



# **Case Study 3**

# **Exploring Multi-Sector Options**

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# Disclaimer

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The authors acknowledge the support of the Conexus Institute and the CFA Societies Australia.

This presentation and supporting research reflect the views of the authors. It does not necessarily reflect the views of the Conexus Institute, CFA Societies Australia, or the authors' employers.

This presentation and supporting research do not constitute financial advice and do not present normative recommendations for the management of funds with illiquid assets.

The purpose of this presentation and supporting research is to stimulate dialogue, discussion, and further research on the issues presented.

# Multi-Sector Funds

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## Working definitions

- Multi-sector option
  - Is assumed to invest into a range of liquid and illiquid asset classes
  - Liquidity frequency is assumed to be daily
  - May provide a 'banker option' service to single sector options (for more information about the 'banker option' refer to Case Study 1 or Case Study 2)

# Framing Liquidity Risk

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There exists a range of risks associated with portfolios containing illiquid assets. Not all risks apply to each of our case studies:

First Order Risks	Solvency <ul style="list-style-type: none"><li>• Ability to meet cashflow demands as they arise</li></ul>		
Second Order Risks	1. Portfolio Quality <ul style="list-style-type: none"><li>• Deterioration in portfolio quality</li></ul>	2. Pricing Inequities <ul style="list-style-type: none"><li>• Inequities due to 'stale' pricing</li></ul>	3. Costs <ul style="list-style-type: none"><li>• Costs of meeting liquidity demands and restoring portfolio quality</li></ul>

# Framing Liquidity Risk (ctd.)

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- The Multi-Sector Case Study explores multiple areas associated with illiquidity:
- Portfolio quality is difficult to quantify. We focus on the following:
  - Allocating to illiquid assets
  - Distance from SAA (strategic asset allocation), measured by tracking error
  - Change in expected return
- Unit price inequities: we consider
  - Expected degree of mispricing: present asset valuation (which may be stale) compared against actual valuation. Note this is deterministic, not stochastic
- The cost of restoring portfolio quality:
  - To restore a portfolio to its SAA by applying user-defined estimates of transaction costs

# Case Study 3 – Model Explained

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- We walk through a user-specified market / liquidity scenario accounting for both a market event and cashflow demands (from FX hedging, member flows and member switching)
- Month-by-month we:



**Calculate market impact  
on portfolio exposures**

**Account for cashflow  
demands by selling  
liquid assets**

**Re-balance the portfolio amongst  
liquid assets to maintain a simple  
growth / defensive target**

- This process allows us to track through time important portfolio characteristics through the specified event, namely: (i) allocation to illiquid assets, (ii) tracking error relative to SAA, (iii) change in expected return, (iv) degree of mispricing in the unit price, and (v) cumulative theoretical cost of selling down illiquid assets

# Model Explained

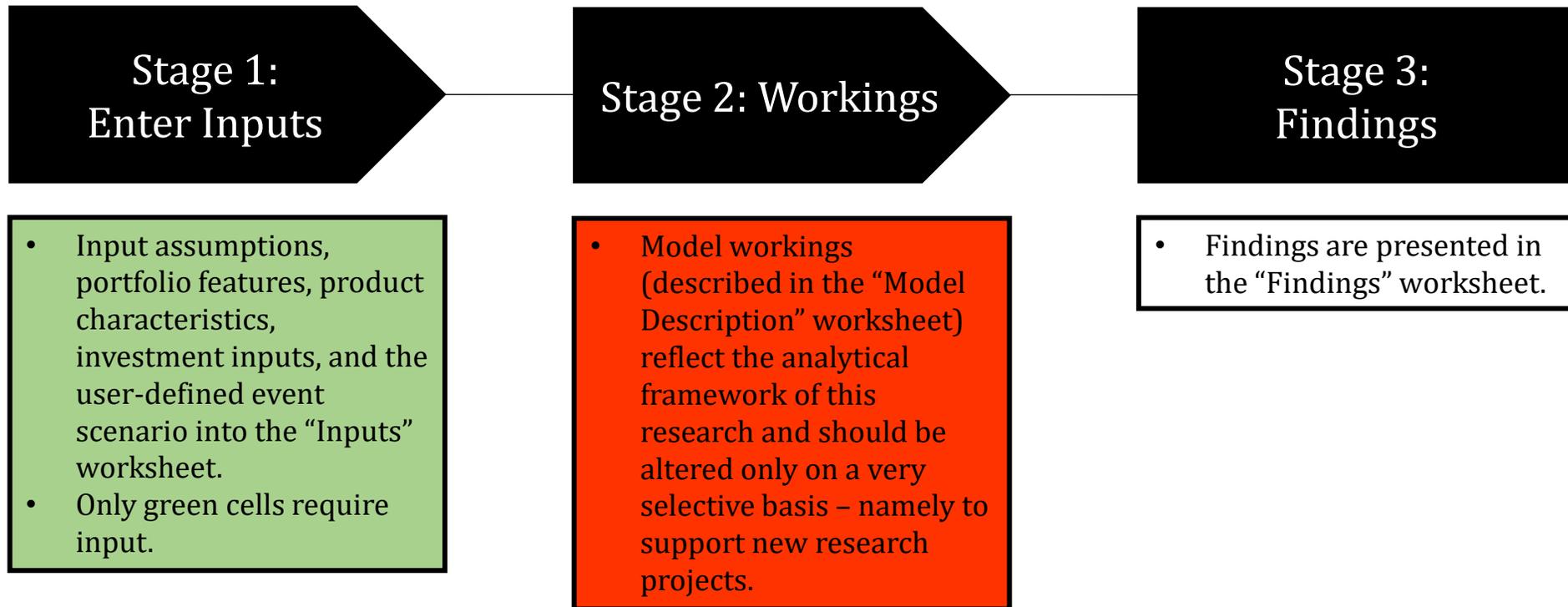
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- The model is deterministic i.e. it assumes an expected outcome and does not explore the range of possible outcomes
- Based on user inputs (including a user-defined scenario) the model provides expectations of how portfolio characteristics will evolve during the scenario

# Using the Model

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- The model is operated as detailed below, where each stage references model worksheets.



# Using the Model - Inputs

Note: This page includes default values. These default values are used to illustrate the model and are not a recommendation.

## Portfolio Inputs

	Allocation	Growth%	Global%	FX Hedging Level	Total FX Hedging Exposure	Directly or externally managed
Liquid - Defensive	22.5%	0%	40%	100%	9.00%	Externally
Liquid - Growth	47.5%	100%	50%	50%	11.88%	Directly
Illiquid	30.0%	75%	40%	100%	12.00%	Directly
	100.0%					

Externally managed means an external manager will manage liquidity for FX hedging (i.e. no direct funding required).

## Portfolio characteristics

	Liquid		Illiquid		
	Growth	Defensive	Growth	Defensive	
Domestic	23.8%	13.5%	13.5%	4.5%	55.3%
Global	23.8%	9.0%	9.0%	3.0%	44.8%
	47.5%	22.5%	22.5%	7.5%	
	70.0%		30.0%		100.0%

# Using the Model - Inputs

**Note:** This page includes default values. These default values are used to illustrate the model and are not a recommendation.

## Return and risk expectations

	E(Return)	E(Volatility)		Valuation frequency (every x mths)	Deterministic Monthly Movement	
Liquid - Defensive	2%	3%			1.0%	
Liquid - Growth	6%	12%			-2.8%	
Illiquid	6%	7%	6		0.0%	-8.4% periodic revaluation
FX	0%	7%			-1.9%	-1.4% monthly theoretical

## Market event

Timeframe (duration of the shock)	18 months
Number of Standard Deviations	4

Return expectations are nominal returns.

These two numbers are calculated based off the market event.

Our market event is a GFC-style scenario.

# Using the Model - Inputs

## Member / flows event

Degree of member switching	Initial month:	1.00%	Subsequent months:	0.25%
Net fund flows (normal)	0.5%	per month	(e.g. reduced contributions, early release scenario etc.)	
Impairment to fund flows (shock)	-1.0%	per month		
Banker option obligations	Single Sector % in Illiquid Assets	% Flows out of illiquid single sector options (p/m)	Illiquid single sector options as a % of multi-sector option (p/m)	Total monthly cashflow requirements
	100%	2%	2%	0.04%

Member switching is assumed to be out of the multi-sector option and into cash.

This is the steady state inflow position pre-event.

## Correlation Matrix

Liquid Defensive	1	0	0
Liquid Growth	0	1	0.7
Illiquid	0	0.7	1

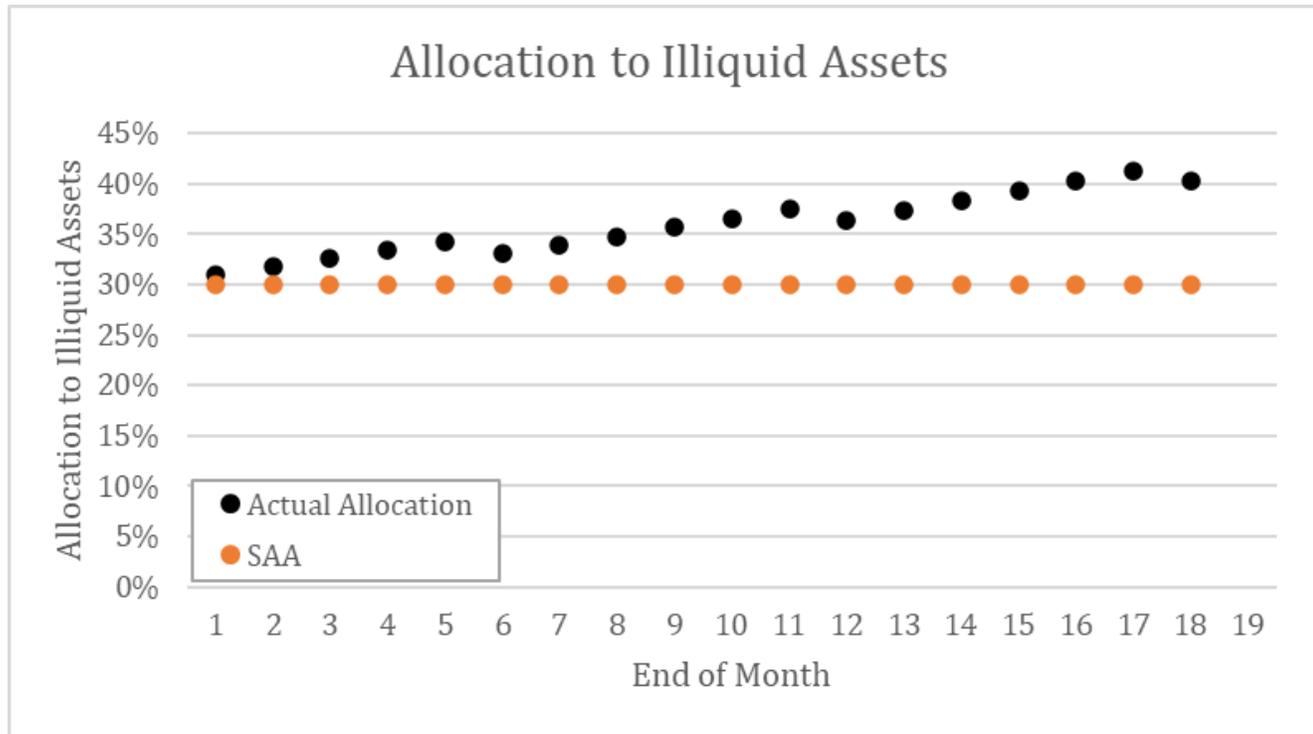
## Cost of transacting illiquids

Fixed cost	5%	(linked to stamp duty etc)
Variable cost	4%	multiple of the variability of the environment (i.e. # standard deviations)

**Note:** This page includes default values. These default values are used to illustrate the model and are not a recommendation.

# Findings

## Findings



This chart illustrates how the actual asset allocation to illiquid assets evolves relative to the targeted SAA.

This provides an indicator of portfolio solvency and a characteristic of portfolio quality.

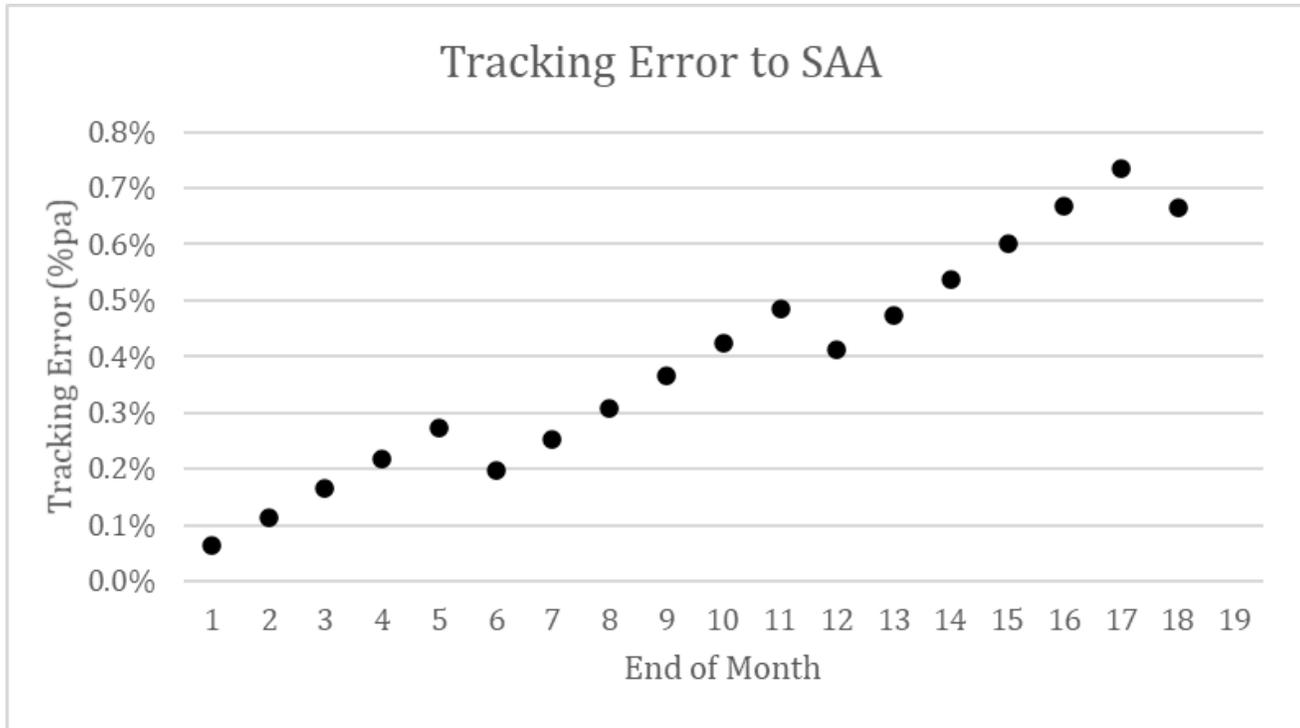
Trustees may want to consider whether there is a threshold exposure to illiquid assets at which trustees need to freeze redemptions.

The scenario is a GFC-style scenario.

This is the top left chart on the “Findings” worksheet.

# Findings

## Findings



This chart illustrates how the tracking error to the SAA evolves through time.

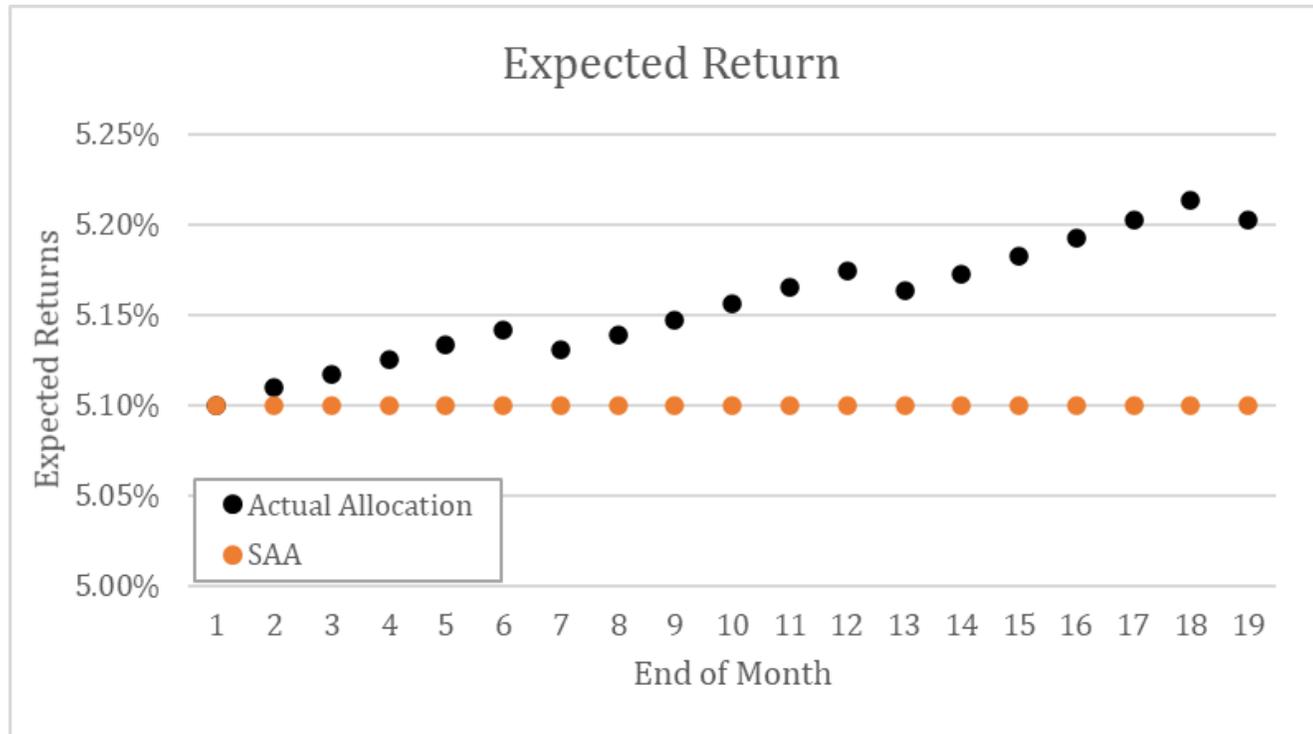
This could be considered a characteristic of portfolio quality.

The scenario is a GFC-style scenario.

This is the top right chart on the “Findings” worksheet.

# Findings

## Findings



This chart illustrates how the expected return evolves through time, compared with the expected return of the SAA.

This is a characteristic of portfolio quality.

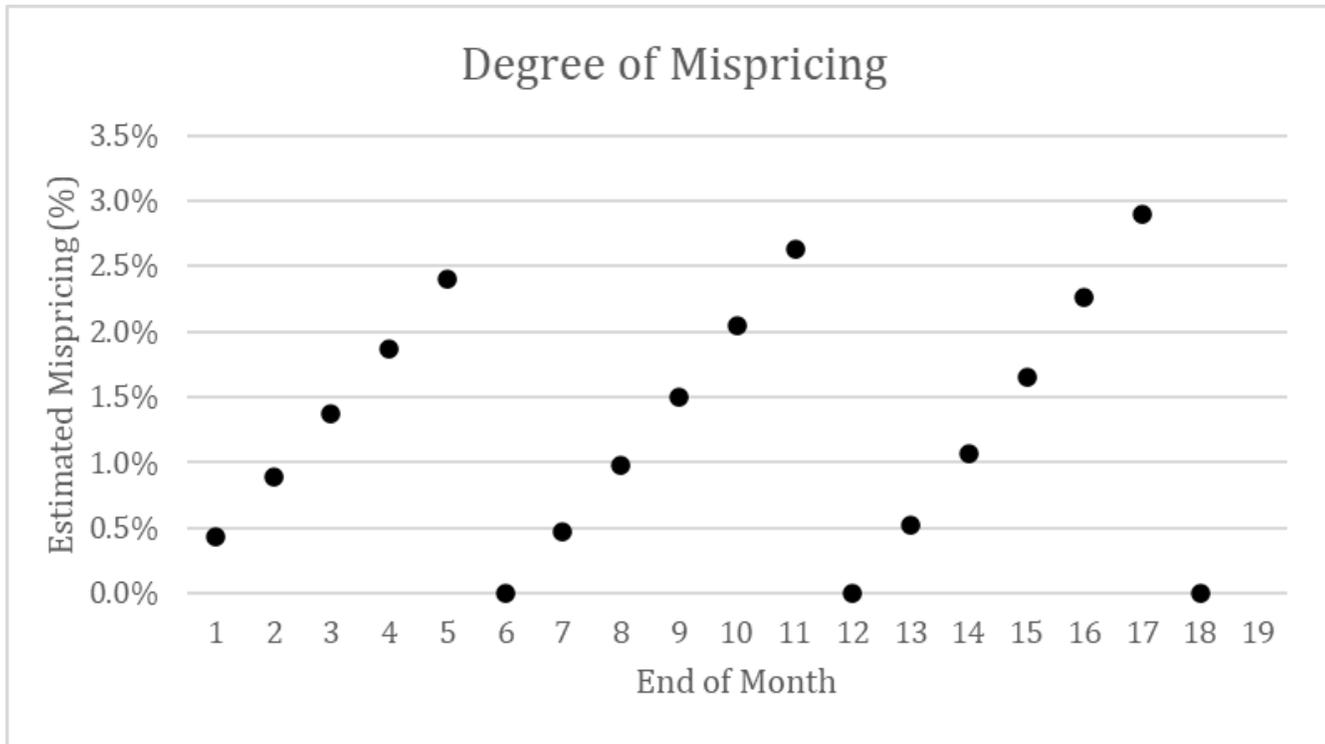
The scenario is a GFC-style scenario. In this case the expected return actually increases slightly because the allocation to illiquid assets increases and the assigned expected returns of illiquid assets are high on a growth-adjusted basis.

This analysis would be more insightful if it accounted for time-varying expected returns.

This is the middle left chart on the "Findings" worksheet.

# Findings

## Findings



This chart illustrates how the degree of mispricing evolves through time.

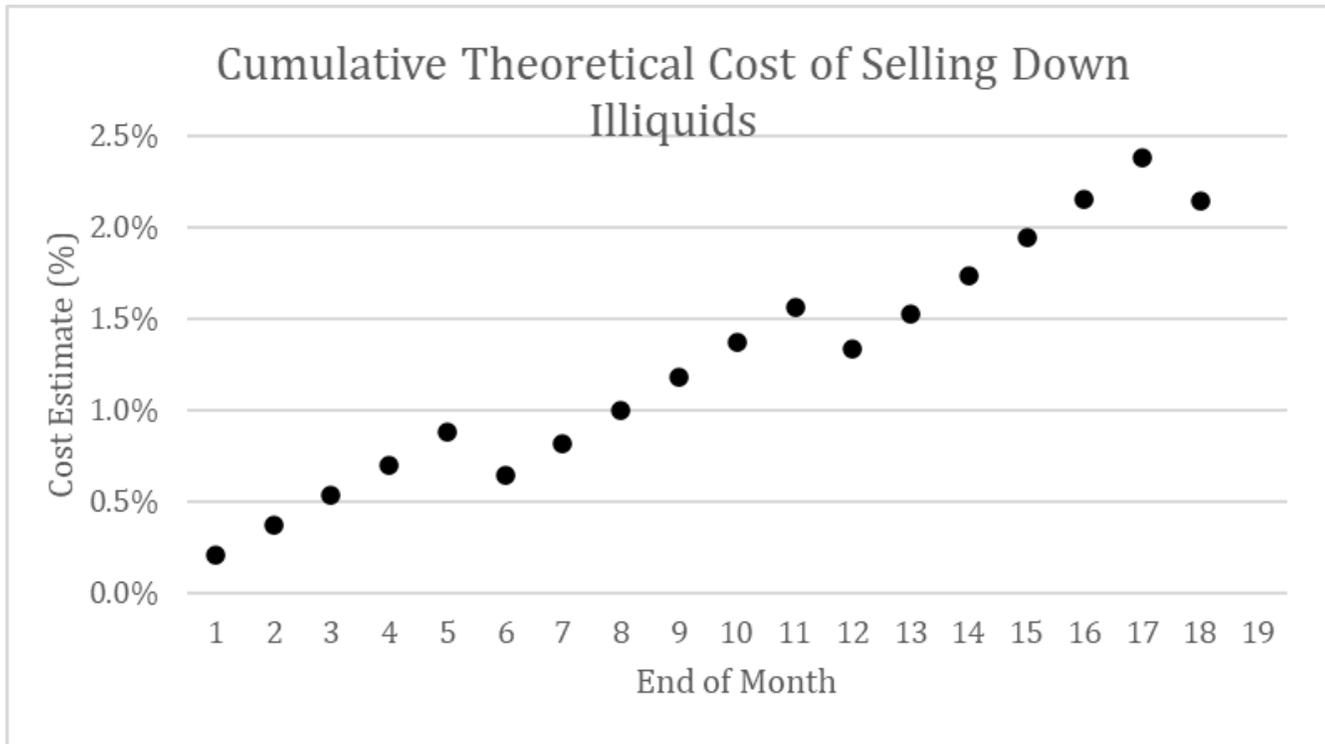
This could be considered a measure of inequity.

The scenario is a GFC-style scenario. In this case the degree of mispricing grows until illiquid assets are revalued (6 monthly in this case). The increasing scale of mispricing between valuations is because the exposure to illiquids grows throughout the scenario.

This is the middle right chart on the “Findings” worksheet.

# Findings

## Findings



This chart illustrates the cost to portfolio performance of selling down illiquid assets to return the portfolio to its SAA.

This could be considered a characteristic of portfolio cost and inequity.

The scenario is a GFC-style scenario.

This is the bottom left chart on the “Findings” worksheet.

# Exploring the Model

- The following individual exercises illustrate the model and allow trustees to further explore product design
- Altering assumptions and choice product features illustrates the relationship with unit price inequity and gapping

Exercise	Expected Impact
Portfolio holdings <ul style="list-style-type: none"> <li>• Allocation to illiquids</li> <li>• Currency hedging</li> </ul>	<ul style="list-style-type: none"> <li>• Negative relationship between the allocation to illiquids and some measures of portfolio solvency, quality, inequity and cost.</li> <li>• Negative relationship between directly managed hedged global exposure and some measures of portfolio solvency, quality, inequity and cost.</li> </ul>
Market event <ul style="list-style-type: none"> <li>• Timeframe (duration of event)</li> <li>• Severity (# Std. Devs.)</li> </ul>	<ul style="list-style-type: none"> <li>• Negative relationship between event timeframe and severity and some measures of portfolio solvency, quality, inequity and cost.</li> </ul>
Member flows	<ul style="list-style-type: none"> <li>• Negative relationship between member flows and some measures of portfolio solvency, quality, inequity and cost.</li> </ul>
Correlations	<ul style="list-style-type: none"> <li>• Lower correlation assumptions between illiquid assets with other assets increases the tracking error calculations.</li> </ul>
Transaction costs	<ul style="list-style-type: none"> <li>• Positive relationship between transaction cost assumptions and the cost of selling illiquid assets to restore the SAA.</li> </ul>

# Impact of Your Future, Your Super reforms

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- The Your Future, Your Super (YFYS) reforms will impact super fund net inflows in multiple ways, including:
  - Funds which fail the performance test: potential for significant outflow.
  - Funds which do not fail the performance test: potential for roll-ins from funds which fail the test.
  - Fund stapling (Your Super Follows You): positive impact for some funds and negative for others.
- The model supports the consideration of different scenarios related to YFYS impacts. Specific fields to consider:
  - Net fund flows (normal) – consider impact of stapling
  - Impairment to fund flows (shock) – consider impact of performance test result
  - Degree of member switching – possible second order impact

# Additional Resources

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- The following additional resources are provided:
  - Overview: Exploring Portfolios with Illiquid Assets (presentation and video)
  - Accompanying model: Model 3: Exploring Multi-Sector Options. The worksheet “Model Description” provides additional detail (spreadsheet)
  - Frequently Asked Questions (document)

# Further Information

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If you have any questions or feedback, please contact:

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