STEPSTONE
inside private markets

Strategic Asset Allocation:

Rethinking the Role of Private Markets

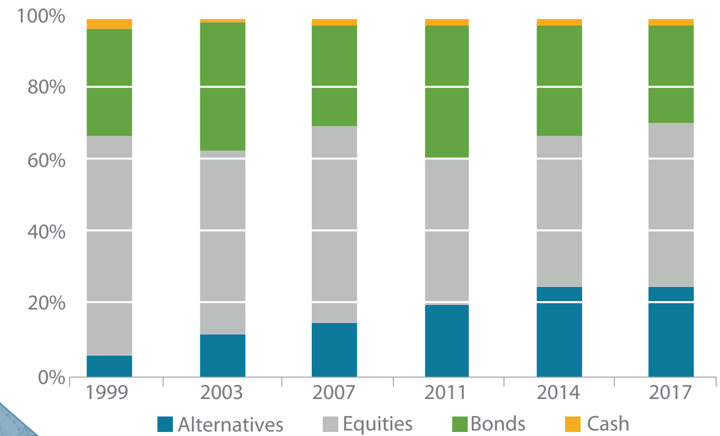
"Plans are nothing;
planning is everything."

– Dwight D. Eisenhower

Since at least the late 1990s, institutional investors have been allocating more capital to private markets (**Figure 1**). Some institutions, like American endowments, were early movers into the asset class. Other institutions increased their allocations gradually, primarily in response to prevailing market conditions. For some, the low interest rates that have come to characterize markets following the global financial crisis (GFC) served as the catalyst; for others, it was the belief that returns from equities would moderate along with global GDP growth. Either decision has hinged on the conviction that private markets would continue to outperform traditional asset classes.

Before the surge in popularity of private markets, the core-satellite approach to portfolio construction was appropriate. The core, which was composed primarily of passive, low-

FIGURE 1 | INSTITUTIONAL ALLOCATIONS TO PRIVATE MARKETS



Source: McKinsey & Co., 2018.

May 2020

cost investments, related to an institution's strategic asset allocation (SAA). Private markets, on the other hand, were regarded purely as alpha-generating satellites—strategies that were still too exotic to be anything more than tactical deployments. This stark delineation made implementing private market investments simpler: Find the opportunities with the greatest return potential. That allocations to private markets tended to be smaller meant they wouldn't change the portfolio's overall risk profile too much.

As private markets have matured, the emergence of robust and trustworthy data and the development of more sophisticated analytical tools have enhanced our understanding of the drivers of performance as well as risk-factor exposure across private markets. Burgiss's Private iQ database has accumulated performance data on 8,700 funds, and our own analytics platform, SPI, houses performance data on more than 120,000 investments.

While the private market industry obtained more data, it also refined its analytical tools, helping portfolio management teams to gain keener insights. Unsmoothing techniques were developed to compare volatility between private and public time series, and the Kaplan-Schoar public market equivalent and Direct Alpha index comparisons allow us to assess time-weighted index performance in relation to dollar-weighted portfolio performance, without the distortions that hampered earlier techniques. Alternative risk descriptions, such as conditional value at risk (CVaR) and mixture distributions, enable us to address non-normality. Each of these developments makes us more confident in the results of an SAA.

The insights from this research have helped us to understand that public and private markets share a number of return drivers, many of which are related to macroeconomic factors (**Figure 2**).

Unsurprisingly, public and private markets have several risk drivers in common, too. This implies that, as allocations to private markets increase, the total risk of that exposure and the degree to which this plays off the traditional assets in a portfolio become economically meaningful. In addition, the exposure to alternative, less correlated factors allows investors to harvest risk premia that are not available in traditional markets. In other words, the rationale for investing in private markets is not as simple as assuming homogenous risk exposure and maximizing potential returns. Once the allocation to private markets crosses a certain threshold, merely looking for the assets with the highest return potential is insufficient. As in constructing a portfolio of traditional assets, investors must find the opportunities that balance risk exposure with the expected net return, without losing sight of the public market's effect on the portfolio. The traditional approach to portfolio construction, however, breaks down when applied to private markets. Without any indices to mimic, there are no passive investment options that provide the same or better risk factor exposures at the lowest possible unit cost.

FIGURE 2 | RISK & RETURN FACTORS

	PUBLIC MARKETS			PRIVATE MARKETS					
	GOVERNMENT BONDS	CORPORATE BONDS	EQUITY	CORPORATE		REAL ESTATE		INFRASTRUCTURE	
				DEBT	EQUITY	DEBT	EQUITY	DEBT	EQUITY
Risk-Free Rate	●	●	●	●	●	●	●	●	●
Inflation	●	●	●		●	●	●	●	●
Real Rates	●	●	●	●	●	●	●	●	●
Growth		●	●	●	●	●	●	●	●
Equity-Specific			●		●		●		●
Credit-Specific		●		●		●		●	
Liquidity				●	●	●	●	●	●
Other PM-Specific				●	●	●	●	●	●

Source: StepStone, 2020.

A traditional SAA is designed to generate a shopping list: Select the level of volatility you desire, and the process will tell you which assets to invest in to earn the highest return. The traditional asset world is highly commoditized so that the SAA, implementation planning, execution, and risk management steps can easily be divided out to different parties. A private market SAA is more like a battle plan: It provides a decision-making framework that helps you stay on track even when things aren't going your way. And like a battle plan, an SAA is most effective when everyone is on the same page. Hence our belief that integrating the private market SAA with the investment execution and portfolio management processes is the best way to generate the optimal private markets portfolio **(Figure 3)**.

Integrating the execution and planning phases is also important because of the long-term and illiquid nature of private markets. Building a portfolio of private market investments takes time: Investors need to identify investment targets, build the infrastructure, and formalize the processes necessary to make timely investments. Also, portfolio management teams can't automatically assume they will be able to access sufficient capacity to support their commitment targets the way they can for traditional investments. Finally, investors need to put the appropriate governance structures in place before, or in parallel with, executing the SAA. Because the structure of the program will influence the types of opportunities that can be pursued, we believe it is better to do so sooner rather than later. Getting it right the first time is paramount: Adjusting the program's structure is difficult and costly once the program is underway.

Investors need to make several choices when determining a private market SAA. Rarely is there one right or wrong answer—an institution's philosophy and needs factor heavily. With so many choices to be made at each stage, soliciting feedback from all stakeholders is essential to eliminating blind spots and ensuring that each choice is in harmony with the next. Deriving an SAA is a multistep process that requires the portfolio management team to make two types of choices and master success factors.

1 **Model Choices:** Some models are suitable when optimizing either liquid or illiquid assets; in other cases, deriving the private market SAA may require a different approach.

FIGURE 3 | PRIVATE MARKET PROGRAM

Source: StepStone, 2020.

2 **Input Choices:** These choices relate to the assumptions that get fed into the selected model. They must be internally consistent. For example, it would be unrealistic to expect an asset to have both outsize return potential and unlimited capacity.

3 **Success Factors:** There are quantitative, qualitative, and procedural requirements for success in any SAA. In private markets, because data and opportunities are scarcer, deriving an actionable SAA imposes increased requirements on qualitative and quantitative success factors.

Objectives & Constraints

Before deriving their SAA, investors should define their objectives and constraints and determine if the two are consistent with their investment policy statement, liability requirements, and the regulatory environment. Defining the objectives helps to determine the most meaningful outputs; setting constraints is critical to developing an SAA that is practicable. During this process, investors need to make several decisions.

TWO-STEP PROCESS

The first step in determining how much to allocate to private markets is to perform a total portfolio strategic asset allocation (TSA). Knowing the mix of traditional assets and setting a maximum of illiquidity tolerance for the overall portfolio are essential. Many consultants can perform this type of analysis; they can provide in-depth coverage of the traditional asset classes and will usually help assess liability streams as well.

The second step is the private markets strategic asset allocation (PSA). Most TSA-capable consultants do not have the data necessary to carry out a detailed PSA. StepStone believes that it is best to rely on a private markets specialist, with a constraint on the upper limit of private markets exposure established in the TSA process. The mix of assets in the private markets portfolio will depend on the assets chosen for the traditional part of the portfolio. It is therefore critical that the PSA process have an appropriate approach to developing the dependence structure between traditional and private markets.

RISK MEASURES

The most common risk measure used in traditional asset classes is volatility. Using it suggests that the investor is comfortable assuming that returns are normally distributed. Because returns from private markets often have non-normal distributions, volatility may not be the best risk measure.[1] The issue of non-normality is most pronounced over short periods (e.g., quarters). When measured over longer time horizons, the presumption of a normal distribution is more appropriate.

Alternative risk measures, such as CVaR, are better at dealing with non-normal distributions, and therefore may be more suitable than volatility. Whereas volatility measures the deviations of returns around their mean, CVaR estimates the losses from bad outcomes. In that sense, CVaR can be used more generally because it can describe risk for asymmetric and symmetric distributions alike. For this reason, many institutions use CVaR as their preferred risk measure, even when assuming symmetric expected return distributions.

The nature of private market returns is an important factor for selecting the risk measure. From the viewpoint of the distribution of quarterly private markets returns, CVaR may be the ideal choice. Practically speaking, however, using volatility as the risk measure makes it much easier to set the TSA and to integrate it with the optimized PSA.

Some institutions may face regulatory environments that suggest alternative risk measures. For example, insurance companies must operate within Solvency Capital Requirements or Risk-Based Capital regimes. In these cases, optimizing based on volatility is not as important as optimizing based on the return relative to the capital charges for an allocation structure.[2] In principle, such an optimization is possible, but executing one requires close collaboration with the investor's risk modeling team. Finally, some investors may take yet another view. If the motivation to allocate to private markets is to enhance returns, risk might be defined as the probability of falling short of a minimum return target.

Choosing a risk measure requires portfolio management teams to select an appropriate return distribution. They should also be prepared to address data-related issues such as smoothed returns.

[1] StepStone Group. 2017. "Blending the Real Estate Allocation."
[2] StepStone Group. 2018. "Investing in Private Markets: A Road Map for Insurance Companies."

OPTIMIZATION METHODOLOGY

There are different methods to choose from, all of which have advantages and disadvantages and pose unique implementation challenges. This paper focuses on just three of the many methodologies that can be used: mean variance optimization, general nonlinear programming, and stochastic simulation.

Mean-Variance Optimization

Mean-variance optimization (MVO) is the most well-known and widely used method: It requires few inputs—a vector of expected returns and a covariance matrix—and is relatively easy to implement. The required asset class input parameters are often estimated using historical index returns on the underlying asset classes. Moreover, MVO makes it easy to perform the PSA in the context of the broader TSA by using the correlation between all of the assets in the portfolio.

MVO implicitly assumes that asset returns are normally distributed. If the SAA focuses on long-term risk and optimizing returns over several years, this assumption is reasonable. However, when measured over shorter periods, private markets can deviate significantly from normality. Here, MVO is not ideal because it tends to underestimate tail risk in the portfolio.

StepStone uses the mean-variance framework in asset allocation, primarily because it is intuitive and traceable. We understand the underlying assumptions and MVO's limitations, especially the need to focus on the tail behavior of the resulting portfolio.

General Nonlinear Programming

A general nonlinear programming (GNLP) approach is much more flexible; it is neither bound to multivariate normal distributions nor limited to the use of volatility as a risk measure. This flexibility, however, comes at a cost. First, implementing it requires specialized software such as MATLAB or R. Second, GNLP does not impose an implied distribution for asset returns, so the weighty burden of determining which distribution to use (as well as how to model the dependence structure) is shifted to the portfolio management team.

Even with the right tools and know-how, using GNLP to cope with higher statistical moments is challenging. Most historical returns have naturally fallen within the center of a distribution. And if the history is short—as it is for most private market asset classes—there are only a few data points in the tails of the distribution.[3] This makes it hard to estimate skewness and kurtosis and requires caution when using them in an optimization.

Stochastic Simulation

With stochastic simulation, portfolio management teams needn't specify a parametric distribution for asset returns. The methodology samples past episodes and combines the outcomes to create randomly generated portfolios. From there, the managers can select the portfolio with the most desirable long-term return distribution. Because stochastic simulation focuses exclusively on simulating future outcomes, it has many applications beyond portfolio optimization. It might streamline the portfolio design process by modeling the uncertainty in asset class returns and in cash flows in a single step.

Given the dearth of publicly available data on private market transactions, only institutions with access to large proprietary data sets can use stochastic simulation.

PORTFOLIO SIZE, RISK & RETURN TARGETS, & PREFERENCES

Most investors are used to determining the input parameters required for a TSA. But in private markets, additional parameters need to be defined. Factoring in liquidity targets, deployment speed, maximum allowable negative cash flow, and other peculiarities is critical to ensuring that the investor receives the maximum benefits from the allocation to private markets without creating a liquidity issue in the broader portfolio.

If other investment policies or preferences exist, they should also be identified at this stage. Geographic, currency, or industry preferences or limitations are important to identify, as are policy considerations such as environmental, social, and governance sensitivities. These preferences may influence the types of strategies that an institution can pursue.

Estimating Asset Class Parameters

During this step, the portfolio management team determines return expectations, risk measures, and the correlation structure for the asset classes that constitute its SAA. Although there are methods to do so for traditional investments, scarce data, idiosyncratic risks, and other variables complicate this

[3] Supra note 2.

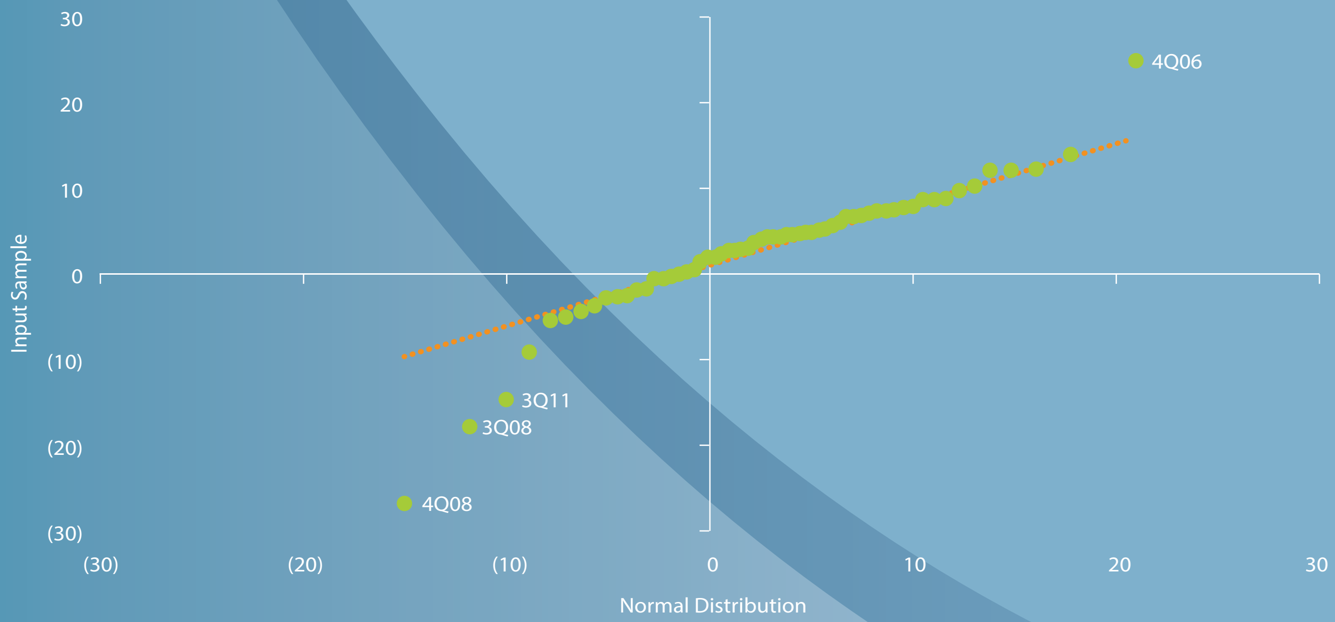
Excursion to Non-Normality

There are several tools to detect non-normality. Some are purely quantitative, while others are graphical. The quantile-quantile plot is one such tool: It helps to determine if two data sets originate from populations with a common distribution. Plotting the quantiles of the empirically observed quarterly returns for private equity buyouts against a Gaussian reference distribution allows us to visualize just how well the observed returns follow a normal distribution.

As **Figure 4** illustrates, most observations fall on, or very near, the dotted orange line. This suggests that it may not be too far-fetched to assume that private equity returns are normally distributed most of the time. But if an asset class's returns are collected over multiple cycles, this assumption does not always hold: Four of the data points fall well below the orange line; one lies far above it. This negative skewness indicates that private equity led to large losses more frequently than a Gaussian distribution would predict, particularly during times of economic turbulence. Two of the lowest returns occurred during the GFC and the European debt crisis.

This dichotomy of behaviors suggests that two very different economic regimes with two very different return distributions need to be modeled.

FIGURE 4 | BUYOUT RETURNS PLOTTED AGAINST NORMAL DISTRIBUTION (MARCH 2005 – DECEMBER 2019)



Source: StepStone, 2020.

process where private markets are concerned. Having the benefit of a private market specialist can be invaluable.

For the SAA to be worthwhile, getting this right is crucial. If risk and return estimates are inconsistent with one another, an investor runs the risk of investing in a suboptimal portfolio.[4] The optimization framework is very sensitive to differences in return expectations. If two assets have the same risk characteristics but slightly different return expectations, the portfolio-optimization algorithm will blindly favor the higher-returning assets even if the difference between expected returns is negligible.

RETURN DISTRIBUTION TYPE

When building an SAA for traditional investments, consultants often use a multivariate normal distribution, which effectively captures the likelihood of a variety of outcomes over time.[5] Also, it is reasonable to assume that private market returns are normally distributed over longer periods. Combine this with the appeal of the mean-variance framework, and it becomes clear why this approach is so widely used.

Evaluated over shorter time frames, private market returns may be not only non-normal but skewed as well. If a return distribution has a left tail, then a normal or other symmetric distribution will either underestimate the potential for large losses or overestimate the potential for large gains. To address this concern, academicians have proposed several distributions to model left-skewed returns. As tempting as it may be to use these novel approaches, portfolio management teams should be aware of some of the challenges of doing so.

1. They would have to use the GNLP instead of the intuitive MVO framework.
2. To use these distributions appropriately, they would need enough data in the tails to estimate a parameter well. This is difficult, given the scarcity of tail data that private market indices and other publicly available sources offer.

After reviewing several alternative distributions, StepStone currently favors the Gaussian mixture distribution (GMD). It adds less complexity and still captures the skewed nature of historical returns. It also intuitively distinguishes between "tranquil" and "stressed" economic periods. While the model's ability to estimate periods of stress suffers from a lack of data, it can estimate tranquil periods reasonably well.

HISTORICAL INDEX RETURNS, RISK-FACTOR MODELS, OR INVESTMENT-LEVEL DATA

Because of the wealth of historical data on the returns of traditional asset classes, many practitioners view the time series as the best way to estimate the covariance between asset classes. When using this approach for private markets, the portfolio management team should be prepared to grapple with two issues: smoothed returns and data scarcity.

Smoothed Returns

Because private markets are more illiquid and transact less frequently than traditional asset classes, often the only way to price an asset is to use data from previous transactions. This leads to serial correlation and smoothing, which often result in overstated risk-adjusted returns and an SAA tilted toward investments that are riskier than they appear.

There are two main approaches to address this issue. The first is the use of statistical "unsmoothing" techniques.[6] In the case of private equity, this treatment leads to risk estimates similar to public markets, which many posit more accurately represent the "true" risk of a private market portfolio. On the other hand, unsmoothing the private market time series individually may not uncover the true correlations between asset classes, which will degrade the robustness of the optimization output.

An alternative to unsmoothing is to use a transaction-based index (TBI). TBIs measure performance using the prices of assets that are bought and sold in the private market. This methodology is therefore not reliant upon interim valuations to measure periodic total returns. The National Council of Real Estate Investment Fiduciaries' TBI is one such example.[7] The main issue with TBIs is that they are not available for all asset classes. Sample-selection bias is another drawback.

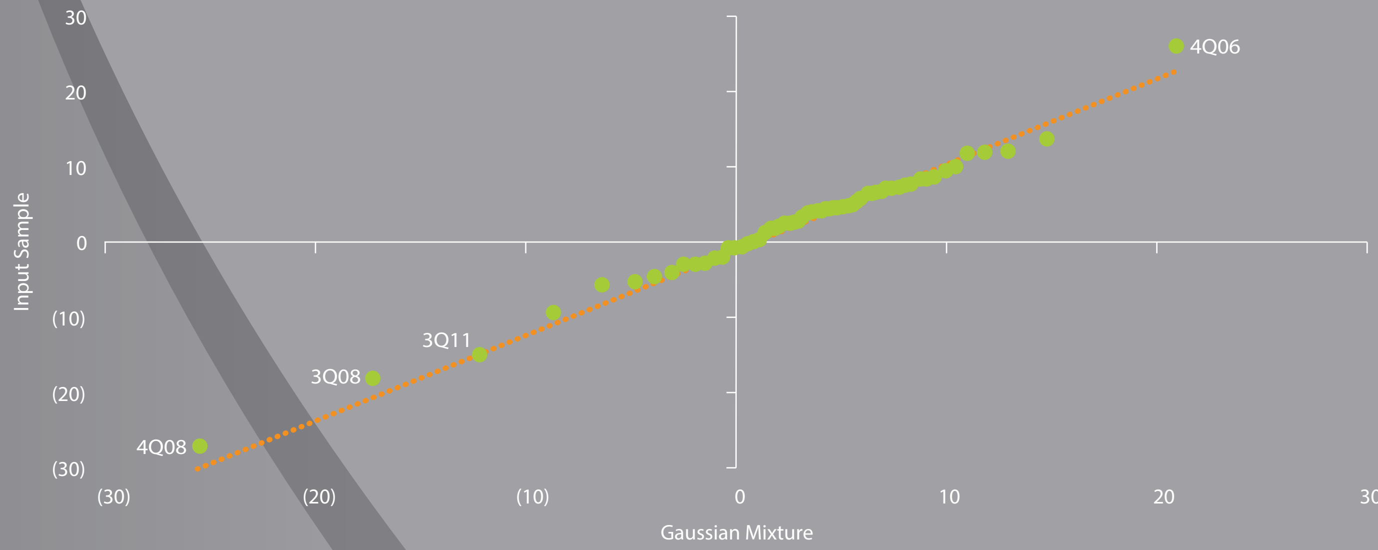
An organization's philosophy can also affect whether it uses smoothed or unsmoothed data. Ultimately, investors will feel the effects of smoothed returns in their profit-and-loss statements and may prefer to use them in their PSA and TSA

[4] See Michaud, 1989.
[5] Distributions that allow for greater kurtosis, such as the *t distribution*, are occasionally used.
[6] See Geltner, 2003.
[7] See Fisher, 2007.

The Gaussian Mixture Distribution in Practice

The GMD is one of several distributions that researchers have been using to model private equity's negative skewness during turbulent economic periods as well as its tendency to follow a normal distribution during more tranquil times. In **Figure 5** we estimate a GMD for private equity buyouts' historical returns. The data fit the mixture distribution almost perfectly.

FIGURE 5 | BUYOUT RETURNS PLOTTED AGAINST GAUSSIAN MIXTURE DISTRIBUTION (MARCH 2005 – DECEMBER 2019)



Source: StepStone, 2020.

We describe this GMD distribution as

$$r_q \sim \begin{cases} N_d(\mu_d = -2.2\%, \sigma_d = 13.9\%), & \textit{with probability } p \\ N_t(\mu_t = 4.2\%, \sigma_t = 4.4\%), & \textit{with probability } p\ (1-p) \end{cases}$$

This means that there's a 18% probability that a return will follow a normal distribution (N_d) during stressed periods with a mean (μ) of -2.4% and a volatility of 14.8% and a probability of 82% that it follows a normal distribution (N_t) during tranquil periods.

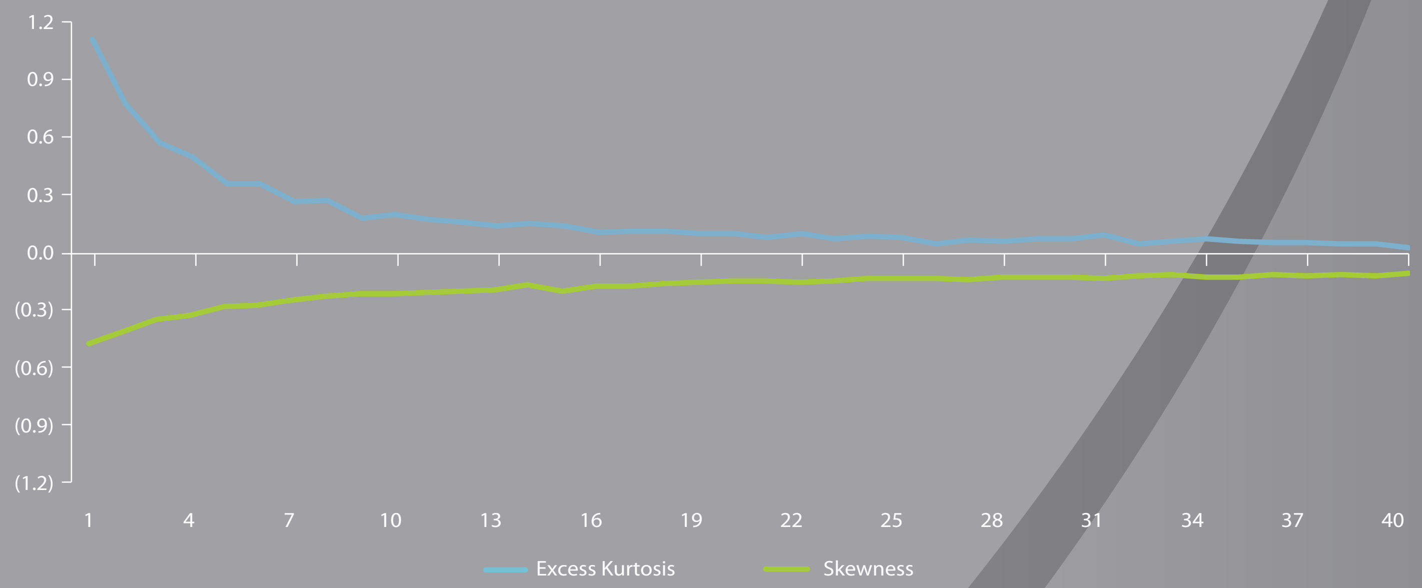
Using a GMD to derive the optimal portfolio, though possible, can be complex and requires sophisticated tools.[8] Also, it isn't always the best approach—especially if portfolio management teams are focused on modeling an asset class's long-term behavior. The skewness in private equity buyout returns is pronounced over relatively short periods. If returns are evaluated over longer periods, skewness diminishes, and the distribution normalizes.

[8] See Buckley, 2008.

To illustrate this phenomenon, we performed a Monte Carlo simulation of multiyear returns using the GMD described above. As **Figure 6** illustrates, for a 10-year holding period (i.e., 40 quarters), both skewness and excess kurtosis approach zero.[9]

Even though return distributions normalize over the long run, some investors may want to account for the skewness and kurtosis that can occur in the short run—they affect a portfolio's value and can stress an organization if the allocation isn't sized appropriately.

FIGURE 6 | NORMALIZATION OF HIGHER STATISTICAL MOMENTS OVER 40 QUARTERS



Source: StepStone, 2020.

[9] To dive deeper into the underlying mathematics, see Meucci, 2010.

as a result. Although StepStone has the data and capabilities required to run the PSA using either smoothed or unsmoothed returns, we typically opt for smoothed. There are two reasons for this. First, the upper bounds of the private markets portfolio is already set in the TSA, mitigating the potential for the MVO to allocated "too much" to private markets. Second, the smoothed returns will deliver a more reliable dependence structure. The combination of expected returns and dependence structure will be the main figure that distinguishes between strategies in the PSA. Therefore, anything we can do to improve the quality of those factors will be significant.

Data Scarcity

The number of data points used to estimate covariance matrices and higher statistical moments should be orders of magnitude larger than the number of asset classes in the portfolio. For a portfolio consisting of private market investments, this condition is hard to satisfy, as indices for some asset classes have a relatively short history. Though there are some approaches to estimate and clean covariance matrices,[10] their results are not always economically sensible. Thus, we recommend that the portfolio management team check that the results of these models are in tune with economic theory and that the relationship holds if other indices are used. The most obvious way to address this issue is to use richer data sources.[11]

A risk-factor model uses historical data to establish relationships between asset class returns and macroeconomic risk factors. When used in conjunction with a view of macro trends, such factor models can be helpful in formulating a consistent set of risk and return expectations. StepStone has developed a multifactor model based on arbitrage price theory that allows us to explore historical relationships between macro-level risk factors and asset returns and to incorporate them into a forward-looking framework.[12]

Decomposing asset returns can provide a more complete understanding of how asset risks and returns originate.[13] Instead of using ad hoc methods to infer risk and dependence structures from smoothed data, the risk-factor model derives systemic (i.e., macro-related) return drivers from individual risk factors. This leads to a more coherent estimate of returns, risk, and dependence structures.

Understanding factor exposure of different assets can be useful in another way. By identifying *ex ante* the risk premia the investor hopes to harvest and making sure that the team responsible for sourcing and executing the investments understands those premia, the portfolio management team can increase the probability that the portfolio will tap into all of the risk exposures underpinning its rationale for investing in private markets.

In the case of public markets, these risk factors account for most of the returns and return volatility. For private markets, however, risk factors account for a smaller portion of risk and returns; private-market-specific components need to be introduced. Some of them are common to all asset classes (e.g., illiquidity); others are idiosyncratic (e.g., prepayment risk compensation in private debt). Modeling the aspects of risk and return requires a certain level of expertise and data that are hard to come by. This is another reason StepStone believes that a private market specialist should play an important role when modeling inputs for private market allocation decisions.

MEDIAN VS. TOP QUARTILE

For traditional asset classes, it is reasonable to assume that markets are on average efficient enough to prevent investors from outperforming them consistently. In addition, tools like ETFs allow investors to invest cost-efficiently in the broad market. Hence, for a traditional SAA it is reasonable to model the average dollar return. With private markets, however, both experience and academic research suggest that sophisticated LPs can routinely outperform the median by investing with blue-chip GPs. Therefore, as part of the private market input parameters, portfolio managers must determine what level of performance is reasonable to expect. Its design must consider an investor's existing relationships, program structure, deployment size and pace, and potentially other factors.

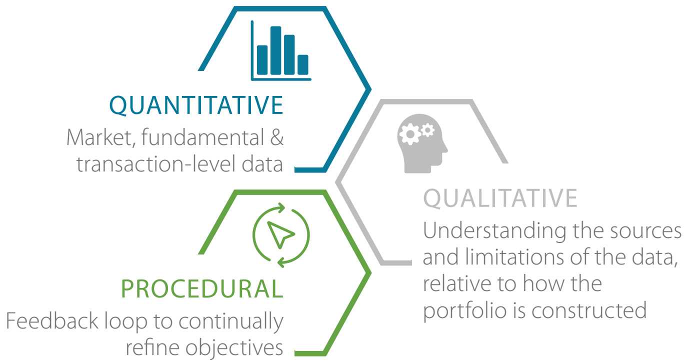
[10] See Ledoit, 2003, or Bun, 2015.

[11] StepStone has been diligently collecting data on private markets for over a decade. SPI, our proprietary analytics platform, has cash flow data on more than 120,000 private transactions, which we use to estimate return distribution more accurately.

[12] StepStone expects to publish a paper on factor modeling early next year.

[13] See Greenberg, 2016.

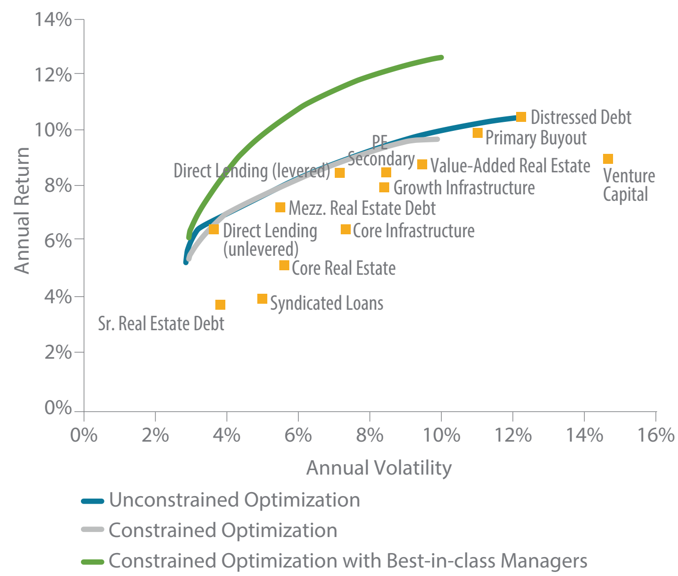
Success Factors to Estimating Asset Class Parameters



Optimizing the Baseline Allocation

In this step, the portfolio management team derives the asset mix that best achieves the portfolio's objectives given the asset parameters selected. It is typically presented as an efficient frontier (**Figure 7**), which helps to link the maximum achievable returns to different levels of risk. If no allocation constraints are applied, the efficient frontier extends from the asset with the least volatility up and to the right, toward the assets with the highest return potential (blue line). To make the allocation feasible, we must apply constraints, which is why the grey line is shorter and lies beneath the unconstrained frontier. The efficient frontier also illustrates our return expectations for blue-chip managers (green line).

FIGURE 7 | EFFICIENT FRONTIER

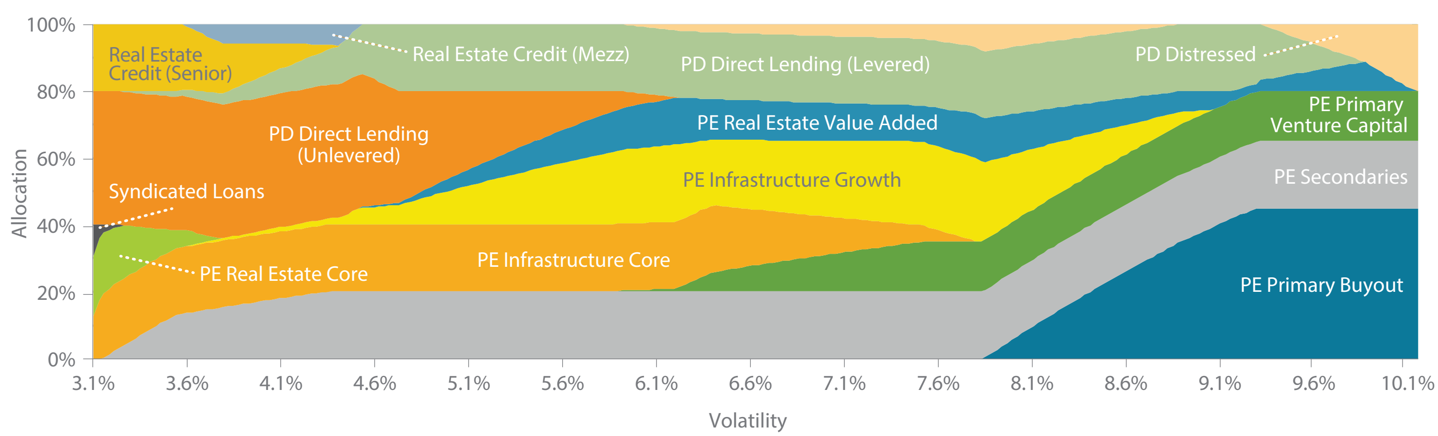


Source: StepStone, 2020. For illustrative purposes only.

Given the uncertainty about the asset class parameters and the limitations as to how precisely an allocation can be executed, we prefer to think of the efficient frontier as a reference line around which a band of equally optimal portfolios exists. This interpretation gives us the flexibility we need to apply qualitative overlays that help to further tailor the allocation.

Along that frontier, the portfolio's composition changes as shown in **Figure 8**.

FIGURE 8 | COMPOSITION OF OPTIMAL PORTFOLIO WITH CONSTRAINTS

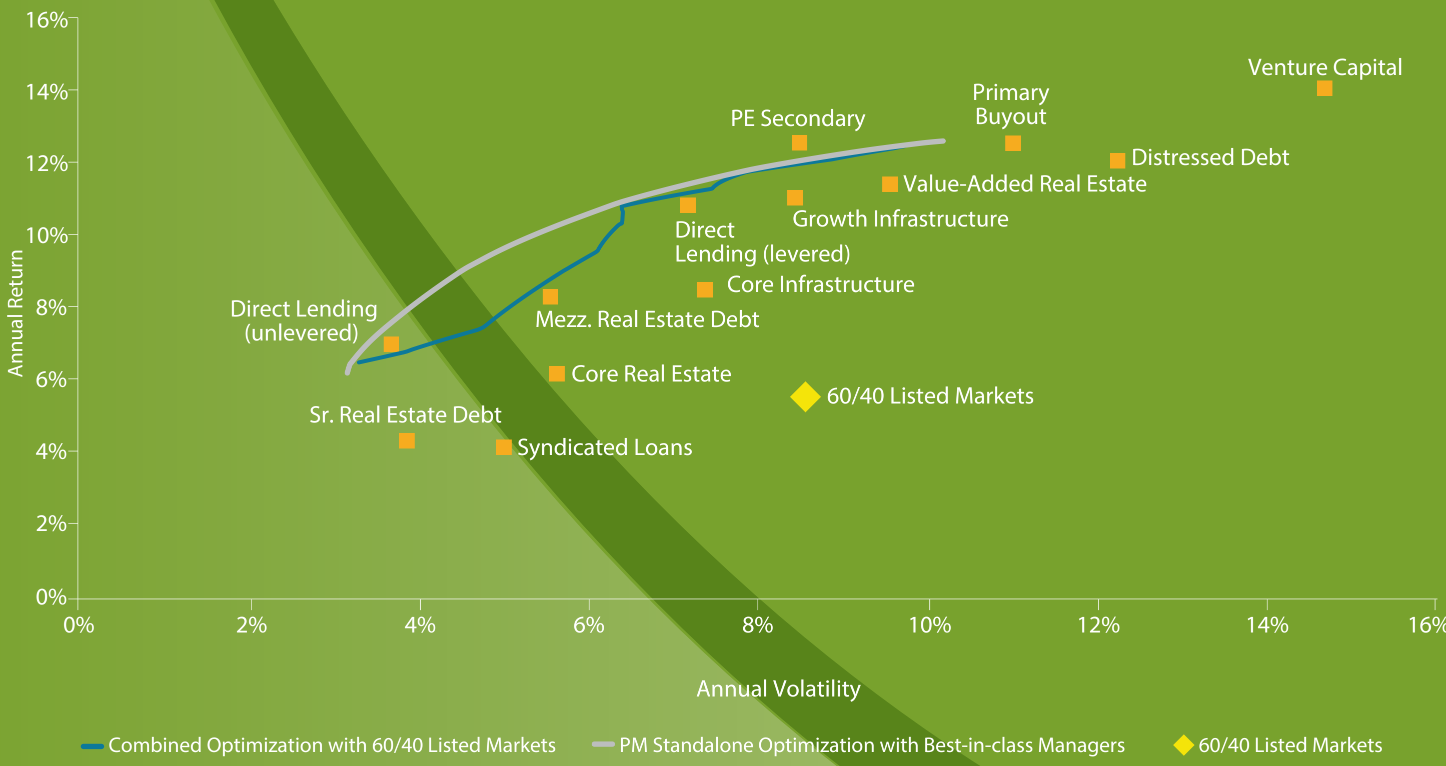


Source: StepStone, 2020. For illustrative purposes only.

PSA vs TSA Optimization

Figures 7 and **8** show the optimal portfolio composed solely of private market assets. We know, however, that private and public market assets share common risk factors. To account for these, deciding how much to allocate to private and public markets within the same two-step process is ideal. When doing so, portfolio managers should consider how they plan to address the challenges that smoothed returns present. If the portfolio manager decides to use parameters derived from the original smoothed time series, they should be aware that the optimization will tend to over allocate assets with lower volatility. One way to mitigate this is to put a cap on the allocation to private markets.

FIGURE 7B | EFFICIENT FRONTIER

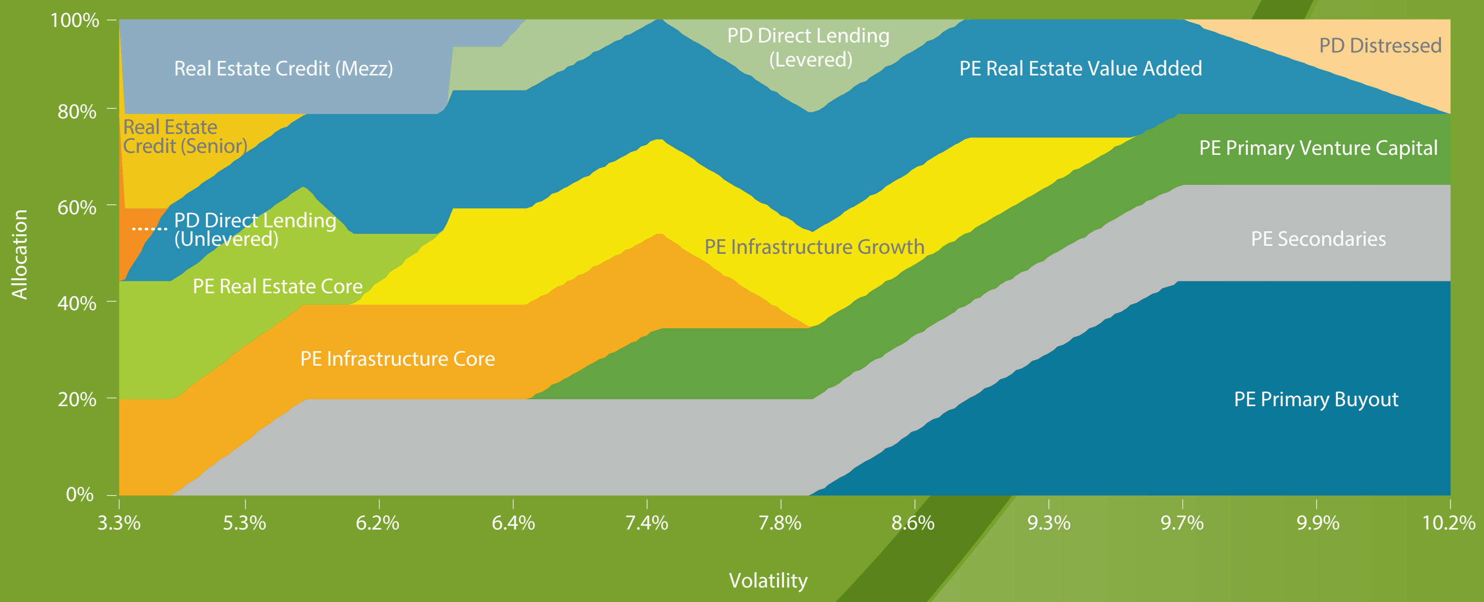


Source: StepStone, 2020. For illustrative purposes only.

Figures 7b and **8b** show the results of such a joint optimization. Here, the private markets allocation is capped at 15%. To allow for a direct comparison of these results with those of the standalone optimization, we only show the private markets part of the joint optimization. Comparing the portfolio derived from the standalone optimization (blue line) to that from the joint optimization clearly shows a difference—particularly for lower risk/return portfolios.

These differences are also evident when comparing the composition of the two portfolios. Whereas private debt dominates the low risk portfolios in the standalone optimization, the joint optimization yields a greater allocation to infrastructure and real estate.

FIGURE 8B | TWO-STEP PORTFOLIO COMPOSITION



Source: StepStone, 2020. For illustrative purposes only.

NEAR-FRONTIER PORTFOLIOS

Once the portfolio management team has identified a constrained efficient frontier, for several reasons we believe it is important to explore portfolios that lie near it.

1. The results of the optimization are very sensitive to the input parameters; even a slight change in the return estimates can lead to wildly different allocations.

2. When implementing a private market allocation plan, it is nearly impossible to achieve the targeted exposures as modeled. Therefore, portfolio management teams should view target exposures as guidelines. This is markedly different from listed markets, where target exposures can be implemented with precision.

3. Other characteristics that have not been cast explicitly into the optimization model may be important to consider when constructing the portfolio (e.g., expected yield, duration, or tail behavior). For example, assume an MVO has been performed focusing on long-term risk and return characteristics. Being aware of the left-skewed nature of many private market assets, an investor may opt for the portfolio with the least skewness among all the near-frontier choices.

4. The optimization model may suggest allocations that are difficult to implement. For example, when translated into investment amounts, an allocation amount might fall below typical commitment sizes. In that case, an institution will want to find a similar portfolio where the allocation is big enough to be implemented or avoid that strategy altogether.

Considering the inherent uncertainty about all asset class parameters, StepStone views the efficient frontier as a band of equally optimal portfolios rather than a razor-sharp line. This allows us to explore other portfolios that provide qualitatively similar risk-return profiles but deliver enhanced performance in one or more other characteristics. To define it, we set boundaries of risk and return dilution we are willing to accept to enhance the portfolio's performance along other dimensions.

Success Factors to Optimizing the Baseline Allocation

Implementation Plan Design

The baseline asset allocation represents a long-term allocation objective. Whereas a target allocation to public markets can be implemented almost instantly, building a private market portfolio takes time. We would even argue that implementing a private market investment program is more challenging than deriving the actual SAA. Thus, planning the necessary steps to get to the target allocation quickly is crucial.

This step requires portfolio management teams to assess current exposures and develop a plan for getting from the portfolio's current position to where the SAA says it should be, in a reasonable amount of time and with as few deviations as possible. The planning step results in an annual plan, which describes how much to commit to each asset class. Formulating a well-grounded annual plan is critical to ensuring that prescribed allocation levels are maintained; doing so requires a firm understanding of the interplay between contributions and distributions and each manager's capital call tendencies. It tells an investor when to recommit and how much to overcommit to maintain long-term portfolio health.

The centerpiece of this step is a pacing analysis, as shown in **Figure 9**. Having analyzed tens of thousands of funds across private markets, we have what we believe is a reasonably accurate picture of how quickly funds in each asset class can draw, deploy, and return capital. When used in conjunction with an allocation to private markets, the pacing analysis helps to determine the optimal ramp and cash balance, and the portfolio's long-term composition. In this particular example, direct lending, private equity secondaries, and real estate secondaries are used to quickly deploy the investor's capital. Growth-oriented strategies kick in later.

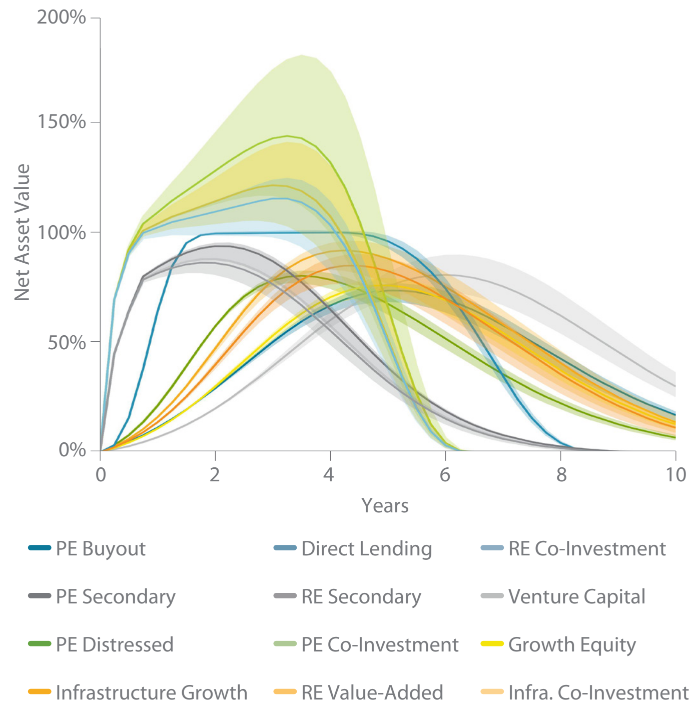
The goal of the pacing analysis is to achieve the targeted allocation, to minimize—both fee intensity and opportunity costs—and to understand the effects of the J-curve. Because this is inherently a forward-looking exercise, a pacing analysis that relies solely on historical data is insufficient—the portfolio management team needs to have a sense of which GPs are returning to market and when. They also need to understand the supply dynamics of the secondary market, which can greatly accelerate a portfolio's ramp.

The portfolio management team can exercise some freedom when designing the ramp-up; the team can still make tactical decisions to prioritize attractive sub-sectors. As long as the risk-return characteristics are the same, whether the capital is deployed in a commingled fund or separately-managed account (SMA) matters little to an SAA. In some cases, however, implementation speed and fee intensity will be different. A separate pacing analysis can address these points.

Since allocating more to private markets often comes at the expense of public markets, portfolio management teams should consider the complexities inherent in this transition. Two common solutions to this problem are selling the public market assets over time as capital is called for the private market allocation or keeping enough cash on hand to fund expected drawdowns.[14]

Remaining invested in public markets may have a higher expected return, but since public markets are prone to volatility, an institution could face the tough decision of selling assets at a loss to fund capital calls. This implies that more public market assets need to be sold to honor the capital calls than originally budgeted. Keeping cash does not present a risk in a correction, but it incurs opportunity costs in benign markets. Two other options exist to thread the needle between these extremes.

FIGURE 9 | PRIVATE MARKET PACING MODEL



Source: StepStone, 2020. For illustrative purposes only.

1 Fund a portfolio of liquid alternatives with similar risk drivers but lower volatility to fund future capital calls. To fund private debt investments, for example, a greater allocation to senior secured loans is sensible. For equity-related private investments, absolute return strategies can get the job done.

2 Blend the public market and cash approaches. This option maintains enough cash to fund projected capital calls over a 12-month period, with the balance of expected drawdowns covered by assets invested either in a small-cap equity index, such as the Russell 2000, or in a mix of assets defined by the public market portion of the TSA.

[14] If the allocation to private markets is small enough, the income from the public portion of the portfolio may be sufficient to fund expected capital calls, in which case funding is not an issue.

Processes, Structure, Reporting & Governance

Every plan needs to be reevaluated to determine whether it is still on track or needs to be adjusted. Thus, establishing a monitoring and reporting framework early on and making it a routine part of the annual planning process can improve an institution's ability to make tactical changes that will help it meet its strategic objectives.

At a minimum, StepStone believes that institutions that invest in private markets should regularly review the following:

- » **Changes in the objectives**: though strategic allocations are made for the long run, it is not uncommon for a change in leadership to precipitate a change in course. Regulatory changes may also have an impact.
- » **Market factors**: market moves will change *ex ante* risk premia offered by the various asset classes. Asset-class-specific factors can also affect the relative attractiveness of the different asset classes. It would be wise to account for such changes by adjusting either the SAA or at least the pacing to ramp up attractive assets more quickly.
- » **Performance**: asset over- or underperformance leads to changes in exposures and deviations from the prescribed allocations. Large deviations may also signal that return assumptions were unrealistic.
- » **Pacing**: understanding whether the portfolio's buildup lags the target can help determine how best to get it back on track.

Conclusion

The larger an institution's allocation to private markets, the more important it is to derive the allocation to private markets in a coherent way. However, the idiosyncrasies that help private markets generate outsize returns make constructing the SAA all the more challenging.

Our solution is not a plug-and-chug operation. Rather, we have described a series of intuitive steps that we hope make the process less intimidating and more transparent. At every step, portfolio management teams need to choose certain inputs and models, and master success factors. To select the best of each, and to eliminate blind spots, it is useful to look at the problem from different angles. Because deriving an allocation to private markets occurs at the nexus of an investor's strategic allocation, tactical planning, risk management, and investment execution efforts, it is paramount that the decisions made by one group are in harmony with those made by another. Being out of sync can be costly.

Private market specialists can help investors make sense of this complex and delicate process. Investors would be wise to make sure that the consultant with whom they partner can help with the following:

- » Accessing the data and know-how to estimate the parameters for the private market asset classes;
- » Determining what level of performance is reasonable to expect given an investor's existing GP relationships;
- » Using SMAs and secondary and co-investment vehicles to get investors deployed quickly, and to optimize fees; and
- » Transitioning from public to private markets.

As important as it is for investors to construct the portfolio that best meets their needs, it is equally important that they get the process for doing so down pat. Just as having a deliberate and reproducible investment process is a key criterion for passing any investment due-diligence screening, mastering each of the pieces involved in formulating an SAA can differentiate the best portfolio management teams.

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