



Financial modeling for startups

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ABSTRACT

Financial modeling for a startup is critical to building a viable business, yet many entrepreneurs still venture into the business world without adequate financial knowledge. This work sought to gather the most important topics of financial modeling and present them in an easy and didactic way. The two main approaches used for this purpose are reviewed: the top-down method, which takes advantage of market data to build a forecast, and the bottom-up approach, which uses internal company data, such as sales data or production capacity. The main data needed to carry out the modeling and the results that can be obtained are also explained.

Keywords: financial planning, fundraising, entrepreneurship, financial statements.

1 INTRODUCTION

Almost all businesses undertake some form of financial planning or budgeting, but there are specific reasons why a financial plan is especially important for startups:

- To build an economically viable business, it is necessary to quantify and validate the business plan and model, assumptions, and vision, to find out if the ideas can be transformed into a sustainable operational business;

- If several scenarios are built, the entrepreneur will be better prepared for the future, especially if things don't go as planned.

- It is part of the fundraising process. Funders typically ask for a financial plan to raise funds, whether they are an angel investor, bank, or grant provider. Certain investors will require more detail than others, but building a model is critical, even if you only need to provide them with high-level data.

- Because it helps answer the tricky questions a financier might have when diving into the business case.

- To inform shareholders and yourself, it is necessary to know how the company is performing, if the goals were achieved, and to inform shareholders about how capital is being invested, and if it is fulfilling its promises (FARIA et al., 2021).

Often, building a financial model isn't a problem. The number of models that can be found online is countless and there is always someone with experience nearby to help with the technical details. The real problem is: how to get to the numbers?

The objective of this work is to present the main methods for new entrepreneurs to do the financial modeling of their startups, making their companies sustainable.



2 METHODOLOGY

Technical-scientific knowledge of corporate finance was compiled from specialized books and scientific articles from high-impact journals. The information was synthesized in a simple and didactic way, to facilitate the financial modeling process for new companies.

3 RESULTS AND DISCUSSION

There are two different approaches to doing financial modeling for startups: top-down forecasting and bottom-up forecasting (HILL, 2018).

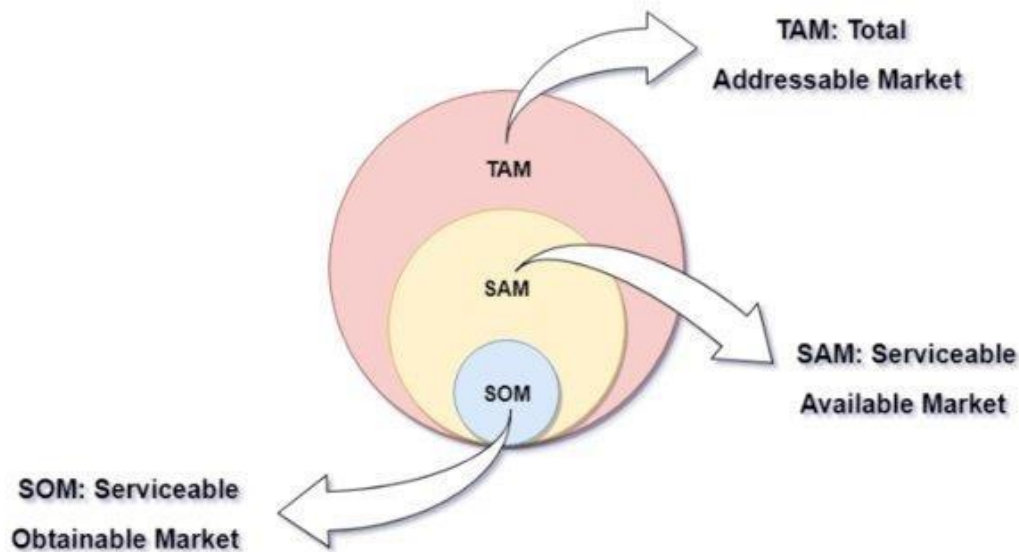
3.1 TOP-DOWN FORECAST

Using the top-down approach, forecasting is done from a macro perspective, from the outside in, towards a micro view. Usually, industry estimates are taken as a starting point and reduced to targets suitable for the company (HILL, 2018).

In essence, this method helps to define a forecast based on the market share that the company would like to capture in a reasonable period. A useful aid for performing top-down forecasting is the TAM SAM SOM model.

The TAM SAM SOM model captures market size at three levels: the total worldwide market for a product or service (TAM: total available market), the share of that market that the company serves with its specific offering, adjusted for its geographic reach (SAM: serviceable available market) and the share of SAM that the company can realistically capture (SOM: serviceable obtainable market), given the existing competition. SOM is therefore equal to the sales target, as it represents the value of the market share that is intended to be captured (PAZOS, 2018).

Figure 1 - Model TAM SAM SOM



Source: Pazos, 2018.

Based on the sales targets defined using the model, the next step is to estimate all costs required to deliver the product or service and all expenses required to perform sales, marketing, research and development, and general and administrative tasks so that the company stays alive. By estimating this, profitability is sought within a reasonable time frame. In other words: at some point, all costs and expenses must no longer exceed the revenue targets to obtain a positive EBITDA (VALANČIENĖ; JEGELEVIČIŪTĖ, 2014).

3.2 BOTTOM-UP FORECAST

The problem with the top-down approach is that it can lead to overly optimistic forecasts. Often, entrepreneurs calculate SOM by taking a random percentage of the market, without really assessing whether that goal is realistically achievable. A small percentage of a market may seem insignificant, but it can be very optimistic, for example, in the year of its release. Therefore, it may be useful to complement the top-down method with the bottom-up approach. This approach is less dependent on external factors but leverages company-specific data, such as sales data or internal company capacity. Unlike the top-down method, the approach starts with a vision.

micro, from the inside out, and develops towards a macro view. This means that a projection is made based on the main business value generators (HILL, 2018; DEL SARTO et al., 2018).

With the bottom-up approach, revenues, costs, expenses, and investments are estimated based on available resources and company data. The pitfall of this method, however, is that it can fail to show the optimism needed to convince others of the company's potential. If a startup founder is looking to raise funds, the bottom-up approach may not work, as investors expect the company to grow and gain market share



quickly (HILL, 2018; DEL SARTO et al., 2018).

Therefore, when building a startup forecast, it is advisable to combine bottom-up and top-down methods, especially when planning to achieve a strong growth curve through external funding. The bottom-up method should be used for short-term forecasting (1-2 years) and the top-down method for long-term forecasting (3-5 years). This makes the entrepreneur able to substantiate and defend his short-term goals very well and his long-term goals demonstrate the desired market share and ambition that an investor is looking for (HILL, 2018).

3.3 THE INPUTS TO A FINANCIAL MODEL

The six most common elements serve as input tools for a financial model: revenues, cost of goods sold (COGS), operating expenses (OPEX), personnel costs, investments in assets, and financing (VAN RIJNSOEVER, 2022).

3.3.1 Revenues

Revenue forecasting is typically performed using a combination of top-down and bottom-up methods. Estimating demand can be a complex task, but one way to handle it is to conduct keyword research. Search tools provide information on search volumes for words related to the company's offer, and it is possible to organize them by city, country, continent, etc. (LEHRER; ALMOR, 2021).

After estimating the demand, it is necessary to list all the company's products or services and determine in which units the sales are intended to be presented: for example, for a beverage producer, it can be bottles sold, but also liters sold. Then, the number of units sold must be predicted and the selling prices must be added (LEHRER; ALMOR, 2021).

3.3.2 Cost of goods sold (COGS)

These are those costs that need to be incurred for a company to deliver a service or produce a good. Without these costs, the product or service would simply not exist. The COGS differs based on the type of offer the company sells. For the sale of tangible products, they would include, for example, the costs of materials used in creating the good. For a company that sells consulting hours, they would include the personnel costs of employees providing the service (HILL, 2018).

One way to predict COGS is to look at the sales targets set in the revenue forecast. When creating revenue projections, you already know how many sales units you intend to have. Then, per sales unit, the raw material costs and labor costs involved in the production of these goods are added (HILL, 2018).

The COGS forecast also depends on the business model. Sometimes it would make more sense to forecast COGS at the total level, for example by month. Or it could be a percentage of revenues, for



example, when working with sales commissions (LEHRER; ALMOR, 2021).

3.3.3 Operating expenses (OPEX)

OPEX are those expenses that a company incurs as a result of carrying out its normal business operations. Unlike the cost of goods sold, they are not intrinsically necessary to produce the goods that are sold or to deliver the promised services. They include costs related to the operational and support side of the business, such as sales and marketing, research and development, and general and administrative tasks (EMIR HIDAYAT et al., 2021)

Typical operating expenses for startups include: events, travel, legal costs, online marketing, payroll costs (off COGS), accounting, rent, utilities, insurance, prototyping, patent costs, IT costs, office supplies, promotional materials, etc. (EMIR HIDAYAT et al., 2021)

If you're not sure what expenses you can incur in the long run, you can always save a certain percentage of your income for different categories of expenses. For example, you could allocate 10% of annual revenue in a budget for sales and marketing activities. The most important thing is that OPEX spending is aligned with the company's strategy: for example, if the company's growth strongly depends on online marketing, then significant spending in this category should be expected (EMIR HIDAYAT et al., 2021; KORPYSA et al. ., 2021).

3.3.4 Work team expense

With your personnel expense forecast, project the number of employees hired, including their respective salaries, fringe benefits, and payroll taxes. To make the staff forecast simpler, you can divide employees into different categories, for example:

- *Direct labor: includes employees who will be exclusively involved in the production of goods sold or services rendered. Engineers and technicians at companies that sell tangible hardware products, a junior consultant at a consulting firm, or a customer onboarding team. These costs are not part of operating expenses, but part of the cost of goods sold.*

- *Sales and marketing: Sales managers, marketing managers, copywriters, social media specialists, etc.*

- *Research and development: R&D managers, engineers, technicians, etc. These employees are part of the operating expenses.*

- *General and administration: this includes back office and C-level personnel, such as the CEO, CFO, CMO, secretaries, accountants, etc. (HILL, 2018; KORPYSA et al., 2021).*

To check whether the forecast for personnel expenses is realistic, one can divide the projected revenues in a given year by the number of employees for that year. This tells you the amount of revenue



you can expect to generate per employee and provides a solid basis for comparison with competitors and industry leaders.

When revenue per employee is at a similar level compared to the top twenty companies in the industry just a few years after launch, this is a strong indicator that the forecast may be too optimistic about expected revenues or that investments in staff are insufficient.

3.3.5 Asset investments

These are funds used to acquire or upgrade physical assets such as physical property, intellectual property, buildings, or equipment. This type of expenditure is made to maintain or increase the scope of operations. They can include everything from fixing a roof to building a new factory (HILL, 2018; KORPYSA et al., 2021).

Typical capital expenditures depend on the type of business and industry. For startups, it is quite common to invest in computers, software, office equipment, and machinery, but buying a building would also be considered a capital expenditure (CASSAR, 2014).

Many startups are encouraged to categorize their expenses as capital expenses rather than operating expenses. This has to do with the fact that, due to an accounting technicality, payments related to asset investments are spread over several years on the income statement and therefore do not all appear at once in the year of purchase. This means that they have a less visible reduction impact on profits (CASSAR, 2014).

3.3.6 Financing

This category includes financing flows such as equity, loans, or grants. Its main objective is to verify the impact of the financing need when adding different types of financing in different years of the model. When a model includes the possibility of entering loans, it needs to account for loan repayment and interest payments, as these have an impact on cash flows (FARIA et al., 2021).

3.4 FINANCIAL MODELING RESULTS

Every industry, business, entrepreneur, and investor is different, but a good financial model usually contains at least three deliverables: financial statements, an operating cash flow forecast, and an overview of key performance indicators (KPIs) (KORPYSA et al., 2021).

3.4.1 Financial Statements

Any financial model includes a forecast of three financial statements: the profit and loss statement, the balance sheet, and the cash flow statement. Financial statements are the generally accepted way of



communicating financial information between companies, banks, investors, governments, and basically, anyone who needs to understand financial performance in some way. Since any professional in the field is capable of interpreting financial statements, having a forecast of them in current regulations is normally a requirement in virtually any fundraising process (KORPYSA et al., 2021).

The profit and loss statement is an overview of all the revenues and costs that the business has generated over a specific period and shows whether it is profitable or not. It shows several crucial performance metrics such as gross margin, EBITDA, and net margin. The EBITDA is

very important for investors as it provides insight into operating performance and allows you to compare efficiency across different companies. The profit and loss statement can be used to compare different periods, budget vs. actual performance, performance relative to other companies, etc., and can therefore show weak or strong performance (KORPYSA et al., 2021).

The balance sheet is an overview of all the assets and liabilities a company has at a specific point in time, for example at the end of the year. Therefore, it is different compared to the profit and loss statement, which shows all the revenues and costs that were generated during a certain period (HILL, 2018).

The cash flow statement shows all the cash coming in and going out during a specific time. It consists of three different parts: operating cash flow, investing cash flow, and finance cash flow. Separating these three categories provides insight into where money is going in and out (HILL, 2018; KORPYSA et al., 2021).

3.4.2 Cash flows

Operating cash flow shows cash inflows and outflows caused by major business operations (CASSAR, 2014).

Investment cash flow shows changes in investments in assets and equipment. In most cases relating to startups, there will be an outflow of cash, because investing in assets costs money, but in some cases, it can also be positive in the case of a company divesting (CASSAR, 2014).

Financial cash flow is related to cash variations arising from financing activities. Cash inflow occurs in the case of capital raising, such as loans or equity, and cash outflow occurs in the case of payment of dividends or when interest on cash financing is paid (CASSAR, 2014; HILL, 2018).

The cash flow statement allows management to make informed decisions about business operations and allows it to prevent and monitor its indebtedness. In addition, it helps define investment needs and supports the timely payment of expenses and debts (CASSAR, 2014; HILL, 2018).



4 CONCLUSION

Financial modeling of a startup is necessary to build an economically viable business, for the entrepreneur to be better prepared for the future, to communicate the company's performance to shareholders or potential new investors, and to set goals. Typically, financial model outputs consist of a three- to the five-year forecast of financial statements on an annual basis, an overview of operating cash flow for the next 12 months, and an overview of key performance indicators (KPIs).). Having a financial model is critical to the fundraising process, as external funders often require a forecast to be provided.



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