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COMMITMENT PACING

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This paper provides insights into Meketa Investment Group's process for setting the appropriate pace of commitments for private market programs. The output of our process is an annual commitment budget designed to approach or maintain our clients' target allocations to each private market asset class. The commitment pacing process also answers questions like "how long will it take to reach a target allocation?", "how should commitments be allocated across time and strategies to reach ideal diversification?", and "when will a program become cash flow positive?" While many complex factors are involved in commitment pacing studies, we believe our robust approach simplifies and demystifies the process.

INTRODUCTION

The process of determining the appropriate level of capital commitments required to build private market programs is challenged by a number of complexities that are unique to the asset class, including fund structures and program diversification considerations.

Fund Structure

The first of these complexities is the illiquid, closed-end structure of private market funds. In the public markets, investors can generally meet and maintain target allocations simply by moving in and out of liquid vehicles that offer immediate exposure to underlying assets. However, investors access private market investments through illiquid vehicles that build portfolios of assets slowly and then gradually self-liquidate. Private market fund managers have a high level of discretion over when they buy and sell assets. As such, it is difficult to predict when a fund will be fully invested and at what point investment liquidations justify new fund commitments to maintain exposure.

Program Diversification

Private market programs typically require careful portfolio construction in order to achieve desired diversification. The first strategic planning challenge is time diversification. The closed-end fund structure utilized by private market managers results in performance sensitivity to the year in which a fund is incepted (i.e. funds formed near cycle peaks may be negatively impacted by price corrections, and vice-versa for funds formed near cycle troughs). We strive to build diversified portfolios over time, and with discipline to check our innate reactions to moments of fear and greed. However, doing so adds complexity to the commitment pacing process by combining funds at various points in their life cycles within a single portfolio. Further, the narrowness of private market strategies typically results in numerous fund commitments each year to gain adequate breadth of exposure. As such, we see that mature programs typically include dozens of active funds of varying maturities, which complicates the process of making inferences about ongoing commitment pacing.

The complexities described above have spurred investors to create tools to aid in the determination of appropriate ongoing capital commitment levels to private market funds. We design such tools to analyze the characteristics and composition of existing private market portfolios, and utilize a variety of assumptions to project the behavior of existing and prospective fund investments.

PACING MODEL FRAMEWORK

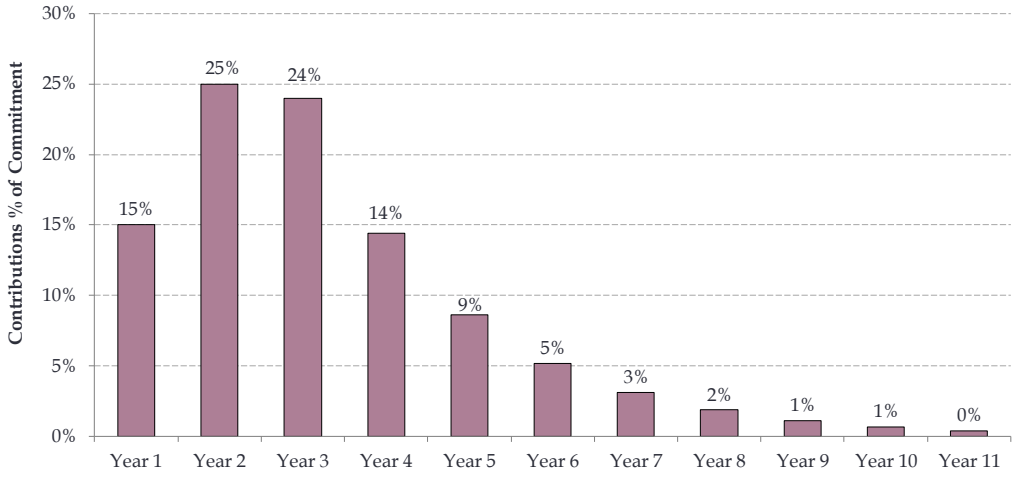
Background

Research into a methodology for commitment pacing began around the time of institutional adoption of the private market asset class in the 1980s. However, a widely accepted framework first emerged in the early 2000s with the publishing of a paper on the subject by Yale in 2001.[1] This paper, "Illiquid Alternative Asset Modeling" ("the Yale paper"), proposed a specific framework for modeling fund cash flow and value behaviors. The primary benefits that the Yale paper's approach brought were simplicity (e.g., a small number of assumptions) and flexibility to respond to actual experience with funds as they progress through their lifecycles. While enhancements to this approach have taken place in the decades since, the basic framework that this paper proposed has remained the basis for most institutional commitment pacing models. We describe the basic components of the model in the following sections.

Contributions

Rates of capital drawdowns are concentrated in the early years of a given fund's life. This should be unsurprising given that closed-end funds have contractual investment periods that, depending on strategy type, typically range from three to six years. After the end of the contractual investment period, capital drawdowns are restricted to follow-on investments to existing assets and fund-level fees and expenses. To capture this dynamic, the Yale paper suggested a three-tier drawdown schedule: 1) a Year 1 contribution rate, 2) a Year 2 contribution rate, and 3) an ongoing contribution rate as a percent of the remaining unfunded commitments. As an example of this approach, the chart below illustrates a pattern of capital calls based on a Year 1 contribution rate of 15% of commitments, a Year 2 contribution rate of 25% of commitments, and an ongoing annual contribution rate of 40% of the remaining unfunded commitments.

Example Contribution Schedule

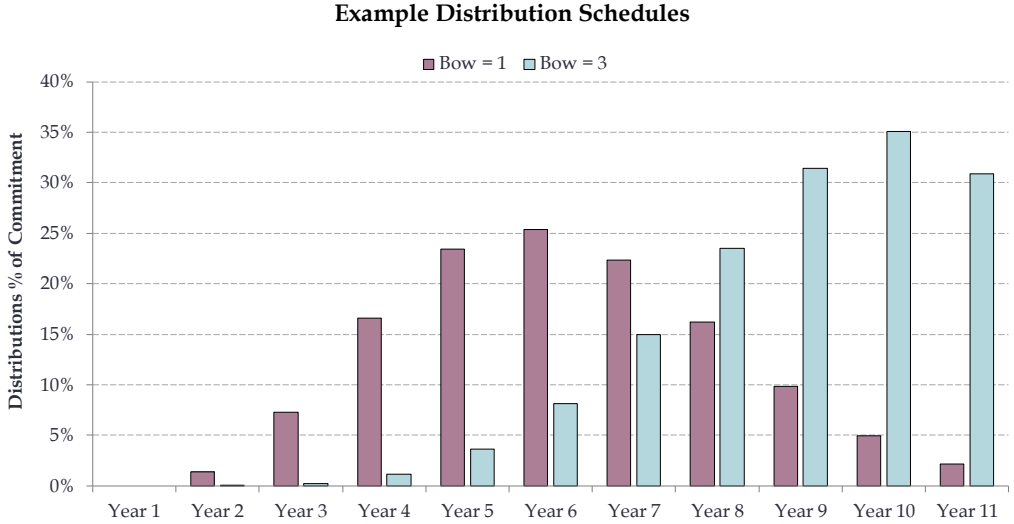


[1] Illiquid Alternative Asset Funding; Dean Takashi and Seth Alexander of Yale International Center for Finance. January 2001.

This three-tiered approach to modeling contributions allows for flexible adjustment to the pattern of contributions to fit the strategy type and chosen data set. The other helpful feature of this approach is its responsiveness to actual experience. For instance, referencing the chart above, if a fund experienced actual contribution rates of *less than* 15% in Year 1 and 25% in Year 2, the model would adapt to this situation in Year 3 and beyond by calculating higher future contributions as a result of the higher remaining unfunded balance. With this flexible approach that incorporates actual cash flow data, a singular framework can be applied to project contributions from any point in a fund's lifecycle.

Distributions

In general, observable patterns of distribution from harvested investments tend to follow the lifecycle of a fund with low rates of distribution early in a fund's life and larger rates of distribution as a fund reaches maturity. The Yale paper's solution for capturing this evolving rate of distribution is a formulaic exponential rate of liquidation (called a "distribution bow") based on the level of outstanding net asset value ("NAV"). A smaller distribution bow (e.g., of 1) results in an earlier, more even pace of distributions throughout a fund's life, whereas a higher distribution bow (e.g., of 3) results in a more concentrated distribution of assets later in a fund's life. We use lower distribution bows for strategies like secondary funds that are likely to produce near-term and steady distributions, and higher distribution bows for strategies like venture capital that require long hold periods before reaching liquidity. The below chart compares distributions as a percent of fund commitments for distribution bows of 1 and 3, respectively.



As in the case of contributions, the formula for calculating distributions allows for selection of a distribution bow that fits the profile of the strategy under consideration. Similarly, the distribution bow responds automatically to the actual experience of a fund by increasing or decreasing projected distributions with actual changes in NAV.

Net Asset Value

Calculation of net asset value is relatively simple within the framework of commitment pacing models. The net asset value grows and declines by two functions: 1) increasing with capital contributions and declining with capital distributions, and 2) increasing at a static long-term growth rate.

Enhancements to the Framework

Meketa Investment Group has made several modest modifications to the commitment pacing study framework put forward by the Yale paper, of which three warrant brief attention. First, as an extension of the Yale framework, our model pools funds of common characteristics (e.g., 2010 vintage buyout funds) together and models them as a single unit. Doing so aids in managing the size and complexity of the model when working with large, mature portfolios.

Second, our model more carefully considers the role of current income for certain private market strategies, such as private debt and infrastructure. Whereas the Yale paper contemplates a single type of investment return in the form of NAV growth, we observe that some strategies have two types of investment return in the form of: 1) distributed income from coupon payments or current operating cash flow, and 2) changes in NAV. Our framework allows for independent modeling of these two return pathways.

Lastly, in rare situations, we believe certain market forces will have a pronounced and near-term impact on the behaviors of private market funds broadly. An example of this is the Global Financial Crisis of 2008 when we observed a marked decline in the volume of private market transactions. In this case, we adjusted our assumptions for the rates of contributions and distributions downward over the coming two years to reflect our near-term expectations for decreased market activity. We may make similar adjustments in the future, if appropriate; however, we expect such situations will continue to be extremely rare.

DETERMINING ASSUMPTIONS

We can group the assumptions underpinning the pacing model framework described above roughly into those that relate to fund cash flow behaviors and those that relate to fund performance. Other critical assumptions within the pacing study relate to the net growth of total investor assets (i.e., the full portfolio of investments, not just the portion that is allocated to private markets).

Cash Flow Assumptions

For assumptions related to historical fund cash flow behaviors, we are able to obtain reasonably robust observations from broadly available databases that catalogue fund performance information, such as Thomson One. Such databases include thousands of private market funds spanning dozens of vintage years, and provide aggregate annual cash flow information. From this information, clear patterns emerge from which we are able to make inferences about how different types of funds behave with respect to rates of contribution and distribution over long periods of time. Certain types of strategies, such as infrastructure, have

limited available data sets from which to make inferences about cash flow behaviors. For such strategies, we must extrapolate based on known information about their fund structures (e.g. investment period lengths, target investment hold periods, and total fund terms) and observations of behaviors for other similar funds.

Performance Assumptions

Our firm's research team and Investment Policy Committee leads the development of our capital market expectations. Each year, we develop long-term performance, correlation, and volatility assumptions for all major asset classes. We designed this process primarily to aid with asset allocation decisions for our clients. To derive these performance assumptions, including those for private market asset classes, our team utilizes a combination of econometric, factor-based, and fundamental-based models and considerations. We determine performance assumptions for each private market strategy (e.g. buyouts, mezzanine debt, value-added infrastructure, etc.) and apply such assumptions to all funds of that strategy category. Our performance estimates for private markets are net of all fees and expenses and exclude any assumed impact from alpha and/or fund selection.

Total Investor Asset Assumptions

The process of designing and implementing private market programs occurs over long periods of time; typically requiring five to seven years simply to reach a target allocation, and perhaps even longer for full maturity. As a result, we must match long-term projections for private market investments with long-term expectations for total investor assets. Such estimates include long-term expectations for net growth of total assets, as well as cash flows that are expected to impact total assets over the long-term (e.g. employee contributions into a pension plan, or expected payout rate from an endowment fund).

The process for estimating growth in total investor assets falls outside of the scope of the commitment pacing exercise. Our clients typically set a long-term target rate of return, and this target is often stated in their Investment Policy. In addition, in consultation with actuaries and/or internal staff members, they provide the estimates for future cash flows into and out of their investment pool.

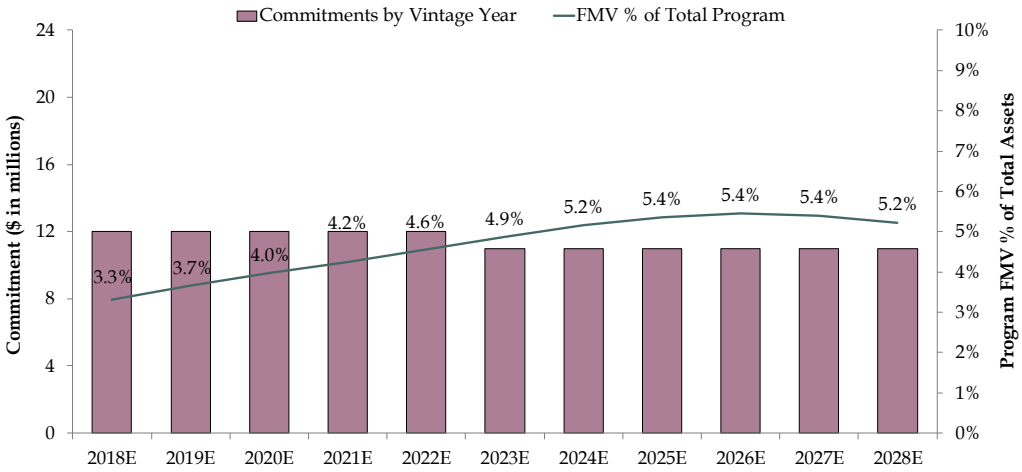
COMMITMENT PACING PROCESS

On at least an annual basis, we update commitment pacing studies for all clients with private market primary commitment programs. We believe it is important to update pacing studies regularly to capture shifts in capital markets, maturation of client private market programs, and changes to client objectives and constraints.

The process of creating or updating a pacing study for a client involves the following summary steps:

1. We populate our model with information for each existing fund in the client's program, such as strategy, vintage year, commitment amount, aggregate capital called to date, and remaining unrealized value. This information allows us to group funds by shared characteristics and project future cash flows and values using the methodology and assumptions described above.
2. Next, we incorporate client total asset projections.
3. Finally, we layer future assumed commitments into the model. These future commitments are subject to the same methodology and assumptions as a client's existing commitments within the model.

Example Pacing Study Output



The determination of the appropriate level of future commitments is an iterative process that seeks to build the private markets program in alignment with client goals and objectives, as well as within the various diversification parameters governing the program. For new programs, we typically seek consistent, sustained annual commitments at a level that build the program to its target allocation within five to seven years. We believe that a faster commitment pace generally brings a risk of client programs becoming overly sensitive to specific points in a market cycle. Conversely, we believe a slower target commitment pace generally brings a risk of not reaching a target allocation within an acceptable timeframe.

We have completed several back-studies to test how client portfolios have behaved relative to our pacing study estimates. In general, our observations are that client programs have behaved in-line with our expectations. For an illustrative example, a client of ours began a private equity program in 2009 and set an initial target allocation of 5% of total assets. The client's private equity program reached its target allocation in 2016; requiring about seven years to reach its target.

SUMMARY & CONCLUSIONS

The nature of private market investment structures creates complexity as it relates to determining the appropriate size and timing of commitments required to reach and maintain target allocations to private market asset classes. However, the combination of structured fund lifecycles and the availability of reasonably robust fund cash flow data allows for management of this complexity through a relatively simple pacing model framework.

Meketa Investment Group has developed a model, grounded in industry best practices and proprietary research, to manage the complex elements of private market program construction and provide a simple, flexible structure to facilitate commitment pacing decisions. Our hope is that this paper has provided helpful insights into the theory and mechanics that drive our commitment pacing process.

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