Epsilon Theory

BY RUSTY GUINN

The Fundamentals Are Sound

February 8, 2018

Cobb: What do you want?

Saito: Inception. Is it possible?

Arthur: Of course not.

Saito: If you can steal an idea, why can't you plant one there instead?

Arthur: Okay, this is me, planting an idea in your mind. I say: don't think about elephants. What are you thinking about?

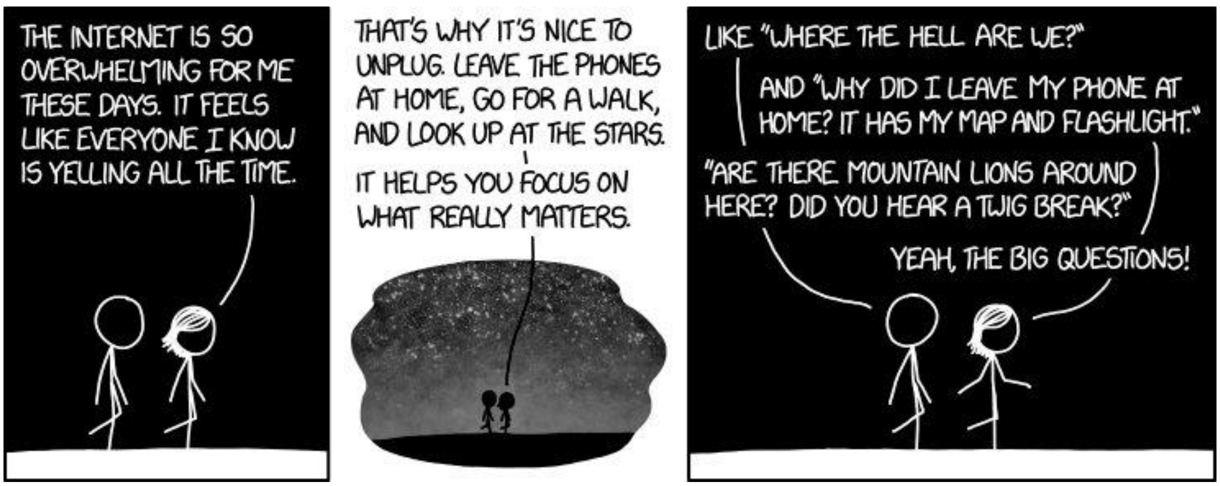
Saito: Elephants?

Arthur: Right, but it's not your idea. The dreamer can always remember the genesis of the idea. True inspiration is impossible to fake.

Cobb: No, it's not**.**

***— Inception* (2010)**

Cobb is right. It's not impossible. When we are deep in our element as analysts of economies and issuers, we are supremely confident. We know the critical assumptions in our portfolios, models and projections cold. But when we apply ourselves to assessing what others' views may be, with understanding what is 'priced in', we begin to doubt. Deeper into the hole, where we grapple with what other price-setters are treating as the consensus of yet other investors, our models break. More importantly, our confidence evaporates. Our vulnerability to those stories explodes. So how do you feel about your positioning today?



— Randall Munroe, "Night Sky", *XKCD*

The dream of retreat to a world where we can win by understanding what's really happening underneath the hood is a siren call. We remember the first time we figured out how to identify potentially unpriced optionality in a business model. When we absolutely pegged that fatally flawed assumption in the new management team's cost reduction plan that no one else saw. You know. The good ol' days.

There are brief flashes in which central bank or inflation narratives, fiscal policy angles, next-thing rotation pitches from the sell-side and "cash coming off the sidelines" think pieces seem to fade to the background and we see daylight again. And sure enough, it's another head fake. That long-awaited rotation back to value unwinds after two or three sessions, and we start grumbling about "algos" and passive investors and volatility-targeted strategies and extravagant tech multiples and cryptocurrency excesses and are there mountain lions around here?

> **Arthur:** So, once we've made the plant, how do we go out? Hope you have something more elegant in mind than shooting me in the head.
>
> **Cobb:** A kick.
>
> Ariadne: What's a kick?
>
> **Eames:** This, Ariadne, would be a kick.
>
> <Kicks the leg of the chair Arthur is leaning back in, causing him to catch and collect himself>
>
> **— *Inception* (2010)**

It's easy, if a bit heartbreaking at times, to move on from a fundamental investment thesis. Most good ones have a list of sell disciplines describing exactly how they fail, anyway. It's slightly tougher to change our perspectives on how other investors are likely to behave. But once we acknowledge that everybody knows that everybody knows something, it is almost impossible to know what sort of evidence we can rely on to reject it. That has a lot of important implications, but one more than any other: Narratives tend to influence prices far, far longer than we expect.

> "I don't know half of you half as well as I should like; and I like less than half of you half as well as you deserve."
>
> This was unexpected and rather difficult. There was some scattered clapping, but most of them were trying to work it out and see if it came out to a compliment.
>
> **— J.R.R. Tolkien, *The Lord of the Rings,* Speech from Bilbo's 111th Birthday Party**

From time to time I speak to and run seminars with students at colleges in Texas, usually with business school students or participants in student-run investment funds. Like any instructor, I have a go-to *challenge* question. It is a question to spark inquiry, to raise a skeptical eye to the priors with which we approach many of the fundamental questions of investing. It's also an asshole question. Because, like most instructors, I am an asshole.

"What", I ask the students, "is the most important single driver of today's price of ExxonMobil stock?"

It's the worst kind of question, because I'm obviously asking it for the sole purpose of telling everyone they're wrong. Still, it's fun to watch the arguments between very bright students. "Value" is always among the first two or three responses. "Well, what do you mean by value?" I prod, usually yielding a response about multiples. "Value may influence your returns going forward, but a multiple IS the price, so that can't be it," a student usually responds, before the discussion descends into bickering and debate over fundamental data which may drive pricing. Earnings? EBITDA? Cash Flow? Oil Price? No, *future expectations* for oil prices!

It's *yesterday*'s price, I tell them.

<audible groans>

It feels like a throwaway, the sort of dad joke enjoyed only by middle-aged professionals in tweed playing at being a professor. But for investors trained by schools, banks or long-only shops in the various churches of fundamental stock-picking, it is a necessary and important reminder. Most approaches to security analysis inherently view each day as a *tabula rasa*. We wake up and decide to evaluate all available information about companies and their securities, determine that the appropriate price either has or hasn't changed and send our updated limits to the desk. Except that isn't how this works at all. Like almost anything else in public and political spheres, prices are *always* determined around the margin.

Consider the tax cut debate the U.S. just endured, and the language used by politicians and media to discuss the issue. Each tax plan is presented as either a cut or a hike, and good or evil on that basis (or on how said cut or hike disproportionately favors one class or another). Did you hear a single analyst discuss what *absolute* level for a particular income category would generate the most revenue? What would be the fairest on either an objective or subjective basis? Stimulate the most consumption or investment? A politician who never said a word about a static 20% tax rate might be furious with the idea of taking it from 15% to 16%, for example. This is true across every kind of policy issue, and across budget issues for every corporation and household in America. We rarely, if ever, discuss and debate policy issues or investment decisions on an absolute, aggregated basis. Our evaluations are always, always, always on the margin.

This is doubly true for financial markets, where these marginal determinations are made daily. That means that exogenously influenced, random and economically sensible drivers of variations in prices, and, most importantly, the narratives built around them, all become part of the accepted structure of a security's price going into the next trading day. Strong efficient-markets hypothesis adherents would say that this is wrong, and that any trading not reflective of currently available information would be quickly stamped out and the price returned to an appropriate representation of all available facts (whatever those are). Strong EMH adherents are also too busy being served negative calorie donuts glazed with a 1937 Chateau D'Yquem reduction from a polished unicorn's horn, so be grateful that the rest of us can have a serious conversation about investing in peace.

That said, the basic idea isn't wrong, is it? Over enough time, securities prices can diverge enough from the price of comparable investments in ways that influence enough investors to abandon the idea that the accumulated information contained in *yesterday's price* is right. EMH assumes that this happens insanely quickly, and the rest of us sane people recognize that it takes some time. In fact, I'd say the world today largely falls into three camps: (1) rare EMH holdovers in academia, (2) kinda-sorta efficient market folks that believe information just propagates slowly, and sentiment…er..something something Brownian motion, and (3) those who believe that prices reflect a shifting mix of fundamental financial data, investor preferences, objective functions and attempts to guess the preferences and objective functions of others.

Some would characterize these differences as a simple question of time horizon.

But are they?

Dick Thaler's Party Trick

If you've ever had a professional dinner with Dick Thaler (maybe personal dinners with him go this way too, but I have never been invited), you've probably heard him give his telling of the Keynesian Beauty Contest that Ben has written about several times.

In Keynes's version of the contest, you win by correctly picking the woman from a series of pictures in a newspaper that you think will be voted as the most beautiful by everyone participating. First-degree thinking, in Keynes's parlance, is to pick the woman you believe is the most beautiful. Second-degree thinking is picking the woman that you believe the other participants will believe is the most beautiful. Degrees above that require thinking less about beauty or what others will think is beautiful, and more about what the contestants are likely to think about one another. There is no neat solution to this illustration, of course, because we don't really know what others find beautiful. We are even less certain about what others will believe about their peers' ability to judge beauty. This uncertainty makes it particularly apt as an analogy to the practice of investment management, but Thaler's version has the added feature of applying simple mathematics in the place of subjective determinations. That's useful because it allows us to quantify consistent behavioral tendencies in the game.

Thaler's version is a little different, and goes something like this:

Everyone at the table must pick a number between 0 and 100. The winner will be the person who chooses the number that is closest to 2/3 of the average.

Because there are multiple calculations that a person might ignore or fail at, I'm taking some liberty of interpretation, but I think the first-degree answer to this question is 33. The player will realize that he has no information to guide his first step within the 0-to-100 range, so he concludes that the average of 50 is the only sensible place to start. We'll give him credit for realizing that he must be 2/3 of that number, and thus arrives at 33.

Unlike Keynes's contest, Thaler's also has a 'real' solution. You've seen it replicated (albeit in a flawed format that isn't Pareto-optimal) in the movie *A Beautiful Mind*. You know, the bar scene with the blonde? Also, why is every example of game theory a creepy story about old male economists picking beautiful women? Anyway, Thaler's problem has a single solution that is a Nash Equilibrium: zero. If everyone can calculate 33, then surely they'll figure out 22, 15, 10, and all the way down. By the time you're playing 23rd-Degree Dinner with

0th Degree	50.00
1st Degree	33.33
2nd Degree	22.22
3rd Degree	14.81
4th Degree	9.88
5th Degree	6.58
6th Degree	4.39
7th Degree	2.93
8th Degree	1.95
9th Degree	1.30
10th Degree	0.87
11th Degree	0.58
12th Degree	0.39
13th Degree	0.26
14th Degree	0.17
15th Degree	0.11
16th Degree	0.08
17th Degree	0.05
18th Degree	0.03
19th Degree	0.02
20th Degree	0.02
21st Degree	0.01
22nd Degree	0.01
23rd Degree	0.00

Dick, you've already gotten down to two digits of zero. A computer would tell you this instantly. But then, a computer would also assume that all the people playing understood AND remembered limits from their first week of calculus. There's no shame if you don't. I mean, there *is*, but it's politer to say that there isn't.

When we have played this game with clients, audiences, classrooms and colleagues, my experience is that the winning guess consistently falls between 15 and 22, usually closer to 22. I expect, but don't know, that Thaler would give you a similar value.

What does this mean? Or at the least, what does it imply?

First, it should be obvious that every sufficiently large iteration of this game will include some people who don't understand it at all. Some won't have a natural grasp of expected value and won't start from 50, but from some other number they expect will be popular. These people will tend to increase the average winning point total somewhat, since they aren't following the averaging and iterative mathematical process that forces all the numbers downward. If you want some real-world examples of what this person looks like, Google "Bitcoin Price Target."

The second group of participants — usually a small group — are those who understand the basic principles of the problem but think that everyone else is a moron who doesn't. They bet on 33. These are your first-degree thinkers. This is basically every graduate of every business school in the world until he has to manage an actual P&L for the first time.

The third group of participants — usually larger than the second — understand the math all too well, and assume that everyone else can, too. They provide the real solution of zero, or if they have a modicum of wisdom to pair with that beautiful brain and neckbeard combo, add a couple points to catch the stragglers who are too slow to catch on. They drag down the winning score. Ben wrote about these people earlier this week in Too Clever by Half. They're the coyotes.

The bulk of participants, however, answer between 22 and 33. They understand that the principle is to recognize that you want to be 2/3 of the answer everyone will guess. Since the most basic answer without getting into guessing others' behavior is 33, they go one layer deeper and judge it to be sufficient. This is second-degree Keynes. In this way, Keynes's example is much more like financial markets, because it incorporates compounding uncertainty at every level. We know what we think. We have a pretty good guess at what others think. But building a mental model of what others think others will think is an order of magnitude more challenging, because it requires perspective not only on the underlying — a woman's beauty — but on others' prejudices and biases about the other judges!

Playing a third-degree game is too daunting a task to consider for most, and so curiously, even in the mathematically deterministic version of the game that has a Nash equilibrial *'correct' answer*, the takeaway is the same as in the beauty contest: you usually win by guessing that others are playing a mix of one to two degrees of the Common Knowledge Game. Some people buy and sell on fundamentals, and some on how they think people will react to them.

But as Ben discussed in The Three-Body Problem, we think that this is changing. We think it has changed. We think that the violent expansion of communications policy by global central banks and the accompanying expansion of always-on media has meant more participants shifting to third-degree thinking. The reason we talk about Narrative so much is that we find it a useful metaexpression of and proxy for exactly the kind of mental model a third-degree participant must construct. When we refer to Narrative, we mean it as an expression of what everyone knows that everyone knows.

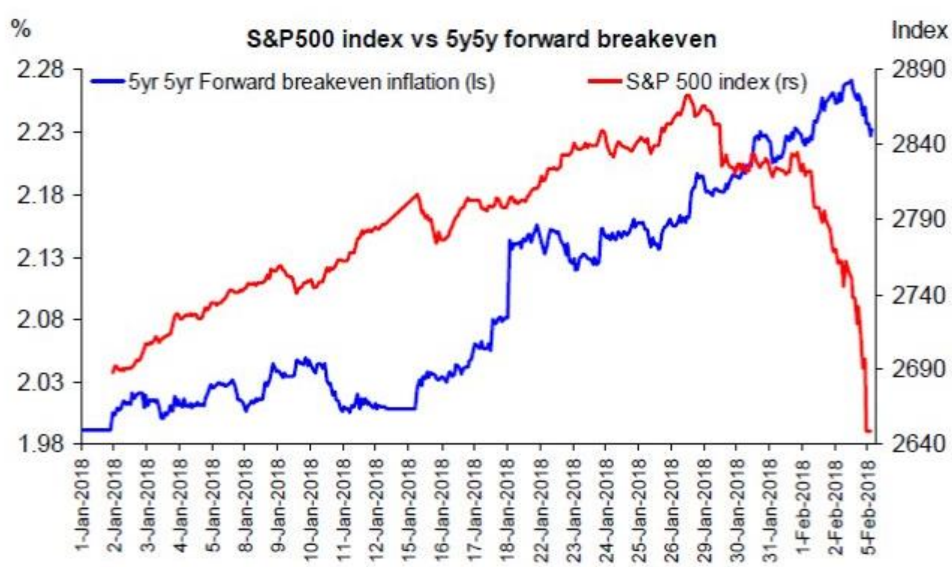
If you accept that Narrative is exerting greater influence on asset prices, you will lose if you play the traditional strategy. You will lose if you assume that others are playing one- or two-degree strategies.

The Fundamentals are Sound

So what did ***everybody know that everybody knows*** over the last couple weeks? And when you looked at the game unfolding, what strategy were you playing?

I've written about the silliness of trying to ascribe specific causes to market action, but I'm willing to stand on this as probably, approximately correct. Let me tell you what I think happened. Then let me tell you what I think other people think happened. And if you'll bear with me, let me tell you what I think markets will ultimately decide everybody knows that everybody knows happened.

I *think* that there was already an emerging Inflation Narrative coming into 2018, although not much actual inflation to show for it. Ben has written credibly about this on several occasions. Torsten Slok at Deutsche Bank put out a nice chart highlighting breakevens leading into the events of last week (don't get too cynical about the forced perspective of sell-side axis ninjas, please).



Source: Deutsche Bank 2018

I *think* that a roaring start for risk assets in early January gave tactical allocators, macro shops and hedge funds an opportunity to bank early returns (and incentive fees) by taking off risk. I say "think," but "know" would be nearer the truth. I have the receipts, as it were.

I *think* these funds *thought* that the emerging Inflation Narrative warranted pulling back some of that risk not just in risky assets but across their book, including in rates (sovereign debt). I think this accelerated and compounded confidence in the Inflation Narrative.

I *think* that many market participants *thought* that the focal point of the event through the end of January was not inflationary expectations, but frothiness of equity markets. I *think* they *thought* this because that is where their focus had been as a result of the remarkable returns of 2017 and 2018 and the length of time since the last S&P decline of any significance. I *think* media bears this out, but it's story, not fact.

I *think* that the resulting spike in volatility on February 2nd and into February 5th confirmed and exacerbated what most people *thought* about the proximate cause of the correction. As a result, the weight of market behaviors shifted from response to a rate shock or rise in inflationary expectations to a classic risk-off trade.

I *think* that with the relaxation in volatility since the events of late January into February 5th many investors *think* that the event was an equity and volatility event. A moment of irrational pessimism brought on by blow-ups in vol-selling and vol-targeting.

I *think* that more large institutional allocators today than at any point since the early 1980s *know that their peers know* that inflation, if and when it comes, will fundamentally change how they must build, allocate and manage portfolios.

I *think* that instead of focusing on this, other investors are comforting themselves with an age-old mantra: **"The Fundamentals are Sound."**

"The Fundamentals are Sound" on the U.S. economy. On stocks. This was just a correction that we needed after things got a little frothy. It was short-term sentiment. It was risk parity and vol-targeting funds driving markets lower for no reason after a jump in vol. If you loved the Dow at 26,000, you ought to really love it now.

"The Fundamentals are Sound" on cryptocurrencies. The price action doesn't matter. It's the technology that matters. As long as you research and understand the technology and what it has the potential to do to overcome overcentralized, centrally planned banking and transactional systems, you won't lose. All the smartest people, all the people who have really done their research on this technology, the people who get it, are not sweating these price moves.

Amazing. Every word of what I just said is wrong.

Well, it isn't that the statement isn't factual. It may be. It's that we have no idea if and when it is going to matter. You can argue all you want that it's a random walk to a known destination, but as the walk gets longer, that distinction becomes less meaningful.

Sure, it serves a useful purpose to use this language with some clients, in that it keeps them from taking rash actions to change their asset allocation without a real basis for doing so. If you're a financial advisor and telling your client this fact helps to keep them from dumping all of their risky assets, then you have my blessing and more. But we must be honest with ourselves. If we believe that "Fundamentals are Sound" is necessarily a relevant statement after a correction like this, we must acknowledge that it also carries two embedded assumptions that are so extreme that it's worth taking a step back to truly unpack them.

1. It requires us to believe that yesterday's price was the right one.
2. It requires us to believe that non-fundamental influences on price (second-degree or third-degree issues) have not changed either, or that they will revert soon.

The silliness of the first ought to be self-explanatory. The "Fundamentals are Sound" relative to *what?* Relative to how they manifested in prices yesterday? Last week? How they would have manifested over the last 30 years? Absolute pronouncements of appropriate valuation and marginal thinking about price changes are a risky combination.

Understanding the second is a bit nearer to my purpose here. After events like this, it is appropriate to ask: do I think that the decision-making processes of other investors have changed? Do I think that those investors' views of other investors' positioning and decision-making has changed? Furthermore, do I think that any of the broad Narratives reflective of how investors are responding to one another have changed, or that they have strengthened or weakened?

Now, my confidence about the mechanics I'm describing here is high, but I don't judge my ability to evaluate using these mechanics to be higher than any of yours. In fact, many of you are probably shrewder investors than I. But I think a lot of investors will be coming out of the last two weeks saying that nothing has changed, or focusing on how long it will take to bounce back from a couple weeks of fear-driven market behavior. I think that may be a mistake. Why?

Because it takes much longer to unwind third-degree thinking. Narratives last.

Think about the Keynes game again. Imagine that I drew a feature on one of the men or women from the beauty contest to make them most distinctive, and perhaps more polarizing. Let's say a diamond nose stud, or a face tattoo. How long does it take you to figure out how your first-degree thinking about the game changes? Second? Third? How much more data would you need to conclude that there was a change, and how would that differ for thinking at each degree? How many more events to give you insight into responses? There's a reason Narrative-driven markets last far longer than we expect them to. Time passes more slowly in a dream-within-a-dream than it does in a single dream alone.

Again, I think investors who look at risky or speculative assets and say, "I like this just as much, and I don't really see why it should have gone down this much," may well be right. I think that they'd be justified in having some expectation that volatility will fall, and that some of the correction would be recaptured over coming weeks and months as people forgot why they felt the need to go risk-off for three days in February.

But I think it's not the Friday and Monday sell-offs and whether they were "justified" that will end up mattering. It's what happened the week before that we should be paying attention to.

If the events of that week did anything, it was to further convince me that market participants have bought into the Inflation Narrative — even well in advance of strong data on *actual* inflation. So while I don't have any valuable short-term positioning thoughts (and I never will, so don't ask), I think that the surprising strength and persistence of this Narrative — and Narratives in general — has real implications for us as asset allocators and alpha-seekers. Even alpha-seekers in the Craftsmanship Alpha mode.

We all talk a big game about diversification, and rightfully so. Look, I wrote a piece that called it the second most important thing in investing. But how big a part do TIPS (Treasury Inflation Protection Securities) play in your portfolios? Commodities? Other real assets? Many of these have been such abominable relative investment opportunities over the last 35 years that they frequently aren't even considered as asset classes. In some generous cases they're called alternatives or diversifiers, but few investors today consider them in the same context as stocks and bonds.

As the Inflation Narrative heats up, I believe asset allocators will have to seriously evaluate the extent to which this tacit assumption is still appropriate. They will have to grapple with whether nominal bonds have the same crisis risk aversion and diversification characteristics that they have over the last couple decades. But here's the rub. They will have to do so in a prospective, long-term way that may not have the benefit of a recent high-confidence in-sample and out-of-sample period for their backtests. Are you ready to tell your committees that you think sovereign bonds may not be the same safe asset in certain types of major equity drawdowns? Are you ready to suggest what to do about that? Are you prepared to stake your career on it?

It's not uncharted territory. There is nothing new under the sun, after all. But it's territory that few of us have trod during our careers. And if you're staring at the ground, trying to convince yourself that it's solid before every step, you may be missing where we're headed. We have to be humble, too. If you've been talking about an emerging Inflation Narrative for a few months, we know enough about behavioral biases to recognize that you'll start seeing 'evidence' of it everywhere you look. But that's kind of how Narrative works in the first place, y'all. In the end, we don't have all the answers, but we do *think* we know how to *think* about these questions.

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