

Tools to Explore Portfolios with Illiquid Assets

Working version of an ongoing project.

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Disclaimer

The authors acknowledge the support of the Conexus Institute and the CFA institute.

This presentation and supporting research reflect the views of the authors and do not reflect the views of the Conexus Institute and the CFA institute.

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.

The Issues

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

- How do you define acceptable portfolio quality?
- When does the performance impact of providing liquidity and restoring portfolio quality become unreasonable?
- 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)

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.

Outcome

Aim: to provide a set of framework tools which assist funds in how they explore and formalise the investment governance challenges associated with illiquid assets.

The tools are 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 minimum standards for super funds

Models

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

A case study follows each of these models that highlights a specific issue.

Single Option – No Liquid Proxy

- This model explores the unit price inequality and price gapping potential for a single sector option investing 100% into an unlisted asset.

Single Option – With Liquid Proxy

- This model explores the unit price inequality and price gapping potential for a single sector option investing 100% into an unlisted asset in the special case that a liquid proxy is used to trigger out-of-cycle revaluations.

Multi Asset

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

Case Study 1 – Model Explained

1

We simulate the actual unit price

We accrue income and incorporate scheduled valuations

2

We simulate the theoretical unit price

We accrue income and incorporate hypothetical daily valuations

- 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
- By running many simulations we can estimate the distribution of unit price inequities and unit price gapping outcomes
- Acceptable portfolio quality is based on the level and frequency of inequities reaching a user defined threshold. Though the thresholds are variable, one can still rank alternative policies

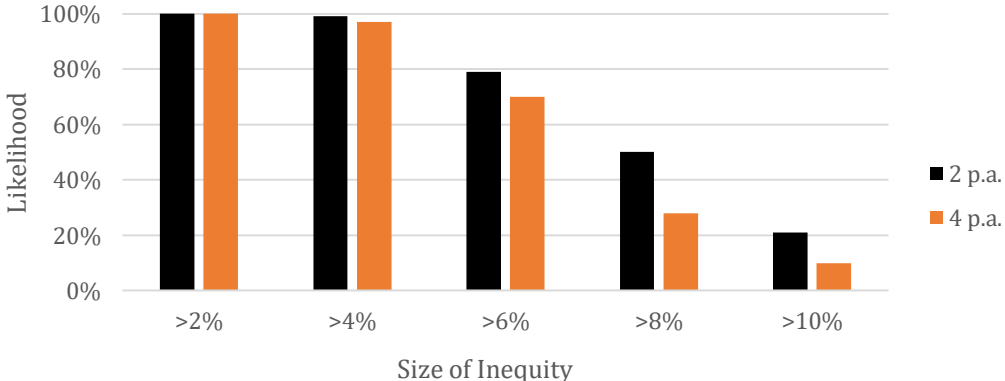
Case Study 1

The output from this case study provides a significant insight:

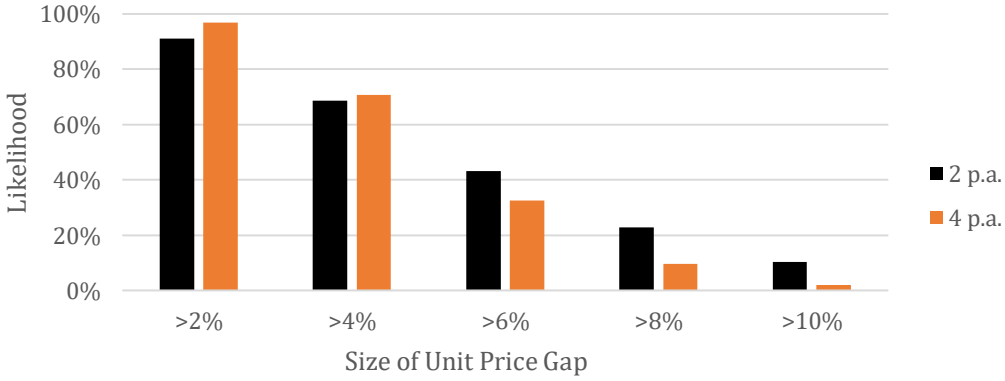
1

More frequent valuations are beneficial but significant inequities and gapping persists.

Inequity - how likely is it that during a year we would experience a unit price inequity of different magnitude



Gapping - how likely is it that during a year we would experience a unit price gap of different magnitude



Case Study 2 – Model Explained

We simulate the actual unit price

1

We accrue income and incorporate scheduled valuations.

We also conduct an out-of-cycle revaluation whenever movement in a liquid proxy reaches a pre-determined operational ‘trigger’ level

2

We simulate the hypothetical unit price

The theoretical unit price is the true instantaneous market price of the assets excluding any market frictions like valuation delays

- The difference between (1) and (2) at any point in time represents 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
- By running many simulations we can estimate the distribution of unit price inequities and unit price gapping outcomes
- The parameters of the model (e.g. valuation frequency) can be altered to explore the characteristics of inequities and gaps

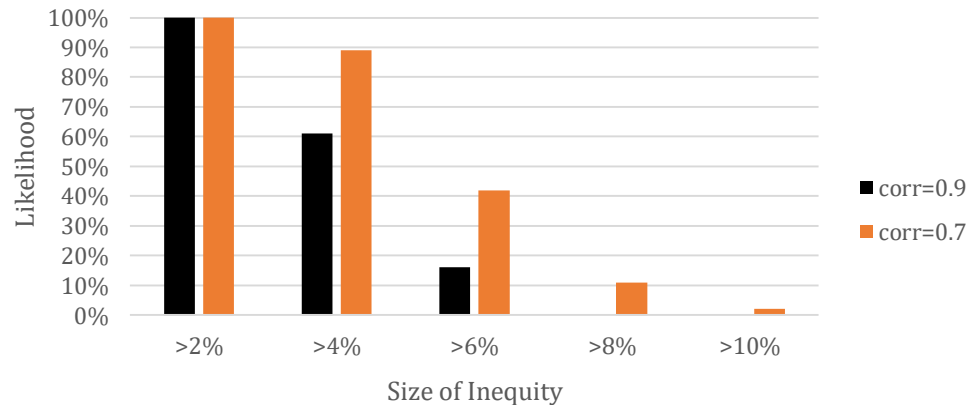
Case Study 2

The output from this case study provides a significant insight:

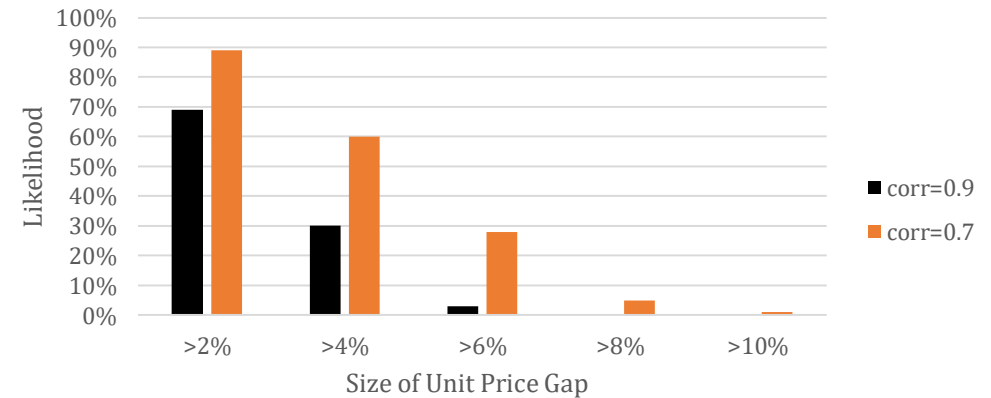
1

Liquid price proxies are not a panacea unless there is high confidence they accurately reflect 'true' illiquid valuations.

Inequity - how likely is it that during a year we would experience a unit price inequity of different magnitude



Gapping - how likely is it that during a year we would experience a unit price gap of different magnitude



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:

- 1 Calculate market impact on portfolio exposures**
 - 2 Account for cashflow demands**
 - 3 We 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
 - The parameters of the specified event (e.g. market event and member activity) and the steady state (e.g. long-term return expectations and member flows) can be altered to explore the impact on portfolio characteristics, given a fund's unique profile, through the specified event.

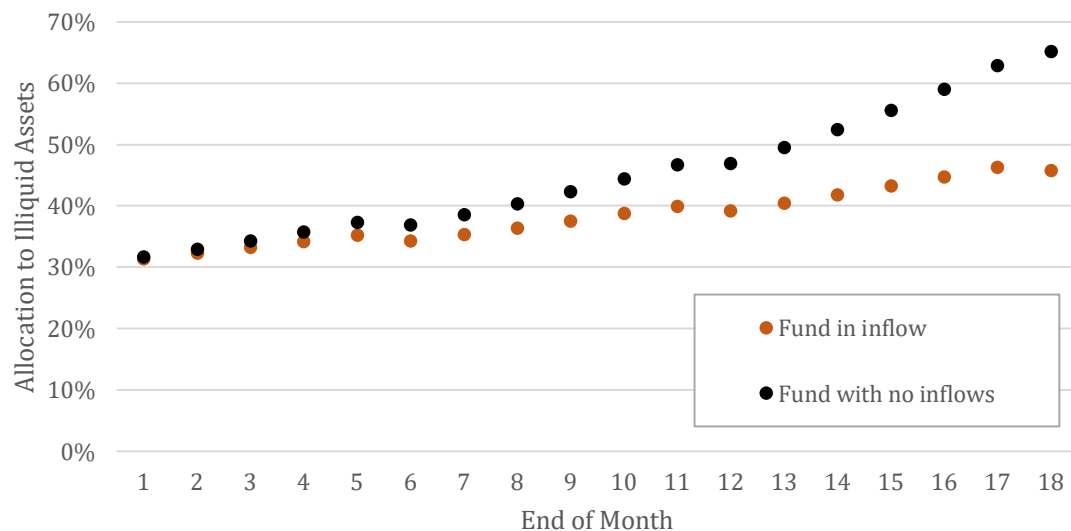
Case Study 3

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

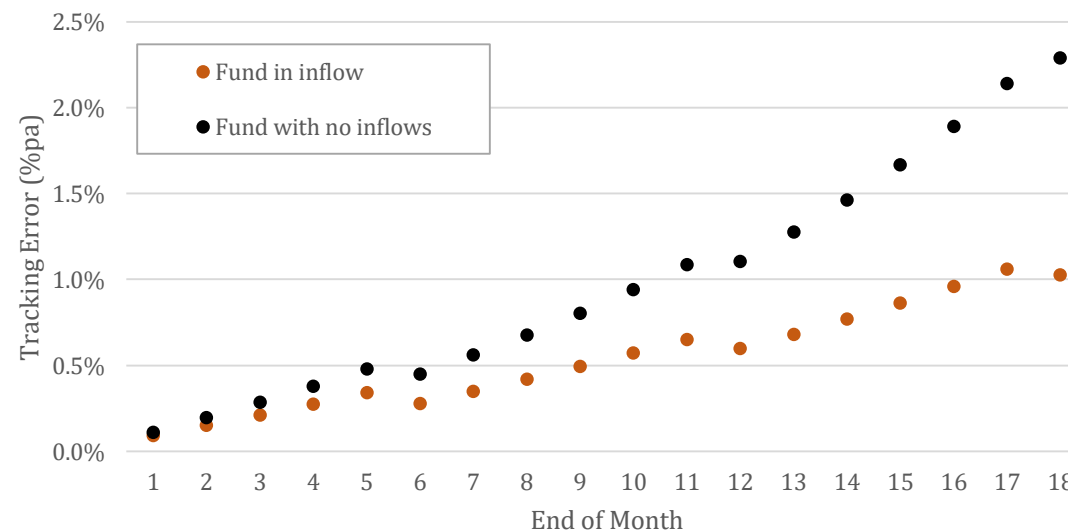
- 1 Fund flows significantly impact the ability to manage the impact of a shock to the system.
- 2 This highlights their distinguishing role in determining a fund specific optimal mix of liquid/illiquid investments

Altering inflow assumptions

Allocation to Illiquid Assets



Tracking Error to SAA



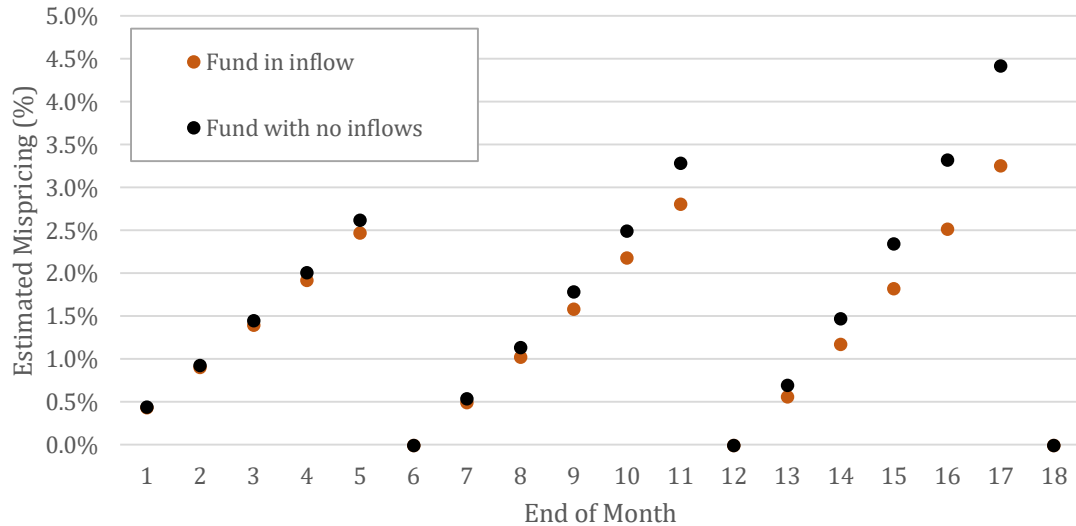
Note: these charts have been created by manually combining the output from the two cases.

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

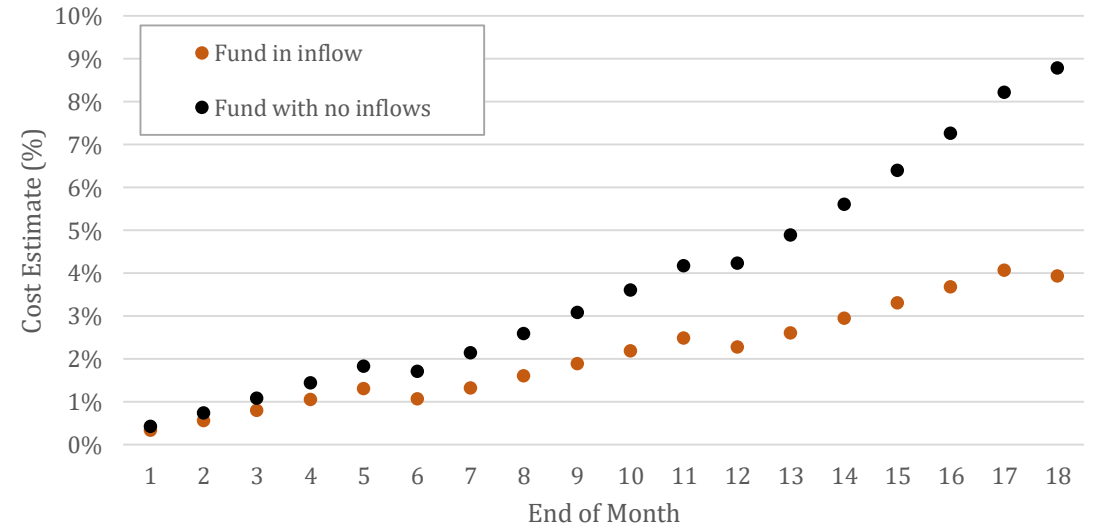
Key finding: As portfolio allocations deviate from their target allocations, risk (as measured by tracking error) increases

Altering inflow assumptions

Degree of Mispricing



Cumulative Theoretical Cost of Selling Down Illiquids



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

Further Research

Product Design

- *Can we modify product design to mitigate some issues we have presented?*
- Should fund buy/sell spreads be variable?
- What are fair redemption rules?
- Should industry fund product follow the same rules as retail products?

Governance

- *How can we enhance our governance guidelines to mitigate issues we have presented?*
- Are trustees privy to non public pricing information and what would this imply for their personal trading reporting requirements?
- How should stale pricing be managed and what disclosure requirements might mitigate information asymmetries with the public?

Public policy

- *How can public policy mitigate the inequities uncovered?*
- Do we have a market failure? Do we need a special organized exchange for illiquid assets?
- What is the trade-off between maximizing the capture of the liquidity premium vs the AA rebalancing costs – who should bear those costs?

Further Information

The models have been designed to encourage conversation and stimulate discussion.

If you would like to have a chat on the information or models, please reach out to:

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