University of Nottingham
UK | CHINA | MALAYSIA

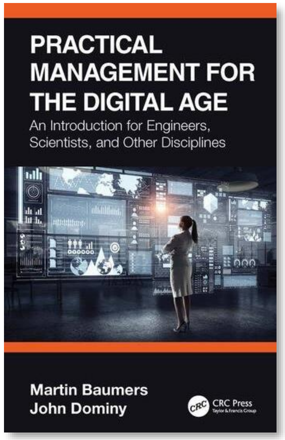
Department of Mechanical, Materials and Manufacturing Engineering

Financial planning and the basics of financial accounting

What we will talk about today:

Financial planning and the basics of financial accounting

- *What is financial management and what is its purpose?*
- *Different kinds of accounting*
- *What is financial planning?*
- *First steps in financial planning: market research & sales budget*
- *Cost budgets*
- *Assets and depreciation*
- *The profit & loss budget*
- *The cash flow forecast*
- *The accounting cycle*
- *Three major financial statements*



Lecture builds on Chapter 13 in Baumers and Dominy (2021)

What is *FINANCIAL MANAGEMENT*

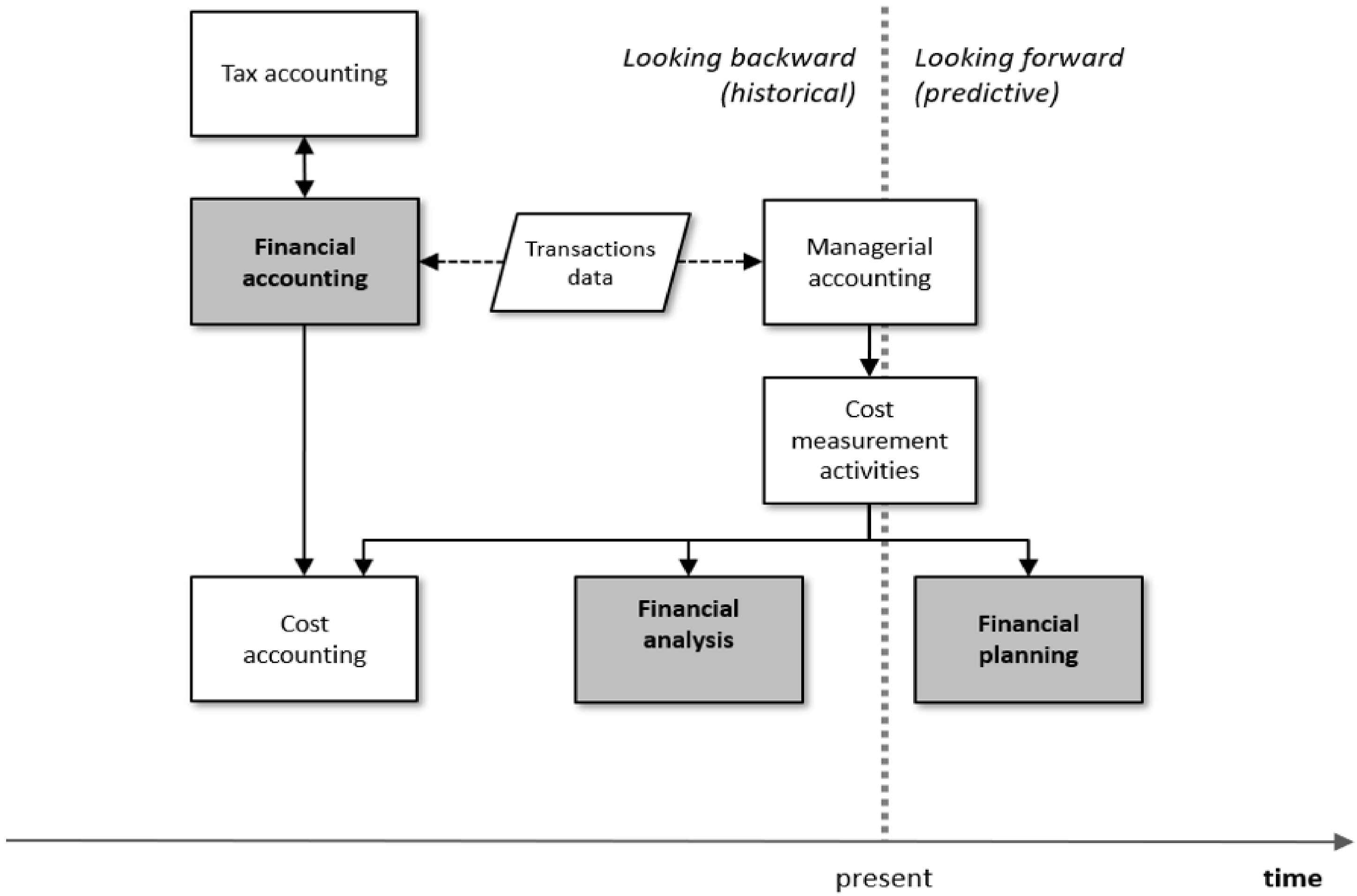
"In any business, the activities concerned with the measurement and recording of flows of money in the forms of profit, expenses, cash or credit are referred to collectively as financial management."

- Its objective is to arrange financial resources such that the business can achieve its goals in the best possible way

- This involves ensuring that the business has an adequate level of cash to carry out its activities according to its plans and without disruption

- It supports the business in minimizing costs to promote competitiveness and profitability while maximizing the financial return to the owners and shareholders

Areas in financial management



adapted from IFAC, 2009

What functions doe operations management incorporate?

We will view financial management as following a general logical sequence:

- **This corresponds the idea that a business has a life cycle requiring planning at the beginning and an analysis of what has happened at the end**

Four different kinds of accounting (at least!)

1. *Managerial accounting:*
   Provide information to management, supports the allocation and control of budgets, the planning and control of cash flows, the measurement and analysis of various costs in the business, and the identification of optimal investment decisions

2. *Financial accounting:*
   Process of collecting and recording information on past transactions resulting from the activities of the business over a defined period of time. Presented to managers and other stakeholders, including regulators and tax authorities, using a set of very specific reporting formats known as *financial statements*

3. *Tax accounting:*
   Accounting for tax purposes. The focus is not the generation of financial statements but to establish how much tax must be paid, known as the tax burden

4. *Cost accounting:*
   The processes that records and reports costs in the business

What is financial planning?

Financial planning is important from a number of perspectives:

- From the accountants perspective
- From the owners' perspective
- To evaluate potential profitability
- Project the cash flow

In the control of finance, there are three general stages:

1. Financial planning
2. Book keeping and reporting
3. Performance analysis

In the beginning of this lecture we will first examine the first element...

Initially, we will look at the financial planning of a small business venture (a café)

The objectives of this process are the following:

- To decide whether or not we have a viable business proposition
- To evaluate what, if any, financial backing is needed to start the business
- To provide data for the Business Plan that we will use to attract investors
- To provide a plan against which we can evaluate our business as it develops

A poll (market research!) among students and staff indicates that a small scale "value" coffee outlet might be a viable business venture

Don't get too excited – we wouldn't be allowed to do it!

It will be called:

"***Starbright Coffee Shop***"

Lets look at the financial possibilities.....

ALSO NOTE: THIS IS IN $, NOT £!

Market Research

Basic market research among the team has allowed us to make the following assumptions:

- coffee will be served in a branded compostable paper cup at a price of $1.00
- the business will offer a stamp-based loyalty programme so that every tenth coffee will be provided free of charge
- the business expects to serve a regular customer base of 60 students and will be open 150 days a year
- each student will purchase, on average, two cups of coffee a day
- the business will operate on weekdays during 30 weeks of the year, distributed evenly due to university holidays and other closure times
- the university allows the business to operate on university premises and handle all processes such as permits and taxation under the condition that the students involved in the businesses are not paid a salary and the business contributes $50 per week to estates costs and purchasing. Moreover, the business must pay for its own electricity costs, charged at a fixed rate of $15 per quarter
- the business will cover its own equipment expenses and raw material costs

Market Research → Sales Plan

This was used to form the following sales plan:

	Annual sales in units	Q1 sales in units	Q2 sales in units	Q3 sales in units	Q4 sales in units
Forecast unit sales	18,000	4,500	4,500	4,500	4,500

The Sales Budget

The Sales Budget simply takes the Sales Plan, and multiplies by the price of per cup and includes discounts etc.

	Annual sales	Q1 sales	Q2 sales	Q3 sales	Q4 sales
Forecast unit sales	18,000 units	4,500 units	4,500 units	4,500 units	4,500 units
Price per unit	$1.00	$1.00	$1.00	$1.00	$1.00
Gross revenue	$18,000	$4,500	$4,500	$4,500	$4,500
Sales discounts and allowances	$1,800	$450	$450	$450	$450
Revenue	$16,200	$4,050	$4,050	$4,050	$4,050

On this basis, we can assessment of our total planned Sales Revenue –

$16,200 per year

However…

Revenue does not equate to profit. We have to purchase materials such as coffee, cups, milk and filters

Raw material / consumable	Purchase price	Quantity in packaging units	Materials/consumables cost per cup
Coffee	$6.00	50 units	$0.12
Coffee filters	$4.00	50 units	$0.08
Milk	$0.60	12 units	$0.05
Branded paper cups and all other consumables	$10.00	100 units	$0.10
Projected total cost of materials and consumables (COGS) per cup			$0.35

The Variable Cost Budget

Consider the materials at 18,000 cups per year:

Cost item	Cost per cup	Annual sales in units	Annual variable costs	Quarterly sales in units	Quarterly variable costs
Coffee	$0.12	18,000	$2,160	4,500	$540
Filters	$0.08	18,000	$1,440	4,500	$360
Milk	$0.05	18,000	$900	4,500	$225
Branded paper cups and all other consumables	$0.10	18,000	$1,800	4,500	$450
Projected COGS	$0.35	18,000	$6,300	4,500	$1,575

As quantity-dependent costs, these are our variable costs - they depend upon the number of cups of coffee that are sold!

The Fixed Cost Budget

In addition, it has been agreed to pay estates and purchasing costs and for the power to run the machines

Following this, a simple fixed cost budget can be formed:

Fixed cost item	Cost	Billing period	Annual fixed costs	Quarterly fixed costs
Estates and purchasing charge	$50.00	weekly	$1,500	$375
Power costs	$15.00	quarterly	$60	$15
		Total fixed costs	$1,560	$390

As quantity-independent costs, these are our fixed costs that do not vary with sales…

Costs incurred through assets

Finally, we have to buy other things to make our coffee sales work, including:

- Coffee filter machines (4 needed to produce 120 cups per day)
- Portable counter bar
- Signage
- Other equipment (containers, small digital cash register, etc.)

Of course, these are our assets:

An asset can be defined as "something valuable belonging to a person or organization that can be used for the payment of debts"[1]

Note that these could be sold to raise cash if necessary!

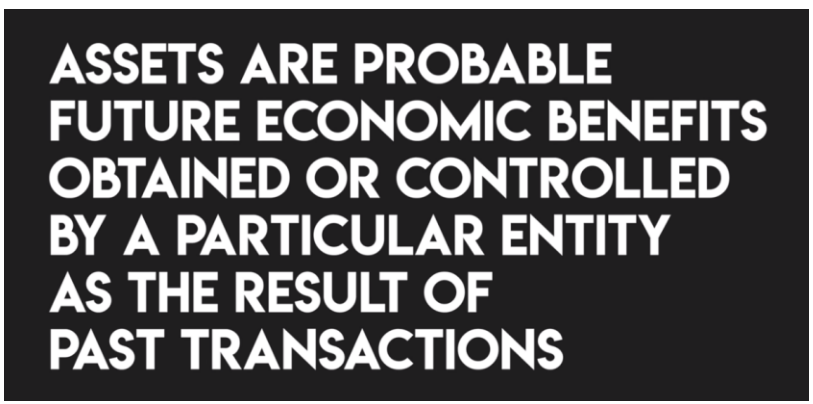
1 https://dictionary.cambridge.org/dictionary/english/asset

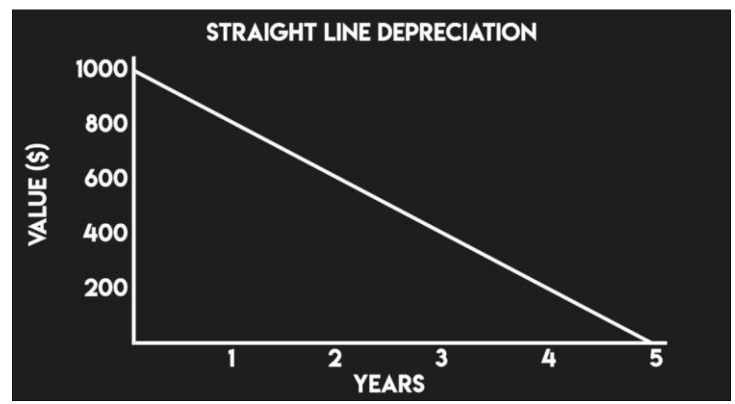
What is an asset?

What would an accountant say?

https://www.youtube.com/watch?v=rOsuqG_J0t4

1:22 – 5:00





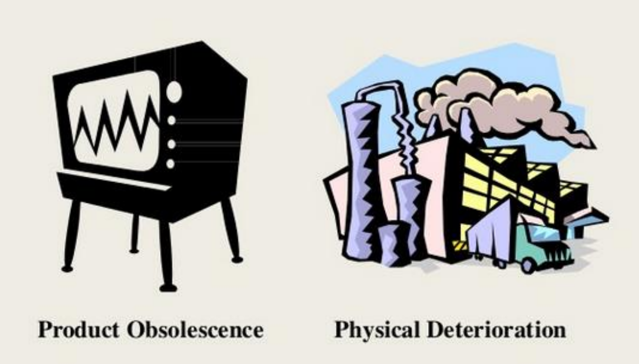
Source: FASB, 1985. Statement of Financial Accounting Concepts No. 6

List of assets

The required assets are captured in the following form:

Asset	Purchase price per unit	Quantity purchased	Total purchase cost
Coffee machine	$150	4	$600
Portable counter bar	$400	1	$400
Signage	£200	1	£200
Ancillary equipment (containers, small digital cash register, etc.)	£200	1	£200
		Total assets	$1,400

Adjusting for depreciation

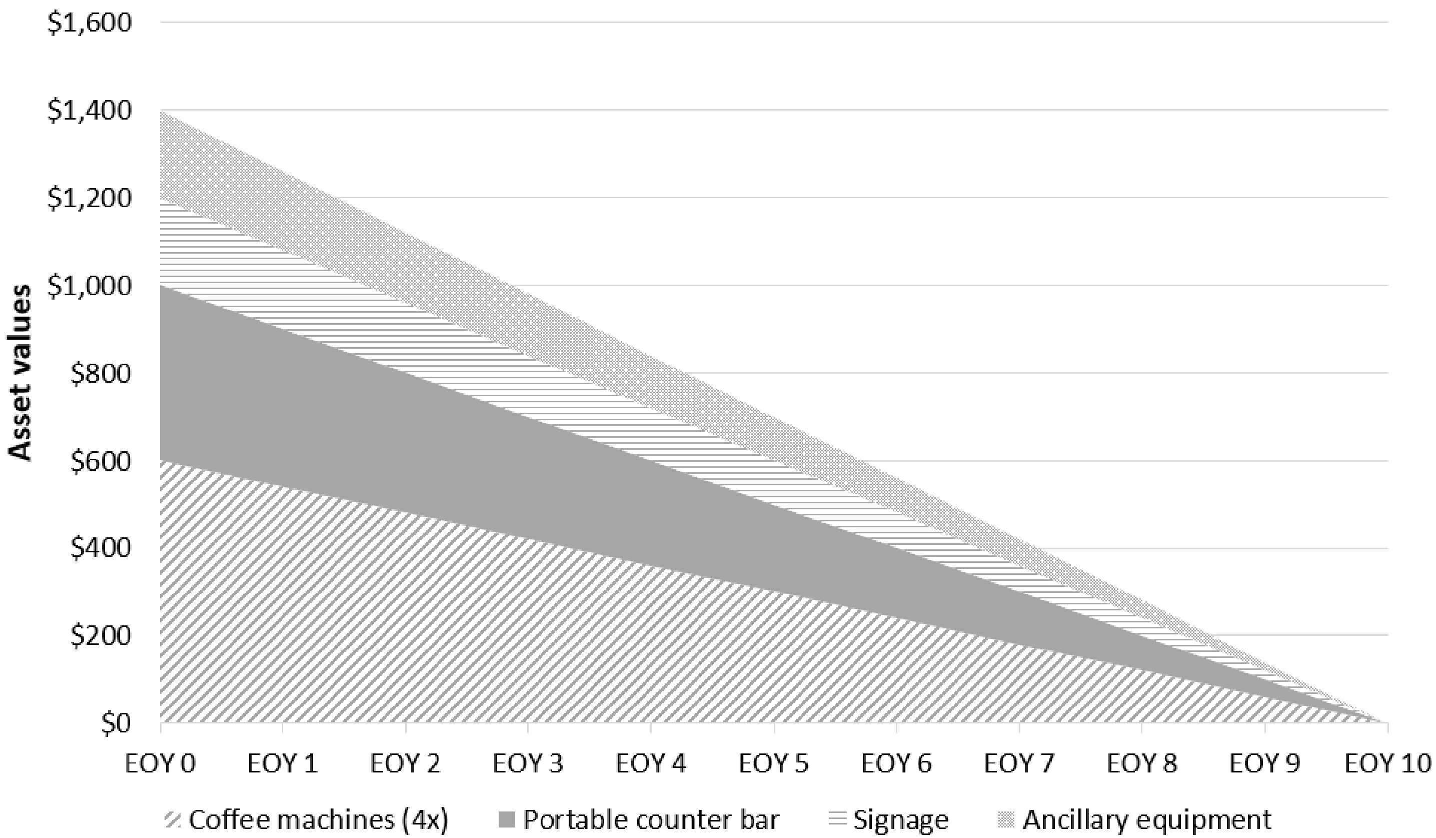


- Assets lose value over time.
- This loss of value is called depreciation.
- In this case the depreciation = $1,400 / 10 = $140 per year

Depreciation can be defined as "the amount by which something, such as a piece of equipment, is reduced in value in a company's financial accounts, over the period of time it has been in use"[2]

2 https://dictionary.cambridge.org/dictionary/english/depreciation

Adjusting for depreciation



Constructing the profit & loss budget

Once the sales budget and the cost budgets are complete, the profit & loss budget for the first year of operation can be constructed.

- Note that this **<u>DOES NOT</u>** show the purchase cost of the assets!

Starbright Coffee Shop
Profit & loss budget for the first year of operation
(All tangible assets are written off over 10 years)

Sales revenue		**$16,200**
Cost of goods sold (COGS)		
Coffee	$2,160	
Filters	$1,440	
Milk	$900	
Branded paper cups and other consumables	$1,800	
Total variable costs		**$6,300**
Gross profit		**$9,900**
Operating costs		
Estates and purchasing charge	$1,500	
Power costs	$60	
Total fixed costs		**$1,560**
Operating profit		**$8,340**
Other costs		
Depreciation	$140	
Total, other costs		**$140**
Net profit		**$8,200**

Some "bonus" context…

A closer look at the 12-Month profit & loss budget suggests that the students are actually planning to spend a lot on variable costs…

- In fact, they spend ~39% of revenue on this ($6,300 / $16,200)
- Does this strike you as high?
- Assuming that variable costs = COGS, we can compare this to some estimates plucked from the web[1]:

REVENUE / COST	STANDARD RATIO RANGE (%)
Food cost / Food sales	25-40%
Beverage (non-alcoholic) cost / Beverage (non-alcoholic) sales*	10-30%
Wine cost / Wine sales	30-50%
Draft beer cost / Draft beer sales	20-40%
Bottled (canned) beer cost / Bottled (canned) beer sales**	30-35%
Liquor cost / Liquor sales	10-20%
Bar mix and consumables cost / Liquor sales***	5-25%

[1] https://www.touchbistro.com/blog/how-to-calculate-your-cost-of-goods-sold/

The cash flow forecast

The profit & loss budget tells the accountant and possible investors that the business is essentially viable. Now we have to think about:

- How much cash do we need to finance the start-up of the business?
- When do we need it?
- When do we become profitable?

To do this we produce a cash flow forecast which generally looks at the four quarters of the first year…

Preparing the cash flow forecast

To start off with, this can be based on the profit & loss budget.

Note that most businesses will require some spend before sales start. This might be:

- Major R&D spend
- Supplies for manufacture
- Simple office supplies – paper and pencils

Starbright Coffee Shop will need the following before it can start operating:

- A supply of coffee and other consumables (10% of annual demand)
- Purchase of assets (coffee machines etc.)

Constructing the cash clow forecast

Once the profit and loss budget is complete, the cash flow forecast can be constructed…

Starbright Coffee Shop

Cash flow forecast for the first year of operation, in quarterly time periods

	Start	Q1	Q2	Q3	Q4
Cash inflows					
Sales revenue	$0	$4,050	$4,050	$4,050	$4,050
Total cash inflow	**$0**	**$4,050**	**$4,050**	**$4,050**	**$4,050**
Cash outflows					
Coffee	$216	$486	$486	$486	$486
Filters	$144	$324	$324	$324	$324
Milk	$90	$202.50	$202.50	$202.50	$202.50
Branded paper cups and other consumables	$180	$405	$405	$405	$405
Estates and purchasing charge	$0	$375	$375	$375	$375
Power costs	$0	$15	$15	$15	$15
Coffee machines (4x)	$600	$0.00	$0.00	$0.00	$0.00
Portable counter bar	$400	$0.00	$0.00	$0.00	$0.00
Signage	$200	$0.00	$0.00	$0.00	$0.00
Ancillary equipment (containers, small digital cash register, etc.)	$200	$0.00	$0.00	$0.00	$0.00
Total cash outflow	**$2,030**	**$1,807.50**	**$1,807.50**	**$1,807.50**	**$1,807.50**
Net cash flow	**-$2,030**	**$2,242.50**	**$2,242.50**	**$2,242.50**	**$2,242.50**
Cumulative cash flow	**-$2,030**	**$212.50**	**$2,455**	**$4,697.50**	**$6,940**

Some questions to consider about the planned business

- Roughly when would you expect it to break even?
- If we bought the coffee machines on credit or with a loan, how would the table differ?
- What would happen if the business had to pay salaries?

Now the team has all that is needed to consider whether or not the business is viable.

The next step would be to raise the cash to start the business and to look after the book keeping…

Back to financial accounting…

In the introduction to the various types of accounting presented in the beginning of this lecture, it was stated that financial accounting and cost accounting do not engage in projections of future transaction but deal exclusively with past, historical transactions.

- The financial planning discussed in the previous parts are prospective financial statements.

Financial accounting can be characterized as the process of collecting, recording, summarizing the transactions of a business and generating *formal reports* of these transactions.

Criteria of usefulness

The financial statements prepared by financial accountants must be made available to the relevant stakeholders and to the wider public. To ensure that these statements are useful and relevant they must satisfy two criteria, which are:

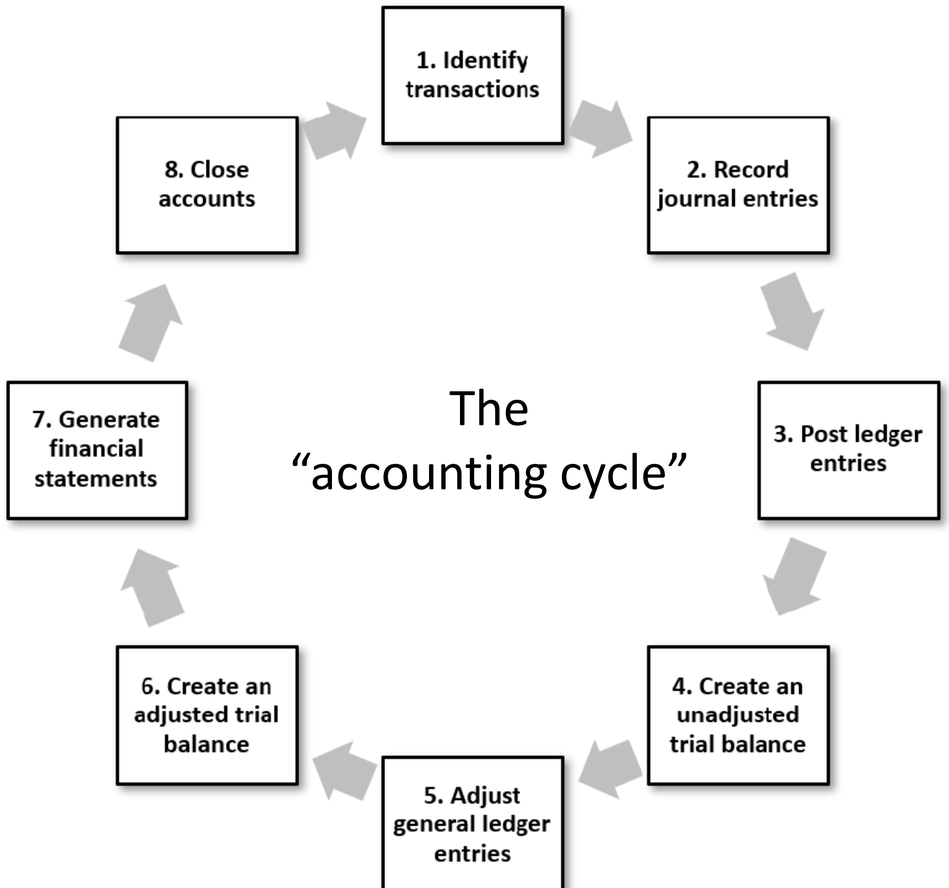
- *Relevance*: The financial statements must be able to influence and inform the decisions of stakeholders.

- *Faithful representation: F*inancial statements must describe the recorded transactions in a truthful way. More specifically, the records must be complete, neutral and free from errors.

The main set of accounting principles accepted in most jurisdictions around the world is the International Financial Reporting Standards (IFRS) issued by the IFRS Foundation, which is a non-profit organization committed to the standardization of accounting processes. In the United States, the main set of accepted accoutring principles is defined in the Generally Accepted Accounting Principles (GAAP), issued by the Financial Accounting Standards Board (FASB), which is also a non-profit organization.

How to think about financial accounting

In a general way, financial accounting is best understood as a process. The process is captured by the accounting cycle:



Identifying transactions and recording journal entries

Financial accounting has a very specific criterion for what is recorded. Only events that have an effect on the "accounting equation" are of interest to the financial accounting cycle. In this sense, the accounting equation forms the conceptual core of financial accounting. It is:

$$Assets = Liabilities + Owners' \ equity$$

> ***"In accounting, a liability is an obligation of a business or person arising from a past event that is expected to result in the transfer of tangible or intangible assets, a provision of services or another benefit in the future."***

If a transaction is relevant, it is first entered into a "book of accounts" referred to as the "general journal".

- The general journal lists transactions in chronological order and provides relevant information for each…

Posting entries into the general ledger

The third stage of the accounting cycle is the posting of the journal entries into a further book of accounts referred to as the "general ledger". The general ledger is the main and most important information repository in any accounting system.

- The general ledger is not organized chronologically but on the basis of accounts that are affected by transactions.

"In accounting, an account is a record in a bookkeeping system that tracks the financial activities and transactions involving a specific asset, liability, equity, revenue, or expense."

The general ledger and trial balances

Example:

CASH — ACCOUNT # 100

Date	Comments	Ref.	Debit Amount	Date	Comments	Ref.	Credit Amount
Jan. 1	Investment	GJ-1	$50,000	Jan. 1	Inventory	GJ-1	$3,000
				Jan. 1	Land	GJ-1	$2,000
				Jan. 1	Insurance	GJ-1	$2,400
	Total		$50,000		Total		$7,400
	Balance		$42,600				

INVENTORY — ACCOUNT # 140

Date	Comments	Ref.	Debit Amount	Date	Comments	Ref.	Credit Amount
Jan. 1		GJ-1	$4,500				
	Total		$4,500				

PREPAID INSURANCE — ACCOUNT # 150

Date	Comments	Ref.	Debit Amount	Date	Comments	Ref.	Credit Amount
Jan. 1	Cash	GJ-1	$2,400				
	Total		$2,400				

LAND — ACCOUNT # 170

Date	Comments	Ref.	Debit Amount	Date	Comments	Ref.	Credit Amount
Jan. 1		GJ-1	$20,000				
	Total		$20,000				

ACCOUNTS PAYABLE — ACCOUNT # 200

Date	Comments	Ref.	Debit Amount	Date	Comments	Ref.	Credit Amount
				Jan. 1	Inventory	GJ-1	$1,500
					Total		$1,500

MORTGAGE PAYABLE — ACCOUNT # 270

Date	Comments	Ref.	Debit Amount	Date	Comments	Ref.	Credit Amount
				Jan. 1	Land	GJ-1	$18,000
					Total		$18,000

OWNERS EQUITY — ACCOUNT # 300

Date	Comments	Ref.	Debit Amount	Date	Comments	Ref.	Credit Amount
				Jan. 1	Initial Investment	GJ-1	$50,000
					Total		$50,000

- The general ledger contains all accounts in the business
- Each account has a “T shape” with debits on the left and credits on the right
- Every journal entry posted creates two entries in the ledger → this is known as “double entry book keeping”
- The trial balance is a check if the credit side and the debit side in the general ledger are equal….

Adjusting the ledger and adjusted trial balances

A variety of events may require an adjustment to general ledger entries to capture in the accounts that some transactions have occurred but have not yet been recorded properly. E.g.:

- Some expenses may have been incurred without payments have been made yet.
- Invoices may have been issued to customers that have not been paid yet
- …

The final stage before the financial statements are created is the construction of an *adjusted trial balance* to verify that the debits and credits match after making the adjusting entries.

Generation of financial statements & closing the books

The previous stages of the accounting cycle lead up to this stage in which the financial statements are generated. Collectively, these statements provide a detailed and accurate representation of the financial situation of the business:

- They can be used to determine how the business can be improved.
- To set appropriate goals.
- To analyse the performance of the business.

Profit & loss statement

Balance sheet

Cash flow statement

The final stage in the accounting cycle is to finalize the accounting process in a step referred to as *closing the books*. This stage involves tasks such as updating and reconciling accounts, reviewing the available petty cash funds and measuring stock levels.

The profit & loss statement

The profit & loss statement is to show the financial results of the business over a period of time, normally reflecting an accounting period of one year.

- The profit & loss statement is known under several other names, including income statement, profit & loss account, statement of profit or loss, revenue statement and earnings statement.

- It reports the total sales revenues achieved by the business and shows how this financial inflow is transformed into net profit.

- The exact entries in profit & loss statements depend on the line of business and the accounting regulations the statement is required to meet.

A simplified example profit & loss statement

Example Company A Inc.

Profit & loss statement for the year ended December 31, 2020

Sales Revenues		
Cash sales	$84,300	
Credit sales	$50,800	
Total sales revenue		**$135,100**
Cost of goods sold	$86,300	
Gross profit		**$48,800**
Operating expenses		
Salaries	$25,600	
Advertising	$2,700	
Office Rent	$2,200	
Utilities	$1,500	
Office supplies and consumables	$450	
Depreciation	$1,300	
Other expenses	$3,400	
Total operating expenses		**$37,150**
Operating profit		**$11,650**
Other expenses		
Interest expenses	$2,300	
Income tax expenses	$4,500	
Net profit		**$4,850**

The balance sheet

The balance sheet shows the assets and liabilities of a business and from which sources finance has been raised.

- It is also known as the statement of financial position or the statement of financial condition

- Unlike the other financial statements, the balance sheet describes the financial of a business at a specific point in time, which is normally the end of the accounting period reflected in a profit & loss statement

- its structure is determined by the accounting equation such that the total assets of the business equate to the sum of the total liabilities and the owner's equity

A simplified example balance sheet

Example Company B Inc.

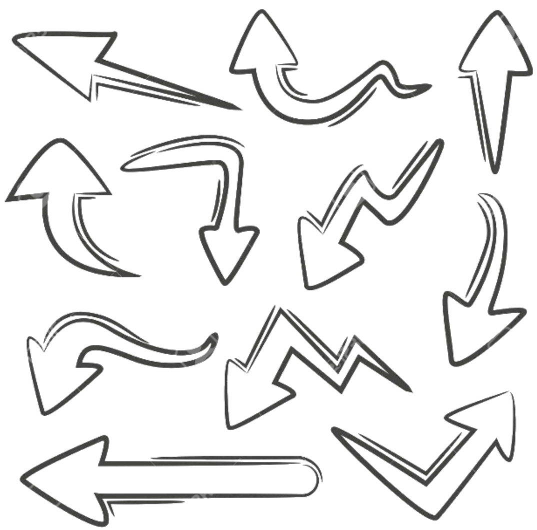
Balance sheet, December 31, 2020

Assets			*Liabilities and owners' equity*		
Current assets			*Current liabilities*		
Cash and cash equivalents	$100,000		Accounts payable	$45,000	
Accounts receivable	$30,000		Notes payable	$12,000	
Inventory	$16,000		Accrued expenses	$6,000	
Prepaid expenses	$50,000		Deferred revenue	$1,500	
Investments	$8,000		**Total current liabilities**		$64,500
Total current assets		$204,000			
			Long-term liabilities		
Fixed assets			Long term debt	$252,800	
Land	$25,000				
Buildings and improvements	$310,000		**Total liabilities**		$317,300
Equipment	$45,000				
Less accumulated depreciation	($4,500)		*Owners' equity*		
			Common shares	$20,000	
Other assets			Additional paid-in capital	$14,000	
Intangible assets	$3,500		Retained earnings	$234,000	
Less accumulated amortization	($200)		Treasury shares	($2,500)	
Total assets		$582,800	**Total liabilities and owner's equity**		$582,800

The cash flow statement

The cash flow statement, reports how changes in the balance sheet entries and financial inflows to the business over a period of time change the cash and cash equivalents present in the business.

- It is also known as the statement of cash flows.
- For managers and other stakeholders, the cash flow statement indicates whether or not the business can operate in the short run and will be able to pay its bills.



A simplified example cash flow statement

Example Company C Inc.		
Cash flow statement for the year ended December 31, 2020		
Cash and cash equivalents, beginning of period		**$115,000**
Operating activities		
Cash receipt from		
Customers	$900,000	
Other operations	$30,000	
Cash paid for		
Inventory purchases	($450,000)	
General operating expenses	($112,000)	
Wage expenses	($220,000)	
Interest	($34,000)	
Income taxes	($20,000)	
Net cash provided by operations		**$94,000**
Investing activities		
Sale of property and equipment	$38,000	
Purchase of investments	($45,000)	
Net cash flow provided by investing activities		**($7,000)**
Financing activities		
Issuance of shares	$350,000	
Issuance of long-term liabilities	$20,000	
Payment of dividends	($45,000)	
Net cash provided by financing activities		**$325,000**
Net increase (decrease) in cash and cash equivalents		**$412,000**
Cash and cash equivalents, end of period		**$527,000**

Lecture summary:

- *Now know what financial management is and about different kinds of accounting*
- *Can construct a limited financial plan for a (very small) business*
- *Understand assets and depreciation*
- *No know the three major financial statements*

Thank you!