

S-Curves for SaaS Models

“...What do all financial models have in common...” – they are all wrong....

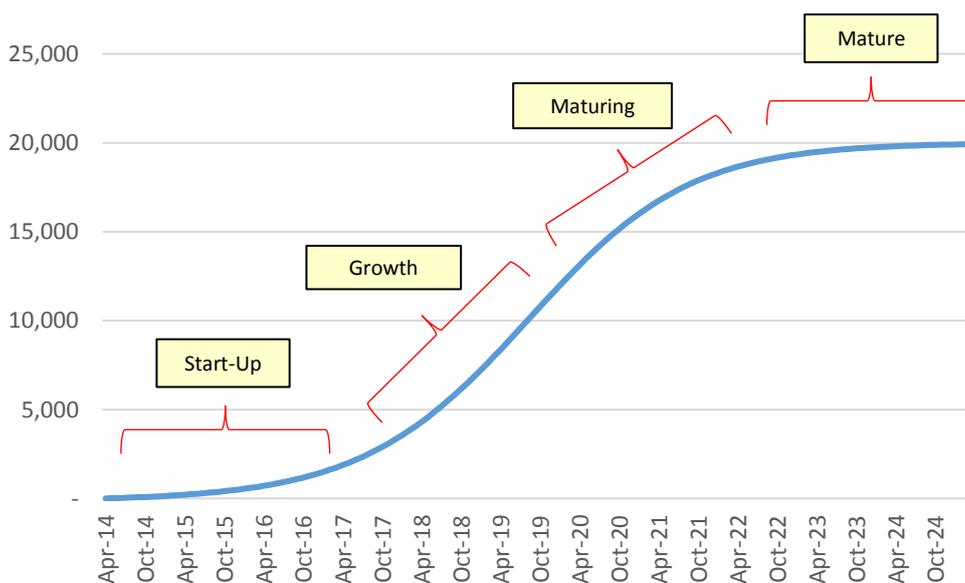
At the core of financial modelling is calculating future cash flows. Nobody, knows exactly what the future holds; therefore how can any model be 100% correct? If they are all wrong, are they of any use? As believers of fundamental structured corporate finance, we would like the answer to be an emphatic yes. However, how useful a model is, is highly dependent on what steps have been undertaken to reduce the potential errors in the model.

This blog is not sales pitch for financial modelling. Nor is it an avenue for outlining good modelling practises to reduce human and calculation errors. Its focus is to establish the assumptions underpinning future cash flows – improved rigour here is directly proportional to the usefulness of a financial model.

Detailed financial modelling often breaks a business operation down to its simplest components – what is being sold/delivered and for what price. It’s these future sales and customer numbers that is the focus of this post, particularly in the relation to SaaS companies.

Sales volumes can be the pivotal piece of the puzzle in a financial model, if set up correctly; revenues and costs are all directly related to these numbers. Future sales growth is highly dependent on the growth-stage of the business (i.e. is it “Start-up”, “Growth”, “Maturing” or “Mature”). In general, sales growth through these stages follows an s-curve. Low growth as the business starts up; followed by a period of exponential growth (the growth rate is proportional to current sales). As the company starts maturing, a period of reducing month on month growth through to a period of stable cash flows represented by little or no growth in sales once the company matures.

Figure 1: General growth-stages of a business



A key feature of the SaaS business model and therefore SaaS companies is significant scalability. Once the product establishes a proven foothold within the market, sales growth can very quickly experience growth proportional to current sales (i.e. month on month growth of $x\%$) – producing exponential growth. Exponential growth cannot go on forever. When and how this is phased out within financial modelling is a difficult aspect. Often growth profiles are “hard-coded” into the modelling based on a (guess) estimate of individual growth rates for the entire period of the forecast cashflows – the easiest approach being no growth from current levels, but this doesn’t work for growth companies such as SaaS businesses.

What if there was a better way...

[or at least an alternative to employ alongside “hard-coded” growth profiles].

The key feature required is to mirror expected future growth stages without having to estimate the growth rates for each of the periods in the forecast cash flows. Employing a mathematical s-curve to future growth achieves this – a simple explanation of this s-curve is that the growth rate in any period is related to the growth in the previous period and the ultimate saturation level in terms of cumulative sales. This approach produces an up-front “tail” of low growth, a period of exponential growth, tapering to a period of stable sales.

A key feature of this approach is that it only requires three key inputs:

- The saturation level (m) – the expected maximum number of future customers/sales which can be derived from establishing the total addressable market and what % of this the company is aiming to acquire.
- A coefficient (p) that influences the length of the “tails” – essentially representing the speed in which a company makes it in and out of the exponential growth phase (i.e. the timing of growth).
- A coefficient (q) that influences the steepness of growth within the exponential growth phase (i.e. the rate of growth). These coefficients can be estimated by regression analysis of historic growth patterns. However, more often than not they are based on a trial and error by reviewing the resulting growth curve.

We think this approach can have its place as it simplifies the number of inputs to: (a) how big are things going to get and (b) how long it is going to take to do this. Essentially management need to have a view of how big the total addressable market is in terms of customers, what % of this the company is likely to acquire and are there a couple of levers to pull that changes the shape of the growth curve to get there. This approach also fits very nicely into ‘what if’ testing (i.e. what if we achieve 10%, 20% or 50% of the addressable market).

Yes, this is a mathematically smoothed approach, but that’s what long-term forecasting is about. The additional benefit is that the longer term s-curve growth curves can be adjoined to a period of more detailed short-term growth inputs. This is our preferred approach (particularly for SaaS companies) – detailed short-term growth inputs supplemented with a longer term s-curve. This gives management the ability to apply more detail in the near term where there is more certainty, but have longer term growth linked to a simple set of assumptions which can be easily understood and communicated.

Your option set for growth forecasts stand at: no growth, linear, exponential, asymptotic growth or an approach that employs all of the above mirroring how a business grows. We choose the s-curve.

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