

MEMORANDUM

To: Investment Company Liquidity Disclosure Proposal File (File No. S7-04-18)

From: Zeena Abdul-Rahman
Senior Counsel, Division of Investment Management

Date: June 20, 2018

Re: Meeting with Representatives of MSCI regarding Investment Company Liquidity Disclosure

On June 20, 2018, Dalia Blass (Director, Division of Investment Management (“IM”)), Sarah ten Siethoff (Associate Director, IM), Melissa Gainor (Senior Special Counsel, IM), Thoreau Bartmann (Senior Special Counsel, IM), Timothy Husson (Associate Director, IM), Timothy Dulaney (Senior Financial Analyst, IM), Zeena Abdul-Rahman (Senior Counsel, IM), and James McLoughlin (Financial Economist, Division of Economic and Risk Analysis) met with Carlo Acerbi (Managing Director), Robert Gutowski (Managing Director), and Brian Bailey (Managing Director) of MSCI.

Among other things, the parties discussed the Commission’s proposal on investment company liquidity disclosure.

QUANTIFYING INVESTOR DILUTION

Presentation at the SEC, Washington D.C., 20/06/2018

Carlo Acerbi

OUTLINE OF TODAY'S DISCUSSION

- **Investor dilution**
 - Definition
 - Intuition
- **Contingent mitigants**
 - Common market practices
 - Contingent fees
- **Dilution diagnostics: bid/ask only**
 - Dilution rate; fair fee level; breakeven holding period
 - Ex-ante, Ex-post
- **Dilution diagnostics: adding market impact**
- **Conclusions**

INVESTOR DILUTION

- Definition
- Intuitions
- Questions

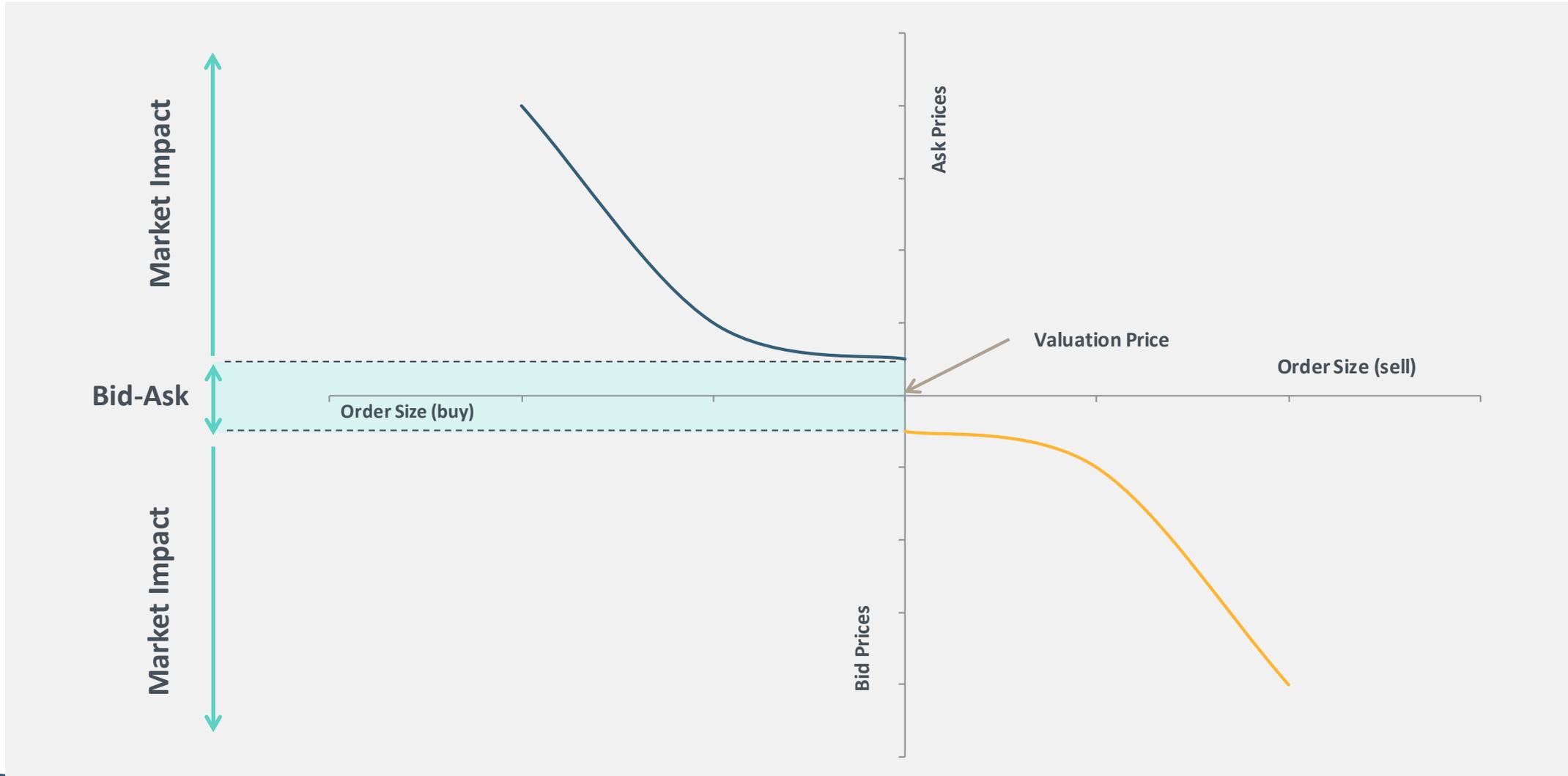
SEC RULE 22E-4: MOTIVATIONS

- **Sep 2015: SEC Rule motivations**
 - “The role of fund liquidity management in reducing the risk that a fund will be unable to meet its obligations to redeeming shareholders while also minimizing the impact of those redemptions on the fund (i.e., mitigating investor dilution) is becoming more important than ever.”
- **We see:**
 - A time problem: funds must be able to redeem in time ...
 - A cost problem: ... without passing transaction costs to others
- **SEC proposed solutions:**
 - Time-to-liquidation bucketing (deadline Jun 2019)
 - Opening to swing pricing (i.e. large redemption fees hidden in daily NAV)

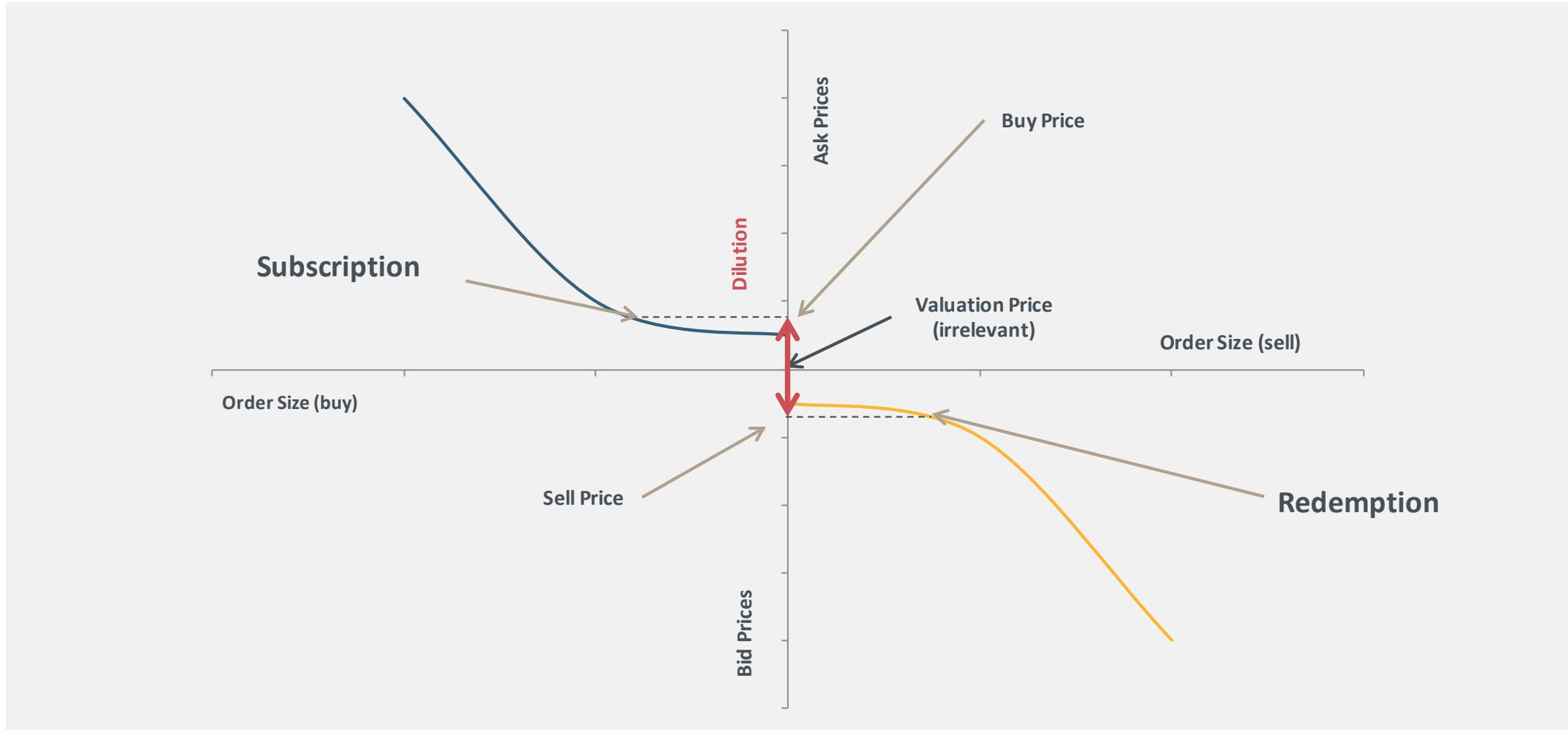
LIQUIDITY RISK MANAGEMENT PROGRAMS (LMRP)

- **The SEC requires funds to define a “LRMP” by Dec 2018**
 - Funds to discuss own liquidity risk and how they manage it
- **What should a fund do?**
 - Quantify fund “dilution” (predicted and realized)
 - Justify the adopted level of “liquidity tools” or “mitigants”
- **This requires**
 - Diagnostics of dilution
 - Appropriate liquidity analytics
- **IOSCO global recommendations go in the same direction: funds should reduce dilution by most appropriate tools available in their jurisdictions**
 - Principles-based regulation

INVESTOR DILUTION BASICS: FUND 'ORDER BOOK'



INVESTMENT LIFECYCLE (UNMATCHED ORDER)



BID/ASK VS MARKET IMPACT EFFECTS

Dilution occurs any time realized prices are different from valuation prices

The cost is paid by all other shareholders

Bid/Ask Spread Effects

- Causes:
 - Any subscription/redemption
 - Exacerbated by high turnover, short term investments
- Steady erosion of performance at every deal
- Less spectacular, not less harmful
 - Long term reputational risk (tracking error)
- ‘Undiversifiable’
- Low model-risk
- Mitigants: fees, “total” swing pricing, dual pricing, in-kind redemptions

Market Impact

- Causes:
 - Large individual, net redemptions *or* subscriptions
 - Large net, crowded, redemptions. Bad timing
- Episodic big dilution events
- Spectacular NAV drops
 - Sudden reputational risk
- ‘Diversifiable’ by fragmenting orders
- High model-risk
- Mitigants: “partial” swing pricing, dilution levies

QUESTIONS: WHO WINS? WHO LOSES?

In absence of mitigants (i.e. fees, swing pricing, levies, dual pricing, etc.)

- Any subscription/redemption costs are charged on the whole fund
- But this occurs to any investor: a fair game?
- If not fair
 - who wins? who loses?
 - how much?
 - is the fund performance affected?
 - how much?
 - is there a level of mitigants that would make it fair?

INTUITION: QUALITATIVE ANSWERS

- **Dilution is unfair for investors**
 - The fund performance is negatively affected by a dilution rate
- **Every investor**
 - Gets a one-off bonus
 - Pays a daily hidden fee
- **The longer your holding period the higher you pay**
 - Becomes a loss beyond some breakeven holding period

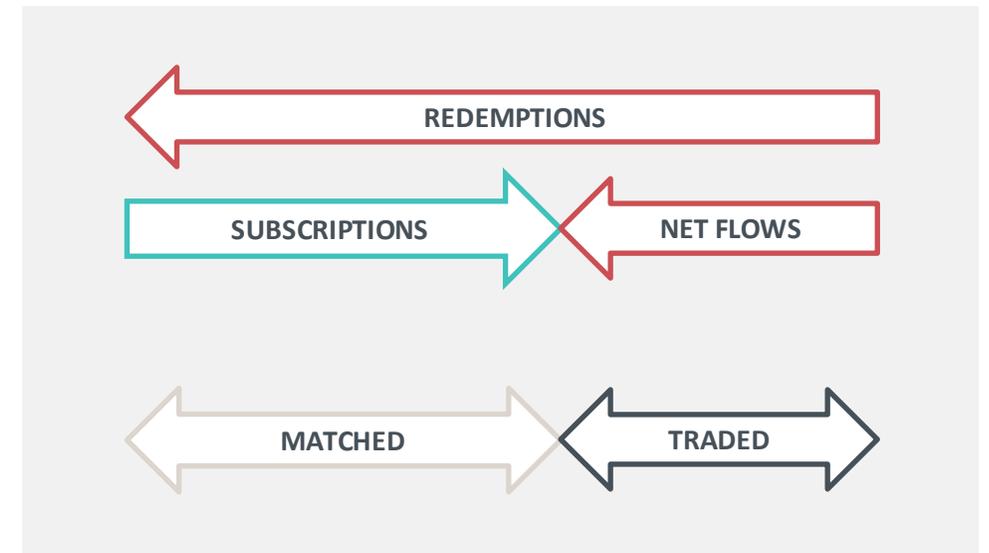
**Longer term investors pay
shorter term investors**

QUESTIONS: FAIR ROUNDTRIP COST IN A FUND

- **The roundtrip cost of an isolated investor is the whole bid/ask spread (β)**
 - Or higher in presence of large orders
- **Are there mutual advantages from investing collectively?**
 - What is the fair roundtrip cost for investors in a fund?

INTUITION: QUALITATIVE ANSWERS

- **Fund transaction costs are reduced by order matching**
 - Matched orders result in shares just handed round
 - Only net flows produce actual market transactions
- **The fair roundtrip transaction cost should be lower than β on average**
 - β minus some sort of “matching rebate”
- **At a given day, a natural criterion could be**
 - Contrarian orders provide liquidity
 - Should be exempted from any cost
 - Mainstream orders take liquidity
 - Should share the costs of net transactions only



CONTINGENT MITIGANTS

- Common liquidity tools
- Contingent fees

FEES: CLARIFICATION

- Hereafter by fee we generically intend any liquidity tools (actual fees, swing pricing, levies, dual pricing, ...) in the form of payments to the fund
- We do not mean performance fees, i.e. a payment to the manager

CONTINGENT MITIGANTS

- “Contingent mitigants”: liquidity tools calculated based on the day’s flows
- We define an hypothetical “contingent fee” that implements our criterion exactly

- Exit fees:

$$f_t^{out} = \frac{\beta}{2} \frac{R_t^{net}}{R_t} \in \left[0, \frac{\beta}{2}\right]$$

- Entrance fees

$$f_t^{in} = \frac{\beta}{2} \frac{S_t^{net}}{S_t} \in \left[0, \frac{\beta}{2}\right]$$

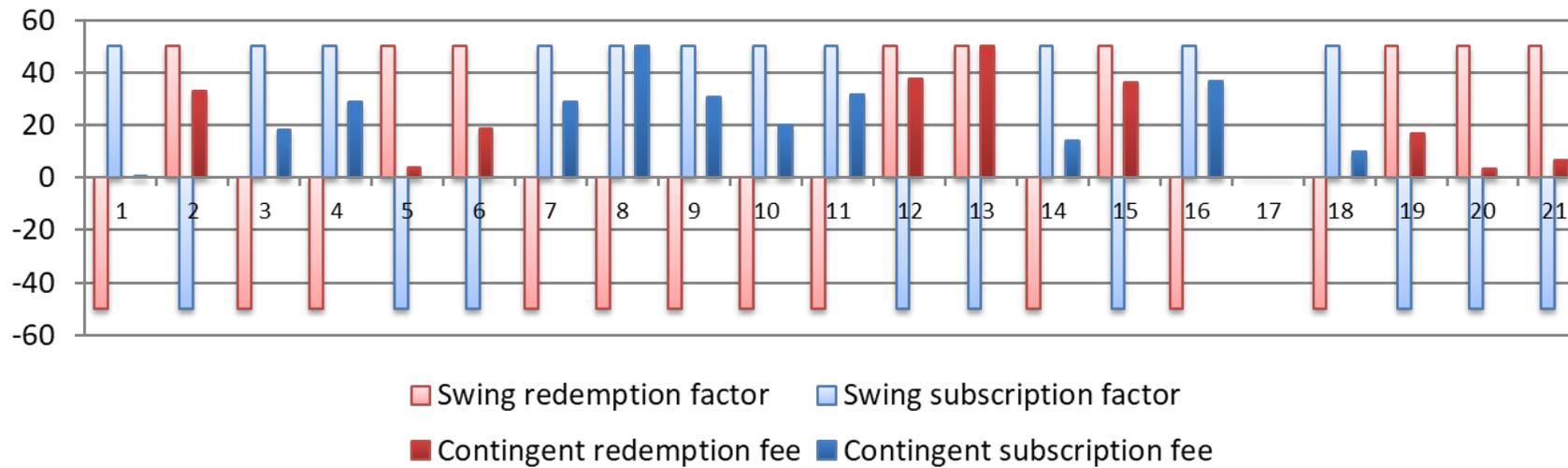
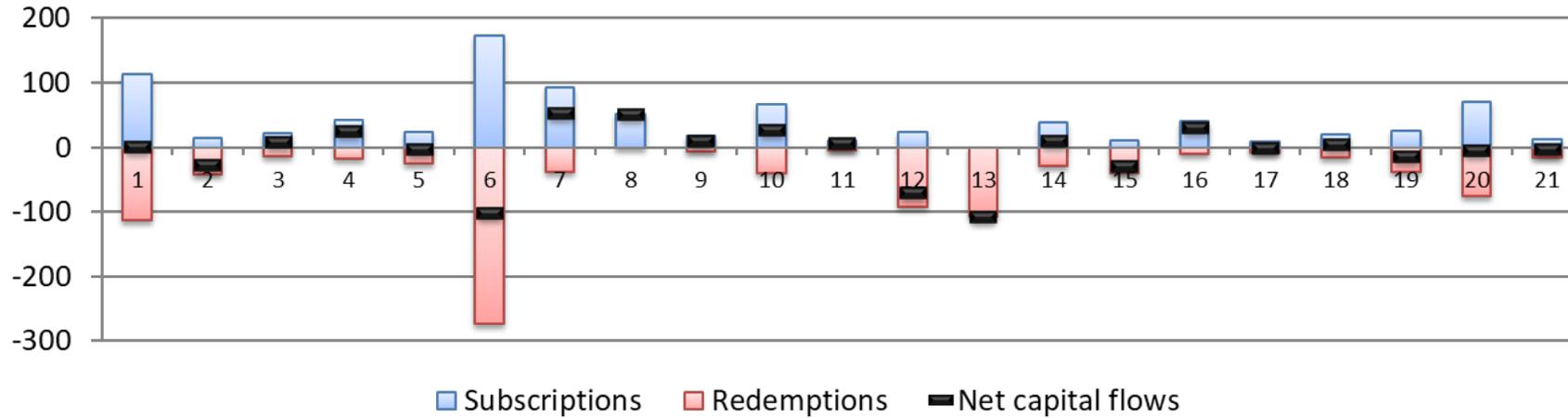
- Contingent fees would compensate transaction cost exactly, day by day
 - For the moment we treat them as a mathematical concept only
- We compare these fees with existing mitigants in the market practice

BID/ASK SPREAD CONTINGENT MITIGANTS

- **Example: negative net flows**
 - redemptions exceed subscriptions ($R_t > S_t$) on day t

	Contingent fees (hypothetical)	Total swing pricing
<i>NAV</i>	Public <i>NAV</i> unaffected (= mid price)	Public <i>NAV</i> shifted down by $\frac{\beta}{2}$ to bid
How it works	Entrance fee = 0 Exit fee = $\frac{\beta}{2} * \frac{ R-S }{R} < \frac{\beta}{2}$	Redemptions and subscriptions executed at same (shifted) <i>NAV</i> Entrance <u>bonus</u> = $\frac{\beta}{2}$ Exit fee = $\frac{\beta}{2}$
Effective redemption or subscription price	<ul style="list-style-type: none"> • Subscriptions at mid • Redemptions between mid and bid 	<ul style="list-style-type: none"> • Subscriptions at <u>bid</u> (!) • Redemptions at bid
Consequence	<ul style="list-style-type: none"> • Subscribers exempted from any costs • Redeemers bear only costs of net redemptions 	<ul style="list-style-type: none"> • Subscribers rewarded as if <u>external</u> liquidity providers • Redeemers bear full costs of <u>gross</u> redemptions
Cons		<ul style="list-style-type: none"> • Matching effects not exploited: too much money circulates • Public <i>NAV</i> displays artefact volatility

CONTINGENT FEES VS TOTAL SWING PRICING



MARKET IMPACT CONTINGENT MITIGANTS

- **Example: large negative net flows**

- Redemptions exceed subscriptions ($R_t > S_t$) on day t
- Net redemptions exceed a certain threshold $|R_t - S_t| > x\%$

	Anti-dilution levies	Partial swing pricing
<i>NAV</i>	Public <i>NAV</i> unaffected (= mid price)	Public <i>NAV</i> shifted down by a “swing factor” F
How it works	Individual large redemptions fees F	Redemptions and subscriptions executed at (shifted) <i>NAV</i>
Effective redemption or subscription price	<ul style="list-style-type: none"> • Large redemptions at mid $- F$ • All other orders at mid 	<ul style="list-style-type: none"> • Subscriptions at mid $- F$ • All redemptions at mid $- F$
Consequence	<ul style="list-style-type: none"> • Only individual large redemptions pay a fee 	<ul style="list-style-type: none"> • Subscribers rewarded as if external liquidity providers • All redemptions pay same fee, regardless of individual size
Cons		<ul style="list-style-type: none"> • Same cons as total swing pricing • Small redemptions hit as large ones

SWING PRICING IN U.S. – OPERATIONAL IMPEDIMENTS

- **Swing pricing has existed in Europe for many years**
- **Despite the SEC's 2016 opening, many U.S. AMs cannot use swing pricing**
 - Closing time for NAV is 4pm
 - With swing pricing, NAV is a function of flows
 - In the presence of intermediaries exact flows are known only several hours later
- **For details see “*Evaluating swing pricing: operational considerations*” Investment Company Institute, Nov 2016**
- **The problem affects partial and total swing pricing alike (not clear if also contingent fees)**
 - A solution to the problem requires revisiting the entire U.S. fund industry distribution structure
 - Otherwise funds can only use flat mitigants (fixed fees, large redemption fees, levies, etc.)

DILUTION DIAGNOSTICS

Bid/ask effects only

MODELING CAPITAL FLOWS

- We assume that β is known and constant
- We model the joint distribution of flows (S_t, R_t)
 - Examples:
 - historical resampling
 - from absolute or relative flows...
 - exponentially weighted
 - parametric models, etc.
- Model diagnostics: ex-ante, forward looking diagnostics
- Replacing expectations with historical averages : ex-post, realized diagnostics

DIAGNOSTICS: BID/ASK EFFECTS

- **We propose the following diagnostics**
 - Dilution rate: expected negative performance rate
 - Objective: should be set to zero by adoption of mitigants
 - Fair fee level: correct level of mitigants (expressed in form of flat fees) that neutralize dilution rate
 - Split into a redemption and a subscription component
 - Breakeven holding period beyond which an investment pays more transaction costs than it should, and subsidizes shorter investments
 - Objective: there should be no breakeven holding period at all

DILUTION RATE

- **Dilution rate: expected negative return from dilution effects**

$$\theta \simeq \boxed{-\frac{\beta}{2} \mathbb{E} \left[\frac{|S - R|}{N} \right]} + \mathbb{E} \left[\frac{\text{mitigants}}{N} \right]$$

- **Large when:**

- β is large
- Net turnover is large
 - Herded collective behaviour
 - Investor base concentrated
 - Short average holding period

Without any mitigants

- **Possibly negligible for huge funds investing in liquid assets with diversified long term investor base, etc...**

FAIR FEE LEVEL

- Fair fee level: $f = f^{in} + f^{out}$

$$f^{out} = \frac{\beta}{2} \frac{\mathbb{E}[R^{net}]}{\mathbb{E}[R]} < \frac{\beta}{2}$$

$$f^{in} = \frac{\beta}{2} \frac{\mathbb{E}[S^{net}]}{\mathbb{E}[S]} < \frac{\beta}{2}$$

- “Fair” because
 - If adopted as flat fees, would make $\mathbb{E}[\theta] = 0$ exactly
 - All investors pay the same

$$f = f^{in} + f^{out} \leq \beta$$

- regardless of holding period

DILUTION DIAGNOSTICS – BID/ASK EFFECTS

- Breakeven holding period (in absence of mitigants)
- $\Delta t^* = \frac{f^{in} + f^{out}}{-\theta}$
 - $\Delta t > \Delta t^*$: loss
 - $\Delta t < \Delta t^*$: gain
- **If the actual level of mitigants is**
 - too low: long term investors subsidize short term investors
 - too high: short term investors subsidize long term investors
 - just right: $\Delta t^* = NaN$; nobody subsidizes anybody

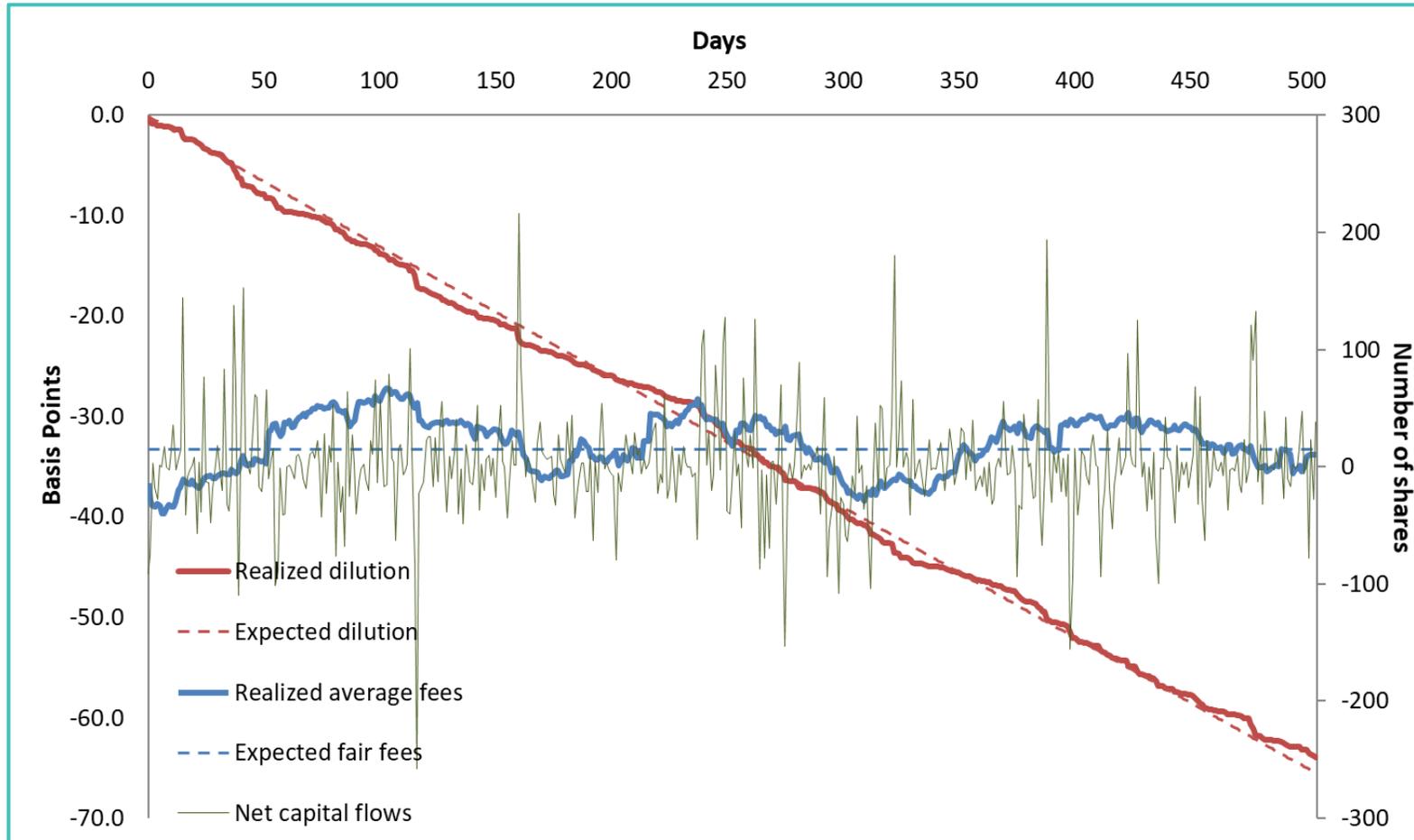
ARE FEES A COST?

- **Equitable fees (from any type of mitigants) are an illusory cost. If everybody pays the right amount, nobody pays anything to anybody**
 - Big education challenge for the industry: explain it to investors
- **Importantly**
 - Fees are bounded. At worst an investor pays bid/ask spread
 - Dilution effects are unbounded. A cumulative invisible “daily fee” has no upper limit in the economic effects of a long term investor
- **Conclusion: investors should be afraid of dilution, not of fees**

Fees are an entrance ticket to a fair game

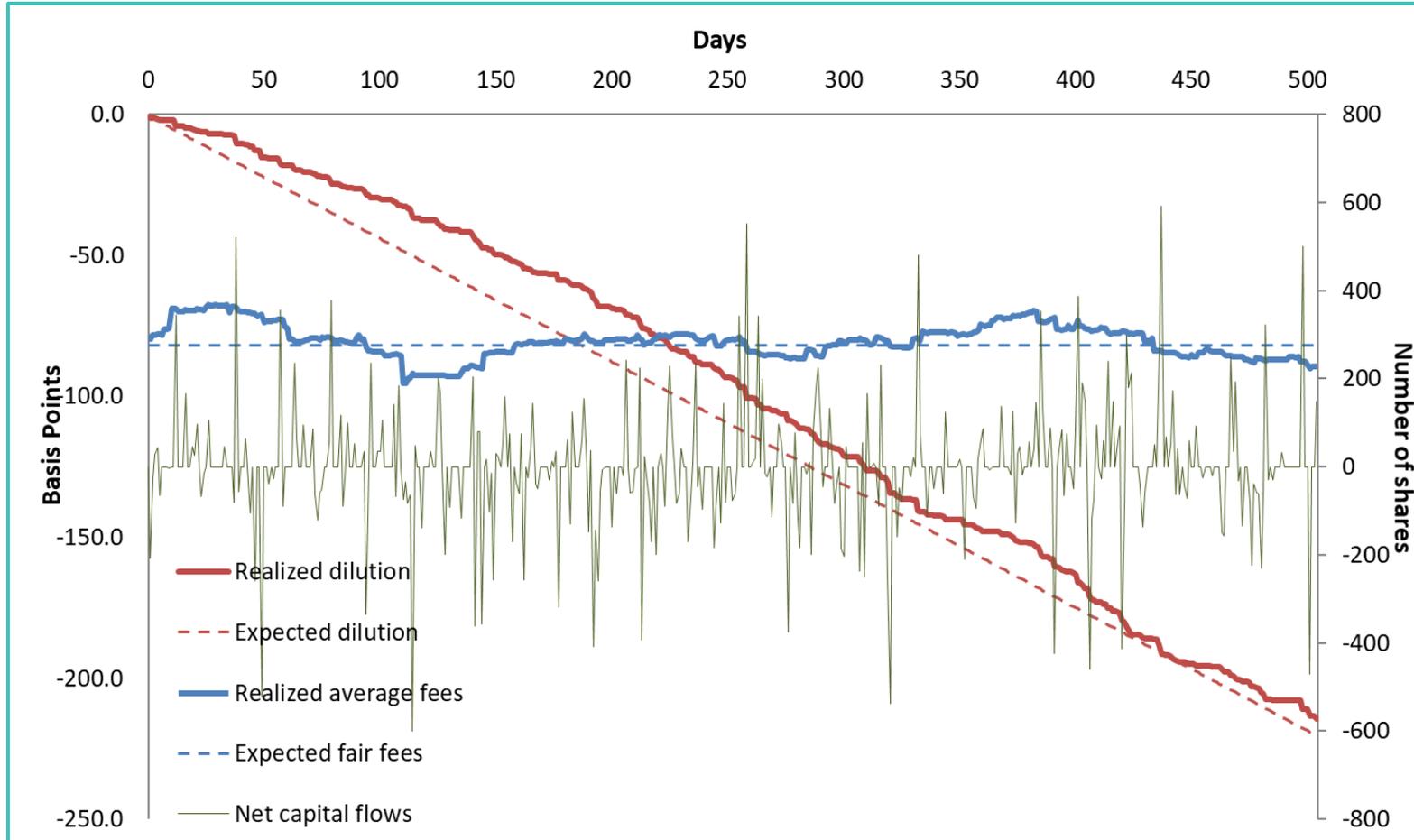
No fees make the game rigged

EXAMPLE



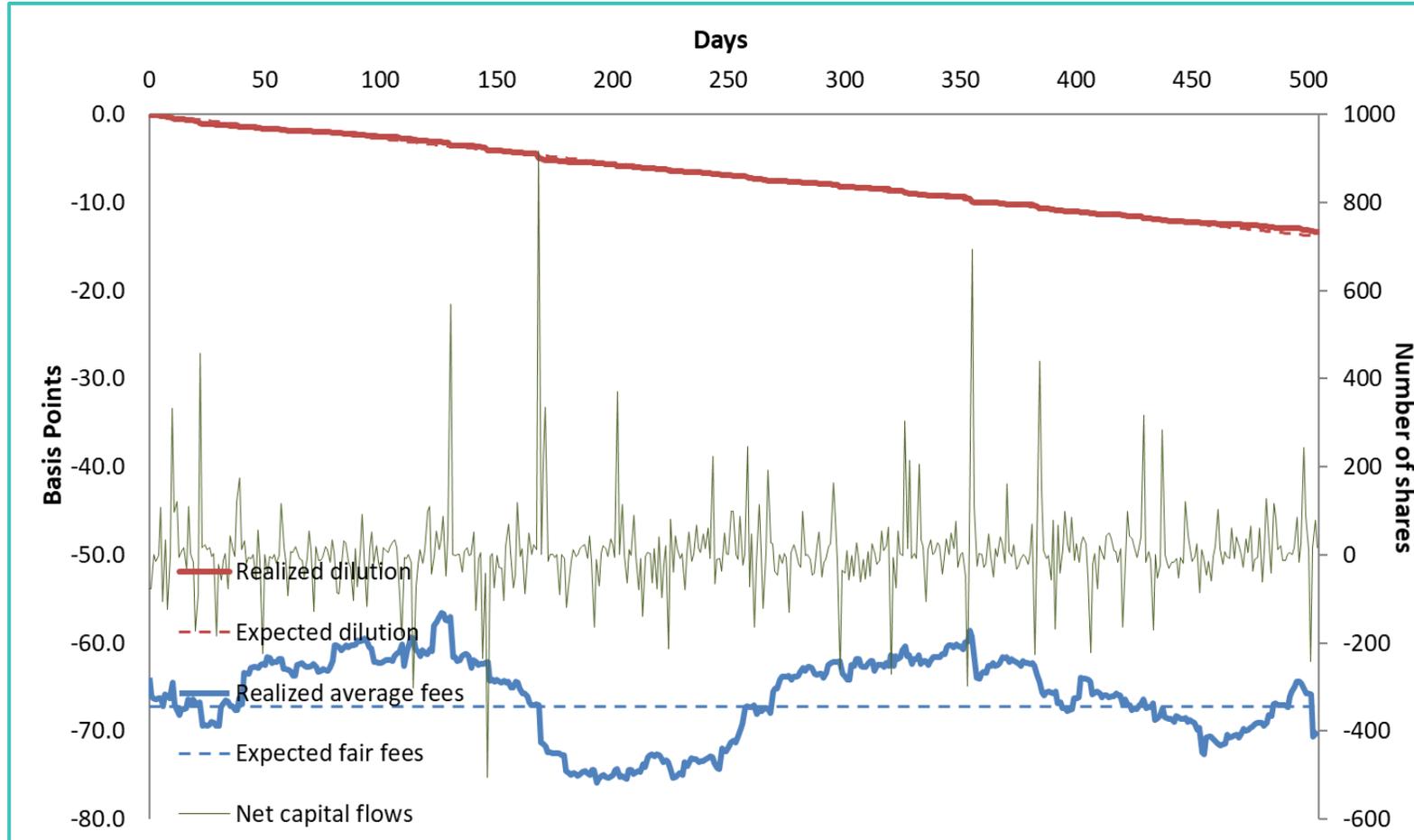
$\beta = 100$ bps, $N = 10.000$ shares

LESS MATCHING EFFECTS



$\beta = 100$ bps, $N = 10.000$ shares

SMALLER TURNOVER



$\beta = 100$ bps, $N = 100.000$ shares

NON-PRO RATA LIQUIDATIONS

- β is not necessarily the bid/ask spread of a pro-rata slice of the fund
- But rather the effective roundtrip cost of cheapest liquidity
- Example strategy:
 - Redemptions are met liquidating a chosen liquid subportfolio
 - E.g. as determined by a “highly liquid” bucket
 - Effective roundtrip cost must include also rebalancing transaction costs
- Complex exercise requiring modeling of all assets liquidity surfaces

DILUTION DIAGNOSTICS

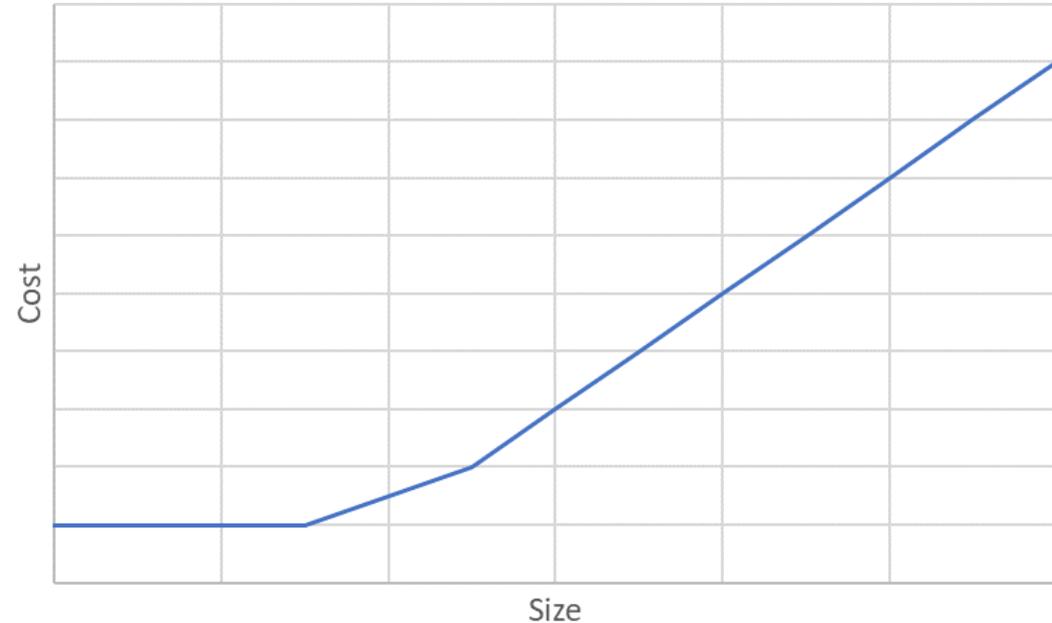
Adding market impact effects

DIAGNOSTICS: MARKET IMPACT EFFECTS

Fund 1-day liquidity surface cross section

- Fund “Normal market size”: quantification of “large flows” threshold
 - Swing threshold(s), dilution levies threshold, etc.
- Quantification of market impact at large sizes
 - Swing factor(s), dilution levies amount, etc.
- Fund overall market depth
 - Exceptional tools: gates, suspensions, etc.

Fund 1d Liquidity Surface



CONCLUSIONS

CONCLUSIONS

- **Bid/ask dilution effects can be quantified clearly and robustly**
 - Dilution rate, fair fees level, breakeven investment horizon
 - Ex ante: forecast dilution
 - Ex post: realized dilution
 - Useful content for Liquidity Risk Management Program reporting
 - Diagnostics help setting mitigants (fees, total swing pricing, etc.) and discussing their effectiveness
- **Contingent fees are a more efficient tool than swing pricing**
 - If used as actual tools could be a useful mitigant
 - They may also overcome current operational impediments to swing pricing adoption (to be checked)

CONCLUSIONS

- **Market impact effects require more significant modeling**
 - Suitable analytics help setting appropriate mitigants (partial swing pricing, large redemption fees, etc.)
- **Equitable levels of fees are just an entrance ticket to a fair game**
 - Educational challenge: explain it to investors

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