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PROFESSIONAL
FINANCIAL
Consultative Wealth Management

*"There are two ways to be fooled. One is to believe what isn't true;
the other is to refuse to believe what is true."*

–Soren Kierkegard

This is part of a series exploring integrity for informed investment management decisions.

Key takeaways:

- Most managers selling a story of skill showing winning investment returns were only lucky.

- Winning past performance of surviving managers has less than a 25% chance of continuing.

- To show skill with statistical confidence, winning managers need at least 30 years of returns.

- Managers who show skill eventually capture all benefit of winning returns for themselves.

- Investors should simplify allocations with dimensional indexes and focus on their outcomes.

Whenever a client discontinues our advisory services, it's disappointing. It may be due to a major move or someone's death. *But people are always surprised to learn we are yet to lose a client due to missing return parameters defined in an investment policy.*

Yet once a year a client leaves based on what they think is a poor return experience **for the prior year**—regardless how well and how long their previous out-performance. For those people we've met who have lost even large sums of money before they became clients, or who missed positive returns for a decade, this behavior never ceases to astonish. In fact, those who decide to leave our firm based on short-term performance invariably had poor results before working with us. Yet they are confident enough once again to seek out a "smarter" advisor. Most later regretted making that change.

We first met Kane, a highly successful senior executive, back in mid-2003. He had moved to Rochester to take his new job after selling his manufacturing business.

That sale instantly made him a multi-millionaire. Kane's problem was that his original investment, divided among six separate manager relationships selected by his advisor's national brokerage firm, had declined by half.[1]

Not surprisingly, Kane was disappointed. An engineer by training, our structured investment process based on the science of capital markets appealed to him—not to mention clients' positive portfolio results through the dotcom tech bust. In 2004 he entrusted us with a total of $2 million in savings and new money added over a four year period.[2]

Kane decided to "retire" at the end of 2007. From then until he moved on in mid-2012, Kane's net withdrawals

1 His experience reminded me of an old investing joke: what's the fastest way to become a millionaire? Start with two.

2 Client names and identifiers are changed for confidentiality. This information does not constitute a client endorsement.

totaled more than $2 million, although large sums were added and subtracted over those four years. High withdrawals were not only for living expenses: soon after retiring Kane was funding a private venture that faced bankruptcy. He could lose all he had initially speculated. Taking full control, Kane added another million dollars or so from his portfolio and sought out new investors for additional funding to manage his risk exposure. Due to excellent executive and professional skills, Kane's venture became enormously successful—so much so that he could move to a glamorous mansion in Florida with his glamorous new wife and he could associate with glamorous new rich friends. Not surprising each had their own glamorous financial advisor. Upon leaving our firm fairly abruptly, he transferred out the equivalent of $3 million *even after his earlier $2 million of withdrawals*. Despite (or perhaps because of) the Global Financial Crisis that started immediately upon his retirement, Kane experienced a 78% gain from inception, exceeding his policy's risk-adjusted benchmark during his eight year tenure by nearly 75%.[3]

But Kane's expectations were high: In 2011 he saw a modestly negative return for the first time, a couple percent worse than a standardized benchmark used generally to evaluate asset allocations. We consider such one-year variations random "tracking error."[4] To preserve his portfolio because of the Crisis and in case his venture failed with a big loss—something Kane worried about on numerous occasions—it became difficult to achieve strong positive results when working around numerous and irregular withdrawals. Withdrawn funds could not grow and increase inside Kane's portfolio, although his strong performance made it possible to keep withdrawing funding for his private venture until it finally took off. As our relationship ended Kane sold most of his business, making tens of millions of dollars from the deal.

A New World Where Everyone is Above Average

The rich friends Kane met during his efforts in raising venture capital opened a new world of investing possibilities for him. At regular management meetings, he began talking about the economic opinions and investment schemes of his new "smart" social group—at least their wealth made them seem smart. Kane obviously wanted to participate in this exclusive club. By associating their wealth from business success to investing skill, Kane assumed their investing opinions were equally smart about money matters. But does research show business expertise reliably translates into investing expertise? Moreover, was the business success of his rich friends entirely due to their "skill"—or possibly due to a beneficial series of events that some may consider "lucky"? By excluding the experience and opinions of *non-rich* people who were excluded from his social group (some of whom must be "smart" albeit "unlucky") Kane's overconfidence from business success unknowingly created a "survivorship bias" in his opinion sampling.

As Kane explored a brave new world of investing, where all his rich friends bragged about successful investments (to show off how "smart" they were), he made a friend who got rich day-trading stocks. His friend's brokerage account had grown from about $1 million to $10 million over a couple of years. Kane seemed very interested in such opportunities. He began expressing doubts about our slower process since returns seemed less impressive than what his "smart" friends talked about. However a few months later Kane admitted, a little sheepishly, that his trading buddy had done something not so smart: he lost *all $10 million* when a leveraged trade went wrong. The ex-rich trader was forced to rejoin the working classes.[5] Nonetheless, Kane still believed that riches from business success and "smart" investing must be related.

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3 These returns may not represent the experience of a typical client. The reader is left to infer returns of a *satisfied* client.

4 We argue our primary objective is to generate the highest relative returns over a long-term horizon given a secondary objective of tracking returns to benchmark indexes. Not everyone agrees, especially index managers with "zero" errors.

5 I wonder how he explained it to his wife. For a clever discussion, see Terrance Odean, "When All Traders Are Above Average," *Journal of Finance* (1998). Odean finds most traders suffer from overconfidence. On average they earn less than investing in an index fund—but they tell themselves a story, fooling themselves that *they* are special and above average.

We all love a good story. Investors frequently fall victim to attractive narratives, especially those appealing to their self-esteem. Envy may play a role when someone wants acceptance as part of "the club." Many people dream about getting rich quick. They are tempted to gamble on the next Microsoft or Google, or the next Peter Lynch or Bill Miller for a killing to retire early—without the effort of saving. A certain type of rich person brags about his successes to look "smart"—but is silent about his failures (or blames his broker). No one in Rochester talks about Kodak shares they never sold, or any Global Crossing or Enron holdings. Because most investment narratives are incomplete, the stories are faulty. What investors need for making truly informed decisions to achieve important goals is an alternative narrative: one founded on the science of statistics that will avoid costly mistakes from misinformed false stories.

About 40 years ago, Amos Tversky and Daniel Kahneman identified a common decision-making bias they called the "belief in the law of small numbers."[6] Their idea was that people over-simplify and tend to interpret a relatively small sample of outcomes in a population of events as representative of a broader population of possible outcomes. The magnitude of this mistake grows larger as the luck-to-skill ratio of different activities rises. For instance, if you see a dozen sprinters compete five times and the same individual wins every time, you could reasonably conclude that she is the most skilled runner. On the other hand, if you watch a big-league baseball player for ten at-bats, you would have very little basis to judge his skill. One estimate suggests that for 100 at-bats, luck determines about 80 percent of the batting average.[7]

An illusion of control is also at play. This illusion is that when we perceive ourselves to be in control of a situation, we deem our probabilities of success to be higher than what chance dictates. That is, *when we put ourselves in control, we think our ratio of skill to luck is*

higher than it really is. Remarkably, this illusion even holds for activities that are all chance. For example, some people throw dice hard when they want a high number, and gently when they seek a small one. Like the belief in small numbers, this illusion is not a problem in high skill, low luck activities but becomes more problematic as the contribution of luck grows. Here again, our minds are poor at differentiating between activities, so what works in one setting fails miserably in another. The training that makes for a successful surgeon, rarely means that training will make a successful trader—but all too often without an investing internship, that experience turns into an expensive lesson.

Skill, Luck and Prediction

Shortly after winning the Nobel Prize in Economics in 2002, Daniel Kahneman was asked which of his 130-plus papers was his favorite.[8] He chose "On the Psychology of Prediction," co-written with Amos Tversky (*Psychological Review*, 1973). The paper argues that intuitive judgments are often unreliable because people base predictions on how well an event seems to fit a story. People commonly fail to consider either how reliable the story is or what happened before the event in similar situations.

More formally, Kahneman and Tversky argue that three types of information are relevant to statistical prediction. First is prior information, or the **base rate**. For example if 80 percent of the taxicabs in New York City are yellow, then 80 percent is the base rate. Absent any other information, you can assume that whenever you see a taxicab in NYC there's an 80 percent chance that it will be yellow. The second type of information is **specific evidence** about an individual case. The third type of information is **expected accuracy** of the prediction, or how precise you expect it to be given the information that you have.

A conversation I had with a cardiologist illustrates these types of information. He discussed a treatment

6 Amos Tversky and Daniel Kahneman, "Belief in the law of small numbers," *Psychological Bulletin*, Vol. 76, No. 2., 1971, 105-110; also Nassim Nicholas Taleb, *Fooled By Randomness: The Hidden Role of Chance in Life and in the Markets*, 2nd Edition (New York: Thomson Texere, 2004), 64-68.

7 Jim Albert, "Comments on 'Underestimating the Fog'," *By The Numbers*, Vol. 15, No. 1, February 2005, 3-5.

8 Shlomo Maital, "Daniel Kahneman, Nobel Laureate 2002: A Brief Comment," *SABE Newsletter* 10, no. 2 (Autumn 2002): 2.
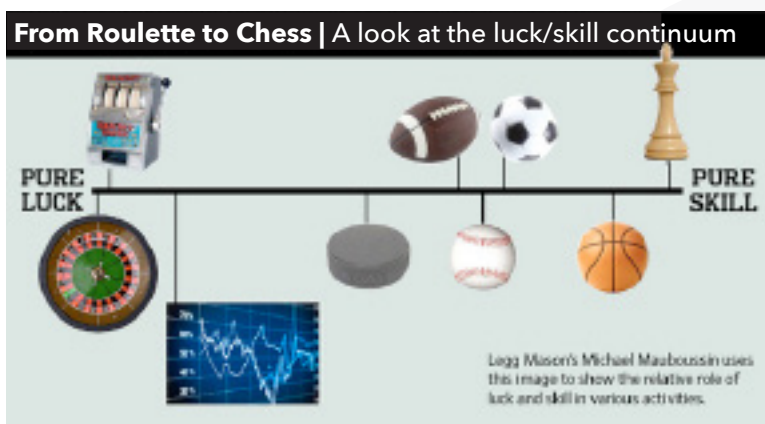
for a specific ailment—say, an ablation for a heart arrhythmia—that succeeded about 50 percent of the time (the base rate). He suggested that he could induce almost any patient to undergo the treatment if he simply told them, "The last patient who had this procedure is doing great!" (specific evidence about an individual case). For patients with a life-threatening condition who were evaluating alternative treatments (such as certain medications), the picture of a story of a recent success would swamp abstract statistics.[9]

The key to statistical prediction (and to better resist misleading sales pitches or rich friends) is to figure out how much weight you should assign to the base rate and specific cases. If the expected accuracy of the prediction is low, you should place most of the weight on the base rate. If the expected accuracy is high, you can rely more on the specific case. In this example, the doctor gives a patient no reason to believe that a procedure has better than a 50/50 chance of success. So the patient logically should place almost no weight on the specific evidence of patient's success, and should rely on the base rate in making a decision.

Here's how weighting of the base rate and the specific case relate to skill and luck. When skill plays the primary role in determining what happens, you can rely on specific evidence. In cases where luck is more important, the base rate should guide your prediction. Just because

someone won a million dollars today (or made a killing on the market recently), doesn't change the odds of you winning the lotto tomorrow. Yet after a big payout announcement, how many people suddenly buy tickets for a "Dollar and a Dream"?

When we make predictions about outcomes—whether the time to fly to the next city or how a stock or mutual fund may perform next year, for example—we often fail to recognize the existence of luck. We do not adequately allow for randomness. Just because someone's friend drove from Buffalo to New York City in five hours at record speed a couple times last January, doesn't make it a smart idea even in July. As a consequence we dwell too much on specific evidence, especially more recent evidence. (It doesn't help that your brother-in-law's gloating about his killing in Google motivates feelings of envy and greed.) This also makes it tougher to judge performance. (Why doesn't he ever talk about his *other* stock picks?) Once something has happened, our natural inclination is to invent a narrative to explain the effect. For example, evening television commentators associate a day's market declines to economic or political announcements when in fact an automated computer trading malfunction could have been the real cause. The problem is that we commonly twist, distort or ignore the role that luck or random chance plays in our successes and failures. We have great difficulty comprehending the true impact of the effect of luck on our daily lives.

From Roulette to Chess | A look at the luck/skill continuum

Source: Michael Mauboussin, *The Success Equation: Untangling Skill and Luck* (Harvard Business Review Press, 2012). The electronic chart is stock trading; a surgeon is like chess.

9 Especially since most people are not used to thinking in numbers. A professor once remarked that 90% of adults could not multiply simple fractions, even with a calculator. Few high school graduates today can add or subtract in their heads.

Thinking, Fast and Slow

A surprising challenge for any investor is our natural love for stories. We innately yearn to believe about relationships of cause and effect. Therefore, by thinking too fast about a matter, we make connections *even where none exist*. Since statistical reasoning is unnatural, we naturally view past events as somehow inevitable or fated. Human minds handle complicated thinking with difficulty. A person's understanding of the world consists of a limited and not necessarily representative set of observations based on a unique set of individual experiences. Furthermore, few people's minds are learned enough in history, politics or economics to account for the role chance plays in human events. They assume that a future event echoes a past event. Thinking explicitly, and accounting for cognitive biases helps make more informed decisions.

The book *Thinking, Fast and Slow* summarizes a lifetime of Kahneman's research.[10] Kahneman describes two different ways that the brain forms thoughts to make sense of things and events occuring in everyday life:

- **SYSTEM 1 (Fast Thinking):**
  - Fast, automatic, effortless, associative, emotional, stereotypic, subconscious
  - Example: Drive a car on an empty road, understand simple sentences

- **SYSTEM 2 (Slow Thinking):**
  - Slow, requires attention, effortful, rule-governed, neutral, calculating, conscious
  - Park in a narrow space, full out an income tax form

System 1 dominates our thinking. "Fast thinking" seeks coherence. It associates new information from observing events with existing thoughts to "see" patterns based on certain mental "heuristics." It reflexively looks for confirming evidence, and ignores evidence that does not fit the narrative.[11] The easier it is to recall the consequences of something, say due to recency of occurrence, the greater we perceive these consequences to be. While such heuristics may have been highly beneficial for survival in a pre-modern era, events that quickly come to mind may not be accurate reflections of certain probabilities in which stocks may perform. While projecting the trajectory of a hunter's arrow may be a valuable survival skill, projecting further stock market decline and cashing out because of today's drop ignores a random walk.

People are loss-averse: they are more likely to act to avert a loss than to achieve a gain. Investors that have brokerage account losses for a month, quarter or a year (a long time for "Fast Thinking"), makes them susceptible to seeking new advice or advisors—like infamous Bernie Madoff—who always know something that out-performed in the past year. Kahneman has shown that the value people place on a change in probability (e.g. of winning something) depends on the reference point: people appear to place greater value on a change from 90% to 100% (going from high probability to certainty) than from, say, 45% to 55%, and place the greatest value of all on a change from 0% to 10% (going to a chance of winning from no chance). Fooling the reflexive "Fast Thinker," all three arrangements have precisely the same change in utility—yet behavior could be motivated toward a particular direction based on which story is presented.

Coherence versus Statistics

"The measure of success for System 1 [Fast Thinking] is the coherence of the story it manages to create. The amount and quality of the data on which the story is based are largely irrelevant," writes Kahneman. "The combination of a coherence-seeking System 1 with a lazy System 2 will endorse many intuitive beliefs. The

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10 Daniel Kahneman, *Thinking, Fast and Slow* (Farrar, Straus and Giroux, 2011). All uncited Kahneman references are here.

11 Kahneman refers to a 2010 study by Graham and Harvey, which found corporate financial executives (CFOs) to be hugely overconfident based on their forecasts of the S&P 500 over a ten year period. Testing their ability to predict, researchers asked for an outcome range that would be right 80% of the time. In fact, the correlation was negative. The CFOs barely got 1 in 3 correct—worse than chance. "The magnitude of the miscalibration is astounding . . . . Overconfidence impacted the way they ran their businesses." "The truly bad news was that the CFOs did not appear to know their forecasts were worthless, Kahneman observed. "Facts that challenge such basic assumptions—and thereby threaten livelihoods and self-esteem—are simply not absorbed. The mind does not digest them." Many financial advisors will ignore empirical evidence in this paper.

Bernie Madoff $65 Billion Ponzi scheme exposed back in 2008 during the Global Panic was possible only because so many participants wanted to believe a good story that, with serious System 2 thinking, was impossible. People like good stories, and don't like thinking hard. So investors talked to "smart" friends who corroborated his story based on returns shown on a company-prepared statement that could not be independently verified using an investment methodology that not even the brightest could replicate.

Back in the late 1990s and the early 2000s here in Rochester Michael Kazacos and his group at Morgan Stanley were involved in "unsuitable investment strategies" that cost hundreds of Kodak and Xerox retirees their life savings, their independence and their dignity after the growth boom busted.[12] How did Kazacos convince so many to trust him with their life savings? Again, by appealing to their intuitive narratives—repeating popular stories they wanted to believe to rationalize doing what they wanted to do: retire early like all their friends. Due to overconfidence from working for years at paternalistic companies with good wages that protected employees from common industrial concerns, these investors believed:

- "Hard work and talent lead to success."
- "Successful managers beat the market."
- "Hot securities (or growth asset classes) go up."
- "Anyone can win at investing."

Professional independent advisors like Professional Financial work with clients to teach them how to avoid falling victim to highly seductive, but false narratives. "People are prone to apply causal thinking inappropriately to situations that require statistical reasoning," says Kahneman" "System 2 can learn to think statistically, but few people receive the necessary training." "Slow Thinking" is essential for a successful long-term investing experience. Slow Thinking helps investors avoid salesmen clever at exploiting "Fast Thinking." Science guides how we invest. Wherever predictions are

being made to make decisions, statistics can test those predictions. It's important to consider statistical significance whenever drawing conclusions from noisy data. Noise in returns data is problematic. Investors overemphasize what might have been a period-specific outcome by simply projecting past performance rather than insist on a robust and repeatable result likely to persist going forward. Manager selection involves noisy performance data, so statistical significance is essential for sorting skill—if in fact, "skilled" managers can be found.

Dimensions and Structure in Planning

Whenever investors, advisors, or consultants search for "skillful" fund managers, their approach usually combines both qualitative and quantitative analysis. Quantitative analysis, of course, requires returns from historical performance data. Hard returns data is easier and cheaper information to study than softer qualitative information. Fortunately nowadays there are enormous academic resources with excellent information such as the Center for Research in Security Prices at the University of Chicago. With advanced computer technology and a close relationship a firm like Dimensional Fund Advisors, sophisticated empirical approaches to financial engineering for wealth management can be conducted.

We invest along investment dimensions identified by financial research. We consider a "dimension" to be a factor that is: statistically **explained** by differences in returns, **persistent** through time, **pervasive** across markets, and **consistent** with an equilibrium view of investing. These characteristics increase our confidence that returns observed in historical data may appear periodically again in the future. Academic research has clarified the investment process by identifying the essential dimensions of performance. Successful investing is accomplished by not only capturing dimensions that generate expected return by reducing risks and costs that needlessly compromise performance, primarily through diversification.[13]

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12 http://www.finra.org/Newsroom/NewsReleases/2009/P118270. The real fools were the over-confident retirees who did not understand the rules of the game working with commissioned brokers. Neither Morgan Stanley or Kazacos admitted any guilt and paid a $7 million fine despite the millions lost. I still remember meeting prospective clients who chose to work with the Kazacos group who simply projected high 1990s past performance at the highest possible level legally allowed by FINRA.

13 Diversification does not ensure a profit or protect against loss in declining markets.

The principal goal of most financial analysis is to identify "alpha" managers—that is, finding fund managers whose positive "abnormal" past performance implies special "skill." Skill may be associated with superior selections of "mis-priced" securities or market timing activities in excess of particular indexes, benchmarks or asset pricing models. Past performance, of course, is historical activity. New investors cannot get those historical past returns, outstanding as they may have been. Due to the difficult challenge, many analysts who study past performance don't attempt identify truly "skillful" managers; instead they claim to avoid "average" managers. But can conditions change so that excess returns do not persist *in the future* for even "above-average" managers? And what about those unknown managers who may have true "skill" but who just happened to be unlucky, perhaps starting their career in a market down cycle?
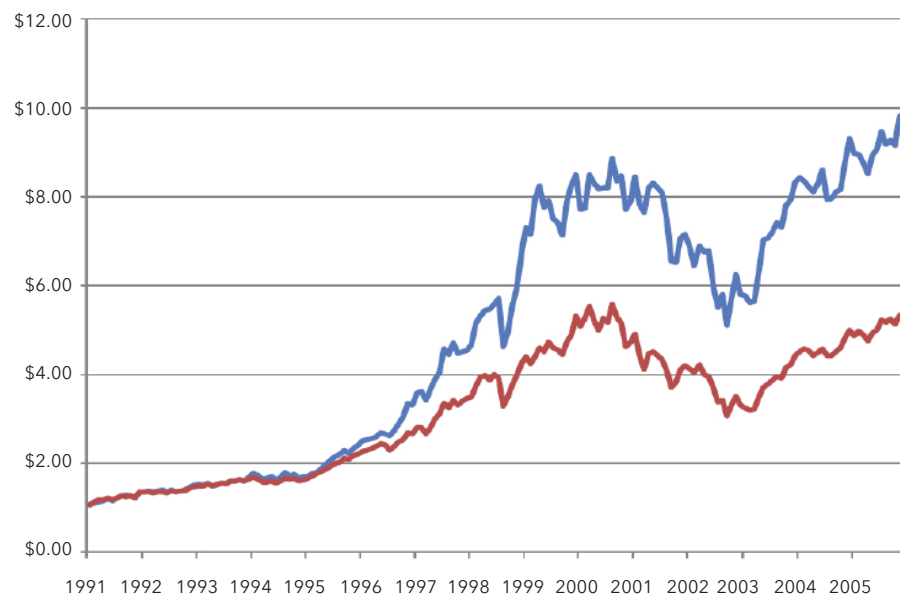
Substituting the Wrong Question

"When faced with a difficult question, we often answer an easier one instead, usually without noticing the substitution," Kahneman observes in his book. For those with a bias for making investing decisions based on past performance, the hard question is: Which money manager (mutual fund) will beat the market? A easier question that misses the entire point is: "Does XYZ look like a winner manager (mutual fund)?"

Bill Miller formerly of the Legg Mason Capital Management Value Trust was among the most closely watched money managers in the industry. His most frequently cited accomplishment was the fifteen year period from 1991 to 2005 during which the mutual fund he managed had outperformed the S&P 500 US large market index each calendar year—the only US equity manager ever to have done so.[14] The fund had doubled the S&P 500 index return during those fifteen years. Morningstar named Miller "Portfolio Manager of the Decade" in 1999, Barron's included him in its All-Century Investment Team that same year, and a Fortune profile in 2006 described him as "one of the greatest investors of our time."[15] A former US Army intelligence officer with a philosophy PhD, Miller's formidable intellect covered a wide range of interests.

Exhibit 1: LEGG MASON CAPITAL MANAGEMENT VALUE TRUST PERFORMANCE

1991-2005 Cumulative Annual Growth of Shares vs. S&P 500 US Market Index

Past performance is not guaranteed, and you may lose money regardless how long you may invest.

14 According to Morningstar, since 1990 only 26 actively managed mutual funds had managed to beat the market index each year over any given 10-year period. The Legg Mason Value Trust 15 years annual series of S&P outperformance is unique.

15 Andy Sewer, "Will the Streak Be Unbroken?" *Fortune* (November 27, 2006).

His expressed desire to "think about thinking" suggested an unusual ability to assess information differently from other market participants, and an unusually strong will to act independently from the crowd of investment managers.[16]

Had you invested $10,000 at the beginning of 1991, you would have had $98,079 in 2005, versus $51,354 for the S&P unmanaged index (Morningstar data). Miller's bold and concentrated investment style—unique among "value" investors—would never be confused with a "closet index" approach. Big bets were rewarded with handsome gains. Unfortunately, more recent big bets revealed the dangers of concentrated strategies, such as heavy losses in Kodak or technology and growth approaches that failed during the financial crisis. For the five-year period ending in 2010, Miller's fund finished dead last among 1,187 US large cap funds tracked by Morningstar. Early in 2012 Miller stepped down after thirty years as fund manager as assets under advisement shrunk from a high of $20.8 billion to $2.8 billion by the end of 2011. *Exhibit 2* shows the final results: the fund slightly underperformed the S&P 500 index over its total history.

Exhibit 2 presents an important quantitative question: how do we disentangle the contributions of skill or lack of skill, and good luck or bad luck in Miller's total investment record? In the six years since his 15 year winning streak ended, Mr. Miller earned *minus* 7.2% annualized compared to the S&P 500 index return of 2.3%. Even though Mr. Miller himself slightly out-performed the S&P 500 index over his 29 year personal tenure, few investors themselves experienced positive asset-weighted returns from his efforts. A large majority of investor assets were not invested in the Legg Mason Value Fund during the earlier best years—they poured in afterward, and gushed out quickly when returns declined during a financial panic period.[17]

Miller is well aware of the challenge of distinguishing luck from skill. He conspicuously declined to boast

Exhibit 2: COMPARING LEGG MASON CAPITAL VALUE FUND TO US INDEX DIMENSIONS

	Period	Legg Mason Capital Value C *LMTVX*	S&P 500 Market Index	Dimensional US Core Equity 2 Simulation	Dimensional US Large Value Sim	Dimensional US Small Value Sim
LAST DECADE	2002-2011	-1.3	2.9	5.0	4.6	7.7
Total Return		**-12**	**33**	**63**	**56**	**110**
RECENT PERIOD	2006-2011	-7.2	2.3	2.3	0.8	1.2
Total Return		**-36**	**14**	**15**	**5**	**8**
EARLY PERIOD	1991-2005	16.5	11.5	13.9	14.5	19.2
Total Return		**881**	**414**	**607**	**658**	**1299**
TOTAL PERIOD	1982-2011	11.3	11.5	12.1	12.3	13.8
Total Return		**2232**	**2369**	**2788**	**2935**	**4422**
Standard Deviation	2002-2011	*21.4*	*15.9*	*18.6*	*19.7*	*23.1*
Standard Deviation	1991-2005	*18.0*	*14.0*	*14.8*	*15.7*	*16.9*

Source: Morningstar Principia as of December 2011. Annualized in US dollars. Past performance is not guaranteed, and you may lose money regardless how long you may invest. Future performance may be higher or lower than any performance shown. Total return is geometric return from share prices and dividends reinvested. Indexes and simulations are not available for direct investment, and do not include normal management fees or other expenses associated with management of actual portfolios. All simulated strategy performance information is based on performance of indexes with model/backtested asset strategies and are achieved with the benefit of hindsight.

16 Joe Light and Tom Lauricella, "A Star Exits After Value Falls," *Wall Street Journal* (Nov 18, 2011). Diana B. Henriques, "Legg Mason Luminary Shifts Role," *New York Times* (November 18, 2011)

17 See the discussion about disappointing investor returns under Ken Heebner discussed in Paul Byron Hill, "Confidence in Planning for the Decade Ahead," *Planning Perspectives* (2009 Annual Review). The CGM Focus fund earned 17.9% annualized during the lost decade, but asset-weighted returns were *minus* 10.8% annualized.

about his results during good times. In 2007 for *Money Magazine* Miller "explain[ed] it as a large degree of luck and maybe some modicum of skill—and by skill I mean just surviving in markets over long periods of time without blowing yourself up" which eventually happened.[18] When asked by a *New York Times* reporter in 1999 to sum up his legacy, Miller replied: "As William James would say, we can't really draw any final conclusions about anything."[19] He has acknowledged that beating the S&P 500 each year for 15 years was an accident of the calendar and that other twelve-month periods produced a less headline-worth result. Yet this highly compelling story failed to yield excess returns for the majority of investors.

A Popular Narrative with No Confidence

System 1 "Fast Thinking" narrative of most investors is "Anybody can win at investing." The media sells that story to attract readership in a highly competitive, but shrinking, print market. But a System 2 "Slow Thinking" scientific narrative implies a clear role for an economic relation between risk and return but little relation between past and future money manager performance. Confident but true narratives are only possible from statistical tests. A definitive 2010 statistical study of mutual funds study of 3156 U.S. mutual funds from 1984-2006 by Nobel laureate Eugene Fama and Kenneth French found **almost no** managers exhibiting "skill."[20] Worse, when regressed against the standard Fama/French 3-Factor Model, fewer managers exhibiting *any* level of skill were found than would be expected merely by chance. Their work implies identifying managers with meaningful "skill" *net of costs in advance* is practically impossible.

Notoriously "noisy" returns data of historic period-specific returns confuses how dimensions of size, value

Exhibit 3: RETURN PERIODS IN YEARS FOR STATISTICALLY CONFIDENT ALPHA-SKILL
Alpha (manager skill proxy) at a 95% statistical significance (t-stat > 2)

		Average Annualized Alpha			
		1%	2%	3%	4%
Standard	4%	64	16	7	4
Deviation of	6%	144	36	16	9
Alpha	8%	256	64	28	16

and profitability may impact expected returns of an equity portfolio. Quantitative analysis is the tool used in empirical research to test statistical significance against CAPM or Fama/French 3-Factor Model equations: Is Manager X's true "alpha" (alpha proxies for "skill") reliably better than the zero that a "no-skill" index fund manager would show in a regression? Can Bill Miller's performance be shown statistically skillful during his management tenure? Actually, a surprisingly long track record is required to determine statistical "confidence." *Exhibit 3* is a return matrix of the period in *years* necessary to demonstrate alpha-skill at just a 95% statistical confidence level relative to a range of possible standard deviations.

A 2% annual manager alpha-skill would attract financial media attention after several years, especially if 5% or so may be an expected equity premium (in excess of a T-bill risk-free rate).[21] As we see in *Exhibit 3,* to have a 95% statistical confidence with a typical US equity standard deviation of 6% [22] to determine whether a abnormal return *is not in fact zero* (implying no skill) requires **thirty-six year of return data.** A more thorough analysis would involve "out-of-sample" tests of an independent second period to eliminate data mining issues. For that test, return periods shown above *must be doubled* to eliminate that uncertainty.

18 Jason Zweig, "What's Luck Got to Do with It?" *Money Magazine@35|1972-2007* (August 2007).

19 Edward Wyatt, "To Beat the Market, Hire a Philosopher," *New York Times* (January 10, 1999).

20 Eugene F. Fama and Kenneth R. French, "Luck versus Skill in the Cross Section of Mutual Fund Returns," *Journal of Finance* 65, no. 5 (October 2010): 1947-1965. A readable summary of this difficult empirical paper referenced several times in this paper may be found in the Fama/French Forum under "Luck versus Skill in Mutual Fund Performance" (November 30, 2009) at http://www.dimensional.com/famafrench/2009/11/luck-versus-skill-in-mutual-fund-performance-1.html

21 That is, if a "risk-free" Treasury bill rate is 2%, then a 5% equity premium plus 2% is 7%, plus 2% for alpha-skill is 9%.

22 A representative standard deviation of alpha in the Morningstar universe of actively managed US equity mutual funds is approximately 6%. Source: Index Fund Advisors

Exhibit 3 suggests that quantitative analysis is not a practical method for reliably selecting managers among actively managed mutual funds. The table implies that by the time alpha-skill could be statistically shown, a manager would be retired. But the selection problem is more complicated. Fama/French in their study found that **only 2 percent of all funds** had statistically confident alphas. Worse, once adjustments for chance outcomes were compared to a simulated control universe of funds with zero alphas, and *after costs of active management were deducted from returns,* "funds look only about as good as would be expected in a world where true alpha is zero." Fama/French results in *Exhibit 4* show that a search for winners is futile.

Let's consider additional risks even when we believe statistical confidence exists. Let's assume a few super-healthy bionic fund managers can exist who could be identified with 95% confident abnormal alpha returns. What else still could go wrong? Technically, even 95% confidence *is not a 100 percent guarantee* of alpha-skill. One out of 40 managers identified with abnormal alphas will not possess true alpha-skill: positive normal distribution has a 2.5% probability range. A statistical regression of a 10,000 fund universe at 95% confidence theoretically could identify 250 managers as having statistically significant returns whose *true alpha is zero*. Moreover, statistical confidence at the 95% level does not a guarantee *how much future alpha-skill could be expected*. This is the investor's version of Russian roulette.

Overconfidence Causes False Narratives

Kahneman's most serious investor concern is "Overconfidence: . . . neither the quantity nor the quality of the evidence counts for much in subjective confidence. The confidence that individuals have in their beliefs depends mostly on the quality of the story they can tell about what they are, even if they see little." Bill Miller simply ignores decades of empirical evidence before Fama/French during that 2007 interview when he was asked: "Why shouldn't investors just put their money in index funds [replicating stock market capitalization weights] instead of trying to find the next Bill Miller?" The reply from someone as smart as Miller illustrates a highly believable but totally false narrative from Fast Thinking overconfidence:

> The odds of getting a manager who can outperform over 10, 15 or 20 years are about one in four. So there's a very significant case to be made for having most of your money in index funds. The fact is, however, that index funds do not give you the results of the index [after costs]. . . . To have a prayer of outperforming, you've got to have some money in active management.[23]

As empirical evidence show us, selecting managers based on their past performance is much like betting. But advisors who hire managers either ignore the evidence or refuse to admit the randomness of picking alpha-skill— whether due to ego, reputation or career risk. Even if a manager success selection goal seems modest—finding

Exhibit 4: PERCENTILES OF t(α) ESTIMATES FOR ACTUAL AND FAMA/FRENCH SIMULATED FUND GROSS RETURNS

US Equity Mutual Funds (non-index), January 1984 to September 2006 (N=3156)

Percentile	Fama/French Simulation	Mutual Fund Actual	Annualized Alpha	Percentage Actual
1	-2.50	-3.87	-16.44	0.08
5	-1.71	-2.84	-13.56	0.08
10	-1.32	-2.34	-12.24	0.05
50	-0.01	-0.62	-7.32	0.04
90	1.30	1.01	-3.48	8.17
95	1.68	1.54	-1.68	30.55
99	2.45	2.47	0.24	57.42
AVERAGE	-0.01	-0.63	-7.45	

Source: Adapted from Eugene F. Fama and Kenneth R. French, "Luck versus Skill in Mutual Fund Performance" (2009) Table 1

23 Jason Zweig, "What's Luck Got to Do with It?" *Money Magazine@35|1972-2007* (August 2007).

only "the top quartile" or 25 percent of skillful managers who will continue out-performing rather than identifying the "best" one, any quantitative process dependent on price data has too short a period to draw confident manager selections. And true confidence is precisely what any investor needs to be committed to their plan through periods of extreme market volatility, such as the Global Financial Crisis. Such times challenge the patience and endurance of even the most disciplined investors.

Theoretically, let's now assume we've identified an active fund manager with 99% confident alpha-skill who is not retired.[24] Persistence presents the final question: how reliably will past alpha-skill persist into future manager performance? Even if an alpha-skill manager is truly identified, many academic studies conclude that continuance of past alpha is highly questionable. The only indication of persistence found in academic literature is among extreme losers, probably due to their higher fees and high turnover.[25]

Empirical Evidence vs. Fast Thinking

"Fast Thinking" aptly describes Miller's winning manager narrative. Of course Miller has financial incentives to promote his fund to investors. Ironically, the interview we quote occurred early in a five-year period when Miller's fund would be *dead last* in its category—well below his "top 25 percent" range. Is a *25 percent success rate* for alpha-skilled manager with 20 year persistence for "smart" investors (as opposed to all those "dumb" investors not buying Miller's fund) even possible? Miller at least acknowledges a 75% probability that investors *fail* to beat a simple index fund return through manager selection. *Thus even Miller is allows albeit indirectly that the average investor selecting active managers must have a negative expected alpha return.*[26]

Financial advisor community creates many stories promoting active managers and their funds that make the number of alpha-skilled managers appear much more plentiful and easily identifiable than scientific studies show is possible. Who are those "dumb" financial advisors that recommend all those non-alpha-skilled managers, anyway? Even "'smart" financial advisors make mistakes sometimes. Will returns from "smart" picks of supposed alpha-skill managers ever be big enough, often enough to offset all the errors? Fama/French's *Exhibit 4* with a *negative* 7.45% average manager alpha-skill exposes that story as a fable.

The great difficulty in selecting alpha-skilled funds—plus the potential losses from switching from a alpha-skilled manager who temporarily underperforms to one not skilled in error—is suggested by the rate at which mutual funds disappear and the rate at which "winning funds"—defined as those that simply outperform the market index *at all* for an equivalent period—cease to persist outperforming in the future.

The rising number of mutual funds over the past several decades combined with annual growth in fund assets masks the fact that many funds disappear each and every year, usually as a result of poor investment performance as investors cash out. The large gray boxes in *Exhibit 5* represent the number of US-domiciled equity funds in operation during the past one, five, and 10 years. These funds comprise the beginning equity fund universe of each period. For example, an investor trying to select a US mutual fund six years ago at the start of 2008 had a choice from more than 3,000 equity funds (or from 800 bond funds).[27]

How many of these funds survived to the end of 2012? An accurate depiction of the fund selection challenge requires performance data from both surviving and non-surviving funds. Striped areas show the proportion of the beginning funds that survived. During the

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24 Perhaps they began investing professionally at age 12. Some otherwise smart people also believe that aliens from outer space originally "seeded" life on earth. Why do so many people believe what is impossible? is the question Kahneman asks.

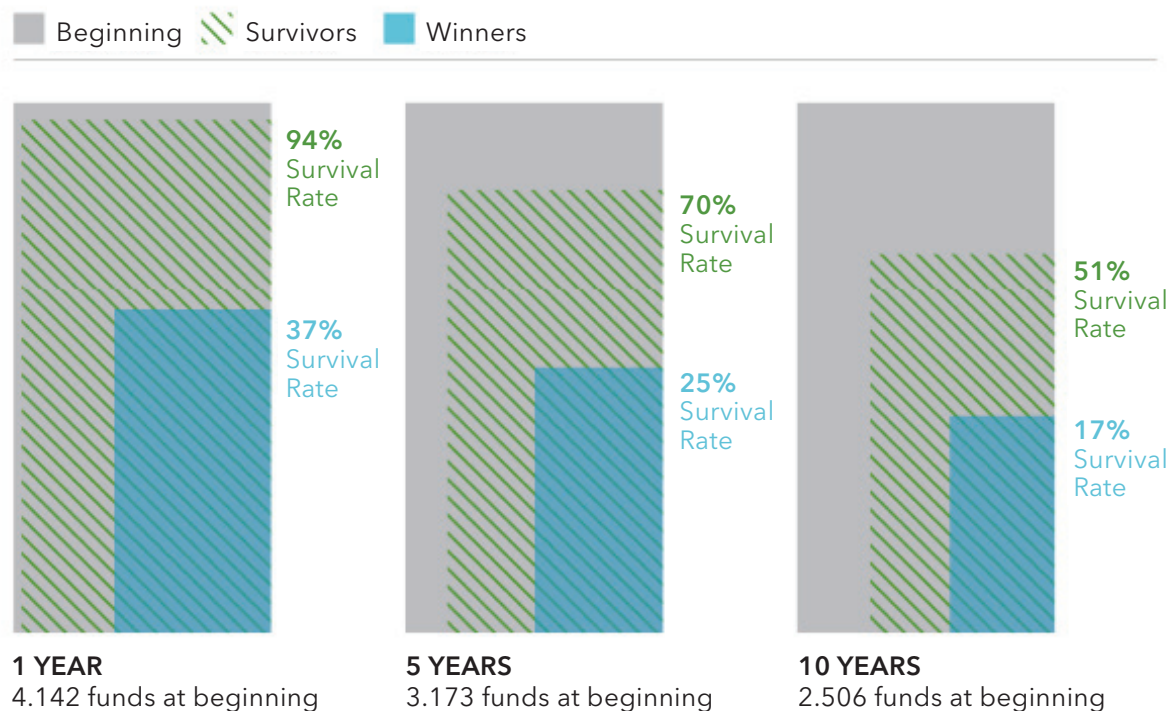25 In these cases, likely the investor is dead, which explains why they have not withdrawn the money.

26 Most investors are simply unaware of how poorly they are doing. Markus Glaser and Martin Weber, "Why Inexperienced Investors Do Not Learn: They Don't Know Their Past Portfolio Performance," (September 2008) ssrn.com=1002092

27 *The Mutual Fund Landscape 2013*, Dimensional Fund Advisors. CRSP Mutual Fund Database, University of Chicago.

Exhibit 5: US EQUITY MUTUAL FUND SURVIVORSHIP AND OUTPERFORMANCE
Performance Periods Ending December 31, 2012

Beginning   Survivors   Winners

1 YEAR
4.142 funds at beginning

5 YEARS
3.173 funds at beginning

10 YEARS
2.506 funds at beginning

Source: Dimensional Fund Advisors. Mutual fund data is from the CRSP Mutual Fund Database, provided by the Center for Research in Security Prices, University of Chicago. Certain types of equity and fixed income funds were excluded from the performance study. For equities, sector funds and fund with a narrow investment focus, such as real estate and gold, were excluded. Money market fund, municipal bond funds, and asset-backed security funds were excluded from fixed income. Past performance is no guarantee of future results. Indexes are not available for direct investing.

one-year period, 6% of equity funds and 4% of fixed income funds closed or merged. Over time, survival rates dropped sharply. The five- and 10-year survival rates were just 70% and 51%, respectively for equity funds. (Fixed income was only slightly better, with 75% making it five years and 57% surviving 10 years.) A 50 percent failure rate over ten years shows the falsity of Miller's 25 percent manager story—that twenty year survival rate is not even close. Certainly, investors would like to avoid funds that will fail. But reality is investors cannot predict which will survive.

But investors want more than find funds that merely survive. Most want "winning" funds that outperform their benchmark preferably by a substantial margin. What are the chances of picking a fund that performed *at least as well* as an index benchmark over five or 10 years? The blue and yellow shaded areas show the proportion of equity funds outperforming their respective benchmarks. "Winning" funds (as we have

defined that term down) are greatly in the minority. Over both short and long time horizons the deck is stacked against any investor seeking fund outperformance. In 2012, only 37% of equity and 40% of fixed income funds survived and outperformed their benchmark for the one-year period. The longer the horizon, the worse it gets. Only about one in four funds survived to provide benchmark-beating performance over just five years through 2012. Over 10 years, the figure dropped to one in six funds. Fama/French research in *Exhibit 4* implies a 20 year "success rate" for surviving funds that *simply beat their benchmark* of less than 3%.

Slow Thinking about Persistent Winners

The competitive landscape makes identifying future winners even a more formidable challenge. Confronted with so many fund choices—without a investment story based on a truly empirical approach—fund selection becomes a series of stories about past performance. The

story of managers and media uses past winning performance as the best predictor of future winners. How smart is that thinking?
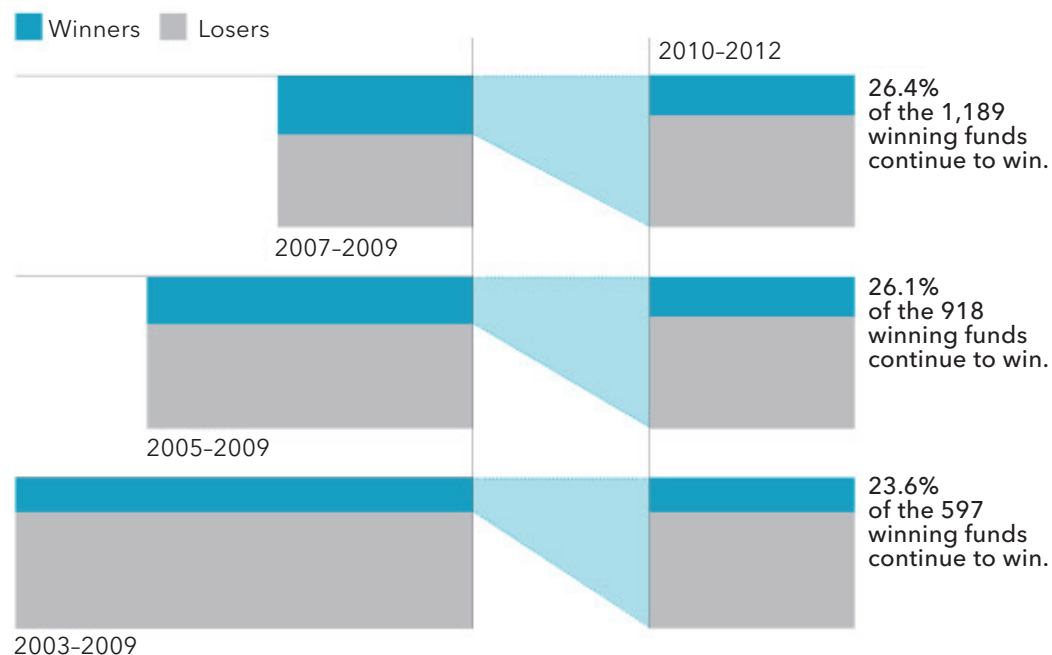
Exhibit 6 illustrates the lack of persistence in equity fund outperformance. Three-, five-, and seven-year mutual fund track records are evaluated as of December 2009. Funds that beat their respective benchmarks are reevaluated in the subsequent three-year period ending December 2012. *Only about a quarter of the equity funds with past outperformance during the initial three-year period (2007–2009) continued to beat their benchmarks in the subsequent three-year period (2010–2012).* Longer track records do little to help investors identify future outperforming funds. The results for funds with good five- and seven-year track records were similar—only about a quarter of those groupings beat their benchmarks in the subsequent period. The investor's big

problem is forecasting which funds will survive—**and keeping them even when not part of the top quartile every year, but still include them for the final winning period**. A manager with persistence could be unlucky for one or more years, and deselected too soon by an investor in error.[28]

Track records for fixed income funds provide no better insight into future outperformance, either. While no exhibit is shown, the number of bond funds with good track records is sparse. Only about 100 funds show benchmark-beating returns during the initial three-, five-, and seven-year performance periods. Only about half of these past winners continued to outperform in the subsequent three years. The results for both winning equity and fixed income funds each show that past outperformance has no guarantees of future outperformance. Most equity and bond funds, even those

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Exhibit 6: US EQUITY MUTUAL FUNDS–DO PAST WINNERS KEEP WINNING?

Past performance vs. subsequent performance in Periods 2003 to 2012

26.4% of the 1,189 winning funds continue to win.

26.1% of the 918 winning funds continue to win.

23.6% of the 597 winning funds continue to win.

Source: Dimensional Fund Advisors. Mutual fund data is from the CRSP Mutual Fund Database, provided by the Center for Research in Security Prices, University of Chicago. Certain types of equity and fixed income funds were excluded from the performance study. For equities, sector funds and fund with a narrow investment focus, such as real estate and gold, were excluded. Money market fund, municipal bond funds, and asset-backed security funds were excluded from fixed income. Past performance is no guarantee of future results. Indexes are not available for direct investing.

28 Daniel B. Bergstresser, John M. R. Chalmers and Peter Tufano, "Assessing the Costs and Benefits of Brokers in the Mutual Fund Industry" (January 2006). Available at SSRN: http://ssrn.com/abstract=616981 They found from 1996-2002 advisory-sold equity funds had only a 2.9% annualized asset-weighted return, far less than the S&P 500 index return of 6.9%. The CGM Focus fund as the leading fund of the "Lost Decade" earned 17.9% annualized from 2000-2009, but asset-weighted returns of investors moving in and out were *minus* 10.8% annualized.

with good returns in some years, must underperform longer-term benchmarks. And due to very short periods, statistical analysis offers no help.

Little persistence in fund performance is found in many studies.[29] This lack of persistence among seeming "winners" in actively managed funds—where no true alpha-skill exists—suggests that gaining a consistent informational advantage by any investor is difficult, if not impossible. Many smart professionals strive to gather morsels of information to help them identify pricing mistakes. But this competition only means that public information is reflected in market prices quickly, leaving few opportunities to actually exploit that knowledge for profit. While prices may not always be "right," markets are so competitive that any single investor or active manager is unlikely to routinely profit at the expense of all others indefinitely.

Some fund managers might have alpha-skill. But as Fama/French show, because they are so few and alphas so modest, they are almost impossible to identify in advance. Stock and bond returns contain a lot of noise, and most impressive periods of out-performance like Miller's, are mostly luck. Due to "equilibrium accounting" (the aggregate holdings of all active equity investors comprise "the Market" defining the total return of any market), while some active managers may outperform "the Market," their success only comes at the expense of other active managers and investors. *Consequently, active management must be a zero-sum game before expenses and a negative sum game after costs.* For investors primarily concerned with long-term outcomes for planning, the high risk of making mistakes from bad bets for small alphas is not a game worth playing.

Storytellers Don't Like Statistics

Storytelling about the fable of alpha-skill by media and others promotes investor competition for "smart" managers. *Perversely the benefit of any manager alpha-skill that does exist gets transferred back to surviving*

managers. That a scarce resource captures its rent is an economic fundamental. Managers are concerned maximizing *their* personal returns, not *investor* personal returns. In freely floating and liquid capital markets, the scarce resource is not investor money: *it is manager skill.* Because investors actively compete with other investors to invest with skilled managers, managers have incentives to create stories that attract the most money.

Let's pretend Alpha Manager outperforms the market (the universe of managers) by 4% each year with no standard deviation of alpha. Such performance would be true skill. However, once investors are convinced Alpha Manager is skillful, he will act in such a way to capture as much of the economic rent of that skill as he can. Who benefits from that knowledge—investors or Alpha Manager? Since true stock-picking skill is the scarce resource, economic rent theory suggests the lion's share of benefits will accrue to the provider of the scarce resource. Either advisory fees are increased to 4% annually equal to the outperformance (as in the case of certain hedge funds), or the asset base of investor money would be allowed to vastly increase, increasing total fees collected, but diluting investor returns by distributing the abnormal alpha return over a larger asset base, dissipating alpha for everyone.[30] This latter approach is common in mutual funds. *Either way investors eventually lose as their alpha return as it reduces to zero, and investors are left with a market-like return.*

Let's look again at returns from Miller's Legg Mason Value Trust with the benefit of hindsight. Over the May 1982–October 2011 period, annualized return was 11.28% for the S&P 500 Index and 11.76% for the Russell 1000 Value Index. Miller's fund slightly outperformed the S&P 500 and underperformed the Russell 1000 by over 0.40% per year. A Fama/French 3-Factor Model analysis over the same period shows the fund underperformed its benchmark by 0.08% per month (0.96% annualized). To cloud discussion even further, both of these results, positive and negative, flunk the test
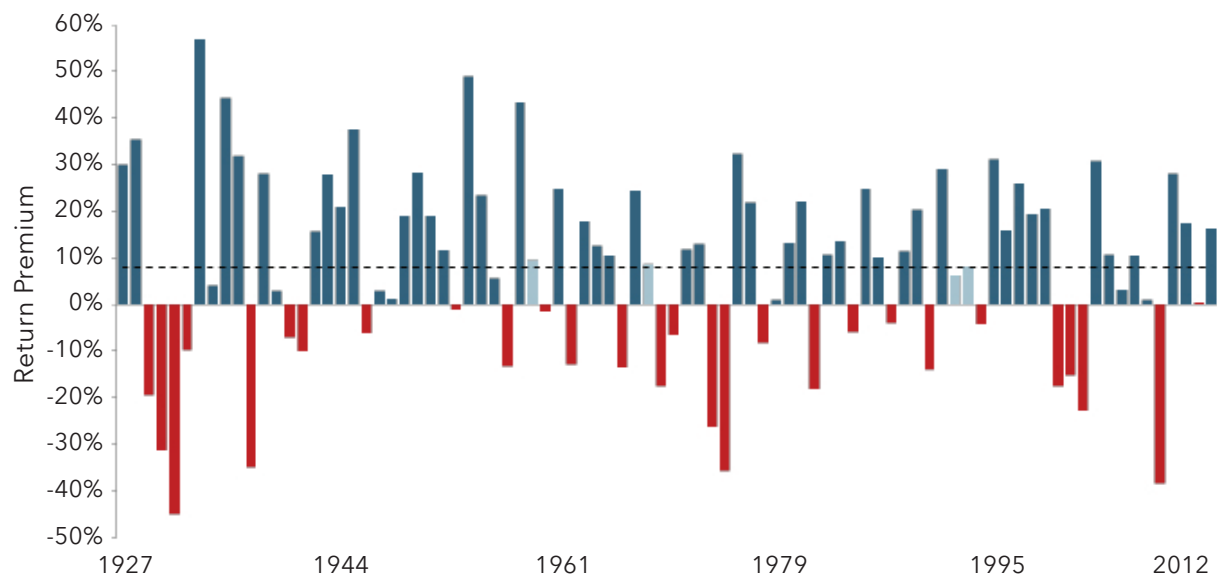
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29 See Garrett Quigley and Rex A. Sinquefield, "Performance of UK Equity Unit Trusts," *Journal of Asset Management* 1, 72-92. James L. Davis, "Mutual Fund Performance and Manager Style," *Financial Analysts Journal 57*, no. 1 (Jan/Feb 2001).

30 Jonathan Berk and Richard C. Green, "Mutual Fund Flows and Performance in Rational Markets," NBER Working Paper No. W9275, October 2002.

Exhibit 7: YEARLY OBSERVATIONS OF THE US MARKET PREMIUM

Market minus One-Month Treasury Bills 1927-2012

Data provided by Fama/French. Total US Market Research Factor (total market minus one-month Treasury bills). Past performance is not a guarantee of future results. Values change frequently and past performance may not be repeated. There is always the risk that an investor may lose money. Securities of small firms are often less liquid than those of large companies. As a result, small company stocks may fluctuate relatively more in price. Even a long-term investment approach cannot guarantee a profit. Economic, political, and issuer-specific events will cause the value of securities, and the funds that own them, to rise or fall. Because the value of investments will fluctuate, there is a risk that investors will lose money.

for statistical significance; in neither case can they be attributed *to anything more than chance* even with only twenty-nine years of data.

However, is that conclusive evidence that Miller is lacking skill? Not necessarily. The fund's expenses are above average at over 1.75% annualized. The aggregate cost of index funds is 0.16% annualized, according to Fama/French. 1.75% is a stiff headwind for even the best alpha-skill manager to overcome. Gross of fees, the fund's performance relative to its benchmark varies from −0.08% to 0.07% per month. It's obvious that over the lifetime of Miller's management, the above-average fees set by the Value Trust successfully extracted *any* excess alpha.[31] Ironically, owning low-cost index funds would have been smarter.

For Slow Thinking investors able to understand statistics, here is the paradox of efforts to out-smart the market in the search for purported alpha-skill managers in order to outperform all other investors: when the goal of most market participants is to select managers hoping to participate in the managers excess returns (alpha), and the more confident they are in knowledge of that manager's skill to generate excess returns (alpha), then *no participant other than the manager* himself is likely to benefit from that alpha! Gaining excess returns through a manager selection process is an illusion, a story for children of all ages.

A Fast Conclusion for Slow Thinkers

Statistical confidence to determine manager skill takes the equivalent of a manager lifetime. Even then an investor cannot be totally certain that past abnormal returns (alpha) were not simply due to chance. And if an investor could identify a skilled manager, he likely will not benefit from that skill unless he had invested with him *before that skill was identified* by others. Once credulous investors believe their stories of skill, Managers will either increase their fees, or increase their asset base, diluting alpha for all investors.

31 Bill Miller himself exemplifies how skilled managers extract their full rents: in late 2013 he announced a new mutual fund under his own name, splitting profits 50/50 with Legg Mason, after his 60% return in 2013 of his Legg Mason Opportunity Trust. Miles Weiss, "Bill Miller to Start Fund With Son Under His Family Name," Bloomberg.com (December 16, 2013)

Fast Thinking investors through consultative wealth management can slow down: a successful investment experience should not depend on good past performance stories. Most investors believe that the essence of investing is making forecasts about the markets, managers or the economy. Financial advisors and financial media fixated on "winners" promote a lottery mentality among investors who become distracted by short-term results, and not focused the long-term outcomes necessary for goal achievement. Since most investors reject "losing" managers, the "manager selection process" is an endless merry-go-round activity:

- Step 1: Hire managers who outperformed other managers in the recent past.

- Step 2: In one/two/three years, fire managers who underperformed other managers.

- Repeat Step 1, then, go to Step 2.

We recall Einstein's definition for insanity: doing the same thing over and over while expecting different results. Professional Financial invests differently. We design strategies and design portfolios based on the science of capital markets. Decades of research guide the way. For twenty years we have helped clients pursue dimensions of higher expected returns through portfolio design, management and trading though our select investment partnerships. An enduring philosophy and deep connections with the academic community underpin our approach to investing, and form the foundation for all client strategies. Our goal is to help every client make truly informed decisions for their wealth in planning life's major concerns.[32]

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32 Before Kane made his exit, he showed a high-dividend stock strategy story adopted by his smart friends. We recently compared a proxy to a multi-factor dimensional approach. That out-performed by 50% to 100% since the time Kane exited. By believing the wrong story from Fast Thinking, Kane endured investment risk but didn't stick around for the return.