Chris Cole: Optimizing portfolio construction for changing times

February 13th 2020

Erik: Joining me now is Chris Cole, founder and CIO of Artemis Capital and, perhaps more importantly, arguably the most requested repeat guest that we've ever had on MacroVoices.

For all of the people who we didn't have time to reply to your emails (because there are so many of them), yes, we got the request and we got Chris back on just as soon as we could. So thanks for your patience.

Listeners, I strongly encourage you to download Chris's article because there are a number of graphs and charts that it contains which will be useful for you to refer to as we are discussing these concepts in this interview.

Also, in addition to the article, there is a version of it in podcast form if you want to listen to the article instead of read it. In that case, I also recommend that you download the paper article first so that you can look at the charts and graphs, but you can hear Chris read it to you if you prefer to listen to the narrated version.

Download links for the pdf of the article as well as Chris's audio book version of the article are available in your Research Roundup email. If you don't have a Research Roundup, email it means you're not registered yet. Just go to macrovoices.com and look for the red button that says Looking for the Downloads? next to Chris's picture.

If there is anything I've learned about markets, it's when Chris Cole writes a paper that has either a snake or a serpent on it, take it seriously. Because the last time that we had you on – or maybe it was two interviews ago – we talked about at the time a brand new paper that you had published called "Volatility and the Alchemy of Risk" and you talked us through that.

In the course of the conversation, you perfectly detailed exactly how the short-volatility trade could blow up the entire VIX complex. And something like two weeks or 10 days after that interview was taped, that's exactly what happened. And it went down almost blow by blow exactly the way that you said it could.

You said yourself later that the timing was luck because you had been waiting for that to happen for more than a year. But it happened exactly the way you described.

You've got a new paper which has gotten the attention of a whole lot of people in finance. It is

called the “Allegory of the Hawk and Serpent.” So, once again, we’ve got a snake in the title.

Before we get into the details, why don’t you give us the high level? What is this paper about?

Chris: Well, it’s a pleasure to be back on the show. And I really enjoyed the last time, so thank you for having me on.

The latest paper, the “Allegory of the Hawk and the Serpent,” I really start out with this question. I pose a question to the reader: Imagine you have the opportunity to grant your family incredible wealth and prosperity for 100 years. But that’s subject to a really important choice you have to make. You have to choose one set of allocations to different asset classes, you have to maintain that allocation to 100 years. What allocation and what assets do you choose?

So to answer this question, I went back and we tested various financial engineering strategies and institutional portfolio management strategies and assets going all the way back to the 1920s.

How does risk parity perform? How does a covered call strategy perform? How does commodity trending perform? How does long volatility perform?

And then we did a portfolio optimization to understand what is the best combination of these different strategies for the modern portfolio. Something that performs throughout all generational seasons that is consistent performance through deflation and inflation.

As a bit of a sequel to the last paper, I was thinking about this idea of volatility and this cycle of risk and how that embodies a snake. And during a period of economic growth, there is solid demographics, solid fundamentals, new technology. And then you have fundamental growth.

But towards the end of that growth cycle, those fundamentals are replaced by debt and leverage expansion such that perpetual earnings growth and asset growth can be attained.

At that point, the snake begins to devour its own tail. And it will do this and self-cannibalize until, of course, it does.

And there is this ancient symbol of a hawk attacking the snake. And the hawk represents the forces of change.

So this idea of the snake and the hawk in this incredible battle, this represents everything you need to know about the perfect portfolio.

The hawk signifies the forces of secular change that challenge and destroy the corrupted growth cycle of the serpent. The left tail of that hawk is the deflationary path and the right tail is the inflationary path.

And if you want a portfolio that lasts for 100 years, you need to balance growth assets like equity, like credit, with countertrend assets that profit from change. These are hawk assets like volatility, like commodity trend, and gold.

If you do this and size these countertrend asset at surprisingly large allocations, you get a portfolio that performs consistently for 100 years.

And while this might not seem groundbreaking, I think the idea behind this is to say the way that we're running all of our entitlement programs, retirement programs, is almost guaranteed to cause a crisis if we don't radically rethink the way that these pension entitlement programs and the asset classes they are sized to – these programs will struggle in a period of secular change.

Erik: Chris, somebody famous (I forget who) said something along the lines of it's not what you don't know that gets you in trouble. It's what you do know that just ain't so.

And what occurred to me as you were speaking is I bet people who are not familiar with your reputation and your background in the industry would listen to you and say who is this guy kidding?

He must be an amateur. He's talking about what's the optimal portfolio for the long haul. Everybody knows that. It's so basic. It's the 60/40 fixed income to stock portfolio. 60% stocks, 40% fixed income.

And if you want to get fancy, you vary it for people who are over 40 years old by increasing the percentage allocation to be the person's age to bonds and the rest to stocks.

And everybody in the industry who has been around knows that that's the proven long-term – what works best. The statistics support it. I know that, because I assume that the people around me must know what they're talking about.

I'm going to take a little leap of faith here and I'm going to assume that you do know all about that. And not only do you know about it, but you can very easily debunk those beliefs.

So what's wrong with that line of thinking? Why do so many people think that is the proven long-term solution? And what could go wrong if everybody stays on that model, even as we get into what Ray Dalio has described as a coming paradigm change in market?

Chris: The 60/40 portfolio, which actually has morphed into about a 70/30 portfolio for most pension systems who are using various equity-linked products like private equity as part of that equity bucket, it suffers from incredible recency bias.

And I will say that, so much so, that recency bias is now a systemic risk that will threaten the

insolvency of the entire entitlement and retirement programs if we don't radically rethink these asset allocations.

So the reason for this and the reason I'll say it is that, by any measure of financial history, the last four decades were one of the most significant periods of asset-price growth ever. 91% of the price appreciation for a classic equity and bond portfolio over the past 90 years comes from the 22 years between 1984 and 2007.

It's absolutely incredible: 94% of the returns for domestic equities, 76% of the profit from bonds. Bonds earned 15 times what they earned over any other period.

So, to this point, any strategy that overweighted stocks and bonds – or, in the case of risk parity, leveraged bonds – did spectacularly well during this unique period of history, the period between 1984 and today.

The reason for this is because you had a once-in-a-generation – 76 million baby boomers. This is a huge demographic boom that – all of these baby boomers, they all entered markets in the '80s and began earning money and spending money and saving money.

So you had this incredible inflow, this wall of capital coming into markets, right as technology and globalization occurred and right as interest rates peaked at 19%.

And over the last 40 years, this tidal wave of money flowing through – with globalization, lower interest rates, lower taxes – has created this pro-cyclical growth appreciation in just traditional asset prices that is unmatched if you look at any other period of history.

I think if one really wants to see this, look at the paper and look at some of the graphs we have that actually demonstrate the returns by period. And you'll just see how much stocks and bonds have outperformed through this cycle than any other period across history.

It is just not reasonable to expect to get that same performance going out over the next 40 years, particularly from the bond segment. Because there is just no way that yields can drop the way that they have over the last 40 years.

So the trillion-dollar question we just need to ask ourselves: Is this repeatable or not?

And if the answer to that question is no, then you've got a major entitlement crisis. If we remove this once-in-a-multi-generation period of asset price appreciation, the typical returns for a portfolio go down from about 7.5% all the way down to about 4% to 5% a year.

And if that's the return that our entitlement programs are going to get, then the unfunded liability leaps up to about $3 trillion – anywhere between $3 to $10 trillion. And that's the entire forward-year revenue of the US government. It's anywhere between four to seven times the price of the last bank bailout.

So if history is any guide and this period of asset price appreciation doesn't repeat – and all odds are against it – we are going to need an entitlement bailout that will dwarf anything we saw during the Great Financial Crisis.

Erik: Chris, one of the concepts that you describe in the article is something that you've given a beautiful title to: *The law of cosmic duality* in investing. And it addresses what I think is one of the most counterintuitive concepts in finance.

Which is, if there are three asset classes – let's call them A, B, and C. And A and B both produce on average a positive return over time, but C is a loser, it loses money over time. Intuitively, if I'm going to choose only two out of these three, I would always choose A and B because they make money and not choose C because it loses money.

But there's a reason that sometimes A and C or B and C might be the better choice. Please explain.

Chris: Yes, I think the reason is that anyone who has done any type of portfolio analytics understands that the correlated return is worth far less than diversification and anticorrelation.

So what does that mean in general?

When I talk about this idea of cosmic duality, it sounds like a new-agey term. But I always like to use this metaphor about Dennis Rodman.

There was a statistical analysis that was done on Dennis Rodman that showed that, even though Rodman as a basketball player (back when he played basketball), even though he couldn't score – he was a really poor scorer, he couldn't hit any shot outside of five feet consistently – that when you put him on the floor, the offensive efficiency of his team leapt up. Incredible stat.

In fact, Rodman wins over replacement value and the offensive efficiency of the team. And all of those metrics leapt up dramatically when Rodman was on the floor or playing for a team.

The reason is that Rodman was six standard deviations better than the average player at rebounding the basketball. So if somebody missed a shot, Rodman would get the rebound. And sometimes he'd get two or three rebounds. And that gave your team a second and a third chance to score the ball. Incredibly valuable.

Another example I give in the paper is Genghis Khan, how he was a military genius. And what he would do is he that would stagger different flows of attacking and retreating forces. He would send in a group that would attack and then it would immediately retreat.

When the traditional European armies would advance in a one line of attack, he would send in

a different wave of attackers that would then surround the opposing army in a countertrend action to the retreating attackers.

This trend/countertrend dynamic resulted in very effective warfare, despite the fact that his armies sometimes were smaller than his opponents'.

Why does any of this relate to portfolio management? It's very clear that if you're combining different asset classes in a portfolio, you're better off taking an asset that has a positive performance to the growth cycle with an asset that actually doesn't have positive performance but performs when the growth cycle turns down. Then you are layering on top of one another growth assets one after another.

It's the same concept.

Dennis Rodman is much more valuable to his team because he is able to get the rebound than an excess scorer is.

To the same point, if you are a pension system, you are much better off investing in something that's non-correlated to the growth cycle and non-correlated to equities – like volatility, like commodity trend, like gold – than you are adding something like private equity, which is correlated to the growth cycle.

Erik: Chris, you lay out a whole bunch of terrific foundational concepts. But I'm going to fast-forward past a number of them because the part of your paper that I really want to discuss with our MacroVoices audience is what you call the dragon portfolio.

And I'm just going to condense a lot of the beginning of the paper to tell our listeners that, basically, you've looked over the long term – not just the last few years that we've been in a particular market pattern, but over the long haul – what really works best in terms of the optimum portfolio strategy. And it looks nothing like a 60/40 equity and fixed income portfolio.

Instead, we see equities only occupying 24%.

Chris, what else occupies the rest of that pie? And why are those other components there?

Chris: Well, a portfolio that performs, of all the portfolios that we tested, actually combines at about one-fifth allocation to each of these asset classes approximately: equities, fixed income in the form of US Treasury bonds or high-quality bonds, gold at about 20%, commodity trend at about 20%, and long volatility at about 20%.

This is a highly unorthodox allocation. But this strategy of these different asset allocations not only performed with the highest rate of returns over 100 years, but also performed exceptionally well in every single market cycle, whether or not we were in stagflation or whether we were in deflation.

And the reason is because you have these asset classes that benefit from these growth regimes, what I call the regimes of the serpent – that's like equity.

But then you have these other asset classes that benefit from the regimes of secular change. That's what I call hawk assets. And secular change can be periods of either inflation or deflation. The left or the right wing of the hawk. And these are asset classes like gold and commodity trend.

Combining all of these, you are able to actually end up being protected with a consistent return through every market cycle.

Erik: Chris, I don't want to spend any time on equities and fixed income because, obviously, everybody understands the roles that they play and the reasons that it's important to invest in them.

But long-vol strategies and gold and commodity-trend strategies, those are things – I guess in the case of MacroVoices listeners, they understand the long gold strategy very well. But long vol and commodity trend are strategies that most people really don't think of, other than as obscure alternative investments that most people don't pay attention to.

You are Mister Long Vol. You run a long-vol fund. A lot of people think it's the best long-vol fund in the industry. So why don't we start there, with long vol?

What is the role of a long-vol strategy in this dragon portfolio? Why is it important that it be there? And how does it compensate or offset what happens in terms of other asset classes in the portfolio?

Chris: Most people think that the role of defensive assets is to make money during a rainy day. But the real reason to hold these assets is to make money during a rainy decade.

And something like long volatility and also commodity trend has this component. They are countertrend assets that profit either during periods of extreme deflation or extreme inflation. So these are asset classes that made money, obviously in periods like '08, but would have made money through the entire decade of the '30s and also the '70s.

Now, a lot of times we think of long volatility as being something that has negative carry. We think of it as a negative-carry asset.

But actually, if you were running a long-volatility or tail-risk position, that carried positively all the way between 1929 and 1946 because you had an entire decade where volatility was realizing at about 35, with massive swings both to the left and right tail.

So, in this sense, long volatility really protects you against these extreme movements.

It also can protect you in periods where there is fiat devaluation, if you're playing the right tail.

During a period like the '70s, you ended up having stagflation with very high auto correlation or trending in market returns. And volatility actually performed really well through that particular decade of stagflation.

Now, I think the problem that we have is everyone thinks about this and they nod their head. And they say, I get it. I understand long volatility. I understand the benefit of an asset class like that. I think that makes sense as a countertrend dynamic and how I can use it in my portfolio.

But then when it comes to actually allocating to these strategies, and this includes commodity trend as well, their emotional lizard brain takes over.

It's very common for people to come in and, after a decade where volatility has been suppressed or where there has not been any kind of trending asset price movement, people come in and say, why would I want to invest in an asset class that hasn't been making money consistently over the last five to ten years?

And that's exactly when you need that asset class.

The converse is also possible, where you have situations like in 2009-2010 when tail-risk hedging was very positive or very popular. Or a period like right after the Great Depression. Everyone would want to buy these defensive assets. That would be very popular, to own the defensive assets during these periods.

That's when you want to be selling the gains from the defensive assets and moving them over to growth assets like equity.

So even though the answer to portfolio management is very clear, it's very difficult emotionally to allocate to these assets classes and to take gains from equity markets and rebalance them to an asset class that hasn't been making money, even though it's anticorrelated and will be there for when you need it.

Erik: Now, Chris, I think there is a side of this whole long-vol concept which most of our listeners already understand. It's the simple, okay, I've got a stock position in my account. I'm a little bit concerned. I want to protect that in case a big rainy day comes, so I'm going to buy a protective put, paying for an insurance policy.

That's a negative-carry trade. I'm paying an insurance premium to get that downside protection. And, as you say, it's kind of hard to justify continuing year after year to keep paying that premium for something that you don't end up using.

But people know how to put that trade on, is my point. You buy the protective put. It's pretty

straightforward.

As an institutional long-vol fund manager, you're apparently doing something a lot more complex than that. Because your fund seeks to provide these downside risk hedges, but you try to do it in a way which, on the whole, does not have a negative carry, that actually has a positive carry.

That's kind of counterintuitive. How the heck do you buy an insurance policy that pays you a premium instead of paying for the premium? Sounds like too good to be true. Sets off a lot of alarm bells.

So how would you as a fund manager design a product that can offer that seemingly impossible balance of features?

Chris: That's an excellent question. And I will say there is no silver bullet solution to this. There is no simple solution to it.

Part of it is being a very dynamic and active manager. So we are very actively looking at the way volatility is valued in the market via term structure, via skew, constantly looking for opportunities to own volatility where there is positive carry or where we can get a minimal cost of carry with high convexity. And then just dynamically sizing into those positions.

So part of it is utilizing some of the same principles that are applied by volatility arbitrage, but skewing that towards the positive tail component of the exposures.

The other thing we do, and we've been moving into a lot of, is we use a tremendous amount of cross-asset features to understand when the probability of a left- or a right-tail move is greater.

And then we use dynamic sizing of option positions based on those probabilistic assessments through thousands of different data features in order to develop a better carry profile for our clients.

There is always an element of basis risk. So I always like to differentiate the idea of long volatility from tail-risk hedging.

Tail risk is purely insurance. It's not an alpha product. It loses money consistently over time. Where long volatility is an actively managed product that, in essence, attempts to minimize the cost of carry. Some years it's up, some years it's down.

But overall you should get a much better carry profile. And that should make money through the business cycle.

Now, in my paper I actually back-test these strategies going back 90 years. And we can talk a little bit about how I did that and some of the assumptions that were made.

But one of the things that's really interesting was I found that a long straddle actually would have carried positively for the greater part of 70 years. You definitely had positive performance through the Great Depression, but you also had really positive performance through the period of the 1970s.

And one of the reasons that this occurred is because – I think something that's understated in the way people think about volatility, everyone thinks that when you're long vol, it's all about vega. They all think it's about the one day the market sells off dramatically. And that's the day you make all your money.

What they don't understand is that in a financial crisis – that could be a crisis that's deflationary like 2008, or inflationary, or stagflationary – what ends up occurring is you have a perpetual trend in the direction of asset prices. So prices move higher each day or lower each day. And they don't mean revert.

The last 10 years have been one of the most mean-revertive periods in the history of markets. But markets weren't always that way and are not that way during a period of a secular crisis.

So a long-vol position is more than just vega or the vol explosion.

You actually make a lot of your money on what I'll call gamma, which is the idea that every single day the trade is moving in a way that's towards your favor and your exposure is increasing. That's your gamma exposure. It's your exposure to the trend of the underlying asset class.

And this was particularly powerful in periods like the 1930s, the 1970s, and, surprisingly, in periods like the 1950s as well.

Erik: Chris, we've had Charlie McElligott on the program as well as our own Patrick Ceresna talking quite a bit to listeners about this gamma flip phenomenon where dealer gamma hedging has really changed the market in terms of just the expected behavior. There are these magical gamma flip acceleration points where market moves change because of this gamma hedging activity.

How does that fit into this story? And how do you accommodate for that, or compensate for that as the case may be, in the composition of a long-vol fund like the one that you manage?

Chris: It's important to understand that this yield-chasing regime, the snake cannibalizing, eating its own tail, is really driven by more than just low vol.

What we've had is a combination of lower interest rates driving a central bank response mechanism, driving low volatility, and then resulting in very, very low asset price trending.

Another way of putting that is to say that there is a very low autocorrelation in markets, or a very high mean reversion.

So, as we've gone through 40 years where rates have dropped from 19 to zero, and we've become accustomed to the fact that central banks will always be there to provide liquidity to the markets or cutting interest rates, that has provided a tremendous reactionary response to asset prices.

And that has resulted in multi-generational lows in autocorrelations among multiple different asset prices, most notably stocks.

Given the fact that the last 10 years have been a generational low in autocorrelations, we've then seen various strategies come online that seek to monetize that mean reversion expectation and low volatility, and sell stability in order to generate excess yield.

So, to that effect, that's where you have all of these call-overwriting, put-selling strategies, short-volatility strategies. And then, in the most incredible dynamic, just like a snake devouring its own tail, the dealer hedging of that short-vol complex has then made the market even more mean-reverting.

The thing I really want to let your listeners know, or it's vital to understand – you can see the graphs – the last 10 years, you are talking the most mean-reverting periods in markets over 100 years.

And markets were not always that way.

So, not only are long-volatility funds losing in their vega exposure, but they're losing in their gamma exposure. It's been one of the most difficult periods in 100 years to own volatility and to own price trend.

One of the ways you can do that, of course, is to look at these periods where the dealer gamma hedging is like a rubber band. Every single time asset prices try to move out of a band, they are snapped back in in a mean-reverted framework. But if asset prices move too far out of that band, the rubber band snaps and there is a jump to the other side.

One of the ways that you can actually time volatility exposure is to actually understand when that rubber band is going to snap and try to allocate at those pinch points.

But, speaking to a broader picture, what will happen to these strategies in the event that there is a secular regime shift and all of a sudden markets become far less mean-reverted? Well, what are drivers that could cause that?

One of the major drivers is the fact that central banks can't cut anymore. So if you end up going to the zero-bound and they are unable to either politically or for various reasons continuously

apply stimulus, that will have an effect on the mean reversion assumption in markets.

The other thing is inflation.

So let's just say central banks decide to print a ton of money and we have helicopter money. Well, that's a form of fiat devaluation. And that's a massive amplifier for autocorrelations that will wreak havoc on any mean-revertive strategy and cause blowouts in all the dealer gamma exposure.

So, to this point – I really want viewers to understand this – if you look at short volatility and you look at it over the last 10 years, you see a really great track record. Or if you look at something like buying dips, you see an incredible track record over the last 10-20 years. That's compounded at 10% a year.

But if you go back over 90 years, these strategies go bankrupt. Completely bankrupt.

And it's not because of vol spikes. It's because of this autocorrelation effect, this price trending. That's what causes strategies like put selling, naked call overwriting, covered call overwriting, and buying the dip to go bankrupt when tested over 90 years – even though they've performed very well in recent history.

Erik: Chris, I want to talk a little more about that short volatility trade because I thought I understood it until we talked off the air and I realized I didn't.

If we look at this trade, it's not just target mangers that are getting into this. It's institutional fund managers who ought to know better who can't seem to resist the performance tease of the short-VIX trade.

And, really, what it comes down to is they're monetizing the contango yield in the term structure of VIX futures. It's that roll every month to a consistently higher number that they're shorting. That is what's being monetized.

Now, I thought I understood that because, obviously, the risk there is someday there is going to be a big downside event in markets. There is going to be a market crash or a major correction. And it's going to blow them up.

That's exactly what happened in 2018. And of course the VIX complex blew up even more than the market did because, once it got going, it was a panic and people couldn't get to the exits quickly enough.

But I always assumed that what would blow up a short-vol trade would be a down event in markets. You told me off the air that that's not always true. Please elaborate.

Chris: We should actually talk a little bit about the difference of different short-vol trades.

Because XIV is a term-structured trade (or what XIV used to be). So, in that sense, you are seeking to play the roll-down of the term premium of the forward volatility curves.

So the idea that, even though VIX might be down at 13, if you want to buy VIX at some month in the future you're going to pay a premium to that. And that's the term trade.

That's a different trade than the variance premium trade, which is describing the ideal of isolating the difference between implied volatility and realized volatility. If we really want to get even more complex, we can talk about ways different institutions monetize implied correlations.

But if we stick on this idea about volatility, in this dynamic, most people are talking about the idea that you're not only shorting vol but you have some sort of gamma exposure.

And I think one of the things that people really have not quantified, they tend to think in terms of shock tests, which is this idea that, okay, we have one day the market sells off and volatility spikes. Can you survive? And that's the way that most of our testing is done, on a risk basis.

But very few people look at the kind of path-dependency risk. This idea that what happens if you have declines day after day after day, or increases day after day after day, and volatility is rising.

So it's not a one-day sudden calamity like 1987 was. It is the market is down 2%. It's down 1% the next day. It's down 3%. It's down 50 basis points. It's down another 2%.

That rolling trend which then accompanies higher vol, no one stress-tests that because it implies a kind of path movement through time.

And one of the things I'm saying is that, even though many of these short-volatility strategies will survive a shock test, XIV didn't. But many of the institutional strategies will survive a shock test.

I will say that very few of them, when applied robotically and systematically, can survive that extended period test where you have autocorrelation and higher vol, you have asset price trending and higher vol.

And I think one of the things the paper does, it shows in very painful detail if you read the appendix that these strategies that people think are safe, like covered call overwriting or selling puts as an equity replacement, actually result in complete bankruptcy, even when collateralized.

And I'll say that again: These short-volatility premium strategies executed by institutions, the major pension funds that many of the listeners have invested in or have stakeholders that they know, many of these strategies will go bankrupt in the event that we have a repeat of

autocorrelations that we experienced in the 1970s or the 1930s.

And there's very defensible assumptions and very replicable assumptions that are put in the paper that explain this.

Erik: Hang on a second, Chris. You're losing me here. When you said even covered call-writing strategies – well, wait a minute. Covered call-writing strategy means I take some income now and maybe get forced out of a position at a profit but just not as big of a profit as I would have made if I had stayed in the position.

It seems to me like I certainly understand why that covered call writing in a sudden face-ripper of a bull market might cause me to underperform my peers. But how could I go bankrupt?

Chris: It's a great question. When we modelled that, let's go through some different scenarios in the 1930s.

So obviously, the covered call overwriting, as a strategy that many financial advisors and large pensions employ, called a buy-write strategy, [in] that strategy you sell the upside by selling a call and then you own the stocks.

Well, in the 1930s, between 1929 and 1932, the stock market dropped 80%. So your equities fell all the way 80%. Now you're making money selling calls into that, so you're performing a little bit better.

But then what occurs is you have a fiat devaluation with the Banking Act of 1932, and a de-val versus gold. And at that point, stocks went up 70% in 1.5 months. Incredible.

So you've taken a 70-80% loss on your stocks on the way down and you've sold off all of your reflation benefit by selling the calls on the way up. That strategy really would have gone bankrupt through the '30s.

But let's imagine how that could play out today. Let's imagine we have a really difficult financial crisis. And all of a sudden we lower interest rates to zero and there is a big crash. And equity markets drop 30%. It's not crazy to imagine that.

From there, we end up having a move towards more progressive politics. And central banks go crazy and they start printing money all over the place.

All of a sudden, instead of printing money just to buy asset prices, we're supporting repo markets, we're throwing money to buy infrastructure. We're giving student loan write-offs. It's not unfeasible to imagine this reality happening.

And all of a sudden asset prices rip higher. Same vein, you realize 30% losses and then your selling volatility on the upside losing any of those gains continuously. You are going to have a

massive underperformance on that type of position.

So it's really interesting. Something as simple as a buy-write strategy obviously would have been completely impaired during the period of the 1930s. And during the period of 1964 to 1984 pretty much made no money at all because of that same fiat devaluation framework and the selling of the upside.

Strategies like naked call selling, that's a terrible strategy. It lost 3% a year for 90 years with complete insolvency.

But many of these short-vol strategies underperform. Not only because of the vega component but also because they are negatively exposed to asset price trend. And that presents a huge problem, particularly in markets where there is a fiat devaluation to support asset prices.

Erik: Chris, I want to come back to the real topic at hand here, which is according to your dragon portfolio, we ought to have 21% of assets in an institutional asset account. If I'm running an institution pension or something, I ought to be thinking about maybe a 21% allocation to a long-vol strategy manager like yourself.

But here's the problem: I don't know how to measure you because, if I'm trying measure equity-linked guys or fixed-income guys, their job is to outperform their benchmark. So I say, okay, show me your tear sheet.

And my eye goes immediately to the performance column. I want to see how your numbers look and how variable they are and so forth compared to the benchmark and compared to your peers.

You've got a completely different value proposition. You're not saying look at my tear sheet, I beat the S&P.

What you're saying is look at this. I just barely eked out a tiny little profit, which means that I was able to somehow miraculously stay carry-positive even though I provided a huge amount of insurance policy effect that's kind of hard to measure after the fact.

So I certainly am impressed if you're able to turn the strategies you're talking about into a positive-carry instrument. That's great.

But how do I know how much protection you really were affording me. Is there some other metric that's used in your side of the fund industry? Because it's not about beating a benchmark, right?

Chris: There are benchmarks. There is the CBOE Long Volatility Hedge Fund Index. But you're right, it's more difficult to benchmark.

Erik: But wait a minute. The goal of these funds, as I understand it, is not to produce big returns the way – if I'm looking at an equity-linked fund, their job is basically to produce the biggest return they can.

Your job is not to produce a big return. Your job is to produce huge returns when there is a rainy day or a rainy decade. But most of your returns that we can evaluate historically were in periods when those things weren't happening.

Chris: There isn't accuracy in the sense of how do you measure the benefit of this. And it's the same problem – it's the same reason why Dennis Rodman was a second round draft pick. Because people are saying, well, he's not scoring. What benefit does this guy have to my team?

So, to the same point, you have to look at the track record of a long-volatility hedge fund manager. And you have to combine that with your risk assets.

And when sizing that long-volatility manager in with your other pro-growth risk assets, your Sortino ratio, your return to downside volatility, or your Sharpe ratio should increase. Particularly your Sortino ratio should increase.

And then the other way to look at it is to say how has this manager performed during the biggest risk-off periods in the markets? Those are also key factors.

What type of returns do you have and what type of anticorrelation are you getting during regimes where it's most impactful? So in that sense it's a little bit harder.

But one has to look and use some base level statistics to combine the long-volatility manager with your other scoring assets to understand the value of the rebalance.

Now this is interesting, because the strongest hidden values to a long-vol manager is this idea that we're giving you liquidity when you need it the most.

Asset prices do not become cheap because people are stupid. They become cheap, predominately, because there is not enough liquidity and credit lines are being drawn, and they have no choice but to sell.

Some people panic. But a lot of the worst declines in market history are driven by the withdrawal of liquidity and the withdrawal of credit and then insolvency.

Well, volatility managers give you liquidity when you need it the most. It gives you an ability to then go buy those undervalued assets.

The problem is we don't get credit for it. If you want to add, we can show that by adding long volatility into the portfolio, your risk-adjusted returns go up.

But what gets really interesting is how do you quantify the benefit of being able to take those gains and apply them to buy undervalued risk assets?

Private equity is the exact opposite.

Private equity is the strategy that everyone is crowding into for excess returns right now. All the pension systems, they all want private equity. And, with due respect to the asset class, private equity takes away liquidity when you need it. And they're not penalized for that liquidity reduction during periods where they're not able to get financing.

So, in the same vein, like having a dollar at the bottom of markets in 2008 is much more valuable, is extremely valuable. There is a way to quantify that. It's much more valuable to have a dollar at the bottom in 2008-2009 than to have a dollar today.

But private equity is taking away those dollars when you need it and locking up those dollars when you need it, while volatility is giving you those dollars when you need it.

So there is a very big difference. And you'd think that major institutions would be smart enough to quantify this.

But the very fact that we have 71% equity-linked exposure and very little exposure to countertrend assets like vol, gold, and CTA shows you that the majority of institutions and retirees are simply pounding the correlated risk-on, seeking excess returns through the assumption of shorting volatility, going long stability, and by taking on liquidity and credit risk than they actually are valuing that liquidity ability that long volatility in some of these other strategies provides you.

Erik: Chris, I want to move on now. Because, as much as I could go on for hours asking you about a lot of nuances we didn't get to with this long-volatility component of the portfolio, you've also got an 18% allocation to commodity trend following.

Now, I think our listeners already understand why you've got the gold allocation there. But commodity trend following, hey, wait a minute. Isn't that something that's just for commodity traders that wear cowboy hats or something?

How does commodity trend following fit into this dragon portfolio? Why is it there? What purpose does it serve in the portfolio?

Chris: For the same reason that volatility profits from autocorrelations, or that long vol can profit from autocorrelations, that's really what commodity trend is seeking to monetize – the trend effect in these various different commodity asset classes.

And commodity trend performs really well during a period of fiat devaluation. We saw explosive performance of commodity trending in the 1970s. And that was also the secular peak

in autocorrelations.

One of the things I get asked a lot of is what do I do in rising asset prices? How can I hedge against rising asset prices? Particularly since there is not a lot of good volatility or accessible volatility trades on interest rates.

How can you protect against rising yields?

Well, if you're afraid of inflation, commodity trend is a fantastic trade, or it's a fantastic asset class to allocate to. Because, very naturally, you end up having these explosive autocorrelated movements in different commodities that that strategy can profit from.

Of course, commodity trend also did really well during the Great Depression as well.

Erik: Well, it certainly makes perfect sense to me. Because one of the things I've pondered is what do you do in a macro environment where you think a lot of things are really kind of rich valuations. Certainly with respect to price earnings ratios and so forth. We've got some really, really rich valuations here.

So what do you buy? Value strategies, nothing is cheap.

But it seems like trend following is something that works, regardless of whether the backdrop is one of high prices or low prices. It's just whatever is trending. So it makes perfect sense.

But I want to ask you about how you measured this over a 90-year period. Because when I interviewed Niels Kaastrup-Larsen on this subject of commodity trend following –he's one of the guys who actually designs the algorithms that run these computer-driven CTA models.

He told me the people that look at this as if there is some magic price level that we've modeled because of, say, a moving average crossover model or something, that's the way this used to work like 30 years ago.

But these days it is much more sophisticated at doing real-time momentum analysis where they're not just looking at price levels but they're looking at rate of change in real time, doing all kinds of fancy computerized stuff in order to run these commodity-trend- following strategies.

And for any listeners who are not familiar with this strategy, be sure to listen to my interview with Niels Kaastrup-Larsen where we spent the whole hour talking about it.

But I guess my question is your whole paper is analyzing the 90-year performance of various different strategies. Commodity trend following, as far as I know, almost didn't exist in terms of anybody running that strategy 90 years ago. And during the last 50 years, it is changed dramatically in terms of how it works.

So how did you measure it? And is that really an accurate proxy of these very sophisticated models that are used today in order to execute that strategy?

Chris: Well, the same logic could be said for the volatility strategies we've modeled, in the sense that how do you measure these going back 90 years when there really wasn't a liquid options market?

And there's numerous assumptions that are put into – and I think very defensible assumptions – that are put into our paper that talk about how we model these.

And we purposefully model them in simplistic replicable ways rather than adding a lot of complexity. Because that's the only way that we really could seek to get an honest assessment of how some of these strategies would have done over 90 years.

So I will say this much: What you're seeing in my paper are the most basic versions of these strategies. And I can go into a little detail on that.

And one of the things that will be abundantly clear is that, even in the most plain vanilla execution of these strategies, it's been one of the most difficult decades for volatility and commodity trend in 100 years.

Anyone who is surviving is probably doing it pretty damned well. And if we end up getting some sort secular regime shift, all of those advanced strategies may end up benefiting them compared to the plain vanilla execution.

Now, how did I replicate commodity trend?

We actually were able to get various different prices of different commodities going back over 100 years. And then we applied simple 50-day moving averages on those broad commodities. We did not include in our commodity trend index – replication index – over 90 years, we did not even include financials in that.

So, once again, this was purposefully simplistic in order to be able to generate a solid expectation and replication of the gist of these strategies over 90 years.

Volatility was even a little bit more complex.

What I did is that, obviously we had asset price movement over the last 90 years, but we had no vol surface going back to the Great Depression. So if you're going to value an option, how do you create a vol surface into the Great Depression?

Well, I took the last 30 years of vol surfaces and I created a vol surface by doing a multiple variable regression looking at observable factors in the underlying market.

For example, what's the price movement of the underlying? What's the realized volatility of the underlying? Can we calibrate a vol surface based on different points to these observable price features from the underlying asset class?

And then from there I was able to calibrate a vol surface that we then applied to synthetic options going all the way back to the Great Depression. We actually looked at a replication index which ended up having, I think, over a 0.9 correlation to some of the CBOE indices that were actually executed with options.

So we actually could show that we had a very solid performance of our replication index since the 1980s. And we felt comfortable then taking that replication index and mapping it all the way back to the 1920s.

And a lot of the detail on how we replicated these different strategies is in the back of the paper. Although, absolutely, these were purposefully simplified in such a way that represented a basic framework so that we could just understand how the gist of these strategies would have performed over 100 years.

Erik: Chris, I want to talk about the big picture, though, of this balanced risk dragon portfolio.

Because, let's face it, what you're saying here is you really approximately – it's not just 20% equities, you're saying 24% equities. But it's still less than a quarter equities.

Dude, look at how equities have performed for the last 20 years. How could you say with a straight face to an institutional asset manager, look, reduce your 60% or 70% – or maybe you're levered up to 400% – equity exposure to just 24% to make room for long vol and commodity trend and gold positions?

How do you justify that?

Chris: Most investors would rather fail conventionally and succeed unconventionally. And what I mean by that is that it's very, very difficult to have high allocations in an institutional portfolio to things like gold, volatility, and commodity trend.

But if you want to thrive for 100 years, you need to balance assets that profit from secular growth with those that profit from secular decline.

The problem that we have is not a problem of investing and it's not a problem of economics and finance. It's an emotional problem.

When stocks have been booming, the longest expansion in history, it's very, very hard to look at a long-vol fund that has flat returns and take those gains from stocks and allocate it to a long-vol fund, even though that long-vol fund is providing much needed diversification and will

help you in the event of change.

At the same time, it's really, really difficult after 20 years of equity price declines, like we had in 1946 –

You're a GI that's coming back from World War II and you want to start a family, and someone tells that GI to invest in stocks and real estate. That guy would say what are you talking about? Stocks have been down for 17 years. Real estate has been down for two decades. Why in the world should I invest in stocks and bonds? I'm going to put my money in cash.

So the consensus knowledge we have today, you had the exact opposite of that consensus knowledge in 1946. And it would have cost that GI a tremendous amount of money from being able to allocate prior to the boom in the 1950s.

To the same vein, if you want to have liquidity at the bottom of the next secular bust or the next stagflationary dynamic, you need to be looking at things like commodity trend and looking at things like vol rather than private equity and yield-enhancement products.

Erik: Okay, Chris, as I look at the pie chart here of this portfolio, I just want for our listeners' benefit –

Fixed income and stocks, if you don't understand those asset classes you shouldn't be listening to MacroVoices.

Gold, we have done lots of gold interviews recently and we've got lots more coming. So we're going to cover that adequately.

Commodity trend following, the interview to listen to is my interview with Niels Kaastrup-Larsen. You can find the download link for that interview in your Research Roundup email next to Niels' picture there.

Then finally moving to long vol, you're the guy, Chris. You haven't said it, but I'll say it for you so you don't sound like you're tooting your own horn. A lot of people in this industry think you are the man who really understands this long-vol and vol-hedging strategy better than anybody else.

Now, unfortunately for our pure retail audience, your fund is only available to accredited high-net-worth individuals and institutions. But most of our audience is accredited investors and institutional investors.

For those folks, accredited and institutional investors who want to contact you and find out more about this, where can they do so? How can they get ahold of you?

Chris: I think the best way to do that is to go to our website at www.artemiscm.com. You can

download the paper there as well. And get some more information from the fund once someone has vetted it as being accredited.

Erik: And for the retail guys who are not eligible to invest in hedge funds, definitely read the paper or listen to the paper, your choice, Chris has provided both. And listen to my previous interviews with Chris. And also that other paper which is now a couple of years old titled "Volatility and the Alchemy of Risk." It's as relevant today as the day it was written. So that's very much worth a read as well.

We are over time unfortunately folks, so we're going to have to leave it there. Patrick Ceresna and I will be back as MacroVoices continues right here at macrovoices.com.