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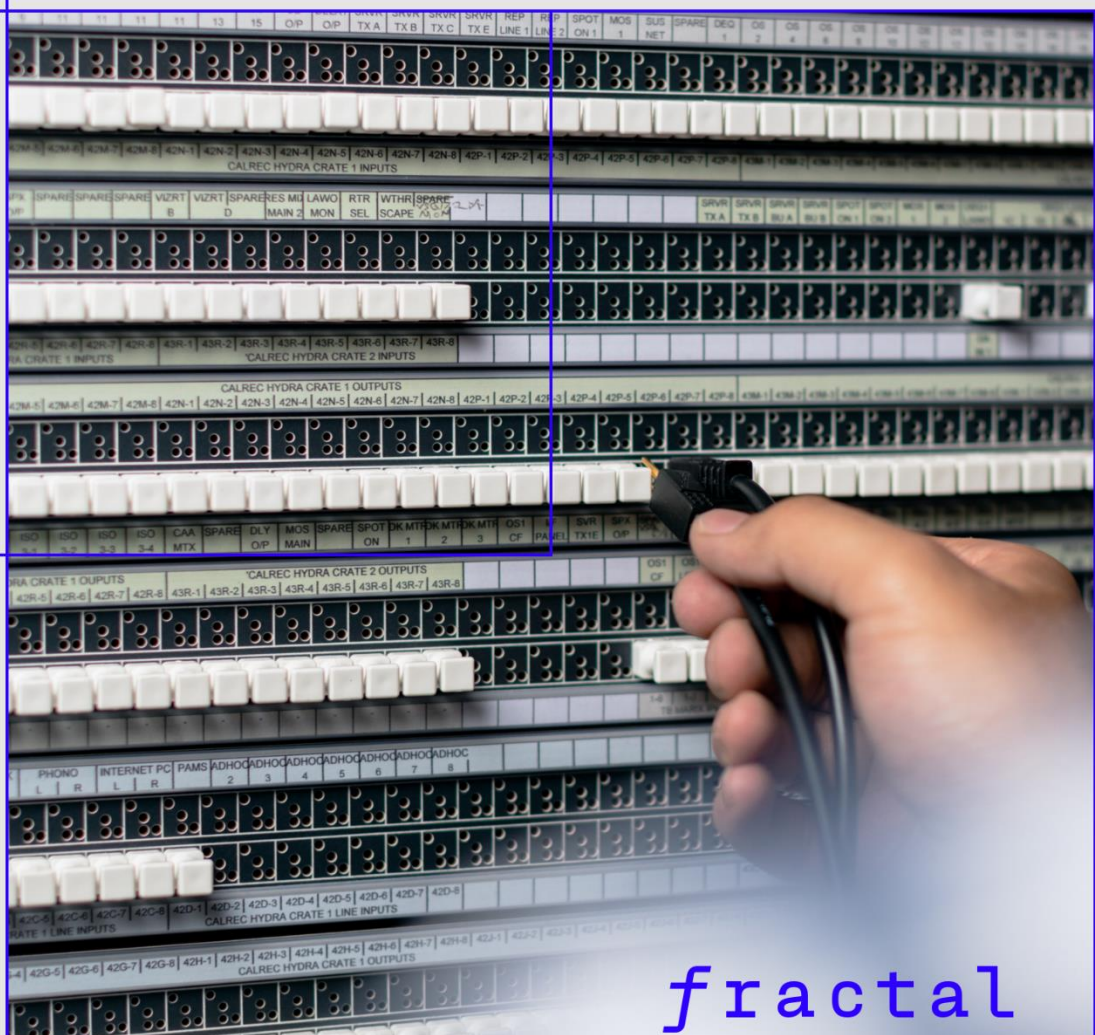
The Fractal Guide to Vertical SaaS Metrics



fractal

Guide to Vertical SaaS Metrics

INTRODUCTION

The SaaS business model lends itself to precise analyses of financial and operational metrics because it is based on recurring revenue. It's critical that the idiosyncrasies of a subscription business are taken into account when evaluating its performance to ensure an accurate understanding of the present state of the company, pathways to improved performance, and what to expect in the future under various assumptions.

There are two main types of SaaS business. Horizontal SaaS is built around a function found in many industries such as HR or CRM. Vertical SaaS is built around the workflow needs of a particular industry. The methods for evaluating both types of SaaS are the same, but the variables and benchmarks may be different.

Fractal's research team built a basic financial model for vertical SaaS businesses to help our founders identify pain points and levers for growth in their business. It can be used to model the company's performance to date and forecast performance several years into the future. The goal is to help founders make critical decisions such as when to accelerate growth with new sales hires or seek fresh investment.

Seed-stage vertical SaaS companies may not have all the data they need to build a robust financial model of their business. Early stage founders should use this guide to identify the data they need to collect to build a financial model in the future, which will be critical when they're preparing to raise their Series A.

SETUP

The first step to use the model is to input parameters on the setup page. Here you can set your unit denominations in dollars, thousands of dollars or millions of dollars and the start of your company's fiscal year. Here you can also determine how far you want your model to extend into the past and future.

1. Set your **Beginning Fiscal Year** to mark the start date of the financial model.

2. You must enter all the data up to the date entered in **First Projected Month**. The model will automatically update based on data entered in the yellow cells, but users can overwrite any cell if they do not have the requisite data for the highlighted input cells.

3. The model is a 7 year model by default and the user can create any combination of actual and projected metrics within that time frame.

Model Set Up	
Units	$K
First Projected Month	Jan-21
Fiscal Year End (Month)	12
Beginning Fiscal Year	2019
First FY Q1 Begin	Jan-19
First FY Q1 End	Mar-19
First FY Q2 End	Jun-19
First FY Q3 End	Sep-19
First FY Q4 End	Dec-19

***Example**: Financial data is denominated in thousands of dollars. Historical data is provided from January 2019 (First FY Q1 Begin) to December 2020. Projection starts on January 1, 2021. The fiscal year is the same as the calendar year (Ends month 12 / December).*

FINANCIAL SUMMARY

The Fractal vertical SaaS model begins with the financial summary of your business. This tab consists of data pulled from the three main financial statements: An income statement, a balance sheet, and a cash flow statement. Note that the income statement includes some common SaaS KPIs that are not included in standard GAAP financial reports. ***This guide will mainly focus on the non-standard financial metrics that are hallmarks of SaaS: ARR, CARR, deferred revenue, and the Rule of 40.***

$K	CY2021 Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
ARR	$5,171	$5,435	$5,868	$6,189	$6,416	$6,731	$7,070	$7,486	$7,844	$8,151	$8,436	$8,699
% Y/Y Growth	177.0%	157.0%	142.5%	135.2%	130.5%	124.2%	116.8%	111.2%	98.1%	90.3%	83.9%	76.5%
Revenue Stream #1	$416	$436	$462	$496	$520	$541	$568	$598	$631	$660	$685	$708
Total Revenue	**$416**	**$436**	**$462**	**$496**	**$520**	**$541**	**$568**	**$598**	**$631**	**$660**	**$685**	**$708**
% Y/Y Growth	199.2%	171.5%	153.0%	140.5%	134.0%	128.8%	122.2%	115.3%	107.6%	96.0%	88.6%	81.9%
Total COGS	($83)	($87)	($92)	($99)	($104)	($108)	($114)	($120)	($126)	($132)	($137)	($142)
Gross Profit	**$333**	**$349**	**$370**	**$397**	**$416**	**$433**	**$454**	**$478**	**$505**	**$528**	**$548**	**$567**
% Margin	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
S&M	($253)	($258)	($264)	($274)	($278)	($279)	($282)	($285)	($289)	($289)	($287)	($283)
R&D	($280)	($287)	($297)	($310)	($318)	($322)	($329)	($337)	($346)	($351)	($353)	($354)
G&A	($242)	($247)	($254)	($265)	($269)	($271)	($275)	($279)	($284)	($286)	($286)	($283)
Total OpEx	**($775)**	**($792)**	**($815)**	**($849)**	**($865)**	**($872)**	**($886)**	**($901)**	**($919)**	**($927)**	**($926)**	**($921)**
EBITDA	**($442)**	**($443)**	**($445)**	**($453)**	**($449)**	**($439)**	**($431)**	**($423)**	**($414)**	**($399)**	**($378)**	**($354)**
% Margin	(106.4%)	(101.4%)	(96.4%)	(91.3%)	(86.2%)	(81.1%)	(76.0%)	(70.8%)	(65.6%)	(60.4%)	(55.2%)	(50.0%)
Net Income	**($442)**	**($443)**	**($445)**	**($453)**	**($449)**	**($439)**	**($431)**	**($423)**	**($414)**	**($399)**	**($378)**	**($354)**
% Margin	(106.4%)	(101.4%)	(96.4%)	(91.3%)	(86.2%)	(81.1%)	(76.0%)	(70.8%)	(65.6%)	(60.4%)	(55.2%)	(50.0%)
FCF	**($442)**	**($443)**	**($445)**	**($453)**	**($449)**	**($439)**	**($431)**	**($423)**	**($414)**	**($399)**	**($378)**	**($354)**
% Margin	(106.4%)	(101.4%)	(96.4%)	(91.3%)	(86.2%)	(81.1%)	(76.0%)	(70.8%)	(65.6%)	(60.4%)	(55.2%)	(50.0%)
% Rule of 40 (Revenue)	92.8%	70.1%	56.6%	49.2%	47.7%	47.7%	46.2%	44.5%	42.0%	35.6%	33.4%	31.9%

Example: *The highlighted rows of the income statement are standard GAAP reporting categories: Revenue, COGS, Gross Profit, Total OpEx, and Net Income. ARR, EBITDA, and FCF are non-GAAP metrics, but they are commonly used by investors to evaluate SaaS companies.*

Annual Recurring Revenue (ARR)

Annual recurring revenue is arguably the most important metric when valuing a SaaS business and can tell you a lot about the health of your company. ARR is your annualized subscription revenue or your recognized monthly recurring revenue (MRR) multiplied by 12. It does **not** include signed contracts for services that have not started or one-time payments such as onboarding fees.

1. Enter your revenue for each month in revenue stream #1. If you do not have multiple revenue streams, leave the other revenue stream cells blank. Note that the revenue entered in the cell may not exactly match your MRR. For example, the revenue will be less than the MRR if a customer signs up for a product in the middle of the month instead of on the first day of the month. Indeed, SaaS revenue typically lags SaaS MRR due to contract timing. Do not include implementation and other non-subscription revenues as ARR.

$K	CY2019											
	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
CARR												
% Y/Y Growth												
ARR	$72	$72	$120	$192	$303	$377	$544	$679	$925	$1,110	$1,338	$1,601
% Y/Y Growth												
Revenue Stream #1	$6	$6	$7	$11	$18	$27	$35	$48	$62	$81	$97	$117
Total Revenue	**$6**	**$6**	**$7**	**$11**	**$18**	**$27**	**$35**	**$48**	**$62**	**$81**	**$97**	**$117**
% Y/Y Growth												

***Example**: In February 2019, the company signed no new customers so its ARR ($72,000) and monthly recurring revenue ($6,000) is the same as January. In March 2019, the company contracted $4,000 in MRR bringing it's total MRR to $10,000. This can be seen in the ARR cell for March 2019: $120,000/year, which is equal to $10,000/month. Notice the recognized revenue for March 2019 is only $7,000. This is a result of the lag between revenue and MRR due to the timing of the contract.*

Contracted Annual Recurring Revenue (CARR)

CARR accounts for the lag between when your company signs a contract with a new customer and when that customer pays you for your product. Whereas ARR accounts for recognized revenue, CARR accounts contracted revenue that hasn't yet started billing. Once a customer's money starts hitting your account the CARR becomes ARR. Like ARR, CARR does **not** include non-recurring revenue such as setup fees.

Accounting for CARR becomes particularly important if your SaaS company has a long lead time between contract signing and the start of service. This creates closing risk because a customer may renege on its contract during the period between signing and the start of the service. This lag can also adversely affect your unit economics because it can increase the time from customer acquisition to payment collection.

CARR is the most generous proxy for revenue because it assumes that all the customers that have signed up for your service will pay for it as stipulated in their contract. It also syncs the cost of acquiring a customer with the expected annual recurring revenue from that customer.

ARR and CARR may be substantially different if your company has a long lead time between contract signing and start of service. Ideally, you want this gap to be as small as possible. Analyzing the difference between your ARR and CARR may help you make decisions about your billing practices.

The Rule of 40%

Great SaaS companies often operate deep in the red when they're in growth mode, which can make it challenging to identify a strong company just by looking at free cash flow (FCF) margins. Conversely, a profitable company that isn't growing may be in trouble.

The Rule of 40% is a heuristic to evaluate the financial health of a SaaS company by combining its revenue growth rate and FCF margin.

The Rule of 40%
revenue growth rate + FCF margin 40%.

The best way to calculate the Rule of 40% is to use your FCF margin, but there are variations such as profit or EBITDA margins. You can calculate your FCF margin by dividing FCF by total revenue. Add that result to your year-over-year revenue growth rate. If it totals greater than 40%, your company is considered best in class for this metric.

It is important to note that The Rule of 40% is just a heuristic and is not necessarily indicative of the overall health of the company. It is an elite benchmark for both horizontal and vertical SaaS that few companies achieve.

The Rule of 40% is also vulnerable to distortions. For example, if a SaaS company is very young and growing rapidly, its revenue growth rate may be several hundred percent. But this is a misleading statistic because it is based on a small amount of revenue. The Rule of 40% works best for a more mature company. Another common distortion is a large, one-time expenditure that may create a substantial cash strain but isn't reflective of the day-to-day operations of the business.

As long as these shortcomings are acknowledged, the Rule of 40% is useful for understanding the tradeoff a company is making between growth and profitability. This is especially important for SaaS businesses since they are typically more willing to invest in acquiring customers because recurring revenues creates predictability about if and when those investments will be recouped. Thus a SaaS company will often operate unprofitably during its early high growth phases, which is perfectly acceptable to investors if it has high margins, high retention rates, long customer lifetimes, a large addressable market, and high barriers to entry because that means the company can expect to generate solid cash flows in the future.

$K	CY2021											
	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
FCF	($442)	($443)	($445)	($453)	($449)	($439)	($431)	($423)	($414)	($399)	($378)	($354)
% Margin	(106.4%)	(101.4%)	(96.4%)	(91.3%)	(86.2%)	(81.1%)	(76.0%)	(70.8%)	(65.6%)	(60.4%)	(55.2%)	(50.0%)
% Rule of 40 (Revenue)	92.8%	70.1%	56.6%	49.2%	47.7%	47.7%	46.2%	44.5%	42.0%	35.6%	33.4%	31.9%

Example: *In CY2021, the company started with a Rule of 40% percentage at 92.8%. This is exceptionally high and suggests that the company is small and growing fast. As the company matures, you would expect to see a normalization of its Rule of 40%, which is exactly what happens over the course of 2021. By the end of the year, the company has a Rule of 40% value of 31.9%.*

Deferred Revenue

Deferred revenue is a GAAP standard that accounts for the difference between the value of a booked contract and when that revenue actually hits your company account. In the context of SaaS, it means that a customer has paid upfront for future products and services. Deferred revenue refers to any upfront payment, whether it's a single month, a quarter, a year, or multiple years.

Deferred revenue is listed as a liability in the financial statement because it commits you to delivering your service for the contracted length of time. But it's a good thing for your company because it means you can deploy capital faster to fuel growth. Investors pay close attention to your deferred revenue because it can have a large impact on your company's cash flow and signals whether your company has healthy unit economics.

$K	CY2019											
	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Current Liabilities												
Accounts Payable												
Accured Payroll												
Deferred Revenue	$12.0	$11.0	$10.0	$9.0	$8.0	$7.0						

Example*: You book an annual contract with a customer for $1,000/month. The value of that contract on signing is $12,000. If the entire year is paid up front the deferred revenue is $12,000. The value of that deferred revenue is reduced by $1,000/month as the service is provided and the revenue is recognized as income.*

Other Financial KPIs

EBITDA: EBITDA is a non-GAAP metric that is defined as earnings before interest, taxes, depreciation, and amortization. In the Fractal financial model, COGS and OpEx are **not** burdened by

depreciation and amortization. This means that calculating EBITDA is simplified to subtracting OpEx from gross profit.

Unlike businesses producing physical goods, SaaS businesses typically do not have significant depreciation and amortization expenditures. Thus there are no D&A lines included in the income statement. However if your business does have substantial D&A costs you should add these lines into the model.

$K	Jan-19	Feb-19	Mar-19	Apr-19
Gross Profit	**$5**	**$5**	**$6**	**$9**
% Margin	80.0%	80.0%	80.0%	80.0%
S&M	($6)	($6)	($7)	($11)
R&D	($6)	($6)	($7)	($11)
G&A	($5)	($5)	($6)	($10)
Total OpEx	**($17)**	**($17)**	**($20)**	**($32)**
EBITDA	**($13)**	**($12)**	**($14)**	**($23)**

Example: The EBITDA for February 2019 is $5,000 minus $17,000 in operational expenses for a total of -$12,000.

Free Cash Flows: FCF is calculated as cash flow from operations less capital expenditures. Your company's FCF is particularly important because it can help determine your run rate and how long your company will be able to survive based on current expenditures, revenue, and remaining capital. The cash flow statement breaks out cash flow from operations, investing, and financing to give a holistic picture of how cash is used in your business.

$K	Jan-19	Feb-19	Mar-19	Apr-19	May-19
Cash Flow from Operations					
Net Income					
Depreciation					
Amortization					
Δ Working Capital					
Total CFO					
Cash Flow from Investing					
Capital expenditures					
Other Investing activities					
Total CFI					
Cash Flow from Financing					
Changes in Invested Capital					
Changes in Debt					
Total CFF					

COGS: The cost of goods sold for a SaaS company typically consist of hosting costs, payment processing costs, implementation costs, hardware costs, and customer success costs. The cost of engineering is typically split between COGS and R&D, with any engineering time spent on solving a problem for a customer being accounted for in COGS whereas time spent on product development is accounted for in R&D expenses.

$K	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19
Total COGS	($1)	($1)	($1)	($2)	($4)	($5)	($7)

Example: The company's COGS are $1,000 for its first three months and then starts to increase as the company sells more of its products and services.

Gross Margins: Gross margin is equal to gross profit divided by revenue. SaaS companies should aim for gross margins above 70% because this indicates that it is a scalable software business. But there may be several reasons why your gross margin is below this threshold, including hardware costs, customer success costs, and price reductions as a company scales. As a result, a SaaS company's gross margins may fluctuate a lot during its first years.

$K	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19
Gross Profit	**$5**	**$5**	**$6**	**$9**	**$15**	**$21**
% Margin	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%

Example: The company's gross margins are healthy and very steady at 80%.

Sales and Marketing (S&M): This is a very important line item for investors because it reveals the efficiency of your go-to-market strategy. Your customer acquisition cost (CAC) is equal to your S&M spend divided by the number of customers acquired. This is a key metric for understanding when your company will be profitable. (See the 'Efficiencies' section below for more details on CAC.)

ARR AND NEW LOGO FUNNELS

The ARR Funnel is a more granular look at your company's recurring revenue stream. The funnel breaks ARR into several segments: new logo, reactivation, upsell, downsell, and churn. The combination of these factors results in your net new ARR. The New Logo Funnel provides the same metrics as the ARR Funnel but on a logo basis instead of a revenue basis. It shows the number of new customers added and churned per month.

ARR Funnel Components	
New Logo	Recurring revenue from new customers that typically represents the largest growth vector for SaaS companies.
Reactivation	Recurring from a customer that had stopped using your product begins using it again. This is typically more relevant later in a company's life.
Upsell/Downsell	Increased/decreased recurring revenue from existing customers. This comes into play as your company expands its product offerings.
Churn	Churn is lost revenue from customers that stop using your product. It is one of the most important metrics in the ARR funnel because it reflects the strength of your product/market fit, your competitive position, and the degree of customer success.

Churn Rates

The ARR Funnel provides metrics on your company's churn, which can be broken out into gross churn and net churn. **Gross churn** is the percentage of monthly recurring revenue (MRR) that is lost due to canceled customer contracts or downsell. **Net churn** is the percentage of all lost MRR modified by upsell. Both metrics are easily calculated with the following formulas:

Gross Churn	Lost ARR / (Average of BOP and EOP ARR)

Net Churn	(Lost ARR - Upsell ARR) / (Average of BOP and EOP ARR)

A best-in-class SaaS business will see annualized gross churn rates around 5%. But there are no hard and fast rules for setting a churn benchmark for your business since retention benchmarks are highly context dependent and will vary by industry, customer base, competitive landscape, and unit economics. A good heuristic for many vertical SaaS businesses is to aim for gross churn rates below 10%. However it is possible to run a healthy business with churn rates as high as 40% if the customer acquisition costs are low enough. What qualifies as a healthy churn metric is highly context dependent.

Revenue Retention

90% gross revenue retention or higher is considered best in class for SaaS companies, but net dollar retention may be significantly higher because it includes revenue from upselling existing customers. For enterprise-focused SaaS businesses, best-in-class net dollar retention is around 120%. For vertical SaaS businesses that focus on small and medium-sized customers it is typically around 110%.

Net dollar retention is a critical input for calculating the lifetime value to customer acquisition cost ratio, which is a major determinant of the strength of a SaaS company's unit economics. (See the 'Efficiencies' section below for more details on LTV, CAC, and payback periods.)

	CY2020				CY2021			
$K	Q1A Mar-20	Q2A Jun-20	Q3A Sep-20	Q4A Dec-20	Q1E Mar-21	Q2E Jun-21	Q3E Sep-21	Q4E Dec-21
% Churn (incl. Downsell)								
Gross Churn	3.2%	2.0%	2.4%	2.3%	2.5%	2.5%	2.0%	2.7%
Annualized	12.7%	8.2%	9.5%	9.2%	10.0%	10.0%	7.9%	11.0%
Gross Retention	87.3%	91.8%	90.5%	90.8%	90.0%	90.0%	92.1%	89.0%
Net Churn	1.6%	0.6%	0.8%	0.3%	1.1%	1.0%	0.5%	1.1%
Annualized	6.5%	2.6%	3.1%	1.3%	4.2%	3.9%	2.1%	4.5%
Net Dollar Retention	93.5%	97.4%	96.9%	98.7%	95.8%	96.1%	97.9%	95.5%

Example: *The company has gross annualized churn rates that are consistently at or below 10%. It's gross dollar retention is right around 90%, which puts it in the upper quartile of SaaS companies, but its net dollar retention is below 100%, which reflects the fact that the company is losing more recurring revenue through downsell and churn than it's adding through upsell.*

Average Selling Price

The average selling price is ARR divided by the number of new customers during that period. ASP is a useful and simple metric for determining the size of your new customers and how they compare to the size of your average customer and churned customers. In general, you should expect to lose more smaller customers than larger customers since customers who are spending more are more invested in using your system. If this isn't the case it's critical to examine why larger customers are churning out of your product.

	CY2020				CY2021			
$K	Q1A Mar-20	Q2A Jun-20	Q3A Sep-20	Q4A Dec-20	Q1E Mar-21	Q2E Jun-21	Q3E Sep-21	Q4E Dec-21
ASPs ($K)								
New Deal	$12.0	$12.0	$11.9	$11.6	$11.4	$11.5	$11.4	$10.9
Churned	($12.0)	($11.9)	($12.5)	($11.9)	($12.4)	($12.0)	($12.4)	($12.5)
Ending	$12.2	$12.2	$12.3	$12.4	$12.4	$12.4	$12.5	$12.5

Example: *The company's new customers are staying roughly the same size and the customers that churn out tend to be smaller than the customers that stay, as evidenced by the increasing Ending ACVs and relatively constant value of churned customers.*

EFFICIENCIES

When investors are examining your SaaS company, one of the metrics they'll be particularly interested in is your sales and marketing efficiencies. In other words, how much ARR does every dollar of S&M spend generate? This multiple is known as your "**magic number**."

There are two flavors of magic number: standard or gross margin adjusted. Both are useful, but investors will tend to focus on your gross margin magic number.

This efficiency metric is a blunt instrument in the sense that it assumes that all sales and marketing spend goes toward new ARR generation. It doesn't account for S&M spent on customer retention. Still, it is a useful heuristic for understanding the efficiency of your S&M operations.

A magic number of 1 is a good target for a typical SaaS company. Often a SaaS company's magic number is significantly below 1, which indicates that it may be spending its S&M dollars inefficiently. If it is significantly higher than 1, the company may not be spending enough on S&M.

Payback

Magic numbers are useful for determining the implied payback period on new customers. Since SaaS companies operate on a recurring revenue model, they generally take a hit up front by spending on S&M to attract customers and recoup this expense over the contract lifetime of that customer.

The payback period is the number of months until breakeven. In general SaaS companies should target a payback period of 1-3 years. If you have a high velocity sales cycle that is mostly dealing with small and medium businesses, the payback cycle should be on the lower end of that spectrum. But for enterprise SaaS and vertical SaaS targeted at certain industries (e.g., hospitals) the sales cycles may be much longer and each customer may be more costly to acquire. This may substantially increase the payback period. This isn't necessarily a problem if the ACVs are sufficiently large and the product has high net retention, which will result in a large LTV.

	CY2020											
$K	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Gross New ARR	$307.8	$265.4	$309.8	$216.5	$172.5	$248.8	$275.0	$331.2	$433.2	$345.1	$340.5	$386.6
Net New ARR	$265.8	$247.8	$305.6	$210.9	$152.7	$218.8	$258.1	$284.2	$414.8	$322.5	$304.8	$342.4
Same Period S&M	($113.5)	($128.7)	($143.2)	($158.2)	($167.0)	($173.6)	($183.2)	($194.1)	($207.2)	($223.5)	($234.5)	($244.3)
Same Period FCF	($225.0)	($253.3)	($279.8)	($306.7)	($321.1)	($330.7)	($345.6)	($362.5)	($382.6)	($407.6)	($422.1)	($433.5)
Same Period Magic Number (x)												
Gross New ARR	$307.8	$265.4	$309.8	$216.5	$172.5	$248.8	$275.0	$331.2	$433.2	$345.1	$340.5	$386.6
Same Period S&M	($113.5)	($128.7)	($143.2)	($158.2)	($167.0)	($173.6)	($183.2)	($194.1)	($207.2)	($223.5)	($234.5)	($244.3)
Magic Number (x)	**2.7x**	**2.1x**	**2.2x**	**1.4x**	**1.0x**	**1.4x**	**1.5x**	**1.7x**	**2.1x**	**1.5x**	**1.5x**	**1.6x**
Gross Margin (%)	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
GM Adj. Magic Number (x)	**2.2x**	**1.6x**	**1.7x**	**1.1x**	**0.8x**	**1.1x**	**1.2x**	**1.4x**	**1.7x**	**1.2x**	**1.2x**	**1.3x**
Implied Payback (Months)	**5.5**	**7.3**	**6.9**	**11.0**	**14.5**	**10.5**	**10.0**	**8.8**	**7.2**	**9.7**	**10.3**	**9.5**

Example: *This company showed strong sales efficiency as measured by their gross-margin adjusted magic number. The company's implied payback period was also relatively low for new logo revenue, another sign of efficiency in S&M spend.*

Magic Number with Lag

Instead of calculating your S&M magic numbers for the same period, it may make sense to incorporate a rolling one quarter delay into the calculation. This lag accounts for the gap between when S&M dollars are spent and when they start producing revenue, which may range from a few weeks to several months depending on the typical length of a sales cycle.

Calculating your magic number without lag is the most conservative method for appraising the efficiency of S&M spend and doesn't really reflect the reality of your sales process. In B2B SaaS, S&M spend rarely results in immediate revenue and the time it takes to move a customer through the sales funnel should be accounted for in your magic number.

It is especially important to incorporate a delay into your magic number if your sales organization is growing fast, which can compound the mismatch between S&M spend and revenue.

A one-quarter lag in your magic number is a simple heuristic for vertical SaaS businesses targeting small and medium-businesses, where the sales cycle is somewhere between a few weeks and three months. SaaS businesses targeting enterprise customers may need to incorporate a lag of two or more quarters to account for an even longer sales cycle.

To do this calculation, divide the rolling gross new ARR from the previous quarter by the total S&M spend from the previous quarter. For example, if you're using January as the current period, you would divide the gross new ARR for January by the total S&M spend in August, September, and October of the previous year.

	CY2020											
$K	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Rolling 1-Qtr Lag Magic Number (x)												
Gross New ARR	$808.5	$841.0	$883.0	$791.7	$698.8	$637.8	$696.3	$855.0	$1,039.4	$1,109.5	$1,118.8	$1,072.2
S&M 1-Qtr Lag	($167.3)	($206.8)	($250.0)	($293.6)	($339.7)	($385.5)	($430.2)	($468.5)	($498.9)	($523.8)	($550.9)	($584.5)
Magic Number (x)	**4.8x**	**4.1x**	**3.5x**	**2.7x**	**2.1x**	**1.7x**	**1.6x**	**1.8x**	**2.1x**	**2.1x**	**2.0x**	**1.8x**
Gross Margin (%)	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
GM Adj. Magic Number (x)	**3.9x**	**3.3x**	**2.8x**	**2.2x**	**1.6x**	**1.3x**	**1.3x**	**1.5x**	**1.7x**	**1.7x**	**1.6x**	**1.5x**
Implied Payback (Months)	**6.1**	**6.7**	**7.2**	**8.6**	**10.3**	**12.1**	**12.3**	**11.2**	**10.2**	**10.1**	**10.4**	**11.2**

Example: The company's gross margin magic number with a 1 quarter rolling lag is consistently above 1. This suggests that they are achieving an efficient return on their sales and marketing spend and may even consider spending more on S&M so long as the marginal dollar of S&M spend remains efficient.

Capital Efficiency

Another useful metric is capital efficiency, which is calculated as the net new ARR for a given period divided by the free cash flow for that period. Capital efficiency is a measure of how much ARR you earn for each net dollar of capital spent. The high-growth SaaS companies have a multiple of 1x or greater—that is, at least $1 of ARR earned for every $1 spent. Overtime, this multiple should increase because your company is adding fewer fixed costs and economies of scale kick in. In general, SaaS companies should aim for capital efficiency multiples between 0.5-1x. A multiple above 1.25x is considered best in class for capital efficiency.

	CY2020											
$K	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Capital Efficiency												
Net New ARR	$265.8	$247.8	$305.6	$210.9	$152.7	$218.8	$258.1	$284.2	$414.8	$322.5	$304.8	$342.4
Same Period FCF	($225.0)	($253.3)	($279.8)	($306.7)	($321.1)	($330.7)	($345.6)	($362.5)	($382.6)	($407.6)	($422.1)	($433.5)
Net New ARR / FCF Burn (x)	**1.2x**	**1.0x**	**1.1x**	**0.7x**	**0.5x**	**0.7x**	**0.7x**	**0.8x**	**1.1x**	**0.8x**	**0.7x**	**0.8x**

Example: *The company showed strong overall capital efficiency with a median multiple of around 0.8x.*

Revenue Recognition Lag

SaaS normally operates on a monthly billing cycle with annual contracts so it's helpful to include a one-month lag in your run rate revenue calculations, which are used to forecast the future performance of your company.

Investors like to see the ARR to revenue lag calculation because it helps them determine that your company is disclosing ARR accurately and not confusing it with contracted ARR. With few exceptions, your company's revenue run rate with a one month lag should always be greater than or equal to the previous month's ARR.

	CY2020											
$K	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Revenue Recognition Lag												
ARR	$1,866.9	$2,114.7	$2,420.3	$2,631.2	$2,783.8	$3,002.7	$3,260.8	$3,545.0	$3,959.8	$4,282.2	$4,587.0	$4,929.4
Run Rate Revenue	$1,667.6	$1,928.9	$2,191.1	$2,473.0	$2,669.4	$2,838.6	$3,067.2	$3,331.9	$3,648.7	$4,040.4	$4,358.4	$4,672.6
1-Month Lag Run Rate Revenue	$1,928.9	$2,191.1	$2,473.0	$2,669.4	$2,838.6	$3,067.2	$3,331.9	$3,648.7	$4,040.4	$4,358.4	$4,672.6	$4,989.9
% of ARR	103.3%	103.6%	102.2%	101.5%	102.0%	102.1%	102.2%	102.9%	102.0%	101.8%	101.9%	101.2%

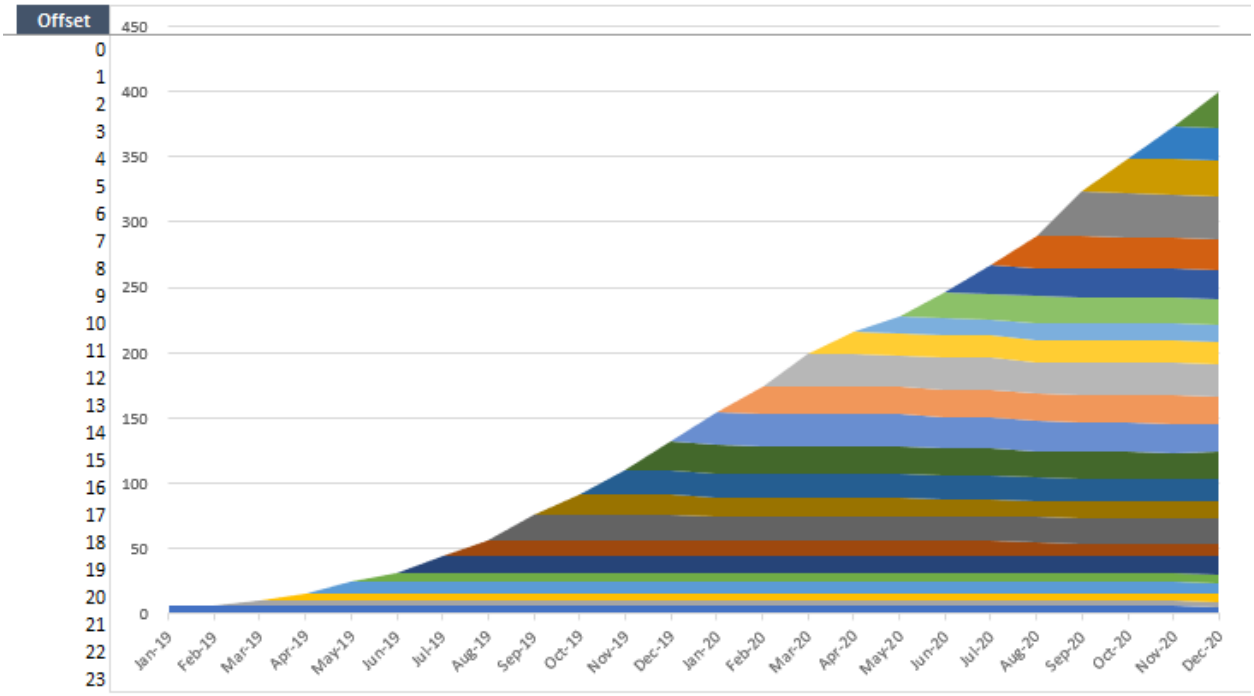
Example: *The company's revenue recognition lag calculation is consistently above 100%, which tells investors that it is accurately reporting its ARR.*

Cohort Analysis

The most common method of cohort analysis divides your customer base into groups based on the month they started service. It's a valuable way of tracking customer retention and revenue over time. Raw growth metrics may conceal important information about the way your customers are engaging with your company.

Layer Cake

When you plot your customer cohorts on a layer cake chart, you want to see the size of the cohorts or the thickness of the layers growing larger indicating that you are adding more users on a monthly basis. By looking at the slope of the cohort bars in a *revenue* layer cake, you can also tell how long customers are using your software and whether there are opportunities to increase customer revenue through upselling. A relatively flat layer in the graph shows that customer revenue stays the same over time, while a gradually widening layer shows that customers are increasing their spend on your platform.



Example: *The company's layer cake chart shows customer cohorts that are getting noticeably larger over time as measured by the thickness of each layer. This is indicative of healthy growth. Furthermore, each layer is relatively stable, which means that most customers in each cohort are not churning during the period captured in the chart. A bar that grows narrower over time would indicate churn.*

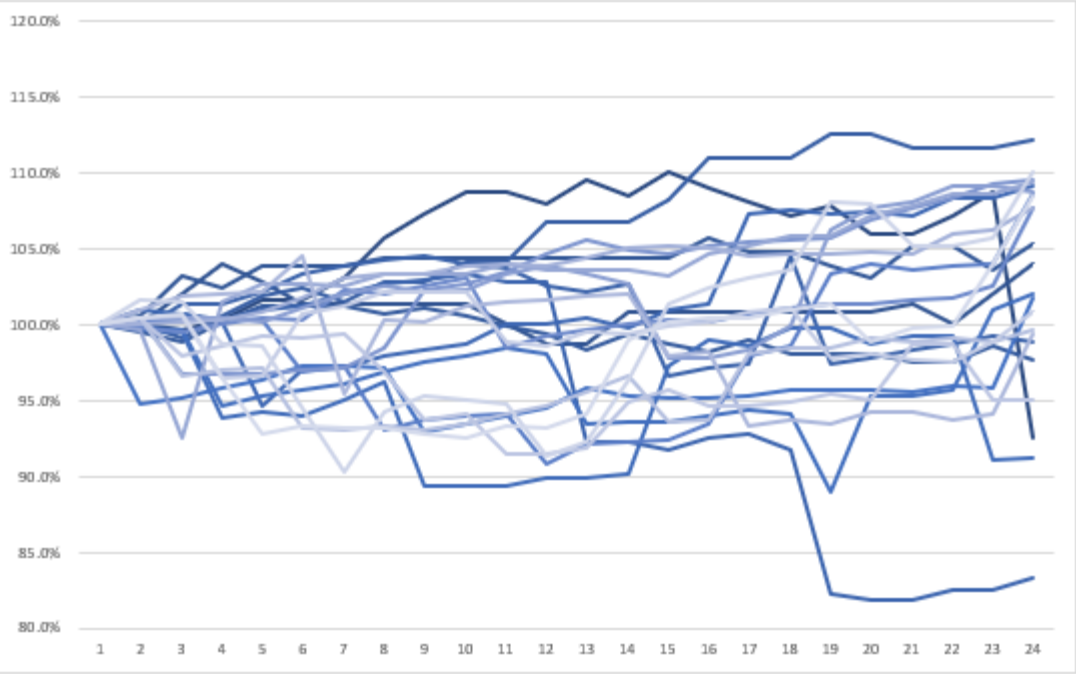
Spaghetti Chart

Cohorts can also be visually analyzed by looking at MRR net retention over time in a "spaghetti chart." These charts track the percentage of MRR by monthly cohorts.

This is a useful analysis for quickly visualizing whether there is a problem with retention or whether you're effectively upselling customers. In the case of low retention, you would see lines trend downward over time, whereas strong net retention would keep the lines stable or show a general upward trend.

If the general trend visualized in the spaghetti chart is positive, that is a good sign that your product is a good match for your customer's needs and you're finding a better product-market fit. If the lines trend down, however, it may mean that your market has become more competitive or you're selling outside of your core market and need to readjust your product-market fit.

In the Fractal model, older cohorts are represented as darker lines and younger cohorts are represented as lighter lines.



Example: *The company's MRR is relatively stable and clustered around 100%. The vast majority of the cohorts show between 90 and 110% net revenue retention, which is a good sign the company has found a solid product-market fit.*

About Fractal Software

Fractal Software launches and finances vertical SaaS companies that solve real problems for businesses in overlooked industries. We unlock entrepreneurship for exceptional individuals by providing capital, a co-founder, a business idea, and ongoing support as their company grows. Together, we'll create fast-growing vertical SaaS companies that modernize the way America's small and medium businesses operate so they can better serve their communities.

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