

**EPISODE 40:****Five Factor Thinking: Using Factors to Spot Trends and Guide Decision Making**

[INTRODUCTION]

**[0:00:05.3] Benjamin Felix:** This is the Rational Reminder podcast, a weekly reality check on sensible investing and financial decision making for Canadians. We are hosted by me, Benjamin Felix and Cameron Passmore. Today, I'm going to say that we went on a factor rant, but everyone's going to be thinking, "Well, isn't that every episode?"

**[0:00:22.6] Cameron Passmore:** No, this week was about a paper you published recently that talks about the rationale for factors leading up to the model portfolio for DIY's. I suggested it be its own paper because I think how you set it up in the paper was so well done. You got pretty fired up about it, it was good.

**[0:00:39.1] BF:** Yeah, I did get fired up, it was a long episode. Hopefully you guys listen to it, but if you want to hear us talk about factors, it was probably in the after what, 30 minutes that we started talking about the paper?

**[0:00:49.2] CP:** Yeah, we covered off stuff from the budget. I mean, that's where we take a bit of a detour as well, talking about one of the things for retirement planning which we thought was interesting, we could have perhaps made that the feature.

**[0:00:59.2] BF:** Yeah, we probably could have cut this up in a two, even three episodes but –

**[0:01:02.7] CP:** We're learning.

**[0:01:03.3] BF:** There's lots of.

**[0:01:05.2] CP:** It's only 40 episodes.

**[0:01:05.7] BF:** There should be lots of good stuff in there.

**[0:01:08.1] CP:** Love the comments and the feedback we've been getting, thanks very much.

**[0:01:11.0] BF:** Yeah, it's true actually, we've had some really nice reviews, new reviews on iTunes and a bunch of people rated in the podcast I mentioned that last time and I don't know if that's what drove people to do it. It seems like more and more people are listening and I know I said this last time, but it just creates really good dialogue because we get, I mean, I probably get at least three emails a week for people who are listening to the podcast and have a question or a comment and that's really engaging and it helps us continue to produce good content on the podcast.

Like I asked last time, if you're enjoying the podcast, rating it is awesome but if you have one person that you can share it with, you also think would enjoy the podcast, that would be awesome. From what I understand, podcasts tend to grow organically.

**[0:01:51.7] CP:** Anyway, have a listen.

**[0:01:53.0] BF:** That's it.

[EPISODE]

**[0:02:01.3] BF:** Welcome to episode 40 of the Rational Reminder Podcast.

**[0:02:04.5] CP:** Nice round number, 40. Anyways, this week, we're going to kick it off with a quick update of a hedge fund that I mentioned, that was pitched the podcast two weeks ago, so I went back into a bit of a homework on that and then we'll talk about some pieces from the federal budget that we think might be of interest. And a little bit of data we found on yes, factor performance. But the main thing we want to talk about, since we're talking about a main theme every other week, is a paper that you just released last Friday I believe.

**[0:02:32.5] BF:** One of the top downloaded resources from the PWL website right now which is good, people are reading it, but we'll talk a little bit about that as our main topic for today's episode. But before we get there, let's hear more about this hedge fund Cameron.

**[0:02:46.0] CP:** Well, it's kind of a story from the friends, was back in, I'm guessing I was pitched this fund in '07. This fund was launched in '03. It's called Seller's Capital and we were

pitched on Mark Sellers of Sellers Capital. It was fund with a two and 20 fee, that's 2% plus 20% of the profits of whatever the high-water mark is. I couldn't find that information. The returns had been so great up to the point we were pitched, it was basically no brainer and you owed it to your clients to use this fund and then the person that was recommending it to us would split the 10% performance bonus for us.

**[0:03:24.6] BF:** Talk about then the investment philosophy.

**[0:03:26.2] CP:** It's crazy. On the comp, it was about the comp. If you're going to make 50% of the fund and make 50%, you're making 20% of that 50, right? There's 10% that's paid and he was going to split it 50/50. 5% of all the money, theoretically. They grew it 50% a year, we're talking, if it had kept up, serious dollars so there's a real commission push that was being pitched to us. At the servers, this is at lunch, right? You say okay, we'll look at it, but I just knew in the back of my mind we would never consider it.

Here's the philosophy. Small cap companies selling at or near tangible liquidation value, okay. Hold a very concentrated portfolio and make big bets, this is on the correspondence of the fund. We don't diversify, we don't think volatility is risk, we like volatility. It's amazing. They spend nearly all of their time figuring out the likelihood of permanent capital impairment.

Get this, the fund was owning, the company called Contango Oil. Which was trading around \$3 and they started valuing it in 2003. By the summer of 2008, the stock had risen to \$92.

**[0:04:39.2] BF:** He really did kill it with the stock.

**[0:04:41.8] CP:** High conviction. I couldn't find all the numbers, but I remember that it was well over 50% of the portfolio was in the Contango Oil, at that time. I remember saying as I mentioned in the last podcast, what if you're wrong? The person didn't even know what I meant by what do you mean what if I'm wrong?

I couldn't even you could have been wrong.

**[0:05:00.9] BF:** Then he was wrong.

**[0:05:02.1] CP:** Then he was very wrong. On October 2008, the manager retired and said that he hated the hedge fund business. Here's the quote, "what I've learned about the hedge fund business is that I hate it," says Mr. Seller, a former stock analyst of Morning Star.

I have enough money that I don't have to work and why should I put myself under this much stress?

**[0:05:21.9] BF:** Pretty brutal thing to say, just losing his clients a whole bunch of money.

**[0:05:25.9] CP:** I think I found one article and said it was up to 1.4 billion in Contango Oil. That's one of the filings I found.

**[0:05:34.2] BF:** Wow.

**[0:05:35.9] CP:** The portfolio, I can imagine, it must have made up like two thirds the portfolio, I couldn't find that data, but the point is the massive bet which is what he said he was going to do. And he delivered, I can only imagine a two and 20. He would have made an absolute fortune. Of course, he didn't have to work again.

**[0:05:53.7] BF:** Anyways, currently, he's the CEO of a company called Bar Fly Ventures which owns a number of student bars and restaurants in the US out of the business.

**[0:06:02.7] CP:** Interesting pivot.

**[0:06:03.9] BF:** That kind of ties in with another article that you sent to me just on the discussion of luck versus skill. Obviously, this guy had Sellers of Sellers capital had high conviction and he had the intention of placing concentrated bets on individual stocks and that paid off.

**[0:06:20.1] CP:** Bet big.

**[0:06:23.0] BF:** Then people went and sold that good past performance. That raises that question that we always have of if someone does well, were they lucky or were they skilled? There was an article that market watch had about a trader in the US that turned \$100,000 into

2.5 million on a single trade. I can't remember what the trade was. I read about it but it was whatever. The guy created a thesis, made a big bet on it with options and won. Barry Ritholtz wrote about that story, Barry said that if you see great past results like that, you have to ask four questions.

Are the results statistically significant? Was the trade the result of luck or skill? What is the long-term track record of the approach? And is it repeatable?

**[0:07:10.7] CP:** Which are all very logical. Normal questions that you and I automatically go to that. But as human beings, we're pattern seekers, we want to believe that this is skill.

**[0:07:20.0] BF:** Of course, we do, yeah. I thought it would be good to go through each of those questions and then just kind of put some data around them. But for the first one, is it statistically significant?

**[0:07:28.4] CP:** I love this stuff.

**[0:07:29.3] BF:** To be statistically significant on active manager would have to generate 2% annual alpha, 2% excess return and in excess of the risk taken per year, with a 6% standard deviation of alpha, pretty tight like in most years you're beating the market or beating your benchmark. It would take 36 years of that. 36 years of 2% alpha with a 6% standard deviation of alpha to have a statistically significant evidence of skill at a 95% level of confidence.

**[0:08:00.2] CP:** Think about that. 36 years, someone starts in their 24, you have to wait till they're 60 and go find a 24-year-old manager of a portfolio so we've been there a while I guess for Warren Buffett, but how many others.

**[0:08:16.9] BF:** You go and find that 60-year-old manager who just had that alpha for that period of time and they're probably not going to be managing money for much longer. They're probably going to retire which is one of the other challenges with active management, is that if you do have a truly skilled manager, your success is tied to that human and humans are obviously unpredictable for all sorts of reasons.

Eugene Fama, Ken French did a paper in 2010 and this is answering one of Barry's other questions.

**[0:08:42.6] CP:** Was it the success, the result of luck or skill? Fama and French looked at US mutual funds. They had a ton of data and what they found was a few funds produced benchmarks adjusted expected returns, sufficient to cover their costs.

Didn't they find even fewer than they would have expect to by luck?

**[0:09:00.4] BF:** Not 100% sure on that.

**[0:09:01.4] CP:** I seem to recall, is that a presentation and Ken French delivered in Toronto when that paper came out. I seem to recall him saying that.

**[0:09:07.7] BF:** Interesting.

**[0:09:08.3] CP:** That's probably due to the cost.

**[0:09:09.8] BF:** Yeah, they talk about that. When you add back costs, they did find evidence of both inferior and superior performance what they would call, non-zero true alpha, in the extreme tails. There were some really good in terms of skilled managers and some really bad managers. But only when your ad cost back in. After costs, I guess – another word to think about that is that the active managers, even the skilled ones were not skilled enough to generate excess returns after costs.

**[0:09:40.5] CP:** Yeah, especially if you look at, what a lot of managers have a lot of freedom as in the hedge fund world which typically have the two and 20 type compensation structure.

**[0:09:49.2] BF:** The point of that bit of data is that when it's been examined with mutual fund data, which is the easiest data to analyze is just because all the public disclosure requirements, the evidence of skill is very bad, not strong. One of the questions was, is there a long-term track record to the approach?

This one's interesting because there are – I mean, you can always find some fund or strategy that has done really well over the long term.

**[0:10:16.9] CP:** Again, it's just chance. You have enough managers, someone's going to have great performance.

**[0:10:23.0] BF:** I think it's always – it's not just looking at the long-term track record, it's looking at the long term track record and then asking the question of why? Which I guess ties into Barry's other questions. Is it repeatable?

**[0:10:32.9] CP:** I can remember back in the 90s, we talked about the fund industry two weeks ago. Companies would launch all these different funds, the ones that didn't do well, they just go out and kill them and let the good ones survive.

**[0:10:42.5] BF:** Still happening. The *Morning Star*, not the *Morning Star*, the standard [inaudible 00:10:45] report for mid-year 2018 showed 10-year survivorship for mutual funds in Canada, about 50%.

**[0:10:54.1] CP:** It's not even getting better.

**[0:10:55.3] BF:** No, survivorship isn't. Anyway, whenever you see, I think I mean, I get the sense that people who listen to our podcast understand this, but whenever you see a person or a fund or whatever it may be with really strong returns, even if they seem smart, you always got to ask those questions before concluding that what they've done can be repeated by you or by anyone else.

**[0:11:18.4] CP:** Show me the data.

**[0:11:18.8] BF:** Yeah, you had a quote from Annie Duke and she said, "the quality of the outcome doesn't tell you about the quality of the decision making."

**[0:11:26.7] CP:** Exactly.

**[0:11:27.2] BF:** Which is pretty good and so you see someone that has to had some great returns, it doesn't mean that they made a good decision. They may well have just been lucky.

**[0:11:33.7] CP:** A bad outcome doesn't mean a bad decision.

**[0:11:36.0] BF:** Well yeah, we talked about this a couple of weeks ago, with rational decision making. If you make a rational decision, there's still a non-zero chance that you're going to get a bad outcome.

**[0:11:42.9] CP:** Exactly.

**[0:11:45.3] BF:** That doesn't mean it was a bad decision.

**[0:11:46.6] CP:** It was budget week a couple of weeks ago, a couple of big takeaways that we noticed. One is, this one I find interesting, it looks like these swap-based ETF's are on their way out and this is something you had talked about in a discussion group that we're in preparing for an article, it just came out of *Money Sense*.

**[0:12:01.7] BF:** I would sometimes wonder why – I mean, I wouldn't wonder, I would question why are we not using the swap based ETF's and we start going through it even after the drawbacks which is stuff like well they don't have access to small cap because well, I'm not going to get into why, but they generally don't have access to small cap, in the swap based structure, so that's a drawback but even with that, if you're in a personal account with a high marginal tax rate or a corporate account.

The tax benefits far outweigh any lack of diversification. It's like okay, well why would we not use them? But the answer that we've always come to and the reason that we were not and are not using them for clients is the legislative risk. We used to always say that and I'd run the numbers on it too and what I found was that if you ended up having to realize the gain on one of those holdings like for example, for HXDM, which was the developed international markets, swap based ETF. You would have to hold that for at least five years, to make it such that you wouldn't have been better of holding a regular long, only ETF for a long period of time.

It's like, if you had to realize the gain on HXDM in year two, you would have had higher after-tax returns after 30 years of holding XEF.

**[0:13:14.1] CP:** What does this mean practically speaking if the legislation does go through, it will be triggering a capital gain fund forward just on growth going forward?

**[0:13:22.9] BF:** I don't know.

**[0:13:23.7] CP:** Horizon did say in a press release that they expect that their funds and list that they had would be impacted by the changes after their 2019 taxation years.

**[0:13:32.6] BF:** Yeah, I mean, they said, the funds listed in the table below which included all of their swap-based funds. But I mean, it's just interesting to see that the legislative risk, which is something that we had based our decision on because we hadn't used the funds due in large part to that risk, but in a lot of cases, I wouldn't say I was skeptical, but it's just a risk that's really hard to know how sensible it is to base a decision on. And a lot of people online would say well no, they're never going to get rid of this structure so I'd question it but then –

**[0:14:02.8] CP:** Then, less than a week later.

**[0:14:04.3] BF:** That it happened and we just released a YouTube video on the same topic and again, there was actually someone who commented on the YouTube videos saying, "wow, you're way overstating the legislative risk, that's never going to happen and then." It was like two days later, the budget came out and it did happen.

**[0:14:17.6] CP:** Really, it makes sense to take it away like – I mean, we're not really – you're not that surprised?

**[0:14:22.1] BF:** No, I'm not surprised and this is something that I've been cautioning people of as long as I've known that this structure existed. I think Justin's written about this in the past too. I think a couple of years ago, he even wrote a post saying that he's – well, he just said that he wouldn't be surprised if this went away.

**[0:14:37.3] CP:** What do you make of the new advanced life deferred annuity or ALDA that was mentioned? Kind of longevity insurance?

**[0:14:46.5] BF:** Well, of course it is, it's an annuity.

**[0:14:48.5] CP:** Anyone could do that at any time so what it is, they're allowing you when you retire that you're going to be able to push 25% of your RSP forward to at the latest, age 85 to buy a deferred annuity. Cash, like a pension that will start later, the most you can push forward is \$150,000. The annuity was always an option.

**[0:15:10.6] BF:** This lets you defer the income.

**[0:15:12.0] CP:** Defer the income of the annuity so therefore, it could reduce your rift payments earlier on which could help you keep your OAS.

**[0:15:19.2] BF:** If you have a large RSP and a long-life expectancy, then I think this becomes a pretty interesting planning tool. I think that annuities are, they're probably underutilized now and I think that as people continue living longer and longer, they're going to become more and more interesting from a planning perspective. This budget item, it's effectively a way to defer your rift minimums, observe reduce your rift minimums and defer income using annuity.

I don't think it's a reason, it's not a reason to buy annuities, but if you're going to buy an annuity anyway, this is potentially a really interesting way to approach it.

**[0:15:53.9] CP:** The numbers aren't that huge, but it takes pressure of worrying about providing income when you are later in life.

**[0:16:00.3] BF:** Yeah, if you don't have capacity to make decisions, it becomes extremely interesting.

**[0:16:03.8] CP:** But I've sat with a number of people who wanted to do an annuity and it came down to doing the paperwork and they couldn't write the check because the money is gone. Literally, they're in the board room, they couldn't do it.

**[0:16:15.0] BF:** Yeah.

**[0:16:15.5] CP:** We've done all the proposals, all the paperwork and they could not do it. Now, the flip side, we've done a number of annuities back when rates were higher and they're so happy now, one example where she wrote the annuity when it's got to be 20 plus years ago and it just keeps on paying and this was back, I think the rate was eight or nine percent on the annuity. It was a prescribed annuity, so not too much of the income is taxable. Worked out incredible for her.

**[0:16:40.3] BF:** Yeah, like I said, I think that annuities have been underutilized by the profession in general, it is an insurance product, but I think it feels like an insurance product and people are generally skeptical of insurance products. But as people live longer and longer, I think that it will be sensible for people in our position who are giving advice to start having a little bit more conviction about annuities and when they make sense and why they make sense. It's all about, we ran the numbers on this a while ago.

It's kind of like, when you compare, when you use the Monte Carlo approach to financial planning, which is what we do, the end result is that you have to plan on average to die with a big chunk of money, in order to not run out of money, spending from a portfolio that has variable returns.

**[0:17:28.0] CP:** Especially the younger you are.

**[0:17:29.6] BF:** Right. When you take that Monte Carlo approach, it ends up being what a lot of financial planning researchers would call, inefficient spending. Because you're not spending all of your money, you're ending up with this big pool of capital left, that you didn't spend before you died, but you had to plan to have that so that you wouldn't run out of money before you died.

**[0:17:48.0] CP:** Because you didn't know the path of returns.

**[0:17:49.8] BF:** Correct. Annuities take that away. So, you're exchanging your risk, I guess. You're exchanging the capital to eliminate the risk of sequence of returns, I guess.

**[0:17:59.8] CP:** But you're taking a more inflation risk, are you not?

**[0:18:01.6] BF:** Well, you're taking on inflation risk, that is true. But you're making a longevity risk go away, I haven't spent too much time looking at annuity products, do we not have inflation adjusted annuities?

**[0:18:12.1] CP:** Then you really give up on cash flow though. And the cap I think, there's a cap maximum 2% inflation on the – I think that's one of the rules I read. It needs to run some of the plans in our software to see what it does due to the success rates.

**[0:18:26.0] BF:** This is the thing. If your goal is to guarantee an amount of income, it will cost you less to do that with an annuity. At least based on the last time or the numbers than it would with a portfolio. That's the only goal is I want to guarantee a thousand bucks a month. It's going to cost you less to buy an annuity to guarantee that than it would be to invest in the market.

**[0:18:48.1] CP:** Because the variability of returns.

**[0:18:49.5] BF:** Right.

**[0:18:50.2] CP:** When that variability returns and when that variability happens.

**[0:18:52.2] BF:** It's going to cost you less, but your next generation, if you have kids or charity that you want to benefit or whatever it is. They're going to get nothing, if you bought the annuity where with the portfolio, they have a chance of getting something. For you, as an individual wanted to guarantee an income, it's less expensive to do that with an annuity than it is to do with a portfolio. You just give up the upside.

**[0:19:15.3] CP:** Sounds like huge piece of mind. I mean, the few people we have that do have annuities, they don't worry about it, the pension just comes in, the check just shows up.

**[0:19:22.2] BF:** Anyway. We've gone off on a bit of an annuity tangent, but I think that was a really interesting item in the budget, was the advanced life deferred annuity. A couple of other things that were in there like they're increasing the home buyer's planned amount, that's small but worth mentioning maybe.

There is the piece about CMHC sort of subsidizing down payments for first time home buyers. That was an interesting little piece as well. I was talking to a friend of mine who is in real estate and he thinks that that is going to push up the price of homes at the lower end because now, people can afford a larger down payment, people who qualify for this supplement, who have been buying less expensive home can now afford to buy, to pay more for that. Could have interesting implications on Canadian real estate. But obviously, who knows.

**[0:20:10.6] CP:** You want to talk a bit about that paper, the Dimensional put out this week?

**[0:20:13.5] BF:** Yeah, it was interesting, the timing of it was interesting just in relation to the paper that we put out and I'm just thinking about it now, but I think that I'd probably talk to Brad about the data and the paper that he put out, which may have inspired me to write the paper that I put out. Maybe that's why they were similar.

**[0:20:30.0] CP:** Yeah, I think there was a conversation around that, but there's some pretty neat data points in there. I mean, the one that really got me, was it showed how the sample timing you use to look at past performance can change so fast. Remember the chart that showed Russel 1,000 growths so large cap US stocks, but the growth part of the index beat value for every single time period from one to 20 years.

One to 10 and 15 and 20 years as of march 31<sup>st</sup>, 2000. Over every past, period from one to 20 years, growth beat value.

**[0:21:06.2] BF:** Over the period ending March 31<sup>st</sup> 2000.

**[0:21:09.4] CP:** I think that's still going through the 90s that's the big growth tech boom on the US. Advance that time period one year and looked back over the same one to 20-year time frames. Value beat growth over every single period. The whole table turned upside down over a matter of a year.

**[0:21:27.3] BF:** It's unreal.

**[0:21:28.0] CP:** That's how bad growth did in that year and it dragged the whole thing down. It's unreal.

**[0:21:35.3] BF:** It feels, I mean, I was not paying attention during the tech boom in the 2000s and the 90s, but the period that we're going through now, I don't feel like it's the same. I don't know, you'd know better than me.

**[0:21:47.2] CP:** Doesn't feel the same at all.

**[0:21:48.8] BF:** But we have seen a handful of tech companies grow their stock prices in an extreme way, which is what is making value look bad.

**[0:21:57.1] CP:** What's different now is not everyone is talking about it. Back then, everybody was talking about it. Cab drivers, people were firing us because we weren't getting the 15, 20, 30, 40% that their friends were getting, everybody was buying Nortel and Endtrust and JDS back then. Mortgaging their house, price goes down, take up your mortgage. That's not happening at all.

**[0:22:17.0] BF:** Interesting.

**[0:22:17.4] CP:** This was rampant back then. Anyways, you put out this great new paper, I love this paper. It's called *Factor Investing with ETF's*

**[0:22:25.8] BF:** Wait, I want to talk one more thing about the paper that Dimension put out.

**[0:22:28.6] CP:** Oh, I thought you are going to link this in anyways.

**[0:22:30.7] BF:** Well they kind of tie in together, but this is one data point that is not in my paper that wasn't a Dimensional paper and I thought it was a really interesting data point to talk about. So, they looked at four factors, so the market factor, size, value and profitability over 10-year periods and they looked at, over 10-year periods, in what percent of the time was at least one factor premium negative? So, in 50% this is going back to 1963 for US data. In 50% of 10-year periods going back to 1963.

**[0:23:08.0] CP:** In 10-year, periods, January to January it's all the rolling 10s, right?

**[0:23:12.7] BF:** Rolling tens yeah, so 50% of the time or just under 50% of the time, at least one premium is negative. So over 10-year periods at least market size value or profitability, one of them was negative.

**[0:23:24.7] CP:** For the 10 years.

**[0:23:26.3] BF:** Yeah, so half the time you are going to have at least one of the factors underperforming. But then they looked at how many instances we have worked two of the premiums negative? Only 8% of the time. So that is like over 10 years you've got the market and also small caps with a negative premium 8% of the time. With three premiums being negative? 0.2% of the time, so that is market size and value for example all have a negative premium over 10-year period, that is almost happening.

**[0:23:54.8] CP:** So, it is not combined. It is individually.

**[0:23:56.5] BF:** Correct, individually. And then all four premiums, so market size value and profitability having a negative premium so that means maybe worth just talking about what that means. That means T-Bills beat market that is a negative premium for the market factor. Large stocks beat small stocks that's a negative premium for the size factor. So, for all four premiums that happened zero percent of the time over 10-year periods going back to 1963.

So, I think one of the buzz words that gets thrown around these days in marketing of funds is multifactor. Like everyone wants to get a multifactor fund. I don't know if anybody wants that, but everyone is trying to sell it. There is some validity to the idea of having multiple risk factors in a portfolio and that is the reason why because they are not going to perform the same way at the same time.

**[0:24:48.3] CP:** I agree. I mean the data is pretty powerful and this doesn't mean negative returns. So small minus big could be negative, but the returns could still be positive. There is a difference between those two.

**[0:25:00.5] BF:** That's exactly correct.

**[0:25:02.9] CP:** And so small could be six and big could be eight. That's a negative premium, they are both positive returns. So, it is a relationship between the two.

**[0:25:10.8] BF:** It is the same for you, market is the same thing. Market could be positive, but if it trails T-Bills that is a negative premium for the market factor. All right, so like we mentioned at the top of the show, the paper that we put out on factor investing with ETF's, it seems like people are reading it, which I think is really neat because I think it's information that has sort of gotten lost just in the discussion on minimizing cost and maximizing simplicity.

And I know we talked about factors all the time but I think that this paper gave something really tangible for people to think about because it is an actual ETF portfolio or it talks about natural ETF portfolio that you could implement.

**[0:25:50.6] CP:** Yeah, I mean I try to make the case that this is really two papers in one, but you decided to keep it all together. I think the first part does a great job of explaining the benefits of the factors. Some historical data and then –

**[0:26:02.3] BF:** So then we have to talk about the – and this is what I wanted to talk about for this piece of the show today, we talk about factors all the time and I know we've had the comment that we've never really explained what they are and I know we said we'd explain it to my mom eventually, which we will do. She'll be in Ottawa in the next few months, so it would be easier to schedule that, but we will still have that show for anyone who is wondering.

But anyway, I still think that even without my mom here, we can try and talk a little bit about – a little bit more about factors at a level that is going to give people more context to understand why we get so excited about it. Any discussion on factor investing has got to start with the capital asset pricing model, which was the first factor model and it just looked at the market factor, But I think my favorite way to think about the CAPM is that it gave us a framework to compare the performance of two portfolios.

Now one of those portfolios might be a benchmark, the other one might be an actively managed fund, as an example. It lets us control for the amount of market risk that each of those portfolios is taking. So, if two portfolios at the same level of exposure to the market risk factor, which is

known as market beta in the capital asset pricing model, if they have the same exposure to market risk, but one of them has higher returns that return difference is called Alpha.

That's positive excess risk adjusted returns. So, if you can take the same amount of risk and get higher returns obviously that is great and that is what active managers try to sell. And before the CAPM, before we had that ability to relate to portfolios based on the amount of risk they were taking, there was no way to know like how did you even evaluate how a manager is doing. So that is great and the market factor was the first factor that gave us that framework to compare portfolios based on risk taken.

The problem with the CAPM was that it only explained about two thirds of the difference in returns between those two portfolios.

**[0:28:00.3] CP:** That is right. This is about portfolios.

**[0:28:03.1] BF:** Portfolios, securities –

**[0:28:03.8] CP:** Portfolio theories goes back to Markowitz and the crisp database. So finally we had data going back to 1926 where you can start doing this kind of research into security prices.

**[0:28:13.7] BF:** Right and this is all based on markets being efficient. The whole CAPM is based on markets being efficient. So anyway, the CAPM explained about two thirds of the return difference. So, what that means is if we had those two portfolios with the same amount of market risk, but one of them had higher returns, there was two thirds of that was explained by – of the return difference was explained by market risk, one third was unexplained.

**[0:28:38.9] CP:** So, you set the academics off to try to figure this out. That is a fact that what will happen.

**[0:28:42.9] BF:** Were saying that so in 1981, Ralph Bonds came up with his paper, which was – and that was actually the paper that came out around the same time that David Booth was implementing the first small cap fund for Dimensional. I think their fund launched before the paper came out.

**[0:28:58.4] CP:** And there we talked about that, I don't know, a month or two ago and that fund was launched not because of CAPM, but just because of diversification. Managers are all managing large cap stocks, how about some smaller cap just for diversification? It was not based on what Bonds found out.

**[0:29:12.6] BF:** But then Bonds's paper came out around the same time and they were like, "Oh wow, this is actually kind of cool."

**[0:29:17.7] CP:** And then they went 10 years with small cap underperformance.

**[0:29:20.9] BF:** So anyway, the reason that Bond's research is important was that he showed through the CAPM framework, he showed that small stocks had consistently higher risk adjusted returns than would be expected in their market beta. So, if we only have one factor to evaluate returns, which is market beta, if we only have that one factor and we look at small cap stocks they look like they are producing alpha. They have higher average returns than would be expected by their exposure to market risk.

So that was an anomaly. That was like, "Okay, well geez maybe markets are deficient after all because they miss priced in small cap stocks."

**[0:29:56.5] CP:** And they weren't behaving like the market.

**[0:29:58.6] BF:** So not long after in 1985, some other guys, Barr Rosenberg, Kenneth Reed, Ronald Lanstein found similar results for value stocks. So again, they found that value stocks were producing higher returns that would be expected based on their exposure to market beta and at this point, keep in mind, we still have the single factor CAPM model. That is the only way we can evaluate the differences in returns relative to the amount of risk taken.

**[0:30:22.0] CP:** This is seven years ahead of the famous Fama-French three factor model came out, this is long before.

**[0:30:28.0] BF:** Correct. So, Rosenberg, Reed and Lanstein their paper was actually titled *Persuasive Evidence of Market Inefficiency*, which was interesting and then Bonds' too. Both of those papers were showing, "Okay, we've got this CAPM framework and security prices and

returns should be related to risk,” but then these two papers come out and say, “Yeah, no. It doesn’t work. CAPM does not work or markets aren’t efficient either one.”

So then in 1992 that’s when Fama and French came out with their paper and obviously Fama had already proposed the efficient market hypothesis. So, he came out in 1992 and said, “no, no these anomalies aren’t proving that markets are not efficient. We just need to adjust our risk factor model.” We can’t just look at returns through a single factor market beta model, we have to add in the specific risk, the independent risk of small cap stocks and the independent risk of value stocks to the model.

**[0:31:21.6] CP:** Exactly.

**[0:31:23.0] BF:** If it going to be meaningful.

**[0:31:24.0] CP:** As a comparative tool for other management, other portfolios. Because even if just by only small caps will explain part of your portfolio returns. So you have to take that factor into account as oppose to the market factor because remember this is a tool to help measure other managers, explain the performance of portfolios.

**[0:31:43.3] BF:** How much risk did you take and what was your return relative to that risk? So instead of looking at that question through that market factor at just the market risk lens, Fama and French said, “we need to look at this through the lens of risk taken from the market, risk taken from small cap stocks which are independent and they have independent risk and the risk taken through exported to value stocks.” So, when they introduced their three-factor model, all of a sudden, the small cap and the value were no longer anomalies.

They no longer had – well they still have higher returns and would be expected by the market beta but they did not have higher returns and would be expected by their exposure to the small cap factor and the value factor. So, this is a breakthrough at the time, it reinvigorated the idea that markets are efficient. We just needed to take into account these specific risk in the model. So, with the three-factor model, the explanatory power, so the ability to explain the difference in returns between two diversified portfolios based on the risk taken.

Increased from about two thirds of the difference with the CAPM to about 90% of the difference with the three-factor model. So, I mean that's a big deal and keep in mind that the reason we really care about this is as investors it is neat that we have better explanatory power over the differences in returns, but the reason that we really care about this is that the differences in returns between small cap stocks and large cap stocks has been positive.

**[0:33:06.1] CP:** So, let's talk about those differences.

**[0:33:07.6] BF:** Yeah, we can maybe just gloss over it. Since then, since 1992 there had been two other sort of I guess you'd call them breakthroughs from the efficient market perspective in asset pricing and that was in 2012 and 2013, which is when the profitability factor and the investment factor respectively were discovered in air quotes, proposed, whatever you want to call it, written about. And Eugene Fama and Ken French took those two new factors and tacked them onto their original three.

And so now, we have the five-factor model and with the five-factor model, we can consistently explain the differences in returns between diversified portfolios to the extent of about 96% of the difference. So pretty much all of the difference in returns between diversified portfolios can now be explained by their exposure to these factors.

**[0:33:58.3] CP:** Talk about incredibly liberating and when I learned is that years ago it is just, "wow, it just takes a whole pile of cognitive overhead away." You don't have to worry about manager selection anymore.

**[0:34:09.7] BF:** Right.

**[0:34:10.3] CP:** Because this will explain it and every time and if you have ever done it, it always comes back to the factors explained in return.

**[0:34:15.8] BF:** Oh yeah, if you take an active manager that has beaten the market, well who did that? Mark Carhart did that in 1997 I think and this is with a different four factor model. It included the Fama-French three factors plus momentum as a fourth factor which Fama and French did not include in their five-factor model.

**[0:34:31.7] CP:** So, to tie the prior two stories together to be able to pick Mark Seller, you'd be able to see if there's anyone of these factors explaining its returns, but then to now, that it is reliable, he has to have done it for 36 years, does something as robust as this framework.

**[0:34:47.1] BF:** But he also got so much security specific risk that it would even be hard to look at it through.

**[0:34:51.8] CP:** So, manager, I am just being fictitious but generally, you have to have – you'd be able to explain the returns by this framework, but then to know that he has alpha he would have to do it for 36 years.

**[0:35:02.8] BF:** Right, yes.

**[0:35:03.6] CP:** That confidence in that decision to pick him over this model.

**[0:35:06.2] BF:** Yes, and his alpha, you're right. That alpha got smaller, the more factors we add to the factor model because remember that alpha is risk adjusted returns like traditionally, alpha is access risk adjusted returns through the single factor CAPM lets. But as soon as you start adding on more factors, a lot of that alpha starts to be explained by the risk taken. So anyway, the reason that we care about this stuff so much on our side for Cameron and I and the reason we get so excited about it is because –

**[0:35:36.2] CP:** Are we excited?

**[0:35:37.0] BF:** Oh, I get excited about factors.

**[0:35:38.3] CP:** Really? I don't think people can notice.

**[0:35:41.3] BF:** Do I need to slow down?

**[0:35:42.8] CP:** No, no keep going this is good.

**[0:35:44.1] BF:** Take a breath? I think that just the fact that the factors explain the differences in returns between portfolios consistently that's evidence that they are a real thing like these aren't just made up things. They consistently explain.

**[0:35:56.7] CP:** You think about the rigor that went on for years behind the scenes to get to this point, to build that crisp database going back decades, to do the research, to have peer reviews of your research to get to this point and they say, "Nah, we are not going to use this. We are not going to pick this manager" I just –

**[0:36:12.7] BF:** I don't get it either.

**[0:36:13.8] CP:** I don't get it.

**[0:36:14.2] BF:** Now I have said this a couple of times and I haven't actually gotten to the point. But the reason that we get excited about this stuff or one of the reasons is that when you start looking at the factor premiums, so how much excess return have each of the factors delivered over the long term, they are really meaningful. I mean you look at the market factor, which is that is just the market. You get that with a regular total market index fund.

In the US going back to 1926, it has had a premium in excess of T-Bills of 6.28% per year on average. And again, in the US going back to 1963, market premium has been 5.09% and I am going to stay with 1963 here because we have data for all five factors.

**[0:36:56.3] CP:** So, everybody gets that. I mean that is part of their revolution towards broad based index funds.

**[0:37:01.3] BF:** You get that just was said –

**[0:37:02.4] CP:** And to B 500, the Morgan Stanley rolled index. That is what you are getting, the market.

**[0:37:07.1] BF:** Getting the market, now SMB so small minus big, the premium, so the premium that small stocks have delivered over big stocks in the US going back to 1963 is 2.35% and that is meaningful. And then HML, so that is high minus low that's cheap stocks minus expensive

stocks, premium has been 3.48% per year on average going back to 1963. RMW, which is robust minus weak, that is from this robust profitability minus firms of the week profitability, 2.84% per year on average.

And CMA, even though it is not targeted like Dimensional does not target CMA in portfolios. Our ETF model portfolios don't have exposure to CMA at least not statistically significant exposure.

**[0:37:50.0] CP:** So, what is CMA?

**[0:37:50.8] BF:** Conservative minus aggressive. So, this is firms that invest conservatively minus firms that invest aggressively and I to be honest don't fully understand why, but it is not – well it is a weaker relationship and I think based on that nobody is really using it in portfolios. It definitely helps to explain differences in returns, but the premium is not as interesting and that could be an issue with implementation like how do you actually define investment, I am not sure. Anyway, CMA's have a meaningfully positive premium as well.

**[0:38:20.6] CP:** So, these are all US factors. So, when the paper first came out in '92 they were criticized I believe for only having US data. So, they went back and dug up the research and Jim Davis was a big part of doing that research to go back and see if it worked out a sample.

**[0:38:34.8] BF:** Yeah, so then we have Global XUS, which is the other sample and markets been less positive than the US, 2.31%, small minus big 1.02%. HML high minus low, 4.29%. Robust minus weak, 4.06% but these are big numbers. I mean Global XUS, HML and RMW are larger than the market premium and that is just one piece of it. So, the other thing that we hear a lot of the time is, "well the factors aren't guaranteed and they might not show up for long periods of time."

So, in our paper, I looked at that because true the factors aren't always going to show up and there will be extended periods of time like we have now.

**[0:39:15.3] CP:** But that is always the criticism of these factors? What if they don't show up? I mean I saw a tweet today talking about now that we've gone a decade where value is underperformed in the US is because that so many people are onto this factor. They have arbitrage it all the way, which I don't think is true. You got many periods where –

**[0:39:33.4] BF:** Well you can't. I mean first of all when we are talking about factors the way that we are, risk factors that explain the difference in returns between diversified portfolios, you cannot arbitrage that away. That is not a thing. It is a risk that you are taking. I think that and we talked about this in the podcast before, when you are talking about behavioral factors that could sensibly be arbitrated away. Now I know that there are limits to arbitrage and that is what a behavior, a person arguing for a behavioral factor will say.

But anyway, I want to talk about persistence of the factors. So, if we look at the market in the US for 10 year rolling periods, so that is again 10 years and they shift one month for the 10 years, shift one month forward 10 years. So going back to 1963 for the US, the market premium so that is the market in excessive T-Bills has been positive 80% of the time. Small minus big has been positive 73% of the time. High minus low, so value in the US has been positive 89% of the time.

**[0:40:27.4] CP:** So more than market.

**[0:40:28.5] BF:** And same for RMW, robust minus weak profitability, 86% of the time.

**[0:40:33.2] CP:** More than market.

**[0:40:34.3] BF:** So, in the US data going back to 1963 over 10 year periods, the premium for value stocks and profitable stocks or stocks are robust profitability have been positive more often than the market premium. So, for someone to say well the factors yeah, that is all good and stuff, but what if those doesn't show up for 10 years that is valid. But the same thing is true for market. The market premium may not show up for 10 years and historically there had been more periods where the market doesn't show up than value hasn't shown up or profitability hasn't shown up.

**[0:41:05.3] CP:** If you believe in factors you got to believe the whole way.

**[0:41:08.4] BF:** You can't believe in the market factor if you believe in market cap weighed index funds, you have to believe in the size premium and the value premium. It is all based on market efficiency. It's all based on the market pricing in risk. You think what is the price of the

stock? At the end of the day, the price of a stock is the discounted – it is the present value of future cash flows discounted at some rate and that discount rate depends on the amount of risk that the stock has exposure to.

And that is the basis of valuation theory. That is the basis of prices and if you believe that all of that stuff is accurate, which it is in an efficient market or at least most of the time it is, you have to believe in all the fact that you just can't pick one and say, "I believe in market or I believe in value."

**[0:41:50.3] CP:** And the greater the risk the buyer of the stock perceives, the cheaper the price will be because they are commanding a higher return for taking that investment.

**[0:41:57.6] BF:** Exactly, so there is information in prices. That is the whole idea of market efficiency. Anyway, this episode is getting long, but I am okay with it.

**[0:42:05.4] CP:** But we got to get the great table, the great chart you got.

**[0:42:08.2] BF:** Yeah so, the point of the chart and you know what? This was covered off in the paper that we talked about that Dimensional just did, but the chart in the paper it is on page nine if anyone is reading along. If you are reading along that is pretty neat.

**[0:42:23.8] CP:** To me this is what seals the deal for me. You can see graphically; it shows 10 year rolling numbers of the factors and it is incredible how differently they perform over 10 years at the same time.

**[0:42:35.9] BF:** But it is like the data that we talked about from the Dimensional paper. You pick one factor and find a time where it was negative and the other factors were not negative.

**[0:42:43.0] CP:** Look at the past 10 years like right now.

**[0:42:45.4] BF:** The value is negative.

**[0:42:46.1] CP:** The value is negative.

**[0:42:46.9] BF:** The size is actually positive.

**[0:42:48.5] CP:** Positive and market is very positive.

**[0:42:51.7] BF:** Very, very positive, but you look at past periods where market was relatively negative over long periods of time this is over 10 years.

**[0:42:57.6] CP:** You are period in 2009 way, way negative on the market, but way positive on value HML and size.

**[0:43:05.7] BF:** But the point is, we are going through this period now where size has been so-so, value has been negative in the US, market has been amazing so people are saying, “well you know the factors they are not going to pay off, they’re uncertain in all this kind of stuff.” But I mean, we’re in this one little tiny sample of time where at least value is not paid off, but that has happened before for the market. It has happened before for small caps and it has happened before with the market more often than it’s happened for value. We could go on about the data in the paper forever, but I guess you guys could read the paper.

**[0:43:43.2] CP:** I think next time we can talk about the securities that we have chosen; you have chosen for the model portfolio. Talk about it next time.

**[0:43:48.5] BF:** We talked about that in the past episode. Yeah, we can talk about it again.

**[0:43:52.2] CP:** I think that is a good summary. I think it is great information. It’s put together, it is very readable, very straight forward. I think you have done a great job outlining the rational and the science behind these portfolios.

**[0:44:03.4] BF:** All right. So, I think that’s it.

**[0:44:05.0] CP:** Good for this week.

**[0:44:05.3] BF:** That is it for this episode.

[END]

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