Investment Innovation Conference

Making dollars and sense of data and disruption
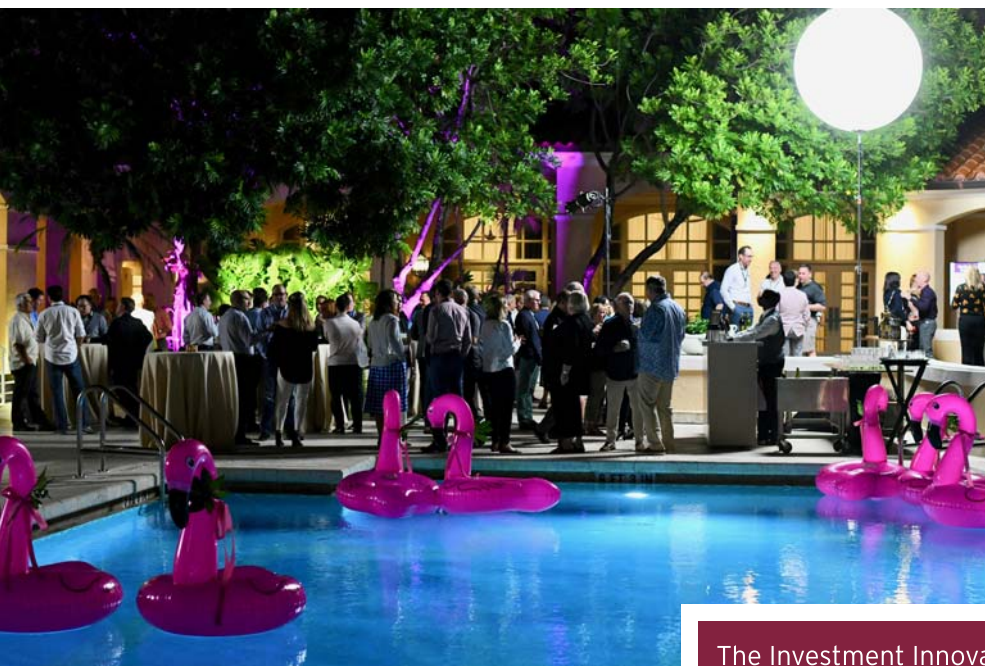
2019
Conference coverage

Canadian Investment Review

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The Investment Innovation Conference took place at the JW Marriott Turnberry Resort and Spa in Miami, FL from November 20–22, 2019

Making dollars and sense of data and disruption

by Yaelle Gang

With technology developing at a rapid pace, and a rise in the amount of data available, the investment landscape is changing.

Along with new innovation comes great opportunity for pension plan sponsors to enhance the investment process across asset classes.

The 2019 Investment Innovation Conference in Miami, FL, featured expert speakers who shared key insights about investment innovation and what new developments mean for institutional investors.

The conference kicked off with an opening keynote from Professor James Weatherall of the University of California, Irvine. Weatherall provided an overview of the history of financial innovation and the importance of understanding the assumptions intrinsic in mathematical models, as well how models can change markets and pose risks to investors.

Other presentations covered a variety of topics that spanned asset classes and highlighted both risks and opportunities, including ways to find operational alpha and better integrate environmental,

social and governance considerations. Finally, the conference closed with a fireside chat featuring James Davis, the chief investment officer of the OPSEU Pension Trust, who spoke about how investors can find opportunity in a changing world.

While the world of institutional investing is changing fast, the Investment Innovation Conference left plan sponsors with key information about opportunities in the current landscape, and what to keep in mind for the future.

Keynote speaker

James Owen Weatherall,
professor of logic and philosophy of science

University of California, Irvine

The importance of understanding assumptions in financial innovation

By looking at what went wrong with financial innovations of the past, investors can learn how to protect themselves and look for opportunities going forward, said James Weatherall, professor of logic and the philosophy of science at the University of California, Irvine.

As an example, he pointed to portfolio insurance and how it performed during the Black Monday Crash of 1987.

A key development that enabled portfolio insurance to become a reality was the Black-Scholes model, which is a well-known model for pricing options contracts that also provided a recipe for constructing options. By the late 1970s, the Black-Scholes model was widespread, as were derivatives and options trading, Weatherall noted.

And then, in 1976, portfolio insurance came onto the scene. "And the basic claim was, 'Look, you don't want to lose everything in a market downturn. One way of protecting yourself is to buy a put option on the whole market.'"

To do this, investors didn't need to actually buy a put option on the whole market because they could construct an option out of a portfolio of other assets, which are much more readily available.

In essence, portfolio insurance allowed for the manufacturing of a put option that was claimed to offer protection in market downturns, Weatherall noted.

Then came the Black Monday crash of October 19, 1987. And portfolio insurance failed.

"In fact, portfolio insurance arguably contributed to the size of the downturn, for a number of different reasons," Weatherall said. "Partly because people were taking riskier positions because they thought they were protected, partially because [of] what was involved in actually unwinding the positions that were theoretically supposed to be equivalent to put options."

After this failure, Fischer Black wrote a paper outlining how people using the model had missed the point and highlighting all the assumptions at the model's core. "And what he did, was he went on to elaborate in detail, in a way that really hadn't been done before, the specific assumptions that had gone into the Black-Scholes model," Weatherall said.

It's important to recognize that conclusions drawn from a model are only as good as the assumptions that went into it, Weatherall said. And models can actually change how markets work." Innovations can change how

markets work because they change the way that people think about the activities that they're engaged in."

For example, if people are inclined to think of portfolio insurance as an insurance policy, this is different than thinking about it as an option or an investment strategy. "When the innovation actually involves a whole bunch of mathematical work based on assumptions that are only going to be good under some circumstances, the whole thing becomes a lot more risky-looking. You're inclined to think of it not as an insurance policy in the traditional sense, but as a kind of investment strategy that you have to be cautious about and you have to look at very carefully."

Yet, once investors recognize how innovations can change markets, they can also find ways to protect themselves and find opportunities, Weatherall said.

"I think the important takeaway here is be vigilant," he added. "Be vigilant for not just mathematical models, but also more causal mental models, like ways of speaking, that get built into financial practices, financial innovation, in such a way that the people who are engaging most with these practices may not be aware of the assumptions that they're making."

Jeff Skoglund,

chief operating officer for fixed income

AllianceBernstein

Finding operational alpha in the fixed income investment process

In the world of core fixed income, technology can offer new opportunities to create alpha, said Jeff Skoglund, chief operating officer for fixed income at AllianceBernstein.

In the past, trading was relatively frictionless, but now the market is highly fragmented, and instead of trading bonds in US$50 million or US$100 million lots, oftentimes these are traded in lots priced at a million or less, he said.

This can be very challenging, because traders must go through various channels and sift through the information. Plus, the deliverable for the analysts is in story form, which can be problematic when running a portfolio with hundreds of names.

Technologies are being developed in the marketplace that can take analog data and turn it into a digital format. One example is a chatbot, Skoglund noted, which can help automate decision-making frameworks.

Traditionally, in the fixed income world, managers decide what they're going to

research, come up with good ideas, present those ideas to portfolio managers and investment committees, do guideline checks and then, ultimately, give those ideas to the traders to execute in the marketplace, he said. "At that point, that's where 80 per cent of good ideas in the industry go to die, because you just can't source that liquidity."

Yet, screening for liquidity can be moved to the beginning of the process. "Ninety per cent of the data that comes into a firm in fixed income, roughly, is noise. It's fictional liquidity. There's real liquidity that's about 10 per cent. So you can start to sort that out. You can feed it into an investment process."

Other considerations can also be fed into a portfolio optimization engine, such as manager tilts and client guidelines, he added.

The fundamental research process can also be digitized, and automation can help focus attention, he said. "Instead of having

four million opportunities to focus on in a day, even if you run sophisticated screens – you're talking thousands – you can narrow that down to maybe 30 to 50. And the premise then is you still have human decision-making, but hopefully humans can make better decisions if they're making 30 or 50 a day rather than several hundred."

Portfolio managers can take more time per decision and also know the decisions are actionable as this was determined at the outset. Trades can then be routed through the chatbot either to high-touch trading or to low-touch trading.

Overall, traditional sources of alpha, like human judgment, will remain, but a new source of alpha can be technology platforms. "I think this is, increasingly, a platform game," Skoglund said. "Yes, it is about talent. But it's about having an organization that can provide every portfolio manager with some level of built-in advantage. It's going to be a scale game and it's going to be a technology race."

Seth Weingram,
senior vice-president, director, client advisory

Acadian Asset Management

A look at machine learning in quantitative investing

"Machine learning offers real benefits for quantitative research," said Seth Weingram, senior vice-president and director of client advisory at Acadian Asset Management.

Weingram provided a real-world case study exploring how machine learning can enhance stock-selection signals.

The example revisited past academic research seeking to distinguish attractive value candidates from "value traps" by considering nine different financial statement attributes related to companies' financial strength, reflecting their profitability, source of company funding and operating efficiency. "For example, change in return on assets in the profitability bucket – if that's increasing, that's probably a good sign," said Weingram.

To construct a predictive signal from this information, the original academic researcher transforms the financial items into binary indicators to reflect whether they were good or bad. "And so, to combine these different attributes together into a single stock-selection signal, what he does is simply add these nine binary variables together and come up with [a predictor that] he called the F-score," Weingram noted.

With machine learning, this selection signal can be further refined for three reasons, Weingram explained.

First, there may be non-linear predictive relationships at play. "It may be that the change in return on assets has a very non-linear relationship with future returns. But we don't have a really strong sense of what that relationship should look like. So, we can use an inductive learning algorithm to try to infer the nature of that predictive relationship."

Additionally, machine learning can assist with variable selection as the original researcher just adds the indicators together, weighting these equally, whereas researchers can use machine learning to identify and exploit the most effective predictors, Weingram said.

Machine learning can also help look at the interactions between predictive variables. "It may be that some of these pieces of information are only interesting conditional on the values of other variables. Machine learning algorithms are much better than many conventional analytical techniques at taking advantage [of], or finding, those interactions in different sorts of data items."

Weingram then showed empirical evidence that the machine learning–based signal outperformed the conventional one.

However, a challenge in applying machine learning is understanding why this occurs. When speaking particularly to the case study about the F-score, he highlighted statistical approaches and best practices for research to provide transparency.

Weingram also highlighted the importance of focusing on the research process.

When using machine learning, investors should focus on including domain-specific knowledge, putting guardrails on algorithms to avoid overfitting and emphasizing disciplined data management to avoid biased results, he added.

"As a foundational statement, we're optimistic about the benefits of machine learning in quantitative investing. We view it as an evolution rather than a revolution. It's not a qualitatively different exercise from things that we've been doing previously. It's an extension of our toolkit."

Samy Muaddi,

portfolio manager, emerging markets debt

T. Rowe Price

Reaping the benefits of emerging market debt

When it comes to investing in emerging market sovereign debt, there are predictable patterns of mistakes that countries make, and understanding these can provide a toolkit for investing in the asset class, said Samy Muaddi, portfolio manager for emerging markets debt at T. Rowe Price.

There are four aspects to look for when considering investing in a country's debt: fiscal issues, political risk, external factors and contingent liabilities, he said.

The way the model works is that a country can have issues in two or three of these areas, but can still manage out of it. However, "if you have all four things go wrong, you're bankrupt."

When looking at emerging markets, one should avoid credit ratings, Muaddi said. "It is the worst possible way to look at sovereign risk. We are dealing with non-linearities. You cannot use a linear

scorecard [with organic risk]."

The promising news today is that the size of the emerging market universe is growing. There are more countries to invest in, and Asian credit is dramatically increasing as a portion of the debt stock. "We've basically had a big disintermediation both in equity and debt, where the historical Latin America-heavy asset class, or the Central Europe-heavy asset class, has been diluted by higher quality issuance from Asian nations," Muaddi said. "You will not see the same volatility either on the political, external or fiscal side from that."

When looking at emerging market debt versus equity, the debt has outperformed over the long term. In fact, over the 30-year history of emerging market debt, Muaddi pointed out this asset class has delivered a compound return of 880 per cent, which is roughly nine per cent per year. This has outperformed emerging

market equity by 600 percentage points, and over 68 per cent of rolling three-year periods bonds outperformed stocks.

There are lots of ways to get exposure to EM debt, which can include both sovereign and corporate bonds, he said.

"If you're more concerned about the asset class, if you think this is something that maybe is a little bit too risky in your fixed income portfolio, you actually want to gravitate towards the corporate market."

EM corporates is a higher quality market, and over nine years of running an EM corporate debt business, Muaddi highlighted, his worst return has been minus 54 basis points.

"Let's say for those of you less risk-tolerant, do some work on the corporate market. For those of you more risk-tolerant, either a blended approach or a sovereign portfolio would be the best way to implement."

Tarek Eldin,

head of research

Geode Capital Management

De-mystifying machine learning tools

In the last few years, machine learning has hit mainstream finance and is now growing quickly, enabled by technology that can support machine learning models, said Tarek Eldin, head of research at Geode Capital Management.

"Our oldest machine learning models are just about 12-years-old. And, back then, it could take weeks to [train one], and now the same problem can be done within hours using Python tools and [graphics processing unit] servers on the cloud. So there are massive differences, massive advances, and that made all this much more workable."

The most common methodologies associated with machine learning are decision trees/random forests, and neural networks.

Using random forests involves building multiple decision trees. "You do that by, basically, randomly drawing from your data set. You randomly draw observations and features, so every tree looks a little bit different. Then you aggregate across trees and you get something that's a lot more robust – less outlier-prone than an individual tree would be," Eldin said.

A random forest allows investors to get a lot more flavour and granularity out of data compared to traditional linear models, and thus see things that they wouldn't have otherwise been able to, he added.

Another method that is getting more popular is neural networks, which look at the connections between inputs and outputs to identify patterns, which can be simple or more complex. The relationship between inputs and outputs is based on several layers of neurons. "As the network learns, something has happened within these neurons; but, a lot of action really happens in the connections between neurons, so that's why people often liken this to the human brain. It's really . . . about the connections."

Neural networks are actually easy to set up in code, Eldin noted. "It has become so simple that everybody's playing around with it. And that, in a way, is also its downside. Anybody – any high school kid – can run a neural network. They may or may not understand what they're doing or what the output is, but it's become really, really simple to run these."

There is a tendency for people without traditional statistics training to throw data at the machine and hope for the best, which can be problematic, he said, noting this can happen with junior analysts who know a lot coming out of school, but have a tendency to trust the machine a bit too much.

It's important to consider not only the tools that are used, but how they're used, he added.

"If you put this into the wrong hands and people get too confident about what's happening within those models, without truly understanding them, there's a certain danger in that, as we can all imagine."

For asset owners looking to select machine learning strategies, it's important to look for people with experience in bad times, Eldin said, noting pain helps with learning.

It's also important to look for those who understand the bets they're taking. "Don't just say, 'Well, it's a black box – it doesn't really matter what it's betting on – it gets it right.' You really want the analytics to go with it – the analytics to tell you what exactly is the bet structure. How does that relate to the factors you know? And what are the risks you're taking?"

Erik Swords,

director, senior research analyst

Mellon Investments

Harnessing the opportunity of blockchain

While there may be lots of hype about cryptocurrency, an exciting area to focus on is the technology that underlies it: blockchain.

Blockchain is far broader than cryptocurrency alone, with many potential use cases, said Erik Swords, director and senior research analyst at Mellon Investments.

"There is a huge distinction to be made between anything to do with cryptocurrencies and crypto-assets in comparison to what enterprise blockchain actually represents," he said.

Blockchain is essentially just putting together blocks of data that are cryptographically linked, Swords explained, noting it will bring along efficiencies in speed and increase trust.

One example of a blockchain use case is enhancing supply chain traceability. Swords pointed to the romaine lettuce recall in 2018, one result of an e-coli outbreak.

This ended up shutting down the industry, costing roughly US$200 million – and it took six to eight weeks to trace the bad source of lettuce, he added.

When using blockchain, companies were able to reduce the time to trace that bad lettuce in tests down to 2.2 seconds. "If you think about the implications that that has on one specific use case, it's magnificent in terms of where this can be utilized as far as any supply chain is concerned."

A further area that blockchain can assist with is environmental, social and governance considerations. "If you think about what this technology is opening the doors to, you have better transparency, better traceability, more security around transactions, et cetera. In the end, one of the biggest constituents in the entire world that is embracing this technology, and contrary to what's actually happening on the cryptocurrency side of things, are governments."

He cited, as an example, that JP Morgan is using blockchain to document transactions for institutional clients. This can be a useful tool for regulators who are looking into potential issues. "From an ESG perspective, there are no other technologies that exist in the world today that are as important as this as an enabling tool to allow some of the components of ESG to take place in a meaningful way."

When looking at blockchain, investors shouldn't focus on the technology itself, but rather the companies that can benefit from these technologies and why, he added.

And the opportunity is huge. Estimates are that enterprise blockchain represents a US$3.1-trillion market opportunity in terms of value creation, Swords said, noting the World Economic Forum has put out some numbers suggesting that 10 per cent of global GDP will be on blockchain by 2025.

Colin Purdie,

chief investment officer, credit

Aviva Investors

Using artificial intelligence to enhance ESG integration

Incorporating artificial intelligence into the investment process can bring significant benefits, particularly when it comes to incorporating environmental, social and governance factors, said Colin Purdie, chief investment officer for credit at Aviva Investors.

Integrating ESG isn't easy to do because there is little standardization when it comes to data. "How one company interprets and assesses an ESG metric can be very different than how another one does," he said. "And it means that the results are not always consistent."

Companies also have a lot of leeway when it comes to what data they disclose and there can be issues with data integrity, he added, noting there can also be issues with stale data.

Artificial intelligence can help build out ESG scores by using data that is available.

This can be as simple as finding data points that are available in financial reports, but can also be done in more innovative ways, like capturing data using satellites, Purdie said.

There are also challenges using ESG data, compared to typical financial data.

This is because multiple years of data sets are not available, as the disclosure of widespread ESG metrics is a fairly new development. As well, the relationships between various factors are continually changing; and, in the ESG space, a lot of data comes from social media, where information is expanding at a quick pace and needs to be captured and understood. "And that's where things like machine learning come in."

Machine learning can allow investors to capture information that would not be possible for humans to do on their own

without a big data engine. "Now, obviously, there's a huge amount of information that's relevant for investors, from traditional company accounts through to those relatively new areas such as social media, which from an ESG perspective, are extremely important. But the point is, wherever it comes from, there is an awful lot of it and you need your engine to know what is relevant for you, what is relevant for your portfolios and what is not."

He points to the example of Volkswagen and the emissions scandal. If an investor was tracking social media with the right AI in place, it could have picked up on the issue early on and positioned its portfolios accordingly, he said.

"Think of the value that that could add to your ESG processes: it is absolutely huge," he said, adding that the possibilities are endless.

Robert Nelson,

vice-president, portfolio manager and research analyst, emerging market debt team

Franklin Templeton Investments

The case for emerging market corporate debt

Many newcomers to the asset class, perhaps including Canadian pension plans, assume that emerging market corporate debt is too volatile, risky or niche, or that it has high defaults.

Yet, these are misconceptions, said Robert Nelson, vice-president, portfolio manager and research analyst of the EM debt team at Franklin Templeton Investments.

EM corporate debt is a growing and deepening asset class, he said, noting it possesses underappreciated quality and offers an attractive risk and return opportunity for investors. These attributes mean that it can now be considered a viable stand-alone asset class.

Since the global financial crisis, the asset class has grown from about US$400 billion to US$1.5 trillion, which is roughly the same size as U.S. high yield and European high yield combined. It is now too large to ignore, he said.

There has also been diversification by sector and by country, he added, highlighting that the market in China is growing drastically.

"Chinese companies are issuing dollar debt for a variety of reasons. You can think about the infrastructure spending, offshore,

'one-belt, one-road'-type schemes," Nelson said. "Chinese companies have also been issuing debt to repatriate funding back to China to make up for tighter liquidity conditions in China as well."

No two emerging markets are the same and China is particularly unique, he added. "It really does need to be looked at very carefully. And in fact it requires investors, I think, to alter and update their investment processes."

Tackling this area effectively requires on-the-ground expertise to sift through the noise and find opportunities, he noted.

As well, the idea that ESG is a non-starter in the emerging market corporate world is false, he added, highlighting that, in fact, the opposite is true.

ESG can be used as a negative screening tool and can also be a source of alpha by discussing governance and disclosure issues with companies' management teams. "There's a real opportunity to enhance disclosure, build confidence in a credit and, ultimately, tighten spreads and reduce the cost of capital, which is good for the issuer and the investor alike."

Emerging market corporates are also surprisingly high quality, with an average

rating of BBB compared to the sovereign index at BB-plus, he said. "It's a real mistake to think of EM corporates as being EM sovereigns, plus a load more risk at top. That's simply not the case."

Furthermore, historic default rates have been broadly similar to the developed market world. This is the case for the recoveries world as well. "When it comes to recoveries . . . bond covenants tend to be stronger in the emerging world than the developed world; which, again, surprises some people."

There are also lots of examples of corporates that are able to differentiate themselves from the countries in which they operate, he added.

When it comes to the return potential of the asset class, there is evidence suggesting that investors are better compensated for underlying quality and volatility than in the developed world, he said, noting that, in addition to higher yields, a lower duration also adds the allure.

Overall, there's a strong case for emerging market corporate debt. "It has underappreciated quality, both from a ratings point of view and a fundamental point of view. And there's a pretty clear risk-return argument as well."

Jay Ritter,

the Joseph Cordell Eminent Scholar,
department of finance

University of Florida

The changing nature of the U.S. listed market

A topic that has received a lot of attention recently in many markets, especially the United States, is the fall in the number of listed companies, said Jay Ritter, the Joseph Cordell Eminent Scholar in the finance department at the University of Florida.

Yet, despite a fall in the number of companies listed, the total market capitalization has increased. "The average listed company has gotten bigger in terms of market cap and U.S. market cap is still about half of the world total, even though now only about 10 per cent of the listed companies in the world are U.S. companies," Ritter said. "Another way of framing that is the average U.S. company is worth 10 times as much as the average listed company elsewhere in the world."

The drop in U.S. listings since its peak 20 years ago has been, in part, due to a lower number of initial public offerings, Ritter said, and also due to an increased rate of acquisitions and mergers.

Although quantitatively less important, there have also been some companies that have gone private, he said. And, there have been changes in regulation in the U.S. and in technology, which are impacting IPO volume.

Yet, in Ritter's opinion, the main factor at play is the mergers. There may be two related businesses that can combine to lower their costs or enhance their revenue, increasing economies of scope. "In many industries, there's an increasing importance of speed and getting big fast is more important than it used to be."

Technology and globalization have made it more difficult for smaller companies to compete against bigger companies, and in many industries on average, smaller company profitability has declined, Ritter said.

Increasingly, companies are also getting acquired before they go public.

"And that's the main reason that I think, in a lot of industries, especially the tech industry, there aren't as many small company IPOs as there used to be; that the successful venture-capital backed companies — instead of going public — instead, they're selling out to a big tech company."

Most successful venture-backed companies sell out, Ritter said, and even those that go public are more likely to grow by making acquisitions, than growing organically.

"Now this lack of public companies — the drop in IPO activity — would bother me if I thought that this reflected problems with the IPO market. But there are a couple of reasons why I'm not too concerned about this."

This includes the reason that returns earned by limited partners on venture capital have not been extremely high. "If their returns were really high, that would lead me to believe that there was a shortage of venture capital — that a lot of start-ups were having difficulty raising money."

Overall, this decline in IPO activity in the developed market is not a bad thing, Ritter said. "Rather than having lots of independent companies, we've got fewer bigger companies. And, I don't necessarily think this is a bad thing. It could be bad. It could be too extreme, but given that, historically, the small companies have underperformed — the fact that a lot of them are selling out, rather than going public and then producing low returns for investors — doesn't lead me to think that public market investors are losing out on things."

Brian Mock,

managing director, direct investments

Russell Investments

A solution to the forgotten costs that erode hard-earned performance

Implementing a multi-manager investment program can come with challenges, but an innovative approach now exists that can help plan sponsors manage their plans more efficiently by centralizing implementation, said Brian Mock, managing director for direct investments at Russell Investments.

A manager can trade securities within one fund or account, but when there are multiple accounts and multiple managers, this becomes less efficient, he noted. "If you're the pension plan executive, you're sort of like the coach, and these are all your players. But your players aren't allowed to play together because they operate completely independent of the other managers in the same plan."

But there is an approach where managers can focus on picking the right investments and building a good portfolio, but then hand over the implementation to another implementation manager that can aggregate those separate accounts. "And basically, by doing that and trading less frequently than the managers would trade, you're able to create some efficiencies."

This is accomplished in an enhanced portfolio implementation model, where managers provide model portfolios on a frequent basis to the implementation manager and the portfolio is typically rebalanced on a weekly basis. "And by trading on a weekly basis, that provides the opportunity for some of those buys and sells to net out."

A main benefit of this type of approach is lower costs, Mock noted, because there will be fewer custody accounts and fewer transaction costs on manager trades. "You're actually being mindful of those costs. And why not just hold one position in Microsoft as opposed to having seven, or six, or however many positions that all your managers have in Microsoft? Hold one net position. That's a benefit."

The reduced trading also means lower turnover. "That's actual savings as a tailwind back to the plan itself. You're controlling your commissions," Mock said.

As well, each time there's a trade, there is a bid-ask spread in the market. "To the extent that you reduce turnover, you're actually not paying the bid-ask spreads as often as your managers were."

This approach can also help consolidate the foreign exchange element in trading by netting out all activity in one transaction,

instead of having all managers trade their currencies independently.

Another consideration is that this can also lead to tax efficiency, because lower turnover leads to fewer capital gains, he added.

In addition to cost considerations, this also provides the ability to better control the portfolio: for example, when it comes to making manager changes. This is because the managers would just be providing a model portfolio, so no money actually needs to be moved from one manager to the other, Mock explained.

Having a single platform can also increase transparency, as data from all the managers is available in one place.

"The bottom line is that asset management is under a tremendous amount of pressure to reduce costs, and the risks of not addressing these implementation costs are, really, far too great to ignore," he said. "And I believe that this innovative [enhanced portfolio implementation] approach not only helps you manage those costs, but it provides you with better tools and better transparency, so that you can make better decisions and, hopefully, deliver better outcomes for your end clients."

Ian McWilliam,
investment manager,
investment innovation department

Aberdeen Standard Investments

The how-to of implementing AI in an investment organization

When implementing artificial intelligence in an investment organization, it's important to structure teams properly, have the right software and hardware in place, and beware of common pitfalls, said Ian McWilliam, investment manager in the investment innovation department at Aberdeen Standard Investments.

For companies that want to implement AI, there are often teams for data sourcing, databases and research, and there's a portfolio management team that looks at the research, picks the strategies they like and uses them to build funds and strategies, McWilliam noted.

When it comes to the skill sets of people on those teams, the investment industry is not yet at the point where it can hire data scientists who don't have financial knowledge, he added. "This domain expertise question is still really, really important because you generally can't just bring someone in who has the data science expertise and set them off. They need to also have the domain expertise."

There are also numerous different types of software and hardware that a company can implement to execute AI.

When deciding about software, it's important to look for a provider that is stable because systems and processes can be jeopardized if the provider goes out of business or discontinues its software. It's also important to have a holistic view of the company's approach to software. "A general approach will often be that, as a company, you will have a standard software that you use. You might say to your analysts, go ahead use 'R,' use whatever you want, but you need to be able to translate that into our code so that we actually have a standard setup. And that's really important as well, to make sure that we have continual support."

There are also considerations when choosing hardware and whether a company should use cloud computing or internal infrastructure. "And cloud computing is obviously very fashionable and I think is probably the area that most people would think to go to first, but there are also trade-offs."

Cloud computing allows companies to pay for what they use, it's easy to expand and there is no long-term commitment. "However, generally, once you start to get into tasks that you're doing very regularly, it begins to become too expensive and it starts to become more efficient to just have internal [hardware]," McWilliam noted.

It's also important to consider algorithm uncertainty, he said. "Just as an example of where we're using algorithm uncertainty is, we'll generally look and say, 'So this could be the prediction of two different models or the same model at different points in time.' And we'll use this in order to scale our positions, in order to essentially take more market risk when our model is more certain and less market risk when it's not."

There have been real advantages to incorporating uncertainty, McWilliam added. "It's actually been, we find, a very important tool in communicating with other people. People, I think, generally find it a lot more intuitive to talk about our predictions with uncertainty than just in general."

Melissa Haskell,

director of fixed income research - North America

MFS Investment Management

Incorporating ESG data into the fixed income investment process

Fixed income yields have fallen over the last 15 years and investors are expected to take on additional risk to deliver the same returns, which makes it especially important to integrate and understand environmental, social and governance risks, said Melissa Haskell, director of fixed income research for North America at MFS Investment Management.

There are various global megatrends that are impacting investment portfolios, she noted.

Firstly, there's a shift in global economic power, with emerging market economies representing a greater percentage of global gross domestic product. There are also demographic shifts as people age. And, there is an acceleration of urbanization. Other megatrends include the rise of technology and climate change, Haskell added.

There can be challenges to integrating ESG into portfolios, as the right data is hard to come by, she noted. "It's important to

the analysis. And while over time the ESG data that is available has increased, it still requires that analysts, as they're looking at credits, do deep and independent research to find data sources that relate to the analysis process and identify those risks and potentially opportunities."

There are some segments of the market that are more developed in providing ESG data than others, with corporate bonds being an example. "However, even with the amount of data that's available for corporates . . . analysts still need to do a deep dive and independent research to make sure that they are fully assessing all the risks and opportunities around ESG factors in their investing."

As well, areas like sovereign bonds still require a lot of independent research, she added.

There is a trend for investors seeking more reporting about ESG integration in

their portfolios, which is likely to continue. "I think that, again, investors are going to push for this and it's going to become compulsory, and we are looking for ways to capture that, integrate it and measure it in our portfolios."

There are providers that give ESG ratings, but analysts don't always agree with these ratings, Haskell highlighted, providing a few case studies of companies that may be rated one way on ESG but the rating isn't necessary reflective of the real ESG risks, in her opinion.

When looking at credit, it is important to consider what risk is material to the credit, what the time frame is for when the credit will be impacted and how this compares to bonds being held in the portfolio. "I think time and materiality are also important concepts in fixed income, unlike our equity colleagues, who may be looking at holding a credit for a much longer time frame."

William Honce,

head of business development,
Quebec and Eastern Canada

Randall Malcolm,

senior managing director and portfolio manager,
Canadian public fixed income

SLC Management

A do-it-yourself Canadian corporate bond portfolio

Corporate bonds are an important asset class for pension plans, but there are shortcomings in the Canadian market, particularly when it comes to long-duration corporate bonds, said William Honce, head of business development for Quebec and Eastern Canada at SLC Management.

According to BlackRock's 2019 Global Institutional Survey, with data as of December 2018, 42 per cent of global pension plans intend to increase their allocation to long-duration fixed income over the next year.

In addition, there has been a steady increase in corporate bond usage among pension plans. Over the past five years alone, the average allocation to fixed income among the top 200 defined benefit pension plans around the world has risen by more than 10 per cent, according to a *Pensions & Investments* top 1000 largest plan sponsor survey, with data as of September 30, 2018.

Yet, there are going to be numerous challenges to executing these strategies in a Canadian market, Honce noted. "The first challenge is a simple one: it's a supply and demand challenge. The Canadian market is a relatively small market."

Another challenge is that the Canadian market is extremely concentrated, he added, and there is also a lack of diversification that is quite prominent in the long-duration segment.

For example, in Canada, there is essentially no technology exposure in the long-end, said Randall Malcolm, a senior managing director and portfolio manager for Canadian public fixed income at SLC Management.

These issues, coupled with the fact that investors around the world are looking to increase allocation to corporate bonds and long-term bonds, might make it difficult for Canadian investors to only invest in Canada, Honce said.

A possible solution is to look outside of Canada. "It's basically a pretty simple idea," Honce said. "It's the ability to tactically go and get some carefully selected foreign credit and apply hedging strategies to them to effectively transform them back into a Canadian equivalent of themselves."

The U.S. market is a lot deeper than the Canadian market. "We look at the U.S. population, [and] it's about nine times the size of Canada," Malcolm said. "You look at the [gross domestic product], it's about 12 times the size. If you look at their long corporate market, it's about 18 times the

size of Canada. So, relative to the economy in the U.S., the long corporate bond market is significantly larger and that winds up giving you a significant amount of choice."

There are many ways to convert U.S. corporate bonds back to Canadian dollars, he noted. "If we're hedging back something short, something that might be pre-payable, we might just use a currency forward. And there are investors out there that will use currency forwards out to 30 years. [A] currency forward is great to cover your currency exposure, but what it really misses is getting that yield curve back into Canadian terms. So we tend to use a cash-flow swap, which is more of a total return swap."

This allows the investor to take a view on both the spread and the swap, Malcolm noted. "The benefit here is not really to take the U.S. index and throw a swap on. It's to take the best of the best out of the index out of the U.S. and swap that back."

Overall, it's a tough market to invest in, and pension plans can use this kind of strategy to maintain most of their liability hedging properties but at the same time improve diversification, and potentially find "nuggets of enhanced performance," Honce said.

Finding opportunity at the intersection of innovation and sustainability

There are some major disruptions and challenges facing humanity. But, where there are challenges, there can also be opportunities.

One example of a disruptive trend is aging, with people living longer. "That's going to have, I think, pretty big implications for pension plans because we're going to have to keep paying those benefits even more and more," said James Davis, chief investment officer of the OPSEU Pension Trust. "And on top of that, as you get older and if you think you're going to live longer, you're going to save more, and if you're going to save more that's going to push down interest rates, and that in turn weighs on returns of a pension plan and it weighs on the value of the liabilities."

Yet, opportunities can be found to invest in the technologies that are allowing people to live longer, which can be like a hedge against aging, Davis said. "It's like why we own bonds to hedge the interest rate sensitivity of our liabilities. We can also look at biotechnology as a way to potentially hedge longevity."

This is just one example of an opportunity at the intersection of sustainability and innovation.

"[Technology is] going to impact what we invest in, but it's also going to impact how we invest," said Davis, noting it's probably more important not to lose money than it is to make money; therefore, investors can try avoiding those companies that are going to be disrupted as a result of the new technology. "That's one of the things that we've certainty brought into our overall investment risk-conscious mindset within the organization."

Private equity is one example of an asset class that is ripe for disruption by technology. "The one thing I've learned about technology is it disrupts intermediaries, and I think that that's going to inevitably happen in the private equity space. And you may see platforms that are set up that will, because of the blockchain technology, facilitate the direct investing, or fractional investing, by investors that don't have that direct access, or don't have deal teams and so forth," he said.

As such, smaller investors won't

necessarily need to have those deep relationships that are currently required to get access to deals.

Technology can also potentially allow for tokenization of assets, he added. "I think there's also tokenization that can happen in corporations as well, where the balance sheet will be broken down into much finer elements and you won't necessarily just think of things as subordinated debt or senior debt, or preferred equity or common equity. You will actually be buying tokens, which are linked to specific income streams of specific assets within a particular company. I can easily see that be something that happens in the future too. So it's going to be a really interesting space to watch."

Overall, Davis is optimistic that solutions will be found to the world's big challenges. "I believe great investment opportunities are going to be found at that intersection of technology, innovation and capitalism. As they all come together to solve these problems, there are going to be great investment opportunities."

2019 Investment Innovation Conference photos

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