

Transcript

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Episode 47 – Rise of the Quants

David Corris - Generally speaking, what an advisor should be looking for are quantitative investors who have transparent, explainable processes grounded in economic intuition, and talking to them, everything is focused on how do we outperform the market going forward rather than relying on how good their back tests look.

Ben Jones - Welcome to *Better conversations. Better outcomes.* presented by BMO Global Asset Management. I'm Ben Jones.

Emily Larsen - And I'm Emily Larsen. In each episode, we'll explore topics relevant to today's trusted financial advisors, interviewing experts and investigating the world of wealth advising from every angle. We'll also provide you with actionable ideas designed to improve outcomes for advisors and their clients.

Ben Jones - To access the resources we discuss in today's show, or just to learn more about our guests, visit bmogam.com/betterconversations. Again, that's bmogam.com/betterconversations. Thanks for joining us.

Emily Larsen - Before we get started, one quick request. If you have enjoyed the show and found them a value, please take a moment to leave us a rating or review on iTunes. It would really mean a lot to us.

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Emily Larsen - Over the last couple of years there's been a resurgence in quantitative investing. Today we're going to demystify quant investing and provide some areas to explore in due diligence when evaluating a quantitative strategy before making a recommendation for your client's portfolios.

Ben Jones - Industry fee compression and the focus on the value equation, what am I getting for the fees that I am paying - continue to drive investors into many types of quantitative investment strategies. Oftentimes they dive in without fully understanding the methodologies and how they even work. When diving into the topic of quantitative investing there's a lot of questions that arise. For example, why did quant strategies fail in the 2000s? How have they changed since then? Is smart beta just a rebranded quant strategy? What about the so called black box issues? Do all quants use proprietary systems, and of course from your position as an advisor what due diligence questions should I be asking of my quantitative managers?

Emily Larsen - To answer these questions and more we've enlisted the help of two born and bred quants. Seriously. One even went to math camp.

David Corris - My name is David Corris. I'm the head of the Disciplined Equity team at BMO Asset Management as well as a portfolio manager on the team.

Chris Jenks - My name is Chris Jenks. I'm the client portfolio manager for our Disciplined Equity team.

Ben Jones - David, Chris and I sat down in our US headquarters in Chicago to discuss the ins and outs of quantitative investing. First we wanted to start with the basics and define what quantitative investing is and some of the differences between quant and fundamental strategies. Here's David.

David Corris - So quantitative investing can take many different forms, ranging from the way we do it, which is using fundamentally inspired principles but investing in a more disciplined manner, to things that are far more complicated in terms of using artificial intelligence and machine learning. But by and large what they have in common is using data and analytical techniques and the ability to research one's ideas historically to make investment decisions.

Ben Jones - Chris, maybe you could just explain what is fundamental investing?

Chris Jenks - Yeah sure thing. Fundamental investing is a little bit different in that you are using techniques to discover the intrinsic values of companies in the stock market. These techniques could be more macro driven by nature or looking at fundamental characteristics of companies within the opportunity set.

Ben Jones - Okay, so we've got these characteristics and we can explore those characteristics fundamentally as a human by going and having a conversation with the management team and learning about the business and understanding it from those techniques, and we could understand it through the data or the information that that particular security throws off into the marketplace. Okay one thing that I really want to understand is you hear this term smart beta and I'm still unclear what the difference is between smart beta and quantitative investing because indexes inherently are quantitative in nature.

David Corris - So smart beta would be one special type of quantitative investing. We view quantitative investing as being a much broader theme, so to start with what smart beta is, smart beta is going to be choosing one or in some cases a couple of the investment factors and taking a systematic exposure to these factors to basically deliver the factor return without any stock selection added on top of it. They are quantitative in nature so as a result they are considered part of quantitative investing but they would be considered a more systematic and passive version of quantitative investing. Whereas quantitative investing in general can be much broader, for example many areas of active management where investors are trying to outperform the market by identifying inefficiencies in the market by using their quantitative techniques.

Ben Jones - So just so I understand and I apologize if I'm asking a dumb question, here, but is smart beta then just Beta?

David Corris - Smart beta is just beta, it's just beta to something different than what a market cap index would be. So a market cap weighted index is just going to give you exposure to stocks based on how big they are. Smart beta is just another version of beta but it's getting exposure to different types of characteristics besides market cap.

Ben Jones - Okay. Now when it comes to quantitative investing are there any asset classes or segments of the market that lend themselves better to quants and conversely maybe you could share some of the areas that don't lend themselves very well to quantitative processes.

David Corris - So there are some general characteristics for places in the market where quant would work better. One would be less efficient asset classes, and that's no different for fundamental or quantitative investing. All active investment typically works better in less efficient asset classes, think about something like US small cap or international or emerging markets. Another characteristic where quant tends to work very well is where there are large numbers of companies. One of the powerful drivers of quantitative investing is when you can make many comparisons simultaneously across lots of different companies and conversely it has more of an advantage over a fundamental because when you have lots of different companies to compare it becomes harder for a fundamental analyst to cover all the companies in the appropriate level of depth. So inefficient asset classes and large asset classes with more names tend to be really good places for quant. Other areas I'd include would be areas where transaction costs matter because quantitative investors can do a very good job of trading off returns, risks, and transaction costs in a much more algorithmic and formulaic way, and so those are a number of areas where they'll probably lead back to the market again would be areas like small cap, international, emerging markets, etc.

Chris Jenks - To add to that, I think one area of the market where investors don't often associate quant would be growth and specifically large cap growth. For many reasons you know this is a space or an area of the market that has been dominated by a small select group of more fundamentally oriented active managers and if we look at growth I actually think we believe that this is an area of the market that is just prime for quantitative investing. You know, quantitative investing at its core is designed to extract or exploit behavioral mispricings in the market. You think about the context of large cap growth specifically this is an area where many of these behavioral inefficiencies exist so think about the glamour effect driving mispricings up, high flying growth stocks. Using disciplined and systematic investment techniques, you could extract excess returns or alpha from these mispricings or large growth and again going back to some of the traditional research and quantitative investing it's more in the sense of value, but what we do believe growth is a space where quant could be quite successful.

Ben Jones - So tell me a little bit more about that because I'm not a quantitative guy. Bear with me if these questions seem a little bit odd but quantitative investing takes historical data and paints a picture forward of where the pricing is on that particular security today. And with some of these growth companies the historical growth might not be the future growth so talk to me a little bit about how quant does a good job of sorting that kind of puzzle out.

Chris Jenks - Yeah, there are a couple things you can look at from a factor perspective to be -- to make predictions on future growth. Specifically some subset of factors that we look at that are highly predictive in explaining growth would be momentum, so if you have a robust and diversified stock selection model you could use momentum factors which tend to be quite predictive for future growth companies. It's also in how you define growth. Growth off the shelf is really a point in time estimate where you're just capturing growth from point A to point B. Our perspective is the type of growth companies you would like to identify are those that can consistently grow sales and earnings, so looking at metrics that are essentially designed to capture variability and growth. That is a way we use quantitative methods to better predict future sales and earnings growth.

David Corris - The other thing about quantitative methods in growth investing are that in addition to adding value through stock selection, a huge value add of quantitative investing within growth is portfolio construction. We found that there are a number of things that growth investors do sub optimally in terms of constructing portfolios. One example would be that in growth strategies a lot of the names tend to be very sexy, attractive names with great stories behind them, and as a result analysts and portfolio managers fall in love with the stories. The consequences are you end up with positions that typically are too large, portfolios that are too concentrated, and you end up with poor buy/sell discipline because as someone falls in love with the name and it goes up they become immune to the valuation and they just keep falling in love with the story. You also typically will have more risk within growth names because one of the riskiest areas of the market can be high growth names that are priced for perfection, when they start disappointing. So one area where quantitative investing significantly helps within growth is with portfolio construction and instilling a much better buy/sell discipline in portfolios, helping them think much more scientifically about what the right position size should be, helping also think about benchmark concentration where there are many-- the FAANG stocks tend to be so large that the quantitative investors typically think about the impact of going underweight as well as going overweight and all of these are areas where quantitative investing in our opinion is superior to fundamental investing for growth.

Emily Larsen - So now we have a baseline on where David and Chris think quant works well. Let's hear about where they believe it doesn't work as well.

Ben Jones - So let's talk a little bit. If we go back to the early 2000s when quant investing had its first sprint and there was a lot of interesting quant investing, had a big surge in popularity and many of those quantitative strategies really fell short of expectations and what exactly happened and why did they get termed the black box?

David Corris - A couple things happened. I think specifically why they did not work well on the market, they worked well for a few years when value, which is the most traditional quantitative factor, while value was working in the early 2000s quant strategies did very well. The blowup really happened in 2007 when there was a crowding amongst quants for the many of them were thinking about the same ideas and doing the same things and they were starting to use leverage in order to increase the positions they were taking and there was underperformance purportedly as a quantitative fund deleveraged or liquidated, that led to mass underperformance among quants because they were all having such similar positioning.

Ben Jones - And so tell me a little bit about what your team learned from those past experiences of other teams about the limitations of quantitative investing.

Chris Jenks - Yeah I think first and foremost having an understanding that best quantitative models have limitations, the point you just referenced, but also as you look at the factors in which you are constructing your stock selection model making sure that you are fundamentally inspired in terms of how you define and create factors and stock selection models. This is something that's particularly important in today's big data environment as we look at new sources of information, it's important to remain grounded in those fundamental insights and perspectives and principles. Another thing I think we learned from the quant crisis in 2007 is just the ability and the need to be adaptive through dynamic markets. Quant models are great but I think the biggest knock rightfully so against quants is that I think your stock selection model works until it doesn't. For that reason you need to be adaptive through changing market environments.

David Corris - So two things I'd add: one, the importance of doing proprietary work and doing things different than other managers are doing. One of the reasons that early quant didn't perform well is that many managers were doing the exact same thing and the entire industry, ourselves included, has spent a lot of time working on proprietary approaches that make all players a little bit more different from each other. The other thing that I'd emphasize is the importance of not being black box and viewing quant not as an end to itself but just as a means to implement fundamental views and portfolios. We view investing as really the end goal here. The difference is that there are multiple ways of getting to investing, and black box approaches that tend to be very very complicated and prone to data mining often end up disappointing investors. One of the other drivers that we haven't discussed about why quant didn't work, is that while quant works very well when implemented properly it has an intrinsic huge risk when done improperly in terms of data mining and over fitting historical data. And when managers, when quant managers do that they open themselves up for potential blowups, so one of the things that we think is incredibly important is making sure that quant is just a means for implementing fundamental insights in portfolios.

Ben Jones - And I think this is a really important point here. Most quant managers are using a quantitative process to impart their fundamental principles on the model to make selections and so there's a human component that's deciding how to select things in the model and implement that going forward. And so that's not very black box, it's explainable, you understand how the model's working and what you're trying to emphasize in the program. But there are actual black boxes out there then people trying to use AI, where they're not explainable, they don't know what it's doing and to your point through overfitting it can find spurious correlations that don't really exist and aren't really important from an investment standpoint. Is that a fair way to kind of explain the two camps of quantitative investing?

Chris Jenks - Yeah, sure thing. I think that's certainly a fair way and I think that's something that investors should certainly ask themselves as they evaluate quant; you know how are you constructing your quant models? And we've all heard the adage; you haven't seen a bad back test. I think model construction is kind of more of an art than a science and building models for the sake of out of sample robustness is certainly critical in evaluating the efficacy of quantitative managers.

Ben Jones - For our audience, in statistical analysis could you just in layman's terms explain the word overfitting?

David Corris - What quants are doing is they are using historical data to make predictions about the future. Overfitting refers to taking historical data and finding patterns in that data that are not there. So one of the quotes we like to talk about is that history tends to rhyme but not exactly. Or you can use history as a guide but not as a detailed road map. And the idea here is that things from history help inform the future but history never repeats itself exactly and over fitting is when you look at historical data and come up with a very very detailed model that fits historical data very well but doesn't work going forward when conditions are different.

Ben Jones - We wanted to create a guide for how you as an advisor can perform due diligence and evaluate various quant managers as potential fits for your client's portfolios so here we go.

David Corris - The ultimate goal of a quant manager or any manager is to perform well going forward in a world that we haven't seen yet so one of the critical ways to evaluate a quant manager is to understand how much of their process is hypothesis and economic reality driven versus how much of it is purely trying to optimize a historical back test. Generally speaking,

what an advisor should be looking for are quantitative investors who have transparent, explainable processes grounded in economic intuition and in talking to them everything is focused on how do we outperform the market going forward rather than relying on how good their back tests look.

Ben Jones - How does the advisor get to this? So for example, how often should an advisor expect the model to adapt or be enhanced as the market conditions change?

Chris Jenks - You know, that's certainly a key consideration because I think that's pretty critical with quants is just consistency of model results. You don't want to see a quantitative manager that is dynamically reweighting or adding factors to their stock selection model, so if you are evaluating that manager based on historical performance it is somewhat meaningless if that model is significantly changing throughout time. So I think the consistency of the model itself is key. Asking them kind of what is that process of adding a new factor or changing your model. What does that look like? An ideal situation, you'd see a manager in which the additional removal of factors is bonded in an intensive research process. Again emphasizing the consistency of that stock selection model.

Ben Jones - And so, let's talk for a minute about factors because they play a big role in quantitative investing as you look at ways to implement your thoughts and principals and ideas. Do having these factors that you're looking at or weighting in your model, does it lead to inherent biases of different quantitative managers? So for example let's just say you had a single factor model that over weighted deep value. And how would a quantitative investor keep the model from buying a company that was of deep value but in a poor market, so for example buying Kodak when the world was going to digital photography.

David Corris - That's a great question and I think the answer is some managers will do a good job of avoiding that and others won't. I'd say it starts with the DNA of the manager, to what degree do they respect the fact that the models have limitations, and are they willing to make overrides because they believe models are imperfect, or to what degree do they want to slavishly follow their models without second guessing any of the individual names with the assumption that buying a basket of names might work well even though individual names in the basket might be toxic.

Ben Jones - And you guys are unique in that you have a fundamental manager on staff and is that how you think about touching the model or should advisors be looking for intervention in the model and asking those questions of their managers?

David Corris - Yes, I'd say broadly there's two ways a quant manager can deal with the risk that you mentioned: One is by building complementary factors into their model to help remove what we would call a value trap at the risk of buying a value trap. So the quantitative approach would be to take your deep value stock that might have a bankruptcy risk and complement your model with lots of other factors to help address that with the idea being that as you combine all your factors together you can systematically remove the bad, cheap names from the universe. And we do some of that. But we think that the other way managers can do it well is blending fundamental research with quantitative research. And as you mentioned, our team is fairly unique in the market in that we have a number of fundamental analysts who are embedded on our team who will work with our quantitative models to help remove the false positives that our models might identify. And in our experience, that's fairly unusual for quantitative managers to have that type of fundamental expertise within their team.

Chris Jenks - I think a couple of tangible examples in today's market environment, if you were to look at retailers today, they're somewhere in the ballpark of three standard deviations cheap, relative to historical levels. And that type of situation, if you're just blindly following your model, without having understanding or appreciation for some of the more secular headwinds that these brick and mortar retailers are facing today, you could find yourself with a heavy composition of some of these value traps, potentially. Going back to the comments on model construction, I think one thing, it's important to give an example, so we look at value as a component - our stock selection model, the company valuation factors, what factors that embody investor sentiment. And the idea there is if you are investing in stocks that are also cheap, also gathering interest from other investors, that could help you potentially avoid value traps in the market or falling knives.

Ben Jones - So we live in the world of big data, and there's virtually no segment of the market that's not using data differently today than they were 10 years ago. So with respect to quant land, is all data created equal?

Chris Jenks - No, I think one thing we see with big data today is just lack of longer term availability of these new data sources that are emerging in today's market. With that being said, in order to sufficiently test and research these big data factors, what many quants find themselves doing, or providers of big data factors, is linking together shorter term performance in order to form a research driven conclusion. And what happens in that scenario is that you are introducing factors in your model that have much shorter investment time horizons. And I think in our perspective, we're building models more for the intermediate to longer term. So that certainly does impact decision making in that respect.

Ben Jones - And so with respect to that -- David, I know you and I have had this conversation -- there's a lot of firms experimenting with alternative data sources. I love that we brand these things so well. Is there a point where all these alternative feeds, I mean satellite pictures of parking lots and social media posts, is there a point where the data just becomes not helpful?

David Corris - That would pre-suppose it is for sure is helpful now, and that's not even clear. I'd say things that make data helpful, general characteristics that make data helpful, are: number one - having long data histories so that you can properly test it. Number two - having broad coverage of large universes of stocks so that you can have robust measurement and not just see whether it works over a narrow set of companies. And number three - having some level of economic intuition or belief that this is telling you something important about companies. I think the alternative data sources that you're talking about suffer from a number of -- they fall short on a number of dimensions. They don't really go back long enough for you to really understand them. They don't have enough breadth in many cases to see whether there is robustness across many different types of companies, and while you can always make up a story to explain why they might make sense, people are very good at making up stories after the fact, but it's not clear that a lot of these things, for example Facebook or Google Trends, are directly capturing the fundamentals of companies.

Ben Jones - So this is a really important point. This is a warning for advisors to not kind of get sucked into the sexy story of satellite images of the Wal-Mart parking lot to predict future sales.

David Corris - Yeah, I think people need to separate the attraction of a really good story that sounds nice versus something that actually works. I think with all the data explosion and all these new data sources, it's very easy for a manager to seduce someone with all the information they're finding and the new horizon the data gives them. But I'd say most

practitioners that we've spoken to, and ourselves included, have found that there's a number of limitations to this data. It tends to decay very, very quickly. It tends to be very prone to data mining. It tends to not be helpful across large groups of companies at one time, and it tends to not have a long enough data history to understand it fully. And we would caution advisors against going headlong into these new data sources until they understand them and frankly have longer histories to prove the concept.

Ben Jones - Great, so while we're on this topic, let's talk about risk controls. So with quants in particular, what are the questions that an advisor should be asking those quant managers and due diligence to understand the risk constraints that they've put on the portfolios in the model to give the advisors some comfort that there's good risk management practices?

David Corris - The first question would be asking a manager how they think about risk and keep it open ended. The types of things you want to be listening for are that people think about -- the managers think about risk broadly, not narrowly. The answer shouldn't be, here's what our beta is, or here's what our sector bound is, but it should be how do they think about risk in terms of their ability to measure it versus the risk you can't measure. How many different measures do they need to look at in order to understand the risk of a portfolio? How many different layers of risk management are they building in? Basically, are they viewing risk management as a check the box activity that needs to be done or something that they truly believe is in their DNA?

Ben Jones - As you evaluate quant managers, you'll want to understand the systems that quants build using various tools. And while some buy or rent those tools, others build completely proprietary system, and others might use a mix of proprietary and purchased systems. Do all quants build their own proprietary tools, or do they rent systems? Tell me a little bit about buy versus -- or build versus rent.

David Corris - I think the buy versus build decision comes down to where managers view their time as being best spent. There are different returns available to an investment team, depending on where they spend their time. So different tools that a manager might typically use would be a return forecasting model, or what managers call an alpha model, and in almost all cases, any reputable quant manager will have that be proprietary. Occasionally you'll find fundamental managers that are needing to integrate quant that may buy a model. But typically speaking, the best models by necessity are going to be built in house. Sometimes risk management systems are better off vended because risk management -- there are vendors who specialize in this in the market, and our view has generally been that where you can get the most proprietary information and the greatest informational advantage, you ought to build, and where you have -- where there's someone else who can do something more effectively, you should buy. But even in the cases where you buy, the real skill is not in the underlying data, but it's how you integrate the data into your process. The analogy that we would use would be a carpenter doesn't need to build all of their own tools. When a carpenter builds a house, what really matters is how they use their tools to build the house most effectively. And so we view our job as using all of our proprietary systems, along with vended systems where appropriate, and then combining them in the smartest way.

Ben Jones - Great. So when it comes to an advisor vetting these quant managers who have proprietary alpha models or different systems that they've built or integrated, what are some of the risks that advisors should be looking for? Are they looking for cyber security risks, are they looking for programming capabilities, are they looking for technology spend? Walk me through kind of some of the questions an advisor needs to ask when they hear the word proprietary tool

David Corris - I think one of the most important questions the advisor should start with is, what is proprietary, what have you bought, and why have you made those decisions? It helps understand how the manager thinks about their value add and how they think about building versus buying. On the proprietary side, I think some of the key questions are who has developed this, what level of talent do you have on your team, and how deep is your team to maintain this in the event of a key person departure? How robust are the modeling techniques underneath it? So again, that you can assess whether there is thoughtful research going on or whether it's potentially data mined.

Ben Jones - Great. And so when it comes to proprietary tools, you guys have built a tool called *Market Monitor*. Just describe what is that tool, and what does it do?

David Corris - The *Market Monitor* is something we developed after the financial crisis. The recognition on our team was that market conditions were always changing, and there will be periods of time where something unusual or extreme is happening in the market, not for one company, but for a factor as a whole. For example, there may be sectors or groups of stocks that are systematically getting too expensive or too cheap or might be getting riskier than they normally would be, and *Market Monitor* is our predictive analytics platform that we've built that identifies when there's a situation in the market that is looking extreme or unusual, and then allows us to make forecasts about what will happen going forward, as this unusual situation were to return to normal. In laymen's terms, you can think about it as we are identifying when there is a bubble, not at the market level, but below the market level where there's a bubble developing in some group of stocks in the market and allowing us to then position portfolios to take advantage of the mispricing that we're seeing. The other thing that allows us to do, in addition to making good investment decisions, is it's something we're happy to share with our clients to help them understand what we're seeing in the market so that they can think about broader implications for their portfolios as well.

Emily Larsen - To recap David's comments, the areas you should evaluate with any quant manager are:

1. The alpha selection model. How much is back testing versus investment thesis?
2. Consistency of that model.
3. How and when will the manager override or touch the model?
4. What data sources are being used?
5. How risk controls are used and integrated.
6. What tools and systems are being used, bought versus built.

Now let's look at some modern challenges facing quantitative investing today, such as dwindling numbers of publicly traded funds.

Ben Jones - We recently had Jon Adams on the podcast talking about the five year outlook that BMO has put together, and one of the kind of things that they're watching and see in the market place is loss of dynamisms. Basically, the winner take all economy. And I think in the US now, there's around 3,500 US domestic stocks listed now, down almost in half from 10 years ago --

more than half from 10 years ago. So how do you think about this trend and this environment, in terms of the impact on quantitative investing?

David Corris - So, in general, having fewer public companies would be a slight negative for quantitative investing, but the market still has more than enough companies with 3,500 companies, for example, in the US. It's more than enough breadth for quantitative strategies to work very well. In addition, the types of companies that you're losing out on when you reduce the universe, it tends to be within the small cap area. It tends to be the less liquid, higher risk names in the first place, and so what you're left with is potentially a slightly smaller universe, but still a very large one, and the companies that you have will typically have been around for longer, have better data and longer data histories, and typically higher quality and more positive earnings. So as a result, while the universe may be smaller, the effective buyable universe is probably not that much smaller, and the data is a lot better, which makes quantitative techniques work better there.

Ben Jones - So Chris, I want to ask this because I know I can just tell you're itching to answer this question, but could you maybe just list the major advantage of quantitative investing for the advisors and their portfolios?

Chris Jenks - Yeah, the major advantage of quantitative investing is going back to that element of removing subjectivity and emotion in the stock selection process and really more effectively managing that trade-off between risk and return, putting the data driven approach together into one value add. It's consistent and repeatable investment decision making.

Ben Jones - So I know you're both very biased, but what would your skeptics say the drawbacks of quantitative investing are?

David Corris - One of the main -- the two main criticisms of quantitative investing that we hear, one is that models work very well over long periods of time and over large groups of companies, but they don't understand the individual companies they're buying all that well. And so especially with an advisor or manager who -- or an investor who has more experience with fundamental managers, they may say, we understand the models work, but you don't understand the individual companies as deeply as the fundamental managers. The other one is something we've alluded to before, which is data mining. I think investors are typically skeptical of processes that they view as black box or that they can't understand because they are afraid that they're turning over an investment decision to a computer or a black box framework, and it might underperform without any explanation as to why.

Ben Jones - I want to get your thoughts on a couple of things. First of all, David, you are a quant. You've been a quant since you were eight years old at math camp, and so could you just tell me what does it feel like when you get a quant model that's just a finely tuned strategy?

David Corris - It's really rewarding when you come up with an idea that you think should make sense and should identify an inefficiency in the market, and instead of just believing that you're right, being able to go through the process of testing your idea, tearing it apart, having other people tear it apart, and have it withstand all that scrutiny, and step back and say, I have found something that other people in the market haven't discovered yet and is going to help me add value for my clients because of this proprietary insight I have. It's intellectually very rewarding as a quant. It's also kind of emotionally and humanistically rewarding to know that we're going to be able to do our jobs better and create value for clients because we found something that other people haven't.

Ben Jones - And Chris, if you could summarize our entire conversation today in two sentences or less, what would you say?

Chris Jenks - Yeah, the world of quant is evolving, and we're seeing quant come to the forefront of investors' mind. But I think it's important to realize and have the understanding that not all quant is created equal. There are certainly considerations in evaluating quantitative processes, new data sources, testing these new data sources, and transferring this to actual investment intuition and how it impacts a portfolio.

Emily Larsen - David and Chris' team produces a quarterly commentary on quant investing. We'll have a link to this at bmogam.com/betterconversations so that you can keep up to date on the topic.

Ben Jones - Chris and David, thanks for sharing your wisdom on the show today. Now, because David is a born and bred quant, I was really nervous during the episode about asking him simple questions like, where are we recording this? I was worried that I'd get some sort of longitude or latitude coordinates versus a description of where we are. Well it turns out, I was wrong. Quants can be quite human with their communications.

David Corris - We're in cold, windy Chicago this morning.

Ben Jones - Stay warm, guys.

Ben Jones - Thanks for listening to *Better conversations*. *Better outcomes*. This podcast is presented by BMO Global Asset Management. To learn more about what BMO can do for you, visit us at www.bmogam.com/betterconversations.

Emily Larsen - We value listener feedback and would love to hear what you have thought about today's episode. Or, if you're willing to share your own experiences or insights related to today's topic, please e-mail us at betterconversations@bmo.com. Of course, the greatest compliment of all is if you tell your friends and coworkers to subscribe to the show. You can subscribe to our show on iTunes, Google Play, the Stitcher app, or your favorite podcast platform. Until next time, I'm Emily Larsen.

Ben Jones - And I'm Ben Jones. From all of us at BMO Global Asset Management, hoping you have a productive and wonderful week.

Emily Larsen - This show and resources are supported by a talented team of dedicated professionals at BMO, including Pat Bordak, Gayle Gibson, Matt Perry, and Derek Devereaux. This show is edited and produced by Jonah Geil-Neufeld and Annie Fassler of Puddle Creative.

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