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Financial Modeling

Framework

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A 5-Step Framework





#1 Model Planning

Before you start building your model you need to choose the right one to achieve Business Case - Financial Model fit.

The most popular models are:

- » Return on Investment
- » Payback
- » Net Present Value (NPV)
- » Discounted Cash Flow (DCF)
- » Integrated Rate of Return (IRR)
- » Customer Lifetime Value (LTV)
- » Sensitivity Analysis
- » Break-Even Analysis





Return on Investment (ROI)



ROI is typically expressed as a percentage. In its simplest form, it's calculated by dividing revenues from an investment by the cost of the project. The ratio indicates that the project is worth pursuing if it exceeds 1, i.e. revenues are higher than costs and the project is profitable.

This metric is popular because it's easy to understand and communicate. Its meaning is immediately clear to stakeholders who don't have a background in Finance.

In practice, the difficulty lies in accurately allocating benefits to a discrete investment. For example, Return on Marketing Investment can be difficult to assess if it is unclear how much revenue a discreet marketing activity such as a TV ad contributed when the company also ran an online and print campaign at the same time.

Payback analysis is closely related to ROI. It expresses how many months it takes until an investment is paid back in full. It uses the same inputs as ROI and can easily be derived by dividing 12 by the ROI. Companies use Payback models to set targets on acceptable investment levels in relation to revenues. They also help to ensure that the company does not underinvest. For example, the target for a Marketing team may be a payback period of around 9 months.





Net Present Value (NPV)



NPV compares the present value of cash outflows and cash inflows to determine the profitability of a project. An NPV of zero means that the present value of cash generated by the project is equal to the present value of investments.

It's a simple concept:: The longer I have to wait for my investment to pay back, the higher are my opportunity costs because I cannot invest the allocated funds elsewhere. This means that future cash flows need to be discounted by the rate of return we could reasonably expect from an alternative investment. Typically, the discount rate (or hurdle rate) is equal to a company's Weighted Average Cost of Capital (WAAC), i.e. the average return that both bondholders and shareholders demand in order to provide the company with capital.

Capital budgets tend to be limited, so NPV is often used to prioritize among different investment options.

NPV vs DCF:

NPV is a metric that compares the value of the investment today to its value in the future. A DCF model determines an investment's value by calculating NPV and shows how long it takes to get returns.





Model Planning

Integrated Rate of Return (IRR)



Discount Rate where NPV = Zero

NPV estimates what the return on the investment may be today in absolute terms. However, to assess risk in relation to returns of an investment, we need to also take a look at the internal rate of return.

IRR specifies the discount rate that would result in an NPV of zero. To put it differently, NPV is the amount of money we make from an investment, while IRR tells us the equivalent rate of return of the project.

Customer Lifetime Value (LTV)



Customer Life Time Value (abbreviated CLTV or often just LTV) estimates how much net profit we expect to receive on average from customers over their lifetime, that is over





the period of time they spend money on our products or services. It's the future value we expect to receive on a per-customer basis. The measure is typically an output of a predictive model, but can also be estimated using past periods.

Companies apply this concept with various degrees of complexity using different formulas and methods depending on what best fits their industry, business model, and data availability. That's why I will not explain how to calculate LTV - various formulas are easily available online.

What's important to know is in which circumstances you should consider applying it. A company offering different products that customers purchase repeatedly, such as subscriptions or Software as a Service (SaaS) companies, needs to understand how their products compare to each other in terms of financial attractiveness. They can't simply compare profit margins to do that, because customers' subscription lengths may be completely different. To combine those considerations, SaaS companies calculate LTV.

Sensitivity & Break-Even Analysis

"When do we break even if our monthly costs don't increase?"

"What's the NPV if sales are up by 10%?"

"Does our LTV still make sense if customer acquisition cost is 20% higher?"

"Can we spend \$50,000 more in Marketing and still have an ROI > 1?"

Oftentimes, we are dealing with imperfect information. That means some inputs are





easily available, while others have to be assumed based on previous experience which may be inaccurate. At times we can't even rely on history and have to come up with an assumption with very little or no data to fall back on. The questions here on the slide are typical examples for when sensitivity analysis is required. Sensitivity analysis can also be applied along with most other models discussed here, such as NPV and LTV models.

Model Decision Guide

Now, which model should you choose? There are four aspects you need to consider.



Step #1: Time Horizon

Do all considered investments have immediate or short-term returns (<1 year)?



🔽 Yes: Use Return On Investment (ROI) / Payback Analysis



Why? ROI is easy to use but doesn't take the time value of money into the account.





Step #2: Recurrence

Do all investments result in regularly recurring returns (subscriptions)?



X No: Move to Step 3

Why? LTV highlights the impact of retention, a key metric for subscription-based businesses. If some of the projects you are comparing have one-off returns, LTV is not an appropriate model to use.

Step #3: Similarity

Do all investments have similar levels of risk?

Yes: Use Net Present Value (NPV) analysis

X No: Use NPV & Integrated Rate of Return (IRR) analysis

Why? Riskier projects should have higher returns. NPV is expressed in absolute dollars, which means results can be high simply due to the magnitude of the initial investment. IRR shows the rate of return as a percentage, which makes it easier to compare projects with different investment levels.

Step #4: Uncertainty

Is there uncertainty in factors that have a major impact on returns?



Ves: Add sensitivity analysis

Why? It takes time to prepare it and it needs to be re-run whenever assumptions change. But it's the only way to be able to quickly respond to questions and create "what if" scenarios.





When collecting information to build your model, make sure you:

- » Capture assumptions (internal & external factors)
- » Challenge Assumptions (they must be falsifiable)
- » Document Alignment
- » Plan post-launch assessment

Data Collection: Common mistakes

- » Lack of documentation
- » Skipping post-launch assessments or blaming any miss on external circumstances
- » Endlessly arguing during the post-launch assessment, because the model wasn't built with falsifiable assumptions

Bonus Tip

When asking for inputs, provide a simplified model that lets people see the impact of changing their assumptions. It can radically reduce the number of iterations and it empowers your business partners.







Each tab has just one purpose:

- » Model overview
- No Shard-coded Sector Output
 - Calculations
 - » Assumptions
 - » Sensitivities
- Limit formulas < » Inputs
- No formulas!

cells!

- System Data
- » Highlight all input cells with the same color throughout the model
- » If you must have a hard-coded cell outside the input tabs: highlight it in **red**.

Why is it important to separate inputs and outputs and not have tabs with hard-coded cells and formulas in one?

It enables you to make updates quickly and confidently. The worst thing that can happen is you accidentally override a formula with a hard-coded number and then later the model is off when you update the inputs properly.

Modeling: Common Mistakes

- » Losing track of hard-coded cells
- » Linking between files
- » Not saving with a new name before making changes
- » Macros outside of the input tab (black box)



Review & Sensitivities



Run the 5- step system to find any mistakes in Excel:

- » Check Sums
- » Formula View
- » Spot Checks
- » Story Check
- » Waterfalls (optional)

Pre-empt questions by preparing the 3-5 most important sensitivities (tip: create a copy of the entire model for each)

The 6th check:

Do the results of the sensitivity analysis make sense?

Review & Sensitivities: Common Mistakes

- » Not planning for at least 1-2 hours of review time
- » Running sensitivities in the same model without saving under a new name (may forget to undo something)
- » Watch-out: The order of implementing sensitivities matters (example: if revenues are lower, changes to expenses have a larger impact on profit margins)



Presentation & Iteration



Go for SUCCES:

- » Simple
- » Unexpected
- » Concrete
- » Credible
- » Emotional
- » Stories

Brainstorm possible questions ahead of time

Memorize marginal values for the most important sensitivities:

- » 1% of revenue change means x change in NPV / ROI
- » Delay by 1 year
- » Half the sales
- » Double the cost
- » ...

Presentation & Iteration: Common mistakes

- Assuming business partners understand the model (they may not want to admit it)
- Not building the model with iteration in mind (input cells need to be easy to find)
- » Not documenting which changes were agreed and when (version control)

