The ReSolve Master Class- Episode Eight

Rodrigo: **00:00:00**   All right, we're back for episode eight. Last episode we talked, we continue to expand the efficient frontier, looking at alternative beta sources, the old premium space being something that could take in a lot of assets. We tend to believe in this linear relationship that the stronger the factor, the better the expected returns should be. And we're going to dig in a little bit further in this episode to see if that is indeed appropriate, if it's the best way to extract as much benefit from those anomalies as a linear relationship or not. So what is it about the traditional factor betas that is missing?

Mike: **00:00:46**   Where does it move from a factor beta to alpha?

Adam: **00:00:49**   I think the factor literature depends on an explanatory variable. First of all, having a linear relationship with price movement and second of all applying with exactly the same specification across every security. So, you're going to use 12 month returns to rank stocks, you're going to buy stocks in the top 10%, by 12 month returns, short stocks in the bottom 10%. And that's your momentum factor. So applying the exact same metric to every stock in your ranking methodology and then by holding only the top stocks, or the very bottom stocks, you're assuming that a stronger expression of that characteristic gives you an expectation of the strongest expected return. I think what we have learned over the last few years is that a lot of the assumptions about how even traditional explanatory variables like value or price to book or price to earnings or momentum, or whatever trend, whatever was originally thought to be the case about the relationships, may not actually be the case. Also, different markets have different relationships with the same variable.

Rodrigo: **00:02:17**   Yeah, and I think value is a perfect one. You have this price to book scenario being that the original value factor for whatever reason back in the early 90s, the data that one had available to them, they were trying to identify whether value existed, they chose as a parameter, they put it across the S&P 500, they found that indeed it was explanatory, that high P value and therefore value is a real anomaly. And over the years what we've found is that at least in the last few years, is that people think that price to book is dead, and there are other explanatory variables that can be relevant, price to sales that have done better. But yet when we look at Japan, the best performing value metric is price to book. Now, what about Japan happened to be different that makes price to book an appropriate parameter? It could be the way they handle their balance sheets, there's a wide variety of explanations. The point being that the idea that price to book is persistent, pervasive across all market environments, and it should be the same across the board, all of a sudden isn't true.

Adam:	00:03:19	Well, it does prompt the question. Should we look at Japan as an anomaly, or just that the noise in the factor over time has manifested such that Japan doesn't seem to respond to certain value metrics in the same way. The problem is, that value in particular is a hard one to draw conclusions exclusively from the data, because you're not rebalancing very often. The forecast horizon for value is measured in months. And so the number of monthly observations that you have, even if you go back a century, doesn't really give you enough data to be able to draw strong statistical conclusions. So one of the things that's important is to seek to make predictions on a timeframe where you have a high enough frequency of data to give you statistical significance. But the other dimension of this is, should we just assume that every market responds to every variable in the same way? I'll give an example, it's a simple one from our early explorations. Trend. Typically trend, you invest in a market if it has a positive sign of returns over the last 100 days, 60 days, pick a number, and you short the market if it has a negative sign of returns, or you go long the market in proportion to the strength of its positive returns or its negative returns.
		So you're assuming there that the relationship is that a market's expected return is in direct proportion to the strength of its previous momentum return. In fact, what we saw is in several markets, that relationship has turned on its head, in the belly of the trend. So when a market just crosses from being in a negative trend into a positive trend, or just crosses from being a positive trend into a negative trend, at that point the relationship is quite strong. There is a strong positive relationship, you want to be long markets that have just crossed from negative to positive. But when that trend strength goes beyond a certain point, when the signal gets really strong, the relationship inverts. In fact, for super strong trends in some markets, you actually want to get short at some point. So you can imagine that presents a non linear shape, it's linear at a certain point, and then it changes direction at some point. So you've got a curve. And if you extrapolate that out to a wide variety of markets and a wide variety of different explanatory variables, so think, now into skewness, and seasonality and carry in other higher orders of the distribution, and then out into a wider variety of less common explanatory variables that we'll talk about, you can imagine that the number of shapes that you might identify as being the right shape to explain a market return, can be an almost infinite array of textures and characters.
Mike:	00:06:38	Yeah. This is one of the things I think is maybe a misconception or grave miss. I'm not sure I want to characterize it but we have different markets. Those markets have different participants, those participants are driven by different factors, the lumber market, the corn market, these are markets that have different participants, different factors, different ongoing speculators and commercials. So, why would you make this broad sweeping assertion that across all of the features, that in this particular market they should manifest in the same way, that the

shapes in fact wouldn't be different? There's different regulatory requirements and all of those. And then on top of that, you've got shifting preferences of investors generally speaking across assets and whatnot. So that one fundamental assertion of this pervasiveness is one that when you poke out a little bit, it seems to us anyway that there's some value to add there.

Rodrigo: **00:07:39**   Yeah. And it's not always the case that the shape is different, but still valuable. Sometimes there is no shape to it. Momentum doesn't work for certain asset classes in many different iterations of it. And so the interesting thing about why the traditional factor investing may work is because there's enough different asset classes that have these characteristics, that when you include them all together in different iterations, if you mix multiple providers or the style premia that attack the problem from a different perspective, that invest in a wide variety of equities and multi asset classes, that there's enough signal that is incredibly strong, that it gives a positive returning equity line versus the noise that compounds it. The key here is to say, okay, that's why it's beta, we can put a lot of money into it and we can capture some signal there. The question is, where do we need to go and find alpha? What do we need to do? It's the one linear relationship that is simple to express generally speaking. It's not that complicated to put together a portfolio that way. When you start looking at the different nonlinear relationships across different parameters, across different asset classes, across different equities, now it becomes complex. Now you need expertise, now you need to do a lot more work than you do from the traditional factor beta perspective. And that is alpha. That's a lot of work and it's in the most competitive landscape in our business.

Adam: **00:09:13**   The other thing that I think for a lot of investors, factor investing misses explicitly, is conditionality. A market may have a positive expectancy when the trend is positive at certain times, and a negative expectancy and other times. So as a simple example, maybe a market has a positive expectancy when the trend is positive and when carry is positive, but it has its random noise when trend and carry are not aligned in the same direction. So that's a simple example, or when the shape of the volatility term structure has a certain slope and trend is in a certain direction, then that is indicative of or has a high probability of leading to certain behavior, and different conditions will lead to different behavior.

Rodrigo: **00:10:13**   Seasonality and volatility term structure will shape the relationships a bit differently. Rather than being independent. Oh, I'm a momentum manager, I don't care if we're going into a poor seasonal pattern, I'm going long gold. That's what the virtual momentum manager feels. When you allow the process to X-ray the different textures and interrelationships, you actually get a brighter picture of what's actually happening underneath the hood.

Mike: **00:10:40**   So seasonality often is maybe poo pooed in stocks because it doesn't seem to be an intuition there necessarily. But then when you think of other asset classes in

the commodity space, well, there's certainly some seasonal intuition behind these items and areas of where you have some mechanical intuition, but you're looking to scope the relationship if you will. These things are nuanced and complex.

Adam: **00:11:07**   It's important to note that once you move away from simple linear relationships, then it gets really easy to find relationships that don't exist, or to assume that you've got a very strong level of competence in a very nonlinear relationship, just because you get a really good fit in sample. And the toolset from machine learning is what allows you to identify what the optimal level of complexity is. For certain features, for certain explanatory variables, maybe the optimal relationship is linear. Maybe there's just no more information to extract. But we know demonstrably from our own research, that there are many many feature relationships with many markets where if you assume a linear relationship, you're leaving excess information on the table. But you need to have the right tool set and skill set to be able to identify what that optimal trade off is.. For those who are familiar with the machine learning literature, this is the bias variance trade off. And you need the right tools to be able to identify what that optimal trade off is, and you need new tools to deal with time series that are different than the tools that you would bring to bear in other types of machine learning tasks. That's a big part of the skill that true alpha brings to bear.

Rodrigo: **00:12:47**   Exactly. And I think when you talk about machine learning, you've seen a lot of experts come into the market that came from the non-financial side of things that have been very successful, Google, or just graduated from Waterloo University, Toronto, some of the leading areas of machine learning, and try to apply a perfectly curve fit approach to machine learning and failed miserably, because they got that bias variance trade-off wrong. Just doesn't apply to finance in the same way that it applies to Googling a picture of a cat. So there's expertise there, there is danger in being too granular and there are tools necessary to do that. But if you're able to apply that technology to these economically intuitive parameters, then you can find a little bit more extra. And by a little bit, having a bit more than a little bit extra, juices extra returns.

Adam: **00:13:42**   The real magic, the reality is that for any individual explanatory variable and market pair, the amount of information and statistical confidence is depressingly small, which is why it's so important to have a reasonably large number of explanatory variables where you've got some economic intuition or mechanical intuition, that there should be a relationship between what's going on with this variable and the evolution of price in markets. But you don't know what the shape of that relationship is or how it interacts with other variables. You've had a long list of these and a long list of markets that you're investing in and the secret sauce here is to be very humble about the strength of any of these individual relationships and bring them to bear as an ensemble. So, you've got a large number of variables, a large number of models on a large number of assets. And

the real juice there is in putting all of those together and extracting the diversity of in the error terms cancel out, you've got some errors that are going in one direction and others are going in the other direction and those error terms will largely cancel out and you'll be left with a greater amount of signal. That's why a strategy like this can generate an astonishingly large aggregate Sharpe ratio at a portfolio level, when the individual models are just barely significant.

Mike: **00:15:16**   That addresses that idea of what the sample size can be. And that's how you expand that sample size to get some significance out of it.

Adam: **00:15:26**   Yeah, you expanded cross-sectionally by adding other variables and other markets and allowing those error terms to cancel out.

Rodrigo: **00:15:33**   When you talk about a junior quant as they look at the literature, they gravitate towards momentum because it happens to have the higher P value in a certain back test. That is being too biased. So you can take a step back and realize, okay, maybe momentum and value are good, or maybe momentum, value and low vol, and you start expanding and diversifying there because you don't know which one trend has done really poorly for 10 years. You don't know which one's going to work. Then you say, how do you define value? How do you define trend? You find a wide variety of ways that are intuitive parameter sets? Is it 100 day moving average or trend is a 200 day? Or is it 150 days, the crossover between a short term and long term moving average, you create that, a wide variety of variables you can create. What we've written about a ton is that if you want to create a true baseline or benchmark for value, momentum, trend, you should come up with as many variables that make sense, average amount and get a back test. And that should be your benchmark, versus just the 100 day moving average being your factor. But if once you get to your ensemble, you have all these different feature sets, then you can start applying the machine learning framework to be able to understand the true texture of all of those relationships independently and interrelated. How do we go beyond that? What does sustainable alpha look like? Do we stop there?

Adam: **00:16:49**   I think you nailed a critically important point, which is that the only sustainable edge is innovation. It's constantly acknowledging, first of all, that markets change and that there are going to be new variables that come to dominate the mechanics of the price evolution where the last little while has made it very clear the importance that the options market plays in determining the direction of equity prices, in the intermediate term. So if you're not using information from the options surface, and from dealer positioning, etc, to inform your models, then you're probably a step behind. So you've got to be constantly on the lookout for new variables that are interacting with markets to change the nature of price evolution. There's other ways you can expand your strategy efficacy. You can add new markets as they become liquid enough, you can add new features, you can

create new synthetic markets. But for example, trading the yield curve, or trading pairs of long short equity markets or trading calendar spreads. Really the combinations and opportunities are limitless once you have a general intuition for how to look for explanatory variables, and you've got the right machinery to be able to identify optimal relationships.

Rodrigo: **00:18:27**   And then what you find is that one of the things that has been going around for the last 10 years is that there is no more alpha, there are no more hedge funds, there's no more active management, because if I put a bunch of factor, basic beta factor strategies together, I can explain away 90% of your returns. We found that as you get deeper into this level, it's completely idiosyncratic. There are small portions of traditional factors in there, but the vast majority of the alpha ends up being new.

Adam: **00:18:56**   Well, yeah. It's systematic, but it's not explained by the traditional factor returns.

Rodrigo: **00:19:04**   And that's the goal. As people go up that learning curve and start getting into our area, we're going to hopefully be in... We at ReSolve and other alpha and active managers are constantly trying to be at the next evolution to create sustainable alpha. I think investors and allocators also have a very personal choice to make as to where they're going to want to lie on that continuum. They should take the time to be very comfortable with their expectations of where they're going to sit so that they can actually achieve the potential excess returns that come from these extra sources of return and as they adopt them. Because what you don't want to have is the opportunity for adoption and then abandonment at the time where you're going to have a drawdown, because that's inevitably where abandonment comes, where you receive the risk, but none of the returns. So it really is something that each allocator and investor has to really contemplate deeply as to where they want to sit on, how comfortable they are, with how much economic intuition versus the shape, versus the new indicators and things like that. These are very inward looking questions.

Rodrigo: **00:20:14**   Mike, talk a little bit about Swenson, and how he's clearly been able to find sustainable alpha through his managers. What is unique about what you've read about him that you feel is a good takeaway for anybody looking to see how they parse out what's good and what's bad.

Mike: **00:20:33**   I'm just going from the books that he's written, we all have to take into consideration that those books are now 20, 30 years old. So when they were written, they were truly evolutionary in that he was, went from bonds to equity, then went to equity exposure to more private exposure, private equity exposure in the 2000s. And in his selection of managers, he was looking for managers who were non economically maximizing. They weren't looking to maximize their AUM and maximize their revenue. They really were craftsman. And he wanted to have

long term partnerships with these craftsmen in the space. Long term partnerships with people who were thoughtful and innovative because he knew, and he knows, I think, and I'm speaking for him. Maybe I don't know this, this is my perception of his skill. But he picks up the fact that partnering with those who are innovative, and are going to be at the vanguard of these types of strategies, are the ones that are going to provide that excess return ahead of the curve. And he's willing and able to take on that potential innovator risk in order to capture that excess return for you.

The other thing obviously he did was he was very cognizant of selecting the Board that he would be reporting to and rebalancing with and allocating to these various sectors. So he had a very good Board where he had the autonomy to pursue unique and novel ideas that were ahead of their time, and then got the expertise to do so, and that's really hard. You're talking about the elephant in the room, the career and pure risk, sacrificing potentially your career, if it doesn't work, doing things that are different from your peers, these are all really hard things to do.

Rodrigo: **00:22:28**   He got a Board that allowed him to hire the manager and not the strategy. But the key here is that he hired the manager not the strategy that he was running, he or she was running at the time. It's about the trust and the ability to continuously find unique edges and be ahead of the curve. And then having a Board that would allow him to do that and maintain those relationships for decades, not three to five years or so, which is what is often seen these days.

Mike: **00:22:56**   These are really the crux of success of comfort and discomfort. That's why I emphasize that any allocator or investor who's contemplating these types of strategies has to make sure that they can stick with it at its worst.

Adam: **00:23:10**   Look, speaking of worst, I think that this sets us up for the next episode which is we've, again, just recapping quickly, maximum diversification from beta, expanding the beta definitions using leverage, applying some unique alpha. Even with all that in place, you do have these moments of stress in long short strategies and short betas and so on that tend to revolve around periods of liquidity shocks, negative liquidity shocks. So in the next episode we're going to talk about something that's near and dear to our hearts. We've been talking about it for years, and I think most people are really in tune with it now, which is how do you deal with tail risk? And how we should think about that from a portfolio construction perspective.

Mike: **00:23:52**   The evisceration of liquidity. Cue the music.