

# Private Equity: Risks and Opportunities

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## PUBLISHER'S INTRODUCTION TO THE PRIVATE EQUITY Q&A

PMR is pleased to share the following synopsis of “[Private Equity: Risks and Opportunities](#)”—part of our quarterly Theory meets Practice webinar series. Presented in a Q&A format, this summary should bring you up-to-the-minute on the latest thinking about private equity, one of the 60+ investment disciplines covered on the PMR platform. It represents our continuing commitment to enhancing the long-form technical research upon which you and your peers rely to build winning investment strategies backed by foundational concepts. We are producing more than 20 videos and webinars a year and publishing more diverse content including Commentaries and Review articles across our journal titles.

PMR publishes more than 550 articles a year—and most of them are online well ahead of the official volume/issue publication dates. The peer-review process and high rejection rates that earned your trust remain entrenched in our processes. This is evidenced by the doubling of JPM's two- and five-year Impact Factors by Web of Science Group's most recent *Journal Citation Reports*. We always strive to deliver even more diversified content, to give our core research a longer tail and make it more accessible to a broader community. This includes educational issues dedicated solely to Review articles, such as [JPM's Investment Models special issue](#) and our [Journal of Derivatives' Derivatives in Asset Management special issue](#).

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### Cathy Scott

General Manager and Publisher, PMR

**Frank:** Briefly explain your involvement in the private equity market.

**Alex:** I lead research for State Street Global Advisors' multi-asset business, the Investment Solutions Group. The team has about \$400 billion under management or advisory, with services ranging from exposure management to target date funds management to tactical asset allocation to OCIO. Our exposure to private equity comes in a variety of ways. First, we need to provide advice on how private equity fits into a broad multi-asset portfolio framework. That includes forming long-term asset class forecasts and implementing appropriate risk estimation and strategic portfolio construction advice. I'm substantially involved with that. Second, Investment Solutions Group has well-established investment capabilities in private equity, credit, and real estate. I work closely with teams responsible for these areas as well.

**Andy:** My experience in overseeing private equity investing dates back to about 1997 when I was serving as the Chief Investment Officer for Nikko Securities International. At the time we made investments in both private equity funds and direct investments in other asset management entities. It was an interesting time to get acquainted with private investments, due to the extraordinary stresses placed on the markets in 1998, which included a T-bill default in Russia and the collapse of Long-Term Capital Management, and the 2000-1 bursting of the tech bubble. These formative experiences provided a good deal of grist for the mill and led to a period of research concerned with how to manage portfolios through crisis events and how to explicitly price the cost of illiquidity. Currently Windham Capital, where I serve as Chief Investment Strategist, offers an investment product that provides liquid access to an important source of private equity alpha, namely the empirically observable sector rotation skill of many private equity managers.

**Mark:** I have invested in the private capital markets for over 20 years starting with my days as the CIO at CalPERS and chairman of Hermes Private Equity in London. Currently, as CEO and CIO of Commonfund, I allocate a significant portion of our client portfolios to private assets: private equity, venture capital, private credit, venture capital, and real estate. At Commonfund, we build intergenerational equity for our clients—many of whom (universities and foundations) are perpetual in their life span, mission, and investment portfolio. Private equity is a critical component to building long term equity returns across generations of students and philanthropy.

**Frank: Are the drivers of private equity performance largely the same as those for “ordinary” publicly traded stocks, or do you see principal differences?**

**Alex:** Over the span of multiple years, the drivers are largely the same—earning expectations of market participants. Over the short-term, however, there is a principal difference. Public equity prices are affected by what Shiller called “excess volatility”—the effects of anxiety and flows, in other words, living and breathing markets. Private prices are not, or at least are to a much lesser degree. The reasons for that are straightforward—private company valuation methodologies tend to anchor in the long-term earning expectation; they change slowly as market fundamentals evolve. Public markets, as we all have seen, may change very quickly. That is the main difference. Over the long term, once again, the drivers of private equity performance seem to be largely the same as those driving ordinary public stocks.

**Andy:** The drivers of private equity performance have a good deal of overlap with public markets, and investors should have no doubt that less liquid investments have their fortunes tied to the stock and bond markets. There are, however, some additional important considerations. To understand the key differences, it is first worth considering the investment process. The archetypal private equity firm pools investor capital, along with other sources of financing, to acquire equity stakes in small companies with high growth potential.

The fund manager then tries to improve these companies by undertaking various forms of corporate restructuring, such as replacing the management team and board of directors, engaging in cost cutting, adding products and services, or perhaps selling off parts of the company in a spinoff to raise funds. Ultimately the goal is to increase the return on investment. There are subsequently two key differences.

First, private equity investing frequently results in a concentrated set of bets. The result is that performance over time can be driven by highly idiosyncratic factors and produce a substantial deviation in performance relative to public markets. Private investment funds often maintain concentrated bets in smaller companies where failure is much more common. Frequently only one or two out of a dozen investments make any significant return for the fund or its investors. An ineffective management team, a

new product launch that fails, or a promising new technology that becomes obsolete due to competitors can lead to significant losses for the fund. Conversely, a single successful so-called “unicorn” can result in substantial outperformance for a fund.

The second key difference is that this style of investment involves liquidity risk, resulting from both the extensive time commitment associated with a typical fund structure and the less liquid nature of the underlying fund holdings. A lack of liquidity of the underlying holdings can produce a substantial deviation between public and private market performance if a forced liquidation is necessitated.

**Mark:** Both private and public equity are tied to global stock markets (beta) and their own individual business model. In addition, both forms of equity provide for a positive return on equity (ROE) regardless of whether that equity investment is public or private. The single biggest difference between public equity and private equity is the role of corporate governance. Private equity is as close to a perfect model of corporate governance as is possible. Instead of a large and disperse shareholder base typical of a public company, in private equity, the equity capital is concentrated with the private equity manager. The private equity manager then takes seats on the Board of Directors to ensure a perfect alignment between the fiduciaries of the company and its shareholders. The private equity firm also sets the compensation metrics for the executive management of the private company to establish a clear alignment between management and shareholders. Last, the private equity firm works with the senior management of the private company to build the most cost-effective (low on perks, high on value add) business plan for the company.

**Frank: How are public and private equity return streams tied to each other?**

**Alex:** Historically, most researchers viewed private equity as an alpha-generating, alternative investment strategy that is connected to private markets but is genuinely different. In our research (Rudin and Farley 2022a), we took a different view.

We assumed that public and private equity prices are exposed to the same market fundamentals. We also assumed that on top of that, public equity prices are subject to Shiller’s excess volatility. If so, it makes sense to model public equity returns as a sum of private equity returns for the same period and a noise term representing Shiller’s excess volatility. I’m simplifying, of course.

To our delight, not only does such an approach shows excellent agreement with empirical evidence, it also brings many insights that we found illuminating.

First, it nicely resolves a long-standing conundrum. Many researchers (Anson 2002, Conner 2003, Pedersen et al. 2014) claimed that private equity returns need to be unsmoothed before use but are generally superior to public equity. However, a similar number of other researchers (Phalippou 2014, L’Her et al. 2016, Ilmanen et al. 2020) noted that over the long term, the advantage of private equity is small or even insignificant for an average manager. This seems like a contradiction, but if you take the position that we proposed, it is not. Both observations are correct. Excess volatility hurts public prices in the short term but that difference dissipates as we extend the investment horizon, explaining the conundrum.

The second advantage is that our model allows computationally easy performance attribution of private equity returns into parts that are linked to how public markets have done, what the leverage difference is, and what the alpha is. We found this helpful.

**Mark:** It may seem like private equity does not suffer the vicissitudes of the up and down movement of the public equity market, but both are linked much more closely than estimated by current metrics. The use of lagged betas—as discussed next—reveals this link.

**Frank: How do you measure the systematic/market risk associated with private equity and venture capital for purposes of risk budgeting and asset allocation?**

**Alex:** It depends on what risks you are trying to measure. If your aim is short-term exposure management—say, you are trying to understand the number of S&P 500 futures with which you need to hedge your buyout exposure for the next couple of months—then the traditional approach of calculating private equity beta to S&P is appropriate; you just need to unsmooth the private returns before measuring your beta. If, however, your aim is to evaluate the amount of strategic, multi-year exposure to equity risk factor in your portfolio, you may want to approach this differently. We view public and private equity as fundamentally the same asset class, with two differences. First, private funds tend to be more leveraged. Second, public equity is exposed to a particular source of risk—we call it excess volatility following Shiller—while private equity is not.

This implies a need for a different way of measuring systematic risks. You want to create a level playing field where excess volatility no longer matters. To do this, we use what we call a long-horizon risk estimation process. We deploy a procedure that filters out excess volatility across all assets and then aim to create portfolios that are long-horizon optimal.

**Mark:** The lagged beta phenomenon is now well established; several reference papers are attached (see Anson 2002, 2007, 2013). In a traditional CAPM setting a one-period model is used to estimate the beta of an asset class. However, the one-period CAPM model assumes that all assets are completely liquid and perfectly divisible. Clearly, this is not the case with private equity, venture capital, and other illiquid asset classes. Consequently, a one-period model will underestimate the beta associated with private equity and overestimate the alpha generated by the private equity manager. To correct for this problem, a multi-period model must be used to estimate the full amount of market beta that washes through a private equity portfolio. This leads to the “Lagged Beta” phenomenon. It has been demonstrated that for private equity (buyouts and growth equity) you must include two to three lagged betas *in addition to the current period beta* to estimate the full amount of systematic risk embedded in a buyout/growth equity portfolio. This assumes a quarterly time period to measure the change in private equity asset values. For venture capital, the lagged betas can extend back three to four quarters, and for real estate—the least liquid asset class—the lagged betas can extend up to five quarters. The great thing about betas is that they are linearly additive, so the sum of the lagged betas plus the current period beta can be accumulated to estimate the full amount of systematic risk. In so doing, you also reveal the true amount of alpha. You cannot measure alpha until you account for all the beta associated with an active investment.

**Frank: From a practical standpoint how should one think about managing risk in the context of these considerations?**

**Alex:** Never forget that private equity is, at the end of the day, akin to leveraged equity exposure, and is correlated to your public equity holdings. Furthermore, during prolonged bear markets, your private equity portion of the portfolio may underperform the public portion. Assessing combined, public plus private equity exposure over both the short-term and the long-term investment horizons is in my mind a practical way of managing relevant risks.

**Mark:** Lagged betas have another key benefit. Accumulating all the systemic risk associated with private asset classes also reveals the true correlation of the illiquid asset classes with the public markets. When lagged betas are included, the correlation of private equity with public equity increases substantially. The same is true for venture capital and real estate. These estimates are critical for risk budgeting—knowing the full amount of beta risk you are taking in private equity—as well

as for asset allocation—measuring the true correlation coefficients between illiquid asset classes and liquid markets. Also, you can use the lagged betas to “de-smooth” the return streams associated with private equity, venture capital, etc., to get a better estimate of the underlying volatility associated with illiquid asset classes. The bibliography includes a paper that shows how to include illiquid assets in an asset allocation framework (Anson 2016).

**Frank: Is it legitimate to use broad private equity index performance history as a proxy for asset allocation calculations?**

**Alex:** One could use it with an important caveat. As opposed to indexes like S&P 500, private equity indexes are not investable. Instead of a broad index, you are invested in a basket of private equity funds that inevitably is much narrower. Using a narrow basket may bring some industry biases but even more importantly, it is guaranteed to bring more idiosyncratic risks. So even if average returns are the same as the index, volatility will likely be higher, affecting your asset allocation calculations.

We did a study of this back in 2019 (Rudin et al. 2019) using anonymized buyout fund data obtained from the State Street custody side of the business. A typical pension fund private equity program that allocates to 4-6 funds a year—which means a portfolio of 30-50 funds in total—is 20%-30% more volatile than a broad index. For smaller programs this risk gap is even wider.

**Mark:** Yes and no. Yes, despite criticisms of peer driven private equity and venture capital benchmarks, these are the best that the industry has to offer. Typically, these indexes are based on the returns to private equity funds where capital is committed from institutional investors such as endowments, foundations, and pension funds. No, because over the past 20 years, the median private equity manager—again buyout/growth equity—underperformed the S&P 500 public equity index. The same is true for venture capital: the median venture capital manager underperformed the public stock market. Therefore, if you use a broad private equity index as your performance history for asset allocation purposes, it will have very little impact on the asset allocation process because of the documented underperformance of the median private capital manager.

**Frank: What have been the key changes to the venture capital market over the past 10 years?**

**Mark:** There have been three key changes to the venture capital market over the past decade.

First, start-up companies are staying private longer. In the old model, an entrepreneur funded with seed capital and then a second and third round of financing (Series A and B) before going public. Today, start-up companies might have a Series C through G round of financing before going public. Much more capital from non-traditional funding sources is willing to flow into later rounds of private companies than in the past—see our discussion of NTIs, below.

Second is the rise of the unicorn. In the past, a venture manager would bank on three to four start-up companies achieving a successful outcome: either an Initial Public Offering (IPO) or a sale to an established company. Today, venture capital managers spend more time looking for a “unicorn”—a start-up company that achieves an IPO value of \$1 billion or more. A single unicorn can carry the whole performance for a venture capital fund. This is also why venture managers will back a start-up company through several rounds of financing—to capitalize on that unicorn status.

The third change has been the entrance of Non-Traditional Investors (NTIs). In the past, the venture capital industry was a small, tightly knit community of select venture capital managers that had access to the best ideas and entrepreneurs.

Today, traditional asset management companies—those investing primarily in public stocks and bonds—are committing capital to non-public companies. Sometimes called “tourist investors”—a pejorative label from the VC community—these traditional asset managers are nonetheless committing significant amounts of capital to later rounds of financing for entrepreneurs.

**Frank: Does the Liquidity Premium really exist and can one measure and separate it from alpha generated by private equity and venture capital managers?**

**Alex:** This is a tricky one. Traditionally, liquidity premium is defined as compensation for illiquidity, and should be measured by comparing identical assets that happen to have different liquidity terms. Less liquid assets ought to command a premium. Importantly, during such comparison, one ought to correct for all systematic biases between the assets. When it is done properly—as we tried in our “Public and Private Equity Returns paper” with Dan Farley (Rudin and Farley 2022a)—we effectively found no liquidity premiums associated with private equity over the long term. Over the short term, yes, private returns are superior... simply because private valuations are model-based as opposed to market-based. We have discussed this already.

The separation of liquidity premiums and alpha is, I think, principally impossible when one compares two assets, liquid and illiquid. It is more feasible, however, when one compares multiple assets. For example, our comparison of broad buyout index—in other words, an average private equity manager with the focus on *average*—with S&P 500 showed very little value added over the past 20 years. That suggests that liquidity premium and alpha for buyouts as an asset class is low over the long term. That said, for any particular group of funds, one can indeed discover outperformance. Since liquidity of all buyout funds is the same, such outperformance could be solely attributed to alpha. That is the process I would follow.

**Mark:** Yes, at Commonfund we recently published a paper in *The Journal of Alternative Investments* that not only documents the Liquidity Premium associated with private assets, but also tracks its performance over the past two decades (see Anson 2017). As a headline, the long-term Liquidity Premium is about 3.5%—this is the premium for investing in private equity over and above the public equity markets. If you lock up your capital in private companies for 7 to 12 years, you should expect to earn an extra premium in return for providing liquid capital to an illiquid market. Also, in the paper, we shocked the Liquidity Premium against the well-known Fama-French and Carhart factors to demonstrate that it is an independent risk premium and not tied to market beta. Last, smart investors need to account for the Liquidity Premium before they can identify the alpha generated by the manager. Our paper in *JPM* (Anson 2022) shows that large private equity managers (those with PE funds greater than \$5 billion) do not fully capture the liquidity premium and do not produce any independent alpha. However, smaller PE funds, and specifically, small PE funds that are sector specialists, fully capture the Liquidity Premium plus another 2% of alpha.

**Frank: What are the observed statistical properties of less liquid portfolios and what are the implications for portfolio construction and risk management?**

**Alex:** Besides serial correlation in private asset returns, I would recommend focusing on the term structure of volatility. Let me elaborate on this. Say you calculate annualized volatility of equity returns. You can use daily returns, calculate standard deviation, and then multiply by the square root of 250. You can also use weekly returns and the square root of 52. Or monthly returns and the square root of 12, and so on. The difference between these volatility estimates is called a term structure of volatility. Crucially, for equities and other publicly traded securities, such

term structure tends to be front loaded—as you reduce data observation frequency, volatility reduces. For private assets, however, term structure is rather flat. The implications of that are that for long-term strategic portfolios you may want to use risk estimates calculated over a long horizon. This approach brings all assets, both public and private, to a level playing field.

**Andy:** Less liquid markets tend to exhibit a substantial understatement of true price volatility. This is directly observable by measuring the autocorrelation of reported returns, i.e., the correlation of returns in one period versus a subsequent period. This occurs because less liquid portfolios tend to be valued adaptively, even when valued by third-party valuation providers. Such “adaptive” portfolio valuations result in price smoothing that engenders autocorrelation in reported performance data. It is worth noting that this is not typically the result of a nefarious motivation but rather, in the absence of an actively traded market, such pricing tends to minimize the error of pricing estimates.

So called “smoothed prices” do, however, create challenges for investors in the context of portfolio construction. Therefore, useful adjustments have been developed to “de-modulate” such data (i.e., to back out a non-smoothed return history that is consistent with the observed data). Notable examples include the Scholes and Williams (1977) and Geltner (1993) adjustments. Unsmoothed data then can be used to calculate more meaningful measures of volatility and correlation.

The main problem with these adjustments, however, is that they ignore the adjustment to expected return that is required by less liquid portfolios. Less liquid portfolios can become, somewhat predictably, involved in so-called forced- or fire-sale events. These events, which are surprisingly common, occur when an adaptively priced portfolio becomes excessively over-priced relative to some implicit credibility threshold. Typically, when a portfolio’s value is excessively overstated, an interested third party (such as a prime broker or other provider of investment financing) steps in to demand a rapid return of capital. Such forced sales can be quite costly.

The bottom line is that autocorrelated/smoothed data tend to result in an important understatement of portfolio risk, an over-allocation to less liquid asset classes, and exposes investors to potentially expensive fire-sale events.

**Mark:** As mentioned above, you need to account for the lagged betas associated with private equity, venture capital, and real estate to understand the full amount of systematic market exposure contained in these illiquid portfolios. Without an accurate measure of beta risk, an investor might over-allocate to private assets and inadvertently increase the risk profile.

Also, without lagged betas, an investor will not get an accurate estimate of correlation coefficients between liquid and illiquid asset classes—a critical input for measuring diversification and asset allocation.

As another point, lagged betas can reveal the true volatility associated with illiquid asset classes—another critical component to the portfolio construction process.

Last, lagged betas are important to measure the residual alpha created by the private equity manager. You cannot measure true alpha until you account for all of the beta associated with a private equity manager.

**Frank: Are liquidity constraints on the total portfolio level the only obstacle precluding equity asset managers from allocating 100% to private equity instead of public equity, given the relative performance?**

**Alex:** No, I don’t think so. Over the long term, we didn’t observe significant performance advantage of private equity over public one for an average manager after common-sensical adjustments for leverage and such are made. That said, risk comparison of public vs. private equity is full of nuances. Briefly, relative allocation between the two should be driven by your sensitivity to short-term risks, return objectives in relation

to the unleveraged equity return expectations, and of course how much illiquidity you are willing to have in your overall portfolio. We have an extensive discussion of this subject in our recent paper with Dan Farley (Rudin and Farley 2022b), which perhaps may be of interest here.

**Mark:** Yes. In any optimizer, if you take first or second quartile private equity returns, the portfolio optimizer will want to build as much private equity and venture capital into the portfolio as possible. One of the greatest advantages of private equity and venture capital managers compared to their public counterparts is that they get to amortize the volatility of their portfolios. Because they only mark to market their portfolios on a quarterly basis and they have significant discretion as to how they “price” their underlying portfolio companies, the resulting volatility of private capital portfolios is typically understated. Therefore, the only *pragmatic constraint* is a Liquidity Constraint or Budget. However, if lagged betas are used to accurately measure the correlation coefficients between illiquid and liquid asset classes, and also to better estimate the actual volatility of private equity and venture capital, then you will have an *economic constraint* that limits the amount allocated to these illiquid asset classes.

**Frank:** This question is for Andy. In an article you coauthored six years ago that was published in JPM (Lindsey and Weisman 2016), you proposed a simple option-adjusted return for evaluating the cost of illiquidity in private equity markets. Please describe the approach.

**Andy:** The article you are referring to was designed to deal with the issue of the required adjustment to expected return resulting from portfolio smoothing. To understand the solution proposed in this paper it is worth considering the anatomy of a typical disaster for a less liquid portfolio. First, portfolio smoothing tends to result in an understated valuation in an up-trending market and an over-valuation in a down-trending market. While undervaluation is typically not a problem, overvaluation is a much thornier issue. If a reported portfolio valuation exceeds some unspecified but implicit credibility threshold, then an interested third party is likely to step in and demand price discovery. This is often the leverage provider, but it can also be a fund investor. The result is usually a dramatic resetting of the portfolio valuation that includes a significant penalty for a sudden, forced liquidation.

The model is operationalized as a Monte-Carlo barrier option model using the following basic steps. First, the degree of autocorrelation of the performance time series is measured to get an estimate of the extent to which volatility is being understated. Second, the reported data are “unscrambled” using a Geltner adjustment to uncover a more realistic estimate of the portfolio volatility. Third, beliefs (“priors”) are developed and specified concerning the credibility threshold and the liquidity penalty. Some empirical information is noted in the paper. Fourth, a Monte Carlo simulation is conducted consisting of several thousand one-year time-horizon paths for both return data that is consistent with the observed but de-modulated returns, as well as an associated smoothed series for each simulated path. Fifth, in each pass through the simulated data, periods are identified where the portfolio valuation of the smoothed series exceeds the unsmoothed series by an amount greater than the assumed credibility threshold. In each case an assumed liquidation penalty is applied. Sixth, the expected value of these periodic payouts is calculated by averaging the payouts across all the simulated paths. When you finish step 6 you have explicitly produced an annualized adjustment to the observed returns that accommodates the risk of a forced liquidation.

It is worth noting that this model is highly effective in identifying problematic liquidity. It produces very little type-one error. From an empirical standpoint, if it predicts a large potential write-down, it is highly likely to occur.

The bottom line: if you have a view on a credibility threshold, a sudden liquidation cost, and observed price smoothing, you can explicitly derive the implicit cost



of illiquidity, which can serve to limit an overallocation to less-liquid assets and help protect against potentially catastrophic losses.

**Frank: When considering value creation of private market investments, is carried interest compensation appropriate or should compensation also consider public market behavior?**

**Alex:** If one takes a view—as we do—that public and private equities are tightly linked through fundamentals, then returns of private equity funds are tightly linked to returns of public markets over the life of those funds. Carried—or “performance”—compensation is intended for excess returns above and beyond what a comparable passive exposure would bring... so, yes, in my opinion, carried compensation should absolutely consider public market behavior.

One may also argue that PE funds already do that to some degree by using hurdle rates, which should be comparable with equity premiums over the long term. Most only get paid if they exceed such a rate. The challenge, of course, is that hurdle rates tend to be too low given leverage embedded in private equity funds.

**Andy:** There’s a lot to unpack in this question. First, where we’re at, at least from a philosophical/research perspective, is that some form of private market equivalent return needs to be calculated to limit the scope for excessive compensation being paid to fund managers who are potentially just replicating simple public market exposures that could be obtained for little or no fees. The problem is how to define a relevant performance benchmark for private investments. Relatedly, how do you disentangle return sources such as market Beta, manager Alphas, and the potential “interaction value” between Beta and Alpha?

There has been a fair amount of work done on the issue of creating relevant benchmarks for private investments. A brief literature survey would first include the Long and Nickels Index Comparison Method (ICM) (Long and Nickels 1996). This paper is generally regarded as the progenitor of this effort. In this paper, every capital contribution and distribution of the private equity investment is matched by an equal and timely investment or sale of the reference benchmark. This approach does have an intuitive appeal. This Index Comparison/Public Market Equivalent method (ICM/PME) is both logical and easy to understand. However, as later research reveals, it does create some strange “corner solutions.” Notably, a very large, early success by a private fund could result in a negatively valued reference portfolio. Additionally, when capital has been largely returned by a fund, the reference portfolio (public benchmark) could potentially be quite volatile, resulting in an inappropriate and disproportional effect on measures of manager performance.

Later, approaches were developed by both Christophe Rouvinez and Capital Dynamics (2003) and Cambridge Associates (2013) that included a scaling factor, or even multiple scaling factors, to deal with the shortcomings of the original Long and Nickels method. Unfortunately, these methods have some serious drawbacks as well. They tend to be very sensitive to early distributions where down-scaling or up-scaling of distributions, due to outperformance or underperformance, has an inflating effect on the calculated internal rate of return (IRR). Second, such methods involve post facto scaling adjustments making the resulting benchmarks un-investable.

In 2005, Kaplan and Schoar (2005), suggested a so-called Public Market Equivalent Ratio (KS-PME). In this method, distributions and capital calls are valued by discounting them using realized market returns over the same time period. The KS-PME measure is the ratio of the two resulting values. There is a lot to recommend this approach. It provides a valid economic performance measure when the investor has log-utility preferences, and the investors’ total wealth is related to the market return. The ratio solution characterizes your wealth effect and whether you achieved under- or out-performance. The problem, however, is that it is not directly applicable to determining fair payment for your manager.

A paper recently published in *The Journal of Portfolio Management* by Turetsky et al. (2021) directly and effectively responds to the above specified concerns. This method can be thought of as annualizing the KS-PME; it has a value of zero whenever the KS-PME is one. The main attraction of this method is that it formalizes the calculation of the exact alpha to a chosen reference benchmark (in dollar terms), avoiding most of the issues of the heuristic methodologies discussed above. It is the closest thing we have in terms of applying modern portfolio theory to private equity. It distinguishes and isolates manager alpha only when capital is at risk. Finally, it is relatively simple and algorithmic.

The bottom line is that there is a sensible and useful methodology available that produces an appropriate comparison of manager performance relative to a specified benchmark. It is based on the actual cashflows (contributions and distributions) and produces a measure of out-performance in terms of money! So, if you're interested in compensating managers according to their performance relative to a passive, relevant, low- or no-cost benchmark, there is a way of doing it.

**Mark:** For better or worse, the carried interest (incentive fees) model is completely embedded in the private equity and venture capital markets. And, yes, incentive fees are a “free call option” on the overall performance of the underlying private equity and venture capital fund. Consequently, to increase the value of the Carried Interest Call Option, a private equity or venture manager might be incented to increase the volatility of the underlying fund.

However, there are safeguards built into private equity and venture fund structures to limit this conflicting incentive.

First, all private equity and venture funds collect Carried Interest *only when there is an actual realization event*. This is different from a hedge fund manager who can collect incentive fees on just market appreciation. Second, most PE and VC managers have a Required Rate of Return—typically 6% to 8%—that they must earn and return to their investors before they can collect any Carried Interest. Third, most PE and VC managers also must return all committed capital back to their investors before they can collect their Carried Interest. Finally, most private equity and venture capital funds also have a “clawback” provision that allows the Limited Partners/Investors to demand the return of some portion of the Carried Interest if it proves to be excessive.

**Frank: Is it possible to market time the venture capital markets?**

**Mark:** It is a fool's errand to try to time the market—and an even larger fool's errand (if such a thing exists) to try to time the venture capital industry. More to the point, in our recent paper in the JPM (Anson 2022), we track the birth of start-up companies compared to the performance of the equity markets. What we discovered is that brilliant start-ups like Facebook, Amazon, and Google are born/created in up markets as well as down markets. In other words, the entrepreneurial spirit and innovation that flows from it operates independent of the business cycle. So, today is a good day to invest in venture capital. Tomorrow is a good day. Yesterday was a good day, etc.

**Frank: How do you deal with the pricing issue for daily marking for collective investment vehicles that include private equity?**

**Alex:** I'm not directly involved with such vehicles, but I am aware of some industry examples in the defined contribution space. My personal view is that you should treat daily marks as model-based indicators of value as opposed to genuine price levels at which such assets can be purchased or liquidated. The spread between those marks and liquidation price could become quite large at the time of stress.

**Mark:** It is a struggle. We know that, for instance, when the public equity markets trade down in any given quarter, it will take time for that negative market performance to impact the private equity portfolios (the lagged beta effect). This means that the private equity portion of the portfolio will appear to outperform the public markets until the lagged beta performance kicks in. It may even be said that private equity can “carry” the decline in value of the public equity markets—but only for a few quarters. Eventually, the negative performance in the public equity markets will catch up with the portfolio marks to market in private equity and venture capital.

The reverse is true when the public equity markets have a resurgence. When a recession hits bottom and the public equity markets begin to recover, this recovery takes place in advance of the private equity and venture capital portfolios. Coming out of a recession, the public market returns tend to be larger and lead the performance compared to private market returns.

Over long periods of time, these lagged betas equalize, and an investor will get a realistic picture of whether private equity and venture capital earn a return premium over the public markets. That is why we emphasize *long-term investment horizons*.

**Frank: What practical strategies are appropriate for managing the constrained liquidity of private investments?**

**Alex:** In my mind, unless we turn to secondary markets, managing liquidity of private equity investments boils down to managing associated risk exposures. This is tricky...because betas to a natural hedge—public equity—are a function of the time horizon that you have. If you go with a short-horizon—smaller—beta, you would likely under-hedge in the long term. If, however, you go with a higher, long-horizon beta, you would over-hedge in the short term and introduce substantial new source of volatility into the portfolio. Neither approach is very effective... I would argue that since it is quite rare for institutional, strategic investors to completely avoid equity exposure, they should see public and private contributions as additive and manage overall such exposure through liquid portion alone.

**Andy:** Investors in less-liquid portfolios have developed three important practices.

First, “ladder” your illiquid alternatives portfolio. If you intend to allocate, for example, 20% of your overall portfolio to such investments, allocate 4% of the overall portfolio each year for a five-year period. Laddering private investment portfolios then creates the possibility that they will become self-funding; distributions from older vintages can help fund the capital calls of newer vintages. Equally importantly, it reduces the likelihood of forced liquidations of assets during stressful market conditions.

Second, limit the overall alternatives allocation. This should be done in the context of having a more nuanced/realistic view of the “true” volatility and expected returns of your illiquid investments. Having a well-considered understanding will help prevent a systematic over-allocation to less-liquid investments.

Third, understand the duration of your commitments. How much time will you be obligated for making contributions? How much time will be required to get your original investment back? How much time until all distributions are received? How much time will your capital be tied up?

Finally, develop an understanding of how these measures vary across investment categories, across time and through differing market conditions.

An article by Castilla, David-Visser, and Brophy (2022) in this special issue is a useful reference here.

**Mark:** Again, understand the lagged betas and the more accurate correlation coefficients and volatility estimates they produce. Yet, even with all of this analysis, an investor can get caught in a liquidity crunch during market turmoil. This happens when private equity and venture managers call on the capital commitments of their investors at a time when liquidity in those investors’ portfolios may have dried up.

This happened during the Great Financial Crisis, and some of the smartest investors on the planet were caught over their skis with respect to the illiquid nature of their portfolios. This led to many of those investors having to liquidate parts of their private equity and venture capital funds at distressed/discounted prices.

What's the solution? In addition to the economic constraints discussed above, it is also critical that an investor have a formal liquidity budget/constraint as well. The largest (and, potentially, the smartest) endowments have a liquidity budget in the range of 40% to 50% of their overall portfolio. However, most institutional investors have a liquidity budget in the range of 20%–30%.

**Frank: What advice can you give on constructing multi-asset portfolios that include private equity?**

**Alex:** First, I would recommend treating private equity as another form of equity instead of a standalone asset class. Both public and private equity instruments fundamentally provide exposure to growth. There are legitimate complexities—private equity funds carry different amount of leverage, industry differentiation, etc. But in the end, these two sources of growth exposure have to be added and accounted for when building multi-asset portfolios.

Second, I would recommend introducing investment time horizon considerations into your portfolio construction process. Most private equity investors are strategic in nature and their horizon is legitimately in years. But to what degree are they insensitive to the short-term risk control? Most are not. So, my advice would be to combine both long term optimality and short-term risk control into your multi-asset portfolio construction scheme. My CIO Daniel Farley and I elaborated on this topic in our recent JPM paper named “Dual-Horizon Strategic Asset Allocation” (Rudin and Farley 2022b). Perhaps it could be helpful.

For commingled multi-asset vehicles that include private or otherwise illiquid assets, I would also add a third suggestion, which is to keep an eye on the liquidity mismatch. Multi-asset portfolio wrappers may have liquidity terms that far exceed liquidity terms of private components of the portfolio. This could lead to problems at times of market stress. For example, in 2008, when redemptions came, most liquid parts of such portfolios were quickly redeemed—which was already not great as it changed the asset allocation mix. And then the choice was between selling illiquid holdings in secondary markets at deep discounts or disallowing redemptions altogether. Once again, not great at all. Liquidity mismatch is something investors must always keep in mind.

**Mark:** Lag your betas!!!

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