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Overview
Exploring Portfolios with Illiquid Assets

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Disclaimer

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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.

Introduction

- The management of illiquid assets in a portfolio is a global problem in wealth management and management of pension funds.
- Our models are largely universal but the focus is on Australian super funds.
- Our aim is that this open-source work assists funds to better understand the various challenges faced when managing portfolios with illiquid assets.
- This work has application for investment managers, risk and governance officers, fund trustees and regulators.
- The work is not prescriptive; it is best complemented by other insights, both quantitative and qualitative.
- Our models provide an element of “baselining”: they can be customized to incorporate assumptions.

The Issues

With no set of prescriptive or (as yet) formalised standards, the responsibility is placed on super fund trustees to address the questions such as:

- How do you define acceptable portfolio quality?
- What is a tolerable level of suspected stale pricing and unit price 'gapping'?
  ('suspected' because one can only estimate the market movement in unlisted assets)
- When does the performance impact of providing liquidity and restoring portfolio quality become unreasonable?

Our work highlights some relevant, qualifying characteristics related to the above-listed questions. This may help inform the creation of regulatory and/or industry standards and/or super fund internal policy.

Aim

The aim is to provide a set of resources which assist funds explore some of the challenges associated with allocating to illiquid assets.

The resources are made available to:

1. Be used to frame and illustrate important trustee discussions in an interactive case study structure
2. Be extended upon and incorporated into existing risk frameworks
3. Provide a baseline framework to establish reference standards for Australian super funds

Framing Liquidity Risk

- We frame the risks associated with portfolios containing illiquid assets as displayed below.
- We will see that not all risks apply to each case study

First Order	Solvency • Ability to meet cashflow demands as they arise		
Second Order	1. Portfolio Quality • Deterioration in portfolio quality	2. Pricing Inequities • Inequities due to 'stale' pricing	3. Costs • Costs of meeting liquidity demands and restoring portfolio quality

Framing Liquidity Risk (ctd.)

- Portfolio quality is difficult to quantify. We consider the following characteristics important:
  - Portfolio liquidity
  - Distance from SAA (strategic asset allocation), measured by tracking error
  - Expected return

- Unit price inequities take the form of:
  - Degree of mispricing: present asset valuation (which may be stale) compared against actual (theoretical) valuation
  - Gapping in the unit price: the size of the movement in unit price when asset valuations are updated

- The estimated cost of restoring portfolio liquidity:
  - To restore a portfolio to its SAA

Single Sector vs. Multi-Sector Funds

Working assumptions

- Single sector options
  - Assumed to invest some or all assets into a single illiquid asset class (the proportion is a choice parameter)
  - We assume option liquidity is implicitly guaranteed by a large multi-sector option. This is sometimes known in Australia as the 'banker option'
  - Product redemption frequency and valuation frequency are choice parameters

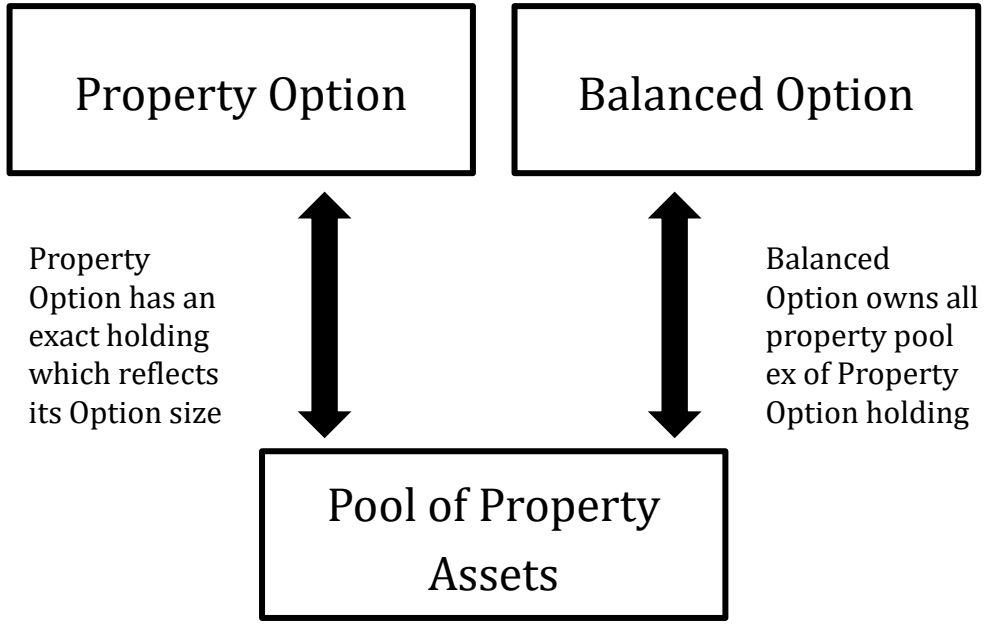
- Multi-sector options
  - Assumed to invest into a range of liquid and illiquid asset classes
  - Redemption frequency is assumed to be daily

Single Sector vs. Multi-Sector Funds

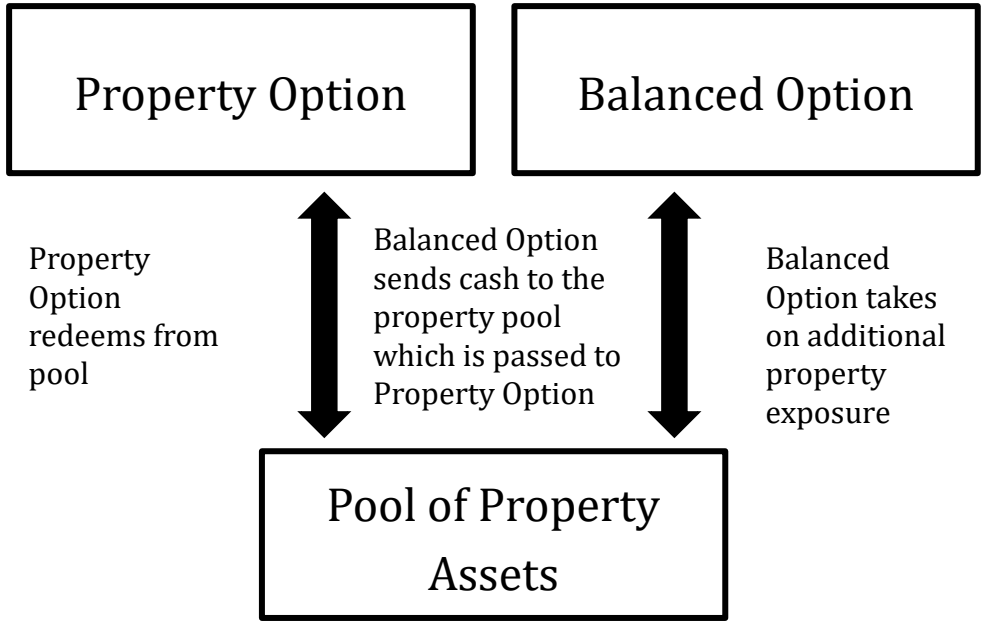
Explaining how the 'banker option' works

- A simplified example of a super fund with just two options: a property option and a balanced option

1. Operating Structure



2. Funding a Property Option Redemption



Case Studies

Three case studies have been developed that aid in the understanding of these investment governance challenges.

Each case study is supported by a standalone model, allowing users to modify inputs.

Case Study 1– Exploring Single Sector Options

- We explore the unit price inequity and price gapping potential for a single sector option investing 100% into an unlisted asset.

Case Study 2 – Exploring Liquid Valuation Proxies

- We explore the potential role of liquid valuation proxies, applied to a single sector option investing 100% into an unlisted asset.

Case Study 3 – Exploring Multi-Sector Options

- This model aims to provide insight into various characteristics of a multi-asset portfolio as it steps through a market crisis.

Case Study 1 – Exploring Single Sector Options

Case Study 1 – Model Explained

1 → 2

We simulate the actual unit price

We simulate the theoretical unit price

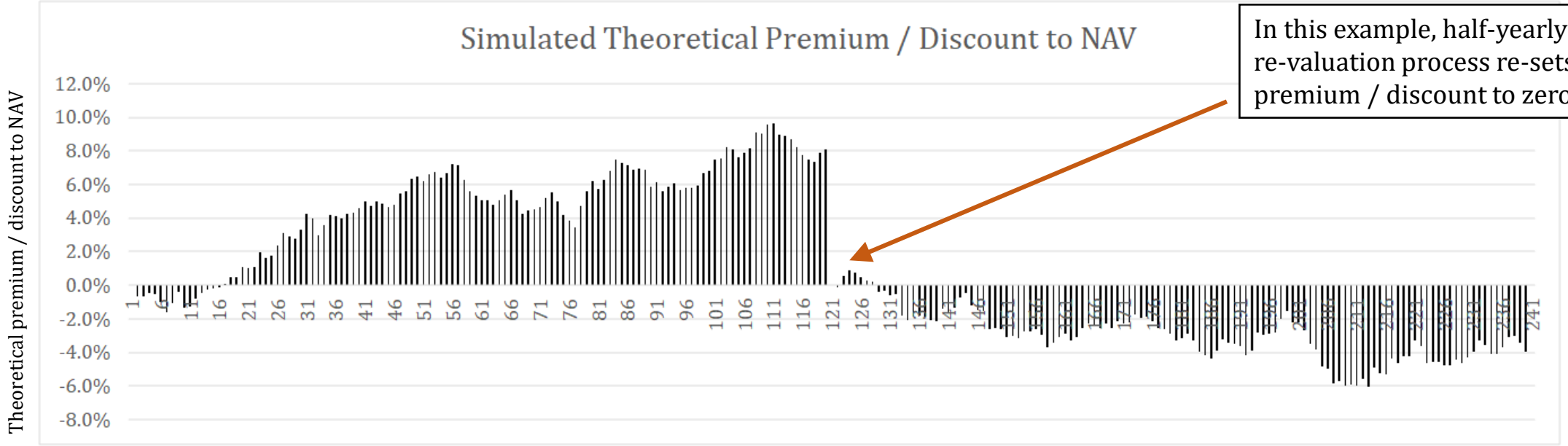
- The difference between (1) and (2) at any point in time represents a simulation of the hypothetical unit price inequity.
- (1) and (2) converge at the time of scheduled valuations, at which point the actual unit price 'gaps' to its updated valuation.
- We run many simulations to estimate the distribution of unit price inequities and unit price gapping outcomes.
- Product equity can be assessed based on the level and frequency of inequities reaching user defined thresholds.

Case Study 1 – A Single Simulation

A single simulation to illustrate the model

Chart 1: Simulated Theoretical Premium / Discount to NAV

This chart simulates the possible daily theoretical premium / discount to NAV.



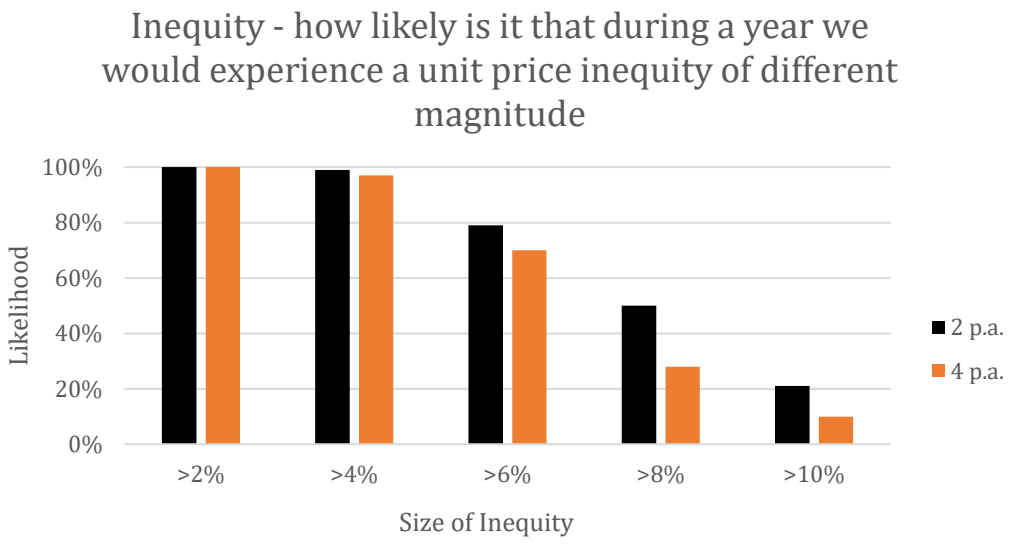
In this example, half-yearly asset re-valuation process re-sets premium / discount to zero.

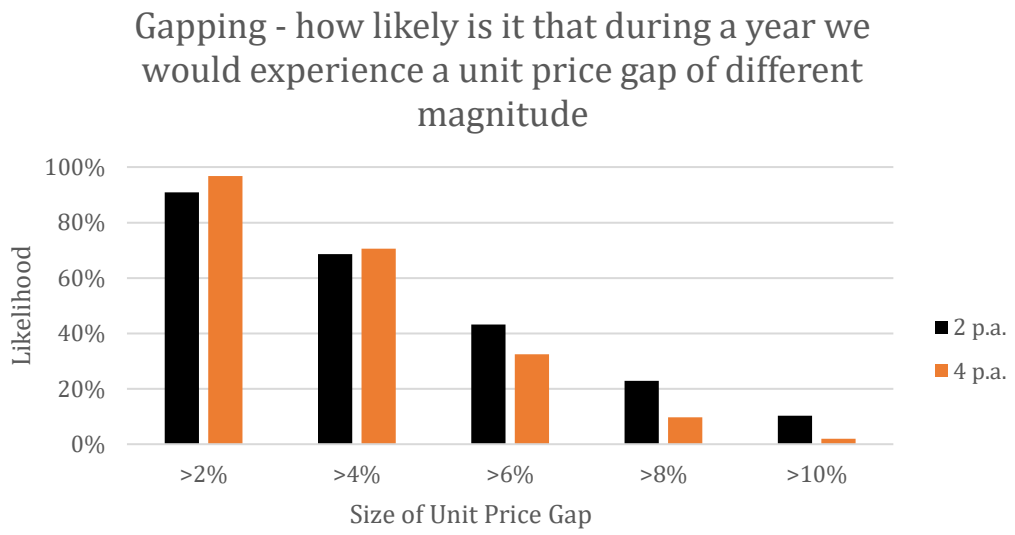
Case Study 1

The output from this case study provides a significant insight:

➔ More frequent valuations are beneficial but significant inequities and gapping may persist (the example below compares semi-annual and quarterly re-valuation processes).

- Further exploration can account for portfolio characteristics





Case Study 2 – Exploring Liquid Valuation Proxies

Case Study 2 – Model Explained

1 → 2

We simulate the actual unit price, accounting for a rules-based out-of-cycle re-valuation process based on a liquid proxy

We simulate the theoretical unit price

- We conduct the same analysis as per Case Study 1.
- How an out-of-cycle re-valuation process works:

  Step 1: Determine an appropriate liquid proxy and the relationship between the liquid proxy and the unlisted portfolio (e.g. correlation).

  Step 2: If movement in the liquid proxy predicts a movement in the unlisted portfolio (since last valuation) which exceeds a threshold level, an out-of-cycle update is applied to the unit price.

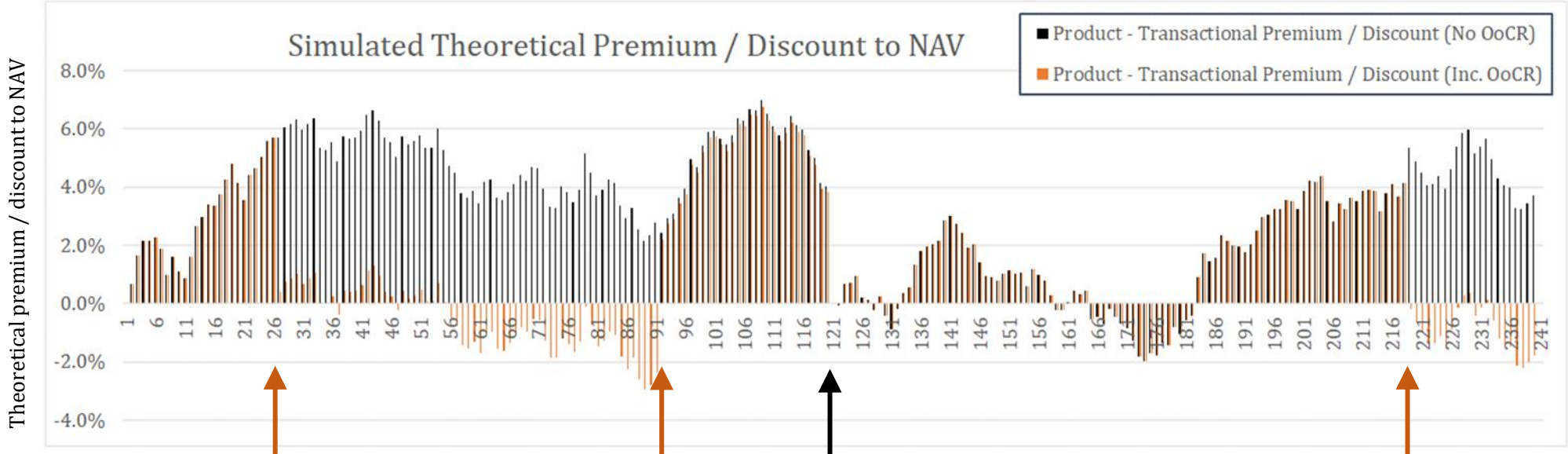
  Step 3: The traditional periodic revaluation process continues.

Case Study 2 – A Single Simulation

A single simulation to illustrate the model

Chart 2: Simulated Theoretical Transacted Premium / Discount to NAV

This chart simulates the possible daily theoretical premium / discount to NAV.



Out-of-cycle revaluation theoretically reduces inequity.

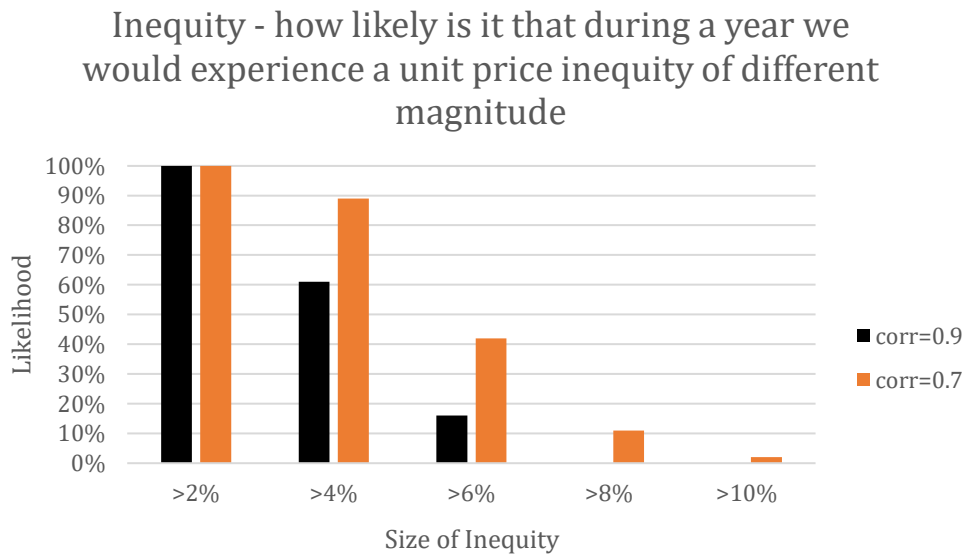
Half-yearly asset re-valuation re-sets premium / discount to zero.

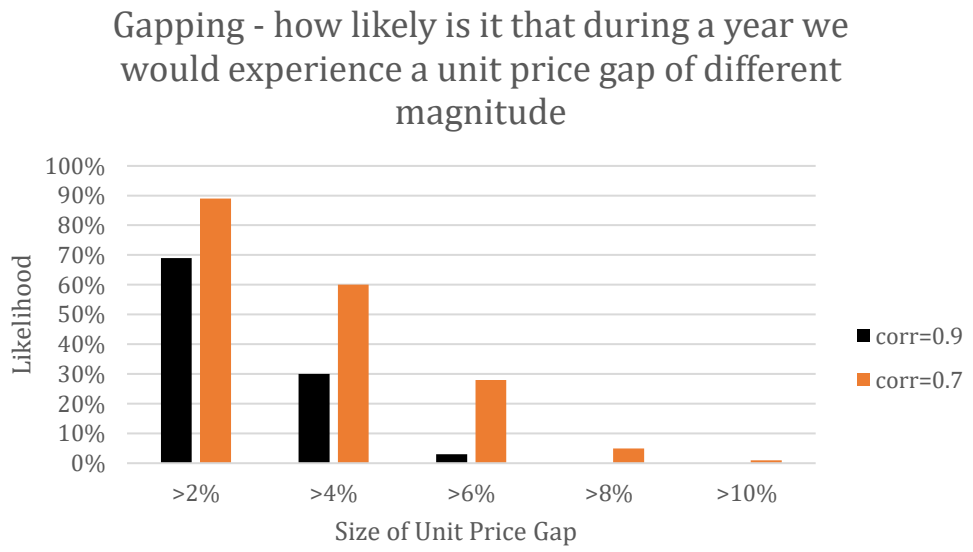
Case Study 2

The output from this case study provides a significant insight:

➔ Liquid proxies are no panacea unless there is high confidence they accurately reflect 'true' illiquid valuations.

- An alternative process where movements in liquid proxies are used to inform a valuation committee may be more appropriate.





Case Study 3 – Exploring Multi-Sector Options

Case Study 3 – Model Explained

- 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

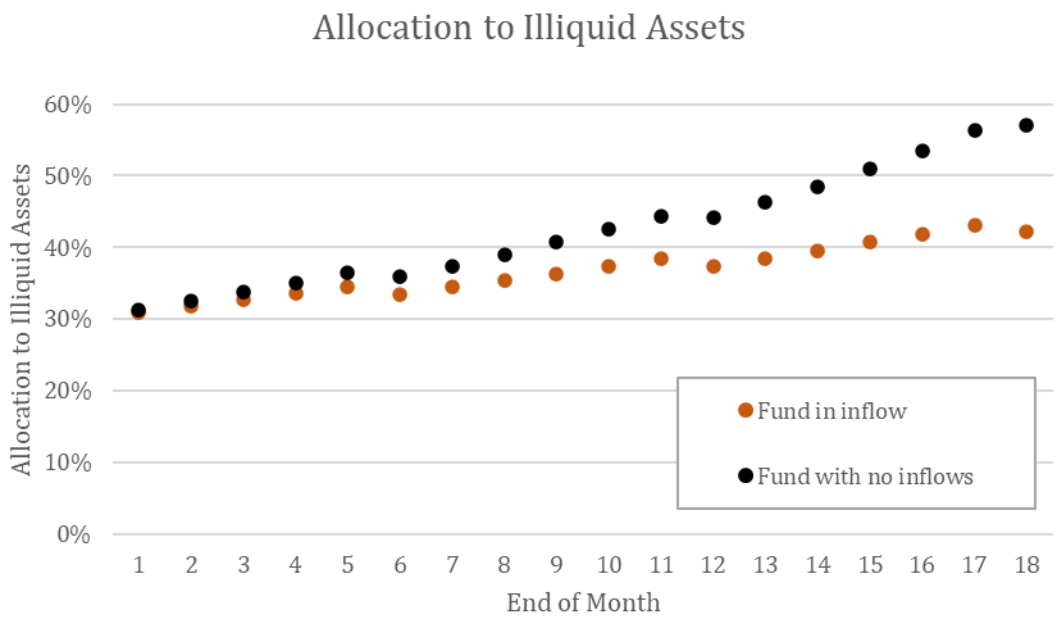
Case Study 3

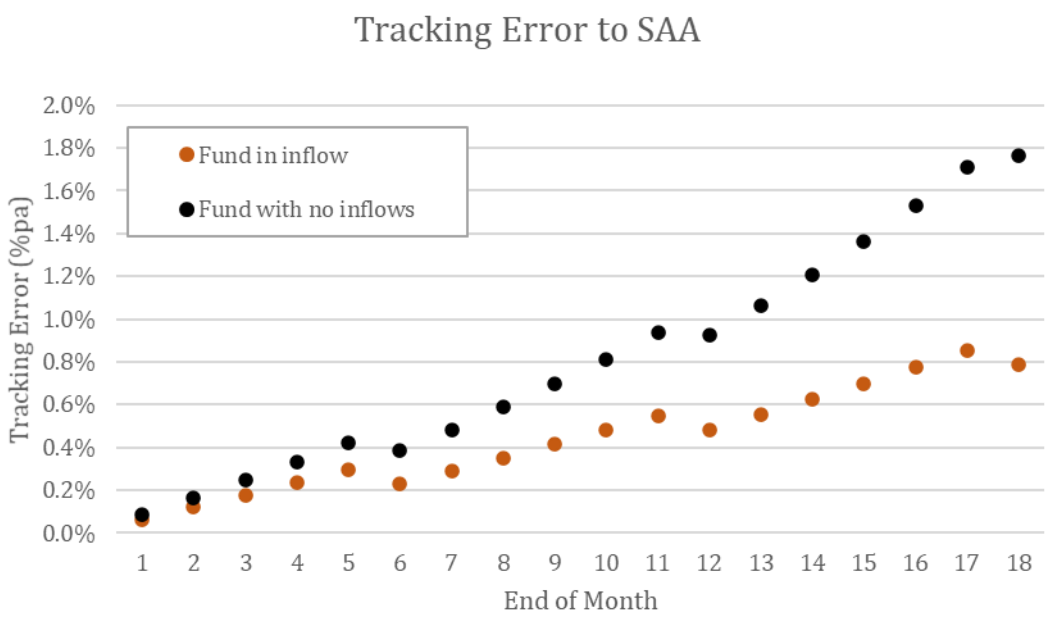
The output from the multi-asset model provides two significant insights:

➔ 1. Fund flows significantly impact the ability to manage the impact of a shock to the system

➔ 2. This highlights the role of fund flow in determining a fund-specific optimal mix of liquid/illiquid investments

Altering inflow assumptions



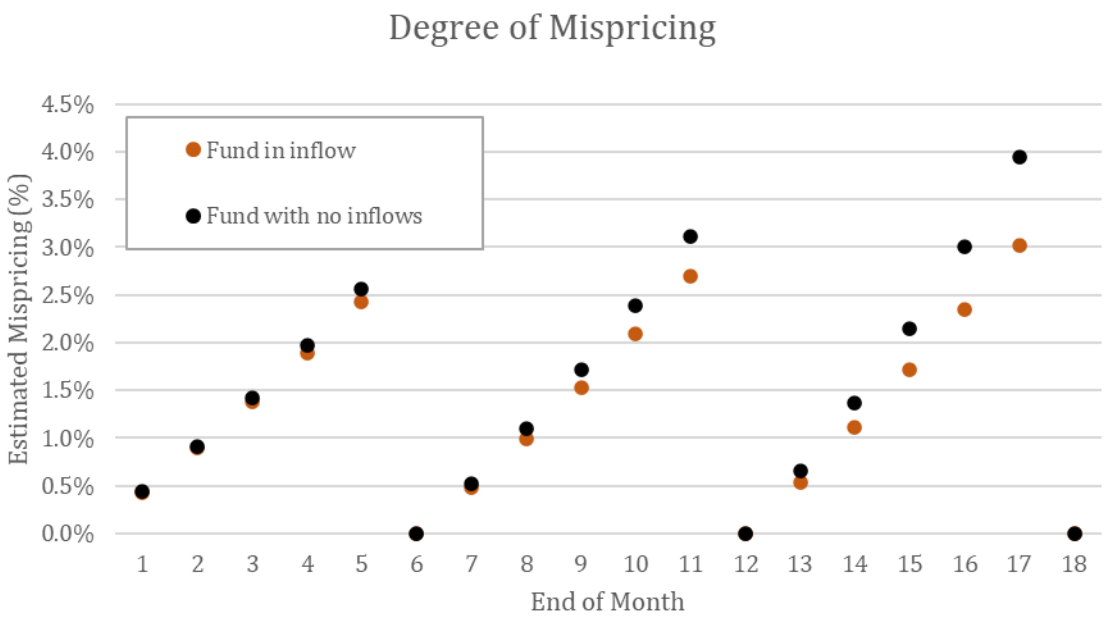


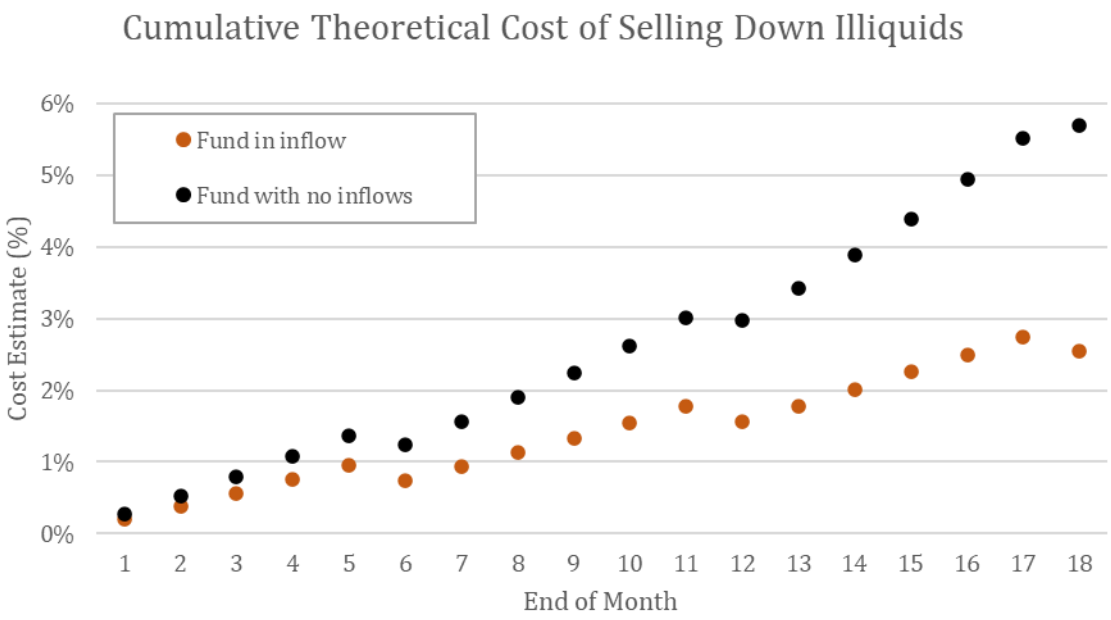
Note: these charts have been created by manually combining the output from the two cases.

Key finding: Funds with lower inflows will experience larger deviations from their targeted allocation to liquid/illiquid investments.

Key finding: As portfolio allocations deviate from their target allocations, risk (as measured by tracking error) increases.

Altering inflow assumptions





Note: these charts have been created by manually combining the output from the two cases.

Key finding: Funds with lower inflows will experience larger mispricings.

Key finding: Funds with lower inflows will bear higher costs of selling down illiquid assets to restore SAA.

Impact of Your Future, Your Super reforms

- 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 models support the consideration of different scenarios related to YFYS impacts. It is important to consider both short-term and ongoing impacts.
- Case Study 3 is most relevant to analysing the impacts of YFYS.

Next Steps

- For super funds which would like to further explore portfolios with illiquid assets:
  - We provide additional resources which allow funds to undertake a deeper analysis based on their own characteristics and assumptions
- The following additional resources are available:
  - A more detailed presentation on each case study
  - Models for each case study
  - Frequently asked questions document
  - Overview presentation video

Further Information

If you have any questions or feedback, please contact:

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