

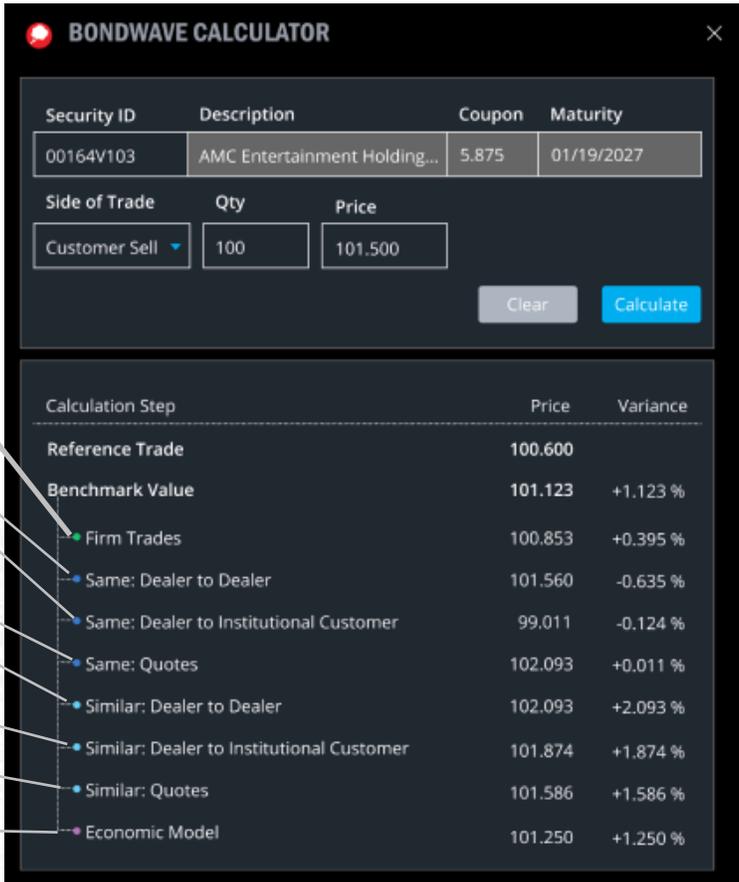
## Think Like a Market Maker

*IPC's integration of the BondWave Pre-Trade Price Discovery Tool automates the thought process of a trader by surveilling today's market activity instantaneously*

When asked to price a bond, a market maker goes through a waterfall thought process to analyze available data and make a pricing decision.

1. *Have I traded this bond before?*
2. *Have any dealers traded this bond today?*
3. *Have any Institutions traded this bond today?*
4. *Are any dealers currently quoting this bond?*
5. *Have any dealers traded a bond(s) similar to this bond today?*
6. *Have any Institutions traded a bond(s) similar to this bond today?*
7. *Are any dealers currently quoting bond(s) similar to this bond today?*
8. *Can I model this bond to produce a price?*

With the BondWave Calculator all these questions can be answered at once, providing the trader with confidence that all factors are considered prior to executing a trade.



**BONDWAVE CALCULATOR**

Security ID	Description	Coupon	Maturity
00164V103	AMC Entertainment Holding...	5.875	01/19/2027

Side of Trade: Customer Sell | Qty: 100 | Price: 101.500

Buttons: Clear, Calculate

Calculation Step	Price	Variance
Reference Trade	100.600	
Benchmark Value	101.123	+1.123 %
Firm Trades	100.853	+0.395 %
Same: Dealer to Dealer	101.560	-0.635 %
Same: Dealer to Institutional Customer	99.011	-0.124 %
Same: Quotes	102.093	+0.011 %
Similar: Dealer to Dealer	102.093	+2.093 %
Similar: Dealer to Institutional Customer	101.874	+1.874 %
Similar: Quotes	101.586	+1.586 %
Economic Model	101.250	+1.250 %

Callouts 1-8 point to the following rows in the table:

- 1: Firm Trades
- 2: Same: Dealer to Dealer
- 3: Same: Dealer to Institutional Customer
- 4: Same: Quotes
- 5: Similar: Dealer to Dealer
- 6: Similar: Dealer to Institutional Customer
- 7: Similar: Quotes
- 8: Economic Model

## How it works

*BondWave leverages a sophisticated trade benchmarking engine that combines market data and proprietary data to produce quantitative, precise values based on the regulatory-prescribed 'waterfall' methodology*

The BondWave Calculator precisely follows the regulatory waterfall process that is described by both FINRA and the MSRB in their supplementary material to determine the Fair Price of a bond<sup>1</sup>. The BondWave Calculator asynchronously attempts to calculate benchmarks at each step of the waterfall and does so instantaneously on a pre-trade basis. A trader enters four fields: CUSIP, customer side of market (buy or sell), quantity, and expected customer price. When a trader hits the "Calculate" button, benchmark values and a variance from the expected customer price for each calculated value will be provided.

The calculated values surfaced by the BondWave Market Calculator first looks at FINRA's TRACE and MSRB's RTRS reported trades, identifying trades executed in the same bond as dealer-to-dealer, then as dealer-to-institutional customer (executed trade size is a proxy for institutional trades). Next, quotations are analyzed (bids and offers are supplied by ICE Bonds). The values surfaced by the calculator are displayed on a par weighted basis. For similar bonds (which can be defined by each client), the calculated values are determined by computing a volume weighted average yield, followed by a yield-to-price conversion to the subject bond being calculated. At the similar bonds' levels, dealer-to-dealer, dealer-to-institutional customer, and quotations are analyzed. Finally, the economic model is determined by looking at the preceding day's mid-market ICE evaluation, which is adjusted by any market movement from last night's closing prices to the time of the calculation, plus or minus the bid/offer spread depending on if the calculation is set for a customer buy or sell.

The default 'lookback period' for market data is same day, such that calculations are based upon market observations on the day of the calculation. However, this lookback period is a parameter that can be set from same day to as far back as 5 business days by each client/firm. Often traders may want more market observations by looking back more days when determining Best Execution versus determining Fair Pricing by looking at same day executions. The BondWave Calculator uses interest rate and ratings event thresholds to ensure that whatever lookback period is chosen, only relevant market data is analyzed for the calculation.

The BondWave Calculator, as offered on the IPC Unigy Turret, offers market professionals the ability to determine, on a pre-trade basis, the Fair Market Value of a bond by surfacing calculated benchmarks across the regulatory prescribed waterfall using client-defined settings and definitions.

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<sup>1</sup> FINRA Rule 2121 in Supplementary Material Section .02 (b) and MSRB Rule G-30 in Supplementary Material Section .06 (a) These rules are known as the "Fair Pricing Rules", describes the determination of the Prevailing Market Price as the means by which a dealer should follow the "waterfall" to determine the Prevailing Market Price or Fair Price of a bond.