ENGR 401 Professional Practice

FINANCE FOR ENGINEERS I

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Finance for Engineers

Finance *noun*

1. the management of large amounts of money, especially by governments or large companies.

2. management of (especially public) money, science of revenue; money support for an undertaking.

The Financial Management Cycle

Planning

- Business/Financial goals
- Action plans

Resource Allocation

- Budgeting

Operating and Monitoring

- Profit and Loss
- Balance Sheet
- Cashflow
- Timesheets

Evaluation and Reporting

- Analysis tools (variance, ratio)
- Remedial action

Financial/Business Planning

Why plan?

"If you fail to plan you plan to fail."

"People don't plan to fail, they fail to plan"

Heard it all before?

How many businesses fail in their first few years?

How many businesses fail indirectly due to natural disasters?

Financial/Business Planning

You, your business and your government should be asking the same questions:

- What is our present financial position?
- Where would we like to be?
  (and how soon would we like to be there?)
- What is the best way to get there?
- How will we know when we've arrived?

Financial/Business Planning

A plan, somewhat obviously, provides the answers to the questions.

A plan states:

- Where you want to go
- How you will get there
- Metrics to tell you you've arrived.

Financial/Business Plan Types

Strategic Plan

- Long-term, 3-5 years
- Details future goals and the means to achieve them.

Business Plan

- Medium-short term, 12 months
- Based on annual budget
- Should be directed to achieve strategic goals

Short-term Plan

- Short-term, 1-3-6 months
- Detailed and typically at lower level than the overall business.

Financial/Business Planning

Plans are useless if they are not *used*!

Users can be:

- You
- Your organisation
- Stakeholders or shareholders
- Investors
- Accountants

Financial Planning Exercise

Gathering Budget Data

What are the internal/external sources of financial data for budget preparation for your home/flat?

What are the internal/external sources of financial data for budget preparation for your workplace or business (or a business in which you have worked)?

Aside: Accounting for Engineers

Accounting: that's what you pay your accountant to do.

Apart from basic bookkeeping:

- Maintaining records of receipts and invoices
- Maintaining records of assets and liabilities

it's generally best for you to concentrate on engineering.

We are going to concentrate on financial statements.

Financial Statement Standards

The New Zealand Treasury provides

> "guidance on the way in which the Crown and its departments must set their accounting policies for external financial reporting"

The sections of relevance to us are the *Qualitative characteristics of external financial reports* and the *New Zealand Generally accepted accounting practice* which state fundamental standards.

https://www.treasury.govt.nz/publications/guidance/treasury-instructions

https://www.treasury.govt.nz/publications/instructions/treasury-instructions-2018-html#section-2

Qualitative Characteristics of Financial Statements

Purpose: the information presented in financial statements is useful.

Relevance:	information to be relevant to the decision-making needs of the users.
Materiality:	focus on information which is expected to affect the decisions of the users.
Fidelity:	a faithful representation; true and fair and free from misstatement.
Comparability:	comparable across periods and across companies.
Verifiability:	communicate the underlying economics of the company's business.
Timeliness:	disclosure of financial information not to be excessively delayed.
Understandability:	understandable by users with reasonable knowledge of business and economic activities.

Fundamental Accounting Assumptions

These two assumptions underlie the development of general purpose financial reports in a New Zealand context:

- the "going concern" concept; and
- an accrual basis of accounting.

They are so fundamental that most corporates in New Zealand follow these conventions.

Fundamental Accounting Assumptions

The "going concern" Concept

An accounting convention under which the financial statements are prepared on the assumption that:

The entity will continue in operation for the foreseeable future.

This is the definition of “going concern.”

Consequences:

- items of property, plant and equipment must be depreciated over their anticipated useful lives,
- inventory is assumed to be realisable within the normal operating cycle, and
- liabilities are assumed not to fall due before their scheduled repayment date.

Fundamental Accounting Assumptions

An accrual basis of accounting

Under the accrual basis of accounting, the effects of transactions and other events must be:

- recognised when they occur (and not as cash or its equivalent is received or paid).
- recorded in the accounting records, and reported in the financial statements of the periods to which they relate.

Financial statements prepared on the accrual basis inform users not only of past transactions involving the payment and receipt of cash, but also of

Obligations to pay cash in the future and of resources that represent cash to be received in the future.

Fundamental Accounting Assumptions

Consequences of the accrual basis of accounting

Financial statements must capture:

- debtors & creditors,
- receipts and payments outstanding,
- contractual and taxation obligations,
- etc.

What might "etc." be?

Fundamental Accounting Assumptions

The concept that the entity will continue as a going concern underlies the preparation of the financial statements.

> *"…management is aware of material uncertainties related to events or conditions that may cast significant doubt upon the entity's ability to continue as a going concern."*

If the assumption of the "going concern" concept is no longer true, the financial statements may have to be prepared on a different basis, *with that basis being disclosed*.

Other Accounting Assumptions

Business Entity Concept: the business/organization and its owners are separately identifiable parties.

Monetary Unit Assumption: only business transactions and events which can be expressed in monetary units are recorded.

Time Period Principle: business activities can be divided into arbitrary time periods.

Full Disclosure Principle: all material information has to be disclosed in the financial statements (directly or in notes).

The Fundamental Accounting Equation

This equation is the foundation of the double-entry bookkeeping system:

$$\text{Assets} = \text{Liabilities} + \text{Capital}$$

or, equivalently

$$\text{Assets} - \text{Liabilities} = \text{Stockholder's Equity}$$

These are statements of *accounting philosophy* not *natural philosophy*.

This equation underpins the concept of the balance sheet.

Financial Statements

Balance Sheet: a financial summary based on the fundamental accounting equation at the reporting date.

Profit and Loss Statement: a statement of financial changes during the reporting period.

Ratio Analysis: methods to obtain rapid estimates of business performance, based on taking the ratios of certain items in financial statements.

Break-Even Analysis: a method to quickly calculate the business parameters required for recovery of expenses.

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Balance Sheets

Balance sheets are a detailed financial expression of the fundamental accounting equation.

$$\text{Assets} = \text{Liabilities} + \text{Capital}$$

Assets: what the business *owns.*

Liabilities: what the business *owes* (but not to stockholders).

Capital: what the business *owes* to *stockholders*.

The assets, liabilities and even capital are often divided into categories.

Fundamental Accounting Equation Exercise 1

My Android App Factory Ltd.

Use the fundamental accounting equation to calculate the business' equity (capital).

Bank balance: $150

Computer hardware: $3,100

Business loan: $4,400

Debtors: $2,000

Fundamental Accounting Equation Exercise 2

The Electronics Guy Ltd.

Use the fundamental accounting equation to calculate the business' equity (capital).

Bank balance: $5,000

Tools and equipment: $12,000

Working stock: $200

Creditors: $1,500

Debtors: $300

Fundamental Accounting Equation Exercise 3

Doomed, Inc.

Use the fundamental accounting equation to calculate the business' equity (capital).

Bank balance: $4,000

Tools and equipment: $1,750

Computer software: $1,600

Business loan: $4,300

Creditors: $3,100

Asset Categories

Current assets

- Cash or anything which could be rapidly "liquidated" (converted into cash within an accounting period)
- e.g. cash, accounts receivable, stock/inventories, etc.

Fixed assets

- Assets, most often revenue-generating, which can not be rapidly liquidated.
- e.g. land, plant equipment, machinery, furniture, fixtures, etc.

Other Assets

- e.g. patents, royalty arrangements, goodwill, exclusive use or licensing arrangements, etc.

Liability Categories

Current liabilities

- Any claim against the assets of the business which needs to be paid within the next period (or two).
- e.g. accounts payable, loan repayments, taxation instalments, etc.

Long-term liabilities

- Any claims against assets which persist across periods.
- e.g. mortgages (loans with specific security arrangements), long-term bank loans, equipment loans, any other obligations.

Reading a Balance Sheet

In your pods, find the balance sheet of a publicly listed New Zealand company

Note that NZ corporate legislation requires publicly listed companies to publish financial statements and these are typically to be found in the company's Annual Report.

What can you read in the balance sheet?

We'll discuss each balance sheet in turn.