checks out

I. The cash flow identity

Cash flow from assets = Cash flow to creditors (bondholders)
+ Cash flow to stockholders (owners)

II. Cash flow from assets

Cash flow from assets = Operating cash flow
− Net capital spending
− Change in net working capital (NWC)

where:

Operating cash flow = Earnings before interest and taxes (EBIT)
+ Depreciation − Taxes

Net capital spending = Ending net fixed assets − Beginning net fixed assets
+ Depreciation

Change in NWC = Ending NWC − Beginning NWC

III. Cash flow to creditors (bondholders)

Cash flow to creditors = Interest paid − Net new borrowing

IV. Cash flow to stockholders (owners)

Cash flow to stockholders = Dividends paid − Net new equity raised

2.4.3 An example: cash flows for Dole Cola

Operating cash flow

- $600 Sales , $300 cost of goods sold, $150 depreciation, $30 interest paid, 34% tax rate, $30 dividends (all are in millions)
  - Information -> income statement -> operating cash flow
  - depreciation and interest cause its difference from net income
    - depreciation is not a cash expense
    - interest paid is a financial expense (here we are looking at only the left side of “cash flow from assets = cash flow to creditors and stockholders”)

DOLE COLA 2015 Income Statement		
Net sales		$600
Cost of goods sold		300
Depreciation		150
Earnings before interest and taxes		$150
Interest paid		30
Taxable income		$120
Taxes		41
Net income		$ 79
Dividends	$30	
Addition to retained earnings	49	

DOLE COLA 2015 Operating Cash Flow	
Earnings before interest and taxes	$150
+ Depreciation	150
− Taxes	41
Operating cash flow	$259

Net capital spending

- Suppose $500 beginning net fixed assets and $750 ending net fixed assets. What was the net capital spending for the year?
  - net capital spending = $750 - 500 + 150 (depreciation) = $400

Change in NWC and cash flow from assets

- Suppose $2,130 current assets and $1,620 current liabilities at the beginning of the year, and corresponding $2,260 and $1,710 at the end
  - change in NWC = ($2,260-1,710) - ($2,130-1,620) = $40
- Put three items together:
  - Cash flow from assets = operating cash flow - net capital spending - change in NWC = $259 - 400 - 40 = -$181
    - If the fixed assets are good investments, the negative cash flow is not a worry

Cash flow to stockholders and creditors

- Dole Cola raised more money (-$181) of new debt and equity than it paid out. Now suppose Dole didn't sell any new equity for the year.

DOLE COLA 2015 Cash Flow to Stockholders	
Dividends paid	$30
– Net new equity raised	0
Cash flow to stockholders	$30

- Cash flow to creditors = -$181 - $30 = -$211
  - Cash flow to creditors = cash flow from assets - cash flow to stockholders
- Net new borrowing = $241
  - recall $30 interest -> Dole borrowed $241 from creditors
  - Net new borrowing = interest paid - Cash flow to creditors (Table 2.6)

Epilogue

- This chapter covers the following key points:
  - Book value and market value can be very different
    - The goal of financial management is to maximize the market value of the stock
  - Net income is not cash flow
    - A primary reason is a noncash expense named depreciation
  - Marginal and average tax rate can be different
    - Marginal tax rate is more relevant for financial decisions
  - There is a cash flow identity much like the balance sheet identity
    - Cash flow from assets equals cash flow to creditors and stockholders

CH2 Assignments (Due at 6 p.m. 2019/9/11)

BASIC QUESTIONS 2, 3, 4, and 8 (Compulsory)

INTERMEDIATE QUESTIONS 14, 15, 19 (No need to hand in)

CHALLENGE QUESTIONS 25, 26 (No need to hand in)

- Hand in an excel file named “class-name-student number”
- Make sure that the answer of each question includes full intermediate process.