ONE JIB

New Products Committee

Agenda

Date:	October 1, 2024, 1:00 p.m.
Location:	AMO Office 155 University Avenue - Suite 800, Toronto, ON M5H 3B7

REPORT

To: New Products Committee
From: Keith Taylor, Chief Investment Officer, ONE Investment
Date: October 1, 2024
Re: Model Portfolios and Allocation Process
Report: New Products Committee 2024-003

1. RECOMMENDATIONS

It is recommended that ONE JIB:

1. Rescind the Outcomes Framework Policy.

2. Approve the model portfolios comprised of PH&N Institutional funds to be used under the OCIO model as per Table 1:

Table 1 - OCIO Model Portfolios

Model Name	Fixed Income	Equity	Real Estate & Infrastructure	Model
Short Term / 0% Equity	100%	-	-	A
Short Term / 20% Equity	80%	20%	-	B
Mid Term / 30% Equity	70%	30%	-	C
Mid Term / 40% Equity	60%	40%	-	D
Mid Term / 40% Equity Plus	50%	40%	10%	D+
Mid Term / 50% Equity	50%	50%	-	E
Mid Term / 50% Equity Plus	40%	50%	10%	E+
Long Term / 60% Equity	40%	60%		F
Long Term / 60% Equity Plus	30%	60%	10%	F+
Long Term / 70% Equity	30%	70%	-	G
Long Term / 70% Equity Plus	20%	70%	10%	G+

2. SUMMARY

At its April 22, 2024, special meeting, ONE JIB directed that ONE Investment work with Philips, Hager & North (PH&N) Institutional, ONE's OCIO partner (and herein also referred to as "OCIO"), to develop model portfolios suitable for most municipalities and individually tailored solutions where appropriate, each comprised of allocations to PH&N Isntitutional funds, to meet the investment needs of Participating Municipalities investing under the OCIO model, and report back to the New Products Committee.

PH&N Institutional would make use of several model portfolios, built with various allocations to any of the eligible investment funds available under the OCIO model, to guide the investment allocations of Participating Municipalities. This report provides an overview of the proposed model portfolios that have been designed and may be used to implement the ONE JIB approved Investment Plans of the Participating Municipalities.

This report is recommending ONE JIB approval of model portfolios that would be used in client investment allocations as detailed in the attachment to this report. The allocations used in the models were guided by an optimization process conducted by PH&N Institutional, and it is intended that PH&N Institutional and ONE JIB would jointly review the model portfolios at least annually. This optimization process would only use the eligible investment funds identified in the Investment Management Agreement (IMA).

3. BACKGROUND

The OCIO model will use a new set of investment funds and allocations to build investment allocations of Participating Municipalities

The OCIO model will use any of the eligible investment funds provided by PH&N Institutional to construct portfolios for Participating Municipalities. As directed by ONE JIB, model portfolios have been constructed by PH&N Institutional that could be used to address the investment needs of most Participating Municipalities investing under the OCIO model.

Existing ONE Investment Pooled Funds will not be used under the OCIO model, and new asset allocation analysis has been conducted to support the construction of the model portfolios introduced in this report. Over 30 eligible investment funds are currently available for use which will allow the OCIO model to provide a wider range of investment exposures than are currently available under the Prudent Investment Offering.

Analysis of municipal reserves will continue to be a key input that influences client allocations under the OCIO model, along with other relevant factors

The OCIO model uses a different set of funds than currently used by Participating Municipalities, and it is contemplated that under the OCIO model, the Outcomes Framework could be used differently. Instead of direct mapping of reserves to allocations, as has traditionally been done under the Outcomes Framework, an understanding of reserves would inform allocation decisions in concert with other relevant factors. The expected cashflows affecting municipal reserves will continue to be a key item that influences the allocation process, and other factors can also be considered in the evaluation of Participating Municipality circumstances, including forecasting uncertainty, risk tolerances, the need for liquidity, expected returns, inflation expectations, and other macroeconomic or capital market factors. Other methods of communicating reserve details to ONE JIB could also be used, such as the short, medium, and long reserve groupings used in Durham's ONE JIB approved Investment Plan.

As directed by ONE JIB, PH&N Institutional has created a set of model portfolios for the OCIO model that are appropriate for the needs of most Participating Municipalities

A set of model portfolios has been developed by PH&N Institutional that is designed to be appropriate for a wide range of Participating Municipalities needs. The modelling, which includes eleven different allocations, each with unique risk and return attributes, has been included in Attachment 1 to this report. Pages eight throught 10 of the attachment provide provide more detailed information about the models.

More detail on the decision history related to this report is available in the following link:

Link 1: New Products Committee Report (2024-01) March 18, 2024

4. ANALYSIS

Client risk tolerances are relevant when assigning investment allocations.

To provide more consistent evaluations, client risk tolerances will be assessed by the CIO and OCIO instead of client self-evaluations. While the Municipal Client Questionnaire (MCQ) has always included questions that attempt to evaluate the risk profile of the municipality, the answers provided to these questions have typically been of limited value in understanding municipal circumstances. Asking a treasurer how much risk should be associated with MNRI will almost always result in an answer of “low’ or ‘moderate’ risk. If all treasurers are answering the question the same way, then their answers make it difficult to differentiate the risk appetite of each municipality.

The most recent version of the MCQ approved by ONE JIB on September 4, 2024, no longer solicits the treasurer’s evaluation of the municipality’s risk tolerance. The risk tolerance will instead be assessed by the CIO and PH&N Institutional based on their understanding of municipal circumstances, investment horizon, and feedback from municipal staff.

Analysis of client cashflow helps describe the investment horizon, which informs investment allocations

Understanding when the MNRI invested will be needed is one of the most important factors to consider when assigning investment allocations. ONE Investment’s expertise in municipal finance allows staff to interpret the reserve details and use them to inform investment allocations, regardless of the format of how the reserves are presented or organized. This also provides insight relevant to the risk profile of the municipality.

The Outcomes Framework maps municipal reserve forecasts directly into multiple outcome accounts, but under the OCIO model it may be more practical to have a single consolidated account for each municipality

Participating Municipalities' MNRI is currently evaluated using the Outcomes Framework, with reserves being grouped by outcome and each investment outcome invested in a unique account. Participating Municipalities typically have multiple investment accounts that correspond to the mapping of municipal reserves. This direct mapping might not be used under the OCIO model.

An understanding of the reserve forecasts and anticipated drawdowns of MNRI is clearly very important when determining how to invest the MNRI, but the mapping of the Participating Municipality's individual investment accounts does not need to conform to the same groupings of municipal reserves. All investments could be held in a single account rather than being held in multiple outcome accounts. Using a single consolidated account to hold all investments would create operational efficiencies and simplify reporting. Unless there is a structural reason to segregate MNRI into separate accounts, each Participating Municipality's MNRI could be managed based on a single consolidated account.

Under the OCIO model municipalities may wish to continue using the Outcomes Framework to describe circumstances

Under the Outcomes Framework, investment allocations are directly linked to reserves and cashflow forecasts. This provides an understanding of when monies will be required, which is the starting point for any understanding of how the MNRI should be invested. As appropriate, the Outcome Framework could continue to be used to help communicate municipal circumstances in a way that informs allocation decisions, but it should not continue as policy for ONE JIB on allocation decisions.

Other ways of organizing municipal reserves could be used, such as the short, medium, and long-term mapping of reserves, as was used with Durham's ONE JIB approved Investment Plan.

PH&N Institutional has developed a set of model portfolios designed to address a wide range of client needs while retaining flexibility in how it could be implemented

PH&N Institutional has created a set of model portfolios that should address a wide range of needs for Participating Municipalities. This includes eleven separate models, each with unique risk-return attributes. The lowest-risk model has a 100% allocation to fixed income. The model portfolio with the highest risk profile has only a 20% allocation to fixed income.

Some of the models presented have allocations to alternative investments, which may not be suitable for all Participating Municipalities. Allocations to alternative investments are only available in models where fixed income allocations are less than 50% of investments. As alternative investments may not be appropriate for all Participating Municipalities, they may only be used for Participating Municipalities that have elected to use them and have documented this choice in a council approved IPS.

The PH&N Institutional may need to make selection choices when implementing client allocations

Currently, ONE JIB's external portfolio managers select securities based on guidance provided by ONE JIB, as detailed in an Investment Management Agreement (IMA). Likewise, the OCIO may need to select funds to fulfill allocations detailed in ONE JIB approved Investment Plans. This may involve substituting funds to address specific client requests/needs or in certain cases, operational constraints may require funds to be substituted by the OCIO when allocations are implemented.

When the first Participating Municipality's MNRI was deployed into the OCIO model, the implementation required the use of substitute funds and included a temporary allocation to Treasuries, neither of which was anticipated in Durham's Investment Plan. These adjustments were required to facilitate an efficient implementation of the MNRI. The OCIO may need to make similar adjustments with ONE JIB approved Investment Plans of other Participating Municipaliteis in the future that will be monitored by ONE JIB's Chair and Vice Chair and reported to ONE JIB through the Investment Plan Implementation report.

For allocations that include access to alternative investments, liquidity and costs become more important considerations

Alternative investment funds are available under the OCIO model that provide liquidity on a quarterly basis, but as the underlying investments may not be fully liquid, there are circumstances where redemptions in these funds may be curtailed. This can create problems if municipalities need to make a drawdown. Furthermore, one of the alternative investment funds included in the model portfolios has penalties for shorter-term redemptions and drawdowns within the first five years, which would involve additional fees.

If the MNRI of a Participating Municipality is stable over time and there is no expected need for drawdowns over the short to intermediate term, then models that include alternative investments are appropriate. If the MNRI is not 'sticky' and drawdowns are expected or balances invested in the allocations are revised frequently, then investing in allocations with alternative investments could be problematic. Because of these issues, Participating Municipalities will need to make an election in the council approved IPS that explicitly allows the use of alternative investments before they could be used. Even with this election, the ONE JIB approved Investment Plans may not necessarily include alternative investments if they are deemed inappropriate considering the municipal circumstances.

5. CONCLUSION

A set of model portfolios has been developed by PH&N Institutional that is designed to be appropriate for a wide range of Participating Municipalities needs under the OCIO model. These model portfolios were built with the eligible investment funds available under the offering based on a portfolio optimization process that evaluates both risk and return characteristics. Eleven models have been designed to provide great flexibility, with each providing different levels of risk. Fixed income allocations in these models range from 100% of investments down to only 20%, which should address the investment needs of most Participating Municipalities investing in the OCIO Offering. Tailored models would also be available as needed.

The evaluation of municipal reserves remains a key factor that informs how the investment allocations of Participating Municipalities are determined with time horizons of reserves and the characteristics of the reserve providing relevant contex. The process will continue to use municipal reserves and associated cashflows as a starting point in the analysis, with other factors that are relevant to determining investment allocations also being considered.

ATTACHMENTS

Attachment 1: OCIO Portfolios Modeling & Analysis

Drafted by: Keith Taylor, Chief Investment Officer
Approved by: Judy Dezell and Donna Herridge - Co-Presidents/CEO

RBC Global Asset Management
PH&N Institutional

Attachment 1

ONE Investment

Portfolio Modeling

Presented by

Martin Leclair, CFA, Vice President & Portfolio Manager
Paul Purcell, CFA, Managing Director & Portfolio Manager
Dylan Rae, CFA, Portfolio Manager
Ivor Krol, Vice President, Portfolio Manager and Team Lead (Institutional Portfolio Solutions Group)

October 2024

OCIO - Who does what?

Spanning policy, investments, operations and reporting

		ONE JIB	PH&N Institutional
Strategy	**Overall Program Governance**	✓	Ongoing Support
Strategy	**Investment Policy** • Define investment objectives • Establish strategic asset mix policy	✓	Strategic Advice
Operational Services	**Implementation** • Portfolio construction • Rebalancing and tactical shifts • Cash flow management and trade execution • Risk management • On-going research and innovation	Delegated to PH&N Institutional	✓
Operational Services	**Monitoring** • Total Portfolio Performance & Compliance	Delegated to PH&N Institutional	✓
Operational Services	**Reporting** • Written and in-person reporting of results • Economic and capital market environment • Fiduciary education	Delegated to PH&N Institutional	✓

Model Portfolios

Overview

Objective: to establish model portfolios with varying amounts of risk

Portfolio modeling: Efficient frontier analysis to optimize the trade-off between the portfolio's long-term expected return and short-term downside risk

Inputs:

- Capital market assumptions effective Q2, 2024
- Asset classes corresponding to the approved list of 34 pooled funds

Modelling constraints

The constraints listed on the following slide were used:

- To provide diversification and avoid overly concentrated portfolios
- To provide portfolio liquidity by specifying maximum limits in illiquid assets
- To ensure that the resulting portfolio is reasonable from a practical standpoint
- To reduce sensitivity to the input parameters and assumptions, especially expected returns

The sizing of the constraints:

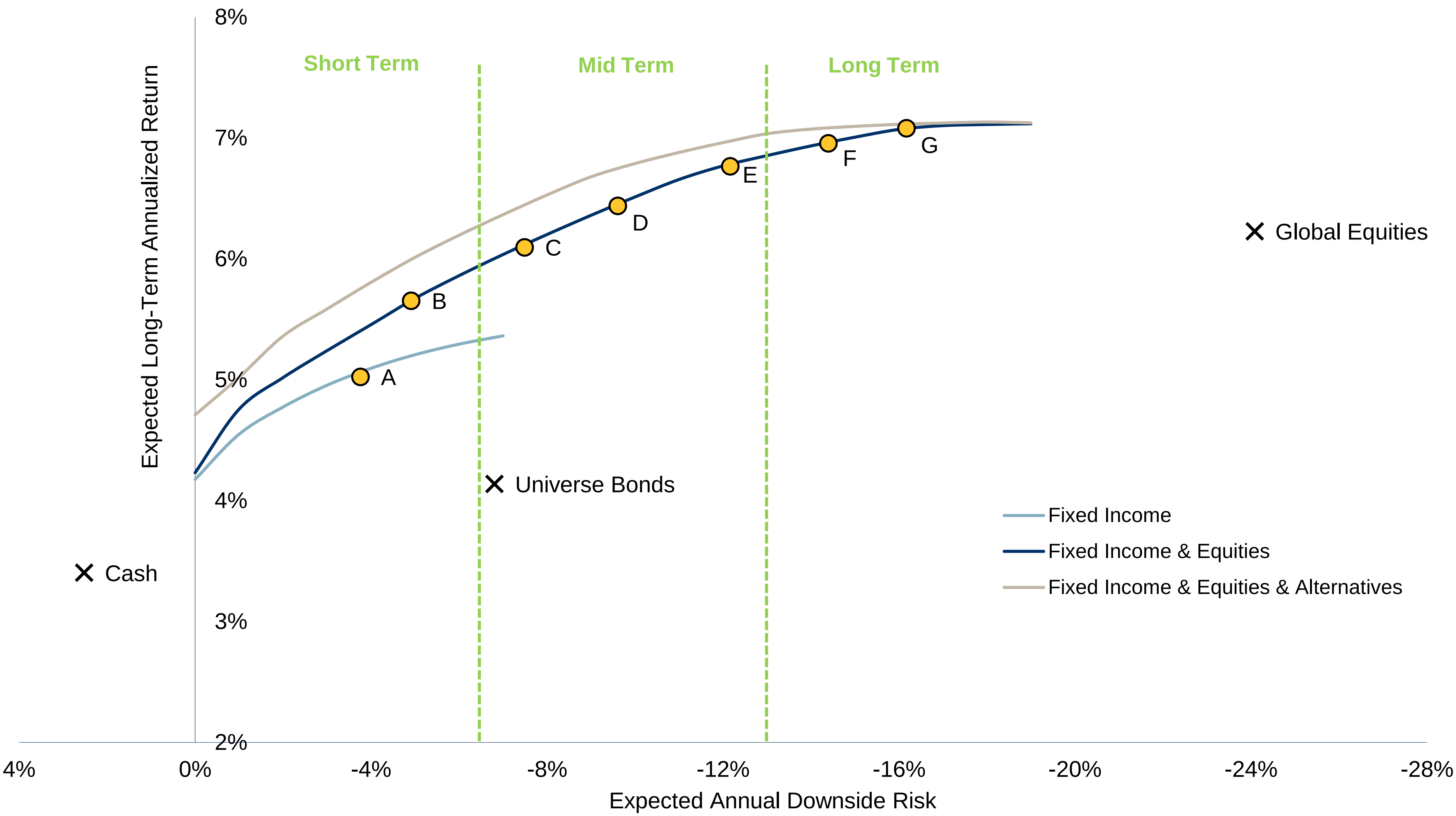
- Depends on beliefs on the level of diversification & liquidity and comfort with various asset classes
- Can be changed on further discussion
- Is based on our experience and intended to produce portfolios for further discussion.
- We provide sensitivity testing on the constraints on slides 11-13

Modelling constraints

- Minimum allocation to core fixed income and money market securities of 20%
- Maximum 25% allocation to any one of money market securities, universe corporate bonds and global sovereign bonds
- Maximum 15% allocation to any one of high yield bonds, emerging market debt, multi-asset global credit
- Maximum 5% allocation to any one of private placement corporate debt and commercial mortgages when 100% fixed income
- Maximum 10% allocation to any one of private placement corporate debt and commercial mortgages when including equities and alternatives
- Maximum 50% allocation to domestic equities (as a % of total equities)
- Maximum 50% allocation to low volatility equities (as a % of traditional equity counterpart)
- Maximum 5% allocation to any one of real estate and infrastructure

Efficient Frontier Analysis

With model portfolios – no allocation to Alternatives



Modeled portfolios – modelled risk & return[1]

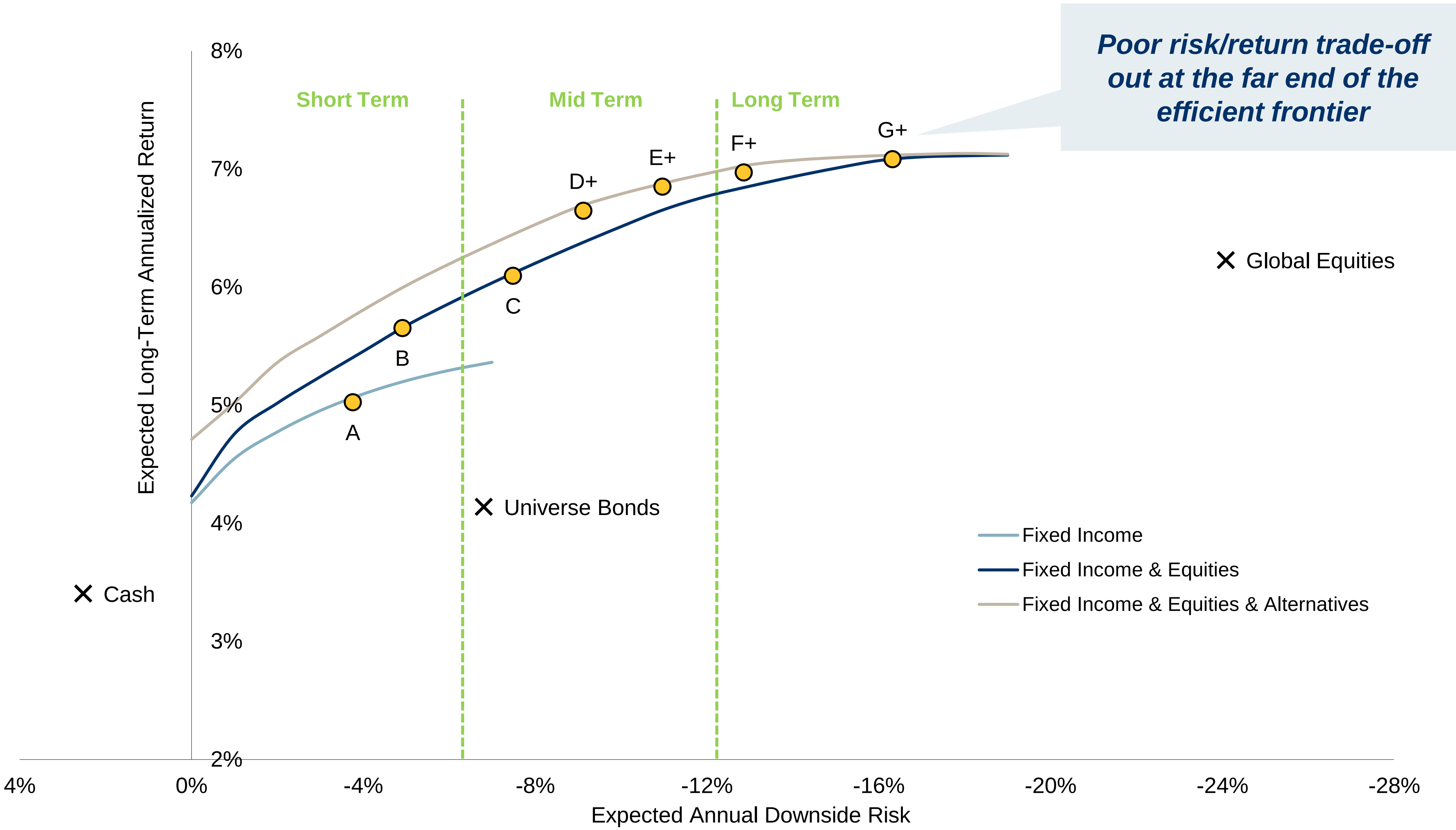
No allocation to Alternatives

Modeled Expectations[1]	A	B	C	D	E	F	G
Long-Term Return	5.0%	5.7%	6.1%	6.4%	6.8%	7.0%	7.1%
Annual Downside Risk[2]	-3.8%	-4.9%	-7.5%	-9.6%	-12.2%	-14.4%	-16.2%
Annual Volatility	3.3%	4.0%	5.2%	6.3%	7.6%	8.9%	10.0%
Sharpe Ratio	0.49	0.57	0.51	0.48	0.44	0.40	0.37
Fixed Income	**100%**	**80%**	**70%**	**60%**	**50%**	**40%**	**30%**
Canadian Money Market	0%	0%	0%	0%	0%	0%	0%
Short-Term Bonds and Mortgages	50%	50%	35%	25%	20%	20%	20%
Corporate Bonds	20%	0%	0%	0%	0%	0%	0%
Private Placement Corporate Debt	5%	10%	10%	10%	5%	0%	0%
Commercial Mortgages*	5%	10%	10%	10%	10%	10%	10%
High Yield Bonds	5%	0%	0%	0%	0%	0%	0%
Global Multi-Asset Credit	15%	10%	15%	15%	15%	10%	0%
Equities	**0%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**
Canadian Equities	0%	5%	7%	10%	15%	25%	35%
Canadian Low Volatility Equities	0%	5%	7%	10%	10%	5%	0%
U.S. Equities	0%	2%	4%	5%	5%	6%	7%
U.S. Low Volatility Equities	0%	2%	4%	5%	5%	6%	7%
International Equities	0%	6%	8%	10%	15%	18%	21%
Alternatives	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Canadian Core Real Estate*	0%	0%	0%	0%	0%	0%	0%
Global Infrastructure*	0%	0%	0%	0%	0%	0%	0%

[1] Refer to appendix for modeling assumptions and disclosures.
[2] CVaR95 which represents the expected loss during the worst 5% of return outcomes.
Hypothetical performance analyses are for illustrative purposes only and there is no guarantee that hypothetical returns or projections will be realized

Efficient Frontier Analysis

With model portfolios



Modeled portfolios – modelled risk & return[1]

Detailed allocations and risk/return metrics

Modeled Expectations[1]	A	B	C	D+	E+	F+	G+
Long-Term Return	5.0%	5.7%	6.1%	6.6%	6.9%	7.0%	7.1%
Annual Downside Risk[2]	-3.8%	-4.9%	-7.5%	-9.1%	-11.0%	-12.9%	-16.3%
Annual Volatility	3.3%	4.0%	5.2%	6.3%	7.3%	8.3%	10.3%
Sharpe Ratio	0.49	0.57	0.51	0.52	0.47	0.43	0.36

Fixed Income	**100%**	**80%**	**70%**	**50%**	**40%**	**30%**	**20%**
Canadian Money Market	0%	0%	0%	0%	0%	0%	0%
Short-Term Bonds and Mortgages	50%	50%	35%	20%	20%	20%	20%
Corporate Bonds	20%	0%	0%	0%	0%	0%	0%
Private Placement Corporate Debt	5%	10%	10%	5%	0%	0%	0%
Commercial Mortgages*	5%	10%	10%	10%	10%	10%	0%
High Yield Bonds	5%	0%	0%	0%	0%	0%	0%
Global Multi-Asset Credit	15%	10%	15%	15%	10%	0%	0%
Equities	**0%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**
Canadian Equities	0%	5%	7%	10%	15%	20%	35%
Canadian Low Volatility Equities	0%	5%	7%	10%	10%	10%	0%
U.S. Equities	0%	2%	4%	5%	5%	12%	15%
U.S. Low Volatility Equities	0%	2%	4%	5%	5%	0%	0%
International Equities	0%	6%	8%	10%	15%	18%	20%
Alternatives	**0%**	**0%**	**0%**	**10%**	**10%**	**10%**	**10%**
Canadian Core Real Estate*	0%	0%	0%	5%	5%	5%	5%
Global Infrastructure*	0%	0%	0%	5%	5%	5%	5%

[1] Refer to appendix for modeling assumptions and disclosures.
[2] CVaR95 which represents the expected loss during the worst 5% of return outcomes.
Hypothetical performance analyses are for illustrative purposes only and there is no guarantee that hypothetical returns or projections will be realized

Constraints – sensitivity testing

- The following constraints were tested (~~original~~ / **new**):
  - Maximum ~~10%~~ **/ 20%** allocation to any one of private placement corporate debt and commercial mortgages when including equities and alternatives
  - Maximum ~~50%~~ / **100%** allocation to domestic equities (as a % of total equities)
  - Maximum ~~60%~~ **/ 100%** allocation to U.S. equities (as a % of total foreign equities)
  - Maximum ~~50%~~ **/ 100%** allocation to low volatility equities (as a % of traditional equity counterpart)
  - Maximum ~~5%~~ / **20%** allocation to any one of real estate and infrastructure

- On the following two slides, we compare portfolios with the original constraints to similar portfolios using the new constraints:
  - We have highlighted allocations in the new portfolios that are likely to be considered unreasonable, with concentrated positions in private placements, mortgages, Canadian equities and/or infrastructure.

Constraints – sensitivity testing

Comparison of portfolios (including Alternatives)

Modeled Expectations[1]	D+	D+*	E+	E+*	F+	F+*
Long-Term Return	6.6%	7.3%	6.9%	7.4%	7.0%	7.5%
Annual Downside Risk[2]	-9.1%	-9.0%	-11.0%	-11.1%	-12.9%	-12.8%
Annual Volatility	6.3%	7.3%	7.3%	8.5%	8.3%	9.6%
Sharpe Ratio	0.52	0.53	0.47	0.47	0.43	0.42
Fixed Income	**50%**	**37%**	**40%**	**32%**	**30%**	**25%**
Canadian Money Market	0%	0%	0%	0%	0%	0%
Short-Term Bonds and Mortgages	20%	20%	20%	20%	20%	20%
Corporate Bonds	0%	0%	0%	0%	0%	0%
Private Placement Corporate Debt	5%	0%	0%	0%	0%	0%
Commercial Mortgages*	10%	17%	10%	12%	10%	5%
High Yield Bonds	0%	0%	0%	0%	0%	0%
Global Multi-Asset Credit	15%	0%	10%	0%	0%	0%
Equities	**40%**	**40%**	**50%**	**48%**	**60%**	**55%**
Canadian Equities	10%	40%	15%	48%	20%	55%
Canadian Low Volatility Equities	10%	0%	10%	0%	10%	0%
U.S. Equities	5%	0%	5%	0%	12%	0%
U.S. Low Volatility Equities	5%	0%	5%	0%	0%	0%
International Equities	10%	0%	15%	0%	18%	0%
Alternatives	**10%**	**23%**	**10%**	**20%**	**10%**	**20%**
Canadian Core Real Estate*	5%	3%	5%	0%	5%	0%
Global Infrastructure*	5%	20%	5%	20%	5%	20%

[1] Refer to appendix for modeling assumptions and disclosures.
[2] CVaR95 which represents the expected loss during the worst 5% of return outcomes.
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Constraints – sensitivity testing

Comparison of portfolios (excluding Alternatives)

Modeled Expectations[1]	B	B*	D	D*	F	F*
Long-Term Return	5.7%	6.1%	6.4%	7.0%	7.0%	7.4%
Annual Downside Risk[2]	-4.9%	-5.0%	-9.6%	-10.0%	-14.4%	-15.0%
Annual Volatility	4.0%	4.5%	6.3%	7.3%	8.9%	10.2%
Sharpe Ratio	0.57	0.62	0.48	0.49	0.40	0.39
Fixed Income	**80%**	**71%**	**60%**	**47%**	**40%**	**40%**
Canadian Money Market	0%	0%	0%	0%	0%	0%
Short-Term Bonds and Mortgages	50%	31%	25%	20%	20%	20%
Corporate Bonds	0%	0%	0%	0%	0%	0%
Private Placement Corporate Debt	10%	20%	10%	7%	0%	0%
Commercial Mortgages*	10%	20%	10%	20%	10%	20%
High Yield Bonds	0%	0%	0%	0%	0%	0%
Global Multi-Asset Credit	10%	0%	15%	0%	10%	0%
Equities	**20%**	**29%**	**40%**	**53%**	**60%**	**60%**
Canadian Equities	5%	4%	10%	23%	25%	60%
Canadian Low Volatility Equities	5%	25%	10%	30%	5%	0%
U.S. Equities	2%	0%	5%	0%	6%	0%
U.S. Low Volatility Equities	2%	0%	5%	0%	6%	0%
International Equities	6%	0%	10%	0%	18%	0%
Alternatives	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
Canadian Core Real Estate*	0%	0%	0%	0%	0%	0%
Global Infrastructure*	0%	0%	0%	0%	0%	0%

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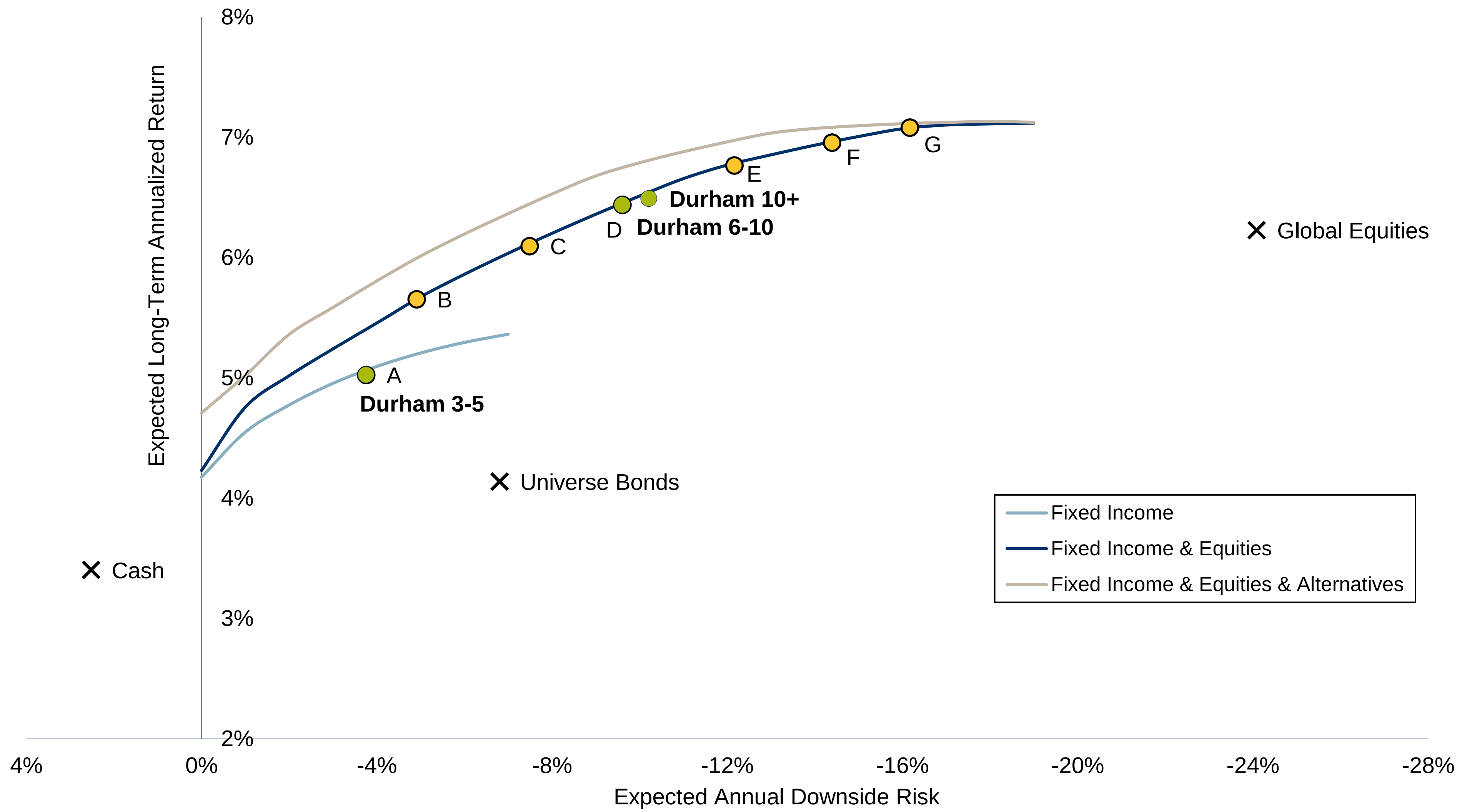
Comparison vs. Durham portfolios

Efficient Frontier Analysis

Custom modeled portfolios for Durham



Recommended Fund Fulfillment

Fund fulfillment

Risk exposure	Approved Fund(s)	Characteristics	Target
Fixed Income			
Canadian Money Market	PH&N Canadian Money Market Fund	Money market	
Canadian Short-Term Bonds	PH&N Short Term Bond & Mortgage Fund RBC Vision Fossil Fuel Free Short Term Bond Fund	Short-term fixed income Short-term fixed income ex. fossil fuel	100% 0%
Canadian Universe Bonds	PH&N Bond Fund RBC Vision Bond Fund RBC Vision Fossil Fuel Free Bond Fund PH&N Enhanced Total Return Bond Fund	Canadian universe bonds Canadian universe bonds w/ ESG focus Canadian universe bonds ex. fossil fuel Canadian universe bonds w/ HY, Mtgs.	
Canadian Corporate Bonds	PH&N Corporate Bond Trust	Investment grade corporate bonds	
Private Placement Corporate Debt	PH&N Private Placement Corporate Debt Fund	Private credit	100%
Commercial Mortgages	PH&N Mortgage Pension Trust*	Conventional	0%
	RBC Commercial Mortgage Fund	Conventional Conventional plus High yield	100%
High Yield Bonds	RBC High Yield Bond Fund	U.S focus	50%
	PH&N High Yield Bond Fund	Canadian focus	50%
Global Multi-Asset Credit	BlueBay Total Return Credit Fund	Global high yield, financial capital bonds, structured credit, global convertible bonds, EM hard currency debt, EM local currency debt, opportunistic, investment grade bonds.	100%
Global Bonds	RBC Global Bond Fund	Investment grade global bonds	
Emerging Market Bonds	RBC Emerging Markets Bond Fund	Emerging market bonds	

Fund fulfillment

Risk exposure	Approved Fund(s)	Characteristics	Target
Equities			
Canadian Equities	PH&N Canadian Equity Value Fund PH&N Canadian Equity Fund RBC QUBE Canadian Equity Fund RBC Vision Canadian Equity Fund	Value Growth Quantitative ESG tilt (exclusions)	33% 33% 33% 0%
Canadian Low Volatility Equities	RBC QUBE Low Volatility Canadian Equity Fund RBC Vision QUBE Fossil Fuel Free Low Volatility Canadian Equity Fund	Quantitative low volatility Quantitative low volatility excl. fossil fuel	100% 0%
U.S. Equities	PH&N U.S. Equity Fund RBC QUBE U.S. Equity Fund	Core Quantitative	50% 50%
U.S. Low Volatility Equities	RBC QUBE Low Volatility U.S. Equity Fund	Quantitative low volatility	100%
International Equities	RBC International Equity Fund PH&N Overseas Equity Fund	Core Concentrated	50% 50%
Global Equities	RBC Global Equity Focus Fund RBC Global Equity Leaders Fund RBC Vision Global Equity Fund RBC Vision Fossil Fuel Free Global Equity Fund RBC QUBE Low Volatility Global Equity Fund RBC QUBE Global Equity Fund	Concentrated Concentrated (large cap focus) ESG tilt (exclusions) Concentrated excl. fossil fuel Quantitative low volatility Quantitative	
Alternatives			
Real Estate	RBC Canadian Core Real Estate Fund	Canadian commercial real estate	100%
Infrastructure	RBC Global Infrastructure Fund	Global infrastructure	100%

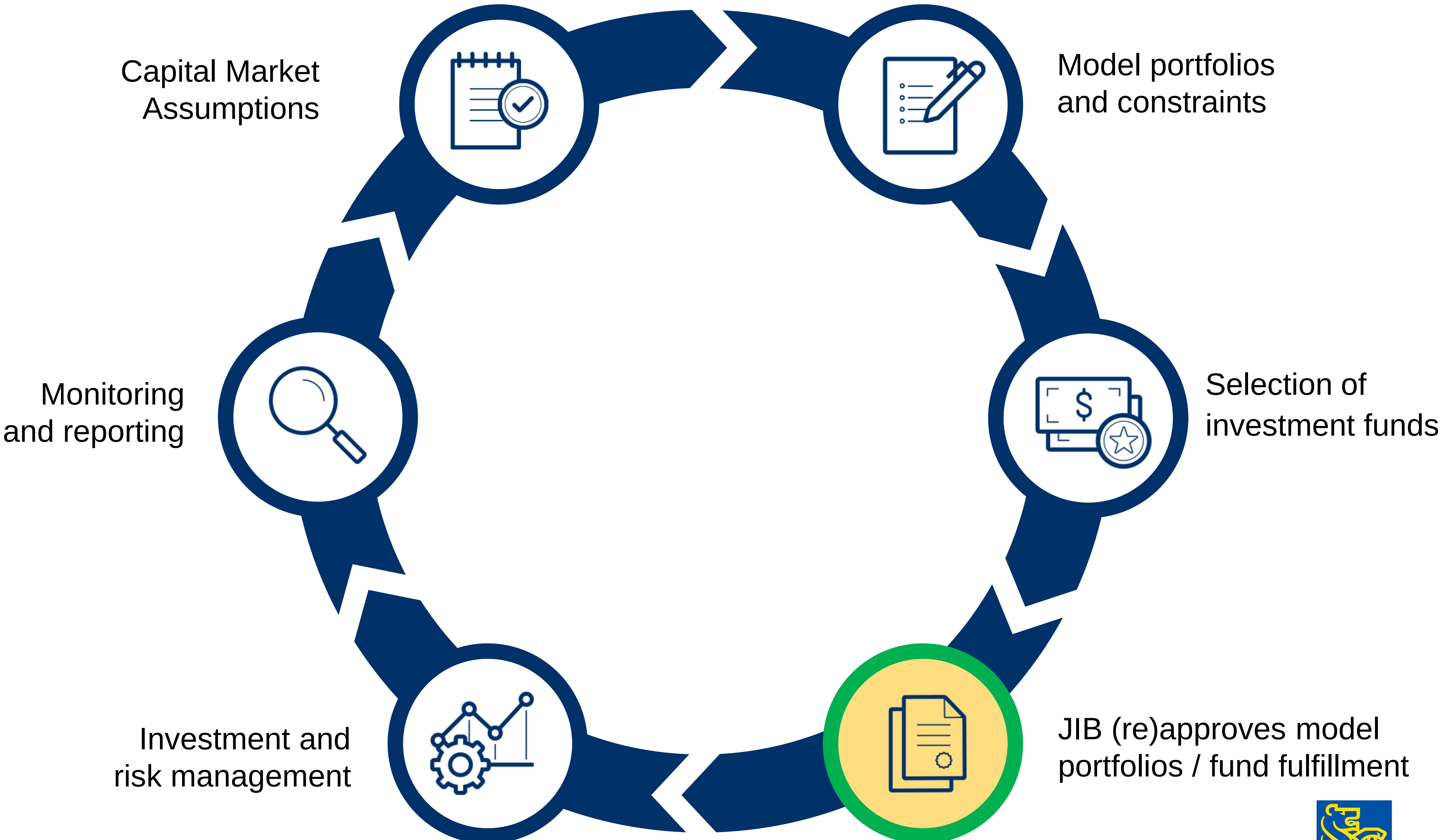
Rebalancing process

- For each asset class, a range will be defined based on size of target allocation:
  - Allocations greater than or equal to 30%: +/- 2.0%
  - Allocations greater than or equal to 15%: +/- 1.5%
  - Allocations less than 15%: +/- 1.0%
- When the range is breached, the asset mix will be rebalanced back to target as shown in the example below:

			Example		
Portfolio A	**Target Mix**	**Range +/-%**	**Pre-trade**	**Trade**	**Post-trade**
Short-Term Bonds and Mortgages	50%	2.0%	**47.5%**	2.5%	**50%**
Corporate Bonds	20%	1.5%	**21.0%**	-1.0%	**20%**
Private Placement Corporate Debt	5%	1.0%	**4.5%**	0.5%	**5%**
Commercial Mortgages	5%	1.0%	**5.0%**	0.0%	**5%**
High Yield Bonds	5%	1.0%	**6.0%**	-1.0%	**5%**
Global Multi-Asset Credit	15%	1.5%	**16.0%**	-1.0%	**15%**
Total	**100%**		**100.0%**	**0.0%**	**100%**

- Appropriate substitutes will be established for funds that do not have daily liquidity.
- Subscriptions and redemptions will be used to rebalance towards the target mix.
- Rebalancing will crystallize realized gains or losses.

Quarterly governance cycle



Capital market assumptions – Q2 2024

Capital market assumptions – Q2 2024

Expected risk and return

Asset Classes	Representative Data Series	Expected Long-Term Return	Expected Annual Volatility	Expected Annual Downside Risk
Cash	FTSE Canada 30 Day TBill Index	3.4%	0.4%	2.5%
Universe Bonds	FTSE Canada Universe Bond Index	4.1%	5.0%	-6.8%
Canadian Money Market	PH&N Canadian Money Market Strategy	3.5%	0.9%	1.7%
Short-Term Bonds and Mortgages	Custom Index[1]	4.2%	2.4%	-0.9%
Enhanced Universe Bond Strategy	Custom Index[2]	4.6%	5.2%	-7.2%
Corporate Bonds	Custom Index[3]	4.7%	4.5%	-5.8%
Private Placement Corporate Debt	Custom Index[4]	5.7%	5.5%	-7.8%
Commercial Mortgages*	Custom Index[5]	7.0%	3.1%	-5.0%
Global Sovereign Bonds	Custom Index[6]	3.8%	4.1%	-4.7%
High Yield Bonds	ICE BofA US High Yield Master II (CAD-Hedged)	5.9%	9.8%	-16.2%
Broad EMD	Custom Index[7]	5.7%	10.5%	-14.2%
Global Multi-Asset Credit	Custom Index[8]	6.8%	8.4%	-16.2%
Canadian Equities	S&P/TSX Composite Index	8.2%	16.9%	-26.1%
Canadian Low Volatility Equities	RBC QUBE Low Volatility Canadian Equity Strategy	7.4%	11.7%	-15.1%
U.S. Equities	S&P 500 Index (CAD)	5.5%	14.8%	-23.4%
U.S. Low Volatility Equities	RBC QUBE Low Volatility U.S. Equity Strategy (CAD)	4.9%	12.8%	-15.8%
International Equities	MSCI EAFE Index (CAD)	7.6%	16.5%	-28.5%
Global Equities	MSCI World Index (CAD)	6.2%	14.4%	-24.1%
Canadian Core Real Estate*	RBC Canadian Core Real Estate Strategy	6.3%	9.6%	-13.1%
Global Infrastructure*	EDHEC Infra 300 Index (Local)	6.7%	12.2%	-17.7%
Inflation	Canadian CPI (Non-Seasonally Adjusted)	2.3%	1.5%	N/A

Please see disclosures on the following slide.

Capital market assumptions – Q2 2024

Disclosures

Capital market assumptions represent the views of PH&N Institutional for the purposes of illustrating and understanding the potential risk-reward trade-off of different portfolio decisions and are established by considering a variety of qualitative and quantitative sources of information including: different forecasting models; internal and external research; existing and implied future conditions as priced by capital markets; and internal views of our fund managers. Expected long term annualized returns are for a 10-year forecast time horizon. Volatilities, downside risk and correlations are estimated from historical data and adjusted as required to reflect future market conditions. Investors should be aware of the limitations using forward-looking assumptions in that there is absolutely no guarantee that future performance will occur according to any ex-ante expectation.
Expected return net of fees

[1] 49% FTSE Canada Short Term Government Bond Index, 45% FTSE Canada Short Term Corporate Bond Index and 6% PH&N Mortgage Strategy.

[2] 12.5% FTSE Canada Federal Bond Index, 32.5% FTSE Canada Provincial Bond Index, 45% FTSE Canada All Corporate Bond Index, 7.5% PH&N Mortgage Strategy and 2.5% ICE BofA US High Yield Master II (CAD-H).
3 25% FTSE Canada Corporate AA+ Bond Index , 25% FTSE Canada Corporate A Bond Index and 50% FTSE Canada Corporate BBB Bond Index.

[4] 98% FTSE Canada Mid Term Federal and 2% FTSE Canada Long Term Federal Bond Index + 50% FTSE Canada Short Term Corporate Bond Index (spread) and 50% FTSE Canada Mid Term Corporate Bond Index (spread).
[5] 45% PH&N Mortgage Strategy and 55% PH&N High Yield Mortgage Strategy.
[6] 90% ICE BofA Global Government Index (CAD-H), 3% ICE BofA US High Yield Master II (CAD-H), 2.5% J.P. Morgan Emerging Market Bond Index (CAD-H), 2.5% J.P. Morgan Corporate Emerging Markets Bond Index (CAD-H) and 2% RBC Emerging Markets Foreign Exchange Strategy.
[7] 25% J.P. Morgan Emerging Market Bond Index (CAD-H), 19% J.P. Morgan Corporate Emerging Markets Bond Index (CAD-H) and 56% J.P. Morgan Government Bond Index-Emerging Markets (GBI-EM) (CAD-H) (weights according to the market capitalization of each individual index as at March 31, 2024).

[8] 7.5% ICE BofA 3 Month US T-Bills (CAD-H), 35% ICE BofA Global High Yield Index (CAD-H), 11.25% J.P. Morgan Emerging Market Bond Index (CAD-H), 11.25% J.P. Morgan Corporate Emerging Markets Bond Index (CAD-H), 7.5% J.P. Morgan Government Bond Index-Emerging Markets (GBI-EM) (CAD-H), 7.5% Credit Suisse Leveraged Loan Index (CAD-H) and 20% Thomson Reuters Convertible Global Focus Index (CAD-H)

Capital market assumptions – Q2 2024

Correlations

Correlations	Cash	Universe Bonds	Canadian Money Market	Short-Term Bonds and Mortgages	Enhanced Universe Bond Strategy	Corporate Bonds	Private Placement Corporate Debt	Commercial Mortgages	Global Sovereign Bonds	High Yield Bonds	Broad EMD	Global Multi-Asset Credit	Canadian Equities	Canadian Low Volatility Equities	U.S. Equities	U.S. Low Volatility Equities	International Equities	Global Equities	Canadian Core Real Estate	Global Infrastructure	Inflation
Cash	**1**																				
Universe Bonds	0.1	**1**																			
Canadian Money Market	1.0	0.1	**1**																		
Short-Term Bonds and Mortgages	0.2	0.9	0.2	**1**																	
Enhanced Universe Bond Strategy	0.1	1.0	0.1	0.9	**1**																
Corporate Bonds	0.1	0.9	0.1	0.8	1.0	**1**															
Private Placement Corporate Debt	0.1	1.0	0.1	0.9	1.0	1.0	**1**														
Commercial Mortgages	0.2	0.7	0.1	0.8	0.7	0.7	0.8	**1**													
Global Sovereign Bonds	0.1	0.9	0.1	0.8	0.8	0.7	0.8	0.7	**1**												
High Yield Bonds	-0.1	0.3	-0.1	0.2	0.4	0.5	0.4	0.2	0.2	**1**											
Broad EMD	0.0	0.4	0.0	0.3	0.5	0.5	0.5	0.3	0.4	0.8	**1**										
Global Multi-Asset Credit	0.0	0.3	0.0	0.3	0.5	0.5	0.4	0.2	0.3	0.9	0.9	**1**									
Canadian Equities	-0.1	0.1	-0.1	0.0	0.2	0.3	0.2	0.1	0.0	0.7	0.6	0.8	**1**								
Canadian Low Volatility Equities	-0.1	0.2	-0.1	0.1	0.3	0.4	0.3	0.2	0.2	0.6	0.5	0.6	0.8	**1**							
U.S. Equities	-0.1	0.2	-0.1	0.1	0.2	0.3	0.2	0.1	0.0	0.5	0.3	0.4	0.6	0.6	**1**						
U.S. Low Volatility Equities	-0.1	0.3	-0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.2	0.4	0.5	0.8	**1**					
International Equities	0.0	0.2	-0.1	0.2	0.3	0.3	0.3	0.2	0.1	0.6	0.5	0.6	0.7	0.5	0.8	0.5	**1**				
Global Equities	-0.1	0.2	-0.1	0.1	0.3	0.3	0.2	0.1	0.0	0.5	0.4	0.5	0.7	0.6	1.0	0.7	0.9	**1**			
Canadian Core Real Estate	0.1	-0.2	0.0	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0	-0.1	**1**		
Global Infrastructure	0.0	0.4	0.0	0.3	0.4	0.3	0.4	0.4	0.5	0.0	0.2	0.1	0.0	0.3	0.0	0.3	0.1	0.0	0.3	1.0	
Inflation	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.1	0.0	-0.1	0.0	0.0	0.0	-0.3	**1**

Capital market assumptions represent the views of PH&N Institutional for the purposes of illustrating and understanding the potential risk-reward trade-off of different portfolio decisions and are established by considering a variety of qualitative and quantitative sources of information including: different forecasting models; internal and external research; existing and implied future conditions as priced by capital markets; and internal views of our fund managers. Expected long term annualized returns are for a 10 year forecast time horizon. Volatilities, downside risk and correlations are estimated from historical data and adjusted as required to reflect future market conditions. Investors should be aware of the limitations using forward-looking assumptions in that there is absolutely no guarantee that future performance will occur according to any ex-ante expectation.

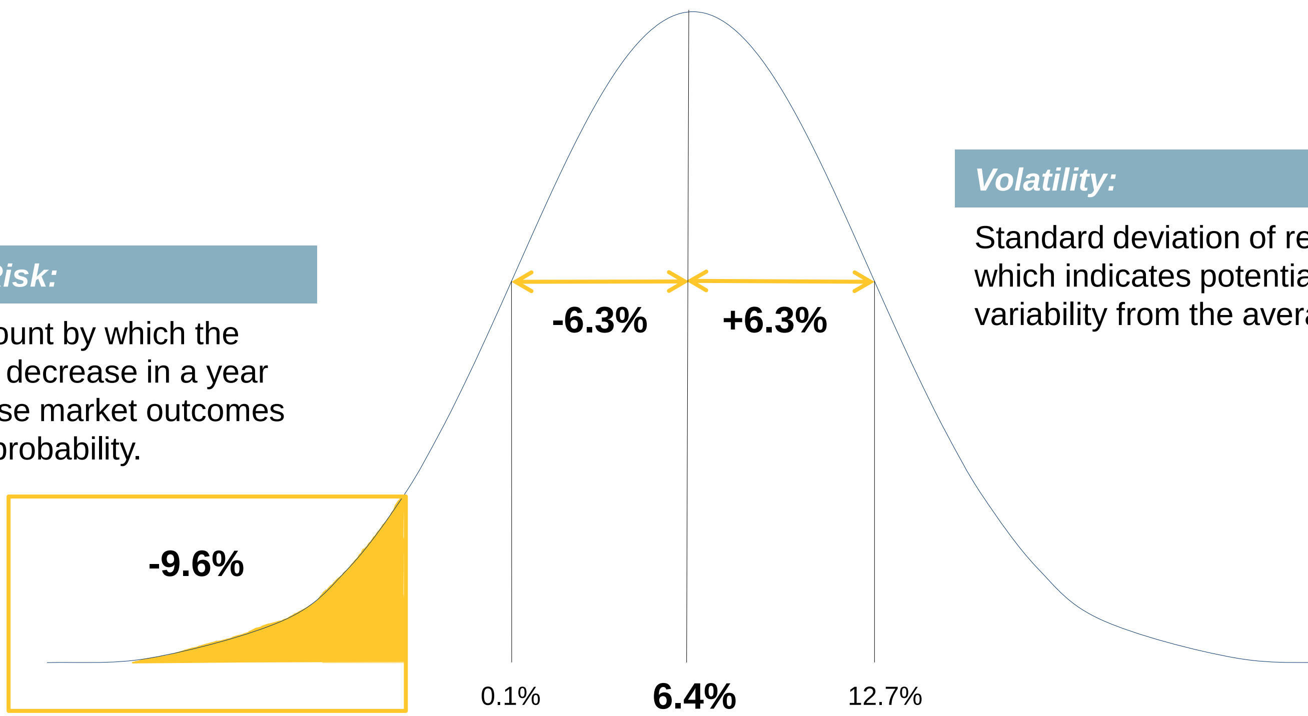
Capital market assumptions - background

Understanding the statistics

Example – Portfolio D

Current Portfolio	
Expected Return	6.4%
Downside Risk	-9.6%
Volatility	6.3%

Return Distribution



Downside Risk:

Average amount by which the assets could decrease in a year during adverse market outcomes with 1 in 20 probability.

Volatility:

Standard deviation of returns which indicates potential variability from the average.

Expected Return:

The average amount by which assets are expected to grow in a year.

Source: RBC GAM.

Long-term assumptions for strategic portfolio modeling

Overview

The RBC Global Asset Management Long-Term Expected Return (LTER) Committee, led by the CIO, is ultimately responsible for approving best estimate return assumptions

Capital market assumptions are established by considering a variety of qualitative and quantitative sources of information including:

- Different forecasting models
- Internal and external research
- Existing and implied future conditions as priced by capital markets
- Internal views of our fund managers

Volatilities, downside risk and correlations are estimated from historical data and adjusted as required to reflect future market conditions

Long-term assumptions for strategic portfolio modeling

Framework and methodology (return)

Systematic process with multiple sources of information

Expected returns

Fixed Income (IG, HY, EM)

Based on projected yield and spread movements

- Risk-free interest rates assumed to follow the applicable forward curve
- Credit spreads expected to mean revert with adjustments for structural market changes

Returns on bonds with credit risk are adjusted for expected default and recovery rates

Equities & Alternatives

Based on output of different forecasting models

- Fundamental Fair Value
- Valuation
- Cross-sectional
- Economic Forecasts

Final assumptions are the result of blending the output from the different models

The RBC Global Asset Management Long-Term Expected Return (LTER) Committee is ultimately responsible for approving best estimate return assumptions

Long-term assumptions for strategic portfolio modeling

Framework and methodology (risk)

Volatilities and correlations are estimated from historical data and adjusted as required to reflect expected future conditions

Volatilities

Calibrated using a dual-state regime switching lognormal model that better captures empirical characteristics and inherent asset class risk

Correlations

Calibrated from empirical distribution at monthly and/or quarterly frequencies

Model generated estimates of downside risk (i.e. CVaR 95) account for the influence of excess skewness and kurtosis

Long-term assumptions for strategic portfolio modeling

- The views of fund managers are incorporated throughout the process and adjustments are made when deemed necessary
- Most assumptions are for generic asset class representations (e.g. market indices)
  - No provision for explicit added value over a benchmark
  - No provision for specific manager investment style that may affect risk
- Expected structural biases and/or fund data are sometimes incorporated when modeling a specific strategy that does not have a sufficiently representative benchmark
- All alternatives are assumed to be net of IMFs (unless otherwise specified)

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