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ASSET MANAGEMENT

# Who's Afraid of Efficient Markets?

## Rethinking the Case for Active Management

By

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### Part II of II: The Elusiveness of Skill

The efficient market hypothesis (EMH) is based on two fundamental insights: there are no free lunches, and the investment future is unpredictable. Unfortunately, the EMH offers the wrong explanation for unpredictability and draws the wrong conclusions. In Part I we saw that “investor rationality” is the wrong explanation for unpredictability. Fear and greed are essential drivers of investor behavior. We also saw that the idea of the random walk is misleading: randomness captures unpredictability, but wrongly suggests that the underlying process is wholly inexplicable. The distinction between explanation and prediction is fundamental to the investment business and throughout “the soft sciences.”

We turn now to the idea of investment skill. According to the EMH, investment skill is an illusion, therefore active management is an illusion, and therefore capitalization-weighted index funds are the only rational investment. But none of this follows from the unpredictability of manager performance.

#### I. Skill is Indistinguishable from Luck: False

The EMH insists that there is no such thing as investment skill, or no reliable way of distinguishing skill from luck. This is presented as a direct consequence of the fact that historical performance does not predict future performance. A manager who has done well for 10 years in a row is in the same theoretical boat as a coin-flipper who has flipped heads 10 times in a row.

The EMH argument does not destroy the idea of skill, but it does destroy the simplistic view that skill is rigidly linked to performance. That view boils down to this: past success is an indicator of skill, skill is a predictor of future success, therefore, past success is a predictor of future success. On this view, skill is the missing link that connects past success with future success. But, as the EMH rightly reminds us, past success does not predict future success, so there is no such missing link.

The EMH argument shows us what we should have known already: past success does not always indicate skill, and skill does not always predict future success. Before we get into the details of the loose linkage between skill and success, let us quickly note three other peculiarities of skill.

- ▶ **Skill is Multi-Dimensional.** Skill is not a monolithic quality, invariant from case to case. For example, skill involves a combination of “book smarts” and “street smarts,” but the proportions vary considerably from manager to manager. Moreover, there is wide variation in how skilled managers respond to losses: some are very risk averse, quick to exit losing positions, while others are more loss-tolerant, and may even double down on losing positions. The variations of skill are endless. Buffett’s skill is utterly different from George Soros’, just as Picasso’s mastery is utterly different from Rembrandt’s.

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- ▶ **It Takes One to Know One.** There are no recipes for identifying skilled managers, just as there are no recipes for identifying stocks that are worth buying. The ability to identify skill is itself a form of investment skill. You don't have to be a superb stock picker to identify superb stock-pickers, but you do need a well-developed sense of what stock picking is all about. Within the category of skilled investors, it takes one to know one.
- ▶ **Skill is Rare.** How many skilled managers are there? This is a meaningless question. It presupposes that there are generally agreed-upon criteria for determining whether a manager is skilled. But there are none, so the idea of a "census" of skilled managers is a non-starter. Still, our strong conviction is that the number of genuinely skilled managers is quite small. In the hedge fund universe, for example, which contains more than 10,000 managers, the number of genuinely skilled managers is definitely less than 5% of the population. In saying this, we are explicitly distinguishing between skill and performance. It is a truism that only 5% of the managers are in the top 5% of the performance charts. But there are skilled managers who are not in the top 5%, and there are managers in the top 5% who are not as skilled as they think they are.

Although there is no ironclad link between skill and performance, skill does deliver a performance edge. A skilled manager has a complex package of virtues that make success more likely than failure. Nonetheless, a skilled manager may fail, and an unskilled manager may succeed. A skilled manager is thus like a Heads-biased coin, i.e., a coin whose physical structure makes Heads more likely than Tails. (Maybe the coin has a sandwich construction, half lead and half Styrofoam, so it tends to land on the heavier side.) A Heads-biased coin has an edge in producing runs of Heads, but an edge is not an ironclad link. Even a fair coin may produce a long run of Heads (these are the "false positives"), and a Heads-biased coin may produce a long run of Tails (the "false negatives"). This is because the outcome of a particular coin toss depends on many factors other than the physical structure of the coin: how it is tossed, the presence/absence of strong air currents, the presence/absence of magnetic fields, and so forth. (For a fascinating discussion of the physics of coin tossing, see E. T. Jaynes, *Probability Theory*, especially Chapter 10, "Physics of 'random experiments.'")

Let's look more closely at the arithmetic of coin tossing. If we toss a fair coin 10 times, the probability of getting a run of 10 Heads is  $0.5^{10}$ , roughly 0.1%. Let's assume that a Heads-biased coin has a 65% probability of coming up Heads, so the probability of getting Heads 10 times in a row is  $0.65^{10}$ , which is roughly 1.35%. A run of 10 Heads is thus much more likely with a Heads-based coin than with a fair coin, but it's still very rare.

**Flipping a coin maybe a very poor way of determining whether a coin is Heads-biased. Similarly, looking exclusively at the performance record of a money manager is a poor way to determine whether the manager is skilled: you have to get behind the record.**

How should we determine whether a coin is Heads-biased? The best approach is the direct approach: examine the coin to see if there are signs of suspicious sandwich constructions, stand it on edge to see if it tends to fall toward one side, drop it in a vertical orientation to see if it tends to land on one side, and so forth. The other approach is the indirect approach: flip the coin. This approach leaves room for many false positives and false negatives. The usefulness of the indirect approach depends critically on how many Heads-biased coins there are.

Let’s assume a universe of 100,000 coins, of which 10% are Heads-biased. Within that group of 10,000 Heads-biased coins, 135 will come up Heads 10 times in a row. Within the universe of 90,000 fair coins, 88 will come up Heads 10 times in a row. So we have 223 coins that show Heads 10 times, of which 135 are Heads-biased. This means that even if a coin comes up Heads 10 times in a row, there is only a 61% probability that the coin is Heads-biased. As seen in the table below, that figure gets smaller if we assume that Heads-biased coins are less prevalent, or if we assume that the Heads “edge” is less powerful. Depending on the background circumstances, flipping a coin may be a very poor way of determining whether a coin is Heads-biased. Similarly, looking exclusively at the performance record of a money manager is a poor way to determine whether the manager is skilled: you have to get behind the record.

**Probability that a Run of 10 Heads is from a Heads-Biased Coin (%)**

		Frequency of Heads-Biased Coins				
		25%	20%	15%	10%	5%
Probability that a Heads-Biased Coin Shows Heads	55%	46	39	31	22	12
	60%	67	61	52	41	25
	65%	82	78	71	61	42
	70%	91	88	84	76	60
	75%	95	94	91	86	75

Source: EACM Advisors

**For a large universe of funds,  
the persistence of above median  
performance is close to what is  
predicted for random survival rates.**

When we move from coins to money managers, the analogue of “Heads on a single toss” is “above median performance during a single time period,” since a randomly selected manager has a 50% probability of delivering above-median performance. (This is true no matter how long the time period is and no matter whether “performance” is raw performance or the many forms of risk-adjusted performance.) The table below shows the relevant statistics for 5,304 U.S. equity mutual funds (including all styles) that have performance data going back to January 1997 in the Morningstar universe. (Note that Morningstar counts separate share classes as separate funds.) Four funds were above median in all 10 years, which is close to what would be predicted given random survival rates (i.e., 50% of the above-median funds in one year survive as an above-median fund into the following year.) But the annual survival rates fluctuate within a broad range. Note especially the transition from 1999 to 2000, when most of the bull market leaders lagged in the more bearish environment of 2000. The transition from 2002 to 2003 was very different: 43% of the bear market leaders remained above median in the more bullish environment of 2003.

### Persistence of Above-Median Performance

Year	No. Above Median	Annual Survival (%)	Cumulative Survival (%)	Random Cumulative Survival (%)	Median Return (%)
1997	2,652	N/A	50.0	50.0	24.7
1998	1,571	59.2	29.6	25.0	14.8
1999	1,002	63.8	18.9	12.5	17.6
2000	154	15.4	2.9	6.3	1.8
2001	57	37.0	1.1	3.1	-7.9
2002	30	52.6	0.6	1.6	-19.9
2003	13	43.3	0.2	0.8	29.9
2004	11	84.6	0.2	0.4	11.6
2005	4	36.4	0.1	0.2	6.4
2006	4	100.0	0.1	0.1	12.7

Source: Morningstar, Inc.

**Skill takes many forms, and the failure of skill to deliver results takes equally many forms.**

To pursue the analogy between skilled managers and Heads-biased coins we need to face two questions: (1) How many skilled managers are there? and (2) What is the probability that a skilled manager will deliver above-median performance in a single time period? These are slippery questions, since there are no agreed-upon criteria for identifying skill. Different practitioners will have different prejudices. Our working assumption is that skill is very rare and the skill “edge” is less powerful than you would like. An “order of magnitude” guess is that 5% of the population has some sort of genuine skill, which gives those managers a 60% to 70% probability of delivering above-median performance. The latter probability is definitely not 90%: the link between skill and results is much looser than that. Notice, incidentally, that the two figures are connected: as you make the skill edge more powerful, the number of skilled managers shrinks.

Skill and results are loosely linked because there are so many other factors that get in the way. The historical results tell you what the manager *did*. To address the skill question you have to ask *why* the manager did what he or she did and ask what the manager *would have done* under different circumstances. Unskilled-but-lucky managers have no good reasons for doing what they did, and probably would have done the same thing even if market circumstances had been less favorable. Skilled managers have solid reasons for doing what they do, and they have the mental flexibility to adjust their behavior to less benign circumstances.

Even a skilled manager can produce weak results. In particular, there are many reasons why skilled managers with strong records often fail to deliver continuing success. Sometimes the problem is over-confidence: success breeds hubris, which breeds a higher risk profile, which breeds failure. The epitaph reads, “He was a victim of his own success.” Sometimes the problem is under-confidence: the manager becomes overly concerned about defending the historical record and “chokes up,” thus becoming merely average. And there are many other reasons why skill may fail to deliver performance: health distractions, marital problems, too many toys, and so forth. Skill takes many forms, and the failure of skill to deliver results takes equally many forms.

## **II. Index Funds are the only Rational Investment: *False***

Skill is not an illusion, but it is elusive. However, the elusiveness of skill is not a knockdown argument for passive management. Index funds have many advantages: they are cheap, they are often (but not always) tax-efficient, and their performance record (in many asset classes) is quite good. But they also have a distinct investment personality of their own. In particular, they suffer from four problems: they are concentrated large-cap momentum-driven portfolios that are not (I hesitate to use this word) efficient. Let’s take these points in turn.

**Although an index fund is a buy-and-hold portfolio, those who invest in index funds are pursuing a momentum strategy, buying on strength and selling on weakness.**

- ▶ **Large Cap Bias.** Most indices are capitalization-weighted, so they are biased toward the largest companies, countries, sectors, etc. For example, in the S&P 500 there are 10 companies whose market capitalization exceeds \$180 billion. Those 10 mega-cap companies account for 20% of the S&P 500 portfolio. To appreciate the degree of large-cap bias, consider the following facts about the S&P 500: the *median market capitalization is \$13.2 billion, but the average is \$25.5 billion and the cap-weighted average is \$100.3 billion.* The same pattern is visible in MSCI EAFE, the main non-U.S. equity index, where 46% of the index is invested in the two largest markets, the UK and Japan. (All data as of December 2006.) This means that a cap-weighted index fund is betting that the bigger companies/countries/etc. will outperform the smaller. Sometimes that bet works out, sometimes it doesn't.
- ▶ **Concentration.** The size bet also manifests itself as a form of "lumpiness:" index funds typically combine a small number of large positions with a large number of small positions. In the S&P 500, the 10 largest positions range from 3.3% to 1.4%. Those positions represent 20% of the index, so that leaves 490 stocks that collectively account for 80% of the index. In this universe of names, the average position size is 0.16%. The situation is similar in the international indices. In MSCI EAFE, Japan and the UK jointly account for 46% of the index; France, Germany, and Switzerland jointly account for 24%; and 16 smaller markets account for the remaining 28%. In both the S&P 500 and EAFE, the index portfolio combines a small number of outsized positions with a large number of positions barely worth owning. (One reason why "130/30 strategies" are now so popular is that a long-only manager cannot effectively express a negative opinion about the many small positions in the usual benchmarks.)
- ▶ **Momentum.** Although an index fund is a buy-and-hold portfolio, those who invest in index funds are pursuing a momentum strategy, buying on strength and selling on weakness. To see this, consider someone who made regular investments in the S&P 500 over the course of the 1990s. As technology stocks advanced during this period, the technology sector, which accounted for 10% of the index at the end of 1994, grew to represent 32% of the index at the end of 1999. As the hypothetical investor made regular investments in U.S. stocks, a larger and larger share of each new investment was going into the technology sector. As new money flows into index funds, it flows disproportionately towards those stocks and those sectors that have experienced strong relative performance.

**Index funds are not automatically bad, but they are not automatically good either. The careful investor needs to ask whether a particular cap-weighted index “makes sense” or whether it contains bets that are perhaps not worth making.**

- ▶ **Inefficiency.** If we think of U.S. stocks as a single asset class, then it seems appropriate to use a cap-weighted index to invest in that asset class. But we can also think of U.S. stocks as a portfolio comprising 10 industry sectors: energy, health care, information technology, and so forth. (And there are lots of other ways of breaking U.S. stocks into component parts.) This creates a classic asset allocation problem: how do we build a robustly diversified portfolio from those 10 sectors? If we approach this problem with a Markowitz optimizer using historical means, volatilities, and correlations, then the cap-weighted portfolio will fall below the efficient frontier. (There may be a time period during which the means, variances, and cross-correlations deliver a frontier that includes the cap-weighted portfolio, but that would be a cosmic coincidence of the first order.) Given enough time, we might be able to create a set of inputs that would make the cap-weighted portfolio look “mean/variance efficient,” but what would be the point of that exercise?

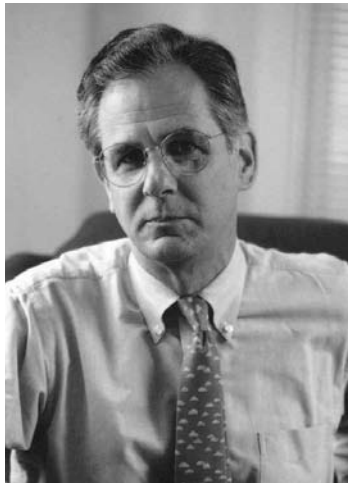
Index funds are not automatically bad, but they are not automatically good either. The careful investor needs to ask whether a particular cap-weighted index “makes sense” or whether it contains bets that are perhaps not worth making. Interestingly, the investment community often recognizes when the cap-weighted indices have become perilously undiversified. For example, in the late 1980s the Japanese bull market created a situation where Japan had become a disproportionately large part of the EAFE index, so many investors began to follow a new benchmark, “EAFE ex-Japan.” Similarly, in the late 1990s many investors tracked the performance of “equities ex-TMT” (technology, media, and telecommunications).

### **III. The Two Cultures**

In its early years, the EMH presented a major challenge to “traditional” active managers, who tried to make money “the old fashioned way” and were largely ignorant of the sophisticated quantitative techniques of academic finance. The investment business now contains a large and growing population of highly quantitative active managers who, having grown up with the EMH, attempt to use their mathematical sophistication to extract alpha from the markets. The “quants” and the “non-quants” have very different ideas about how to generate alpha.

The two main insights of the EMH present a challenge to all active managers, both quants and non-quants. As we suggested earlier, if a manager tells you that he has identified a free lunch or that he can predict prices, watch your wallet. This leaves a more humble group of managers who accept the two main claims of the EMH and then try to hone some distinctive skill.

Within this group, the quants and the non-quants are using different tools to achieve the same ends. This is perfectly legitimate: we should let a thousand flowers bloom. And we should be open minded about what will work and what won't. There is no royal road to alpha: extreme mathematical sophistication is not guaranteed to do the trick, nor is “traditional fundamental analysis.” The best managers use a variety of tools, and are keenly aware of the limitations of all their tools. Investment tools are like guns: they can be used either intelligently or recklessly. In the ongoing debate between the quants and the non-quants, our bumper sticker is very simple: Tools don't capture alpha, skilled managers capture alpha with tools.



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