



Rob Campbell 00:38 Well, today on the podcast we've got Paul Moroz, our Chief Investment Officer. Paul, welcome back.

Paul Moroz 00:43 Thank you! Thanks for inviting me back.

Rob Campbell 00:45 Well, you're always welcome, Paul, to be on the podcast. I'm sure all of you know, but Paul is our Chief Investment Officer [and] Global Equity Portfolio Manager. And today Paul, I thought what we would explore a little bit is a question that I'm getting increasingly from clients, which is just around negative interest rates. Clearly, the last couple of years you've seen increasingly amount of negative yielding debt, and one of the questions is, well, could this come to North America? In Canada and the U.S. we haven't seen that yet, but is this something that is possible? And if so, what does that mean for either the economy, but more specifically for investors? And that's where I really interested in your perspective as CIO and as somebody actually managing money for a portfolio.

So that's a starting point. And, I guess, maybe just to get you started: why are there negative interest rates in certain parts of the world? And what does that mean?

Paul Moroz 01:34 So, this is happening in Europe mostly; a little bit in Japan. The Japanese 10-year bond is negative; the Swiss 10-year bond is negative; the German 10-year bond is negative—just to understand where it's happening, the scale of it. At one point there was \$17 trillion of negative yielding debt. That's a huge amount of it. Today, it seems like we've backed off of that number and we're standing just over \$11 trillion (to understand the scale). I mean, there's going to be many listeners that are familiar with this concept of negative yielding bonds and there's going to be some that might even be hearing this for the first time and are thinking, "oh my gosh, this is a scenario where when you buy a bond, you're not getting paid interest, you're effectively paying the government interest for that safety."

Rob Campbell 02:34 Sure, but even for those investors who may not have experienced it—for example, here in Canada or in the U.S.— certainly the trend has been in that direction over the past 30 or 40 years anyway, right?

Paul Moroz	02:46	Lower interest rates, lower inflation—
Rob Campbell	02:50	—Correct.
Paul Moroz	02:50	—expectations. You're right, that has been the direction. This is a very odd concept, especially if you experienced the inflationary periods of the 70s and 80s. So to your question, well why is this happening? Well, there's perhaps a few reasons, but also, that we don't know exactly why it's happening on the scale that it's actually occurring.
Rob Campbell	03:11	Is it different? So, if interest rates have been falling since the early 80s or late 70s, and have been on this path lower—the interest rate that you would get on a Government of Canada Bond 25 years ago is much lower today than it was 25 years ago. Is the fact that it's dipping in a negative something different, or is it just a continuation of that trend? And does that matter?
Paul Moroz	03:32	Well, it's something different. It's unprecedented. One of the best time series of interest rates is out of the UK, so you can look at British Consols , which were perpetual bonds, and those had really never gone negative. Or even the British T-bill series previously—never gone negative. So this is, at least, as much as we've been able to find data in any period of the world, this is the first time that you've had this negative interest rate phenomenon.
Rob Campbell	04:02	Right. But I guess what I'm asking is, are the pressures that have pushed interest rates down over the last 40 years different than the ones that are now pushing them into negative territory? Or is this sort of a longer term story that we're talking about here?
Paul Moroz	04:16	I think there's a couple of catalysts, some major changes, and maybe that's what you're really asking about. What are the themes? Why is this different now than how it was different before? And I think, again, we're going back to different theories of why this might be existing, but one idea is demographics, and this is the idea—and there's many people that have had this idea—that we're really going through this demographic bulge where baby boomers, as they've gone through their life cycle, are saving. And now we're at a point where they're at kind of...maximum saving. Everyone's saving at the same time; they're creating a savings glut. So, some people think that this could be just a world demographic problem, and that could actually roll off, and, as those savers withdraw their funds later on, you have another problem: your cost to capital around the world actually goes up.
Rob Campbell	05:12	Got it. Okay. So that's different today.

- Paul Moroz** 05:15 That could be very different today. I think a big one is technology. I mean, there's these massive unintended consequences of the internet and smartphones, and what that has done is, I think, put a lid on inflation in some cases. Imagine, before the internet, how difficult it would be to price check. And [if] a business or a consumer wanted to buy something, it was just...very difficult to compare even the exact same item. You would have to, I guess, make phone calls or if you were driving physically driving out to make a purchase, just the cost for search—
- Rob Campbell** 05:53 —Search costs.
- Paul Moroz** 05:54 —Yeah, search costs were too high. So, what that has done is dramatically reduced search costs, and, I think, made consumers and businesses that transact commerce-wise a lot more honest on an ongoing basis. So that's been a major change. I think it's also brought in all sorts of untapped labour. I mean—and then, this is the whole globalization theme—you can kind of go back to the fall of the Berlin Wall as maybe a starting point of that. The world kind of opened up and you got more competition. And so there [are] many products and services where they might originate in a totally different country, and create competition. That competition puts downward pricing pressure.
- Rob Campbell** 06:37 Deflationary, yeah.
- Paul Moroz** 06:38 It's deflationary.
- Rob Campbell** 06:38 An example that would have been [AutoZone](#) for example, where, even though Amazon may not compete directly with them in terms of auto parts, the fact that you can now go on Amazon and price compare is deflationary for those auto parts ultimately was a negative for that business.
- Paul Moroz** 06:53 It could be. The real simple example that I use is, and I do this all the time, I walk into an Indigo bookstore and I price check on Amazon. I mean, I think we've all done that at some point, and before you, you didn't do that. So, there's lots of examples of that.
- 07:10 And then there's this other thing that's happened—and this more relates to smart phones—but there's all these new apps and software that make us more efficient. I mean, I think Uber's a great example of taking existing capacity. Imagine if you took all the stock of cars in the world and kind of...counted the hours where they just sat idle and weren't really being used. You'd say, "this is very inefficient," [and then] using technology to better utilize the existing assets. And I think that's a major theme. If you are more efficient with what you have, then you don't have to produce new stuff. And that's deflationary.

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| Rob Campbell | 07:51 | Okay, so you've got potential savings glut, you've got search costs coming down dramatically across a wide variety of products and services, and you've got better asset utilization—more efficient asset utilization—all being deflationary forces, deflationary in nature. |
| Paul Moroz | 08:09 | Yeah, there's probably one more in there in terms of: all this existing stuff that we've been built. And the way I would think about it is...before, you had all this stuff in your basement. You might actually want my old pair of hockey skates, Rob. I don't know if you skate much, but I do have an old pair of hockey skates for sale, and we now have this wonderful thing called Kijiji, and you can provide those hockey skates, put them on Kijiji, or we can do a deal to sell them. (Sell them directly.) |
| Rob Campbell | 08:36 | I would want to know the thickness of the socks that you wore in those hockey skates before I agree to anything. |
| Paul Moroz | 08:41 | Right, yeah. But my point is there's all sorts of stuff that's already been produced, which we have. And the problem before was, well, it was too expensive to figure out what to do with that. Or I didn't know who would want, maybe, that pair of hockey skates. And we had things like garage sales and stuff, but maybe that wasn't very productive. There's a high cost to that. |
| Rob Campbell | 08:58 | Well, it's very local in nature too. |
| Paul Moroz | 09:00 | It's very local. And now, in sharing technology, you're much better to understand where there's a market for used things. So, to the extent that things have been produced and have a long asset life, they can be traded around much more easily, and in some cases, that competes with new goods. |
| Rob Campbell | 09:18 | So, this is better asset or more efficient asset utilization—not of labour, but more of the capital. And I've heard you talk about concept “peak capital” before, which I assume is what you're talking about. |
| Paul Moroz | 09:28 | Yeah, that's a related point for sure. |
| Rob Campbell | 09:30 | Okay. Do you want to expand on that aspect? |
| Paul Moroz | 09:32 | Well, we've built a lot of things as an economy, and whenever you're building something that requires capital, it can attract cost to capital, because it makes capital scarce. But just imagine if you get to a point where you've built all the things you really need to build. |

Let's say you've built the railway system and yeah, you have to do a little bit of maintenance, you're replacing railroad ties, but you don't have to outlay a lot of capital. So, as people are saving, there's no place to put the capital back in. We may have hit peak capital required for a lot of what we're producing. A lot of the new companies are more focused on services and technology. They're asset light or capital light; there's not a lot of capital required.

Paul Moroz 10:21 So, unless we invent (as mankind) a new industry, and we might—maybe this spaceship thing is going to really take off, we're going to colonize Mars and we're just going to require tons and tons of capital to do that; there could be something like that that requires capital, and therefore makes capital scarce and creates a higher cost to capital. But if you don't need that, if the economy's really evolving into a place where it's more service-based, it's knowledge-based, you're not requiring capital, then there's going to be a lot of competition for the capital that you already have and where it could go. And that would drive returns down, or in the case of safe assets, interest rates down, as the capital's kind of competing for a place to go.

Rob Campbell 11:10 Okay. And so, so far, we're talking about these pressures all having the impact of actually, not just putting the cost of capital and of borrowing down, but actually, so far down that it's now negative.

Paul Moroz 11:20 Yeah. I mean, we also have to stop and say that the policies of the central banks—especially in Europe, quantitative easing and things of this nature—do play a significant role. So, it's tough to tease out...if you took the central bank policy and put that to the side, well, what would be the factor or impact?

11:42 I mean, economists have tried to take a look at what they call the “natural rate of interest,” the rate of interest required to sort of...make it that inflation isn't increasing or decreasing. And it does seem that this natural rate of interest has come down over time, so that suggests to me, at least, that there's probably some other structural things that are going on, and creating a scenario or a situation for why this is much more structural—as opposed to just simply central bank manipulation.

Rob Campbell 12:14 Okay. And then just for my own benefit, there [are] a couple of different interest rates we've talked about. There's this natural rate, there's a real rate, there's a nominal rate, which includes inflation. Are they all impacted the same? Is this sort of... uni-directionally impacting these things? Or are there nuances between the two or the three?

Paul Moroz 12:29 Well, they're all different. So, jump in to clarify where you want me to go with this, but your nominal rate is the rate of interest that you're going to see without any adjustment, as opposed to your real rate of interest, which takes into consideration inflation. And that's actually really important to understand. There's a little bit of a money illusion here, because if you, say, have a 2% bond, 2% interest bond that you're collecting and inflation is 1%, your real rate of return is the difference. That's 1%. And actually, that's what matters over time, your real rate. In some cases, you could get tricked by a lower rate of interest. If you go years back, you might've had a 5% interest rate, 3% inflation or 4% inflation, and then you're getting that 1 or 2% spread.

Rob Campbell 13:20 Okay, so what really matters is the real interest rate. But what I'm toying with is this idea of...once things go negative, you could still earn a positive real return on a negative yielding asset—

Paul Moroz 13:31 —Yes.

Rob Campbell 13:32 —so long as the inflation wasn't such that it sort of wiped out your real interest rate.

Paul Moroz 13:38 That's right.

Rob Campbell 13:39 And is that a problem? Or is that different? Because then, you're accepting a positive real return, but yet in nominal terms, you're still losing money.

Paul Moroz 13:47 What matters is real terms, and the way to think about this is, there are scenarios out there that could be extremely deflationary, and if you get extreme deflation, your cost of goods are going down. So, even if you start with \$100 and you invest in a bond, it's negative 1%, so you're left with \$99. But if the price of goods, the basket of goods you're buying, goes down by 2 or 3 or 4%, you're going to be better off. So again, it's this money illusion in a different setting than what we're used to in an inflationary environment.

Rob Campbell 14:26 So, we understand some of the factors influencing this; we understand some of the mechanics between what really matters from an interest rate perspective, but so what? I mean, what does this mean for economies, for you as an investor? I think we should emphasize, or take the time to emphasize, that we're not sitting here saying, "we're moving into a world where the entire world's going to be in negative interest rates." We're talking about a scenario that is developing in Europe where there is a lot of negative yielding debt.

We're also saying, hey, look, as we think out the next 5 or 10 years, if these are really structural trends...there is a possibility (we're not saying it's going to happen necessarily), but there is a possibility this really does come to North America and that we're dealing this on a much more global basis than simply pockets in Europe and possibly Japan.

15:09 So, what does that mean for you and your seat as CIO as you think about risks and opportunities and how to allocate capital both just generally across the platform, but as well as for the portfolio that you manage?

Paul Moroz

15:19 I think [listeners] have to recognize that we do look at things very probabilistically and we're talking about one side of the probability distribution today. And just for background, as we're [recording] this podcast, we're in a scenario, where, in the UK, the Tories have just won a government. Jeremy Corbyn has stepped down from the Labour Party. It looks like we've sewn up an agreement trade-wise, at least in principle, between the United States and China. Who knows whether that fully gets implemented. But in just a few scenarios that occur just over the course of days could completely change the direction we go with this. It might be very inflationary—already I'm reading articles about market participants worried about inflation as a risk.

16:12 But back to your question about well, so what? You've followed Japan's history and the deflationary challenges that they had and where they went...and you compare that to what Europe is going through, too. If negative interest rates came to North America, one of the things from that history that we would be very concerned about is just the impact on the banking system. You start to struggle to earn a lot of money because you just don't have the same sort of spreads; you don't have the same sort of volume growth in terms of loans, so there's going to be spots where it actually makes a big difference—macro meets micro—in terms of how a business model is put together and the capacity for that business model to generate wealth.

Rob Campbell

17:00 So, the micro is just the profitability of those businesses, the macro is just the amount of credit in the system.

Paul Moroz

17:05 The macro in this case would be if you're in that deflationary scenario, your loan growth is slower or negative; it scales your business differently, that's the micro. You're not going to be able to earn the same sort of net interest margin that you have before—especially if your yield curve flattens out. Especially in the United States, that can be a tougher situation. So, there's things that go on with that particular model that haven't worked, and banks in Japan had struggled. Banks in Europe had struggled. We've seen this playbook before, should that happen.

17:38 So that's one. From an asset mix perspective, one of the things might be—and it's difficult for people to get their heads around—where, if bond yields are, say, the Canadian 10-year is close to 1.6% and U.S. 10-year 1.8%. But those could still be very attractive investments if you got into that deflationary scenario. And so, the playbook would be investing in some of those securities.

18:04 I'm not sure you want to make a full-out bet that the world goes that way, but you maintain your bond position in balanced portfolios rather than just assuming that inflation comes back and be worried about that risk to the other side.

Rob Campbell 18:20 Those are, I guess, some of the conclusions that I think you would naturally go towards when talking about interest rates: financials and bonds. But what are some of the more... "exotic" ramifications of this? You hinted earlier about capital-light businesses, discount rates in general when it comes to equity valuations. I assume this is more far-reaching than just financials and bonds.

Paul Moroz 18:40 Well, you can use your imagination and create all sorts of different scenarios. I mean I've thought before—

Rob Campbell 18:45 —I'm interested in your imagination.

Paul Moroz 18:47 —[laughs] in my—Would the future of asset management really be about vaults and storage? Would you, as an investor, want to buy up money to hold in a vault? Because even if you're deflating, if your choice is buying a bond that's negative and if you can hold that cap just in bills—

Rob Campbell 19:08 —You got a real return.

Paul Moroz 19:10 —you got a real return. And then you can start to think about well, what assets would be picked off? What would be more interesting? Large bank notes—because small bank notes would take a large area to store. So, for example, there's \$1,000 Swiss bank note. So, if you really want to speculate in that scenario, you start picking up all those different bank notes. That could be an odd outcome.

Rob Campbell 19:32 You're talking about the physical size of these things.

Paul Moroz 19:34 I'm talking about physically buying \$1,000 bank notes.

Rob Campbell 19:38 Okay. And a big garage to put them in.

Paul Moroz 19:39 And a big garage.

Rob Campbell 19:40 With a padlock.

Paul Moroz 19:41 Yeah, exactly.

Rob Campbell 19:42 Got it.

Paul Moroz 19:43 But humanity starts to do different things if this is happening.

The other thing to start to think about would be...can you ever pay back the debt that an organization has? That becomes more tricky thinking about, well, wait a minute, what organizations are actually insolvent? The debt you just can't possibly pay back. And I think that there becomes a lot of concerns from a humanity perspective around, well, what does that mean for a number of people?

Rob Campbell 20:19 And so you'd be worried about companies with higher leverage.

Paul Moroz 20:22 Not even companies, Rob. I'd be worried about pension plans. I'd be worried about people saving.

Rob Campbell 20:27 This is the central bank thing, right? You've heard about the theory that well, at some point, just given some of the liabilities out there, you need to inflate that away. Potentially. And so in a super deflationary environment, it's more challenging.

Paul Moroz 20:37 Well, inflated away or redistribute wealth. One of the odd...other theories that you can think of negative rates is... [are negative interest rates] just a tax on wealth? Have we reached a point—I mean, we didn't talk much about one of the ideas... this is kind of where [Ray Dalio](#) I think, would go with this...is just: there's so much debt in the world, government debt and leverage—that could be a reason why interest rates are low. Because you actually just can't manage for higher rates, don't need to build more things—you're levered there. So, you could look at negative rates as really, a wealth tax. And that would be required, as it's just redistribution of wealth to keep the entire system going.

Rob Campbell 21:22 I don't know if I understand this right, but...the path towards negative rates though, would seem to create the opposite effect. Lower discount rates, lower interest rates; seemingly inflating asset prices...as you said earlier, with lots of capital with nowhere to really go has seen an increase in asset prices, which has perhaps exacerbated some of the wealth concerns.

Paul Moroz 21:41 Right. So, you get your one-time lift. So, Rob, you've bought, I don't know... [a] [100-year Austrian bond](#) came out, which I think actually existed and did really well. It was one of the best performing investments, I think, last year. So, you've made a whole pile of money, but at this point from this level, it's now effectively implying a negative yield.

Rob Campbell 22:02 For 100 years.

Paul Moroz 22:02 For 100 years. Forever.

Rob Campbell 22:04 Or 99 years at that point. Yeah.

Paul Moroz 22:04 Or maybe all assets...maybe [a] better example—that's just the new price. So, you've benefitted, but you actually pay; you're just chipping away. That's just the new price of stuff. Any bond you buy, even though you've made all that money, has a negative coupon and you can't compound wealth anymore in a safe fashion.

Rob Campbell 22:23 You mentioned the 100-year bond and immediately, my mind went towards duration in all of this. Can you talk a little about a negative interest rate environment duration? I know we've chatted in the past just about convexity and what that means for certain investments. I'd love to hear your thoughts on that as it pertains to what we're talking about.

Paul Moroz 22:37 Okay, so duration—you can think of it as interest rate sensitivity. And as interest rates, your discount rate goes down, goes lower, your interest rate sensitivity or duration increases. And so, I think there's a few consequences of this. One of the big questions—and it goes back to peak capital—is the world short duration? Are we running out of places to invest money? And if you are of that belief, there are spots where there's still decent investments. Public global equities still probably—even though valuations are more elevated, we're late in the cycle—are probably earning a through-cycle internal rate of return anywhere from...call it 5 to 7% by our estimates.

23:27 These are companies that we think can create wealth. And that will probably be vastly wrong, but even if your median was 6%, which would be pretty lousy by historical standards, that could be wonderful if you're running out of plays; if you're short duration. That's one concept, thinking about duration. Where is there duration left that you can actually invest in?

23:49 But another one is...we've been hearing lots about this whole... "growth versus value style" swing. I guess it would have been the fourth quarter of 2016, we had a big swing towards value versus...so there's this kind of—

Rob Campbell 24:04 —Well, and even in the last couple of months, particularly in—

Paul Moroz 24:06 In the last month, few months—

Rob Campbell 24:06 —particularly September or October—

Paul Moroz 24:09 —there's been a few hiccups and it pops up in the news: is it value, [is it] going to be growth. What I think people are actually seeing, is the impact of higher duration. Where, a lot of "growth investments," [are] just higher duration. It's not a value versus growth thing, it's a duration thing. And it's creating more sensitivity and maybe more volatility—what we're seeing in the market. I don't know what the right answer is in terms of where the discount rate is going to go, but my thinking is that, I think investors should start looking at that duration concept more carefully and recognizing that a lot of the gains they're picking up is from being long duration or short duration, depending on how the market is actually evolving.

Rob Campbell 24:52 So I want to explore that a little bit more, because I think what you're saying is: if this hasn't been so much of a growth/value style—I get this question all the time from clients as well—if the way or at least a possible way of thinking about it is through a duration lens, then if you've been a growth investor and have done very well and this has been well documented (that value has led growth in the last 10 years)...maybe that's just that you've been long duration. And you've benefitted from this move towards low interest rates.

Paul Moroz 25:17 Yeah. But one scenario is—this is for a lot of investors—this has been just one big outcome of being long duration.

Rob Campbell 25:25 And so when you say, "investors ought to think about that," are you saying, or at least positing, that it's possible that some people don't realize the degree of duration exposure that they have in their equity portfolio? In other words, that as they've ridden that, say if you're a growth investor, maybe the risks that you have in your portfolio today is greater than it was 5, 10 years ago.

Paul Moroz 25:45 Yeah. There's some of that. But [also...] you can take the risk of impairing capital because of duration sensitivity, but then there's also reinvestment risk because of—

Rob Campbell 25:59 —This is the other side of it, yeah [laughs].

Paul Moroz 26:01 —because of duration sensitivity. So again, I'm not telling people what the right answer is, but to understand, well, what are you actually more concerned about? Are you concerned about a market that is long in the tooth in the cycle? And the type of securities might be wonderful prospects, but they're backdated: if you get a backup in the discount rate, you might impair a little bit more capital or at least go through a lumpier period of underperformance. Or, are you more concerned about this idea that...well, actually the world is running out of places to invest and the investment landscape is just different because we're not just...building factories anymore. The stuff that's coming on is much more knowledge-based and there's just not as many places to put your capital.

Rob Campbell 26:45 You've ultimately got to come back to your desk and make decisions as to what to do faced with these varying scenarios that might unfold and the sensitivities and the risks. So, you mentioned some advice for investors, which I think was just—be aware or be mindful of this. I think the second piece that you just mentioned is, it depends on what your priorities are, and that may be specific to individual. But ultimately, you're managing a [global equity fund](#) or portfolio. And so, what have you been doing? Or, what have you been doing in the portfolio to either protect against various outcomes or gain more exposure to things that you think you need in the portfolio?

Paul Moroz 27:20 Well, I think there're some cases where companies will have options to invest, which are pretty significant. And I'm not convinced that the market really values long-term options and options to allocate capital. I just think that that's probably underestimated and there's an inefficiency there.

Rob Campbell 27:41 So this would be a [Brookfield](#) as an example, or would this be—

Paul Moroz 27:45 —No, well...Brookfield's raising (Brookfield's an alternative investment manager) money to invest in things that have already existed. I'm talking about building new things or inventing new things. There [are] a few opportunities that we have that I think have long-term, far-reaching consequences that the market's just not pricing in. And I'm not going to mention them on this podcast [laughter] because we're currently buying them. I always get a kick out of people who give their best stock ideas. If it's really that good, you don't want to tell anyone about it.

Rob Campbell 28:23 Can you offer any more specific—

Paul Moroz	28:25	—You want any more specific, best ideas of the—
Rob Campbell	28:30	—Or it doesn't even have to be a best idea, but just sensitivities, I guess, within the portfolio that you thinking about. And maybe it's stuff that you've done historically.
Paul Moroz	28:36	The point I'm trying to communicate, it's not about sensitivities. You're trying to bolt on real options or investment opportunities that are in addition to your base rate duration sensitivity. And then, options have a lot of value because, depending on the rate environment, if you don't want to do it, well that's fine, but if you can then deploy a bunch of capital and build a whole business that didn't exist before, then well that's wonderful. And frankly you want to be doing that regardless of a duration question.
Rob Campbell	29:05	So, this is probably an unfair question then, but in simple terms, I think of that as...you're favouring growth.
Paul Moroz	29:10	I think that, well, you're favouring cashflow. There's much more power to companies that can take that cashflow and do something with it, as opposed to just return it to me. They return it to me, fine. That's great. But it amplifies your ability as a portfolio manager if you have not only a CEO and a CFO, but a whole system of people that are creating something. That's the wonderful thing about the stock market—how there's an alignment of incentives; you really capitalize on a whole decentralization theme.
Rob Campbell	29:49	So, it feels like we're back to sort of...first principles. Our philosophy. Why wealth-creating companies, why great management teams that can allocate capital in an effective way.
Paul Moroz	29:58	Sure, exactly.
Rob Campbell	29:59	I think for me, the underappreciated aspect of the third part of the philosophy, which is purchasing these things at a discount to intrinsic value, is that if you are investing in a truly wealth-creating company with a great allocator of capital, that can bail you out sometimes, if you get the valuation a bit wrong.
Paul Moroz	30:12	Sometimes that's correct. Sometimes it's not correct.
Rob Campbell	30:16	Sometimes it's not correct—it depends on the magnitude of your error, I suppose.

Paul Moroz 30:19 That's right, yeah.

Rob Campbell 30:20 I do want to end again on just...the probabilistic nature of this thinking. We had [Justin on the podcast a while ago](#) talking about our discounted cashflow model and how it's stochastic in nature. In other words, it's not looking at price targets, but really a range of scenarios and then being able to isolate certain scenarios that help you understand business models. And it feels very much that's what we're talking about today, just at a more macro or portfolio or market sense—just the probabilities that are out there and what negative interest rates do, either as a scenario itself as one of those probabilities, but also if that, then what happens in terms of other things that might occur as offsets. Any last thoughts on that for our listeners?

Paul Moroz 30:58 You've addressed our discounted cashflow models and we do use [Monte Carlo Analysis](#), which takes into consideration the iteration of key variables hundreds and thousands of times. And one of the reasons we do that is to be aware of how that can impact the securities and really, not to get stuck in thinking that we know the answer. One of the variables that we iterate—and we create a distribution—are the discount rates and the bond yields that we use to build up the discount rates. And these are logged normally distributed when we create the distribution.

31:35 So, we're prepared for certainly scenarios where there's a lot of securities that could be extremely expensive if interest rates are to move up. And we have to be mindful of that. And we're also mindful of those scenarios where interest rates remain low or go lower, and the discount rate changes. And then you have parts of the equity market which are extremely inexpensive. And so, you could foresee these two very different scenarios. And if you're an allocator of capital—even with your own individual portfolio—you have to make decisions where you can come to peace with either scenario. No matter which way it plays out, you have to be in a spot where you can bounce back and you're going to be at peace with that. And I think that's where I want to leave our listeners.

Rob Campbell 32:27 Well, that seems like a great place to end. Paul, thanks so much for being on the podcast. Hope to have you on again soon!

Paul Moroz 32:31 Great, thanks for having me.

