How should I invest? What the Efficient Market Hypothesis does and does not say.

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Northwestern | Kellogg
Nate Silver, *The Signal and the Noise*: http://www.northwestern.edu/onebook/
The Signal and the Noise

• What do I mean by passive investing?
  – Indexing: holding a proxy of the aggregate market
  – An alternative interpretation is never trading – I do not mean this

• What do I mean by active investing?
  – Not indexing (there are an infinite number of ways to be active)
    • Investing in individual assets that we expect to “outperform.”
    • Changing our allocation to industries or asset classes (e.g., stocks vs. bonds) based on which we expect to “outperform.”
The Signal and the Noise

• Holding 100% of your portfolio in Apple stock and never buying and selling is an “active” portfolio by my definition.
  – Someone else might call this passive.
The Signal and the Noise

• Prediction is at the heart of active investing
• Investing is a prediction problem where the signal-to-noise ratio is extremely low.
• In this case it is difficult to distinguish skill from luck.
  – Good investors can look bad for long periods of time.
  – Bad investors can look good for long periods of time.
• Judging skill with small sample sizes is difficult.
The Signal and the Noise
The Signal and the Noise

• The “arithmetic” of active management (Sharpe (1991)).
  – Before transactions costs, active management is a zero-sum game.
  – Every asset issued needs to be owned by someone.
  – In the aggregate, the world’s investors hold the world market portfolio – the world index.
  – If I overweight DLX relative to its weight in the index, someone else has to underweight DLX.
Deviations from the index: implementation costs

- It is theoretically possible that the active investors are able to fleece the passive investors by getting them to trade at unfavorable prices when they rebalance the index (which is not that often), Pedersen (2016).
- However, most active investing strategies incur higher costs than indexing.
- French (2008) estimates the annual cost of active management versus indexing in the US stock market is 0.67% of the market value.
- For 2016 this is $189 Billion.
What about skill?

- If 6 poker players each bring $100 to the table, then $600 is leaving the table with them (ignoring any entrance fee or snacks and drinks they buy).
- It is still possible for the skilled poker players to win from the unskilled (maybe 2 walk away with $300 each and 4 with zero).
  - They need a supply of “patsies” to join the game.
- Skilled investors should be able to do the same.
  - They also need a supply of “patsies” to join the investing game.
What about skill?

• Nate Silver made a living playing poker for a while
  – Most successful during a boom in online poker
• When did he stop making money?
  – Unlawful Internet Gambling Enforcement Act – 2006
  – Drove out the majority of casual American players
• The pool of patsies was drying up and the remaining
  players had better skill, on average. He became the
  patsy.
Wisdom of the Crowds

- Sir Francis Galton made some very important contributions to science: e.g., created the notion of standard deviation.
- He also was an elitist: believed in (and coined the term) eugenics.
- Attended a sale of livestock at which the crowd was asked to submit estimates of an animal’s dressed weight.
- Expected the best guess to be very close and the average guess to be way off (because, in his opinion, most people are stupid).
Wisdom of the Crowds

• Galton collected the data and found:
  – Median estimate: 1,208 pounds
  – Mean estimate: 1,197 pounds

• Dressed weight: 1,197

• Independent errors cancel out in the mean.
Efficient Markets Hypothesis

• Financial markets give everyone an opportunity to bet on the value of an asset:
  – If the market price is too low we can bet by buying.
  – If the market price is too high we can bet by selling.
• What happens at the race track when many bettors place bets on the same horse?
• The odds change.
• What happens in the stock market when many bettors place bets on the same stock?
  – The price changes.
Efficient Markets Hypothesis

- The Efficient Markets Hypothesis states that competition amongst investors leads to prices that incorporate information.
  - **Weak form** efficiency: prices incorporate all past history of asset prices
  - **Semi-strong form** efficiency: prices incorporate all public information
  - **Strong form** efficiency: prices incorporate existing information
Efficient Markets Hypothesis

• Nate Silver remarks a number of times that predictions where the forecaster has “skin in the game” are usually better than those without “skin in the game.”
  – Television pundit: main deliverable is entertainment, not accurate forecasts → forecasts tend to be inaccurate.
  – The markets for stocks and bonds are the ultimate “skin in the game” type of bet.

• When you trade, you are not trading against the average investor, but an investor who has a reason to trade.

• You need to have an “edge” over that trader to win.
Efficient Markets Hypothesis

• If markets are fully efficient, we would all rationally index.
• If that is the case, nobody is “minding the store” – keeping individual asset prices correct.
• When information is costly to produce, markets can’t be fully efficient (Grossman and Stiglitz (1980)) because there has to be an incentive to produce value-relevant information – i.e., profit to creating valuable information.
• Warren Buffett, Charlie Munger, Lou Simpson, Joel Tillinghast (’83), Jeff Ubben (’87), Jim Simons.
Efficient Markets Hypothesis

• When/where are markets most likely to not be efficient?
  – When there is a common element to the forecast errors of investors.
    • E.g., when market prices lead to positive, rather than negative feedback.
  – When it is risky to “buck the trend.”
  – In places other people are not looking.
Efficient Markets Hypothesis

• There are many tests of the hypothesis and a fair amount of disagreement about it.
  – Two of the winners of the Nobel Prize in Economics in 2013 have completely opposite views on the hypothesis.
• A number of studies find price patterns that seem to be consistent with behavioral biases found in the psychology literature.
Efficient Markets Hypothesis

Panel B. Simple $t$-statistics of cross-sectional regression estimates

Figure 1. Cross-sectional regressions of half-hour-interval returns. We divide the 9:30 to 16:00 trading day into 13 disjoint half-hour return intervals. For every half-hour interval $t$ and lag $k$, we run a simple univariate cross-sectional regression of the form $r_{i,t} = \alpha_{k,t} + \gamma_{k,t} r_{t-k} + \epsilon_{i,t}$. The variable $r_{i,t}$ is the return of stock $i$ during interval $t$ and the variable $r_{t-k}$ is the return of stock $i$ in interval $t-k$. The cross-sectional regressions are calculated for all combinations of half-hour interval $t$, from January 2001 through December 2005 (16,261 intervals), and lag $k$, with values 1 through 65 (past 5 trading days). Panel A plots the time-series averages of $\gamma_{k,t}$ (in percent). Panel B plots the respective Fama and MacBeth (1973) $t$-statistics. The analysis uses NYSE-listed stocks.

Source: Heston, Korajczyk, Sadka (2010)
Efficient Markets Hypothesis

- Do the patterns provide a profit after trading costs?
- Do the patterns persist?
  - Compare performance over pre-test period, test period, post-test period.
- One of the most relevant pieces of information is the performance of money managers
  - Multiple tests over a span of over 70 years show that the vast majority of (well educated and highly compensated) mutual fund managers do not outperform the market index (or their relevant benchmark).
Implications for Us?

- “If 30 minutes into a poker game you don’t know who the patsy is, your it.”
  - Given the signal to noise ratio, it might take longer.
- In investing, are you the patsy or the expert? Being self-aware is really important. In poker and investing we all tend to overestimate our ability.
- What is the optimal response by a patsy?
  - Don’t play the game.
Implications for Us?

• When you are trading against informed traders, the optimal response (when we don’t have an external, non-information-based reason to trade) is to not play the game (Milgrom and Stokey (1982)).

• Groucho Marx “I don’t want to belong to any club that will accept me as a member.”

• I don’t want to trade with an informed trader who wants to take the other side of the trade.
Implications for Us?

• Why don’t I just hire one of the experts (like Warren Buffett)?
  – The low signal-to-noise ratio in financial markets makes this harder than most think.
  • There is very little persistence in manager performance.
  • Goyal and Wahal (2008) study cases where pension plans and endowment funds fire a manager and replace with another manager. Over the next 3 years the fired managers slightly outperform the hired managers.
  • When there is a lack of data, process might tell you more about future performance than does past performance.
  – The scarce resource is investing talent, which can get priced into their shares (Berkshire) or fees (Renaissance Technologies).
Implications for Us?

**Table X**

**Round-Trip Excess Returns for Investment Managers**

Returns are cumulated separately for hired and fired firms. In Panel A, we show the separate returns for hired and fired investment managers, as well as the return differential for the entire sample of round-trips. In Panel B, we show only the return differential for various subsamples. Heteroskedasticity and serial correlation consistent standard errors are calculated using the procedure described in Jegadeesh and Karceski (2004) and appear in parentheses. Low and high cutoffs for the allocation index are based on the bottom and top quartiles. Similarly, small and large cutoffs for sponsor size are based on the bottom and top quartiles.

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<thead>
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<th></th>
<th>Pre-event Period</th>
<th>Post-event Period</th>
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<tr>
<td></td>
<td>−3 to 0</td>
<td>−2 to 0</td>
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<td>Fired firms</td>
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<tr>
<td></td>
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<td>(1.60)</td>
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<td>Return differential (hired−fired)</td>
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<tr>
<td></td>
<td>9.52</td>
<td>9.12</td>
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<tr>
<td></td>
<td>(2.47)</td>
<td>(2.30)</td>
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<tr>
<td>Number of round-trips</td>
<td>331</td>
<td>389</td>
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Source: Goyal and Wahal (2008)
Implications for Us?

• If you truly have an “edge” you should be able to outperform passive investing.
  – The edge is relative to the person on the other side of the trade, not the average holder of that asset.
  – Having an edge in some types of assets does not mean you have an edge in all types of assets.
• Many smart people have failed to succeed, so you should not take this step lightly.
  – If you are looking for a hobby, active investing is probably not the best choice.
Implications for Us?

• If you do not have an “edge” (i.e., are the patsy).
  – Don’t play the game (Nate Silver quit playing poker for a living when his edge disappeared).
  – Index.
  – Trade as seldom as possible.
    • To rebalance your portfolio back to optimal weights
    • The average mutual fund owner has a lower return than the average fund
      – How can this be?
        » Get into the market to before low returns and out of the market before high returns
        » Pick underperforming funds
  • Tax planning
Implications for Us?


Source: Mauboussin, Callahan, and Majd (2016)
Implications for Us?

Exhibit 7: Active Allocations for Retail and Institutional Investors, U.S. Domestic Equity

Source: Mauboussin, Callahan, and Majd (2016)
Implications for Us?

• Finding your “edge.”
  – Great investors have some common traits (Mauboussin (2016)).
  – Being self-aware and always questioning one’s assumptions.
  – Avoiding behavioral pitfalls.
  – Knowing the limits of your expertise (e.g., Warren Buffett).

• While having common traits, great investors don’t have a common investment style.

• Essential to evolve (first mover advantage does not last forever)
References


