Week 4: Toolbox

Keyboard Shortcuts

Today's Date

Today's date – **CTRL + ; | CMD + ;**

This enters the date as a fixed value, unlike using the **TODAY** function which is dynamic. Remember that the **TODAY** function is a volatile function and will take up calculation resources as it re-calculates every time you make a change in your spreadsheet.

Excel Terminology

Some Useful Date Functions

EOMONTH: This function returns the last day of the month after adding a specified number of months to the date. E.g. **EOMONTH(C5,2)** this will give the end of the month 2 months after the specified date in **C5**. If the specified date represents the beginning of a quarter this function would provide the date of the end of the quarter.

WORKDAY.INTL: This is a newer version of the **WORKDAY** function. This function returns the date after adding a specified number of working days to a given date. This function allows the user to specify when the holidays are and also when the weekends are. To specify a unique set of holidays use weekend string values. E.g. "0001011" would mean Thursday, Saturday and Sunday are the weekends. The start is Monday, 0 represents a working day and 1 represents a non-working day.

EDATE: Returns the date after a specified number of months have been added to a date.

DATEDIF(start_date, end_date, unit): this function returns the difference in two dates. The units argument determines what sort of difference in the dates is returned. E.g. “MD” means return the excess of days after years and months have been taken into account.

Financial Terms

Principal: This refers to the amount of money that goes to reducing the loan amount after interest charges are removed.

Future Value (FV): This represents how much an investment will be worth in the future. It can also refer to the residual on a loan.

Present Value (PV): The amount of money invested or borrowed today. This represents the value of a stream of cash flows today. This is sometimes also called the principal.

NPER: Number of repayment periods. If there are 4 years and payment frequency is monthly then this value will be 4*12 = 48.

PMT: Payment amount, regular payment made annually or monthly. Excel assumes this stays constant.

Type: The default for type is 0 to represent at the end of the period. 1 means at the start of the period. E.g if an annuity is paid every year if it's paid every 1 Jan that would correspond to start and therefore 1 and if it's paid every 31 Dec that would correspond to the end of the period so 0 or left blank.

Sign convention: Excel's sign convention is that cash inflows are considered positive and cash outflows are considered to be negative values.

Loan Schedule: This is a table detailing each periodic payment on a loan. This shows the interest paid and also the reducing amount of the loan. The example shown in the video is one for an amortization table. A way of paying off a loan such that each payment first pays the interest and what is left pays off the outstanding debt.

Annualised interest rate: This represents the effective interest rate for a period that has been annualised, e.g. if the effective rate per month is 2% the annualised value is 24%.

Capital Budgeting

Capital budgeting: These are some techniques that a firm can use to select between different projects. The most profitable project is selected. This is done because in most cases resources are scarce and so not all projects can be selected.

Cost of Capital: This is the amount of return that shareholders require for investing their money into the business.

IRR: The Internal Rate of Return. This tells us the rate of growth that a project will produce. When comparing projects with the same investment amount, the one with the highest IRR is the most desirable. If only one project is being compared then compare it to the cost of capital and select it if IRR > cost of capital.

NPV: The Net Present Value. This is the difference in the present value of the income produced by the project and the costs needed to keep the project running. If multiple projects with the same investment income are being compared, the one with the highest NPV is the most desirable. If only one project is considered select it if NPV>0.

Depreciation

Depreciation: This is a reduction in the value of an asset. This is done to reflect the fair value of assets as time goes by. Depreciation is also used by companies for tax purposes, depreciation is recorded as an expense on income statements and so reduces the amount of tax the company pays.

Some important terms in depreciation.

Life: This is how long you estimate the asset will be useful for.

Salvage value: This is how much you estimate the asset will be worth at the end of its lifetime.

Cost: This is how much you pay for the asset.

Depreciation amount: This the amount each year that you calculate the asset should depreciate by.

Value of asset after depreciation: This value is calculated by the beginning of year value - depreciation amount for that year.

Some examples of depreciation methods are:

Straight line method: In this method, the same amount is depreciated from the beginning of year value of the asset for the lifetime of the asset. The amount to depreciate by is calculated by the following formula: (Cost - Salvage value)/life

The Excel function **SLN(cost, salvage, life)** will calculate the depreciation amount.

Sum of Year Digits: This method assumes that most of the depreciation takes place at the beginning of the assets life.

For example, if the asset is assumed to have a life of 10 years, for the first year the depreciation fraction is 10/55, for the second year 9/55, and so on (55 = 1+2+...+10). The fraction is then multiplied by (cost - salvage value) to get the depreciation amount.

This Excel function can calculate the depreciation amount: **SYD(cost, salvage, life, period)** to specify the period e.g from the given example 1 for the first year, 2 for the second year.

Double declining balance method (DDB): Another depreciation method that assumes most of the depreciation of the asset takes place at the beginning of the assets life. The default in this method is to take double the straight line method percentage and multiply it by the value of the asset after depreciation.

The following Excel function can calculate the depreciation amount: **DDB(cost, salvage, life, period, [factor])** there is an additional argument called factor which you specify if you don't want the default which is double the straight line method percentage.

Ninja Tips

There should be a distinction made between interest and interest rate. Interest refers to an amount paid because of the cost of borrowing money. Interest rate refers to the rate charged. E.g $200 would be the interest paid and 6% would be the interest rate.

The annualised interest rate should be differentiated from the effective annual interest rate. An effective annual interest rate of 12% p.a would be equivalent to **(1.12)^(1/12) - 1** per month. To find the equivalent rate solve the equation **(1+ i/100)^n = (1 + r/100)**, where **i** is the effective interest rate of the period you desire to find, e.g. monthly effective rate, **n** is the number of periods of compounding that makes the period for **i**, equivalent to 1 year e.g **12** in the above example, **r** is the annual interest rate, e.g. **12%**. If we were looking for an effective quarterly rate **n** would be 4. When the above equation is solved it gives **i/100 = (1+ r/100)^(1/n) - 1**.

Conventional cash flows are cash flows with only one sign change. This means all cash inflows precede the cash outflows or the other way around. Only conventional cash flows are guaranteed to have a unique IRR value. If the cash flows aren't conventional then the IRR value may not be unique.