

Speaker 1: [00:00:00](#) Welcome to Gestalt University, hosted by the team of ReSolve Asset Management, where evidence inspires confidence. This podcast will dig deep to uncover investment truths and life hacks you won't find in the mainstream media, covering topics that appeal to left brain robots, right brain poets, and everyone in between. All with the goal of helping you reach excellence. Welcome to the journey.

Speaker 2: [00:00:28](#) Mike Philbrick, Adam Butler, Rodrigo Gordillo, and Jason Russell are principals of ReSolve Asset Management. Due to industry regulations, they will not discuss any of ReSolve's funds on this podcast. All opinions expressed by the principals are solely their own opinion and do not express the opinion of ReSolve Asset Management.

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Adam Butler: [00:00:54](#) Welcome to the latest version of the Gestalt University Podcast. This is Adam Butler. I am Chief Investment Officer for ReSolve Asset Management, and today we have [Michael Green from Logica Asset Management](#) on as our guest.

This was a mind blowing conversation for me. Michael shared his background and the thesis he's developed on how regulatory changes over the past couple of decades have led to a deluge of passive flows in markets that have disrupted the past equilibrium that was enforced by a balance between largely momentum and value traders, and shifted several expected levels for markets in terms of valuations, expected returns, etcetera, in ways that I think very few investors have intuited or are positioned for.

And I want to thank Michael for sharing some new and novel charts and analysis. I have to say that I was, and am, much more persuaded of his thesis than I was going in, than I expected to be coming out. So, a testament to the coherence and comprehensiveness of Michael's analysis. So, want to warn you, there were a few small technical difficulties, which I think people have come to expect, given that everyone's working from home and there are a lot more variables to control for. So, I would encourage you to push through those. You will not be disappointed. So, without further ado, I bring you my podcast with Michael Green.

All right, so I'm here with Mike Green. Mike, thank you so much for joining me. You're calling in from San Francisco today?

Michael Green: [00:02:49](#) Yeah. Just outside San Francisco, Marin County.

Adam Butler: [00:02:51](#) I really appreciate it. You are an omnipresent personality on the podcast circuit and on the video circuit recently, which has been fantastic because it gave me lots of material to review, and you and I have obviously corresponded privately, which has been great. So, there's lots of grist for the mill here. I know that while you've been out in front of it, lots of people who are going to listen to this are going to be

familiar with your background, but you'd probably still better give us a brief review of where you've come from and that'll help us frame this conversation.

Backgrounder

Michael Green: [00:03:23](#)

I've been involved in securities markets in one form or another now for about 30 years, ever since I graduated from the University of Pennsylvania. Initially, I went into management consulting, where I developed an expertise in working with corporations for strategic planning purposes, in particular, the acquisition or disposition of business units from a strategic corporate planning standpoint.

I recognized that there was an opportunity to codify some of the valuation techniques that we were using at that time, tools that not broadly spread out. Feels insane to think about this, but even as early as the 1990s, most people didn't understand this kind of cashflow techniques or MPB type analysis. So it was actually quite a challenge.

So we actually built a software tool that led to my introduction to Mitch Julis. Mitch Julis was one of the founders of Canyon Partners. He actually proposed that we link our valuation tools to the public equity databases. That turned into an equity valuation tool, and ultimately led to the sale of that business to a firm now affiliated with

With the sale of that business in 1999, I transitioned to the buy side, initially joining a separate account manager up in the Boston area. Some of our clients focused on small cap value, which is where I saw the greatest opportunity. I was fortunate that I only had about six months left of the dotcom cycle, otherwise, I'm not sure I would have survived. But the process of going through that was an extraordinary development and discovery that then led me to mutual funds down in New York, working for Royce & Associates and then Canyon Partners, who repeatedly tried to get me to come back out to Los Angeles to work for them.

Finally, he said, "There's an office in LA." And I said, "That's LA. I don't want to live in LA." Which is, of course, ironic because in all ways I'm now associated with LA, that's where our firm is based.

They asked me to open the New York office of Canyon Partners. I built that from a small business to a team that ultimately, it's about 15 people running somewhere in the neighborhood of \$2-5 billion in notional capital and that's now actually one of the main offices of Canyon Partners.

I left Canyon in 2014 to launch a hedge fund called Ice Farm Capital which was backed by Soros. That was an interesting adventure. I strongly encourage everyone to go through the opportunity do that wrong at least once. But after that experience, I went to work for Peter Thiel managing some of his personal capital.

And then recently in December of this past year, I left and joined Logica to develop what we call our absolute return products, which is built on a lot of the research that we'll talk about today, with the impact of passive vehicles on markets.

Adam Butler: [00:05:49](#)

Nice. How did you meet Wayne? And how did that partnership develop?

Wayne

Michael Green: [00:05:53](#)

I met Wayne over Twitter, believe it or not. It's similar to the way you and I interact. I make a point on Twitter of trying to put real people behind the avatars on occasion. Wayne was one of those individuals who spent a lot of time talking about the theory and the philosophy behind trading and how to think about the dynamics of optionality, and it was clear to me that he knew what he was talking about. And so I suggested that we sit down and talk and of course neither one of us looks very much like our avatars. And so there's this awkward meeting at a coffee shop in Los Angeles. And what could have been a very safe 15 minute date turned into a two and a half hour discussion and blossomed into a business partnership.

My initial thought, as I became involved with Wayne, was that he would be an interesting allocation for Peter Thiel's capital. And then as I dug into his process, it really became clear that what he was doing in the quantitative space was very, very similar to what I was doing in the discretionary space. And so my structure has always been to seek out a straddle, basically find a way to participate to the upside and find a way to participate to the downside in

Part of the challenge of doing that in the discretionary framework, particularly from a macro perspective, is just that there's so many assets for you to choose from, that you're on an extraordinary basis risk. Did you happen to get the right trade at the right time? And as a result, you tend to diversify your efforts. Now that is fantastic in a lot of ways, because it means that you gain exposure to an extraordinary number of instruments and an extraordinary number of markets.

And not all macro guys do that, to be clear. Some macro guys are very focused in rates and extremely good at what they do. I operate under the principle that I'm somewhat incompetent in execution strategies, and so what I'm always looking for is the greatest value opportunity. It just takes me back to my value roots, and I approach the macro space from the same standpoint. Where is the largest disconnect? Where is something creating the greatest convexity to the return profile? And so when you're doing that, it's fantastic to walk around and basically say, things are going to mean revert. The Aussie/Yen relative to the S&P is more extended than it's ever been in history. Therefore, the Aussie/Yen has to correct and the S&P has to correct, and so the two are going to converge.

That type of quantitative analysis, go ahead and describe it as quant light, where you're effectively looking at the alligator jaws separating, they inevitably have to

recover. That tends to be actually where I find the greatest opportunity, where people are looking for those to converge and something fundamental has changed.

And so what Wayne had stumbled across was this idea that he could create a better foot, that he could create a better straddle, by using the tools of quantitative finance and understanding the theory behind what he was doing. I had the opportunity to listen to your podcast talking about tail risks. So Wayne had at originally constructed the Logica tail risk product with the idea of being that it would hedge a multi-manager long bias overlay, effectively creating protection.

He chose to do something very important, he modularized the up capture and the down capture components of that. And the up capture was his approach to how he wanted to defray the cost of carrying that foot. So one of the biggest challenges, and again, in your last episode, which I thought was fantastic, you talk about this issue of how do you carry the cost of the foot? How do you offset the inherent cost of that protection?

And so what Wayne had done was he had built a module that was built on prior work he had done to try to gain positive expectancy on the top side that would offset the cost of the downside. And at the same time he built some rules and tools for how to, what we refer to as scalp gamma basically, say, well, this isn't the move so I'm going to sell a little bit of my protection, basically offsetting the smaller moves in either direction.

When I looked at Wayne's product, what became very clear to me was that he was tapping into a phenomenon that I had identified, this dynamic of the impact of the growth of passive, and it was creating a positive expectancy to his return that he didn't actually understand why it was occurring. He had basically stumbled onto a goldmine. He was like, people seem to like this yellow metal. And my approach is to look at it and say, "Holy cow, Wayne, this is absolutely brilliant, but you've improperly weighted the portfolio. You need to increase your upside capture."

And that was the growth of the absolute return fund, which takes the traditional tail risk protection and embeds it into a portfolio that is designed to take advantage of the characteristics of the market that have changed over the past 15 to 25 years.

Adam Butler:

[00:10:28](#)

Wow, okay. There's a lot of threads to pull on. There's two directions that I'd love to go. One, is in terms of the overlooked goldmine, and the other is in terms of how to structure a tail hedge strategy. And I'm not quite sure which direction to go.

The Overlooked Gold Mine

I think that the tail hedge discussion will emerge from some questions I wanted to get to later on anyway, which is about how your... Because in a lot of the articles you've written, a lot of the interviews you've given, you've referred to the fact that you've positioned clients to participate asymmetrically to one of a finite number of potential outcomes, and so I think we can probably drill into some of the optionality and how you structure that optionality as we discuss that. So maybe I'll go back toward the direction of your primary thesis around this idea of passive flows and of passive oriented market, or how that changes the structure of how we should think about capital market expectations, what the potential upside is on a market, given that things have become completely disconnected, or to a great extent disconnected, from fundamentals, but I'm probably getting ahead of myself.

I know you've stated your thesis on passive investing a couple of times, but just give us the broad strokes so that we have a platform to drill in.

Michael Green: [00:11:58](#)

The very premise of passive investing is an outgrowth of the efficient market debt offices. The idea that the market itself reflects the best available information at any point in time and passive is then built on top of that, which is to say, well, if that's the case, then no individual analyst or portfolio manager can outperform the market, or let me rephrase that, in aggregate the individual analyst can't outperform the market because they compose the market. And therefore you can obtain free rider status by simply buying the market.

The problem with those assumptions is that it relies on a couple of different features. One is the idea that the market itself is actually efficient. And so we use this paradoxical phrase, we talk about markets becoming more efficient. We talk about information being disseminated more rapidly, and this contributing to markets becoming more efficient.

At the same time, we see this strange phenomenon that you're referring to, where it feels like the markets are completely disconnected and as a result, we're forced to say, well, maybe the market sees something that I don't see. Maybe the market understands something that I don't understand.

Adam Butler: [00:13:02](#)

The premise being that the market in aggregate has wisdom that no individual possesses and therefore there is signal in current market prices that individuals should listen to.

Michael Green: [00:13:12](#)

And while my wife will assure you that everyone else has wisdom that I lack, the problem is when you actually dig into the assumptions that are behind these things. And so there are a couple of different vectors that are quite unfortunate that have been built in since the 1950s and they've now become basically the

orthodox description of how markets work, which any participant knows are actually untrue.

A simple example of an efficient market hypothesis component is that you can, in a frictionless manner, trade in and out of securities. Well, anyone who's ever traded anything beyond the size of a small personal account knows that you actually need to take into consideration the impact that your strategies have on the market. So it's completely absurd to imagine that an entity the size of BlackRock or Vanguard is not influencing the market itself. We know that to be true, it has to be influencing.

So then the question becomes, can you actually identify how it's impacting it? Can you see the changes? And this is where things become complicated because there's never a single variable. These are complex dynamic systems. You can't point to Vanguard or point to BlackRock and say, that's the entire story.

That's one of the things I always caution people when they hear my thesis on passive, or try to caution people, is that while I think this is the most important story, it's not the only story. And so there are multiple components and multiple layers to peel back the onion. And I think for me, that's one of the most interesting dynamics. I have always posited myself less as an investor and more as a detective, basically see something and you need to then understand why that happens.

It's interesting, Wayne and I just had this conversation, most quants come from an environment in which they look at the empirical data and they assume that the data represents truth. I had a good conversation in one of my Real Vision interviews, ... where part of the point that I was making is that markets don't actually represent truth. They represent transactions. And the price that you see on the screen today is actually not the price at all, it's the price of the last transaction. Now it's an assumption that the next transaction is close to that transaction. That's the definition of liquidity. That's the way we think about liquidity in markets, but it's far from true. And part of what we saw in February and March was that liquidity evaporated and that the mechanics of the market actually began to matter.

For me, I think one of the things that tends to be a huge advantage for people is if you have an extraordinarily good memory and you're able to pull disparate pieces of information together. And so for me, a lot of this, actually, it was predicated on some work that was done when I was running Ice Farm. We were watching the Chinese stock market and the Chinese stock market in June of 2015, or up until June of 2015, was rising at a rate that made the NASDAQ phenomenon in 1999 look like nothing. It literally went up 500% in the course of about a year.

Adam Butler:

[00:16:08](#)

I remember it.

Michael Green: [00:16:09](#)

And all the conversations on the street... I was watching China and looking at it and saying, this is completely insane because I know at its core, this data that we're receiving, it's terrible. We're seeing this dynamic that the narrative that emerged on the street was, well, China is going to liquefy itself, it's going to re-equitize its economy by selling all these shares and selling equity to the rest of the world. And that's going to allow it to de-lever. And it took about 36 seconds of math to figure out that that couldn't possibly be the case.

And so we actually dug into understanding the mechanics of what was going on in the market. And so what was actually happening was that the construction of the Shanghai stock market was it was market cap weighted, and yet many of the companies that were listed in the index had floats of 10%, 5%. So tiny fractions of shares were actually available. And you had Western investors that were looking at the price signals associated with Chinese stock market rising, deciding that they wanted to buy into this narrative. And they were coming in because they weren't qualified investors and QV type investors. They were coming in in liquid form through futures in Singapore. And Singapore, they were then trying to replicate the index.

Well, if money was coming in in proportion of the market cap, and yet you only have a small proportion of the float that's available, and it meant that far more money was chasing these shares than was actually available. And so we began to track a phenomenon where we were exploiting another feature of the Shanghai stock market, which is while the index itself had no real limits, the individual stocks had 10% limits both up and down. And so what we were tracking is the proportion of stocks, the number of stocks, that would go limit up with zero transactions. And so it meant that literally no trades were happening. What you were seeing on the screens, and it was reflected in the index price, was basically the limit of behavior.

The extreme was we had one stock that only had about 5% float that went limit up with zero transactions for 32 consecutive days. So 1.1 to the 32nd power. Rapidly became one of the largest companies in the index and nobody could actually transact any shares. Nobody.

Observing that, that then forced me to go back and look at the behavior of what we saw actually in the 1999 market. Because if you've lived through that whole time period, you realized that in 2004, there was a change where the market shifted to market cap weighted and away from market cap weighted to float weighted.

It was presented as if it was absolutely no big deal. It has no impact. The academic papers that came out re-weighted the index on the basis of this and said there was 1-2% change, not a big impact. But what they didn't consider was exactly this phenomenon, that the difference between market cap and float, even if done in small size, was actually causing a huge disconnect.

And again, going back into the memory banks, what I remember was in the mid 1990s, there was this phenomenon where companies that had high levels of insider ownership outperformed. It was the single best factor from 95 to 98. What you were actually capturing was exactly this phenomenon. The Vanguard's, and BlackRock's, et cetera, of the world, were starting to come in, particularly after the issuance of the SPY ETF, they were coming in and trying to buy stuff in proportion to its market cap. But that meant you were buying twice as many shares of Microsoft as were actually available, or 10 times as many shares of Google.com. And so you ended up with this crazy phenomenon where prices were being driven by these mindless investors that were trying to replicate an index that was improperly constructed.

Adam Butler: [00:19:44](#) So you should be able to empirically test this thesis. And so I guess one of the tests is insider ownership because that implies that the float as a proportion of the total number of shares outstanding is probably lower than average. But you can just test it directly by just examining the float as proportion of total-

Michael Green: [00:20:05](#) So can go back and you can look at that. And as I said, it was actually the best performing factor of the 95 to 98 time period. You'd also though, and this is the complexity of markets, there's multiple explanations for why insider ownership could lead to out performance. Companies themselves could actually be outperforming. They could be better businesses. The portfolio managers could be screening for it and therefore allocating more capital to them. There's all sorts of reasons that you can explain why this happens.

What was so interesting was that the other feature that's associated with low float is that you've relatively recently IPO'd, and so the correlation, the overlap in a Venn diagram sort of framework, of technology and insider ownership in the mid 1990s, morphed into a feature of the market that was exploited by the way the market itself was structured then in terms of mutual funds. So you didn't have an ETF focused on the idea of insight or ownership at that point. You would have a technology...

Michael Green: [00:21:00](#) ... of insider ownership at that point. You would have a technology fund or you would have an industrials fund or you would have a large cap balance fund. Well, if the insider ownership factor overlaps with the technology designation, then you're suddenly in a situation in which technology begins to outperform and the technology then attracts additional capital. Looking at that outperformance and that additional capital, the technology fund managers needed places to put their money other than Microsoft, Cisco, Dell, et cetera, and so the new IPO crowds came out.

Adam Butler: [00:21:37](#) This is obviously directly observable, empirically testable, and it does make eminent sense. Do you continue to see the same dynamic playing out in the current environment?

Michael Green: [00:21:50](#) Well, you see it play on a very different fashion. When they change the structure of the market... And actually, why don't I share my screen and I'll show a couple of slides just to-

Adam Butler: [00:21:58](#) Yeah. That would be great.

Michael Green: [00:22:00](#) Because one of the points that I would actually make is that if this idea is correct, that passive is actually driving a large component of it. What we should see is we should see a rise in correlation. We should see stocks behaving together as a group more than otherwise. Again, in that complex feature, we actually saw something that said the exact opposite. Since 2011, and I show this dataset in parts, this is the implied correlation for the S&P 500 stocks. What you can actually see since 2011, and largely since the global financial crisis, until the end of 2017 this had actually been nearly continuous decline. That's actually strong evidence against my thesis. The idea was that you were actually seeing markets behave as if the individual securities were less associated with each other than more. This, again, speaks exactly to the type of complexity that you have to deal with because you could immediately dismiss this.

Now, I show this certain part, because this is actually the sum total of the data series that's available on Bloomberg. Most investors would only have access to things from the CDO areas, which are even shorter in nature and difficult to decipher. But if you look at that same history over a longer period of time, this is logical calculations that we're looking at here. The black line here corresponds to the chart we were just showing before. The yellow line is just a mathematical derivation of that were using a simpler approach to allow us to easily calculate this back over time. Correlation itself requires a 500 by 500 covariance matrix with the weighing scheme of the S&P at all times. You need to know the magnitude of each individual move, et cetera, et cetera. Even then, there becomes questions, or do you want to look at interdict correlation end of day correlation, et cetera.

The approach that we're using, what we call comb movement, takes a much simpler approach. It takes advantage of a mathematical property called Kendall's Tau, which I only know because of mathematician told me what it was. But we're just asking a really simple questions. Did two stocks move in the same direction on the same day? And if they do so on a continuous basis, they should be correlated. And lo and behold, the data series over the observable history is almost identical. And so instead of falling correlation, now we actually see that rise in correlation. We see the fact that over time we're trending upwards in correlation. And going into the end of 2017, it wasn't that correlation retreated to normal, instead it was more extended below this historic uptrend than it had ever been before.

Adam Butler: [00:24:32](#) We were expecting some kind of mean reversion here. So this series going forward from the end of 2017 has reverted back towards its higher level of, so this thesis that the trend is steadily rising.

Michael Green: [00:24:47](#) So we actually have absolutely seen the correlations rise significantly. And if I actually show... I want to show two quick slides here. And I'm ..., again, this is the sort of thing that you need to dig in really deeply to understand what's going on. So why was there this disconnect between my theory and the empirical reality? Well, it's because you need to understand what correlation itself is measuring. So it measures the fractional movement of variable Y that can be explained by the movement of variable X. It means there's two reasons why correlation could be low. One is there's no relationship. And the second is if you don't move X. So if you don't move X, there can be no explanation for Y. Therefore, correlation will be low.

And that was really what was going on in 2017 was that we have the highest fraction of days in history, which the market was moving less than 25 basis points in either direction. It's a very sloppy chart. All I've done is recreate the history of the S&P based on the proportion of daily closes in which the market moves less than 0.25% positive or negative, 25 to 50, 50 to a hundred given as the widening out the standard deviations on a normal distribution sort of thing. Well, 2017 had the highest fraction of history, which the market didn't move. In other words, X wasn't moving, therefore it could offer no explanatory power for Y.

Adam Butler: [00:26:03](#) Interesting. Okay. There's no variance. So there's low covariance.

Michael Green: [00:26:07](#) Correct. Mathematically, absolutely correct. If you isolated it and kept the volatility constant though, now you really see this trend in correlation emerge. So when you move less than 25 basis points there's basically no correlation, exactly to your point, because the market is centered basically around zero. But half the stocks are going to be up and half the stocks are going to be down on any given day. And therefore you get low observed correlation. But if you look at the 50 to a hundred basis point move, your correlations have doubled over the past 25 years. So we're actually absolutely seeing this. And if I look at... I tried to normalize this, and so hopefully the screen is going to come up now.

This is what this actually looks like. And so this is taking it all the way back to 1928. And what you're seeing is we're experiencing levels of correlation. A really co-rel movement, to use the phrase that we're really sticking with, that was just never seen before.

Regime Shift

Adam Butler: [00:27:03](#) Yeah. And it looks more like a regime shift than it does a change in trend. I think we can probably establish that the distribution of co-movement since call it 2000 is not the same as the distribution of co-movement prior to 2000. It has shifted higher.

Michael Green: [00:27:21](#) Yeah, I think that's right. I think statistically, you would say that from 2000. But I would actually identify ... that there were two primary events. The first was the registered investment advisor act of 1940 that created the modern mutual fund.

And one of the most important things that that did was it forced you to disclose, if you planned on using any form of leverage. Because we're coming out of the great depression and nobody wants to disclose that they're using leverage. That's an unappealing feature to most people. And as a result, most mutual funds didn't deploy leverage. And so they actually didn't have a situation in which the markets fell 20%. And then everybody had to meet their margin requirements at the same time. And that's the sort of thing that leads to an increase in correlation, where everybody is forced to sell because of a collateral level, for example.

In the mid 1990s, and again, this is with probing the data bank. And if you didn't happen to be alive then there's no way you could have possibly known this. But there was an obscure article in The Wall Street Journal, somewhere around 1994, '95, which I remember reading that Vanguard was having trouble because it was beginning to experience variance from its benchmark. They were rolling large enough that the size that they were trying to deploy in the market was leading to tracking error and then went to The Street and said, "Hey, what can we do? Because we're now big enough. We've got 1% of the market. We're trying to buy into these securities and we're causing their prices to move. And that in turn is leading to us experiencing tracking error versus benchmark." And The Street said, "Well, that's a silly way to do it. Why don't you just buy futures?" And they said, "See, we can't because we're a mutual fund. And the registered investment advisor act of 1940 says we can't use a margin account, which are required for futures." So The Street said, "Well, hire a new law firm and go lobby the SEC. Explain, you're not trying to speculate, you're just trying to give Americans access to the cheapest and best performing mutual funds on the planet." And they did this and the SEC looked at it and blessed it with what's called a no action letter. And says, "We're not going to change the law, but we're not going to prosecute you under it." And at that point, the index world... And this also is tied to the SPY release and other ETFs began to track these things. We began to see an explosion in futures volume associated with these mutual fund players, deploying capital into the markets. Basically taking this problem of index per application and kicking it out to The Street.

And when this happened, that was the sort of the .com cycle. That was the start of the irrational exuberance. Why? Because you suddenly had retail players and we're saying, "Hey, I've got cash. I have to deploy it. I need to put it on the futures." They don't actually care what the price is. I'm not trying to get the best price. I'm assuming the market price is the correct price. And that led to the futures players trying to replicate the futures, because that's how they're created. You offset it through arbitrage, by going out to buy all the stocks. I mean, you had stocks that were improperly weighted in the index like Microsoft and Cisco and Dell. Well, then the stocks outperform.

Adam Butler:

[00:30:13](#)

And they were improperly witted in the index because their market cap was so much larger than their float.

Michael Green: [00:30:19](#) Exactly. The shares just weren't actually there. You were trying to get Bill Gates to sell you his shares.

Passive Flows

Adam Butler: [00:30:25](#) Gotcha. So here we are. I know you've talked a lot about changes in retirement laws that have been driving passive flows into different types of retirement accounts. So what's happening with that at the moment? And how was that impacting the price of the S&P and passive funds?

Michael Green: [00:30:47](#) So again, one of the assumptions is that all market players are equal. And as we know in our increasingly unequal world, some players are bigger and stronger and have more influence than others. Basically all of the industry's lobbying resources now concentrated in BlackRock and There are a few players on the side, but they can spend money that nobody else can and they can have influence that nobody else can. In part, because they're perceived as disinterested, they're perceived as passive players. So a lobbyist for Vanguard was just lobbying for the Americans. They're lobbying for mom and pop. It's not true. I'll tell you it's among the most cynical organizations I've encountered, but that's the perception. And so the changes that have been put in place that have favored passive and favored these dynamics, and I understand this all sounds like complaints, but I'm actually quite ecstatic because it gives me opportunity to exploit it.

In the 1970s, we introduced IRAs and 401(k)s, which were designed to facilitate individuals' savings. The IRA was created to avoid the tax hit associated with a defined contribution or defined benefit pension plan rollover. The 401(k) was created to help corporations offer a benefit to their employees that didn't establish the type of obligation, that a defined benefit plan did. Remove that hidden liability from their balance sheets, and basically put it onto the backs of the employees. At the start of the bull market in 1981, those products were about a hundred billion dollars each. As of today, it's the single largest pool of assets on the planet. It's about \$17 trillion between the two. So these are grown in an explosive fashion. In 2005, we introduced the idea of qualified default investment alternatives. And we also in 2003, allowed stepped up participation in the aftermath of the 2000 crash, that facilitated people increasing their tax deferred savings in 401(k)s.

And the QDIA was actually a really important limitation because many people, one of the big complaints about 401(k)s was that investors would often receive this benefit and have no idea what to do and so do nothing. And so the money would just accumulate into a money market fund. That'd be none of the compounding that we were hoping for and none of the provision of investment money that is embedded in the idea that you're going to have those savings set aside.

When we changed those rules in 2005, we specified that HR managers and the company themselves actually became the source of making this decision. Where

do you put the money first? And in 2012, those rules again changed. And what's called a target date fund became, in most cases, the default assumption. And so target date fund is when they basically ask a simple question. "How old are you, and when do you plan to retire?" And then chooses an asset allocation on that basis. And so this is a market that didn't exist prior to 2003. It's now grown. It's larger than hedge funds by a significant measure. And somewhere around 85% of every incremental dollar, that's now going into retirement accounts in the United States is going in, in the form of a target date fund.

I've actually got some statistics here, thanks to Vanguard. And this just gives you some idea. And I apologize that the screen's a little bit small. And I jokingly referred to it as, Tesla's not the only company that's offering autopilot. But this is actually showing... This is from a study that's done by Vanguard that shows the equity allocation by age. The maroon line here is the traditional form of the target date fund, where it steps down every five years or so. This is true for Vanguard products. And for most of these products, when they were introduced, they were nowhere near the size. For efficiency purposes, the idea was let's do a five year window and I can customize by allocating two thirds to one and one third to another to get a specific date in terms of allocation. But they do this, consistently rebalancing.

This dark gray line is showing you the median 401k. And what you can actually see is that the medium 401(k) looks exactly like a target date fund up until about 45. And the reason why is over here on the right, because the medium 401(k) actually is now a target date fund. This is one of these interesting dichotomies that's emerged. If you look at... And this is also just the autopilot idea. So slightly more than 60% of all participants are just in an automatic enrollment program. So this is the QDIA. Your HR manager has decided for you where your money's going to go.

Adam Butler: [00:35:25](#)

Interesting

Michael Green: [00:35:26](#)

Vanguard's expectations by 2023, 80% is going to be in some form of a target date fund in terms of the total market. This is completely crazy, because what you're telling me is I know exactly what you're going to own and exactly what you're going to buy and sell based on the rules of construction. And everybody's going into this. That's a nightmare.

Adam Butler: [00:35:49](#)

So how does this translate? Walk me through the stock versus flow issue here. We know that the price of a commodity is set at the margin. There's \$17 trillion in stock in investors that have already purchased market cap weighted equities. What is it? Is it 60% or two thirds of retirement plans have already adopted this framework? So, I mean, eventually this trend... It's a migration from one pool to a different pool over the last 15 years or so. But now the vast majority has moved into a certain pool. The pool is very large. Is the marginal dollar going to have the same marginal impact on price?

Michael Green: [00:36:30](#)

So this is where it gets really crazy because the marginal dollar has a bigger impact on price. And so, again, this is proprietary research, I don't often show this. But this format is suitable for it. And I was, as I said, extremely impressed with the content of the discussions that I've listened to on your podcast. So, I think, your listeners are sophisticated enough to understand these compliance. And this is looking at exactly that question saying how the markets work. And it's built on proprietary survey of roughly 450 investors subscribed to Real Vision. So as part of the reason why I do things like Real Vision is it actually gives me access to data and information that I can't otherwise obtain.

And so what I did was asked a really simple question. I surveyed investors as a European portfolio manager, with 5% cash in your portfolio. You receive a new inflow or outflow. What's your probability that you're going to deploy that capital based on valuations in the market? So here we have your propensity to buy or sell, marginal propensity to buy or sell. And on the X axis we have valuations. And what you see is exactly what you would expect. Your propensity to sell rises as valuation rises, your propensity to buy falls as valuations fall. What's fascinating is not that which you would kind of expect. But the insight that on the simple survey, the intersection of these two at almost exactly 50/50, is that the market's historical average is 16 and a half times earnings.

Adam Butler: [00:37:55](#)

It seems intuitive.

Michael Green: [00:37:57](#)

Well, it's intuitive, but it's also deceptively powerful. Because what it's telling you is that the mean reversionary characteristics of the market are created by the mean reversionary characteristics of the participants. So as valuations get higher, people become less willing to buy and more willing to sell, which pushes prices back down. Likewise, as prices get lower, evaluations get lower, your propensity to sell falls, propensity to buy rises, and then pushes prices back up. It creates mean reversionary characteristics. When you introduce passive though, and that's what we're doing right here, we've shifted the market to 50% passive. Passive operates off the world's simplest algorithms. Did you give me cash? If so then buy. Did you ask for cash? If so then, then sell. There's zero consideration. And so those participants shift the market up and away from this mean reversionary 50%. And towards a flow driven component, around 80% or 50% passive penetration, which we're close to now.

Now, if you look at the impact of that, the historical marker... The market composed only of active participants as shown here at the blue line. And I'm trying to have true fidelity to the actual data. So because it was slightly above 50/50, what you see is that valuations, this blue line, go up and down from being largely stable. Although there's a slight drift that's created by the slightly greater than 50%. But when you introduce passive and it grows over time, now what you have is valuations begin to rise in an increasingly unconstrained format. And then we actually see this, yeah, this is the valuation of the medium stock in the S&P 500.

This is actually an important chart for a couple of reasons. One is here's your low with the introduction of index funds. The second is because we're really using the median stock that doesn't really appear to be a bubble in 2000. So that was a very narrow, low float technology sub segment of the market that was created by these dynamics. Now we've pushed way beyond that. So there's all sorts of narratives. Humans are storytellers. This is a story. It could be wrong. I think there's extraordinary evidence that supports my thesis.

- Adam Butler: [00:40:03](#) Well, the cap weighted price sales ratio would tell the same story. The chart would look different, but it would tell the same story. Obviously.
- Michael Green: [00:40:08](#) Tell the same story, but it would be interrupted by an extraordinary peak here. And so it'd be this huge debate where you can say it in 2007, that's not a bubble, this is a bubble. Again, it becomes one of these features, just like the correlation. You have to actually dig into the data. You have to be able to have a top down view and the bottom up understanding of what actually transpired to do the detective work properly.
- Adam Butler: [00:40:33](#) Yeah, it just complicates the story a little bit. Because the thesis relates to the fact that the stocks with the largest market caps will receive the largest flows. And now you're examining an index that deflates away market cap by just looking at the medium. You've just introduced another variable. I think if you'd preserved the market cap weighting, it would tell the same story, but I agree visually it would be less instructive.
- Michael Green: [00:41:00](#) We could certainly show it. It would show a similar trend, but again, it would be so heavily interrupted by this spike. The only recently surpassed that you would look at it and you'd be like, "Oh, okay, maybe this isn't really a bubble yet." To me, this has been an extraordinarily clear bubble. But that then introduces a totally separate question, which is how do you trade those things?
- Adam Butler: [00:41:20](#) Absolutely. And I mean, you've now disrupted any sense of equilibrium. And majority of-
- Michael Green: [00:41:26](#) That's the most important takeaway is just that the equilibrium has gone. And the behavior that you would expect is that the markets rise faster and more unconstrained fashion than they ever have before, because they're now dominated by an algorithm. It's the world's simplest algorithm. Did you give me cash? If so, then buy. In what proportion should I buy it? Well, the thing that went up the most, I'm going to add the most incremental capital to. That's the way it works. Now that's a momentum strategy.
- Adam Butler: [00:41:52](#) So does this show up in the momentum indices? Because I think there's two different dimensions to examine this on. The first is a macro dimension. To what extent does... Or how should we think about-

Pricing Global Market Expectations

- Adam Butler: [00:42:00](#) To what extent does, or how should we think about global capital market expectations? How should we price the relative value of the S&P versus the FTSE, or the Nikkei or treasuries or crude? From a macro perspective, does it produce greater levels of disequilibrium? Are we exacerbating Samuelson's dictum here? So that at an aggregate level, markets are going to trend further and further from equilibrium? Then the other dimension is, cross-sectionally, how should we think about this from a stock picking standpoint? Which stocks are going to outperform? Which stocks are going to underperform? If you earn a living as an active stock picker, what characteristics of stocks should you be emphasizing in a portfolio? Which ones should you de-emphasize? I think we've already spent some time on the macro, though I'm not sure we've fleshed it out totally, but maybe let's drill down to the micro. How should stock pickers think about this in terms of the characteristics of stocks that are likely to outperform?
- Michael Green: [00:43:04](#) That's what we've tried to do with our portfolio. We've tried to recognize that this is the underlying framework. That pushes us into a discussion where our stock selection techniques, and we do have a component of stock selection at Logica, is predicated on the idea of actually finding stocks that are uniquely susceptible to these types of forces. It gives us a natural momentum bias. We want to buy stocks that are attracting that incremental capital from the passive players. More accurately, what we're really looking for are stocks that exhibit increased inelasticity in response to this. Again, I think this isn't important area of research that is just beginning to come into the market.
- There's a 0.8 version white paper that just came out of Harvard in Chicago that references this type of feature, and it's recognizing that the order books effectively, the process of buying an individual security is not uniform. It's important for people to understand that the behavior of the larger cap stocks is not only a function of that increased allocation dynamic, but it's also a function of how market-making operations are done. A lot of people will say yes, but as Apple gets bigger or as Microsoft gets bigger, it requires more capital to make them move relative to other stuff. And so this is not a problem. Well, that's a misunderstanding of the feature of how markets are made. The order book is composed of people who are willing to buy and sell. The depth of the order book does not scale exponentially with market cap.
- Adam Butler: [00:44:35](#) Does it scale linearly?
- Michael Green: [00:44:37](#) More linearly than it does exponentially.
- Adam Butler: [00:44:40](#) Okay.

- Michael Green: [00:44:41](#) It's entirely possible that somebody has 10 times as much capital deployed... Apple has 10 times as much market making capabilities deployed into it as does Delta Airlines. I don't actually know the respective market caps of those two, although it sounds like it's probably a hundred X difference. It's possible it's 10 X difference, but we have a hundred X difference in market cap, so a hundred times more capital is trying to go into Apple than into Delta Airlines. That causes Apple to actually out perform because it pushes outside that market maker band on a more consistent basis.
- Adam Butler: [00:45:15](#) Do you need to be able to examine the order book directly, or can you infer the depth of the order book relative to the size of the market cap using some kind of function?
- Michael Green: [00:45:24](#) You can effectively proxy this type of behavior and synthetically create the order book. I owe this insight to... This should be clear, I have very few original insights that pull most stuff from other people, just put together in a different way. Dwayne Farmer who's associated with the Santa Fe Institute, gave a presentation back in I think it was 2001, at a conference that was hosted by Credit Suisse. Michael Mauboussin, who's talked about some of these phenomenon, and he explained what he had done with this company, called The Prediction Company, in the mid 1990s. The Prediction Company is basically a hedge fund that he had built, I believe starting in 1994, that between 1994 and 2001 at that point, had generated 450% plus per year. It was very limited in terms of the amount of capital it could deploy... Only could deploy about a billion dollars worth of capital.
- What he had actually done was the predecessor to the modern high frequency trading firm. So he had recognized that he could model the specialist order book, and he used an atomic decay pattern effectively to build this order book simulation. You recognize that he could properly model the impact that any given order would have on this order book, and the propensity to basically shift it, in a scientific term, it was similar to the shift of an electron to a higher orbit when you pulse it with a photon. He recognized that you could take advantage of this and you can basically force these pulses into the market. It's a form of market manipulation. You're not actually using insider information, you're using a derived insight that says, if I do this, it's more likely to affect this stock than this other stock, where it's likely to push it to this quanta, and that was what he did.
- Adam Butler: [00:47:07](#) You identify the stocks where the smallest marginal dollar will have the greatest impact.
- Michael Green: [00:47:12](#) And you basically forced them to move. So that insight is... kind of builds into what we're talking about here. This idea that by understanding the difference between these order books or by inferring the difference in these order books, you can more accurately model where this capital is going to be most effectively deployed.

The Value Premium

Adam Butler:

[00:47:28](#)

That's a characteristic that you are focusing on and trying to distill and dig into. You've had a lot to say on this. I want to get into some of the recent articles that you and Wayne have published, which I think are great on the value premium. I think this dovetails quite nicely with that, but before we get into that, I also want to talk about the low volatility effect because I published a paper on min-var optimizations, and we were back and forth on that, and you proposed a potential framework for how to think about a volatility sort as a certain class of investors selling optionality to another class of investors. I'm just wondering whether or not you've given that any more thought. I thought that was a really interesting way to think about it.

Michael Green:

[00:48:12](#)

I think that's right. First of all, the papers that you're referring to can be found on our website, logica.com. I've written a bunch of stuff on these things, and my observation would be that much of the phenomenon that we observe, and min-var would be a perfect example of this, is actually a portfolio construction technique. That you're being compensated for the purchase or sale of embedded options, when you systematically decided that you're going to do something. I agree in advance, and this is the point behind much of the value stuff we've written so far, if I didn't agree in advance that if something goes up relative to everything else, that I will sell it, I am a value investor and therefore it becomes unattractive simply due to price appreciation relative to either its fundamentals or the rest of the universe.

Well, I've sold an option. I've actually sold a call option for the market based on the out performance of that, and I can price that. I should be compensated for that if I'm willing to do that on a systematic basis. Likewise, a value portfolio can be thought of as saying, "Hey, if a company does really badly and its price falls a lot, and I'll buy it from you." What you've done is, you've sold somebody a put. You should be compensated for that. Min-var is very similar. What you're effectively saying is, "I'm going to select securities on a certain basis. The fact that they have observed a low volatility, and then I'm willing to sell them under conditions under which that changes." Most implementations of min-var are not market cap-weighted. They tend to be somewhat equal weighted or modified cap-weighted, as many of the least volatile stocks tend to be, some of the largest stocks. There's an embedded component there, where you're actually choosing to equal weight and so slightly over weighting small. But the more important feature is actually, if we can share the screen, is taking advantage of the same thing that we're seeing in terms of the rise in correlation, which is that there's an increasing fraction of volatility that's occurring around fundamental events.

Volatility is actually a really interesting phenomenon because you can think about it as anti momentum. High vol leads to an increase in what's called vol drag, and that in turn creates a drag on momentum components. If you think about a stock that rises 5% one day and falls 5% the next day, most of the ways we think about

average return is we'd say, "Well, that's zero return." But the reality is because it's a compound feature, it's 1.05... It's one times 1.05 times 0.95, which is less than one. If I expand that volatility to 10%, end product is actually lower than the 5%. If I take it to 20%, it's even lower. If I take it to the extreme, and I say, "It's a hundred percent volatility." Then it becomes one times two times zero. Completely wiped out. Min-var is actually taking advantage of that feature. It is a positive momentum bias. You're basically picking stocks that have less observed volatility and as a result, outperform under a positive momentum framework. I would argue that momentum framework is being reinforced or created by passive penetration.

- Adam Butler: [00:51:11](#) Would we capture that directly by simply sorting on geometric returns for momentum rather than arithmetic returns?
- Michael Green: [00:51:17](#) I'd say that there's a second component that you're doing. One is, by definition, any stock that is going to come through that screen is going to actually have survived that process. There will be no minus hundred percent outcomes there.
- Adam Butler: [00:51:31](#) The fact that it exists in a market cap or listed index means that it is eligible for inclusion. That's an important facet that's often missed. Yes.
- Michael Green: [00:51:39](#) Right. The second thing that I would actually say about that though, is that when you're sorting on that basis, you don't actually have to do that because it's just a mathematical construct. If I know that I'm sorting on the basis of average volatility versus geometric volatility, but what's going to rise to the top? These ... stop because by definition, the higher geometric volatility has to be composed of higher linear volatility. It's not really going to actually change your output at all.
- Adam Butler: [00:52:06](#) The volatility ignores the drift. Whereas, when you measure momentum, if you sort on geometric returns, then you're going to sort into stocks that have a high drift, and what you're saying is that that drift will be attenuated by higher variance. So you're more likely to identify high momentum stocks using geometric mean sorting that have lower variance than high variance. All things equal.
- Michael Green: [00:52:35](#) I would rephrase it slightly differently. Again, part of the point of the articles that we've written is that we think of these techniques as selecting stocks, what we're actually doing, building the rules of portfolio construction. If embedded in that portfolio construction, I'm either buying options or selling options. There's some really powerful research. I often find stuff that I think is super powerful gets ignored. In 2011 a senior research guy, a GMO I've got the name of Sam Wilderman and his partner wrote a piece called Rethinking Risk, I believe is the title of it, which explored the idea that value and momentum can be thought of in these terms. Are you buying and selling options in your portfolio construction? They identified that momentum portfolio can be thought of as one that is fractionally longer call. So it's the S&P plus a fractional call.

A value portfolio is effectively the S&P short a call, and also it exhibits negative convexity to the downside that the extreme tails and so it's also short a put. Exactly the construction that I was describing. You would read that you're going to buy stuff that falls in price, so your short a put, and you agreed that you're going to sell stuff that rises in price, short a call. That means that your short a straddle, you should be compensated for that with a premium that shows up over an extended period of time. Your output at any point in time is going to be somewhat stochastic and random. Did the straddle work or not? And the worst conditions for that portfolio are going to be one under which there's strong, positive momentum drift, exactly the conditions that are created by the growth of passive.

Adam Butler: [00:54:09](#) So the momentum is long S&P, long fractional call. Shouldn't momentum investors pay a premium to be long that fractional call.

Michael Green: [00:54:17](#) They should. They should underperform over time, unless there is an outside feature that is changing the structure of the market. Again, let's go to the empirics. This is the alpha created by the return associated with short option strategies. This is just something as simple as an S&P Buy-Write. Well, an S&P Buy-Write, an S&P Put-Write, can be thought of in exactly these terms. I'm long the S&P, and I've either shorted a call option or more accurately, I'm long the fully funded future value of the S&P and treasury forum.

Adam Butler: [00:54:53](#) Okay. This chart is astonishing. In the current market environment, investors are getting paid to own optionality.

Michael Green: [00:55:05](#) That's exactly the opportunity that we're exploiting at Logica. This is why we built our portfolios this way. The reason that this is actually happening, is because these options are mispriced. Right?

Adam Butler: [00:55:05](#) Interesting.

Michael Green: [00:55:17](#) The assertions that are built into... Options are the extreme version of reliance on the efficient market hypothesis. They cannot accommodate a drift feature associated with the penetration of passive strategies. Hassam is creating this momentum reinforcement simply by virtue of its allocation methodology. It is being reinforced by the regulatory framework that is pushing capital into these products. If I go back to that chart and I look at the allocation schema associated with this, and the fidelity to a target date format, what we see is that older investors don't look anything like a target date fund. Younger investors look exactly like a target date fund. Why is this? Because 75 year olds don't have target date funds. 75 year olds don't have passive vehicles.

We talk about the penetration of passive as if it's this uniform phenomenon. Passive is 43% of the market cap. Well, that's not true. Passive is 95% of the market cap for those under the age of 40. Passive is 15 to 20% for those over the age of 65. And so what's happening is even more perverse, we're firing the value

managers. We're firing the discretionary managers, the ones who were supposed to set prices. That's naturally placing pressure, simply the flow dynamics, back to this macro inelasticity framework. It's putting pressure on the stuff that is selected with an expectation of forward return. Those are being sold. The securities that are being bought on the basis of, "Hey, they went up in price." Those are getting reinforcement.

Adam Butler: [00:56:49](#) They're being sold by elderly investors who are leaving legacies to next generations of those marginal dollars are being placed in passive products? Or am I missing a mechanism there?

Michael Green: [00:57:02](#) Well, it goes in both directions. Again, 401(k)s are funded through contributions from working individuals and they receive outflows from those who've retired. It's not an intentional legacy leaving. It's just, seniors have to eat that food, eat that money, or use it to pay their mortgages or anything else. Whereas, those who are working are contributing.

Owning Optionality

Adam Butler: [00:57:23](#) Got it. I want to go back to the fact that the current environment pays you for owning optionality. I think what this implies is that in the current environment, you can own S&P cash, plus you can own a straddle and you'll expect to earn a premium on the straddle.

Michael Green: [00:57:42](#) I think you have to be careful with that, but yes is the quick takeaway. In any given period... I mean, you just have to be very careful about what we're showing here. We're showing alpha. Part of what's happening is, is that you are receiving a positive return associated with the strategy of Buy-Write, but that's actually being driven by your exposure to the beta of that exposure to the S&P. You have to be cautious in terms of how you think about this. It's also one of the things... I should show this here. Back to this point, if we have this curve, if we have this rising valuation. We have this rising valuation, we have this increasingly out of control framework, then what we actually have happening is that time has now become a proxy for passive share gain. That curve can be thought of as an accelerating return function. Valuations rising means that returns are actually rolling over time. When you try to use the tools that were taught to use for portfolio construction and the evaluation of managers, things like alpha or Sharpe ratios, those are linear constructs and they presume the distribution. Right? They assume that the central tendency of the return to the underlying asset class is stable over time. You can have outcomes, that's captured by the standard deviation, but you can basically think of it as you would expect there to be a straight line coming off here with a pattern of standard deviations around it. There's no provision for this type of drift. The perverse dynamic is, when you have that drift, then time changes. You get your alpha times zero, it's just the intercept, or $Y = X$ in the equation. So that's what it is. But if I had advanced forward in time, and I'm trying to use a linear solution to a curved surface, my alpha is forced lower. I time too, when passive is

large enough, that we're really beginning to see this distortion and passive valuations have really started to accelerate.

The alpha for the active segment is negative. We actually see... I'm going to skip that, that's the research I was referring to. People can freeze and go back to it if they want to read on it. This is the theory of what should be happening to alpha. This is the empirical data. We see it in hedge funds. We see it in strategies that have no fees, so it can't be a fee story. We're seeing this linear decline. This is the equivalent of Columbus looking at a ship coming over the horizon and recognizing the fact that he sees the tip first, tells you that the surface is curved. Now, obviously it's not quite historically how happened, but that's what's going on. The declining alpha that everybody thinks is a function of active managers competing away the alpha from each other, that the market has become more efficient, is actually telling you the exact opposite. The market is becoming increasingly distorted.

Asymmetric Alpha

- Adam Butler: [01:00:23](#) Interesting. This is a great way to circle back to the assertion that at Logica, you guys are attempting to create asymmetric alpha, but you've said several of your papers, position clients for asymmetric payoffs in the context of this accelerating passive dynamic. Are you able to reveal a little bit more about what that looks like?
- Michael Green: [01:00:49](#) We can talk a little bit about it. The objective is basically, if you're going to trade something like this, that curved surface lends itself to the exploration of a straddle. The vast majority of time, what you're going to experience is upside pressure. The market is going to be mean expanding. It's going to experience mean expansion to the top side and valuations are going to go increasingly crazy. It's just a mechanical output from this approach. Until we change the regulations and until we actually change the structure of the market again, I don't see how this changes.
- Adam Butler: [01:01:23](#) Parenthetically, what might be a catalyst for a change in those regulations since I think most politicians would perceive it as serving their political utility?
- Michael Green: [01:01:32](#) I think it stays direct opposite. I think most politicians would perceive it as against their interests to represent the hedge fund managers and well-paid mutual fund managers who have done nothing but underperform and complain about it the whole...
- Adam Butler: [01:01:48](#) No, no, that's what I mean. It's in their political interest to perpetuate the current dynamic where the widely quoted indexes are perceived to continue to be moving higher and higher, because it presents a sense of false strength in the economy for which they get rewarded politically.
- Michael Green: [01:02:04](#) I think that's exactly correct. And not just rewarded politically, they actually can be rewarded through funds that are deployed into their re-election campaigns. That's

what lobbying is. When it's presented under the construct of, this is Mike Green, self-interested discretionary portfolio manager, active portfolio manager saying, "Hey, the bad guys are the passive ones." They can understand I have my own narrative and that's important, but I think I have to approach it from a slightly different framework than most people by saying, "Hey, look, this is the actual mechanism by which this is happening."

- Adam Butler: [01:02:04](#) I am wondering though, is there a catalyst?
- Michael Green: [01:02:39](#) I think if anything, the catalyst is in the opposite direction.
- Adam Butler: [01:02:42](#) That this trend will accelerate.
- Michael Green: [01:02:43](#) It's going to accelerate. The way to think about this, I always search for the analogs. The analogs and the aphorism work very well for Warren Buffet, so I'll try to emulate from that standpoint. Effectively what we're doing is we're driving a car that has no brakes, uphill. You don't notice it until you hit a dip in the road and then when you try to apply the brakes, they don't work, you have momentary terror and...

PART 3 OF 4 ENDS [01:03:04]

- Michael Green: [01:03:00](#) And then when you try to apply the brakes, they don't work. You have momentary terror and then the road starts to move back up again. And if you're not actually curious about what just happened, you can dismiss it and say, "Oh, thank God. We're going up again." Well, eventually you're going to hit the peak of the mountain and you're going to be coming down the other side. And that's not the time you want to try to figure out why your brakes aren't working.
- Adam Butler: [01:03:21](#) Understood, but this invokes Stein's law, which is that if something can't go on forever, it'll stop. So is the contention that there's no plausible catalyst for this dynamic to stop and reverse and therefore, the tree grows to the sky?
- Michael Green: [01:03:39](#) I don't think that's the case, but I do think that we need to be cognizant that the potential impact is far greater than anything we could have imagined.
- Adam Butler: [01:03:47](#) And it could go on far longer than any of us could have imagined.
- Michael Green: [01:03:49](#) Right. When you start talking about regulatory change, it becomes really, really difficult to think that that's going to happen immediately. So the way that I arrive at all this stuff, the way I determine these things is ... agents and basically have them trade against each other, and give them the rules of asset construction, give them the rules of value investors for our research. And the unfortunate reality is that we have simulations in which flows remain positive and continue along the path that we're talking about and prices can reach levels that we couldn't even, as a true value investor. I look at it and I actually can't believe that.

- Adam Butler: [01:04:26](#) We don't even need to be a value investor. Just need to be fundamentally anchored to some sort of cashflow expectation.
- Michael Green: [01:04:32](#) Yes. Again the challenge is, we've been taught our entire lives that markets are discounting mechanisms and that they have the best price. That's how we approach it. When you wake up in the morning and you look at the market, what's the commentary here? What is the market pricing in? Well, what I'm saying is increasingly the market's actually not pricing anything in other than the directional flows, flows that are flowing into passive. And the flows of money into passive are far more powerful than people think they are.
- Adam Butler: [01:05:00](#) Yeah. It's pricing in the fact that flows beget flows.
- Michael Green: [01:05:02](#) Correct.
- Adam Butler: [01:05:03](#) I interrupted you as you were describing how to position for this type of environment. I'm sorry.
- Michael Green: [01:05:08](#) So the way we try to construct it, and again, we're trying to optimize the straddle because we recognize that we want to maintain our performance. We want to try to participate in the market as it goes up, recognizing that that's the default characteristic and that it's likely to do so in an accelerating fashion.
- And yet at the same time, we want to basically have brakes that are better than brakes, they actually cause us to go back up. So we have negative correlation to these downside events. And the only way you can do that is through a straddle. And so the question is, how do you construct that straddle? Well, we've used the insights that we have, both intentionally and somewhat by accident, again, back to this idea of Wayne discovering a goldmine, being like, "Hey, this is interesting. People seem to like this yellow metal." We've actually tried to build a portfolio that optimizes to those components. And so to the top side, we're trying to capture the phenomenon of momentum and mean expansion. And to the downside we're trying to capture the phenomenon of increased correlation and the market's propensity to plunge in a fashion that inspires absolute care. And we've built it around this framework. We've been fortunate so far that it largely has delivered under exactly what we look like. If you look at the payoff of our portfolio, it's delivered this straddle. And so we're fortunate that the theory is meeting the outcomes.
- Adam Butler: [01:06:22](#) Has the price of a straddle not increased pretty substantially? It has come down obviously very substantially over the last three or four weeks, but it's got to be sensitive to the prevailing vega.
- Michael Green: [01:06:35](#) Yep. So again, we've tried to build portfolios that take that into account. Our call options are not struck out of the money. And if they're struck in the money, effectively providing us with another way to think about options is that they are a

way to have non-recourse leverage. The most you can lose is the money that you put up. The quantity of money that you have to put up is sensitive to that implied vol level, which has risen, the cost of that non-recourse leverage has risen. And the question becomes, is that more than offset by that increased curvature that's mispriced? And we think it is.

Tail Hedging

- Adam Butler: [01:07:08](#) So this actually is a really good segue to where we began, which was on tail hedging. And so the way that I've been sort of trying to think about tail hedging is that there's two primary costs. One is the cost of basis. The closer you want to get to hedging the exact risk that you want to hedge, in other words, the smaller the basis of the trade relative to the risk, the more expensive it should get, to hedge the risk. And the second is conditionality. So if you've got only one condition that needs to trigger in order for the payoff to materialize, then the premium for that is going to be significantly higher than if you need two conditions to be met, to receive the payoff. So when you guys try to manage the cost of the carry on the tail hedges, how do you think about this trade off between basis and conditionality?
- Michael Green: [01:08:07](#) I think those are obviously very important topics. Basis we addressed and referred to this earlier, as a discretionary macro manager. I could trade anything. I can choose to express downside protection through Japanese yen or Swiss franc, or I could use the S&P 500. Options are often deceptively cheap or expensive. And so a very popular trade a number of years ago was a trade that said something along the lines of, "Well, we absolutely know that the key risk to this market is valuations. And therefore what you want to buy is a conditional put that pays out if the S&P falls conditioned on interest rates being higher." So, that's likened to an S&P collapse, well, that was super cheap. And you got an 85% discount or a 70% discount to buy that option relative to a simple put on the S&P.
- Adam Butler: [01:08:07](#) Of course.
- Michael Green: [01:09:08](#) And a lot of people wasted a lot of money chasing that, because they didn't understand that the core phenomenon, or there are a couple of different things, but they often didn't understand the nature of curves. And so the forward market was very different than the spot market. The second component was that the relationship between the S&P and interest rates had changed significantly. So the correlation was such that higher interest rates were actually correlated with higher S&P, not lower, which was why you got that cheapening discount.
- And that's a function of Fed policy, shifted in 1998. The Fed began cutting interest rates in every situation in which asset prices fell. And as a result, you were actually fighting the Fed the entire process through that. The other component is always understanding why that product exists. So the reason that discount existed, the reason it was being priced that way is because the demand for insurance from

insurance companies who themselves were attempting to reinsure their net worth and exposure, which is adversely effected by falling interest rates and adversely affected by the S&P. And so we were very interested in buying that trade on the other side from you. So you were actually paying a premium for what you thought was a discounted product.

Adam Butler: [01:10:14](#)

Great example.

Michael Green: [01:10:15](#)

The way we choose to address the basis is that we recognize we're trading the S&P. And so we have some basis risks to the top side, and that the securities that we select, because of this momentum bias, there are conditions, and I would actually argue that after these types of corrections is one of the more difficult periods for us, because we tend to see some forms of leadership shift. You've actually seen that in the past couple of weeks. We have a way of addressing that that has actually proved fairly effective. We introduced that this year and it's working very well.

Again, theory meets the empirical, but that type of basis risk exists, to a limited extent, for us to the top side. To the downside where that protection is increasingly important, we saw that very simply by identifying the fact that these options are mispriced and in particular, almost the inverse of what Nassim Taleb pointed out in 2007, where the tails are mispriced because of this log normality feature and the fat tails component. We look at it and say, "Well, what's actually happening is this; that there's a correlation dynamic that's being mispriced." And because of that pattern that I've identified that I showed you at the very beginning where correlation has actually risen dramatically on small changes in the S&P, we think we're taking advantage of cheap correlation bets.

Adam Butler: [01:11:30](#)

So there's a conditional change in correlation that's regime dependent, that on extreme negative days, correlations converge much more strongly than historical models would suggest. So just lastly, this is obviously timely. It's intuitive to me the long thesis for the passive flows, but I'm not quite connecting to how this dynamic plays into the observation that the corrections in this market environment have had a very different character than corrections previously. They've typically been extremely sharp and recovered obscenely fast. Now I can get behind the fast recovery somewhat, due to, very directly from your thesis, but what is the driver of the extremely sharp corrections?

Michael Green: [01:12:27](#)

So again, recognize all of these are narratives that I'm telling. So I don't have the answers. I have an answer. Currently what I would actually highlight is that the character of the market, and if you want to share the screen, part of what's going on is that we've had a structural change in how people are investing. And in addition to the passive component, because of the generationally low interest rates on a global basis, people are in a constant search for yield, and yield can just be thought of as a short wall expression. The pay off associated with a corporate bond is almost identical to the payoff associated to a short foot. You get a fixed

upside, and your downside becomes effectively 100% of the notional value of the bond that you've purchased, that is a short foot. Well, as that type of short foot has been compressed, people have sought out other ways of selling volatility to generate yield.

And so those components would include things, we have things that yield enhancement strategies, call overriding, which we've talked about, Asian retail investors with varieties of structured products, Canadian pension plans, we just saw Alberta investment management have a significant loss associated with this. Retail VIX ETFs like the XIV are a source of supply corporate share buybacks, particularly in the form of what are called accelerated share repurchase programs which is companies writing puts on their own stock. Systematic investment programs at 401ks are a source of vol selling because you're deciding every two weeks, regardless of market behavior, you're going to put money in, systematic rebalancing where you're going back and forth between bonds and equities based on performance. These are all ways of shorting volatility. And when they all come together, they create conditions under which the dealer community, the broker community has actually been able to source volatility from the street at negative costs, leaving them in a position where they have what's called positive gamma, positive beta.

So the positive gamma means that they are effectively long volatility and they benefit from moves in either direction on a small component. And in this component, if the market falls, they find themselves more short the market than they actually need to be from a hedge standpoint until they buy futures, which pushes the market back up. Likewise, if the market rises a small amount, they find themselves more long the market, they need to sell futures, which pushes it back down. And this is what drove that extraordinary experience in 2017, where we basically had no movement in the market and it drifted upwards in a pattern. It was exactly like a short vol decay. It's what contributed to that extraordinary short ratio and it's what we've seen over and over and over again. The problem is, when you push, and actually I'll show this, I've got a video that illustrates these dynamics pretty well.

Hopefully it will come through here. So one of the big innovations post 2008 was we began to manage this on the basis of algorithms, and with an algorithm you can manage these exposures in a way that basically means nothing changes. The market sails perfectly still. But if you notice there's still limits, and if the market gets pushed by an outside force against these limits, then the system is going to fall over.

Adam Butler: [01:15:35](#)

You can't equilibrate anymore.

Michael Green: [01:15:37](#)

You can't equilibrate. Exactly correct. And so the dealers are actually forced into a position when you move outside these ranges, where they're forced to buy volatility themselves, and that contributes to this explosion of volatility, where

those who had suddenly been willing to sell some volatility are now demanding it. And typically at the exact same time, other investors are doing the same. We just keep seeing these extraordinary moves. Another way to think about it is when you have passive vehicles, they don't react. Your money in your 401(k), that two week paycheck, that proportion of your paycheck that goes in, it doesn't increase. There's no increase in the demand to buy when the market falls 20%. Likewise, once you hit that two week window, you're going to show up and be buying.

What we actually think happened in the February-March time period was that you actually had active managers who had told themselves in the fourth quarter of 2019, that the recession that everybody feared because of the inversion of the yield curve and deteriorating economic dynamics, that had been fixed by the Fed action, so they piled into cyclicals. They became very explosive. It came into January, we began to see that wiggle and suddenly people were like, "Oh my God, I'm not quite sure. I'm going to go buy a bunch of stocks that I'm confident are going to perform." Microsoft, the Amazons, etc, the world that led the market in that last component. And then suddenly they're like, "Oh my gosh, coronavirus is the worst thing ever, I need to sell." And they went to sell. The buyer in the market was the passive vehicle and they received no instructions that said, "Hey, buy more." And so that creates an order of mismatch and an order mismatch very quickly seeks its own level, which in this case was 30% lower.

Adam Butler: [01:17:17](#) Is there any way to anticipate, or is this just, you are better off just implementing strategic positions that are prepared for this type of market environment, or are you able to use things like the GEX, for example, to analyze contemporaneous dealer gamma to determine whether or not you're near these limits?

Michael Green: [01:17:37](#) It's funny you mentioned that. So this is literally a discussion we have on a continuous basis. We think the opportunity exists to improve the signals around these events. And so you can modestly increase or decrease your straddle weightings in either direction. But as long as the options themselves are mispriced, going back to the chart that I was showing that shows the negative return expectation around shorting options, as long as that return is positive, and we think it's going to become increasingly positive as this curvature amounts, you want to always have a straddle type position on, it just becomes a question of, "How do you want to weight it?" The problem with indicators like GEX, and I think that they're important and powerful and they speak to actual fundamental position, is that because it's a dynamic market, people are going to increasingly respond to that GEX with incremental changes in their behavior. GEX is positive, therefore I can short volatility.

Adam Butler: [01:18:34](#) Yeah. The thresholds will migrate over time.

Michael Green: [01:18:37](#) Exactly. Our focus is always around identifying, how do we predict how those thresholds have changed? And that's more interesting to me than exploiting something like a static GEX, like if X then if it's above a certain level, then short

vol, if it's below a certain level, then you need it to be a long vol. I think those are very dangerous type rules.

- Adam Butler: [01:18:59](#) Becomes a tool in a toolbox.
- Michael Green: [01:19:00](#) It becomes a tool in a toolbox, but we all know the dynamics of market timing are really hard. If we could all time as perfectly as David Tepper or other players who have shown a capability to do this, then we wouldn't be having this discussion. But in the absence of that type of genius, I'm going to constantly run a portfolio that has participation for the top side and protection to the downside, ie: a [long straddle](#).
- Adam Butler: [01:19:21](#) Agreed, okay, well, listen, we're up against 90 minutes here. We have covered a tremendous amount of ground. I appreciate you sticking with the technical difficulties. And like I say, I think people came to see you anyways, and you've shared some really tremendous charts and visuals to help make the case. So thank you very much. Unless you have something that you want to make sure that you added to cap this conversation off, I think this is a natural place to end it with the hope that we have another opportunity to carry on further discussion in the near future.
- Michael Green: [01:19:57](#) I'd enjoyed that very much. I think this is spectacular and I apologize to the public for having to look at my face for 90 minutes.
- Adam Butler: [01:20:04](#) I'm sure that no one's going to complain. All right, Mike, thanks again. And have a great day and happy trading and I'm sure we'll cross paths in the near future.
- Michael Green: [01:20:14](#) Excellent. Thank you very much. I appreciate it.
- Rodrigo Gordillo: [01:20:17](#) Thank you for listening to the Gestalt University podcast. You will find all the information we highlighted in this episode and the show notes at investresolve.com/blog. You can also learn more about Resolve's approach to investing by going to our website and research blog at investresolve.com, where you will find over 200 articles that cover a wide array of important topics in the area of investing. We also encourage you to engage with the whole team on Twitter, by searching the handle [@investresolve](#) and hitting the follow button. If you're enjoying the series, please take the time to share us with your friends through email, social media, and if you really learn something new and believe that our podcasts would be helpful to others, we would be incredibly grateful if you could leave us a review on iTunes. Thanks again and see you next time.