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INVESTMENT MANAGEMENT
ASSOCIATION OF SINGAPORE

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Fund Management Fair Valuation Best Practices

Exchange Traded Instruments

Contents

1 Background

Capital market disruptions are becoming quite common and their impact on fund managers can no longer be taken lightly. During the Inaugural Asia Investment Management COO Roundtable organized by Stradegi in 2016, COOs agreed that market disruption and its consequences on valuation, i.e. not having readily available or reliable market prices to value funds, usually lead to an operational "crisis management mode" placing a high risk on the firm and its investors. For instance, during mid -June 2015 and again during the first week of 2016, the Chinese market crisis caught asset managers by surprise and the lack of regulatory guidance aggravated the challenge of fairly valuing funds holding Chinese stocks. While it may not be possible to predict when and where the next market disruption will happen, asset managers are fully aware that it is only a matter of time and hence they are taking steps to be as prepared as possible for the next such event.

The intention of this paper is not to review or evaluate how asset managers responded to previous market disruptions. The objective rather, is to gain an understanding of different practices at various asset managers and document best practices from such events so that asset managers can be better prepared during future market disruptions.

The valuation process is typically well-documented and standardized throughout the investment management industry. However, we realised from our discussions with the participating asset managers that there were varied approaches to handle fair valuation; we also observed that there is no common set of industry best practice around fair valuation. Some of the most relevant differences revolved around governance, the organisation structure supporting the valuation process, fair valuation triggers, definition of proxies and reporting. These observations are discussed in further detail in this paper.

It was agreed at the roundtable that there would be merit in building a set of guidelines and documenting the fair valuation practices followed by different organizations to establish more clarity and transparency in the industry. This would also help industry players in reducing the risk and costs in dealing with such unexpected events and ensuring standardized fair valuation for their investors.

This paper lists the best practices in fair valuation for funds investing in exchange traded instruments.

2 Approach & Scope

2.1 Approach

Stradegi conducted meetings with heads of valuation at large global and regional investment management firms in Asia, having assets under management (AUM) ranging from US$ 20 Bn to 500+ Bn. These individuals explained their fair valuation policies of funds investing in exchange traded instruments and the challenges they faced in times of market disruptions. Stradegi also held discussions with third party service providers and pricing vendors to understand the services or products they offer in fair valuation.

2.2 Scope

The scope of the paper is fair valuation of funds investing in exchange-traded instruments, namely exchange traded equities and fixed income. The following scenarios and the relevant fair valuation policies and procedures were covered during the discussions:

- Trading halts, suspensions, or other market disruptions
- Crisis events such as in Greece
- Gap in market close, dealing deadline and NAV calculation
- Large investor flows
- Absence of trading in a particular security

3 Observations

The discussions established two key elements of fair valuation practice. One is the governance structure in place to ensure valuation is done fairly and independently, and the other is the operating model to ensure that it is done in a timely and efficient manner. In this section, observations made under each of the above two categories have been listed and differences in practices have been highlighted.

3.1 Governance

One common theme was the presence of a Central or Group Pricing Committee. The committee has oversight and final authority on all fair valuation decisions. The committee also meets periodically to review all fair valuation decisions. The committee is predominantly made up of the COO, Head of Compliance, Head of Risk, Head of Data and at times the CIO/Head of Investments. The policies and principles are defined at the Central Pricing Committee level and provide guidelines for the following components of a fair valuation practice:

a Pricing Source	Ensuring independence, objectivity and consistency in producing or sourcing fair valuations
b Valuation Monitoring	Definition of monitoring criteria and situations that call for fair valuation
c Fair Valuation Methodologies	Definition of procedures for fair valuing assets and the hierarchy of valuation methodologies
d Process Review	Review of methodologies, controls, and processes regularly to ensure oversight and compliance with regulatory requirements

The main differences observed in terms of the governance, mostly came from the support teams around the Central Pricing Committee. There were different types of pricing support teams and different levels of engagement of the Investment Management team with the Valuation Committee. The key differences can be grouped into two major structures, although some asset managers had a governance approach with characteristics from both groups.

3.1.1 Group Pricing Committee supported by Independent Local Pricing Units

Example 1

Example 2

This structure is characterized by not involving, and almost banning, investment teams from valuation procedures. Pricing Units are made up of individuals with a high degree of market and financial expertise that can rigorously provide fair valuation of assets without relying on inputs or quotations from investment teams. Depending on the scale and size of the asset manager, there can be multiple regional pricing units, a single central pricing unit, or a combination of both. The regional pricing units were responsible for understanding and communicating local regulatory requirements for fair valuation to the committee.

Although investment teams can provide valuable inputs on market conditions and interpretation of events, the key issue when implementing this governance approach is clearly defining and documenting the limits and boundaries of the involvement of investment team members in pricing committees or units. To substitute or complement inputs from investment members, asset managers typically employed specialists with valuation expertise in these pricing units to provide reliable fair valuations of assets. These asset managers are well aware of the potential conflict of interests arising from traders, fund managers, and CIOs when it comes to valuation.

3.1.2 Group Pricing Committee supported by Investment Teams

This structure relies on fund managers to provide the fair valuation using their model or views on price adjustments in case of unavailable market prices. The recommendation from the investments team is then reviewed by the Central Pricing Committee and a decision is made on whether it is reasonable and fair.

These asset managers tended to have the belief that fund managers are well equipped to fairly value assets given their investment expertise. However, we advocate that the pricing committee should be supported by independent valuation teams, be it internal pricing units or third party vendors, rather than investment teams to avoid any conflict of interest.

3.2 Operating Model

Having an operating model in place is critical in assuring that asset managers are ready to face market disruptions and that they are able to conduct a fair valuation in a timely and efficient manner. During the discussions with the various valuation leaders, there were certain differences in how the practice operates.

3.2.1 Pricing Source

Asset managers rely on either internal teams (pricing teams or fund managers) for fair valuation, external sources such as vendors, or a combination of the two for different markets/asset classes. We observed some asset managers completely relied on internal teams for fair valuation, while others used vendors for certain markets and internal teams for the rest of the markets.

When selecting pricing vendors, asset managers would either decide to use a single vendor to provide independent pricing for the complete range of asset classes and markets they invest in, or use a combination of different vendors depending on the vendor's range of offerings and market coverage. For example, an asset manager might use a vendor for listed equities and fixed income while using a separate vendor for OTC derivatives. For fair valuation, an asset manager could use a vendor for US market assets where the particular vendor has reasonable coverage, but rely on internal teams to fair value the rest of the markets.

One of the drivers for looking at single-source pricing vendors is to centralize the pricing source for all assets, eventually leading to cost optimization and operational efficiency. But asset managers are willing to look at vendor consolidation only if the quality of prices is not compromised; the ultimate objective is always to select the best pricing vendor for each asset class.

Vendors' offerings for fair valuation of listed instruments vary. It can be either proxy based, where pricing of an asset is compared with relevant proxies, or a fundamental bottoms-up quantitative approach. The proxy could be a market proxy such as an index future or an ETF, or a security proxy, or a market factor such as interest rates. The selection of proxy depends on the strength of correlation of the security and proxy movements. The quantitative approach on the other hand is akin to a private equity approach of fundamentally valuing a company or asset. The methodologies are further explained in the Section Fair Valuation Methodologies.

Asset managers are increasingly evaluating vendors' offerings to see whether they can meet the coverage in terms of assets and markets, and also whether the methodology is something that the asset manager agrees with.

The vendor service could be subscribed on either:

- a transaction basis - as and when asset managers need to fair value securities, there is a transaction fee based on the number of securities, or
- a recurrent basis - which has a recurrent fee and as the asset managers need fair valuation pricing, the vendor provides it.

We are of the opinion that subscribing to a fair valuation service on a recurrent basis is best practice, especially for markets that are highly volatile or are not mature.

Since most of the asset managers outsource NAV calculation to fund administrators, the fund administrator relies on the asset manager for guidance when fair valuation is required as the latter bears the ultimate responsibility of fair valuation.

3.2.2 Valuation Monitoring

Market bubbles, technical glitches, and "Black Monday" types of capital market disruptions stump investors as there is no clear market value to trade on or value their portfolio. Asset managers need to continuously monitor their assets and the capital markets to track whether any event calls for fair valuation of assets.

Fair valuation monitoring is performed at two levels, one at the fund level and second at the individual security level. The following table summarizes the events that are monitored and the points where the thresholds are set. It was observed that the threshold values and triggers varied across asset managers.

Fair Valuation Monitoring Triggers

Event Type	Events	Fund Level Fair Valuation	Security Level Fair Valuation
Market	Disruptions or trading halts	Movement in relevant fund proxy threshold and net unit dealing threshold [1]	Movement in relevant security proxy threshold and cumulative impact on fund NAV threshold
	Significant events after exchange closure and before valuation point	Movement in relevant fund proxy threshold and net unit dealing threshold or Significant events that indicate an impact on fund valuation	Movement in relevant security proxy threshold and cumulative impact on fund NAV threshold or Significant events that indicate an impact on security valuation[2]
Investor	Large investor flows	Trading cost threshold and net investment flow threshold	-

The monitoring process is further explained in the following sub-sections:

3.2.2.1 Fund Level Monitoring

Events that are typically monitored at the fund level are:

- **Market disruptions or trading halts -** market closures or suspension of trading due to political, economic, natural events or technical glitches
- **Market events -** change in market conditions such as currency movements or movements in relevant fund proxies such as index futures between the close of exchange and valuation point of the fund
- **Large investor flow -** large net inflows or outflows

For market events such as the first two points in the list above, asset managers typically monitor for movements in index or market proxies such as futures or ETFs.

[1] Hong Kong's Securities and Futures Commission (SFC) has mentioned in their circular dated 20th July 2015 that receiving no or few subscription or redemption orders is not a valid reason for the Manager not to undertake a fair valuation adjustment where the market circumstances for fair valuation exist.

[2] Case by case analysis should be done in security specific events. Security fair valuation in events such as fraud should not use the security's proxy; the proxy would likely not be impacted by company specific event and would not provide an accurate price basis.

The selection of fund level proxies takes into account the time difference between the dealing and valuation points. To protect the fund from market timing investor-related events, the proxies should anticipate time zone, holidays and trading hour differences. Following are some sample fund level proxies or indicators:

- Country/regional futures
- Country/regional/sector ETFs
- FX rates

If the movements meet a defined trigger point and a defined portion of the fund is cumulatively impacted, fair valuation is applied. For example, if the proxy index future moved by 2% after the exchange closed and before the valuation point of the fund, fair valuation will be applied to the entire fund.

Asset managers should also determine whether the fair valuation adjustment should take into account the current beta of the selected proxy. Continuing with the previous example, if the proxy index future moved by 2%, valuation teams should determine whether the fair value adjustment should equal 2% or be adjusted according to a high or low beta.

In case of investor related events, such as large net inflows or outflows, asset managers monitor trigger points that breach thresholds and then apply dilution adjustments, also known as swing pricing, or dilution levy, on top of the calculated fund NAV. For example, if material net inflows exceed threshold of say 5% of total AUM, a dilution adjustment of 50 basis points is applied on the fund NAV of $100, swinging the NAV up to $100.50. It is worth noting that the actual value of the dilution adjustment will depend on the estimated dealing costs incurred by said inflows or outflows.

It is important to note that dilution adjustment or dilution levy are separate concepts to market level fair valuation. Market level fair valuation is applied to securities or to the fund itself due to change in market conditions. The dilution adjustment or dilution levy does not form part of the portfolio valuation. The dilution is applied to pass on the incremental trading costs resulting from large net inflows or net outflows to the investors trading on that day, and thus fairly treating the existing investors in the fund.

3.2.2.2 Security Level Monitoring

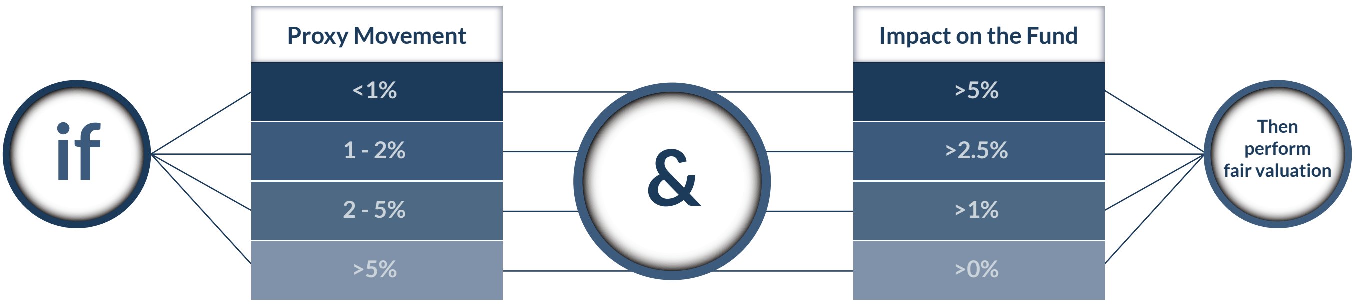
Events that are typically monitored at the security level are:

- **Security trading halts -** suspension of trading in that particular security due to market events, security specific events or technical glitches
- **Security events** - events such as market, economic events or corporate actions that impact security valuation after the close of exchange and valuation point of the fund
- **Lack of trading/stale prices** – no or low trading in the past x number of days

Pricing teams monitor triggers that demand security fair valuation. These triggers are typically a combination of quantitative and qualitative triggers. Quantitative triggers such as no trading for more than x hours or fair valuation impact greater than x% of the fund or a combination of the two. Qualitative triggers being earnings announcements, litigations and other events that have an impact on the value of the asset. In some instances, we also observed valuation teams in asset managers having an ex-ante view of markets and having a watch list of assets that might need fair valuation. These securities were typically highly volatile or distressed securities. In case of multiple regions, the regional watch lists were consolidated by a central unit to ensure consistency and transparency across regions.

Movements in security proxies could also trigger fair valuation. Following is a sample two-step rule table defining the triggers that call for application of security fair valuation (please note that the numbers are not actual or prescribed numbers):

Fair Valuation Two-Step Rule Sample Table



For example, if the proxy movement was between 2-5% and the impact on the fund is >1%, then the manager should perform fair valuation. As proxy movement increases, materiality and impact on the fund is less relevant.

The security proxies typically used are the following:

- Market indices
- Sector-specific indices
- Identical security trading on another exchange
- Security ADRs

An important difference to highlight in this section is the structure of the teams monitoring fund level and security level fair valuation. We observed that some asset managers had the same team responsible for monitoring both fund level and security level fair valuation, while others had separate teams. The reason of having separate teams stems from the segregation of responsibilities. While the fund level fair valuation team looks after market events that impact fund fair valuation, it also looks after investor events such as large net inflows or outflows. The security level fair valuation team is usually the, or a part of the, security pricing team, and thus not responsible for monitoring the day to day trading in the fund.

Having separate teams, however, could lead to duplication of the fair valuation application, or inaccurate application of fair valuation techniques. For example, if a market is closed and the fund proxy moves by 2% due to a corporate event in a major security which is also present in the fund. In such a situation, it is not clear which team is responsible for applying the fair valuation and at which level.

3.2.3 Fair Valuation Methodologies

As market or investor events trigger fair valuation of assets, pricing teams need to select the appropriate methodology of fair valuing the assets. The following table summarizes the methodologies we observed:

Event Type	Events	Fund Level Fair Valuation	Security Level Fair Valuation
Market	Disruptions or trading halts	Valuation adjustment based on proxy movement or Fair valuation of underlying securities	Security fair valuation in the following order: • Identical asset in another active market • Valuation using similar asset in another market or using observable market inputs such as interest rates • Valuation using unobservable market inputs such as cash flow discounting
	Significant events after exchange closure and before valuation point	Valuation adjustment based on proxy movement or Fair valuation of underlying securities	Security fair valuation in the following order: • Identical asset in another active market • Valuation using similar asset in another market or using observable market inputs such as interest rates • Valuation using unobservable market inputs such as cash flow discounting
Investor	Large investor flows	Dilution adjustment/swing pricing or Dilution levy	-

3.2.3.1 Fund Level Fair Valuation

In case of market events, some asset managers tended to apply valuation adjustments directly to the fund NAV based on market proxy movement while others tended to fair value the securities and then calculate the fund NAV post the fair valuation of securities. While the former seems to be a more straight-forward technique, fairly valuing the securities in the portfolio is a more accurate method of fairly valuing the fund as the impact on the holdings will not be consistent across the board.

While conducting fund level fair valuation, asset managers should exclude cash holdings. Fair valuation adjustments should only be applied to the invested portion of portfolios. Proxies might move enough to trigger fair valuation but this would not affect a fund's cash position. Fund level fair valuation may also introduce higher operational and administrative risk than security level fair valuation, valuation teams should be aware of differences and consequences of both approaches.

In case of investor events, asset managers either use dilution adjustments/swing pricing or dilution levy. While both methods apply adjustments equivalent to the estimated dealing costs in underlying investments in the fund, dilution adjustment adjusts the NAV and is applicable to everyone who deals on the day, while dilution levy is a separate fee and only affects the investors who trigger the dilution.

During our discussions with local Valuation teams, we found dilution adjustments to be more commonly applied, but methodologies and frequency to estimate dealing costs differed in some asset managers. The objective to calculate a dilution adjustment rate is to closely replicate dealing costs, avoiding over or underestimation when a dilution adjustment is applied. The dilution adjustment rate is calculated on a periodic basis but it may be recalculated as needed depending on market conditions.

3.2.3.2 Security Level Fair Valuation

The security fair valuation techniques observed are the following:

- Sourcing fair value pricing from a third party which in turn uses comparables or fundamental valuation
- Last traded price adjustments using market proxy or security comparables
- Adjustments using internal models such as cash flow discounting
- Conservative approach of marking down the price of the security to 0

It was observed that the conservative approach of applying large haircuts was common but mark-ups seldom happened.

The hierarchy of fair valuation methodologies was relatively consistent amongst asset managers, starting with using proxies to fair value followed by using internal quantitative models if there is no clear proxy. We observed a greater dependence on market proxies such as ETFs and index futures rather than security proxies to apply valuation adjustments.

Once the asset has been fair valued, the fair valuation price then goes to the valuation committee for approval. There was a high reliance on guidance from regulators in developing Asian jurisdictions on how to fair value assets. At times the NAV was not cut and trading in the fund was halted when a substantial portion of the fund was affected and there was no or ambiguous guidance from regulators.

3.2.4 Process Review

In normal circumstances, asset managers have day-to-day price variation checks and index movements to review accuracy of pricing data. However, in cases of market disruptions, to review the fair valuation price supplied by vendors or internal teams, asset managers used internal models and/or broker-dealer quotes as benchmarks to check for any large deviations. Asset managers also seemed to review vendors' methodologies periodically. There was no standard timeline observed for the vendor's review.

When performing fair valuation, asset managers must also review and understand the impact of modifying valuation prices on a wide breadth of processes throughout the value chain. Fair valuation can become a common source of error in other processes if changes in inputs are not clearly identified. Security prices are the main source of information for a variety of processes, especially risk management and performance measurement. Asset managers must understand and map the effects of fair valuation on these practices.

Robust definition of key valuation risks, incorporation into policy & process documents, and identification of the teams responsible for monitoring and mitigating such risks would help in minimizing errors in later processes. Risk and performance metrics to be monitored include, both at the security and portfolio level, absolute and/or relative ex-ante risk metrics, ex-post risk metrics, benchmark analyses, composition analytics, and relevant performance attribution factors.

In terms of reporting and oversight, the committee met periodically, either monthly or quarterly to review valuation decisions and assets that were fair valued. The assets being fair valued are divided into lists to ensure that they are tracked effectively and reported to the Pricing Committees. We observed some or all of the following lists being reported to the committee:

- **Fair value list -** list of securities that are fair valued
- **Zero price list -** list of securities whose value has been marked down to 0
- **Stale price list -** list of securities whose value is the last traded price (usually securities which have not traded in the last 5 days)
- **Watch list -** securities that are highly volatile or distressed or whose market price is suspicious

A sample of or all fair valuation decisions are also reviewed in the periodic meetings.

4 Best Practices

As gathered from the discussions, the best practices have been listed in the following table. The principles of independence and fairness to investors drive these practices. In addition, practices that mitigate business or valuation risk also form part of the list. The best practices are listed along with a brief description to show how they would apply to an organizational process.

Asset managers using this list as a guide should be aware that Stradegi developed these best practices along with global and regional investment management firms in Asia, with AUM ranging from US$ 20 Bn to 500+ Bn. Differences between asset classes, markets, regulations, the scale and complexity of operations, and available financial resources should be analyzed on a case-by-case basis to determine the appropriateness of each recommendation. Careful consideration should be given, including rigorous testing, before deciding whether or not to implement the recommendations outlined in this paper to ensure they are suitable and pertinent. The relevant fund's auditor and trustee should agree on the approach and avoid situations where asset managers reasonably deem that investors are not being benefitted by the recommendations. As with any best practice, asset managers should perform a cost-benefit analysis to determine the viability of implementation.

#	Best Practice	Description
Governance Structure		
1	Voting members in the Central Pricing/ Valuation Committee should be independent of the portfolio management function.	The committee should be completely independent of members involved in the investment process to avoid any conflict of interests. Investment team members can provide valuable inputs on market conditions and valuation, but they should have no vote or decision power in the committee.
2	The pricing committee should be supported by independent valuation teams, be it internal pricing units or third party vendors, rather than investment teams.	Pricing or Valuation specialists should be responsible for fair valuation of securities. Where available, third party vendors provide a greater degree of independence, followed by internal pricing teams and lastly investment teams.
3	Clear and consistent policies and procedures should be defined for fair valuation of different asset classes and markets at the committee level. These should include monitoring criteria, methodologies, and controls.	Different asset classes and markets have corresponding characteristics and regulatory requirements, and accordingly need relevant fair valuation processes.
4	Any material changes in policies and procedures should be documented and signed off by the board or similar body.	More frequent changes are expected in internal policies and procedures to support market volatility and regulatory requirements, and any such changes should be documented, approved, and clearly communicated across the organization.

#	Best Practice	Description
Pricing Source		
5	Independent fair valuation source should be used, where available, third party sources should be preferred to avoid any conflict of interest.	In addition to offering higher degree of independence, third party vendors have access to greater amount of data and thus could offer more accurate security level fair valuation pricing.
6	Thorough analysis of methodologies, coverage, and cost-effectiveness of third party vendors should be conducted and documented.	Third party vendors should not be used for the sake of sourcing external valuations. At times when the vendor's coverage or methodology is not appropriate, internal pricing teams independent of the portfolio management function should be used.
Valuation Monitoring		
7	Events that demand fair valuation should be clearly defined and documented.	Specific capital market rules such as exchange rules on price variation amounts that lead to trading halts should be documented. Internal fund structures and requirements, such as feeder funds structure and holidays in the master fund domicile, should also be documented.
8	Fair valuation proxies and triggers should be clearly defined and documented both at the fund level and the security level.	Clear definition of proxies and triggers helps in active and timely monitoring for fair valuation. Preferably, an individual or system, should map all the proxies and consolidate both fund level and security level fair valuation actions.[3]
9	There should be segregation of roles and responsibilities in monitoring for events that lead to fair valuation.	Local/Regional teams could have more timely and closer access to markets and participants to monitor for significant events. Provided a robust governance structure is in place, these teams should be prepared, permitted, and have the proper flexibility to be able to make timely fair valuation decisions which will in turn be notified and reviewed by a central pricing team.
10	Process flows and protocols that define the inclusion of assets in the monitoring framework should be documented.	Depending upon the type of event, relevant securities should be placed in the corresponding watch list/tracking list. This should be well-documented for the asset universe and mapped with the type of event and tracking list.

[3] Fund level proxies and triggers are usually managed by the Fund's Board while Pricing Committees manage Security level proxies and triggers. The SEC has been discussing the idea of appointing a Chief Valuation Officer whose role is to handle the whole valuation process and be the missing link between the board and committees, making sure both fund and security level processes, events, proxies and triggers are consistent and coherent.

#	Best Practice	Description
11	Pricing monitoring should be used to have an ex-ante view of assets under management to account for securities that may need fair valuation and thus carry valuation risk.	Securities under distress or market conditions that signal a future significant event should point to assets that might need fair valuation. Even if asset managers marginally incur more operating expenses, it is a best practice in the long run given the reputational and financial risk that wrong valuation carries.
Fair Valuation Methodologies		
12	The pricing techniques and their hierarchy of use should be clearly defined and should be consistent in use.	A clear definition of pricing techniques should be present and they should be mapped to events, funds and securities. The rationale of selecting the techniques should be tested and documented.
13	Fair value pricing should be periodically back tested to ensure consistency and accuracy.	Fair value prices should be tested with market prices once available to check for accuracy. This practice helps in continuous improvement of fair valuation methodologies.
14	Internal fair value models should be documented and periodically validated, at least on an annual basis.	At times, internal quantitative models are used to value assets. These models should be documented and periodically reviewed to ensure relevance.
15	Artificial tracking error arising from fair valuation should be identified and documented for performance and attribution purposes.	When performing fair valuation at a security level or for calculating the fund NAV, managers should be aware that an artificial tracking error exists when benchmark prices use different sources or methodologies as compared to those of the fair valuation adjustments.
Process Review		
16	Regular meetings should be conducted to review fair valuation decisions and the asset list with clear mapping to the events leading to fair valuation.	Committees, to ensure adequate oversight, should be aware of the fair valuation decisions and the assets that are under monitoring. Any exceptions should be discussed to ensure compliance with policies and principles.
17	Fair valuation effects and linkages to risk and performance processes must be understood and mapped.	Fair valuation will affect data sources for many processes, models and reports. Proper identification of linkages will minimize the risk of fair valuation as a source of error.
18	There should be review of internal controls, processes, procedures, and results.	Reviews should be done at least on an annual basis.
19	Review of third party providers and vendors should be conducted.	Reviews should be done at least on an annual basis.

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