

**Adam:**            00:00:01       That's right.

**Mike:**            00:00:02       Yeah from it.

**Adam:**            00:00:02       Hey, welcome to this week's Resolve Riffs. Today we are excited to host none other than Mike Green alongside your favourite ReSolve partners and contributors Mike Philbrick and Richard Laterman. As usual, we'll go through and cheers. We are having a lighter day, I think Mike and I are bouncing back off of a tequila tasting last night which is actually really good. I hadn't really tried much tequila since my university days other than sort of in Margaritas or what have you. It was a really pleasant shock just how far tequila has come. It's just remarkable. It's like this gentle sipping drink, and then we got into the really nice mezcal, which was even nicer, smokier and just had this really rich flavour that I wasn't expecting. I was a little bit worried about today but I bounced back. Drinking a glass of wine so keeping it light and tame, but in the spirit of things and I guess, Mike, it's a lot earlier for you, right?

**Mike Green:**      00:01:18       It is. So I'm going with the bourbon. It's a-

**Adam:**            00:01:24       Non sequitur alert.

**Mike Green:**      00:01:25       This is my second day in a row drinking at lunch. I spent the morning and afternoon with Mark ... and Bill Fleckenstein yesterday and so we had to sample some of Mark's legendary rum punch, which is really quite spectacular. It was nice, along with a tri-tip that he made that was just unreal. Anyone following me on Twitter can tell that I've been eating product from Mark ... farm for the past 12 hours now so I'm pretty happy camper.

**Adam:**            00:01:58       I see. I'm connecting the dots now on some of those posts about eggs and chickens.

**Mike Green:**      00:02:02       Yes, exactly.

**Adam:**            00:02:03       Gotcha.

**Richard:**         00:02:05       Well, cheers guys.

**Adam:**            00:02:05       Yeah. Cheers.

**Mike Green:**      00:02:06       Cheers.

**Mike:**             00:02:07       Cheers gentlemen. Here's to a wonderful Riff. And as always, I will just remind everybody that this is for entertainment purposes and if you're looking to

pursue investment advice in your portfolio, consult a professional. This is entirely a free form conversation that could go in many different ways. Consult a local professional for things that might be applicable in your portfolio because the four scoundrels on this particular show may or may not know what they're talking about.

**Adam:** 00:02:42 A creative disclaimer. I like that. So Mike, I bet...this is going to be hard with the Mikes, so Mikey G I guess and Mikey P, I don't know how we're going to do this. But let's-

**Mike Green:** 00:02:53 Let's not do Mikey, but you can call me what my lacrosse coaches used to say, which is Green, you dumbshit.

**Mike:** 00:03:01 Yes. I will respond the dumbshit too though.

**Adam:** 00:03:07 That's not working. Okay, I'll just call you Michael and Mike I guess, we'll try that. So Michael maybe I don't want to spend too much time with you going through your thesis your sort of, I know you have many theses but your core thesis in too much detail because I think many people will have already heard many of those points but maybe summarise it. First of all, what are you doing now? What's your role at Logica? What does Logica do and what is this core thesis that you guys are playing out? Let's try and keep that tight and then I think this is going to go for a while. So I hope you budget a little extra time at the tail end of this thing, but maybe start there.

## Backgrounder

**Mike Green:** 00:03:50 Okay, sure. I am the Chief Strategist and Portfolio Manager and a partner at Logica Capital Advisors. Logica at its core, is a firm that trades with...falls into a classification of long volatility product, although we actually, our flagship product is what's called an absolute return product. So, the Logica Absolute Return Product, and it's very unique within that niche, is most absolute return products are running significant short positions which expose them to high negative skew. The products that we choose to trade put us into a very positive skew framework. In some weird ways, we overlap with the more traditional crisis risk type products but we're trying to deliver a positive return under all market conditions as compared to simply under crisis dynamics, although that tends to be where we shine as all of our products start working together at that point, all the securities we trade.

What most people know me for at this point is the observations that I've made into the dynamics of passive investing in the markets. I wish I could lay claim that that was 100% de novo and that I came up with it but I'll be totally frank

with you that the vast majority of my insights are actually just taking insights by other people and trying to push them a little bit further. So, I would actually highlight the work, I'm actually at AQR, which is funny because I tend to get into tiffs with Cliff Asness on a fair basis. Laci Peterson at AQR wrote a brilliant paper a couple of years ago called "Sharpening the Arithmetic on Active Management", which challenged the work of Bill Sharpe in 1991, says something we've all kind of come to accept, which I think is wrong. The idea that it's a zero sum game and that active managers are effectively trading against each other and therefore passive managers by taking the best information that is available from the outcome of that battle between them. What we call the current price, are able to free ride on the system and outperform the average manager because they're able to offer lower fees, do it at lower costs. The assumptions that Bill Sharpe made in that paper simply don't hold water. The most obvious one being the passive investors never transact, which means how do you...will raises the obvious question, how do you get into the market? Well, it has to be magic. How do you get out of the market? That has to be magic too?

Brent Johnson and Santiago Capital has a great line. They believe in magic, you believe in math and I believe in math. I don't think there is any magic and would go a step further from Laci's work, and point out Laci's work was focused on the idea that on index rebalancing, passive investors would have to transact and therefore they became active for that period in time. My insight and observation was just very straightforward, which is, well wait a second, they're transacting every single day because they're receiving flows. And if they're receiving flows, then we can actually begin to model and understand the impact that they have on the market, and when you do that you discover some really surprising things which you talked about, I've shared broadly and influenced the way that we think about the world at Logica.

**Adam:**

**00:06:58**

Yeah, that was a great summary. Actually, one of the most surprising things that has emerged from your thesis and this if I understand it correctly, I recall a conversation maybe with Grant Williams, where you describe the fact that historically active mutual funds held about 5% cash on average, just to manage withdrawal redemptions and investment, and that a typical index fund like the Vanguard Total Markets Fund, for example, holds about 0.1% cash and the migration, so an investor sells at the margin, they sell an active mutual fund and they buy a passive index fund. There's a transfer of that 5% that was held in cash, the vast majority that now gets deployed into the market and I think you made the rather astonishing claim that in theory, if everybody did that, that would result in about a 50 fold increase in market valuations. I was just wondering if you'll of walk us through and I could have misinterpreted that, but

maybe just walk us through the mechanics of that and how you arrived at that general...what the math of that looks like.

## Market Valuations

**Mike Green:**      **00:08:24**

Sure. The math is actually very straightforward and it can be thought of in two separate frameworks, right? If you create conditions under which somebody values cash, they're willing to hold it as 5% of the portfolio because they need to meet redemptions, they need to position themselves to take advantage of opportunities in adverse situations without having to sell securities, so that cash on hand becomes valuable in a market draw-down. And you replace it with somebody who effectively views cash as a toxic phenomenon. I can't hold cash. If I hold cash, I get killed. Well, you're willing to pay a lot more for stuff under those conditions if cash becomes a toxic asset. If you walk through the simple math of it and we have some slides that we share with our investors on this sort of stuff, walking through the very simple mathematics behind it, but you can just think about it in like the simplest form.

Let's just imagine a scenario in which there's \$1,000 total capital invested into funds. So, if we start with 100% active, that means you're going to have \$1,000 total, 950 is going to be equities and 50 is going to be cash, right? If you decide that you're going to replace an active manager with a passive manager, so let's take \$10 from the active managers and give it to passive managers. When you do that, you're actually taking \$10 of cash from the active management community. So they now have \$40 in cash, 950 of equities. You're handing that \$10 to the passive manager who now has \$10 in cash and zero in equities and the two of them want to rebalance their portfolio. By definition the active managers who want to sell \$9.50 of securities to get themselves back to 5% cash. The passive managers are going to want to buy \$9 and 99 cents worth of stock to get themselves to 10 basis points of cash. Well, that's not a market clearing phenomenon, you can't have that, you can't have somebody paying \$9.99 and somebody else receiving \$9.50. You actually have to solve that problem iteratively to understand where that transaction will actually occur, and the astonishing fact is, when you do that, you discover that on that tiny move, just taking the market from zero percent passive to 1% passive you're going to lead to a more than 1% increase in equity prices in order to solve that phenomenon. The cash can't change, there has to be 50 bucks of cash at the end of it, and suddenly it has to be 4.9% of the market. So, when you run through this calculation, that's where you get to the 50X as you take this to its logical conclusion.

- Adam:** 00:11:02 I see. So that's why you reference Mish and his assertion that there's no such thing as cash on the side-lines that the cash needs to net.
- Mike Green:** 00:11:12 Correct.
- Adam:** 00:11:13 But the market also needs to clear. So that's why you get this amplification mechanism on the price vector, because that's the only way that that transaction can clear. Okay.
- Mike Green:** 00:11:25 Correct.
- Richard:** 00:11:27 If 43% I think is, Adam we were talking about this earlier. 43% of equity holdings are now held in passive vehicles. How much of that move do you estimate may have already occurred Michael?
- Mike Green:** 00:11:42 Well, I'm a little confused by what you mean in terms of the 50X increase.
- Richard:** 00:11:47 Yes, correct.
- Mike Green:** 00:11:48 About 2.3X. If I'm right, we've got another give or take 20X to go.
- Adam:** 00:11:55 So it's an accelerating phenomenon.
- Mike Green:** 00:11:58 It absolutely is, and you can think about it in the...just think about it in the extreme version. You're 99% passive, how do you get that last 1% active manager who's huddled through this whole process? How do you get him to sell to you? And he knows the minute he sells, he's out. He can't get back in because you'll never sell to him again. What's the price at which that clears? And the answer is the mark on that last component the market goes up 10X.
- Mike:** 00:12:31 Isn't that what we observe in bubble phenomenon generally? You see that intensification all the way up the chain until such time as that last dollar flows in. Now, I guess the big question is, how do you determine when we get to the last dollar? Is it in fact require 100% shift to passive or does it occur at some point? Before that, are there ebbs and flows along the way? I'm sure there are.
- Mike Green:** 00:13:00 The problem is, is that alongside that shift you have an increase in volatility, and volatility can effectively be thought of as your speed on the highway. So, you're cruising along at 55 miles an hour on an uncrowded highway, your odds of an accident are pretty low. Take it to 65, they go up. 75 they go up, hundred miles an hour, man, you're starting to get a little sketchy here. Just to put it in perspective. If you think about volatility as a function of that same type of multiple, by the time you get to around 90% passive, you're travelling 400 miles

an hour on the freeway. You're going to have an accident. And so I don't actually think we're going to get there. The question is just, is the accident so bad that we don't have capital markets anymore? I think there's a very real risk of that.

**Adam:** 00:13:49 Are you able to - it's a state criticality more than is, anticipating exactly when that threshold is identifying that there is an accelerating state of criticality ... increasingly prepared for that.

**Mike Green:** 00:14:08 That's exactly right. People ask us from a professional standpoint like, when is this going to happen? I got to tell you well, first if I knew exactly when it was going to happen, I wouldn't tell you. Secondly, if I knew exactly when it would happen, and if I knew in either direction, I wouldn't bother putting on the positions that we have at Logica, which by and large are straddles. Our objective is to put on a straddle and say we don't know which way the market is going to go. We just don't want to pay the penalty associated with that indecision. So we're going to use everything in our power to express that straddle in a way that we can carry it positively for our investors.

**Mike:** 00:14:47 Right. So that straddle is a function of positioning for the skew but avoiding that consistent negative drift.

**Mike Green:** 00:14:55 Yes, that's exactly right. I mean, my complaint against the traditional long vol type product as I said, it has some...the marketing pitches, some variant of we promise you that yes we're going to lose money every single year, but we promise you in over the course of 10 years, you'll be really happy. Well, I've been doing this closing in on 30 years now and I can assure you that if I'd ever entered into a nine year time period where I lost money, nine years in a row I still wouldn't be doing this. It's not an honest expectation to turn to anyone, particularly a CIO and say, you should incur behaviour that's going to subtract two to 3% from your return on any given year. But boy, I assure you in that 10th year, it's going to really pay off. One of the interesting phenomena for us actually has been the very positive feedback that we've gotten in the aftermath of the March events where some people in the long vol space reported 4,000% returns in March. The vitriol that that engendered amongst their client base are like, that is absolute garbage. That's just not true. It was really interesting. The knock on long vol I think is deserved, right? You can't expect people to lose money on a continuous basis to protect your portfolio.

**Adam:** 00:16:20 Right. So you're trying to capture both tails, not just the left tail. Then you're also subsidising that potential negative carry with basically a long equity overlay. But with specific characteristics.

**Mike Green:** 00:16:36

Yeah, specific characteristics. So it's not long equity, t's actually long options. Wayne and I talk about this on a regular basis and it's one of these weird dynamics. People reach out to us and say, "well, how do you handle an environment in which the VIX is really high? Or the VIX is in backwardation. And I'm like, well, we don't actually trade VIX. So I could actually care less. Many of the features of the term structure that you see in the VIX are a byproduct of what's actually called a correlation convexity. A correlation coefficient is actually what it's called I'm sorry, that highlights the dynamics that you have higher certainty about the behaviour of the market in the short term, less certainty about it in the longer term and so you have a fairly steep upward sloping curve in volatility, that doesn't really exist in the single stock space. It's not the same, the skew dynamics again that you see in terms of the indices, those are largely a byproduct of an expectation of higher correlation as you move to the tails. And so there's penalties associated with that that we take advantage of. We think that it's funny, you talk about the tails, like we actually focus more on what I would describe as the shoulders. We think the shoulders are a lot deeper and actually, ironically, many of our competitors that are classified as long vol will sell the shoulders to finance the tails. While we would never sell volatility, because that's contra thesis, we look at selling those shoulders as wrong. We think that you're actually selling the cheapest part of the market.

### The Cheapest Part of the Market

**Adam:** 00:18:15

Speaking of the cheapest part of the market, I did want to give you an opportunity to chat about your fairly recent article series on value investing. Maybe just state the general thesis there. And I bet a couple of general questions maybe that might flow from that, but I thought it was a really interesting series of papers. It's worth exploring. So what are you trying to say?

**Mike Green:** 00:18:45

Well, in really simple terms what we're actually saying is that systematic value is distinct from the individual stock picker who's going and finding the undiscovered gem that is just waiting to be picked up by Wall Street, or revalued by Wall Street more accurately. But systematic value investing where in simplest form you're buying the cheapest third of the market, selling the most expensive third of the market and counting on the forces of mean reversion to generate a source of alpha or excess return relative to the market. That's just a short vol trade, and that's really what that whole series of papers was built around. Was demonstrating that what was actually happening can be replicated by synthetically selling puts and calls on each of the individual components of the indices themselves. So what we literally did was walk through the dynamics of how value generates its excess return, and then

reprice that in the framework of what would happen if I agreed in advance to sell a call option on anything that outperformed and sell a put option on anything that underperformed, which is functionally what you're doing with a systematic value strategy. You're agreeing to buy something if it falls in value, and you're agreeing to sell something if it rises faster than the market in total.

So, one of the things I would point out for simplification purposes, we priced these as if they were vanilla options. Technically, they should actually be outperformance options, both against the index and against the fundamentals. That's a lot harder to price. And so when you're doing it, we did it on, I want to say roughly 1600 stocks, so to turn that into an out performance option would require some pretty heroic calculations that candidly me and my beta fish on my desk are not prepared to do. But regardless, you end up when you do it in aggregate actually with a number that is very similar, and we're able to explain basically the entirety of the value premium with that type of behaviour, and also explain the underperformance.

**Adam:** 00:20:50 I think it's worth going into a little more detail on the underlying mechanics of your option framework. If there's two dimensions to it, one is size and one is book to market. First of all, is there anything special about book to market? I know you did go into some detail on some of the flaws of the market and how some of those flaws have become especially prominent or impactful in the modern era. But does the same basic framework and then prognosis for value apply if you use different value metrics?

**Mike Green:** 00:21:27 It does for the very simple reason that if you actually were to disaggregate the source of volatility in the book to market phenomenon all of the volatility is contained on the market side. It's very rare that book changes by-

**Adam:** 00:21:41 ... any earnings or cash flows.

**Mike Green:** 00:21:44 Yeah. That's actually part of the reason why I would argue that book to market had the most demonstrable impact in the past because it's actually the slowest moving. So sales changes more rapidly than book value does for the most part. Earnings trades change much more rapidly than book value does for the most part because at best your book value should reflect some compound component of your earnings, less dividend streams. And so you basically are just isolating more and more of the volatility by moving to book to market. You're isolating more and more of the volatility in the price. Again, that just reinforces the idea that what you've actually done is just synthetically sell options. If you're generating the source of your return through the price framework and your behaviour is largely determined by the price component, well, then it's just an option.

- Adam:**            **00:22:31**        Okay, so let's walk through an example. You've got a small value stock and you do a great job of this in the paper. I'm trying to recall it, it's been a while since I've read it, but-
- Mike Green:**    **00:22:43**        It's been a while since I read it too. But just very quickly for anyone who's watching if you want to go to [logicafunds.com](http://logicafunds.com) it's available on our research page.
- Adam:**            **00:22:52**        And there's three parts of this series and I'm sort of digging into part two now because you guys actually went into the underlying mechanics of your options framework, and the idea is a small value investor will sell stock if it moves into either it goes up into a higher market cap category, or it goes up into a higher book to market category. Right?
- Mike Green:**    **00:23:19**        Right.
- Adam:**            **00:23:18**        So you've got an enlarged value, has almost an opposite profile where you will buy it if it goes down into a smaller market cap category. So you've got all these different categories and different buy/sell agreements essentially based on whether they move from one category to another because systematically you have agreed to rebalance into stocks of these characteristics, and so you're synthetically creating an option series for every stock based on its category in each period to reflect the net premium or that you either get or pay from holding a stock with these characteristics. Am I on the right track?
- Mike Green:**    **00:24:10**        No, you're on exactly the right track. The easiest way to think about it is that there are more categories that can migrate into small value than can migrate into large growth, for example. Or it is harder and less frequent for those migrations to occur and so almost by definition, the options that you're selling or buying in those scenarios because when you buy a small growth portfolio to a certain extent, you have sold fewer options than you have sold if you're in small value, large growth sells fewer options than if you buy a small value portfolio. So, the differences between those, largely explained actually the difference performance, the differences in performance over time.
- Adam:**            **00:24:55**        Yeah, so basically, you are selling Vega and it's the number of options that you're able to sell Vega on, that that dictates the size of the premium. Is that generally- okay.
- Mike Green:**    **00:25:14**        Yeah, it - correct. It's an easy way to think about it effectively if you are buying small value, you are selling more options than if you do large growth. And that's when again, when you look at what's called the migration frequency, the propensity for stocks to leave that bucket or enter that bucket. That's basically

what we're calculating. Again, it reverses into telling and explaining the value premium, the small and value premiums that we experience.

**Adam:**            **00:25:44**        Yeah, so you're multiplying the expected premium by the probability of migrating from one category to another and that's generally how you get to your... which I think is really intuitive actually, and I was on the one hand really astonished by how well this options based framework maps to the empirical results, especially for small value the expected premium from the options selling thesis was almost exactly the same as the realised premium from a small value strategy.

**Mike Green:**    **00:26:18**        Which should be clear, right? There's a stochastic component to it like over the time period that we have, you would expect the two to converge, but at any point in time there's a highly stochastic dynamic.

**Adam:**            **00:26:29**        No question, for sure. ... migration probabilities will happen over the long term, but not over the short term.

**Mike Green:**    **00:26:37**        But that's actually one of the interesting things that comes out of it, because under a passive framework you actually would expect far less migration. Things effectively become frozen into their relative positioning. As a result, the returns associated with a strategy that relies on those migrations or the risks of those migrations, you would actually expect it to fall.

## Value and Volatility

**Adam:**            **00:26:59**        Okay. That is really fascinating. So, on the one hand, because I know in your part three of the series, you also connect the value premium to market volatility regimes. You demonstrate during periods of high ambient volatility and I think you use 1966 to 1944 as a period of fairly high volatility, and then this great moderation from '44 to '75, pretty low volatility, and then a subsequent period of higher volatility. And you show that the value premium is highly explained by the volatility regime. So there's that component which I think I find very intuitive, but then there's also this other component of the probability of migration which...so to the extent, the premium is a function of the carry on Vega from selling options, and the probability of migration, so if Vega is small, then you've got a lower expected premium. If the probability of migration is small, you've had a lower expected premium. So you've got these sort of competing dynamics. What does that say about the prognosis for systematic value as your thesis plays out?

**Mike Green:**      00:28:16

Well, if I'm correct about the continued migration into passive, you're effectively talking about a higher and higher fraction of stocks that just get frozen. ? And so it's part of the reason why I emphasise that if you really did this properly, you would convert it to an out performance option as compared to an vanilla option. I'll leave that for somebody younger and smarter than me. But, having shown the path I can let somebody else do some work for change?

**Adam:**            00:28:41

Well, yeah, but the drift term is small. It depends on the rolling frequency, but if the rolling frequency is monthly, or quarterly, then the average drift term is very small and so you can almost and I know you're going to argue that that drift term is not priced in option theory. And so there's a there's a convexity there that you could take advantage of and notwithstanding all that. I think you can actually eliminate that drift term to a large extent at a fairly high rolling frequency, and I agree you'll get greater precision if you use the excess, but certainly you get qualitatively in the right direction.

**Mike Green:**      00:29:19

Yeah, exactly. And that's why it's just not worth the extra calculation from my standpoint. I feel fairly comfortable that we've actually demonstrated the mechanism that ironically fits actually with Ken French and Eugene Fama reformation as they came back and revisited it and said, hey, we're not entirely sure this exists anymore. We can't disprove it. But here's actually the source of the returns and they highlighted the migration dynamic. The irony is, is that most people, it's very hard for people to think about stocks as actually options. That's happened in a variety of ways. I had a conversation that's going to go on to Real Vision in a couple of days speaking with Jamie Catherwood of O'Shaughnessy Asset Management is, a brilliant young historian in terms of the financial markets and just a lot of fun to talk with and there are changes that we have made in terms of the dynamics of capital structure that make equities option right. So if we went back to the 19th century, if you bought shares in a company, you became liable for its debts which meant that there was a two tail component associated with buying equities. The minute you eliminated that, you can actually see this in the data, that there was a mechanical step up in valuation for equities that occurred in the 1860s, as that became standard. It's because you'd abrogated the left tail, you could argue that there's some similarities to the idea of a Fed put. If the Fed is going to take away the left tail outcomes that that raises the valuation of equities. So I think those things all contribute to this type of behaviour.

But this broader thought process of what is a payoff function, which is really what options analysis is all about, identifying the payoffs and pricing them properly. It really hasn't penetrated into the valuation markets. People just haven't. The valuation theory has become ironically and not ironically, expect as you might expect, as valuation does a worse and worse job of explaining

returns, people seem to care less and less about what's actually true about how to value stuff.

**Adam:** 00:31:24

So one thing that I was curious about because I actually really like your thesis, I find it very intuitive and I've done my own digging and I think it's a valid risk that investors should be thinking about how to hedge but I also am curious about why we don't or, do we are or have we observed similar phenomena playing out in other markets. Are there any other foreign analogues in credit or in some other market, maybe you're certainly in equities that might provide some map or some guide or model about how this plays out. Obviously, I don't want to put words in your mouth, the understanding is that a major motivating factor in your thesis is the change in regulations and migration from defined benefit to the defined contribution plans, a lot of the IRAs, the 401K's that sort of stuff, and the changes in regs that mandated a move to the least expensive products. So motivated this move to passive. Are there analogues? I know that the superannuation model in Australia certainly mandates savings. There's other models around the world that approximate the same objective, obviously with some nuanced differences, but is there any other model you can point to that might provide some map or indication about how this whole thing evolves and plays out?

## Analogues

**Mike Green:** 00:32:56

The quick answer is that unfortunately as you highlighted, this is an exponential function. So it increases in terms of its severity and impact as it gets further and further through the process. The only analogues that we can point to are markets that have been managed in the past. People have heard me talk about the Nazi stock market, for example. That by the way, did not end well and on a single day it fell 90%, when it was reopened effectively. So, the answer is no, that creates part of the problem, is that I have a hypothesis, now that word thesis can refer to an English essay in which here's the thesis of my essay. But if we're talking in scientific principles what I actually have is a hypothesis. That is unknowably true until the events occur that actually demonstrate that this was the case.

So, part of the challenge is that this is in no way the only thing that's going on. There's lots of other stuff that is unique to this market, and technology moves the pace in a variety of ways. And so for our investors, one of the things that we've been increasingly writing about is that you need to understand not just the flows, but also the mechanical process that emerges as equities are increasingly used both in index form and in single stock form for things like structured products which are used for yield enhancement purposes, and the

structured products have never really existed in part because we never had interest rates this low that led people to forego many of those protections that are created by the limited liability corporation. The irony is, somebody who if you look at the academic literature, and you look at the data series in terms of volatility selling, the XIV is something obviously that I played a role in as well. People would do the math and say, well, selling volatility as the same return profile is being long equities, and it carries better, it offers higher current income associated with it. Yet, when you actually are selling equities all you've done is remove that protection on the left tail. You could theoretically lose a hell of a lot more than you actually put in to the trade. So you should expect a higher premium associated with it.

- Mike:** 00:35:16 I don't think that's theoretical anymore.
- Mike Green:** 00:35:19 Again, this is part of the irony, right? We saw it with the XIV and then people continued to do it, and we saw Alberta, I mean, you guys are largely Canadians. So, when you saw Alberta Investment Management blow up a blow up as to stronger phrase, but the losses associated with that product I think actually one of your guests was highlighting the dynamics there, that a strategy that had six plus Sharpe ratio throughout its history. Now, if you look at the entirety of its history is a minus two. Again, I wish I could lay credit to it being my observation, Chris at Hudson Hill is famous for the expression that high Sharpe ratio asset is just one that hasn't seen its left tail event yet, and that's a perfect illustration of it. The XIV went to zero functionally in a couple of days, I was having a conversation with somebody the other day and they were talking about the .... And they're like, "Well, did you get the warning to like scale up the trade?" Like it went to zero in two days. When was I supposed to scale up that trade? Come on?
- Adam:** 00:36:20 Obviously, you weren't watching.
- Mike Green:** 00:36:21 Yeah, I just wasn't paying attention. The amazing part about that trade actually is that I know professional investors at very well known firms that were buying XIV into the closing minutes of February 5th 2018. These are guys running billions of dollars that did not know that there was an NAV ticker associated with XIV, they were paying 72 bucks for it. The NAV was printing 11. It was like you did what? Like, I don't understand how I lost money. I'm like, Oh my god.
- Adam:** 00:37:00 Efficient markets.
- Mike Green:** 00:37:01 Yeah, exactly.
- Richard:** 00:37:03 Yeah, I was going to actually ask. Sorry about that Mike, you go ahead.

**Mike Philbrick:** 00:37:07

No, go ahead.

**Richard:** 00:37:08

I was going to ask. As Michael pointed out earlier, your hypothesis on passive flows is part of a larger mosaic. And we obviously know that rates have been at ... level for a while and I think maybe it's these regulations that have allowed for passive flows to become such a large part of markets as a whole, that has differentiated US markets from perhaps European or Japanese markets that have had zero interest rate policies for such a long time. But in recognising all of this, Buffett said, if we extrapolate interest rates at 0% into the future, we're likely experiencing cheap stocks as opposed to them being expensive. So how do you put all these different moving parts together? And perhaps even understanding that some players may be adding fuel to the fire, witnessing this mania and just adding fuel to surf the bubble up.

**Mike Green:** 00:38:15

Wow. Now you're pushing me into dangerous territory. First, I think that you want to be very careful in interpreting anything Warren Buffett says because Warren is smarter than you.

**Mike:** 00:38:29

And more conniving.

**Mike Green:** 00:38:30

And more conniving. I have literally followed into and followed him into trades, I've seen what he's done and almost inevitably where someone's like, "Buffett made a mistake." It's like man, no, you missed an option that he bought. People will highlight the dynamic of him selling 15 year puts on the Nikkei, the S&P is...my dog in the background. Selling puts on the S&P/Nikkei /FTSE and euro stocks in 2007 are like how could you be so dumb and not realise that it was actually the terms of that trade construction that allowed him to take 10% of Goldman Sachs for a song. Just a brilliant, brilliant trade construction. So I would be very careful in terms of interpreting that. I think Warren knows quite well that you can't actually use zero interest rates to discount equities for the very simple reason that the payoff function is going back to options theory of equities are radically different than a zero coupon bond. I do think that this is actually going to play into the dynamics of what we see going forward. Just in really simple terms, if you think about the outcomes from an equity, it looks like an upward sloping cone where the...upward sloping in terms of its mean, but the outcomes are zero and let's just call it infinity to make life simple.

So, the terminal point is where you have maximum uncertainty. I think about a riskless bond, risk free bond, a sovereign bond, it's actually the exact opposite, it looks like a football. I have maximum certainty at the end-point. To relate those two instruments, you actually have to use options. This goes back to put/call parity which is that the value of a stock is actually the value of a call

plus the present value of the dividends, plus the present value of the forward strike price.

Now, if I do that, all of a sudden I realise I have a totally indeterminate equation, because what I do know is that the forward strike, that is sensitive to interest rates. So higher interest rates means that's going to fall in value. Lower interest rates means that's going to rise in value. The dividend is uncertain, because the dividend has a nominal and a real component to it as well as a share of the economy component to it. So the corporate profits rise or fall based on the underlying phenomenon. Is the interest rate a real phenomenon or is it inflation phenomena? If it's an inflation phenomenon then you would expect your dividends to rise, and it's unclear what the discount factor would do to that PV component. On the 'call minus put' component explicitly that it works in the opposite direction of interest rates because calls rise in value as interest rates rise because they're effectively alone, and puts fall in value as interest rates rise. So that call minus put component of the value goes up. There is no way to use interest rates to figure out what the value of equities are.

- Adam:**            00:41:23        Yeah, I mean, that's a really good point. You only have to look to other markets like Japan or Europe or whatever where you've got lower interest rates than what we observed in the US.
- Mike Green:**    00:41:33        Exactly. And so this is the silliness. No one is doing the work. Nobody's stopping to say wait a second, theoretically, there is no link between these two, right? It just creates a really nice narrative that allows people to say, hey, equities are going up and it's all because of the-
- Adam:**            00:41:50        Asness discredited the Fed model and in like an early 1990s paper and many have discredited it since. I think we've got a paper in the actuarial journal that discredits that as well. There's just no theoretical or empirical basis for the Fed model. But, the reality is stocks go up and people need justification to buy. This enters the lexicon without having any empirical barrier.
- Mike Green:**    00:42:17        It's just like the Fed model actually came from Ed Yardeni, who also was the guy who said, "Hey, guess what? The world is going to fall apart on y2k." I had a theological debate with somebody on Twitter earlier today where I pointed out that, zero doesn't always mean the absence of something. It can be positive something and negative something. There's just no evidence, there's no theoretical link, there's actually increasingly negative empirical evidence, where we actually see interest rates rise alongside equities typically.
- Mike:**             00:42:52        Right. Richard Werner done some work on that too.

## The Collateral Component

- Mike Green:**      **00:42:55**      Well, Richard Werner is a true genius, right? I play one on TV. He's a true genius. His work in 2014 where...and just very quickly. He did the same thing I did. He basically walked through forensically and said, "What are people saying, and is it true?" And so he wrote a 2014 paper where he literally went through the whole fractional reserve model and instead of saying, hey, how about let's talk about a theoretically et cetera, he literally radio tagged a mortgage application and said, "At what point do we reference reserves? And the answer was never, never. So, Werner's analysis is 100% correct, like the value that is created under these dynamics and the reason that we see credit expansion associated with it and it goes to Mike's point, in terms of why we see these components associated with rising interest rates relative to equity prices is it's the collateral component. As prices rise, your borrowing capacity, your collateral increases. That in turn creates demand for real investment as people say, "hey, I have more collateral against which is the borrow-
- Adam:**            **00:44:00**      It's the perfect reflexive dynamic?
- Mike Green:**    **00:44:05**      Exactly.
- Adam:**            **00:44:06**      I want to get some tactical questions, Michael as well, I know you run strategies, right? You run, you're a partner in an investment firm, along with Wayne. So obviously you've got a thesis that you're betting on, but I think you'll acknowledge it's not the only risk or opportunity that investors should be contemplating. And you've got I'm just sort of thinking about the plight of a typical RIA with a billion dollars or a few RIAs that an RIA firm with a few billion dollars and clients with real liabilities in the form of maybe it's endowments and it's got to be real distribution obligations, or maybe it's retirees who need to meet educational and retirement liabilities, and you've got global rates near zero and equities at these valuations. I'll let you comment on whether you feel they're high or low and whether there's any merit in that discussion at all. But, what are the risks that investors should be thinking about hedging? How do you construct a portfolio to meet real liabilities in 5, 10, 20, 30 years? At the moment that sort of fits, that scales. I don't know how you think about your strategy, maybe you think about it as being infinitely scalable, or it can be core for all individuals. I'd be surprised I think. I'd want to hear more about that. But I guess in general, how should an RIA that's bounded by compliance and regulations and clients with tracking error aversion but real liabilities they've got to meet, etc. How should they be thinking about building portfolios here?

## Building Portfolios

**Mike Green:**        **00:45:58**

Well, there's an awful lot of questions there. First, I think we're infinitely scalable. We'd like to have that money in \$10 million chunks please. We of course face limitations of scale, but we have built our portfolio to trade the more liquid components of the equity markets, and so we by and large are isolating ourselves to the S&P 500 in terms of the constituents that are in our portfolio. Within our portfolio, only about a third of it is actually allocated to single equities. The remaining portion is allocated to more macro securities, including the S&P for example, which we think has characteristics that make it very attractive in terms of, in particular misprice correlation. So, in the last part that I would add, while I'm talking about Logica is that I have the luxury of not having to worry about your liabilities. Like that's not my problem. I can solve a portion of it but I don't actually have to tell you how to invest to meet your liabilities.

Now, taking that hat off and putting on the hat of a concerned citizen and saying, "How do these liabilities get met?" I would actually suggest you already know the answer to this, right? You had a guest on a couple of weeks ago who was discussing the dynamics of, "Look, at the next 10 years there's no way a CIO can rely on the same sort of return profile that they had previously and yet, we're less funded and require higher returns and more allocation is going into the riskier portion of the portfolio with basically the idea that the asset class is going to find a way to deliver it regardless." Now, the irony is, is that my analysis would suggest that's going to feel awfully good as people continue to pile money in an increasingly beta oriented or passive way, So you're going to see the prices rise, and then you're going to try to take some money off the table, and you're going to have March 24th. Because there's just no bid underneath it. There's no incremental buyer in a market that is passive where you're presuming that the current price is always the right price. Why should somebody increase their allocation at that point?

**Mike:**                **00:48:05**

So we're going to go back to that idea of the value player being the put, under the market.

**Mike Green:**       **00:48:09**

Exactly. There, it's brilliantly put Mike

**Mike:**                **00:48:11**

... lacking that.

**Mike Green:**       **00:48:13**

Exactly. Ironically, we're increasingly shooting that player, right? We're basically, you're the loser at the table and so we're going to take you out. Again, back to my thesis, if you assume markets are not frictionless, which I would argue very strongly, they are not. Then firing that cautious person and replacing them with an incautious person who's willing to drive at 400 miles an hour. Of course, that's going to make markets look better.

- Mike:**                    **00:48:46**                    It's also going to promote the incompetence. So the CIO from a behavioural perspective, or the RIA who assumes that they should have some amount of assets at Logica or at some other shop that's managing the risk, that is having those alternative strategies to put some shock absorbers, is it going to be increasingly coming under fire and being fired?
- Mike Green:**           **00:49:09**                    Well, and again, I am sympathetic to that because this is again part of the thesis behind Logica. Like its unreasonable to say to that person, hey, you should put your job at risk because I'm telling you that it's a dangerous environment. That's just not reasonable. All the systems are in place, I've described this. This is a Doom Loop for active managers. The tools that we use make assumptions. Sharpe ratio assumes things about the market, like there is an assumption embedded in the calculation of beta and alpha about the market, and I'll tell you occasionally crazy things. I've got my oldest son who's like sliding along the wall behind to make sure that he's on the camera.
- Mike:**                    **00:49:55**                    It's happy hour, he can walk by and give a wave.
- Mike Green:**           **00:49:57**                    He's almost 21. He actually joined Mark and Bill and I yesterday, so it was a lot of fun. Now he's mad at me for bringing him into the subject. But welcome to the world of 20 year olds.
- Mike:**                    **00:50:12**                    Embarrass them at any opportunity that you can.
- Mike Green:**           **00:50:14**                    My father certainly did it, I plan on doing it as well. Your goal is to get them to hate you enough that they leave the house. So, when you look at the tools that we use for managing managers, they presume that there can't be these sort of feedback loops that we're talking about. Mathematically, to calculate an alpha or a beta presumes that there is actually an IID distribution that has the same mean and standard deviation over time for the benchmark. Well, if the benchmark becomes self-referential and actually exhibits convexity, then mechanically alpha is going to shift negative and you've seen some of the research that we've shown on this, that this is exactly what we're seeing. If you turn around and you say to active managers will you have negative alpha, therefore, I'm going to fire you, you're just accelerating this process. Everything is set up right now to just destroy it and then it's further magnified by the fact that the Vanguards and BlackRocks of the world can stand on a fake city on a hill and a soapbox, and basically, we're here for the little guy, we're protecting them from the rapacious asset managers that are trying to charge excess fees for underperformance. Next thing you know, you're passing all sorts of laws and regulations that favour passive.

- Adam:**            **00:51:37**        It's a metaphorical turkey, it's where the turkey is born, the farmer keeps him safe, every day the farmer comes in and feeds the turkey. When the fox comes around, the farmer shoos it away. Every day the turkey gets more and more confident in the Vanguard or...I mean, sorry in the farmer-
- Richard:**        **00:52:04**        Is nurtured until the left tail comes along.
- Adam:**            **00:52:07**        Absolutely. And then it becomes maximally confident right before Thanksgiving, when the time the farmer comes and chops off its head, and that's Where we're heading in the investment community at the moment.
- Mike Green:**    **00:52:24**        Well. Part of my pushback against that analogy, and it's not very hard because I actually do think that's right. I think in effect, that's what we will see. But the entire time the farmer knows what he's doing. He's protecting his investment with the anticipation of killing the turkey. And so, when the farmer says to you, "Yeah, I have such a well taken care of turkey," You as the observer know what he's actually thinking. Right. **But the Vanguards and BlackRocks of the world are functionally cults**, and they actually believe that, it's more dangerous. They believe they're protecting the investor. And please don't take this the wrong way but Malvern PA doesn't exactly attract the stars of the industry. This is not where if you're intellectually curious, you don't go to work for Vanguard. You go to work for Vanguard because you want safety. You want to be in a good job. You want your mom to be like, "Yeah, he works for Vanguard. I mean, that's safe. You're not going to get the innovative thinkers, I can assure you that I would have lasted about 15 and a half minutes at Vanguard as an employee, because I literally would have been...they would be like, yeah, this guy asks too many questions. He pushes too hard against the envelope, and he makes me feel uncomfortable. You're not supposed to question.
- Mike:**            **00:53:40**        How many assumptions ... and they all have to be 100% true. ...
- Richard:**        **00:53:49**        Michael, I wanted to get back to one of Adam's earlier questions, and you're mentioning some of the instruments that you trade at Logica. You mentioned something I'll name some of the more liquid ones, the S&P. What are some of the other instruments if you care to share because I'm thinking of some of these other broader, maybe even geopolitical risks that we see in the horizon? I was wondering how you think of them and how that factors into the investment universe that you trade and into your broader strategy.

## Other Investment Instruments

- Mike Green:**    **00:54:18**        In Logica we have two primary components. **We have the long volatility component**, which is S&P calls, S&P puts, and single name calls on components

of the S&P largely selected, although we've introduced a new module in the past couple of months that has slightly different characteristics, it's actually what we call our anti momentum portfolio, but largely our stocks are selected on the basis of a momentum type dynamic. And that's in part because we would point out that passive which is the growing force in the market has a momentum bias. It's the single most important component to it. Again, we are not doing exactly momentum. We're trying to take advantage, have a slightly different feature, I would actually describe it as in elasticity, we're looking for stocks that exhibit the greatest response to the incremental dollar coming in from a passive type vehicle, but close enough to think about it is highly correlated with momentum. We have a second component to the portfolio which is what we call our macro overlay. That's by and large composed of products that don't need an expansion of volatility in terms of the specific components of equity volatility, in order to participate.

So, the extreme scenarios that you enter into there, when you get to a point, you can think about equity volatility the way we think about it, is more of a cost of capital. So I couldn't care less about the implied versus realised dynamics. I actually think that's a false methodology, and it only means something if you're Delta hedging. And so just very quickly, why that doesn't matter to us is if you think about what you're doing when you're Delta hedging, if I think the return surface of the instrument itself has drift and has a, effectively a convex surface by delta hedging, I'm selling that convex instrument and cancelling out the convexity that I'm actually seeking. So why would I do that? That's completely in counter thesis. On the macro assets I can see Adam is thinking like, is that true? But yes, it's true.

**Adam:**                    **00:56:17**            I'm think about the Delta, where the Delta gets large on the curved surface relative to, up to a linear model. So anyways, keep going.

**Mike Green:**        **00:56:28**            Yeah, it's an interesting exercise to go through. And it'll also lead you in the direction of understanding the correlation coefficient when you do that across a 500 stock portfolio, 505 stock portfolio but the macro components for us are effectively the components that don't need an expansion of volatility or they can continue to perform if there's an extreme expansion of volatility. So those would include rates, they would include the dollar, they would include gold. We are in the process of evaluating some additional modules. In particular, I would argue that some inflation components have some interesting characteristics. TIPs, in particular have an anti volatility component. I talked about the anti-momentum portfolio TIPs, the way that they're structurally priced and traded in the markets actually rely on the pricing of volatility. I would walk you through that, but so they have some interesting characteristics for a portfolio.

**Adam:**                    00:57:27                    Actually, if you could walk us through a few of your points there, I'd be curious, if they're well formed.

**Mike Green:**                    So in really simple terms if you think about the dynamics of how a TIP is actually priced and what you're talking about when you talk about inflation expectations right there, you need to split that into a nominal bonds, you need to split it into the tradable instrument, the TIP itself, and the spread between the two is what's called the inflation component. The inflation breakeven. That inflation breakeven is held in check by an inflation swaps market which effectively tracks that underlying component but has, is a realised component that delivery against CPI and it tends to trade within the one and two year time horizon. So if you're going to trade the difference between an inflation expectation and a realised inflation level, one of the interesting outputs is that virtually all of the volatility associated with inflation on a realised basis is tied to the energy sector, it only represents about 10% of the weighting but it's about 70% of the annual volatility. There's very low volatility associated with housing, healthcare, all the other components that make up the vast majority of CPI.

So if you're going to trade this market, look, if you had transparency in terms of the future price of energy, why would you waste your time with inflation swaps? You'd be trading energy. So you hedge out that component. Hedging out that component requires you to buy options and those options have a positive correlation with other forms of volatility. So, the break evens actually are forced to widen mechanically as volatility increases. Which paradoxically, we could enter into an inflation regime that enhances volatility on CPI. But to hedge out the energy components is still sensitive to that volatility component. So it creates very interesting dynamics for a portfolio like ours that is at its core long volatility, it allows us to express a rate component that actually has a negative volatility dynamic to it.

**Adam:**                    00:59:20                    We've discussed this internally because we focus a lot on trying to hedge the big muscle movements, inflation and growth shocks and TIPs obviously featured prominently in a discussion of inflation hedges and we've always wondered out loud, just how reliable an inflation hedge is where the entity that to a large extent controls the definition of the consumption basket, needs to be relied upon in order to pay out on shifts in inflation, right? The government can change how they define inflation so that the consumption basket that they use to measure CPI and therefore measure their liability is more favourable to them, and less reflective of the actual underlying inflation that their citizens are experiencing. How do you, how do you think about the risks there? And are there any other types of allocations that you can add to a TIPs portfolio that might also help to hedge against this inflation risk?

**Mike Green:**        **01:00:41**        The quick answer is that while I know that there is a cottage industry built around decrying the CPI and the hedonic adjustments and everything else associated with it, I'm much less concerned about that dynamic in the United States, at least at this point, than I would be if I was in Argentina right now. Remains to be seen, we may end up in Argentina.

**Adam:**                **01:01:04**        It's going to be tested. I mean, there were no tests around in the 1970s. So, we don't really know how governments would have responded to an actual pickup in inflation risk. I guess we're relying on the credibility of the US government, but when push comes to shove I guess, I don't know.

**Mike Green:**        **01:01:23**        Let's just be honest. When you use the actual phrase credibility, of course, the US government is not very reliable. But the incentive structure for them to destroy what little credibility they have by intentionally fudging the inflation figures at this point. It's just not there. It may be eventually but it's not there currently. The second component is I think, we always have to be very careful when we use historical episodes to say what has happened or what actually would have occurred. I'm well known for speaking - for telling a contra thesis on the dot com cycle right in terms of what actually drove the dot coms. I actually think that we have the story of the inflation in the 1970s totally wrong as well. Which is the assumption that people have about the inflation in the 1970s is that it's a story of negative real rates. I just don't actually think that's the case. I think what you actually had was an outward shift in the aggregate demand function that was tied to the maturation of the baby boom, women entering the labour force, minorities entering the labour force and being able to acquire things, financial innovation in the form of credit cards, instalment debt, et cetera that allowed an outward shift of the aggregate demand curve which naturally causes an increase in prices. That increase in prices was then met by resistance from the central bank who increased interest rates.

Well, if you have a population shift, an outward shift in aggregate demand that is driven by a younger age population, they exhibit very low sensitivity to interest rates in terms of their consumption dynamics. You could care less. Think about the number of kids in their 20s who stop and think about what the credit card interest rate is, we know that they're at all time high while the interest rate on their student loans is relative to them spending that money and obtaining the increase in human capital. They exhibit low sensitivity, but who exhibits high sensitivity? Manufacturers, and people who are building factories. They look at that signal and say, okay, we're not going to meet it. So, even though you had that increase in interest rates, what you actually did was restrict supply, relative to an outward shift in the aggregate demand function. That's what drove the inflation of the 1970s.

- Adam:** 01:03:44 Then why do we see that picked up in real GDP? I mean, obviously real GDP could track-
- Mike Green:** 01:03:48 By definition. You're talking about inflation, right? So if you say, hey, we have very high inflation instead of saying, oh, we have an outward shift in aggregate demand that actually caused prices to rise because we were restricting supply.
- Adam:** 01:04:01 You can, like we're relying on the definition of the consumption basket, or we're having an increase in prices.
- Mike Green:** 01:04:07 Completely agree. So what is the consumption? Look at the actual data in the 1970s. We had the highest housing starts in the history of the United States on roughly half the population base we have today. The demand for durable goods was so high, the demand for automobiles was so high that despite the fact that the US auto industry couldn't build and sell any more product, you had an influx of product from Datsun and Toyota and other providers into the United States that created massively negative terms of trade. It just doesn't fit the data set.
- Mike:** 01:04:38 That was the easing in Japan. So Volcker was a mistake, pure and simple. It was a policy error, massive policy error.
- Mike Green:** 01:04:43 Volker was the worst central banker we ever had.
- Mike:** 01:04:49 Isn't that amazing. So worst policy error set up the Japanese experience in the easy credit that was facilitated in Japan to export all of those goods and services to the United States to fill that gap, inevitably leading to the Palace being worth all of California.
- Mike Green:** 01:05:07 Not inevitably but yeah, I agree with that story.
- Mike:** 01:05:12 It's an interesting. I'd never thought that. I like that.
- Adam:** 01:05:15 So your thesis is we actually had a strong economic growth in the 1970s.
- Mike Green:** 01:05:25 The 1970s had the highest rate of job growth of any decade in American history again, despite having half the level of the population, more jobs created.
- Adam:** 01:05:35 It's just mis- specified inflation deflates real GDP
- Mike Green:** 01:05:42 Correct.
- Adam:** 01:05:44 So why did stocks, stocks and bonds did poorly, well bonds did poorly because of low real rates or I mean I'm sorry-

- Mike Green:** 01:05:54 Bonds did terribly because the central bank hiked interest rates through the whole process.
- Mike:** 01:05:58 Yeah. Policy.
- Adam:** 01:05:58 Okay. And Stocks did poorly because?
- Mike Green:** 01:06:04 Well, at that point, you actually did create a scenario, where why the hell would you take risk when you could get 15% yields on-
- Richard:** 01:06:11 Opportunity cost.
- Mike Green:** 01:06:12 Absolutely.
- Adam:** 01:06:15 Yeah, high rates crowded out.
- Mike Green:** 01:06:17 We all talk about how cheap stocks were in 1981 and go back and look what George Soros and everyone else is saying they're like, Oh, my God, the opportunity is bonds. Either we believe George Soros was an idiot, or we think that he was a genius. And I tend to think he was a lot smarter than Paul Volcker.
- Adam:** 01:06:33 Well, I mean, it's been borne out. We've seen the relative returns of long bonds versus stocks in the last 30 years and ...
- Mike:** 01:06:40 Well, that is ...
- Mike Green:** 01:06:44 But I think that actually, I mean, again, similar to the passive dynamic. The only thing I refuse to accept for the sacred cows. Volker is a genius. He saved America - bubble, like those are just nonsense stories. They don't fit the fact pattern.
- Adam:** 01:07:03 Interesting. Okay. So do you have any concern for inflation going forward? Is that a risk that should be on investor's radar? And if so, how do you hedge that or manage that?

### Managing Future Inflation

- Mike Green:** 01:07:19 I do think you have to have concerned .. I think there's a couple of components around that dynamic that are significant. One, we've entered into a regime in which all of the behaviour that we have in the United States and elsewhere around the world is in one form or another restricting the supply function. So the provision of services in particular has been catastrophically restrained by the behaviour associated with the Coronavirus. And we're seeing that with a

complete collapse in the purchasing of services and an explosion in relative demand for goods in particular durable goods. That subsidy may or may not go away. We just don't know this yet. And so what we know is that situations where significant inflation have occurred in particular hyperinflationary scenarios. It has been when the government has chosen to subsidise consumption while simultaneously engaging in policies that restrict supply. **We're doing that on two fronts.** One, we're entering into a regime in which we're cutting off the supply from China.

And the second is, is that we're reducing the flexibility of economies to respond in a flexible way in the provision of goods and services in the private sector domestically. I absolutely think that there is a risk that we have another significant policy error and I think the irony is, we have been going through roughly 10 years of policy errors since the global financial crisis, where in many ways we've done the mirror image of what we did in the 1970s. Our policies have been focused on maintaining the production function, preserving Zombie firms that don't have an economic reason to exist while restricting demand, or more accurately, **not recognising that demand itself should be restrained by the demographics associated with slowing population growth in an ageing population.**

- Richard:**            **01:09:17**        I think that's a velocity of money right? At the end of the day, the velocity of money function is what you're getting at?
- Mike Green:**       **01:09:22**        Well, that's the output actually. Some of the velocity of money is an output of the fact that there is very low real demand for investment capital.
- Richard:**            **01:09:31**        Actually they're saved by the demographic components of the ageing population, and it is a baby boomers who are retiring and who own most of the assets anyway, and they're more inclined to save than to spend.
- Mike Green:**       **01:09:45**        Actually, no. I would flip that on its head and highlight that baby boomers are more inclined to spend than they are to save because they are now into the harvesting function. But ironically, not ironically, I would argue incompetently intentionally, we have subsidised their consumption function by increasing the asset value, right? Whether that's tied to the Federal Reserve's actions or whether that's tied to the dynamics of passive, I'll leave for smarter people.
- Mike:**                **01:10:17**        **Sadly, it's the grandparents stealing from their grandchildren.**
- Mike Green:**       **01:10:21**        I think that's 100 correct.

**Adam:**            **01:10:25**        We didn't really address the question of how an RIA that needs to serve middle market or even in an endowment or I mean, anyone with a stream of liabilities that are sensitive to inflation, so sort of excluding many of the public defined benefit pension plans where their pay-outs are not indexed to inflation, but any private individual that's going to fund liabilities or institutions that have inflation linked liabilities, how do they allocate capital right now?

## Allocating Capital Today

**Mike Green:**    **01:11:03**        I mean, Bill Gross said this very well. He sells hope, right? You know the answer to this, that unless I'm right, and you get a mechanical inflation of the equity asset class, and the other asset classes are just not positioned to deliver the returns that are required to meet most of those return objectives. So, my simple advice and again, we've built our portfolio to try to take advantage of a feature in this market, I can't solve the problem for the RIA, right? You can't hire Logica and put all your capital in Logica and expect to meet your investment objectives. So I don't know what to tell you to do with the rest of that money. But I would just highlight that the simple answer is just get yourself as close to politically connected and too big to fail as you possibly can so that you'll be bailed out by the government. I think you see that on a broad basis. That's the way these things work. At the end of the day, if you can't generate the returns through any form of reasonable expectation of productivity improvements, growth, et cetera. The only thing you can do is rely on Caesar to bail you out.

**Adam:**            **01:12:14**        Interesting. Okay. Well, that's a reasonable place to end. I think we could keep going, there's like four other immediate threads to pull, but-

**Mike:**             **01:12:23**        Absolutely. More and more money chasing more and more things.

**Adam:**            **01:12:29**        Yeah. And Jason Buck was wondering whether Mike Green said anything intelligent. I think we could probably say that there are one or two tidbits in here. So yeah, this is this has been a lot of fun and really appreciate your time and insight Mike and hopefully we can do this again, because I mean, like I said, there's a variety of different directions that we could have gone here. Richard, for sure really wanted to dig into your thoughts on MMT and what exactly was the purpose of taxation? And I had some questions on some of your statements about the advantage of being young and naive, relative to old and experienced. So there's lots of other different places to go. But we'll leave that for another occasion.

**Richard:**         **01:13:21**        Do you want to keep going Adam maybe?

**Adam:** 01:13:26 I was trying to give everyone an out. But yeah, we can keep going.

### Thoughts on MMT

**Mike Green:** 01:13:31 So, first of all, thank you and Jason hopefully I didn't embarrass you. But to answer the question on MMT. I think at the core of MMT is something similar to what Lacy Hunt and others have said, if the money is spent well, that's fine. The right way to think about government debt is not as debt, it doesn't meet the characteristics of household debt. **It's actually equity in your nation.** Like equity, if you issue more equity and you don't increase the positive productivity investments that allow you to grow the net income of your corporation, your dividend per share will fall by definition. Same thing happens with interest rates, your capacity to service that debt will fall, interest rates mechanically have to follow. This is what Lacy Hunt is making clear in his in his various interviews where he pushes back about the idea that there's some bond vigilante who can demand a higher rate of interest. **That's called a person who sells your currency.** For better or worse, like we were probably heading down that path because the nonsense policies that I hear in terms of what we're going to spend money on, and people can castigate me for my views on climate change and everything else. But at the end of the day, replacing coal fired energy with solar energy does not enhance productivity. **It just doesn't enhance productivity except in the most obtuse form...** That's my dog again, is waiting for somebody to come in through the door.

**Adam:** 01:15:01 He's like been my favourite character in this whole episode.

**Mike Green:** 01:15:03 I know, he's so much more handsome than I am.

**Adam:** 01:15:08 What's the purpose of taxation in a world where debt doesn't matter?

**Mike Green:** 01:15:14 **Taxation's purpose is to create a need for the currency.** The only reason why you need taxation is to create a situation in which if you don't pay the government they're going to shoot you. That's what it is for and so this is part of the irony associated with the parameters that we're engaged in were like, okay, let's waive this taxation. Let's waive that taxation. You're setting up the situation in which the demand for the currency to meet your obligations, the monopoly provider of violence, the bully on the playground. You're creating the conditions where they're like yeah, no, you can have as much lunch money as you want, you don't need to pay. Imagine yourself you're on the playground right, the schoolyard bully, you know he's going to take your lunch money and you want to eat, what do you tell your mom? **Hey, Mom, guess what the lunch price has doubled.** Whether it happened or not. You're going to demand

additional currency. That's what taxes are for, they're to create a scarcity, a demand component associated with currency.

- Richard:**            **01:16:13**        So if you're subscribing to Lacy Hunt's whole idea that unless the Fed's liabilities become legal tender, and the whole idea of high powered money, which would then really, in fact create a potentially hyperinflation. But if that doesn't happen, then it's only through the means of a break in supply chains and this whole deglobalisation trend that we've been witnessing the last few months through Corona, that would probably be the only avenue through which we might observe some form of inflation.
- Mike Green:**        **01:16:45**        I think we have to be very careful when we look at the 20th century. And this is one of the dangers that we have particularly as quants, right? We rely on data that comes from a unique period in history, in which I'll just lay it out in very simple terms. We started the 1900s with roughly a billion people in the global labour force, we finished the 2000s, we finished the 1900s with roughly five and a half billion people in the global labour force, so five and a half X increase in the global labour force, all of whom needed apartments, sofas, dishwashers, garages, microwaves, cars to get to work, the infrastructure to take care of them, etc. Over the next hundred years, we'll get to roughly 6.2 billion people in the global labour force. We're not even going to grow it by 10%. So to imagine that that's an environment in which there's an extraordinary increase in aggregate consumption functions, that's really hard for me to see. Inflation is hard to generate, at least the experience of rising general price levels is hard to experience in that environment of relative aggregate demand, low growth and by the way, that 6.2 relies on some fantastic assumptions in terms of fertility rates for countries like Nigeria and Indonesia, that increasingly look impossible to achieve.
- Mike:**                **01:18:02**        Does that factor in though the increase in potential standard of living across the globe? There's a fairly small portion of that grouping that would have the access to first world. I'm not actually sure how much of the world would make the leap from third and second world to first world, and what would that do for demand and the ability to create that. Is that that's something that you don't think is feasible.
- Mike Green:**        **01:18:29**        I think that path is increasingly infeasible. I would just highlight that those who have made the transition have largely done so by taking the place of lower skill and more menial labourers along the curve in the United States and the rest of the developed world. You have substituted American workers for in order, Japanese Korean, Chinese workers. And now we're actually talking about reshoring that because the productivity in the sectors that are historically tradable, the agricultural sector and the manufacturing sector the productivity

is so extraordinarily high, that it's increasingly unclear that we need the rest of the world. That's hard to imagine is a positive for the emerging markets.

**Adam:**            **01:19:16**        How do 4 billion people that live outside the first world, how are we expecting them to react to the reality that they will never rise to the same standard of living? Is that not a recipe for a pretty large acceleration of geopolitical risk?

**Mike Green:**    **01:19:32**        I think it is a recipe for an increased rise of a bipolar world that represents, where one voice represents an exit from relations with the western world and a move to autocratic norms that raises the standard of living for a select elite within those countries, while suppressing the potential for growth and increase in living standards for the remainders of those populations.

I think we're seeing this. I would also suggest that it would lead to a reaction function in the rest of the world where their fertility rates would plummet because they would realise that the potential for income expansion for their children would be far worse than it was for them. And as a result, they would make a choice not to have children. I think we're seeing all the evidence of that and I think there's a very real chance that you end up with catastrophic outcomes in those regions around the world that potentially draw the western world, the developed world into conflicts around those components. But we can't know that yet. There is no march of progress that is guaranteed. We happen to inhabit a lucky century, a fantastic century in which by and large, by the measures that our ancestors would have looked at, we defeated death, we eliminated any form of random death. We took away fertility, or we took away mortality rates for women in the process of childbirth. We took away mortality rates for those in the prime of life tied to bacterial infections or viral infections. We're now seeing some of those re-emerge, but in very minor fashion relative to what we would have seen historically. So this was the most fantastic hundred and 50 years that the world has ever seen and that becomes our frame of reference.

**Mike:**            **01:21:11**        ... an S curve. And we've got the diminishing returns part of the S curve for the next, until we get space travel done.

**Mike Green:**    **01:21:23**        I think that's right. And I think broadly, that's really underappreciated that we will eventually discover alternate forms of energy that allow us to accomplish radically more than we could today. We will eventually discover the ability to travel off this rock and find resources that allow people to say, okay, there is a better future for my children. That's largely what the United States and Canada and Australia represented to the quote unquote developed world at that point. I'm caught on the Grant Williams giving a positive shout out to smallpox, but you can't actually under emphasise from a western perspective the dynamics

of discovering a continent the size of North and South America that you depopulated and made available to the peasants of your society who are willing to take the risk of travelling on a boat for three months to get across an ocean and escape from the oppression tied to the nobles that inhabited your regime at that point. That changed the course of the world in such a fantastic way. And to disregard that, I mean, I'm not going to move into the Robert Gordon dynamic of everything wonderful that can be invented has been invented. But I do think it's really important to consider the ramifications of we've largely solved the hard problems. The ones that are left for us, like how do we live forever, and I got to be honest, that's not a problem I personally want solved. I'm happy with the opportunity that I've had to experience the world as I've seen it, and I'm not afraid of moving on to the next stage.

- Adam:**            **01:22:53**        I'm personally very excited about the fact that we are currently focused on technology about how to maximise the number of likes you get on a dog farting. It's like that's where we seem to have peaked from a technological...
- Mike Green:**    **01:23:06**        It's a little bit horrifying but I agree with you on that.
- Mike:**            **01:23:10**        So Mike, I don't know if you've talked about this with Jamie Catherwood as well, because I don't really know this. I sort of have a sense that through history, there have been just the Dark Ages, the periods of growth through global history where we've had expansion, the Roman Empire, the proliferation of technology, and then contraction. Is there any...you talked about the discovery of North America, South America as being one of these like, but are there other analogous periods where there was no discovery of anything new and there was this period of stagnation that you can point to? I'm sure there are I just don't know them well enough to-
- Mike Green:**    **01:23:48**        That's what the Dark Ages were. We basically lost the ability to transit on Roman roads across Western Europe giving way to banditry and a collapse of trading spheres and so you were limited to what was available in your local village. We're on that same pattern. If you think about the dynamics of things like student debt, it's functionally a form of serfdom. Serfdom was introduced in the Roman Empire because they couldn't keep workers on the farms. So they made it illegal for them to leave the farms. . Well, that's what we're doing now. We're setting up conditions that say it's illegal for our children through non dischargeable debt to escape from the burden of participating in our society. They're forced to work.
- Mike:**            **01:24:29**        Well perpetuating the ones that are wealthy that can pay for and allow some of those children to escape that serfdom. But the vast majority of the 4 billion that are in certainly the second and third world are never going to emerge.

- Mike Green:**      **01:24:47**      I think the 4 billion in the second and third world are uniquely challenged. I think that we are creating conditions that make it increasingly hard for the children in the first world to make those transitions. And I think one of the challenges that we have as professionals is that by and large, we represent individuals who are in the privileged class and we have to very carefully tread between seeking their best interests in a purely monetary and financial sense, while simultaneously explaining to them that many of the stories that they have been told about what is in their best interest could very well not be in their best interest long term.
- Richard:**      **01:25:23**      Yeah, you're talking about the fabric of society coming undone at the seams. I hope this is not the last point that we're raising to end this happy hour.
- Mike:**      **01:25:33**      I was going to end that on that.
- Mike Green:**      **01:25:35**      Alcohol is a depressant, come on.
- Mike:**      **01:25:39**      Well, I mean, these cycles are long in nature. This is the ebb and flow through history.
- Richard:**      **01:25:45**      People like to say that one of the most dangerous phrases in finance is "this time is different", and I think that is because of this last 150 years that you were describing, which is so atypical in the long arc of history of how beneficial and everything is by way of the improvement in quality of life that has happened. But if we are indeed coming into a crossroads into a paradigm shift, then indeed this time is different. So people need to contemplate things that are outside of the realm of whatever observable past they have for their models.
- Mike:**      **01:26:25**      Or is it different? I mean, on what timeframe? On what fractal of time are you referring to it being different?
- Richard:**      **01:26:31**      Last few decades, at least.
- Mike:**      **01:26:32**      Correct. But over the last 200 or 500 years it's not-
- Mike Green:**      **01:26:37**      Last 500 years broadly...I would argue the last 500 years has been pretty darn positive. But that largely encapsulates the period in which we radically expanded the amount of land per capita available to those of western descent. You just have to consider that and you have to think about it and I could be totally wrong. I'm one voice in the wilderness saying a particular thing and I would also just highlight that the bearish case always sounds more intelligent. We are genetically programmed to respond with more...Yeah. I mean, if somebody says, hey, there's fruit in that bush, you're like, that's nice. And if

they say there's a lion in that bush assuming you're in a place where there's likely to be a lion you like, you immediately respond, right? And so, if I tell you that the end of western civilization is nigh, and that we're all going to be scrambling out our existence in caves, you're kind of wired like, how that matches the way how terrible things feel.

But, I also think that there are very positive outcomes. I'm hopeful that the human ingenuity is able to create the innovations that lift us out of this and I would highlight individuals like Jeff Bezos who are focused around space exploration. I'm not going to mention Elon Musk because I can't stand any aspect of that discussion. But you know, I do think that that they are tapping into a cultural zeitgeist that recognises we need to do something different. We need to actually do something different. We're hopeful that that happens in time, and that we're able to lower the cost of getting humans off this rock so that we can expand that land once again. But remember, if you got on a boat to travel to America in 1650 the odds were that you were going to last about 10 years here. This was not a good trip. There's a reason indentured servitude was typically nine years. Because that 10th year was your expiration date. The cynicism has always been there in terms of the debt contracts. But, you know, I'm hopeful that we will do it.

- Mike:**                **01:28:48**        What with the current standard of living that you would take that bet to hop on the boat?
- Mike Green:**       **01:28:55**        100%.
- Mike:**                **01:28:56**        ...was it that you would do that?
- Richard:**            **01:28:59**        I think a positive light that we can also bring to this is the fact that nothing moves in a straight line. So everything moves in a sine curve. Maybe we're in our continued upward drift, but maybe we're at the peak of that sine and we're at being a little lower, but the positive drift still remains. Michael, have you read The Three Body Problem, because a lot of the ideas that you're bringing in towards the end of this conversation strikes me as you're ... Liu Cixin and or at least have been delving into that space.
- Mike Green:**        **01:29:29**        The irony is, is that I actually have not read that book. But it's been referenced many times. I probably should add it to my repertoire, but I cannot claim knowledge of that.
- Adam:**                **01:29:46**        Actually on the fact that I'm pretty sure that you're being cagey about your reference to Elon Musk because you don't want to keep your head on your huge call book on Tesla. So, we can just believe that you're there to try to be cagey.

- Mike Green:**      **01:30:01**      You guys have heard me talk about this. I think at the end of the day that Elon and others, we could talk about SPACs ...I mean, there's all sorts of stuff that's going on, that other parties have figured out how to play this system. If I'm going to give you on credit for something, it's that he clearly figured out how to game a system that the rest of us are left scratching our heads. That was one of the subjects in my lunch yesterday with Mark ... and Bill Fleckenstein. This is the golden age of frauds. I mean, what could be better for a fraud than a situation in which the single largest investor and by far the majority of flows, actually more than 100% of the flows are flowing to an investment theme where the current price is the right price, and there's no understanding or no knowledge of the fundamentals. Hey, that's perfect for frauds.
- Richard:**      **01:30:53**      And to your point earlier, if you want to really make yourself too big to fail, you start supplying NASA.
- Mike Green:**      **01:31:02**      Exactly. That's exactly correct. Again, I think he has cracked the algorithm that we're all asking about. And, I'll take it even a step further. I mean, he doesn't actually have to sell a share because we now live in an environment in which he can borrow against his shares, he can take that securitized against those shares, and if they ever fall, he just points to the evil investment Wall Street bankers who forced him to sell his shares. Wasn't his fault.
- Mike:**      **01:31:32**      Positive upward spiral. This is my favourite part of the conversation. OK, next time, we get Mike on with one full drink, in him first.
- Mike Green:**      **01:31:47**      There's a reason I'm not often invited to cocktail parties because-
- Mike:**      **01:31:50**      You're going to be the most popular guy at our cocktail parties.
- Richard:**      **01:31:54**      As part of the conversation for sure.
- Adam:**      **01:31:57**      Yeah, the irony is, you're the optimist in this group.
- Mike Green:**      **01:31:59**      Man, that's frightening. Anyway. All right, guys listen, this was a real pleasure.
- Richard:**      **01:32:07**      It was a lot of fun. Thank you for your time, Michael.
- Mike Green:**      **01:32:09**      All right. Take care.

