



Epsilon Theory

BY RUSTY GUINN

The Three-Body Portfolio

Bernard: If knowledge isn't self-knowledge, it isn't doing much, mate. Is the universe expanding? Is it contracting? Is it standing on one leg and singing 'When Father Painted the Parlour'? Leave me out. I can expand my universe without you.

'She walks in beauty, like the night of cloudless climes and starry skies, and all that's best of dark and bright meet in her aspect and her eyes.'

Arcadia, Tom Stoppard

It is a romantic thought, that we might divorce our personal universe from the universe around us. For us investors, maybe that means to hide in a room building an elegant model to work out the true value of a thing. I mean, by itself it's a complete waste of time...but so romantic!

To make a prairie it takes a clover and one bee,

One clover, and a bee.

And revery.

The revery alone will do,

If bees are few.

"To make a prairie," Emily Dickinson

Since I'm bogarting Ben's title, I might as well steal his best literary reference, too. The market isn't necessarily tied to 'fundamentals' any more than a prairie is to bees. Revery alone will do, and sometimes it will do for a very, very, very long time.

A true German can't abide the French,

But he'll gladly drink their wine.

Faust, Johann Wolfgang von Goethe

You don't have to be French to drink their wine, y'all. Being part of the *Epsilon Theory* pack doesn't mean buying into narratives. It means understanding that in a market, if it matters to someone, it should matter to everyone. And narratives matter to a whole lot of someones.

[Epsilon Theory started from a pretty simple idea](#). Ben observed that no financial or econometric model can ever fully explain the returns or volatility of financial markets. I don't think he'll be too mad if I point out that this wasn't a particularly novel observation. After all, every statistical model in the world has an error term that basically accounts for this — *epsilon*.

$$\beta + \alpha + \varepsilon$$

His more novel observation was that *epsilon is people*.



Said less vaguely, epsilon is the way in which — as people — investors respond to both financial *and* non-financial stimuli in various non-random ways. It is an observation that a not insignificant portion of the systematic (i.e., not diversifiable) risk and return in your portfolio is completely divorced from the risks faced by economies and businesses. It is a feature only of the markets and the people who comprise them¹.

Some regard changing perceptions, sentiment and shifting narratives as a source of short-term volatility in securities prices, and little more. Indeed, that is the implication of the old Benjamin Graham trope I disputed in [The Myth of Market In-Itself](#) — that the market is a short-run voting machine, but a long-run weighing machine. *Sure, sentiment may matter in the short run, but eventually truth will out!* I did a fair job, I think, of identifying my issues with that point of view, but as per usual, it was Ben that really got to the heart of the issue. In his [latest note](#), he characterizes the occasional sharp rise in unpredictability of market outcomes — not to be mistaken for volatility — as the result of a [Three-Body Problem](#). You do yourself a disservice if you haven't read the piece, and probably a greater disservice if you haven't read the Liu Cixin book of the same title recommended in it. But in short, a three-body problem refers to a system that is solvable not through elegant algorithm, but only through brute-force computation. There is no closed-form solution to predict the future locations of a set of three planetary bodies in a vacuum like, say, the Earth, the sun and the moon.

¹ I know some will pipe in that this is just part of beta. This is mathematically true in that systematic sources of risk are what we mean when we say 'betas', but anyone reading this who pretends not to understand that what we're talking about is a specific component of systematic risk that tends to be understated in favor of econometric and financial variables is a filthy pedant.

In most environments, where the purpose of markets is to efficiently and accurately price risk of various uses of capital, those markets tend to behave more or less like two-body systems. The interaction of Planet A (which we'll call 'fundamental data') and Planet B (which we'll call 'prices') is generally predictable. Oh sure, there's volatility. Remember, not everyone agrees on the starting point and velocity of Planet A — at least, not since Reg FD, anyway. Information takes time to propagate. But we also know that Planet C (let's call it 'epsilon') is sitting out there somewhere. Yet it's far enough away that its gravity can't do more than induce short- and medium-term distortions in the relationship between A and B. If you *knew* the truth about the starting positions and velocities of Planet A and Planet B, however, you could develop a formula that would tell you within a pretty fair margin where prices would be down the line.

In this typical state of the world, being a better investor has meant getting better at uncovering the *truth* about Planet A so that you can predict Planet B's future location. It's no wonder that a generation of investors grew up learning about traditional security analysis, the only way investment management is taught in every business school in the world.

Still, everyone from the most well-respected market commentators to the staunchest Graham and Dodd-quoting undergrad recognizes the existence of markets in which Planet C — epsilon — contributes its gravity to the system. Among those periods in which our ability to make predictions on the basis of relationships between fundamental data and securities prices is especially poor, are those we know as bubbles and manias. William Bernstein characterizes these periods as those typified by the "flood of new investors who swallow plausible stories in place of doing the hard math." He goes on to quote Templeton, admonishing investors, "The four most expensive words in the English language are 'This time it's different.'"

Well, guess what? Roll your eyes at the expression to your heart's content, but I'm telling you what Ben has been telling you for years now:

This Time It's Different.

It's not different because people really got it right this time (in ways they missed every other time) about some new technology that's going to Change The World! Electric cars, cryptocurrency, AI and automation, these may all be fabulous things, and they may well prove to be game-changers for productivity and returns on capital down the line, but if you think any of those things explain current valuations, you're nuts. You're also wrong.

It's different because financial markets are no longer a mechanism for price discovery and the pricing of risk of capital allocation decisions.

Markets have been made into a utility. More to the point, they have been made into a political utility, a tool for ensuring wealth and stability of our political structures. The easing tools we dabbled in to stabilize prior business cycles were brought to bear instead as tools for propping up and expanding financial asset prices. Beyond the direct marginal price impact of the easing itself, central bankers tailored communications policies to create Pavlovian responses to every narrative. Our President

tweets about the policy implications when the S&P 500 hits new highs, for God's sake². This isn't a secret, y'all. The singular intent of every central banker in the world is to keep the prices of financial assets from going down, and the singular intent of every government that puts those central bankers in power is to ensure that they do so, in order to retain social stability. Sure, there's a dual mandate. But the mandates aren't employment and price stability. They're (1) expanding financial asset prices and (2) effectively marketing the idea of corresponding wealth effects to the public.

Markets have also rapidly become a social utility, an inextricable part of every contract between governments and the governed. Underfunded pensions and undersized boomer 401(k) accounts mean that ownership of risky assets is not a choice driven by diversification or relative return expectations, but by the fact that it is the only asset they can buy that has any potential of meeting the returns they would need to be adequately funded. Let's say that you are running a state pension plan that is 65% funded. Your legislature is telling you that no help is coming from the state budget. You and every member of your agency will be fired if you even suggest cutting benefits, if you even have that authority. Your consultant or internal staff just did their new mean reversion-based capital markets return projections, and higher valuations mean projected returns on everything are lower. What's worse, your funded status assumes returns that are higher than anything on their sheet. You are being presented with a [Hobson's Choice](#) — behind Door #1, you get fired, and behind Door #2, you lever up your stock exposure with an increased private equity allocation. This a brutal position to be in.

And sure, like most markets with bubble-like characteristics, this one has become a utility for psychic value as well. Investors buy Bitcoin on the narrative-driven belief that it is an 'investment' in the technology, a way to participate in shifting the economy toward privately negotiated and settled transactions. It isn't. We've all seen the absurd stock charts of companies who did nothing more than add "blockchain" to their names. We've observed TSLA, NFLX and CRM continue to trade on earnings reports that provide zero incremental data on business direction or momentum but heroic narratives that the sell side dutifully push out to the masses looking for good stories. If you must own risky assets and those assets don't have growth, then *revery alone will do, if bees are few*.

It may comfort us to say that "The market has been divorced from fundamentals for so long, but eventually it must swing back." And it will. The point of this note, and the point of The Three Body-Problem isn't to say that it won't. Planet C will drift away again, and outcomes will look more like what economic and business fundamentals would predict. More like our historical analysis of what drives good, high quality investments. But too many investors are comforting themselves with the stories of the 1990s, of the Nifty Fifty, and the idea that non-fundamentally-driven markets mean return to sanity after five to ten years. But they don't have to. And because of the utilization of markets, because of the exit of passive-oriented investors from the price-setting margin of markets, it's possible that they won't for a very long time.

This Three-Body Problem isn't going anywhere for a while.

² Actually, he tweets about the Dow hitting new highs, because *of course* he refers to the Dow.

The Three-Body Portfolio

When I began this Code series at the beginning of 2017, I kicked it off with [A Man Must Have a Code](#), a conversation about why we think that all investors ought to have a consistent way of approaching their major investment decisions. I posited that a code ought to consist of a concise list of Things that Matter, Things that Don't Matter and Things that Don't Always Matter (But Do Now). And so, my notes have focused on investing principles that I think of as generalized solutions. These are things that I believe are true in both Two-Body and Three-Body Markets:

1. In [I am Spartacus](#), I wrote that the passive-active debate doesn't matter, and that the premise itself is fraudulent.
2. In [What a Good-Looking Question](#), I wrote that trying to pick stocks doesn't matter, and is largely a waste of time for the majority of investors.
3. In [Break the Wheel](#), I argued that fund picking doesn't matter either, and took on the cyclical, mean-reverting patterns by which we evaluate fund managers.
4. [And They Did Live by Watchfires](#) highlighted how whatever skill we think we have in timing and trading (which is probably none) doesn't matter anyway.
5. In [Chili P is My Signature](#), I wrote that the typical half-hearted tilts, even to legitimate factors like value and momentum, don't matter either.
6. In [Whom Fortune Favors](#) (Part 2 [here](#)), I wrote that quantity of risk matters more than anything else (and that most investors probably aren't taking enough).
7. In [You Still Have Made a Choice](#), I wrote that maximizing the benefits of diversification matters more than the vast majority of views we may have on one market over another.
8. In [The Myth of Market In-Itself](#) (Part 2 [here](#)), I wrote that investor behavior matters, and spent a lot of electrons on the idea that returns are *always* a reflection of human behavior and emotion.
9. In [Wall Street's Merry Pranks](#), I acknowledged that costs matter, but emphasized that trading costs, taxes and indirect costs from bad buy/sell behaviors nearly always matter more than the far more frequently maligned advisory and fund management expenses.

In all of these, you've gotten a healthy dose of emphasis on getting beta — how we get exposure to financial markets — right. But you've seen precious little on alpha — uncorrelated sources of non-systematic, incremental return. Where we dealt with the usual ways in which investors seek out alpha, I have been critical. Maybe even derisive. Sorry, not sorry. There's a reason:

Even in normal environments, alpha is hard.

Alpha is hard because it's hard to measure. It's hard to know if what we're doing is actually something that adds value, or if we're being fooled by randomness. We may even just be layering on some other systematic factor, or beta, that is just compensating us for taking additional risk. Every couple of years, someone rediscovers that bond managers tend to "have more persistent alpha", and a couple of weeks later, someone rediscovers that bond managers just layer on more corporate credit risk than the benchmark. Every couple of years, stock-picking strategies go back into vogue — it's a

stock-pickers' market, they say! Fundamentals matter again! No, they don't. You're structurally smaller cap and loaded up on higher volatility names, and when those factors work, you feel smart.

Alpha is hard because randomness is an insanely powerful force in the universe and within our industry. Any time I hear a fund manager or financial advisor say, "Look, a 10-year track record like that doesn't just happen by accident," every part of me wants to scream, "Yes, it bloody well does, and if there's anything true and good about mathematics at all, it will happen by accident ALL THE TIME." I'm not saying that Warren Buffett's success is an accident, but I am absolutely saying that with as many investors as there are, it is improbable that history would not create Warren Buffett's track record. We are all looking for a way to increase returns that doesn't involve taking more risk, and once we've gotten all we can out of diversification, *believing* in alpha is our only choice.

In a three-body market where *epsilon* exerts its gravity, alpha is not just hard. Finding it emphasizes entirely different types of data and analysis. The whole point of recognizing an increasingly chaotic system is that our confidence in the causal relationships over time and between assets at a point in time drops significantly. Given that tools relying on temporal and cross-asset relationships are the ones we most often use to evaluate investment strategies, it puts us in a bit of a pickle! Sure, there are some exogenous strategies like high-frequency trading that are pretty effective across environments for mechanical reasons. But many of the "time-tested" strategies that work in Two-Body Markets can stop working for a very long time, and the "new" strategies we identify in our in-sample periods can start looking like hot garbage the second we drop them out-of-sample. The search for alpha in this kind of environment — even when it occasionally bears fruit — is time-consuming, expensive, and often leads to unintended risk, cost and diversification decisions that more than offset any positive that they generate. We get a stock pick right, but it is dwarfed by sector effects. We pick the right country to invest in, but get killed on currency. For many investors — for most investors — this means that trying to beat "the market" on an intra-asset class level or at on an inter-asset class level through tactical asset allocation should not be part of their playbook. For these people, I hope the Code to this point is a useful tool. Thanks for reading.

But for those who know they won't be content with that very adequate outcome, I'll do my best to talk about alpha strategies that I think can work in a Three-Body Market. That means identifying the likelihood of success of various analytical security and asset class selection strategies. It also means giving you my perspective on what edge (ugh, I know) would even conceivably look like in a fund manager. As we close the door on 2017, I also close my series on The Things That Matter and The Things that Don't Matter. As we open the door on 2018, look forward to a new series on the Things that Don't Always Matter (But Do Now).

Together, I think they'll provide a pretty good roadmap for the Three-Body Portfolio. But I mean, even if they don't, at worst you'll get to read horror stories of terrible fund managers, so what have you really got to lose?

From Texas, my best wishes for a prosperous New Year to you and yours.

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