

The Efficient Market Hypothesis vs. Roaring Kitty (JPM Series)

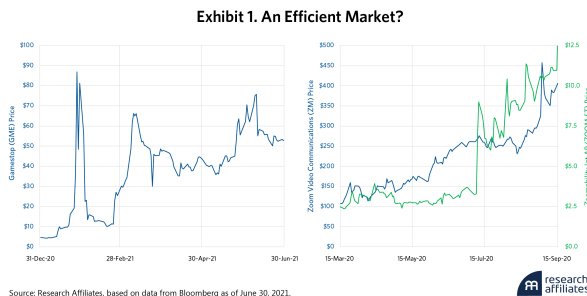
November 2024

This is part of a series of articles adapted from [my contribution to the 50th Anniversary Special Edition of The Journal of Portfolio Management](#).

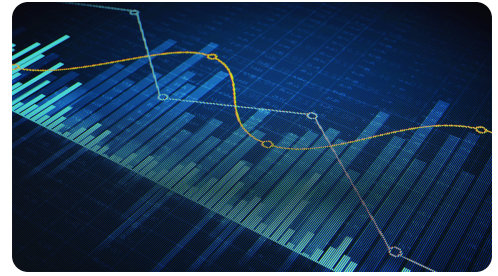
Introduction

Much of modern finance falls into one of two camps, neoclassical finance and behavioral finance. The former posits efficient markets, the latter posits the opposite. The former identifies risk, risk aversion, and risk premia as the fundamental drivers of investor behavior. The latter identifies fear, greed, herding, and various other all-too-human emotions as key drivers of the capital markets, though such inefficiencies may vary across markets and across time and will, therefore, confound most investors most of the time.¹

While academic finance embraced the [efficient markets hypothesis](#) (EMH) for decades, with many adherents accepting it as an incontrovertible fact, the practitioner community was more skeptical. **Exhibit 1** demonstrates why. The first graph shows what happened when a social media stock picker called "[Roaring Kitty](#)" advocated for a short squeeze on [GameStop](#) (GME) in January 2021. The stock rose 17-fold in two weeks on no fundamental news about the company's underlying business. The second graph depicts how the stock of the video conference company [Zoom Video Communications](#) (ZM) soared during the pandemic in 2020, along with that of [Zoomability](#) (ZOOM), a Swedish manufacturer of recreational vehicles. Both stocks quadrupled in six months, the former because of its timely technological innovations, the latter because of its ticker.



David Hirschleifer conducts a simple thought experiment in a wonderful 2001 article. He imagines an alternative reality in which the foundations of modern finance are a "[Deficient Markets Hypothesis](#)" (DMH) and a "[Deranged Anticipation and Perception Model](#)" (DAPM), instead of the EMH and [Capital Assets Pricing Model](#)



AUTHORS



Rob Arnott*
Partner, Chairman

*Corresponding author

Key Points

- Conventional finance views risk, risk aversion, and risk premia as investors' key motivations, while behavioral finance perceives fear, greed, herding, and other all-too-human emotions as the principal movers of the capital markets.
- Modern finance may have been better served if, in its early days, an *inefficient* market hypothesis had been proposed. Such a premise would have been easier to validate and harder to disprove than its more "rational" counterpart, the efficient market hypothesis.
- When it comes to the equity risk premium, we need to define three concepts: the risky asset (global stocks, U.S. stocks, etc.), the risk-free asset (cash, Treasuries, TIPS), and the expected return difference between the two.

(CAPM).² He suggests that had an *inefficient* market hypothesis been embraced at the dawn of modern finance, it would have been more easily validated *and less readily falsifiable* than the EMH.

The Equity Risk Premium

Words have consequences. A *risk premium* presumes a logical homo economicus who makes investment choices based on sound reasoning and objective reality. At a minimum, a risk premium presumes a collectively rational market, with individuals' emotions canceling in some psychological variant of the central limit theorem. The "madness of crowds" cannot exist. But suppose in the early days of the EMH, academia had thought like Hirschleifer and acknowledged the human component of capital markets and sought to understand the nature and magnitude of a "*fear premium*" instead of an ostensibly quantifiable "*risk premium*."

A *fear premium* accounts for human emotion and renders many of the "anomalies" and "factors" that have consumed academic finance in recent decades unsurprising, perhaps even expected. In an efficient market, can a frothy growth stock be priced at a negative *risk premium*? Under most conditions, of course not.³ Its risk—and its contribution to portfolio risk—is objectively higher than that of the risk-free asset. The market must therefore expect sufficient future growth to justify the premium valuation multiples, no matter how large they may be.

“A fear premium accounts for human emotion and renders many of the ‘anomalies’ and ‘factors’ that have consumed academic finance in recent decades unsurprising, perhaps even expected.”

Conversely, with a *fear premium*, might our frothy growth stock be priced at a negative *fear premium*? Of course! Whenever the fear of missing out (FOMO) leads investors to view low-risk assets with dread. Charlie Munger often observed, "The world is not driven by greed. It's driven by envy." It is difficult to imagine how any investor could view an investment in today's "[Magnificent Seven](#)" as less risky than an investment in cash. But the "Mag-7" could easily sport a negative "fear premium," priced to offer a lower future return than cash, if investors collectively fear the opportunity cost of idle cash reserves more than they fear the volatility of their beloved growth stocks.⁴

Several myths relating to the [equity risk premium](#) (ERP) have persisted for quite a while, so it is important to separate myth from fact to better understand the natural limits of the risk premium. Let's begin with the unarguable: Stockholders are further down in the capital structure of a business. Bonds have first call on company resources, stocks are secondary. Therefore, for the capital markets to "work," stocks should be priced at levels that can produce higher expected future returns than bonds. This relationship should hold particularly when comparing stocks to (ostensibly) risk-free government bonds. Unsurprisingly, stockholders have enjoyed outsized returns from their investments. When investors collectively expect a greater return for stocks relative to bonds or cash, we call this expectation the "equity risk premium."

At its essence, the equity risk premium is the incremental return that we should earn relative to a risk-free asset, as a reward for our willingness to bear risk. But there is no risk-free asset. Cash may have zero volatility, but its purchasing power diminishes over time. Unless we're planning to spend the money tomorrow, cash is not risk-free. Bonds may have a recurring coupon that creates an illusion of eliminating risk from our ability to fund our long-term spending needs. But most of us have spending needs that vary over time, notably rising with inflation. Long [Treasury Inflation-Protected Securities](#) (TIPS), inflation-linked bonds, can be used to fund a real spending plan, well into the future, with minimal risk. In short, the risk-free asset will vary from one investor to another, depending on what future spending our investments are intended to serve.⁵

“At its essence, the equity risk premium is the incremental return that we should earn relative to a risk-free asset, as a reward for our willingness to bear risk.”

Accordingly, we need to tightly define *our* meaning for the term “risk premium,” in order to avoid confusion or disagreements that are rooted in semantics, rather than true real-world differences of opinion. Not only do we need to define what our risk-free asset is (e.g., cash, bonds, or TIPS) and what our risky asset is (e.g., U.S. stocks, global stocks, individual stocks, or some other risky asset). We also need to specify what return difference we are using. A risk premium may be based on single-year expected arithmetic return differences, geometric return differences, log return differences, or compounded multiyear return differences. With such semantic differences, we risk talking past one another in any dialogue on the topic.

“[W]e need to tightly define our meaning for the term ‘risk premium,’ in order to avoid confusion or disagreements that are rooted in semantics, rather than true real-world differences of opinion.”

Exhibit 2 shows how this can happen. Suppose we are comparing past excess returns, which I define as the log-return difference between stock and bond returns, and you define as the annual arithmetic difference between stock and Treasury bill returns. Over the last 75 years, I would calculate a 5.6% excess return compared to your 8.8%. That’s a big difference, but we’d both be correct.⁶ Any discussion of either past excess returns or the expected equity risk premium must precisely specify what definitions we are using.

Exhibit 2. Stocks, Bonds, Bills, Inflation, and GDP, 1949-2023: Different Measures

1949-2023 Returns	Stocks	20-Yr. Bonds	T-Bills	GDP Growth	CPI Inflation
Average Return	13.0%	6.1%	4.2%	6.4%	3.5%
Std. Dev	16.9%	10.6%	3.2%	3.5%	2.9%
Average Log Return	11.0%	5.4%	4.0%	6.1%	3.4%
Std Dev	16.0%	9.7%	3.1%	3.3%	2.7%

Source: Research Affiliates, based on data from Bloomberg, Shiller, and Ibbotson as of December 31, 2023.

Conclusion

Many of modern finance’s foundational theories can be misleading or worse. That doesn’t mean they have no insight to offer. While ample evidence, from Roaring Kitty to Zoomability, may demonstrate that markets in the real world are far from efficient and that homo economicus is as elusive as Bigfoot, by seeking greater clarity and zeroing in on precisely what these concepts mean at the individual level, we can gain a better sense why and how markets and investors behave the way they do. Yes, investors are prone to irrational decision-making, to behavioral biases and cognitive errors. They may also have separate and distinct definitions of the equity risk

premium and its components. But that doesn't mean we should dispense with the ERP or any of the other fundamental principles of modern finance. Our task today should be to think like Hirschleifer did when he developed the equity fear premium and inefficient market hypothesis and seek to bridge the gap between conventional and behavioral finance.

End Notes

1. The 2013 Nobel Memorial Prize in Economic Sciences was—hilariously, IMHO—simultaneously awarded to Eugene Fama for his pioneering work in market *efficiency*, to Bob Shiller for demonstrating market *inefficiency*, and to Lars Peter Hansen for methods to measure and test both.
2. Consider this wonderful excerpt from David Hirshleifer (Hirshleifer, D. 2001. "[Investor Psychology and Asset Price](#)." *Journal of Finance* 56 (4): 1533-1597): "In the muddled days before the rise of modern finance, some otherwise-reputable economists, such as Adam Smith, Irving Fisher, John Maynard Keynes, and Harry Markowitz, thought that individual psychology affects prices. What if the creators of asset pricing theory had followed this thread? Picture a school of sociologists at the University of Chicago proposing the Deficient Markets Hypothesis: that prices inaccurately reflect all available information. A brilliant Stanford psychologist, call him Bill Blunte, invents the Deranged Anticipation and Perception Model (or DAPM), in which proxies for market misvaluation are used to predict security returns. Imagine the euphoria when researchers discovered that these mispricing proxies (such as book/market, earnings/price, and past returns), and mood indicators such as amount of sunlight, turned out to be strong predictors of future returns. At this point, it would seem that the deficient markets hypothesis was the best-confirmed theory in the social sciences."
3. Of course, if the beta or correlation of the asset is negative with the rest of your portfolio, a negative risk premium (or even a negative return) can make sense. Neoclassical finance also allows for a negative risk premium (indeed, the certainty, with assets like lottery tickets) by positing a preference for skew. Some people like the low odds of a big payout enough to tolerate negative mean and median expected returns. In this discussion, I am disregarding preference for skewness, because homo economicus should not value skew enough to tolerate a negative ERP. I view the "skew preference" as a convenient way to adapt the EMH to a world of irrational choices, not unlike an ERP that varies across time and across assets. Neither example is particularly helpful in our efforts to predict markets and asset prices.
4. Whoever coined the expression "Magnificent Seven" clearly did not see the movie. Four of the seven are dead by the end of the film.
5. See Arnott (2006) [Fundamental Indexes: Current and Future Applications](#).
6. My long-standing preference, which has never really caught on, is geometric return differences for stocks versus inflation-linked bonds, as both have inflation passthrough. Cash yields are inherently short term and hugely variable, whereas forward-looking stock market returns are inherently long term and rather more stable. If we define our expected future stock market return as the sum of the current yield plus long-term expected growth in income, that sum is not likely to move more than 1 or 2 percentage points in a single year. Meanwhile, bonds offer a nominal return, while stocks and TIPS offer a real return. In an inflationary world, investors in stocks and TIPS both enjoy inflation passthrough, so that income (TIPS coupons or stock market dividends, and their respective asset prices) can rise with inflation. Treasury bonds do not. Rising inflation helps TIPS, can help stocks, and assuredly hurts bonds.

References

- Hirshleifer, D. 2001. "Investor Psychology and Asset Price." *Journal of Finance* 56 (4): 1533-1597.
- Ibbotson, R. G., and R. A. Sinquefeld. 1976. "Stocks, Bonds, Bills and Inflation: Year-by-Year Historical Returns (1926-1974)." *Journal of Business* 49 (1): 11-4.

The material contained in this document is for informational purposes only. It is not intended as an offer or a solicitation for the purchase and/or sale of any security, derivative, commodity, or financial instrument, nor is it advice or a recommendation to enter into any transaction. Research results relate only to a hypothetical model of past performance (i.e., a simulation) and not to actual results or historical data of any asset management product. Hypothetical investor accounts depicted are not representative of actual client accounts. No allowance has been made for trading costs or management fees, which would reduce investment performance. Actual investment results will differ. Simulated data may have under- or over- compensated for the impact, if any, of certain market factors. Simulated returns may not reflect the impact that material economic and market factors might have had on the advisor's decision-making if the advisor were actually managing clients' money. Simulated data is subject to the fact that it is designed with the benefit of hindsight. Simulated returns carry the risk that actual performance is not as depicted due to inaccurate predictive modeling. Simulated returns cannot predict how an investment strategy will perform in the future. Simulated returns should not be considered indicative of the skill of the advisor. Investors may experience loss of all or some of their investment. Index returns represent back tested performance based on rules used in the creation of the index, are not a guarantee of future performance, and are not indicative of any specific investment. Indexes are not managed investment products and cannot be invested in directly. This material is based on information that is considered to be reliable, but Research Affiliates, LLC ("RA") and its related entities (collectively "Research Affiliates") make this information available on an "as is" basis without a duty to update, make warranties, express or implied, regarding the accuracy of the information contained herein. Research Affiliates is not responsible for any errors or omissions or for results obtained from the use of this information.

Nothing contained in this material is intended to constitute legal, tax, securities, financial or investment advice, nor an opinion regarding the appropriateness of any investment. The information contained in this material should not be acted upon without obtaining advice from a registered professional. RA is an investment adviser registered under the Investment Advisers Act of 1940 with the U.S. Securities and Exchange Commission (SEC). Our registration as an investment adviser does not imply a certain level of skill or training. RA is not a broker-dealer and does not effect transactions in securities.

Investors should be aware of the risks associated with data sources and quantitative processes used to create the content contained herein or the investment management process. Errors may exist in data acquired from third party vendors, the construction or coding of indices or model portfolios, and the construction of the spreadsheets, results or information provided. Research Affiliates takes reasonable steps to eliminate or mitigate errors and to identify data and process errors, so as to minimize the potential impact of such errors; however, Research Affiliates cannot guarantee that such errors will not occur. Use of this material is conditioned upon, and evidence of, the user's full release of Research Affiliates from any liability or responsibility for any damages that may result from any errors herein.

The trademarks Fundamental Index™, RAFI™, Research Affiliates Equity™, RAE™, and the Research Affiliates™ trademark and corporate name and all related logos are the exclusive intellectual property of RA and in some cases are registered trademarks in the U.S. and other countries. Various features of the Fundamental Index methodology, including an accounting data-based non-capitalization data processing system and method for creating and weighting an index of securities, are protected by various patents of RA. (See applicable US Patents, Patent Publications and protected trademarks located at <https://www.researchaffiliates.com/legal/disclosures#patent-trademarks-and-copyrights>, which are fully incorporated herein.) Any use of these trademarks, logos, or patented methodologies without the prior written permission of RA is expressly prohibited. RA reserves the right to take any and all necessary action to preserve all of its rights, title, and interest in and to these marks and patents.

The views and opinions expressed are those of the author and not necessarily those of RA. The opinions are subject to change without notice.

©2024 Research Affiliates, LLC. All rights reserved. Duplication or dissemination prohibited without prior written permission.

AMERICAS

Research Affiliates, LLC
660 Newport Center Drive, Suite 300
Newport Beach, California 92660
USA

+1.949.325.8700
info@researchaffiliates.com

EUROPE

Research Affiliates Global Advisors (Europe) Ltd
78-79 Pall Mall
London SW1Y 5ES
United Kingdom

+44 (0) 20 3929 9882
uk@researchaffiliates.com