Follow-on allocation in venture capital portfolio construction is critical. Being able to "double down" on the "winners" in a portfolio is an important factor in the success of venture fund managers, especially those at the seed stage. This is why so many managers fight for pro-rata rights to maintain their ownership stake in a company. And when raising a fund, nearly every potential institutional LP will ask a GP about the fund's follow-on allocation, or what percent or amount of the total fund a manager will allocate to making follow-on investments.

In a previous post in the Kauffman Fellows Journal we wrote about overall portfolio construction and the various trade off implications a GP must consider when building a portfolio. While follow-on reserve was included in that post's construction strategy outline, it was a simple percentage of AUM input that did not consider any of the other factors that can impact follow-on allocation strategy.

In this post, we are again using Tactyc to go deeper in our exploration of follow-on strategy and how flexing specific assumptions around follow-on round dynamics, graduation and exit rates, and the exercising of pro-rata rights can impact fund construction and overall performance.

How VCs Think About Follow-On Strategy

There are two main ways the majority of VCs think about follow-on strategy and both are pretty straightforward. The first way--which we will call the "Percentage of the Fund" strategy--makes follow-on allocation the driver of other portfolio construction considerations like number of companies in the fund, average initial check size or targeted ownership percentage. As the name implies, this strategy picks a percentage of total fund size the manager will reserve for follow-on investments. Under this strategy, VCs will typically allocate between 40% and 60% of their funds for follow-on. For a $100M fund with a 60% reserve allocation and a 2% yearly management fee, there would be 20% or $20M available to make initial investments. If the manager is targeting a portfolio of 40 companies they would be able to write initial checks of $500K, which are

not lead sized checks in seed rounds which could affect their ability to secure pro-rata rights. Under this follow-on scenario, the manager might be forced to have fewer companies in their portfolio.

The other method VCs use in follow-on strategy is what we will call the "What's Left" strategy. In this case, a manager has a construction strategy of 40 companies with a targeted 10% ownership in the initial investment round (and assuming the same 2% management fee). On the same $100M fund, after fees there would be $80M of investable capital. If the average seed round was done at a $10M valuation (or cap) the initial check size would have to be $1M to hit that 10% ownership target, and in a portfolio of 40 companies, the allocation to initial checks would be $40M, leaving $40M, or 40% to allocate to follow-on rounds.

Thinking Deeper About Follow-On Strategy

Under both of the strategies above, VCs normally say they will use their follow-on reserves to re-invest into their biggest winners. Sometimes VCs are more specific and say they will follow on into the top 25% companies in their portfolio. Not going deeper into follow-on strategy past this point can be very problematic. As we mentioned under the "Percentage of the Fund" strategy, allocating too much of a fund to follow on might not allow a manager to write large enough checks to get follow-on rights. Additionally, as portfolio companies start to raise subsequent rounds of financing, it's not exactly clear which of the portfolio companies are in the top performing bucket. And even more challenging, most managers will have to make follow-on decisions before they have finished making initial investments, so how can they know if the company currently raising a round is performing better or worse than a company the manager hasn't yet invested in?!

And while most managers say they will only use follow-on to invest in their top-performing companies, in practice they may end up allocating some to companies that need a bridge or who are struggling but continue to show promise.

To help solve some of these challenges we feel it is more advantageous to use a "Graduation Rate" follow-on strategy that we will detail below.

Graduation Rate Follow-On Strategy

The graduation rate follow-on strategy involves looking at and considering the following:

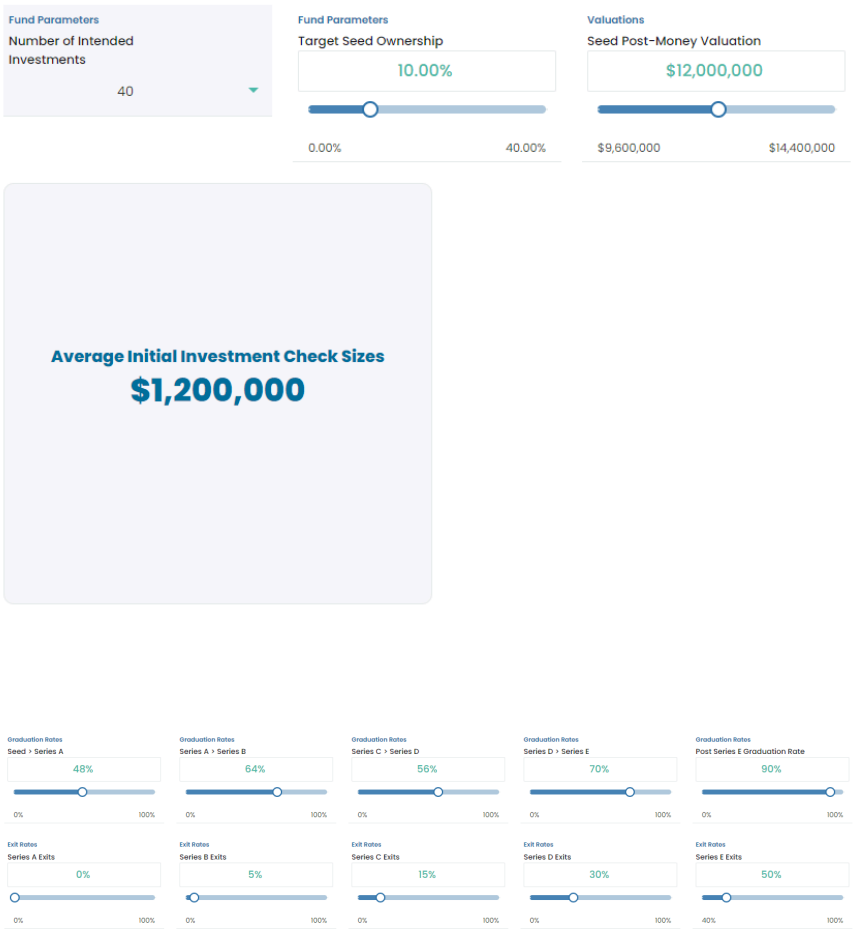
- Graduation Rates: These rates are benchmarked data around what percentage of companies successfully raise follow-on rounds. Surprisingly there is not an authoritative source on these graduation rates, but to guide the analysis in this post we are using 2018 data from CB Insights who broke out fundraising funnel data on 1,119 seed stage companies. Many VC firms have their own proprietary data around graduation rates from their specific portfolios. Using the interactive Tactyc, you can flex these graduation rates by round.
- Follow-On Round Assumptions and Implied Dilution: It is important for a manager to understand the average percentage dilution faced in any given follow-on round. These dilution percentages can be calculated by estimating the size and pre-money valuations from these rounds. For the analysis in this post, we are using round benchmarks from NVCA in their Enhanced Model Term Sheet 2.0.
- Percentage of Follow-On Deals Done by Round: This can be more art than science and influenced by a number of factors, but the strategy here involves a manager asking themselves of all their companies that raise A, B, C, D rounds, etc, what percentage will they follow-on into. Most managers stop following on after a particular round unless there are extraordinary circumstances. Naturally, the funnel of companies that raise subsequent financing rounds narrows, meaning there will be fewer portfolio companies to follow-on into. And it may be challenging for a manager to not take her series A pro-rata allocation. There is signaling risk whereby by not taking their pro-rata share, the VC sends the signal to other potential investors that the company is not doing well. It also might be hard at the series A stage to really tell if the company is going to be a breakout success.

In addition to considering the factors above, the total fund dollar size needs to be considered. It seems like most managers pick an arbitrary fund size and then work backwards with their portfolio construction strategy. But it feels like LPs appreciate GP thoughtfulness when it comes to the size of a fund being managed, and rather than forcing things like initial check size, targeted ownership, number of companies and follow-on reserves, the correct strategy could be to determine which of those factors is most important to the manager and optimize those and let that determine fund size.

Portfolio Construction with Graduation Rate Follow-On Strategy

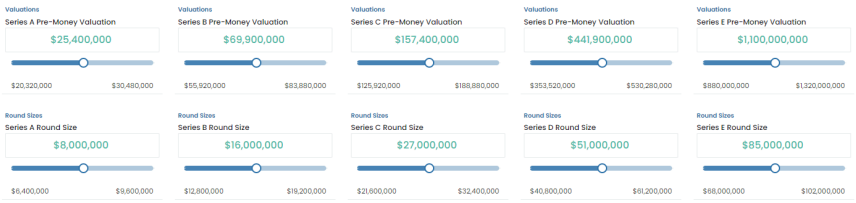
We will now walk through an example of optimizing fund size and construction through graduation rate follow-on strategy by starting with some base assumptions about our fund: 40 companies (we will look to go deeper into the optimal size of a portfolio in a later post - but suffice it to say that for a firm that is sector and geographically agnostic we feel it's best to have a portfolio that is on the larger side to increase the odds of us investing in more fund-returning companies), 10% initial ownership (another target worth going deeper on) meaning that given an assumed $12M post-money valuation at seed we need to be writing initial checks of $1.2M--or a total of $48M into initial checks--and the traditional 2% and 20% fee and carry structure.

Get Started

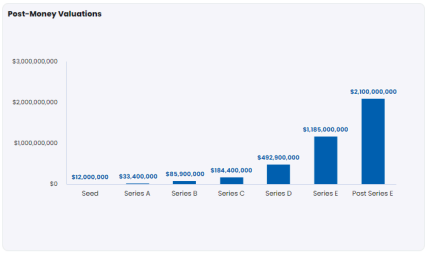


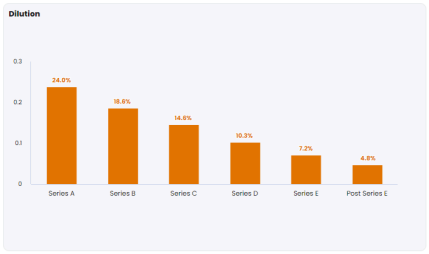
Using the graduation rates above we can calculate how many of our 40 portfolio companies will raise subsequent rounds. We will get into exit

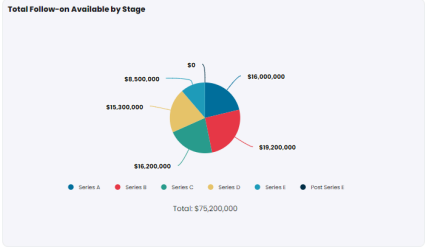
rates later, but we are netting out how many companies we assume will exit after each round.



With these assumptions in place we can now calculate our assumed dilution in each round and what our theoretical pro-rata would be. And by calculating the total number of our companies raising follow-on rounds and our average pro-rata for each of those rounds, we can then determine our total maximum follow-on potential. If we were to follow on into every single one of our companies' subsequent rounds this would be the total amount invested.

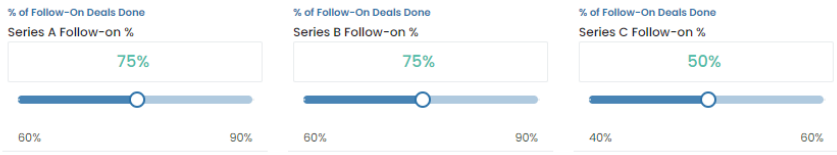




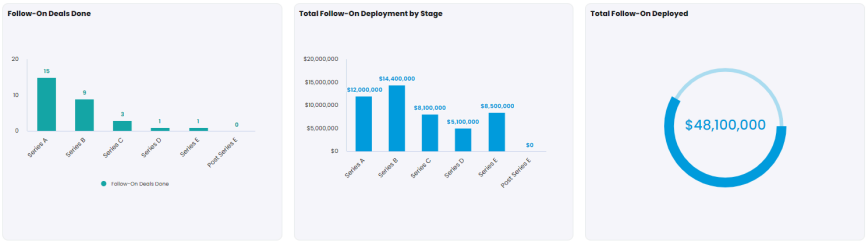


Now comes the hard part: determining what percentage of companies we will follow into round after round. Our assumptions here align around

the thinking that we will want to follow on into a higher percentage of A and B rounds to not trigger signaling risk nor abandon companies as they're still moving towards product-market fit. We will only do half of C rounds and a quarter of D rounds because by that point valuations have become much higher and dollar-for-dollar we're getting much less ownership (see "the flat, the elbow, the wall"). However, we make series E and beyond follow-on assumptions that ensure that if we have run-away wildly successful companies in the portfolio we continue to double down into some of them as long as we can.



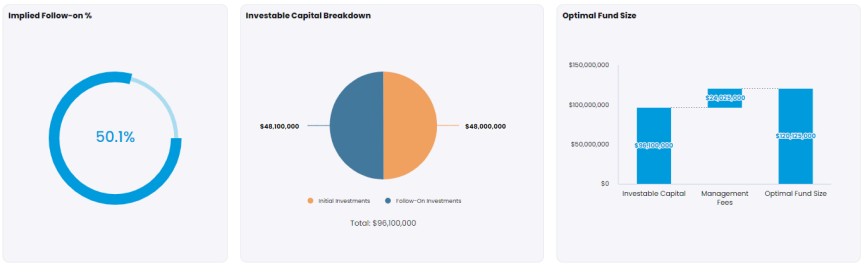
From here we now know how many follow-on rounds we're investing in, how much total per round we're investing, and the total amount of follow-on we will do for this fund.



In our analysis, given the assumptions above, we are making a total of 32 follow-on investments into 15 separate companies with a total follow-on dollar amount of $62.4M, for an average follow-on check per investment of $1.95M, and an average follow-on allocation per company of $4.16M. You will see in the table above that we actually allocated more follow-on

dollars in earlier rounds but to more companies. In this analysis we invest a total of $23.6M into one company in the D through post E rounds.

Given we want to write $48M into initial checks and anticipate investing $62.4M into follow-on deals, we would need to raise a $138M fund to achieve both those objectives while also allocating 2% per year to management fees. If we felt we wanted to invest in more follow-on rounds, or have a higher initial ownership percentage, or if we felt our portfolio's graduation rates would be higher, we'd of course have to raise an even larger fund. Alternatively--and this is also a subject for a future post--we could recycle some or all of our management fees into follow-on deals so that we could allocate more to follow on without having to raise a larger fund. For the purposes of this analysis we will assume we are not recycling fees, but in reality, it can be a very good practice to boost fund performance as you are putting more of your AUM to work.



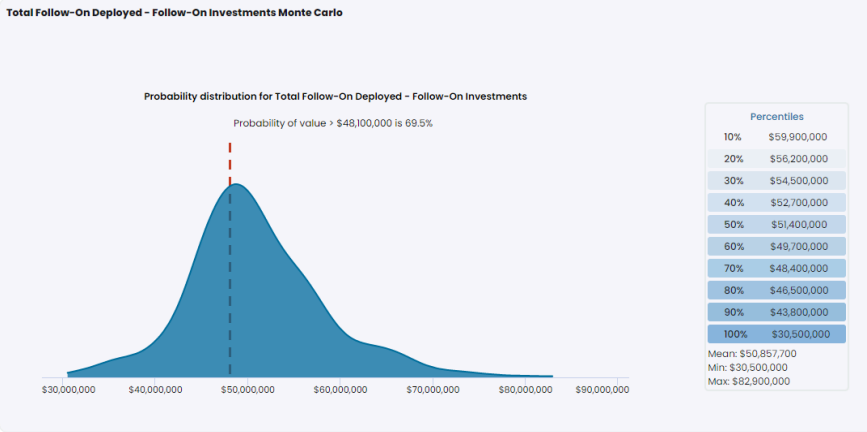
Monte Carlo Simulations (Advanced)

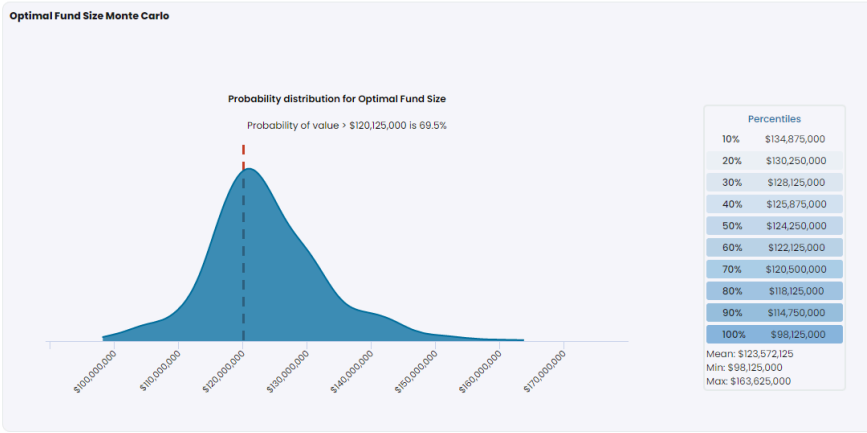
So far, we have assumed a fixed graduation and exit rate to imply the number of follow-on deals, the follow-on capital needed and our resulting optimal fund size. These graduation and exit rates vary depending on sector, geography and market conditions. Ideally we would want to *stress-test* our model by varying graduation and exit rates to see the implications on follow-on capital and optimal fund size. Tactyc comes with an in-built Monte Carlo module that we can put to work here. A Monte Carlo simulation in its simply running this model over thousands of simulations - and in each simulation, we change the values of graduation and exit rates. We can assign a probability distribution for our

graduation and exit rates, and in each simulation, a random value would be picked from the probability distribution to run the model.

After the simulation is completed, we can then see an overall distribution of follow-on capital needed and optimal fund sizes. We've put this to work on our default case and run this model over a 1000 simulations, while assigning a Normal distribution to our graduation and exit rates.

The results below show that the mean for Follow-on Capital deployed is $51mm, slightly higher than our estimate of $48.1mm - in fact there is a 67% probability we'll need more follow-on capital than $48mm - implying we may want to increase our cushion slightly.





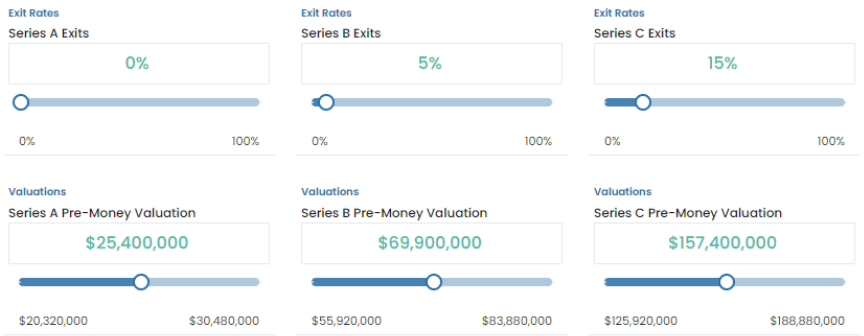
A Monte Carlo analysis such as above can be helpful tool in quantifying the risk and uncertainty inherent in our graduation and exit assumptions

and is used by some of the most succesful venture investors as part of their fund construction strategy.

Exit Analysis

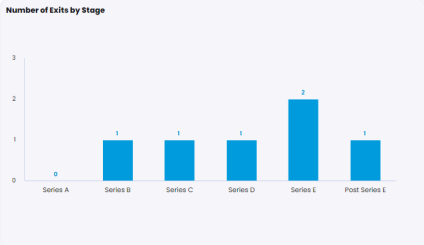
To bring this home we now want to consider exit rates, or what percentage of our companies at each stage will have a successful exit, and at what average value they will exit. For example, in our assumptions below we assume that none of our series seed companies will exit between their seed and series A rounds, but we assume that 85% of the companies that get past a series E fundraising round will exit. We were surprised again not to find any benchmarked data here so we had to make estimates based on a few industry sources. For exit value we used the assumptions from the previous follow-on round assumption, so if a company raised a series C round at a $184.4M post-money valuation we assumed that valuation would be their exit value if they exited after their series C round but before raising another round. This is probably too conservative as most companies would look to exit at a premium to the last round raised.

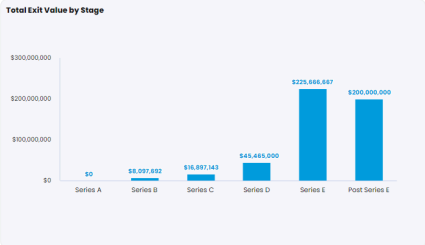
Exit rates and values can be flexed below:

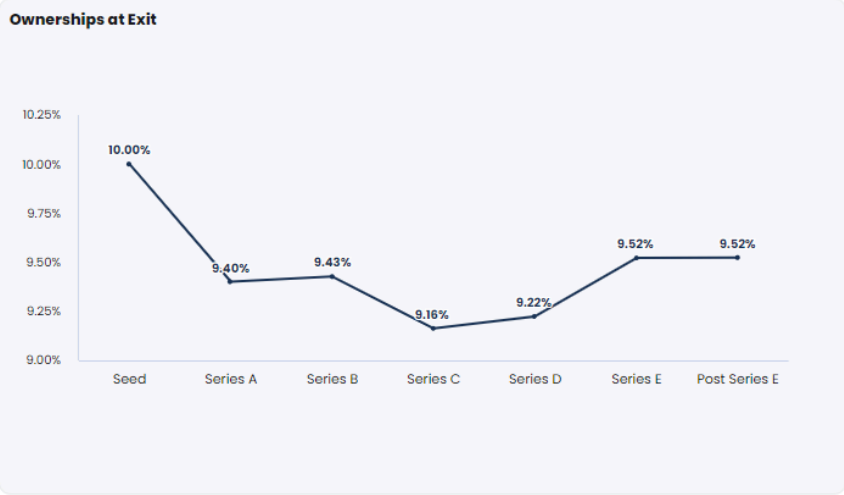


The follow-on assumptions from the previous sections will allow us to calculate an average ownership of each existing company by stage, and the exit rate and valuation assumptions will tell us how many of our portfolio companies will exit after each round as well as the total exit

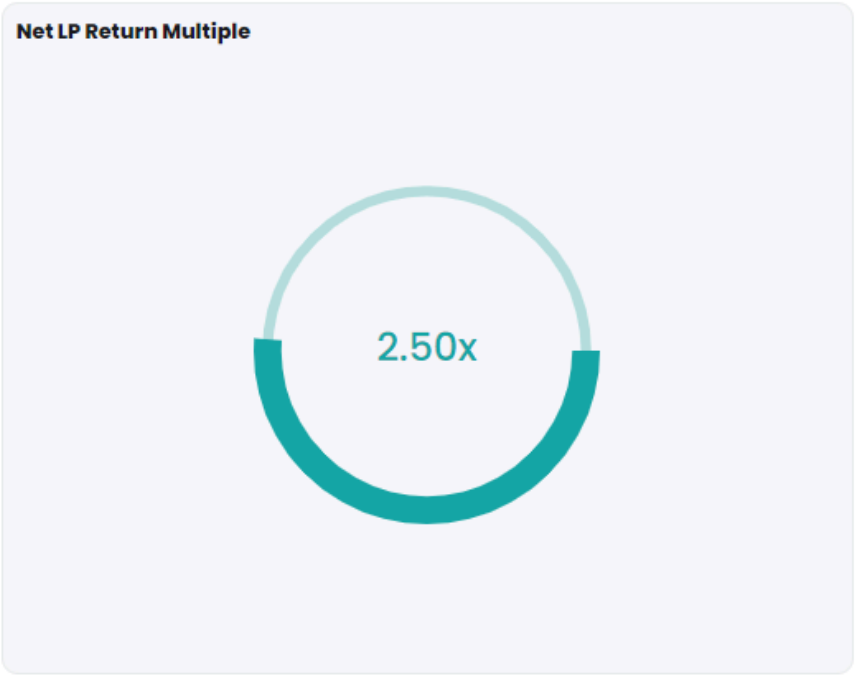
value. Multiplying our average ownership after each round by the total exit value gives us our realized exit value by stage and for the entire fund.







Finally, given these exit numbers we can calculate fund profitability and the net return multiple to LPs.



Final Thoughts

While follow-on allocation is one of the most important considerations a VC fund manager can make, we've found it is one of the least considered. A more detailed analysis to follow-on strategy can yield more purposeful and better-performing funds. That being said, all of the analysis above are all based on assumptions. The best practice with follow-on strategy is to revise the model in real-time as actual events happen and align assumptions with actuals and adapt as necessary. Obviously, once a fund size is chosen and raised that portion of the strategy is locked, but adjusting the number of follow-on rounds done by stage could be an effective way to optimize strategy. As with all seed-stage VC investing, there is always a mixture of art and science.