BlackRock.

Swing Pricing

The dilution effects of investor trading activity on mutual funds

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The dilution effects of investor trading activity

BlackRock is an industry leader in developing processes that provide protection to existing mutual fund investors from the negative 'dilution impact' that occurs when a fund invests or disinvests in securities as a result of investor activity. This paper discusses how our single-priced UCITS and UCI funds address the issue, through our development of the technique known as swing pricing.

How investor trading activity can dilute fund performance

When an investor subscribes into or redeems from a fund, that transaction is valued at the Net Asset Value (NAV) of the fund calculated at a single point in time for each trade date - the fund's valuation point. When the related cash proceeds are invested in or disinvested from underlying securities in the fund's portfolio, the purchase or sales impact related to that activity will not have been included in the calculation of the NAV for a single-priced fund.

Dilution (being the difference in value received from or paid to the investor compared to the price paid by the fund to invest/disinvest the cash proceeds) occurs because the single net asset value price at which investors buy and sell the fund's shares reflects only the value of its net assets. It does not take into account bid/offer spread, transaction charges, taxes, commissions, market impact or anything that would otherwise dilute the position of existing investors.

UCITS regulations permit these costs to be met directly from the fund's assets or to be recovered from investors in a variety of ways at the time of purchase or redemption of shares in the fund. If the costs are not recovered the performance of the fund will be impacted.

The greater the relative volume of investor activity in a fund, the more important the need for an effective anti-dilution mechanism. In the interests of our ongoing investors, BlackRock applies a number of anti-dilution mechanisms. The fund ranges listed at the end of this flyer have implemented swing pricing..

Swing pricing adjusts the price of a fund with the aim of reflecting the estimated trading costs of shareholder subscriptions and redemptions in the NAV at which those shareholders transact. This should result in a reasonable level of protection against dilution for existing shareholders.

Protecting investors' longer-term interests

Swing pricing provides a mechanism for attributing the estimated cost of investing or disinvesting to the active investors causing that activity, thereby minimising the dilution impact to existing shareholders.

All of the benefit of swing pricing is received by the fund. As such it is not an additional charge.

Swing pricing adjusts the NAV at which all investors' transactions in a fund take place on a particular day. It is based on the cumulative total fund flows for the day, netting off purchases and sales, to arrive at a total net flow.

Swing pricing is based on estimated underlying fund trading costs (more details are set out later in this document) and is designed to reduce the dilution impact.

There are two main methods of swing pricing. The first, known as full swing pricing, means that a fund's NAV is adjusted/swung every time there is any net capital activity (i.e. investor flows in or out of the fund), with its direction being determined by the net flows of the day. The second, known as partial swing pricing, means the process is triggered, and the NAV adjusted/swung, only when the net investor trading activity exceeds a predefined threshold known as the swing threshold.

Once the decision has been taken to adjust a price by applying swing pricing on any particular day, the next step in the process is the calculation of the size of the adjustment to be made to the fund price. This adjustment is known as the swing factor.

For any fund using swing pricing to protect investors from dilution there are therefore two key components: the threshold and the factor.

BlackRock's approach

In line with many of our peers in the industry, BlackRock has adopted the partial swing pricing method for most of its swinging funds. Therefore, if the net trading on a dealing day from investors in one of these funds exceeds the pre-determined swing threshold, then a swing occurs. Conversely if the net trading activity does not exceed the swing threshold, then the fund's NAV is not swung, as any dilution impact has been estimated to have little material impact on the fund.

Partial swing pricing has a lower impact on NAV accounting volatility, given that the price is not necessarily swung on each valuation date. Additionally, having a threshold recognises that smaller deals can frequently be managed with no significant market impact.

At BlackRock, when establishing the swing factors, we take account of all four component parts of the swing factor (spread, market impact, brokerage & other market charges and government taxes & duties). The swing factors are typically based upon an estimate of trading a 'pro rata' amount of each security within the portfolio at different volumes in the marketplace. Therefore, we consider:

- The average daily market volume for the underlying securities.
- The market impact of trading different shareholder flow volumes, for example 1%, 2%, 5% or 10% of a fund's net assets.
- The frequency of smaller shareholder flows to ensure a relevant amount of the dilution impact is captured.

We give consideration to the size of the fund as market impact may be less relevant to a small fund.

Certain funds utilise leverage as allowed within UCITS limits. The swing factor for such funds may be greater than that of similar unleveraged funds. This is because where funds employ leverage, the level of underlying securities trading will be of greater value than the associated flow. This needs to be reflected in the estimated impact and can make the swing factors of leveraged funds appear higher than might be initially assumed.

That said, where funds utilise a high level of leverage, such as levered long/short 'market neutral' strategies, there are additional factors which may need to be taken into consideration:

- Such strategies typically have a higher level of daily turnover within the portfolio and the interaction between this dealing and the 'flow-related dealing' may be such that they partially offset each other and should be considered in swing factor analysis.

- In addition, the level of leverage is likely to vary over time at the discretion of the portfolio manager.

This means that (i) an investor flow may not be transacted in its entirety and (ii) these two factors can combine to produce a lower estimated swing factor than may otherwise arise.

Component parts of a swing factor

There are four main components to be considered when calculating the swing factor, which are based on the observed transaction cost for each fund portfolio as follows:

1. An adjustment for the spread. Spread is the difference between the bid and offer price of a security. This needs to be captured because the funds calculate a single NAV price each day while the underlying securities held within the funds' portfolio are traded at bid and offer prices. This spread is not caught in a single NAV price, unless it is captured in the swing factor adjustment.

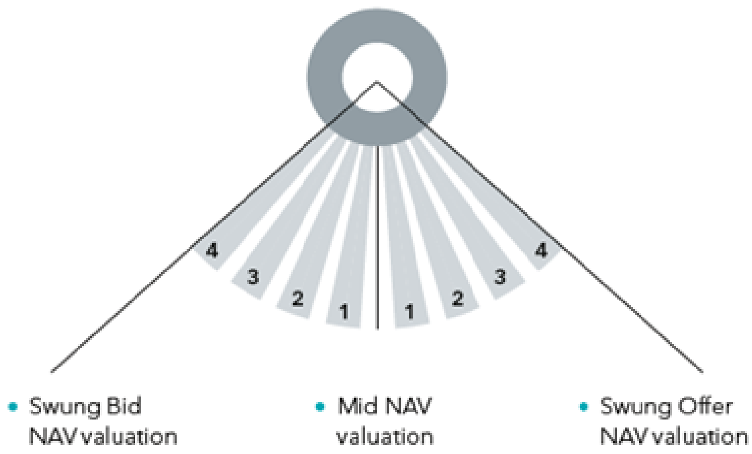
2. An adjustment for broker fees and any other market charges.

3. An adjustment for governmental taxes and duties payable on securities transactions (in general, not including capital gains tax and withholding tax). This is described in more detail below.

4. An adjustment for the market movement caused by the trading activity. This may be close to zero for liquid securities with large market capitalisation. When dealing in less liquid securities with lower daily trading volumes a trade can cause the securities' price to move (due to demand and supply), therefore this movement is estimated and included in the swing factor for each fund.

Illustration 1 –
Component parts of a swing

1. Adjustment for bid offer spread for a composition of securities in the fund's portfolio.
2. Brokerage and any other market charges (excluding governmental taxes and charges).
3. Governmental taxes, levies, duties and charges.
4. Adjustment for estimated market movement based on current market conditions and liquidity.



It should be noted that market liquidity has a cost. Only on rare occasions (for small deals or in very liquid markets) will the sale or purchase of securities within a fund's portfolio be completed at the market 'touch spread' or 'screen price' without that price moving to reflect the market activity. Our analysis of the dilution effect takes into account that the trading will not necessarily be transacted at the same prices as those used in the NAV calculation. This liquidity cost or 'market impact' is taken into account when calculating a 'swing factor'.

Swing factors may be asymmetric as some transaction taxes and other charges may apply only to sales or purchases of securities. An example is UK stamp duty, which applies to the purchase (but not the sale) of UK equity securities and would therefore only be incorporated in a swing factor when the fund experiences net inflows from investors.

Governmental taxes and charges

Some countries charge tax or duties on the purchase and/or sale of certain securities. Where a fund is invested in such a country and securities, an amount relating to those taxes and duties will be incorporated in the relevant swing factor. Examples of such taxes and duties would include, but are not limited to, UK, Hong Kong and Irish Stamp Duty, Italian or French Financial Transaction Tax.

The estimate of these amounts relating to taxes and duties is calculated based on the percentage of the fund that is invested in securities subject to the tax/duty in that specific country.

As a simple hypothetical example: Fund A invests solely in UK equities. Every time it purchases securities it must pay UK stamp duty (currently at 0.5% or 50bps). When it sells it pays no taxes or duties. The additional transaction costs due to this governmental tax of 50bps would create a differential between bid and offer swing factors. If we take a hypothetical market transaction cost of 25bps then this would give swing factors of 25bps bid and 75bps offer. Please note the example here is for illustrative purposes only.

Where a fund is invested in countries where sales taxes apply, the impact would then be applied to the bid swing factor to the relevant securities.

BlackRock's Tiered Threshold Model

Starting in 2015, we have further refined our partial swinging method by introducing the concept of tiered / multiple swing thresholds.

As noted above, where a single swing threshold and swing factor are in place, and the net flows from investors on any dealing day exceed this threshold, the NAV will swing by that single swing factor,

BlackRock has implemented a tiered threshold model, with the capacity to implement a range of thresholds, each of which triggers a specific swing factor. This takes account of the different levels of dilution incurred at varying shareholder flow sizes – that is, the differences between overall costs and dilution on small security deals (typically low spreads) and very large deals (typically with much larger spreads and where market impact occurs). As an illustrative example, a 2% net inflow might trigger a 20 bps swing to offer, while a 10% net inflow could trigger a 40 bps swing to offer.

This range of thresholds allows for the better capture of trading costs, particularly the increased bid/offer spreads and market impact incurred when trading to satisfy large scale shareholder dealing. The aim of multiple thresholds is to have more representative swinging – funds will swing more often, but on average by less.

Each fund has unique swing thresholds and swing factors, dependent on a number of elements, including fund size, the dealing costs and liquidity of the underlying markets and investment universe in which the particular fund invests.

An illustrative example is shown in the table below.

At the time of writing, BlackRock operates this tiered threshold model on the majority of its swinging funds but may apply single thresholds and swing factors in certain circumstances where considered appropriate by the EMEA Swing Pricing Committee.

For Illustration

Fund name	Lower threshold – as % of NAV	Upper threshold – as % of NAV	Swing factor in bps
Fund A/ generic Emerging Markets fund	0.5%	1%	15
	1%	3%	20
	3%	5%	25
	5%	10%	30
	10%	20%	40
	20+%		55
Fund B/ generic specialist sector fund	0.5%	1%	35
	1%	3%	40
	3%	5%	50
	5%	10%	70
	10%	20%	110
	20+%		150
Fund C/ generic large cap Developed Markets fund	0.5%	1%	3
	1%	3%	4
	3%	5%	4
	5%	10%	4
	10%	20%	4
	20+%		5

Swing pricing works and is increasingly becoming the industry standard

We believe swing pricing is tan effective method of addressing the issue of dilution for single-priced UCITS and UCIs, and we are not alone in doing so. In terms of protecting the interests of investors, swing pricing has become the standard in the cross-border mutual funds market. It is a well-established market practice in a number of countries where we manage funds, such as Luxembourg, Ireland and the Netherlands. In addition, more countries, such as Germany, the United States and Spain have approved the use of swing pricing.

The investor protection benefits of swing pricing

BlackRock carried out an analysis across the 74 funds that swung in its BGF range, the 33 funds that swung in the BSF range and the 10 funds that swung in the BGIF range over the calendar year 2019. The analysis showed that as a result of this policy the funds have been shielded from dilution effects which would otherwise have impacted the fund's annual performance by up to 66bps per annum.

Open-ended' funds, such as BGF, BSF and BGIF are all exposed to the dilution effects caused by investor dealing activities. Failure to employ an anti-dilution method would result in the funds' investors experiencing poorer performance over any holding period, with the long-term investor suffering the most.

The results below highlight the most significant performance impacts across the BGF and BSF ranges during the period January to December 2019:

BGF range	Anti-dilution effect of swing pricing in BP
Systematic China A-Share Opportunities Fund	24
Future of Transport Fund	21
Asia Pacific Equity Income Fund	15
United Kingdom Fund	13
India Fund	13
ESG Emerging Markets Blended Bond Fund	11
China Bond Fund	11
Asian High Yield Bond Fund	10
World Gold Fund	10
Global Inflation Linked Bond Fund	10

BSF range	Anti-dilution effect of swing pricing in BP
European Diversified Equity Absolute Return Fund	66
Global Real Asset Securities Fund	55
Emerging Markets Equity Strategies Fund	38
Multi-Manager Alternative Strategies Fund	29

UK Emerging Companies Absolute Return Fund	24
European Unconstrained Equity Fund	24
Global Long/Short Equity Fund	18
Emerging Markets Absolute Return Fund	17
UK Equity Absolute Return Fund	16
Emerging Markets Flexi Dynamic Bond Fund	16

Swing pricing challenges

The benefits of swing pricing are clear and address the central issue of investor protection. However, this successful anti-dilution mechanism can create certain knock-on impacts to reported short-term fund performance via accounting volatility. The official NAV of the fund is the swung NAV, which is likely to be more volatile/ variable than the unswung NAV as a result of the swinging process. Therefore, price swinging is likely to result in an apparent increase in the level of divergence between a fund and its benchmark index.

This volatility could be considered artificial and is not reflective of realised underlying asset volatility. However, given there is only one published official NAV for each fund, there is no easy means for investors to separate the two sources of volatility within the official data. To help address this, Blackrock will share with clients on request whether a fund has swung on key performance dates i.e. month-end.

Similarly, the ability of investors to compare 'like for like' performance between BlackRock funds and those of a competitor (and peer group performance) may be reduced due to differences in each fund's anti-dilution methods. In the event that a fund swings on the last day of a reporting period (i.e. month end), the swing effect will, to some extent, obscure underlying fund performance. The impact can be positive or negative, depending on the direction of the swing. Some mention of this impact may be made in commentaries should the effect be significant. This is an unavoidable consequence of a process which exists for the sole purpose of investor protection. BlackRock will therefore provide investors, on request, with details of any swing factor applied to a fund on a day that the investor has subscribed or redeemed units of the fund.

BlackRock's governance framework

Thresholds and swing factors are set by BlackRock's Swing Pricing Committee which is accountable to the appropriate Fund Boards and Management Companies and which has ultimate authority and control of the process. The Committee consists of experts from a number of BlackRock teams including Risk and Quantitative Analysis, Trading, Liquidity and Lending, Compliance, Investment Oversight and Technology & Operations. While the Committee will consult with portfolio management teams, it is

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independent of both sales and portfolio management. Since the process is independent of sales, the sales team have no influence over it. Similarly, since the decision-making process is independent of portfolio management, whilst they can contribute, they cannot unduly influence an increase (or decrease) in swing factors.

The Swing Pricing Committee usually meets monthly but may do so more frequently as market conditions require. These meetings capture our best estimate of expected trading costs and review the current levels of protection provided by swing pricing to ensure they remain appropriate.

At present, it has been deemed appropriate that a small number of our swinging funds continue to apply a single (as opposed to multiple) threshold and single swing factor. These thresholds are confidential, as is generally the case in the industry, in order to prevent any attempt to avoid a price swing by dealing in an amount just below the threshold. However, we are happy to discuss our swing factors with clients, giving them a clear understanding of the impact their trading activity may have.

Where we have adopted multiple thresholds and multiple swing factors for our UCITS and UCI funds – we are prepared to disclose to investors and advisors the range of the thresholds and swing factors but will not match specific swing factors to specific thresholds. Multiple threshold swinging reduces the opportunity for investors to attempt to take personal advantage or manipulate the swing pricing process, and thus there is a case for disclosing all corresponding thresholds and swing factors. However, this is also commercially sensitive information and releasing it to trading counterparties may lead to less favourable dealing terms should they seek to profit from this information, to the detriment of the fund's underlying investors.

Upon client request, we are willing to provide the size and direction of a pricing swing in relation to any relevant investor transactions on any given valuation day.

It is worth noting that economic and political events can create uncertainty in financial markets with the result that market liquidity can deteriorate and dealing costs rise. In such scenarios, the Swing Pricing Committee will take action, including raising or lowering thresholds or factors to provide the appropriate level of protection in the new conditions.

Conclusion

BlackRock has pursued its approach to fund performance dilution for a number of years, reflecting its status as a pioneer in this field. Our objective is to protect the interests of investors and we should emphasise again that when an investor is impacted by a price swing in subscribing to, or redeeming from, a fund they are only paying/receiving an appropriate price, taking into account the impact of dealing. Our fund investors are being treated fairly.

Funds that apply anti-dilution measures, such as swing pricing, will show superior performance over time compared to those (with otherwise identical constructs, investment strategies, portfolio performance and trading patterns) that do not.

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Glossary of terms

Investor	An investor in a BlackRock mutual funds
BGF	BlackRock Global Funds
BSF	BlackRock Strategic Funds
BGIF	BlackRock Global index Funds
Anti-dilution method	Any methodology used by an open-ended investment fund to negate the portfolio transaction impacts resulting from subscriptions and redemptions by investors.
Swing factor	The amount by which the NAV is adjusted in order to protect existing shareholders in a fund from dilution caused by securities trading following investor subscription/ redemption activity.
Swing threshold	The value of net investor trading activity for a dealing day upon which the fund will be swung.
Partial swing	The practice of applying a swing factor only when a swing threshold is breached.
Full swing	The practice of applying a swing factor systematically each day, therefore without reference to a swing threshold.
UCITS/UCI	Mutual fund based in the European Union under a harmonised regulatory regime

Risk Warnings

Capital at risk. The value of investments and the income from them can fall as well as rise and are not guaranteed. Investors may not get back the amount originally invested.

Past performance is not a reliable indicator of current or future results and should not be the sole factor of consideration when selecting a product or strategy.

Changes in the rates of exchange between currencies may cause the value of investments to diminish or increase. Fluctuation may be particularly marked in the case of a higher volatility fund and the value of an investment may fall suddenly and substantially. Levels and basis of taxation may change from time to time.

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