Fair Value Hierarchy Leveling

Standard Rule & Methodology Overview

Bloomberg

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Fair Value Hierarchy Leveling

Increased scrutiny on security prices requires additional pricing transparency and information

In recent years, the International Accounting Standards Board (IASB) and the Financial Accounting Standard Boards have been increasing their scrutiny of the inputs of financial instrument prices. This is a result of the issuance of ASC 820, Fair Value Measurement in the U.S. and IFRS 13, Fair Value Measurement internationally. Both accounting standards require increased disclosures around the sources, inputs and methodology used to calculate the fair value of financial instruments presented in the financial statements. A key component of both of these standards is the requirement for companies to include a "leveling" table in the notes to the financial statements, which classifies all investments presented at fair value as Level 1, 2 or 3, based on the significance of unobservable inputs:

- **Level 1 inputs:** Quoted prices in active markets for identical assets or liabilities that the entity can access at the measurement date

- **Level 2 inputs:** Inputs other than quoted prices included within Level 1 that are observable for the asset and liability, either directly or indirectly

- **Level 3 inputs:** Unobservable inputs for the assets or liabilities

Not only have accounting standard setters increased their scrutiny on the composition of so-called 'fair value' pricing, international regulators have as well.

In order to help our clients address these challenges, for years Bloomberg has provided a number of tools and data sets which enable our clients to defend their prices to investors, auditors, and regulators alike:

Pricing Transparency Fields: Clients can request over 70 unique data fields which provide granular information on the composition of the Bloomberg Valuation Service (BVAL) prices through a data feed;

Fair Value Hierarchy Leveling (FVHL <GO>): The FVHL screen allows clients to create their own fair value leveling rules to generate unique, client-specific leveling results. These rules are user-created, leveraging the 70 unique Pricing Transparency fields.

Market need for transparent, defensible leveling which can be accessed quickly and consistently

While many clients value the customizability offered by the FVHL<GO> platform and the ability to create, store and manage custom leveling rules, many clients were looking for a more simple, straightforward, operational solution. These clients wanted to have fair value leveling data at their fingertips and available in real-time in order to understand the impacts of their trading decisions. Further, clients who were not well versed in the underlying accounting standards were looking for help to interpret and translate these accounting standards into operational rules.

Based on this feedback, Bloomberg has created a set of 'standard' FVHL rules that are designed to function as market consensus rules for determining fair value levels. These rules were developed based on a thorough review and understanding of the accounting standards and years of feedback from clients.

This level information is available to subscribers of the BVAL pricing service through Data License. This data is captured in two fields: BRAM_STANDARD_FV_HIERACHY_LEVEL (DW094) and BRAM_STANDARD_ASSET_GROUP (DW095). For more information on these fields, please refer to Appendix A: FVHL Fields. The values can also be seen on the Pricing Transparency tab of the BVAL <GO> screen on the Bloomberg Terminal®.

The purpose of this document is to outline the rules used to generate these leveling results.

Leveling rules

Over the next few pages, this document will discuss the 'standard' rules created for the purpose of generating consistent FVHL leveling results, starting with a summary of the rules and then an in-depth explanation starting at Level 1 and working down to Level 3, discussing asset-specific considerations, if and where necessary. This document should be read in combination with Bloomberg's Regulatory Transparency Brochure which provides an overview of the fields discussed in the rules below. For more information, please refer to RAAP <GO> on the Terminal.

For more information on the fields discussed in the sections below, please refer to Appendix B: Commonly Used Transparency Fields for Leveling Purposes.

Leveling rule overview

Asset Class	Fixed Income		Mortgages	Munis
Sub-Asset Classes	• U.S. Government • Agencies • IG Corporates • Convertibles • IG Emerging Market Debt • G-20 Sovereigns • Non-G20 Sovereigns • Defaulted	• High Yield Corporates • High Yield Emerging Market Debt • Syndicated Loans	• Pools • CMOs • CMBS • RMBS • TBAs • Others	• Investment Grade • High Yield
Level 1	• BRAM Direct Observation Executable Percent > 0 • BRAM Price Percent Observable = 100 • OR BRAM Yield Percent Observable = 100 • BRAM Direct Observation Percent = 100			
	BRAM Executable Direct Observation Weighted Average Age <= 5	BRAM Executable Direct Observation Weighted Average Age <= 5	BRAM Executable Direct Observation Weighted Average Age <= 6	BRAM Executable Direct Observation Weighted Average Age <= 10
Level 2	All priced instruments which are not Level 1 are Level 2	• BRAM Price Percent Observable >= 95 • OR BRAM Yield Percent Observable >= 95 • BRAM Income Method Percent < 5	BRAM Observation Weighted Count > 0	All priced instruments which are not Level 1 are Level 2
Level 3	N/A	All priced instruments which are not Level 2 are Level 3	All priced instruments which are not Level 2 are Level 3	N/A

Level 1

IFRS 13

IFRS 13 defines Level 1 inputs as follows:

Level 1 inputs are quoted prices in active markets for identical assets or liabilities that the entity can access at the measurement date. [IFRS 13:76]

A quoted market price in an active market provides the most reliable evidence of fair value and is used without adjustment to measure fair value whenever available, with limited exceptions. [IFRS 13:77]

ASC 820

ASC 820 defines Level 1 inputs as follows:

Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the reporting entity can access at the measurement date. [820-10-35-40]

A quoted price in an active market provides the most reliable evidence of fair value and shall be used without adjustment to measure fair value whenever available, except as specified in paragraph 820-10-35-41C. [820-10-35-41]

Bloomberg's Rules

Based on the guidance above, we built rules in order to individually address each key requirement of IFRS 13 and ASC 820.

Must be accessible:

Both ASC 820 and IFRS 13 state that the prices from active markets must be "accessible". This means that you must be able to gain access to the transaction and enter or exit the position without undue cost.

In order to capture this, Bloomberg uses the following rule to ensure that the prices come from accessible markets.

BRAM Direct Observation Executable Percent > 0

By ensuring that the price is at least some percentage executable, we ensure that there are in fact accessible, executable quotes for the instrument. This ensures that the price meets the accessible requirement of IFRS 13 and ASC 820.

Must be directly observable (without adjustment):

IFRS 13 and ASC 820 also implicitly require that the price be directly observable. This is touched on by the fact that these standards require that the prices can be accessed. More explicitly, Level 2 allows for inputs which are not directly observable, implicitly stating that Level 1 inputs must be 'observable'.

In order to capture this, Bloomberg uses the following rule to ensure that the prices come from accessible markets.

**BRAM Price Percent Observable = 100
OR BRAM Yield Percent Observable = 100**

By ensuring that the price or yield is 100% observable, we ensure that all inputs to the price are directly observable quotes as required by IFRS 13 and ASC 820.

Identical assets or liabilities:

ASC 820 and IFRS 13 both require that the Level 1 inputs be quoted prices for "identical assets and liabilities". Bloomberg's pricing data breaks quotes into two categories: direct observations and observed comps.

In order to capture this, Bloomberg uses the following rule to ensure that the prices come from accessible markets.

BRAM Direct Observation Percent = 100

Bloomberg's pricing data breaks quotes into two categories: direct observations and observed comparables ("comps"). Simply put, direct observations are prices from identical assets and observed comps are based on comparable assets. Therefore, in order to ensure that the price is entirely derived from identical assets and liabilities, the price needs to be entirely derived from direct observations.

Active Market:

IFRS 13 and ASC 820 require that for an instrument to be Level 1, the inputs and prices used in determining the fair value of an instrument come from an 'active market'. ASC 820 defines an active market as "a market in which transactions for the asset or liability take place with sufficient frequency and volume to provide pricing information on an ongoing basis". The IFRS 13 definition is effectively the same.

In order to capture this, Bloomberg uses the following rule to ensure that the prices come from active markets.

BRAM Executable Direct Observation Weighted Average Age <= X (where X = 5 for fixed income, X = 6 for pools and securitized products and X = 10 for munis)

The definition above begs the question what is "sufficient frequency and volume", and, as a result, the rule above represents the first time that the leveling rules diverge for different asset classes. The reason for that is that market and trading norms are different for different asset class. Different asset classes are expected to trade at different frequencies. Therefore what might qualify as an active market for municipals might not for government bonds.

In determining whether a market is active, we use the average age of the quotes. We use the direct observation average age specifically, because we are only interested in how actively traded identical instruments are (not comparable instruments). Lower average ages obviously mean a more inactive market. As a result, we have tried to use ages that are reflective of the different market norms in the fixed income, mortgage and muni markets.

Level 2

IFRS 13

IFRS 13 defines Level 2 inputs as follows:

Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for the asset and liability, either directly or indirectly [IFRS 13:81]

Level 2 inputs include:

A) quoted prices for similar assets or liabilities in active markets

B) quoted prices for identical or similar assets or liabilities in markets that are not active

C) inputs other than quoted prices that are observable for the asset or liability, for example

    i. interest rates and yield curves observable at commonly quoted intervals

    ii. implied volatilities

    iii. credit spreads

D) market-corroborated inputs [inputs that are derived principally from or corroborated by observable market data by correlation or other means] [IFRS 13:82]

ASC 820

ASC 820 defines Level 2 inputs as follows:

Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. [820-10-35-47]

Level 2 inputs include all of the following:

A) Quoted prices for similar assets or liabilities in active markets

B) Quoted prices for identical or similar assets or liabilities in markets that are not active

C) Inputs other than quoted prices that are observable for the asset or liability, for example:

    i. Interest rates and yield curves observable at commonly quoted intervals

    ii. Implied volatilities

    iii. Credit spreads.

D) market-corroborated inputs [820-10-35-48]

Bloomberg's Rules

Must be observable, either directly or indirectly:

Both IFRS 13 and ASC 820 explicitly require that all Level 2 inputs must be observable, either directly or indirectly. This means that either the price must be composed of quoted prices or any pricing information not observable in the market must rely on observable inputs.

Bloomberg's Level 2 rules differ between asset classes as the sources of prices differ from asset class to asset class. Below we look at Munis, Fixed Income and Mortgages (including sub-asset classes as necessary) in order to explain how Bloomberg addressed these requirements.

Munis & Mortgages (Securitized & Pooled Products)

Bloomberg's BVAL model only prices muni bonds using two sources: direct observations and observed composites. That is to say that there are no additional, model driven sources which could potentially include unobservable inputs. To the extent that the BVAL pricing source prices a muni, it contains only Level 2 and Level 1 inputs. Therefore, for Munis, any instrument which is not Level 1, it is automatically Level 2.

Mortgages (Securitized & Pooled Products)

For mortgage instruments, the methodology is a bit different. For these instruments, in many cases what is classified as an "observed comparable" is actually based entirely on a discounted cash flow model leveraging a surface and inputs from the market. In order to ensure that there are truly observable comparables being used instead of a purely DCF approach, we ensure that there is a least one tangible price being used.

Fixed Income

For fixed income, prices can be derived from three different sources: (1) direct observations, (2) observed comparables and (3) 'model-based' prices. 'Model-based' prices is a catch-all term used to describe a number of different pricing methodologies which are leveraged as a tertiary source in the absence of more observable prices or comparables from the market. Some of these methodologies rely purely on observable inputs as outlined about in IFRS 13 and ASC 820. However, others use unobservable adjustments. Therefore, in order to determine appropriate leveling, we need to review the methodology for each asset class and model:

- **Convertibles (Convertible Model)** – No unobservable inputs – Bloomberg evaluators won't release pricing on a convertible until we have actual pricing on that convertible

- **Defaulted (Defaulted Model)** – No unobservable inputs – Bloomberg BVAL evaluators group securities pari passu in order to determine a recovery value (e.g. for Lehman Brothers there may be 8-9 different groups); prices for an instrument in a bucket are leveraged across the bucket; therefore all data is prices are real observed prices for similar instruments

- **Sovereigns, Investment Grade Corporates & Agencies (Yield Coupon Model)** – No unobservable inputs

- **High Yields (HY Model, HY Capital Structure Model)** – Significant Unobservable Inputs – Adjustments are made to other market-derived valuations (e.g. "not rated adjustment", etc.), as necessary

- **Syndicated Loans (Loan Model)** – Significant Unobservable Inputs – Assumptions are made to the market-derived valuations, as necessary

Munis, Convertibles, Defaulted, Sovereigns, IG Corps & Agencies

All priced instruments which are not Level 1 are Level 2

High Yields & Syndicated Loans

BRAM Price Percent Observable >= 95

OR BRAM Yield Percent Observable >= 95

Mortgages

BRAM Observation Weighted Count > 0

Level 3

IFRS 13

IFRS 13 defines Level 3 inputs as follows:

Level 3 inputs are unobservable inputs for the asset or liability. [IFRS 13:86]

Unobservable inputs shall be used to measure fair value to the extent that relevant observable inputs are not available, thereby allowing for situations in which there is little, if any, market activity for the asset or liability at the measurement date. [IFRS 13:87]

ASC 820:

ASC 820 defines Level 3 inputs as follows:

Level 3 inputs are unobservable inputs for the asset or liability. [820-10-35-52]

Unobservable inputs shall be used to measure fair value to the extent that relevant observable inputs are not available, thereby allowing for situations in which there is little, if any, market activity for the asset or liability at the measurement date. [820-10-35-53]

Bloomberg's Rules

Instruments which do not meet the criteria above are level 3

In Bloomberg's rule methodology, Level 3 effectively represents those instruments which do not meet the criteria to be classified as Level 2 or 3. What is left are instruments where the fair value includes significant unobservable inputs. From a Bloomberg standpoint, a Level 3 instrument is an instrument that includes model-based pricing where the model features subjective, unobservable inputs.

Appendix A:

FVHL fields

CALCRT ID	FIELD NAME	GSAC	MTGE	MUNI	DEFINITION
DZ788	BRAM FV Hierarchy Level Output	Y	Y	Y	Fair value hierarchy leveling result (1, 2 or 3) based on the client defined rule set saved in the fair value hierarchy leveling tool.
DZ789	BRAM Client Asset Group	Y	Y	Y	Client customized asset group classification for which a fair value hierarchy leveling rule has been created.
DW094	BRAM Standard FV Hierarchy Level	Y	Y	Y	Fair value hierarchy leveling result (1, 2 or 3) based on the standard, default rules outlined above.
DW095	BRAM Standard Asset Group	Y	Y	Y	Standard, default asset group classification for which a fair value hierarchy leveling rule has been created, based on definitions outlined above

Appendix B:

Commonly used transparency fields for leveling purposes

CALCRT ID	FIELD NAME	GSAC	MTGE	MUNI	DEFINITION
DZ796	BRAM Yield Percent Observable	Y	Y	Y	Percentage of the BVAL Yield based on direct and indirect market observations. This includes yield adjustments that are calibrated to market data.
DZ797	BRAM Price Percent Observable	Y	Y	Y	Percentage of the BVAL Price based on direct and indirect market observations. This includes price adjustments that are calibrated to market data.
DZ810	BRAM Direct Observation Executable Percent	Y	Y	Y	Percentage of the BVAL Price derived from direct executable market observations on the target security.
DZ792	BRAM Direct Observation Percent	Y	Y	Y	Percentage of the BVAL Price derived from direct market observations on the target security.

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