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CFA Societies Australia

Case Study 1
Exploring Single Sector Options

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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.

Single Sector Options

Working definitions

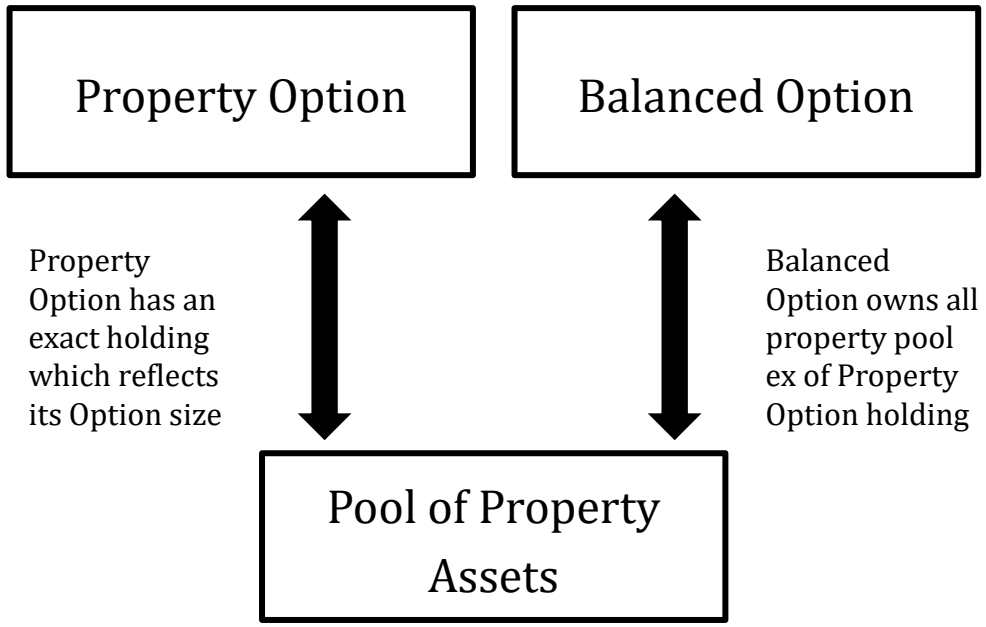
- Single sector option
  - Is assumed to invest some or all assets into a single illiquid asset class (the proportion is a choice parameter)
  - For this Case Study we assume single sector option liquidity is implicitly guaranteed by a large multi-sector option. This is sometimes known in Australia as the ‘banker option’
  - Liquidity frequency and valuation frequency are important choice parameters in the model

Single Sector Options (ctd.)

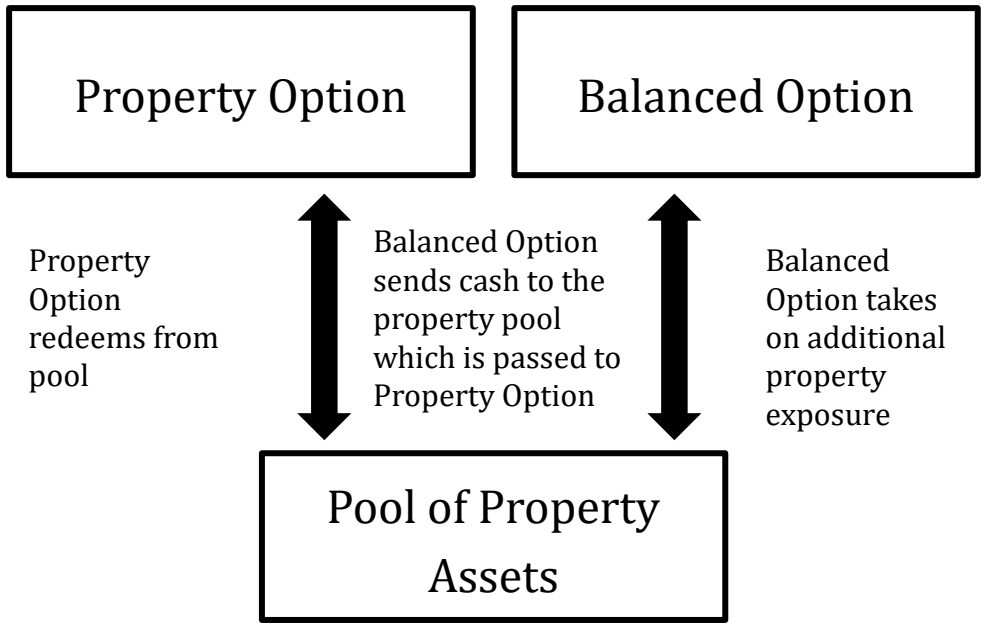
Explaining how the 'banker option' works

- A simplified example of a super fund which only offers a property option and a balanced option

1. Operating Structure



2. Funding a Property Option Redemption



Framing Liquidity Risk

There exists a range of risks associated with portfolios containing illiquid assets.

First Order Risks	Solvency • Ability to meet cashflow demands as they arise		
Second Order Risks	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.)

- The focus of the Single Sector Case Study is on unit price inequities
- 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

Model Explained

We simulate the actual unit price

We simulate the theoretical unit price

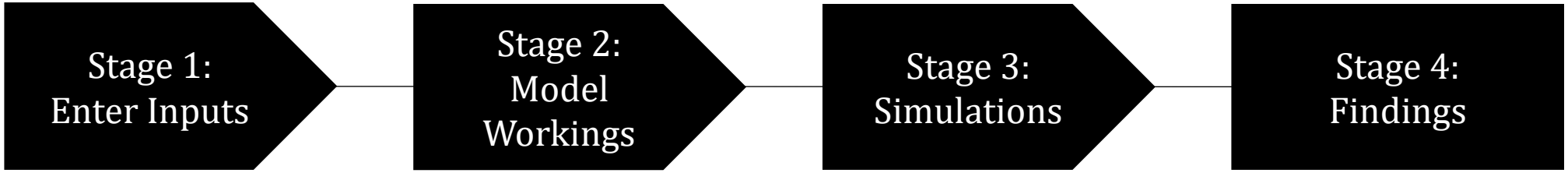
- The difference between (1) and (2) at any point in time represents a simulation of the hypothetical unit price inequity.
- (1) and (2) converge at the time of scheduled valuations, at which point the actual unit price ‘gaps’ to its updated valuation.
- We run many simulations to estimate the distribution 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.

Model Explained

- The model is stochastic i.e. it considers the distribution of possible outcomes
- Based on user inputs the model simulates possible outcomes of inequity and gapping
- Aggregating many simulations provides estimates of likelihood of pre-defined threshold outcomes

Using the Model

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



- Input assumption, product features, and key trustee criteria into the "Inputs" worksheet.
- Only green cells require input.

- Model workings (described in the "Model Description" worksheet) reflect the analytical framework of this research and should be altered only on a very selective basis – namely to support new research projects.

- Simulations can be viewed in the "Interactive Simulations" worksheet. These may assist understanding.
- Hit F9 to generate a new set of simulations.

- Aggregated findings are presented in the "Findings" worksheet.
- It is important to hit the macro button to ensure the results are updated for inputs.

Using the Model - Inputs

Asset Return Characteristics

- Expected return:	
- Income:	4%
- Capital growth:	3%
- Total expected return:	7%
- Volatility:	7% ann.

Income assumed to be accrued into unit price daily.

Portfolio Allocation to Illiquid Assets

Allocation to illiquid assets:	100%

Transaction Frequency

- Transaction frequency (pa):	Monthly

Valuation Framework

- Valuation frequency (pa):	2

Note:
(1) For simplicity we assume a 240 business day year.
(2) For simplicity we assume that there are no distributions.
(3) For simplicity we assume that undertaking a re-valuation is instantaneous.

Trustee concerns

- Trustee is concerned about level of unit price inequity exceeding:	5%
- Trustee is highly concerned about level of unit price inequity exceeding:	10%
- Trustee is concerned about the unit price gapping by:	6%

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

Users may want to be conservative and use a higher than realized volatility to account for autocorrelation in the returns of many illiquid investments.

We assume that application and redemption frequency are the same. We acknowledge that industry practice is often daily liquidity. We use monthly to illustrate the capability of the model.

For illiquid assets.

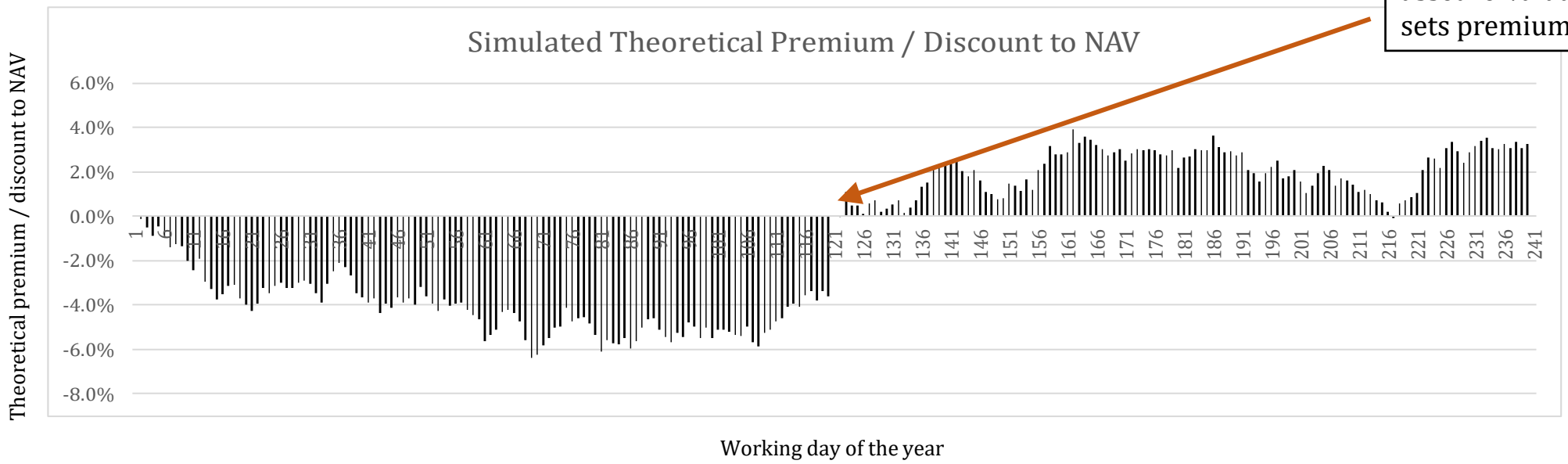
These values are based on anecdotal experience and are not recommendations. The analysis will provide greater insight if based on inputs that a Trustee considers appropriate.

Simulations

Interactive Simulation

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.

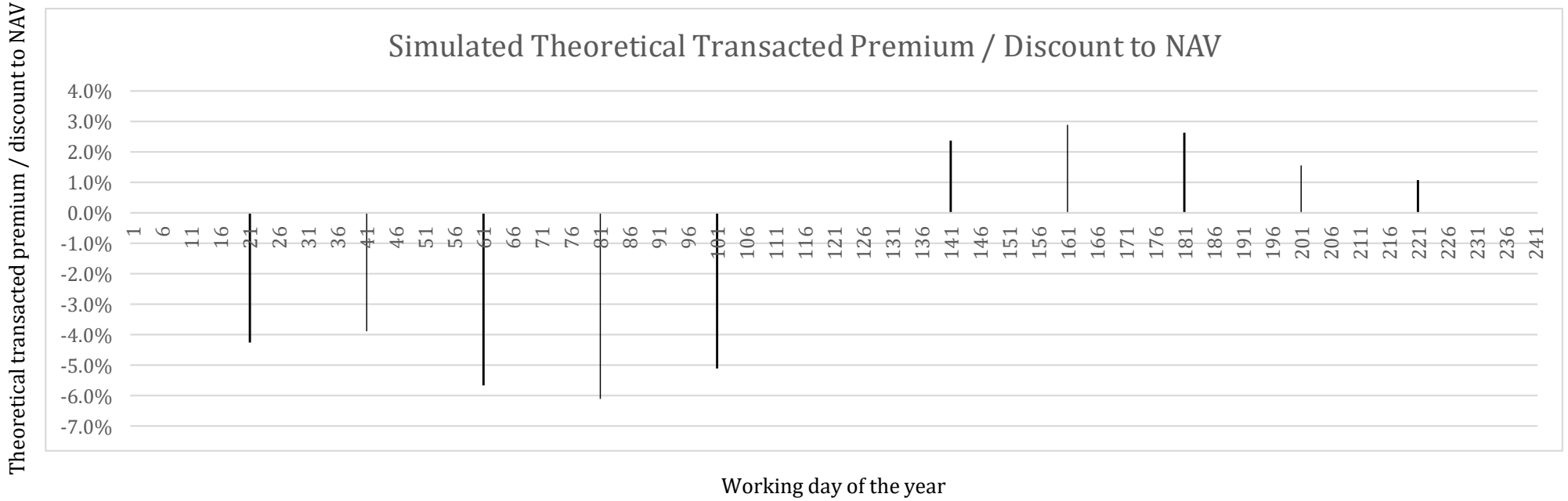
Source: top picture on the worksheet "Interactive Simulations".

Simulations

Interactive Simulation

Chart 2: Simulated Theoretical Transacted Premium / Discount to NAV

This chart simulates the possible theoretical premium / discount to NAV at transaction points.



In this example transactional frequency is monthly.

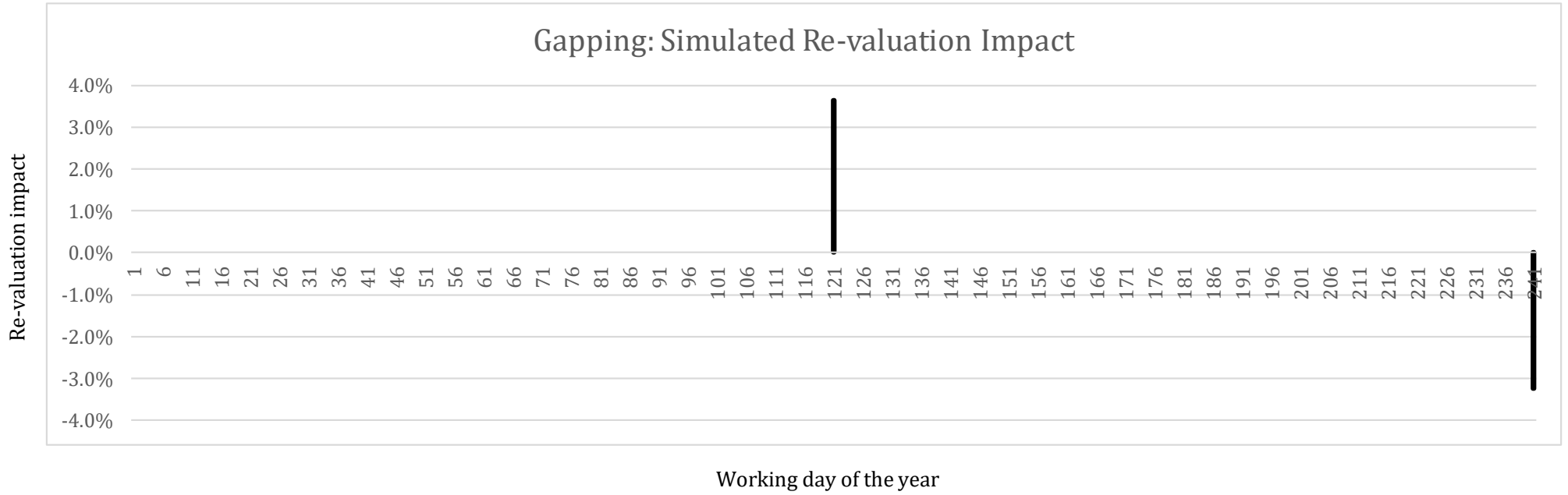
Source: second picture on the worksheet "Interactive Simulations".

Simulations

Interactive Simulation

Chart 3: Gapping: Simulated Re-valuation Impact

This chart simulates the possible impact when the unlisted valuation is updated.



In this example assets are valued twice year.

Source: third picture on the worksheet "Interactive Simulations".

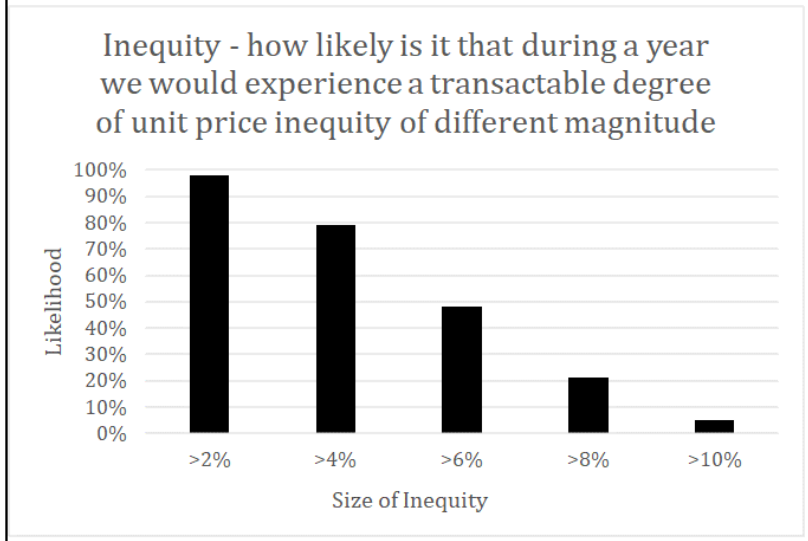
Findings

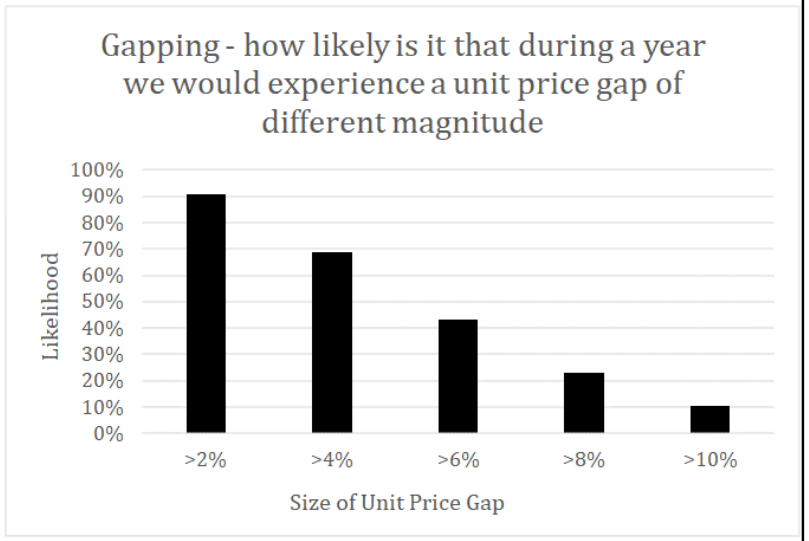
Findings

Trustee Considerations

Recall - Trustee concerns

- Trustee is concerned about members transacting at a level of unit price inequity exceeding 5% during the course of a year.
  ==> The estimated likelihood of this occurring is 71%.
- Trustee is highly concerned about members transacting at a level of unit price inequity exceeding 10% during the course of a year.
  ==> The estimated likelihood of this occurring is 5%.
- Trustee is concerned about the unit price gapping by 6% or more.
  ==> There is an estimated 43% likelihood of this occurring during a year.





The information on the "Findings" worksheet is calibrated to the inputs, including the concern levels. It is based on 100 simulations.

Source: "Findings" worksheet.

Exploring the Model

- The following individual exercises illustrate the model and allow trustees to further explore product design
- Altering inputs allows users to explore the relationship between the input and unit price inequity and gapping outcomes

Exercise (alter these inputs)	Expected Impact on Unit Price Inequity and Gapping
Expected return • Income • Capital gains	• Income has little impact • Positive relationship between expected capital gains and scale of inequity and gapping
Volatility	There is a positive relationship between volatility and the scale of inequity and gapping
Allocation to illiquid assets	There is a direct positive relationship between the level of exposure to illiquid assets and the scale of inequity and gapping
Transaction frequency	There is a complex interaction between transaction frequency and valuation frequency. If they perfectly align then there is no inequity
Valuation frequency	There is a direct positive relationship between valuation frequency and the level of inequity and gapping
Trustee concerns	Setting the concern levels higher will mean these concerns are less likely to be experienced, but does not alter the consumer's possible outcomes

Additional Resources

- The following additional resources are provided:
  - Overview: Exploring Portfolios with Illiquid Assets (presentation)
  - Accompanying model: Model 1: Exploring Single Sector Options. The worksheet “Model Description” provides additional detail (spreadsheet)
  - Frequently Asked Questions (document)

Further Information

If you have any questions or feedback, please contact:

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