



The Great Divide

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I'm Not Exactly Unbiased (But at Least in Both Directions)

I was Eugene Fama's Teaching Assistant for two years and he's still one of my investing heroes

...But I wrote (with Fama's blessing) a dissertation on price momentum (and that it worked!)

...But I also think markets work very well (not perfectly) most (not all) of the time

...But I try to beat markets on a daily basis (and at least somewhat for "behavioral" reasons)

Bottom line: I've learned to live with my schizophrenia – while I'm not a super hard-core efficient marketer, I do think markets are closer to efficient than most practitioners do



Outline

1. **What exactly does the Efficient Market Hypothesis (EMH) say?**
2. **Challenges to market efficiency**
3. **Lessons from the trenches**
4. **A more reasonable start to the efficiency debate**
5. **Some takeaways**



1. What Exactly Does the Efficient Market Hypothesis Say?

Let's Start With the Definition

“I take the market efficiency hypothesis to be the simple statement that security prices fully reflect all available information” (Fama, 1991)

Notice what market efficiency is not:

- A belief that security returns are normally distributed
- “Stocks for the long-run,” or a love of equities
- An argument for free markets (though clearly related)
- Whether the “CAPM” is the right model
- Ex ante prices “reflecting all information” vs. ex post being always right (very different things)



1. What Exactly Does the Efficient Market Hypothesis Say?

The Joint Hypothesis Problem

You cannot directly test the Efficient Market Hypothesis

To determine if security prices “fully reflect all available information,” we need a model that says how prices are supposed to reflect this information

Thus, any test of market efficiency is a test of the joint hypothesis of market efficiency + a model

Model is right and Market is efficient	Model is wrong and Market is efficient
Model is right and Market is inefficient	Model is wrong and Market is inefficient



2. Challenges to Market Efficiency

What Does the Data Show?

Tests of market efficiency can be broken down to micro and macro

Micro: testing the cross-section (e.g., value versus growth stocks)

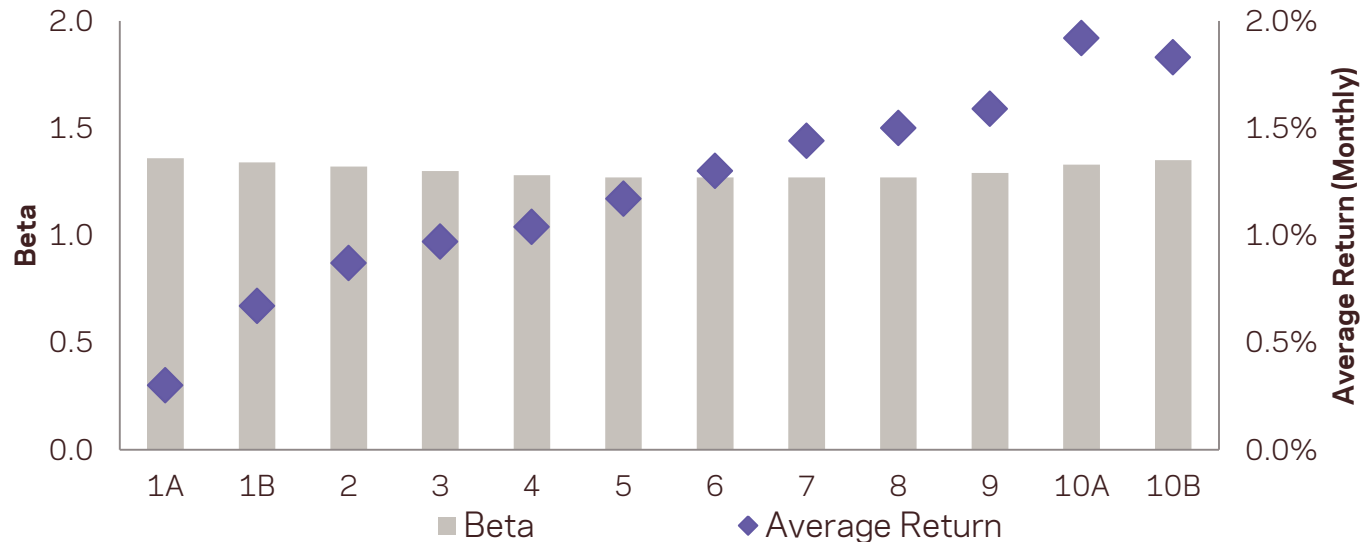
Macro: testing an overall market (e.g., S&P 500)



2. Challenges to Market Efficiency: Micro

Value: Compensation for Irrational Behavior or Risk?

Early Evidence: Stocks With High Book-to-Market Ratios Outperform the Average
Stocks Sorted by Book to Market (July 1963–December 1990)



Behavioral explanation: cheap stocks are overlooked, investors have a preference for “glamour”

Efficient markets explanation: compensation for risk, value stocks are distressed

Source: AQR, Chart adapted from Fama and French (1992). Please read important disclosures in the Appendix.

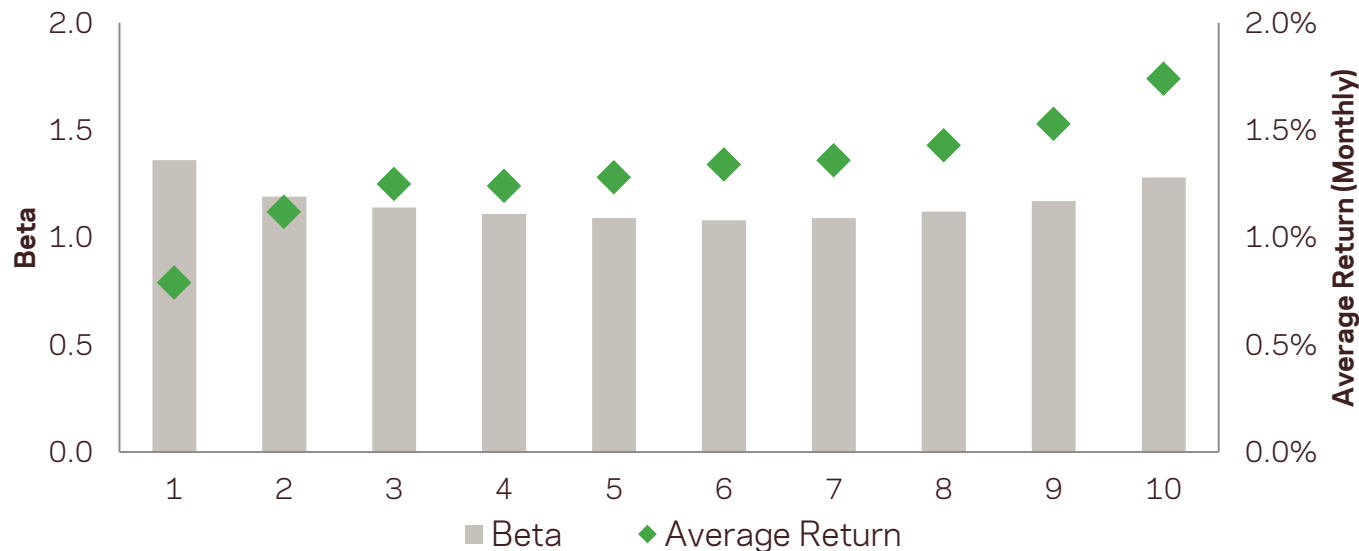


2. Challenges to Market Efficiency: Micro

Momentum: Compensation for Irrational Behavior or Risk?

Early Evidence*: Stocks With Attractive Momentum Also Outperform

Stocks Sorted by 6-month Lagged Returns (January 1965–December 1989)



Behavioral explanation: prices react too slowly to new information (among others)

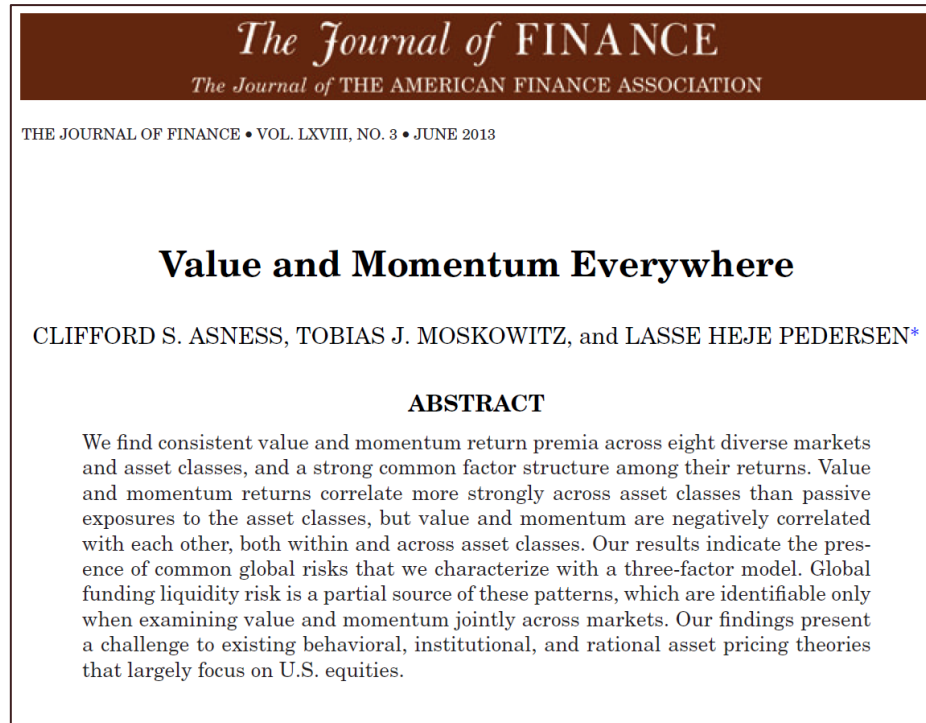
Efficient markets explanation: momentum stocks co-move, and there could be risks out there we haven't identified yet



Source: AQR, Chart adapted from Jegadeesh and Titman (1993). Portfolios are based on 6-month lagged returns and held for 6 months. Please read important disclosures in the Appendix.

*This was the most influential early academic study of momentum, but the methodology does not deliver nearly the best momentum results. For that method, which is the most widely used today, see Asness (1994) ©

2. Challenges to Market Efficiency: Micro And Value and Momentum Aren't Restricted to U.S. Stocks



Behavioral explanation: the negative correlation between these clearly points to irrational markets as the returns on the combination are “too good”

Efficient markets explanation: there is a common factor structure across all these “anomalies,” which is a requisite of a risk factor

Source: AQR; Asness, Moskowitz and Pedersen (2013)

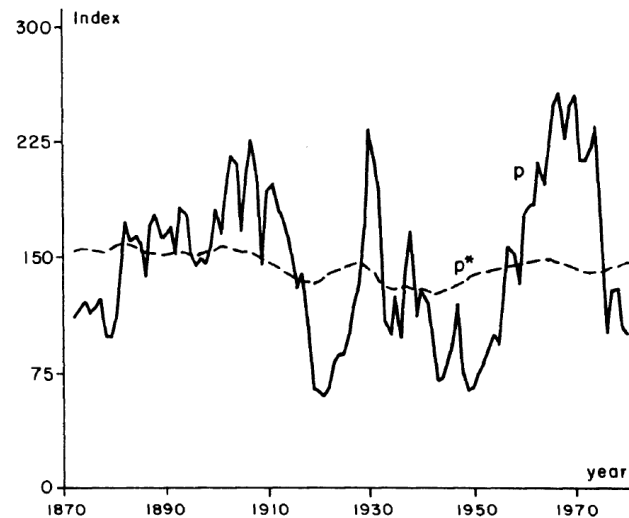


2. Challenges to Market Efficiency: Macro

The “Value” of the Stock Market

Do Stock Prices Move Too Much To Be Justified by Subsequent Changes in Dividends?

Real S&P Composite Price Index (solid) and ex post rational price (dashed), 1871-1979



Behavioral explanation: the market can swing (wildly) away from seemingly sensible prices

Efficient markets explanation: the discount rate can vary over time (more on this later) and the above graph absolutely ignores this

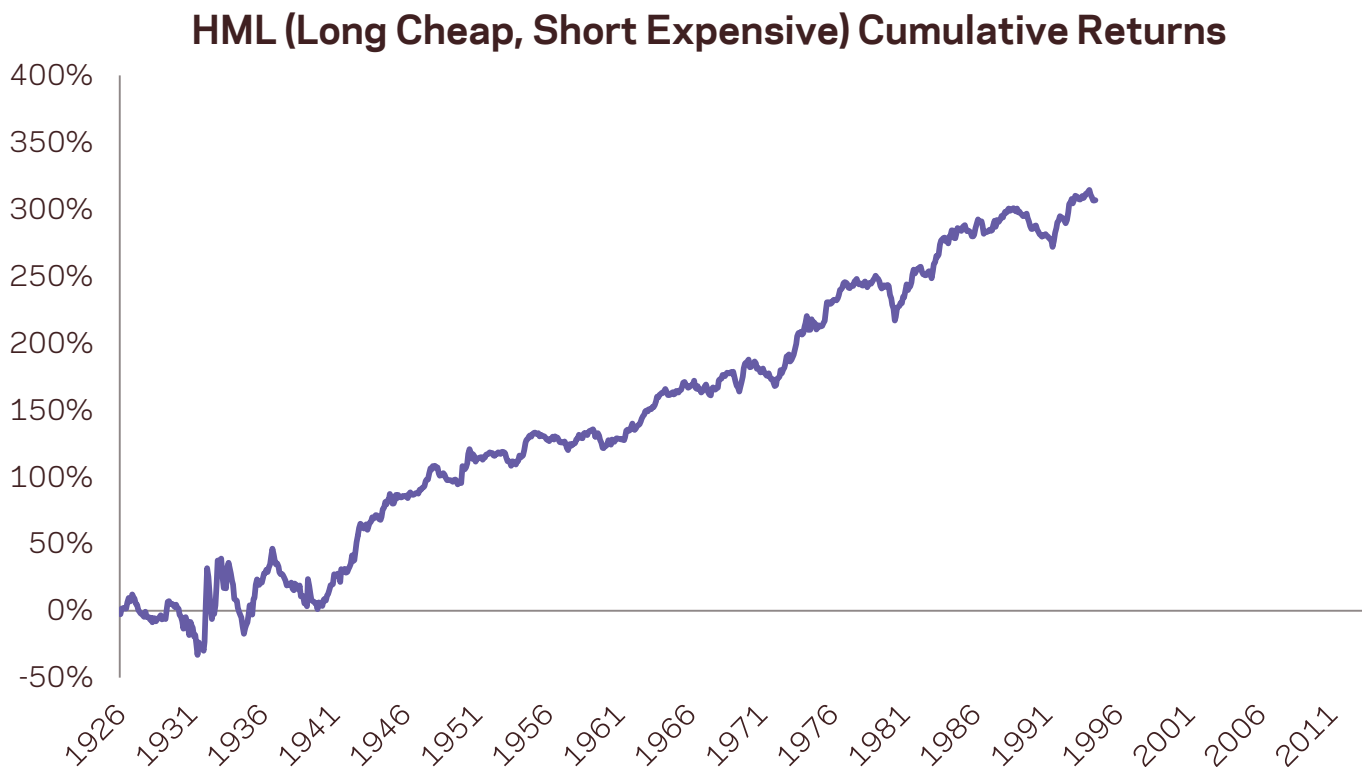
Source: AQR, Shiller (1981). Please read important disclosures in the Appendix.



3. Lessons From the Trenches

Our Introduction to the “Real World”

Naturally, we had a good candidate to start with



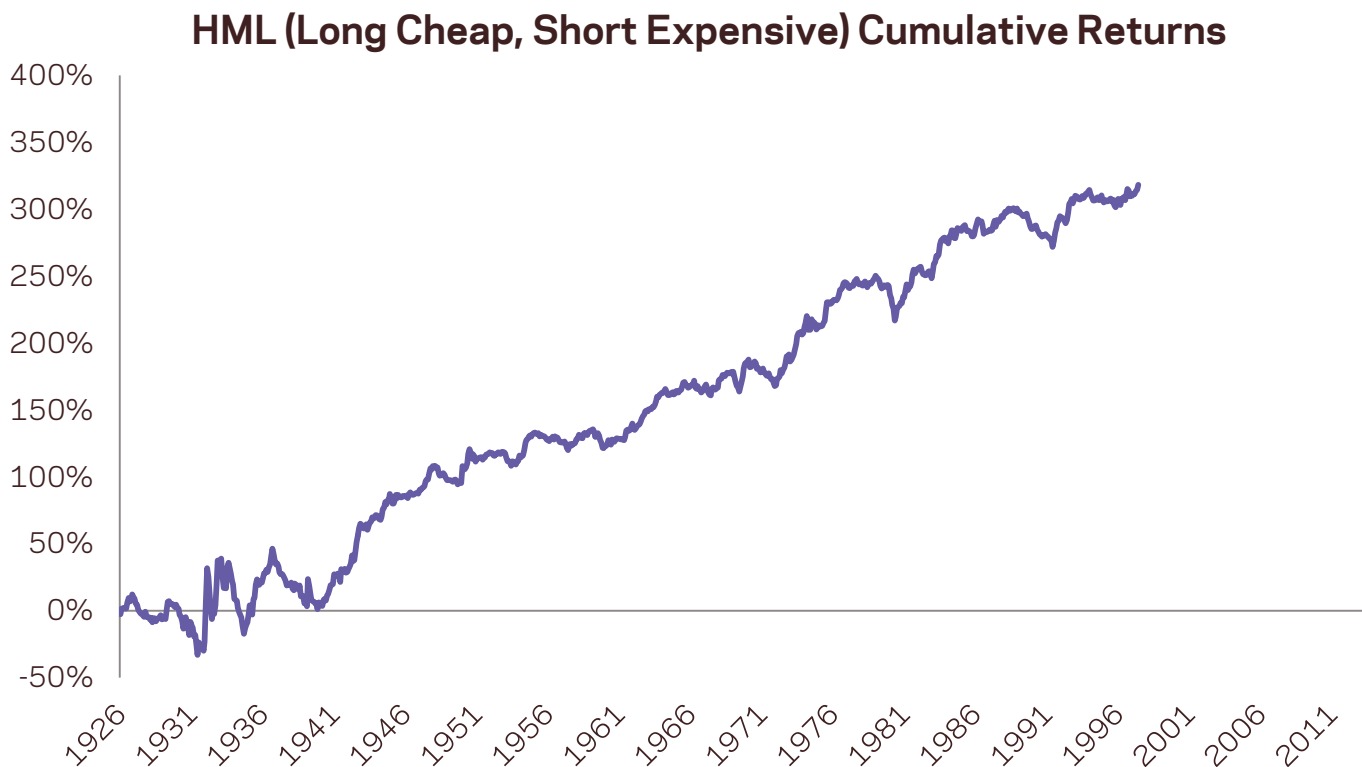
Source: AQR and Ken French data library. HML is defined as high-minus-low, where “high” is a portfolio of stocks with the 30% highest book-to-market values (i.e., “cheap” stocks), and “low” is a portfolio of stocks with the 30% lowest book-to-market values (i.e., “expensive stocks”). For complete methodology, see Fama and French (1993). Dates shown are July 1926 - December 1994. Please read important disclosures in the Appendix.



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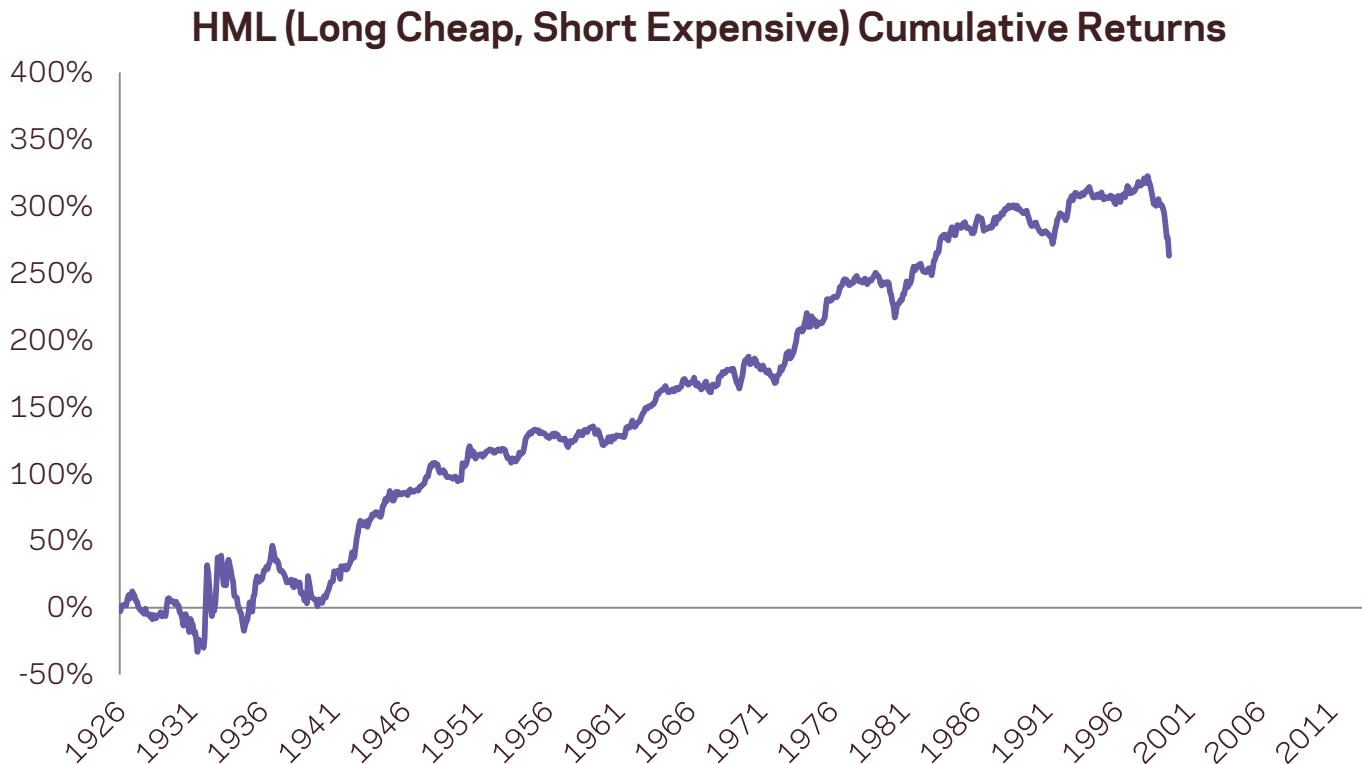
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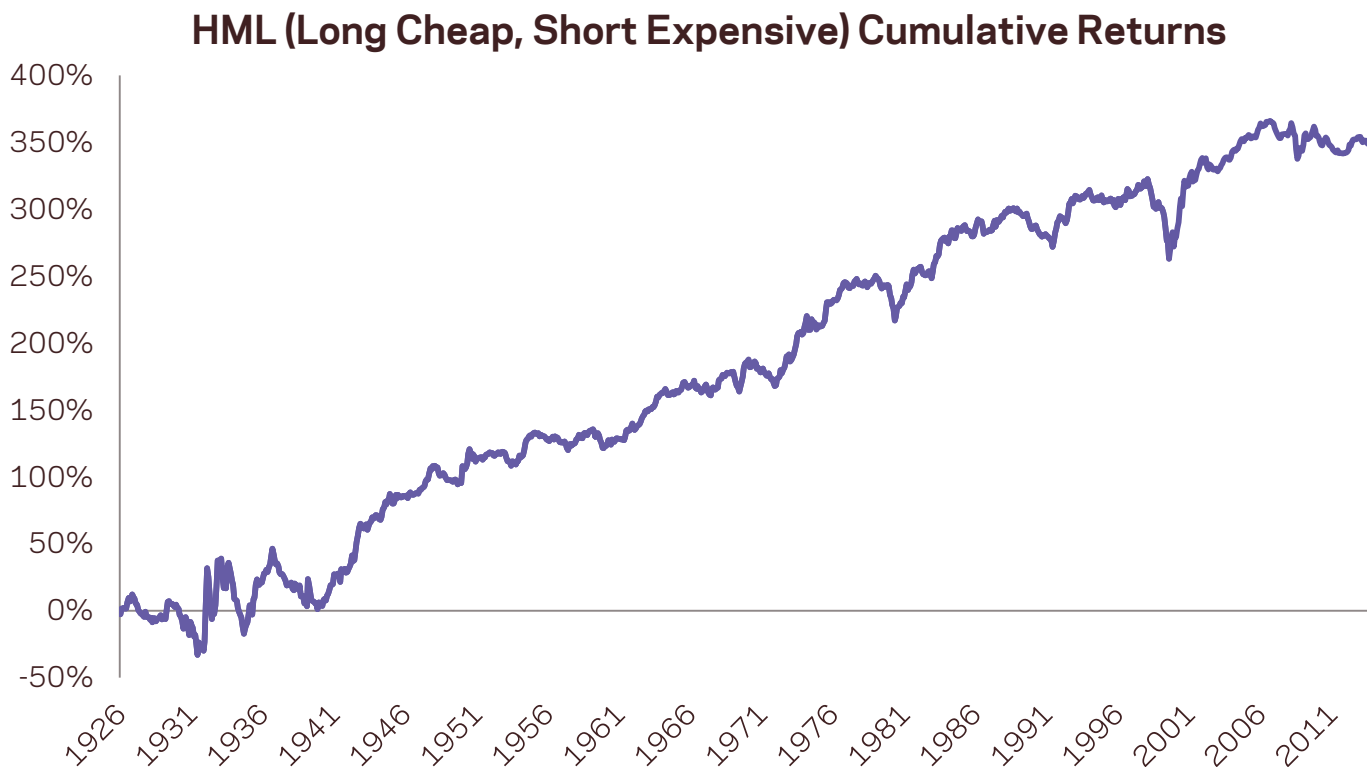
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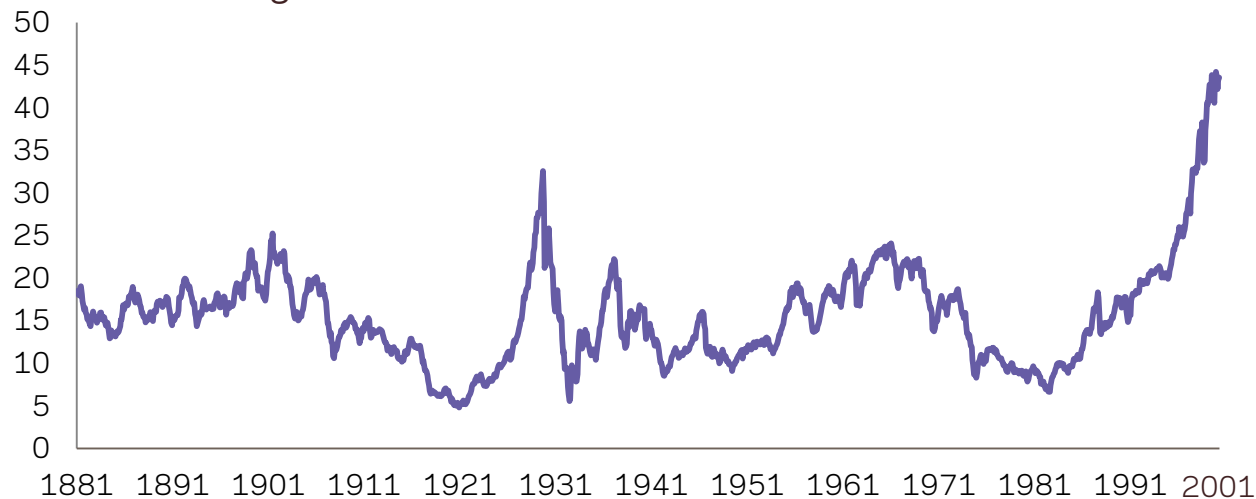


3. Lessons From the Trenches

It was a “Macro” Not Just a “Micro” Phenomenon

The Scariest Chart Ever

Price-to-Earnings of the S&P 500



Even the most diehard efficient markets fan was having trouble explaining this

- Could a rational market ever be priced so high that it simply could not deliver an acceptable long-term risk premium without making absolutely incredible assumptions about future dividends?
- We think no. We think this one was a bubble (e.g., “Bubble Logic” 2000).

So why didn't the canonical arbitrageur fix everything?

Source: AQR and Robert Shiller data library. Please read important disclosures in the Appendix.



3. Lessons From the Trenches

Inefficiency in the Real World

Fama (1991) “The extreme version of the market efficiency hypothesis is surely false.”

At least two related versions of the story

- Limits of arbitrage (e.g., Shleifer and Vishny)
- Someone must make the market efficient, and it will never pay to make it perfect (Grossman and Stiglitz); fixing errors is a risky bet (e.g., Fama and French)

“Offsetting actions by informed investors do not typically suffice to cause the price effects of erroneous beliefs to disappear with the passage of time.” Fama and French (2007)



3. Lessons From the Trenches

Efficiency in the Real World

You might get the impression from the prior page that markets are **really** inefficient and **really** easy to beat...

Sorry, not even close.

E.g., As much recognition as Robert Shiller has gotten for calling the stock market bubble, recall he was saying very similar things at least back to 1996 (remember “irrational exuberance” was Alan Greenspan’s statement inspired by Shiller and his colleague John Campbell’s analysis)

So what about “genius managers”?

- Some geniuses are ex post lucky
- For others it’s pretty hard to reconcile their performance with efficient markets or luck
- But then again, can you invest with most of them? (we can’t!)
- In general, it seems like whenever we find managers with something we’d agree is truly special, they’re either 1) not taking new money, or 2) taking out so much in fees that *they’re* capturing much of the “special”
- Have you heard of the phrase “the exception that proves the rule”? How many dollars at stake?



3. Lessons From the Trenches

Back to the Central Debate - Risk or Inefficiency – The Case of Value

Consider investment managers who assert that value investing is compensation for risk

- If value works because of risk, there should be a market for people who want the opposite
- That is, real risk has to hurt — people should want insurance against things like that
- However, we know of nobody offering the systematic opposite of HML (long expensive, short cheap)
- Although far from a proof, the lack of such products like -HML is a bit vexing for the pure risk story

More generally, there seems to be a tendency for proponents of risk-based stories for value's success to not really want to find that risk, as risk is scary, and a great sales technique is to call something “risk” while presenting no evidence it's scary (see “hunting for the real killers”)

Having said all the above, value has underperformed in the GFC, and, on perhaps more suspect data, in The Great Depression. It could definitely have “long-term disaster” risk; and value companies are in fact systematically correlated and dodgier than their expensive counter-parts

Again, we think value (among other anomalies) is a combination of risk and inefficiency



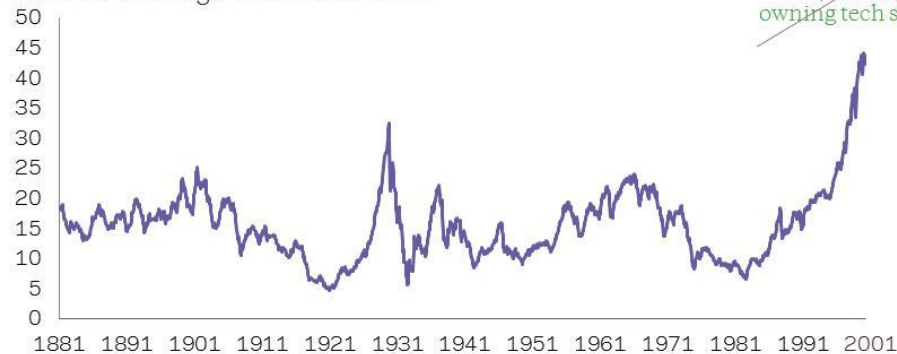
4. A More Reasonable Starting Point

The “Reasonable Joint Hypothesis”

Some EMH proponents have proposed explaining prices with extreme and odd tastes, or discount rates that vary wildly¹

- Can a market that *efficiently* reflects *irrational* prices save EMH?
- The “Reasonable Joint Hypothesis” says no, as these proponents miss the point and create an untestable hypothesis

The Scariest Chart Ever
Price-to-Earnings of the S&P 500



- Here's the kind of statement we'd like to see more of: “Our results cannot be reconciled with efficient markets and, to date, any model of how prices are set that assumes generally rational investors.”



¹ For a selection of (IMO) the more entertaining explanations, see Bubble Logic (Asness, 2000)

Chart source: AQR and Robert Shiller data library. Please read important disclosures in the Appendix.

5. Some Takeaways

So What Do You Do If You Believe Me?

If markets aren't perfectly efficient, but not grossly inefficient either, what does that imply for investors?

- I believe the majority, particularly individuals, would be better off acting like the market was perfectly efficient
- Active management is hard, and so is deviating from the market (the market can stay irrational longer than you can stay solvent!)

Which is not to say that the index is the only portfolio worth holding

- Remember the “micro challenges” to efficiency
- Regardless of whether they work due to risks or inefficiencies, they may add value to a portfolio that has only market risk
- Remember they are not arbitrages

If markets are not perfect, market design matters, e.g.,

- Regulation
- Accounting
- Liquidity



Conclusion

So Where Do I Stand in the Great Divide?

Behavioralist / Inefficient Markets?

- They often go too far — anomalies everywhere
- Many out-of-sample failures
- But I do think there are some reliable behavioral effects offering opportunities
- Ultimately, the strength and weakness of behaviorism is its flexibility

Efficient Markets?

- Clearly, markets are not perfectly efficient (Gene Fama told us this a long time ago)
- But they are not easy to beat!
- I believe they are closer to efficient than do most “active” managers (but probably less than Gene)

*"It is difficult to get a man to understand something,
when his salary depends upon his not understanding it!"*

- Upton Sinclair



Conclusion

EMH Is Still a Very Big Deal (and a Very Good Thing)

Would we know more or less without EMH and all it's led to?

Was there another null hypothesis for the whole field that would've been better?

- Rational market theories pushed aside a lot of terrible ideas
- Do we believe too strongly in rationality some times? Perhaps

Would anyone argue with the idea that markets, at least at some things (like pricing events, or making active management very difficult) are much more efficient than we thought before EMH?

- Prior to EMH they were thought wildly inefficient
- Index funds, and the general focus on cost and diversification, are perhaps the most direct practical result of EMH thinking, and the most welfare-enhancing financial innovation of the last 50 years
- You don't need EMH to get to index funds (Jack Bogle yelled at me for this!) but the thinking and timing does coincide

Markets not being perfectly efficient means we need to work to design them better, and stop working against that



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