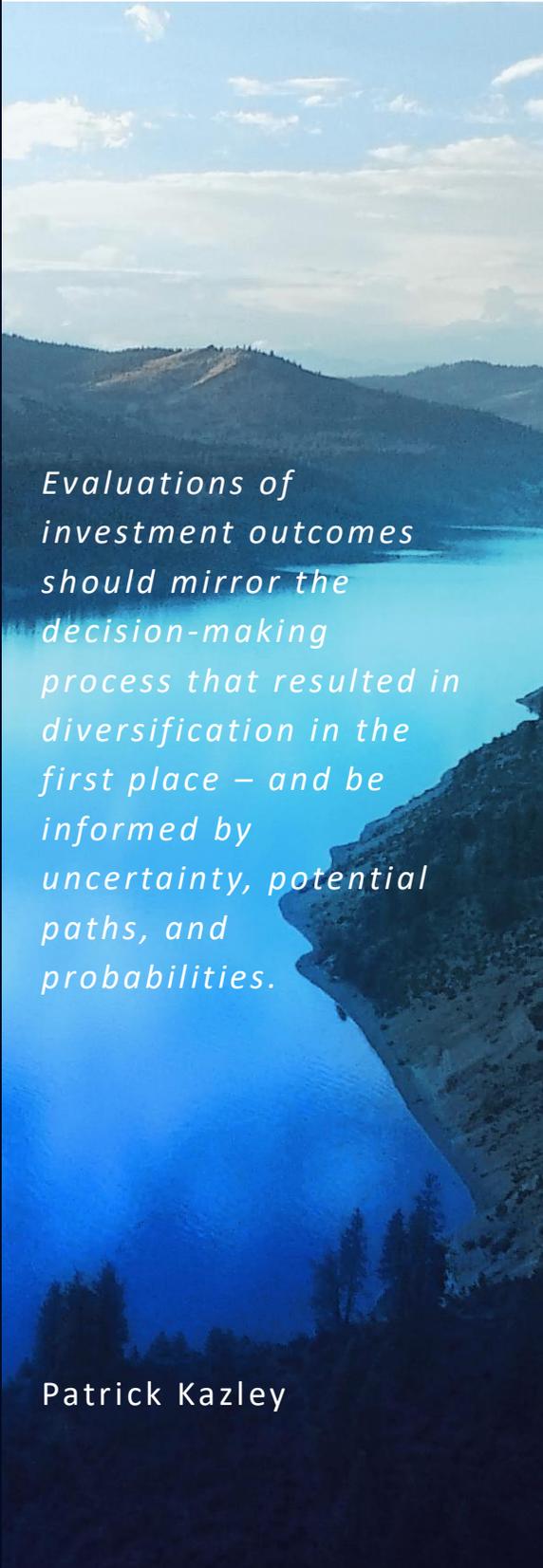


# The Ex-Ante Problem - Part I

Deadlocked in the Dohyo



*Evaluations of investment outcomes should mirror the decision-making process that resulted in diversification in the first place – and be informed by uncertainty, potential paths, and probabilities.*

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*“Judging by outcomes is a dangerous habit in a probabilistic world.”*

— Howard Marks

## Deadlocked in the Dohyo

It is easy to confuse a calm surface with underlying stability. However, stillness can be deceptive. During lengthy periods of stability and strong market returns, the most diversifying exposures (e.g., those that are negatively correlated and positively convex) by construction face the strongest headwinds. The decision to diversify your portfolio away from concentrated bets on prolonged stability is still a smart choice ex-ante, even if ex-post that diversification wasn't rewarded (more on this “ex-ante problem” later). Like most investment decisions – it takes a good mix of patience, skill, and good evaluation criteria to maintain such diversifying exposures full market cycle.

Consider Japanese sumo wrestling, in which the two participants face off inside a ring (the “dohyo”), with the intention of knocking their opponent out of the dohyo or to the ground using a combination of sheer force, balance, and misdirection. The infamous size of sumo wrestlers makes this objective particularly challenging – often resulting in sustained periods in which two (very large) wrestlers are apparently frozen in a deadlock of roughly equivalent, opposing forces, pressing against each other. The observer of this deadlock would see no kinetic energy and very minimal visible movement. The knowledgeable observer would know that while appearances seem calm on the surface, the deadlock is full of potential energy and is prone to break – violently and rapidly when it does.

Imagine compressing an entire market cycle into a bet on the outcome of single 1-on-1 match (a “bout”), which typically lasts less than half a minute. Effectively, every second of the bout equates to roughly 0.5-1 years in the market cycle. To make the experiment simple, let's assume the betting options are twofold in which you can bet your money on some combination of 1. stability / continuation of the bout (e.g., beta exposure), from which you can yield a market risk premium, or 2. a sudden victory / end to the bout (e.g., long convexity exposure or tail hedge), from which you can harvest an insurance-like payout.

Based on how these bouts typically go, it would be wise to bet on some prolonged period of stability or deadlock. There's always a chance of an immediate victory – some bouts last just a few seconds. So, it's prudent to put some portion of your betting capital on an immediate end, especially if you can purchase those odds on the cheap, with a convex payoff, and to deploy the majority of your capital on the (more probable) bet of there being some period of prolonged stability.

As the bout carries on, however, signs of fatigue appear, form begins breaking down, improvisations and late-stage cycle behavior indicate that a break is more imminent. Now, the cost of betting on a break may be multiples more expensive than it was at the onset of the bout – which isn't to say it's not a good buy if indeed it suddenly ends, but now the cost of being wrong on that hedge is far greater.

For those that did hedge at the onset of the bout, they face difficult choices at this point: they can monetize their hedge fully and put those proceeds into a bet on continued stability, monetize partially to spread their bets, or hold the defensive bet fully (or even lean into it more aggressively) betting on continued momentum and the bout ending imminently. Leaning into the hedge more aggressively runs the risk of losing the accrued gains on the hedge completely if stability is quickly reestablished, while monetizing it fully makes a further decline even more painful. It's likely best to do a combination of these actions, and [papers](#) have been written on how best to strike that balance.

## Allocation Choices Reflect Uncertainty

Perhaps allocators should source diversifying exposures similarly. First – understand what concentrated bets you are making. For most all institutional portfolios, this is equity beta – comprising anywhere from 50-95% of the risk of a fully-deployed portfolio. Second – identify the paths for markets that could impair the compounded value of your portfolio. For equities, such adverse paths would include reflexive crises that

don't immediately recover, and prolonged risk asset declines that erode the portfolio through gradual losses or forgone time value.

Then, the game plan is quite simple: maintain equity exposure full cycle with an understanding that eventually the deadlock of stability will break, and massive losses will occur. To mitigate the loss of long-term compounding that results from such events, you should pair these equity exposures with sufficiently cheap sources of convexity and hold that full market cycle as well. The episodic proceeds from this defensive convexity enables you to buy more equities at lower prices along the cycle (i.e., use payouts from the hedge intra-and-post-crisis to buy equities), hold larger amounts of equity risk full cycle (i.e., barbell risk-on and defensive exposures), and protect against major disruptions and reflexive declines (i.e., receive an outsized payout when the bout "ends", or when a major crisis effectively resets the market cycle).

## The Ex-Ante Problem

Some bouts, like market cycles, persist in a stable state much longer than others. The speculator who chose to hedge on the first second of a 30-second bout (i.e., day 1 of a 20+ year cycle) runs the risk of evaluating the performance of that standalone hedge intra-cycle and determining that it was a poor bet ex-ante. Even if over a large sample of such cycles, that bet is actually well compensated (even including the prolonged periods of low / negative returns).

When constructing portfolios, investors must consider potential outcomes ex-ante but only get to experience one path ex-post. That single path determines outcomes, but it doesn't always reflect the quality of the original allocation decisions. Ex-ante uncertainty is what necessitated the diversification in the first place. That uncertainty beforehand can be correct even if the path ex-post doesn't reward diversification, which can lead to evaluation frustrations. We call this the ex-ante problem.

There's no perfectly robust way to evaluate skill in navigating hypothetical paths that did not manifest but certainly could (or maybe even should) have. However, to achieve a truly diversified portfolio, such analyses are required. Otherwise, investors will succeed in constructing portfolios that will solve yesterday's problems today, at the direct risk of sacrificing future resilience.

Designing truly diversified portfolios often means embracing decisions that might be hard to explain ex-post. Counterfactual evaluation – asking what could have happened and how your portfolio would have performed – necessitates an assessment of paths not taken and paths that might unfold in the future. Such exercises can be difficult to explain to investment boards and other stakeholders, who (like the rest of us) prefer to evaluate outcomes. A dogmatic adherence to historical results, however, can reliably lead down the path of overfitting to a process that would have worked well in the past. Further, such decisions tend to assign too much weight to recent observations as allocators seek to minimize regret in the event that history repeats in the near future.

Conversely, simple outcome-based analyses, especially over shorter horizons, run the risk of abandoning the principles of uncertainty that necessitated diversification in the first place. Evaluations of investment outcomes should mirror the decision-making process that resulted in diversification – and be informed by uncertainty, potential paths, and probabilities. Looking in the rear view in this way can lead to highly deterministic conclusions – in other words, what happened in markets is a function of what needed to happen, and that the ex-post outperformers were also right ex-ante, and the underperformers were likewise ex-ante wrong.

In fully defined problem sets, such logic breaks apart quite easily. For instance, betting "00" in roulette is 1 in 38 odds. Since we know that outcomes are randomly distributed ex-ante, and we can also readily observe all possible paths, we can easily attribute an outcome to luck versus skill. Thus, if "00" indeed hits, the rational bettor should feel lucky, and not skillful. Conversely, betting that from a sample of one hundred distinct coin flips that it would yield 40% or greater "heads" outcomes is a good bet statistically, and so if ex-post only 38%

“heads” manifested, you would assign that outcome to pretty poor luck and should make the same bet again if presented the option at the right price.

Markets, however, are unbounded and complex systems in which all of the possible paths cannot be observed in advance, and almost no risk factor or bet is truly independent. In markets, an imperceptible change in certain conditions, or any number of unpredictable catalysts can kick off a cycle of reflexivity that works against well-established factors or bets - even those that have consistently worked over a much longer time frame. Which is why sources of capital-efficient, frequently rebalanced, and highly asymmetrical convexity can help a market-invested portfolio in curtailing the inevitable loss of compounded portfolio value in such events. This can elevate total portfolio returns even if the standalone average return for such diversifying strategies is low or even negative, as we covered [here](#), [here](#), and [here](#).

However, when allocating to diversifying strategies, especially those that are designed to defend against unexpected events, it can be far more useful to ask what could happen instead of what has happened historically. By definition, you’re supposed to hedge something that you think won’t happen, but that you fear might. If you believe equities will crash imminently, you should sell (and not just hedge) them – many investors (for a host of reasons) can’t do this. If you are exposed to equity risk and fear markets might crash, then you should source efficient and reliable diversifiers while concurrently maintaining (or ideally leaning more heavily into) your equity exposure. This is how One River’s clients typically approach risk mitigation.

## Ex-Ante Evaluations of Long Volatility and Trend

This mindset is particularly poignant in both long volatility and trend investing today, in which recent market dynamics have led to highly differentiated returns across managers with very similar objectives and investment styles. Even if the longer-term evidence very much supports using a combination of differentiated design choices that outperform at different times, recency bias and this misattribution of skill can lead to abandoning good strategies at the worst time and doubling down on strategies that happen to have been better rewarded.

In **Parts II and III** of this paper series, we will explore distinct, data-driven case studies for both long volatility and trend following in an effort to lift the veil of uncertainty when it comes to evaluating the quality of design choices ex-post. Within, we will explore techniques to avoid the trap of overfitting to recent results, and to source resilient diversification without over-relying on past outcomes or simulations.

The conclusion for allocators will suggest using a combination of historical results and intuition surrounding when certain approaches should pay off and when they might come under pressure versus other approaches. The objective for any allocator isn’t necessarily to find the best single strategy, but to construct a collection of sensibly designed approaches that delivers the intended benefits of these strategy exposures over the long-term – while avoiding overfitting to just the best historical performers.

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