



# Latest Developments in Municipal Bond Pricing & Benchmarks

WEBINAR | 25<sup>TH</sup> MAY 2017 | 10AM EST

# Agenda



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Welcome	Ian Blance   Voltaire Advisors
1010 - 1020	Municipal Data & Pricing: A User Perspective   J.R.Rieger, S&P Dow Jones Indices
1020 - 1030	Observation Based Pricing  Tom Metzold, Best Credit Data
1030 - 1040	Credit Research & High Yield Bonds  Dan DiBono, Thomson Reuters
1040 - 1050	Specialist Vendors & New Data Sources  Matt Fiordaliso, IHS Markit
1050 - 1100	Audience Q&A
1100	Close of Webinar



# 2017 Municipal Bond Pricing & Benchmark Survey

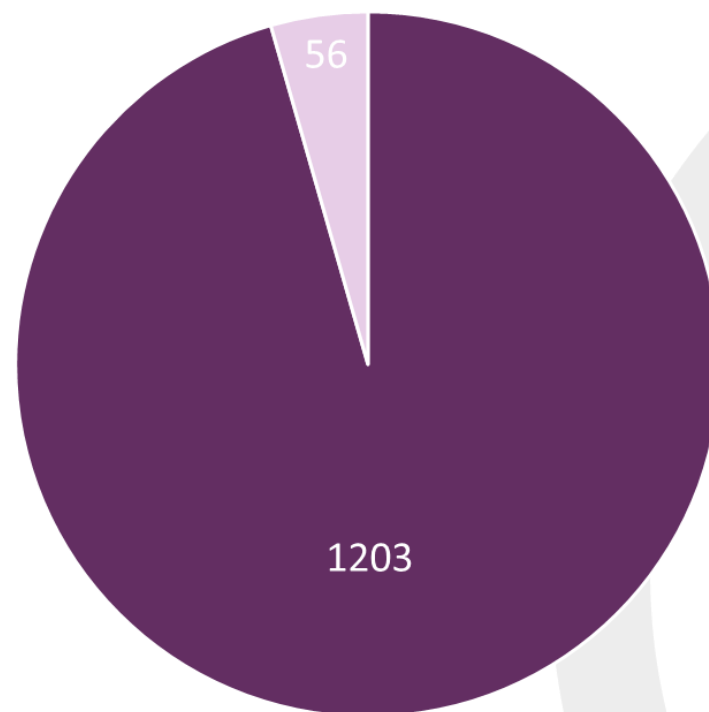
Ian Blance  
Managing Director  
Voltaire Advisors



- ◆ 40 of 110 advisers polled responded (36% versus 30% in 2016). This included all of the top ten mutual fund managers and 15 of the top 20.
- ◆ These respondents managed 1534 of the 2236 existing funds (69% versus 65% in 2016).
- ◆ In terms of assets under management (AUM), the respondents manage close to 85% of all mutual fund investments in municipal bonds.
- ◆ This response suggests that the topic remains an issue for muni managers, and the response can truly be regarded as a representative snapshot of industry opinion and action. The results of the survey are reported below.

# Primary Price Sources

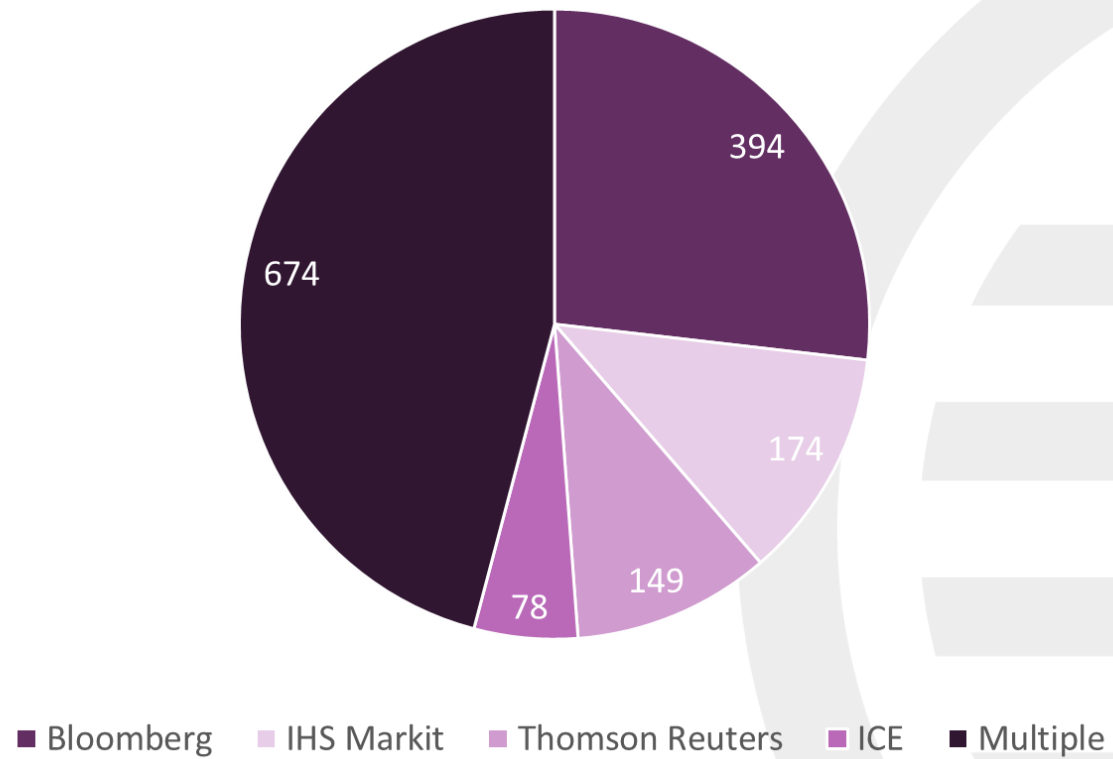
Primary Pricing Source (# Funds)



■ ICE ■ Bloomberg

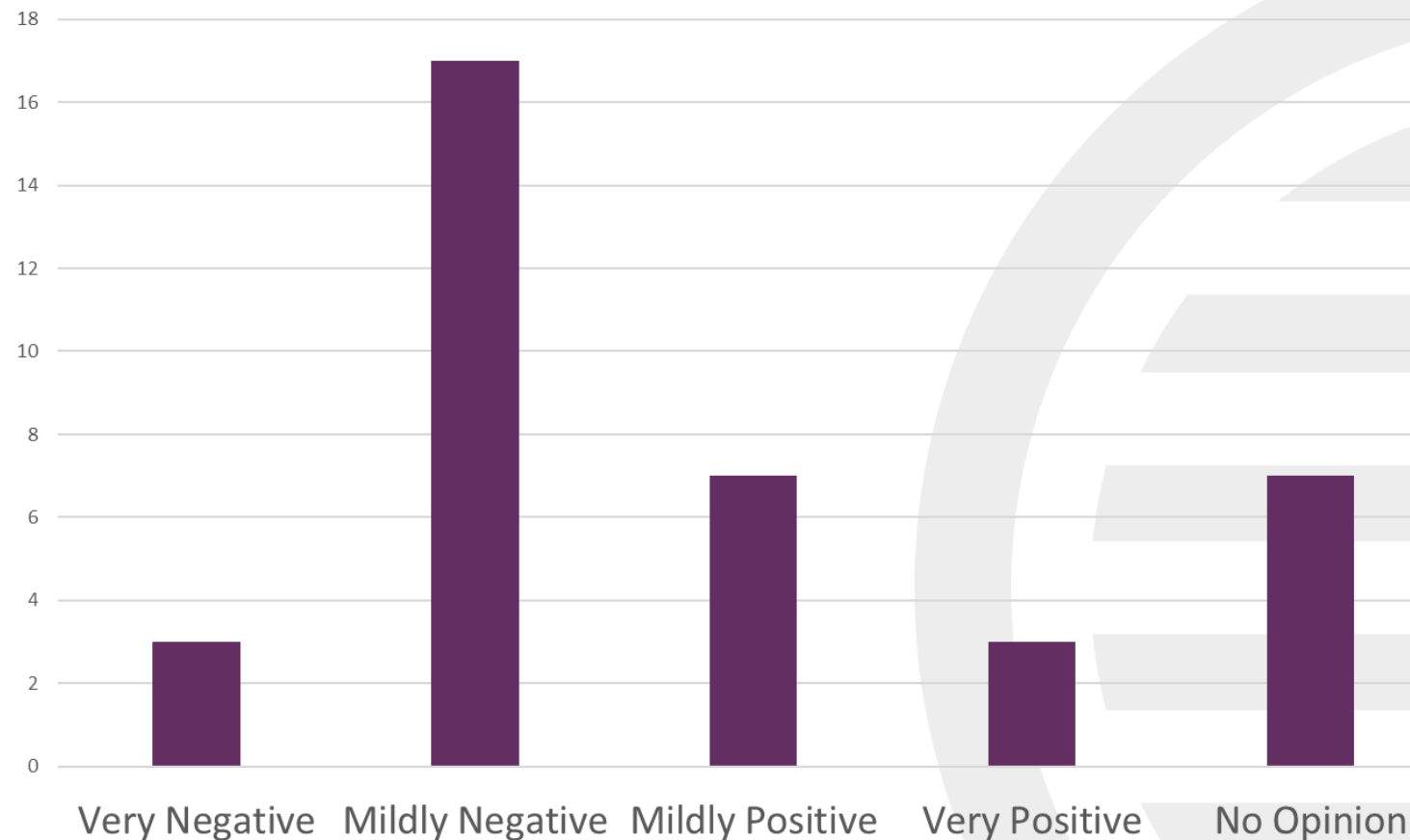
# Secondary Price Sources

Secondary Pricing Sources (# Funds)

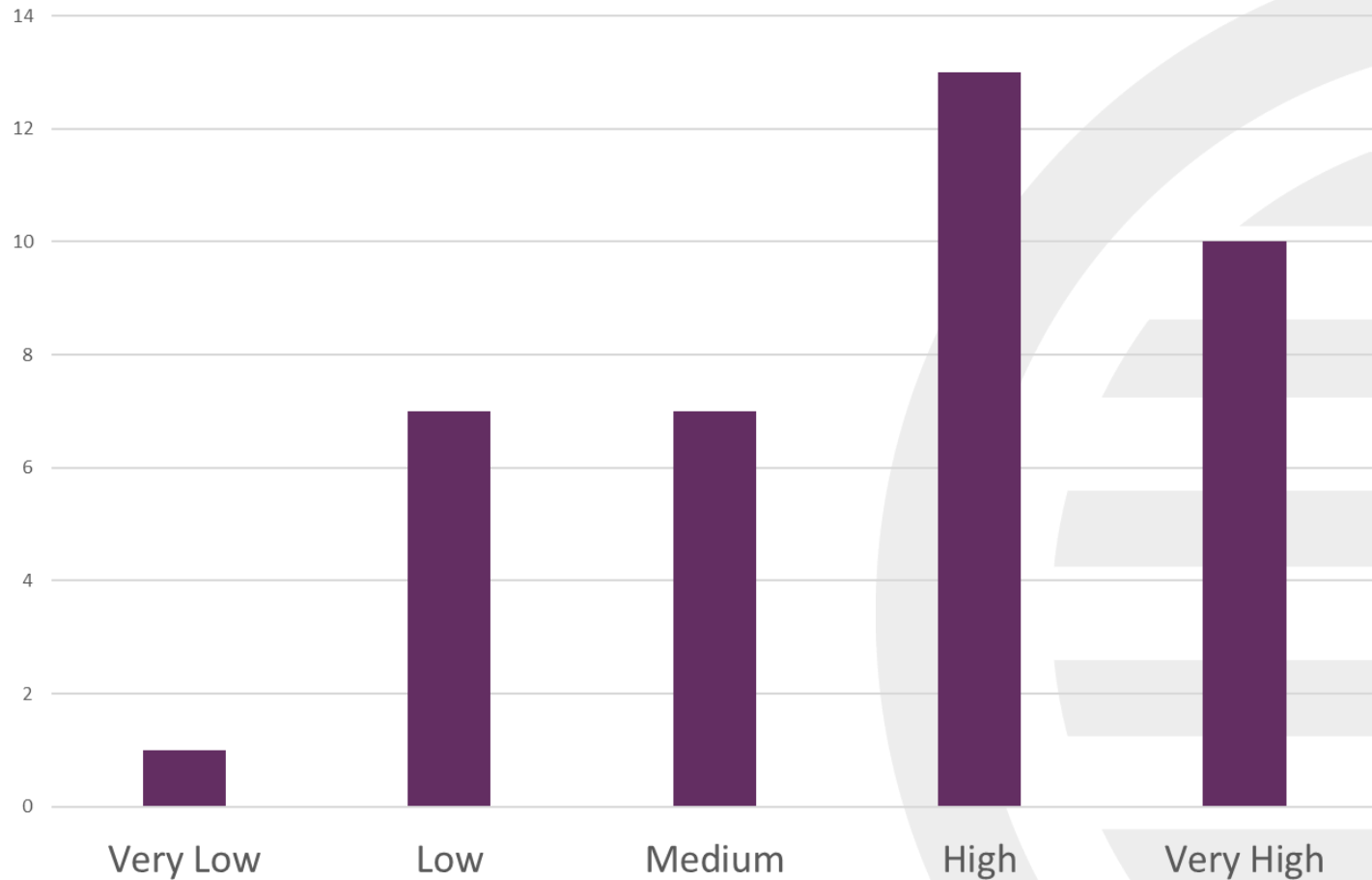


# SPSE/ICE Consolidation

View on the Acquisition of SPSE by ICE (# Firms)

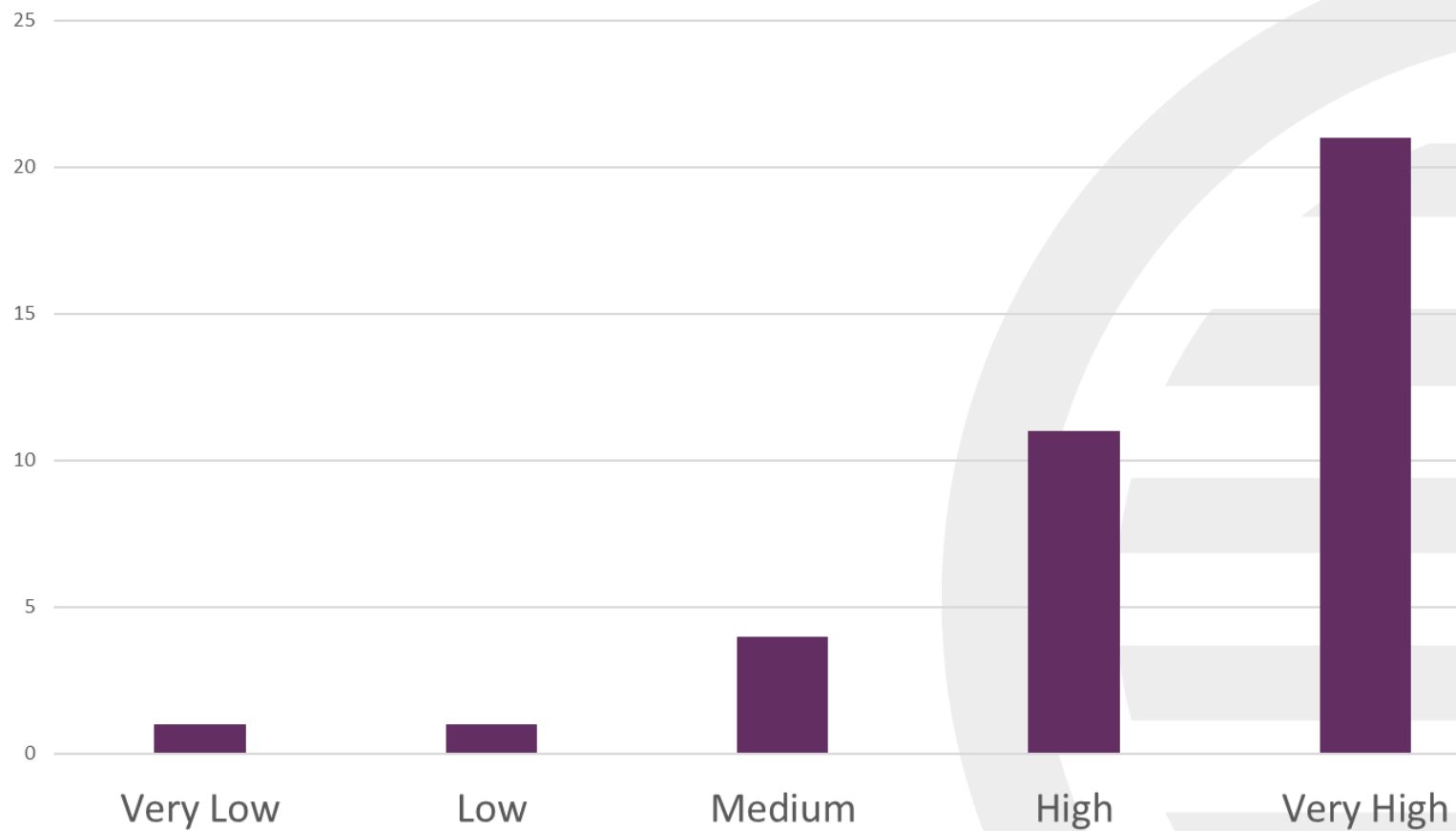


Importance of Credit Research for High Yield



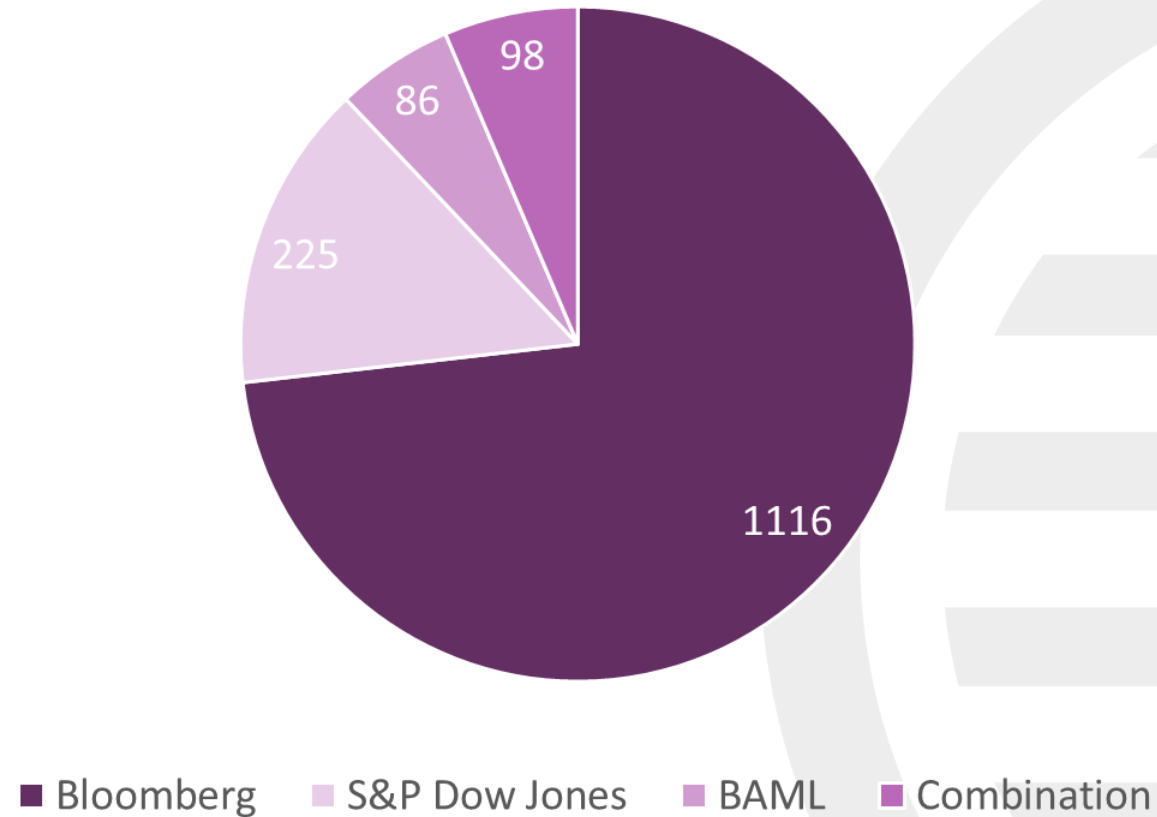


## Importance of Evaluator/Analyst Access

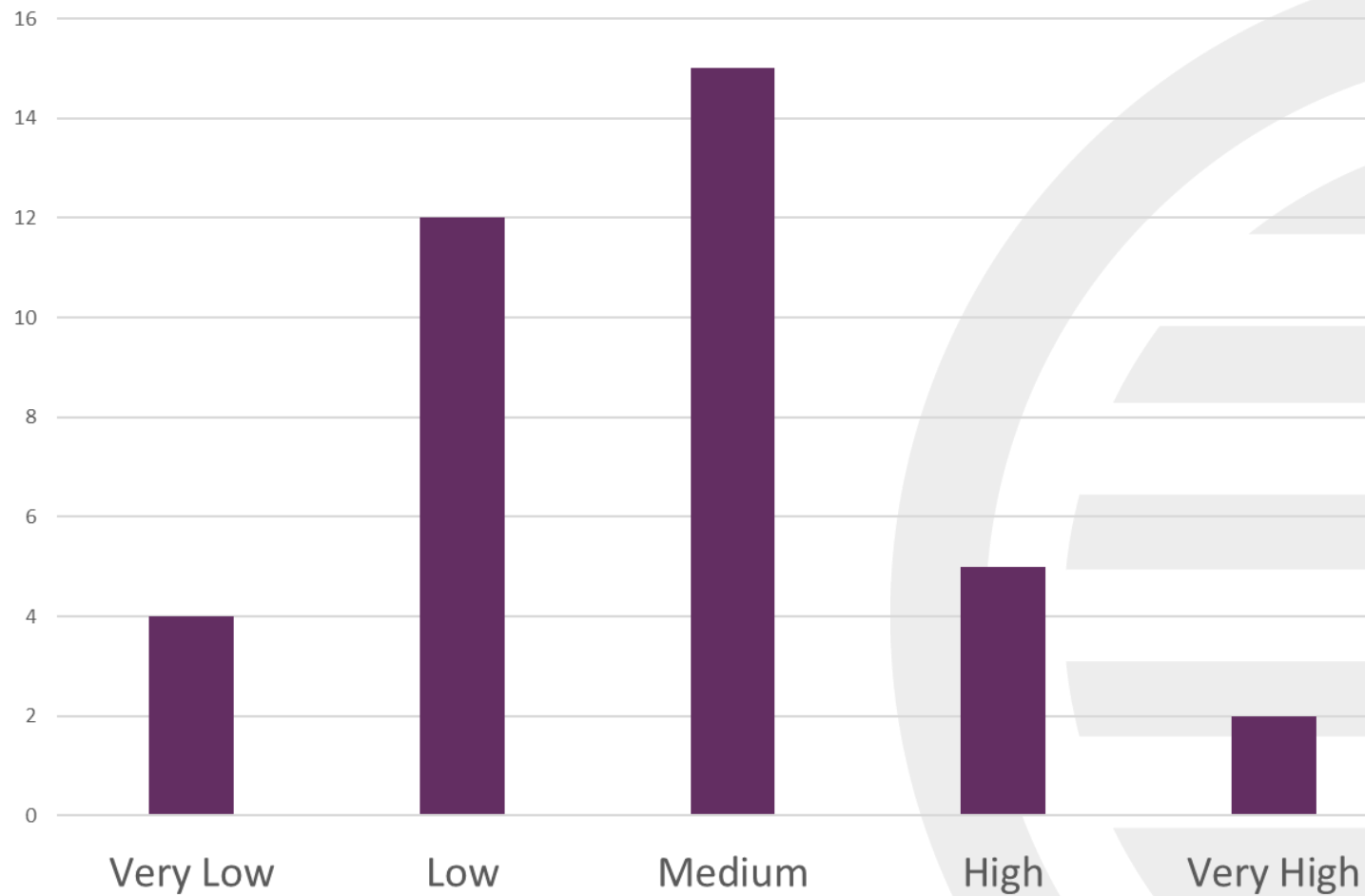


# Benchmark Indices

Benchmark Indices (# Funds)



## Importance of Aligning Index & Fund Pricing



- ◆ Full Survey & Special Report *Municipal Market Moils Redux* released on Tuesday 30<sup>th</sup> May
- ◆ Accompanying Service Provider Directory *An Industry Sea Change?*



# Municipal Data & Pricing: A User Perspective

J.R. Rieger

Global Head of Fixed  
Income

S&P Dow Jones Indices



# Voltaire Webinar

## Latest Developments in Municipal Bond Pricing & Benchmarks

J. R. Rieger  
Managing Director, Global Head of Fixed  
Income Indices  
S&P Dow Jones Indices

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# Municipal Data & Pricing: A User Perspective

- Shifting sands
- Benchmark vs “investable” indices: ever growing complexity & uses
- As a massive data and pricing user: What we look for in service providers

# Municipal Data & Pricing: Shifting Sands

- The two leading municipal bond pricing providers both purchased by Intercontinental Exchange (ICE).
  - Standard & Poor's Securities Evaluations (fka J.J. Kenny) (Purchased in 2016)
  - Interactive Data Corporation (IDC) (fka Muller)
- Bloomberg purchased Barclays Indices and switched muni pricing and data to Bloomberg from IDC in 2016.
- These events have created unprecedented competition by other pricing providers attempting to gain market share as either primary or secondary pricing source.
- In addition, Mergent, a muni bond terms & conditions data source has been purchased by London Stock Exchange Group (LSEG) and supports FTSE Russell's core index offering. (2016)



# S&P Municipal Bond Indices: Benchmarks

Objective: reflect daily market conditions and provide essential information about the complex municipal bond market place via a series of nearly 200 municipal bond indices.

- S&P Municipal Bond Index: broad index for performance measurement and attribution analysis
  - Approximately 99,000 bond issues, all States & territories
  - 30 sectors
  - Quality ranges from AAA to N/R and defaulted securities
- S&P Taxable Municipal Bond Index: broad index for performance measurement and attribution analysis
  - Approximately 24,000 bond issues
  - Includes sub-index: S&P Municipal BAB Index
- S&P Municipal 7 Day High Grade Index: Used as base index for VRDO coupon resets.

Methodology documents can be found on [www.spdji.com](http://www.spdji.com)

Source: S&P Dow Jones Indices. Data as of May 22, 2017

# S&P Municipal Bond Indices: Investable

Objective: reflect daily market conditions and provide essential information about the investable portion of the municipal bond market.

- S&P National AMT-Free Municipal Bond Index: broad investable index for passive investing.
  - iShares and Vanguard both have exchange traded funds (ETFs) based on the parent index
  - Concentration limits apply to help ensure diversification
  - Approximately 11,000 bond issues
  - Investment grade only, excludes AMT
  - California and New York are sub-indices
- S&P AMT-Free Municipal Series: 2017 - 2026
  - Bonds in each municipal series 'mature' as a result the index acts like a diversified bond
- S&P Municipal Yield Index:
  - 70% below investment grade, 20% BBB- to BBB+, 10 % A- to A+
  - State & territory capping

Methodology documents can be found on [www.spdji.com](http://www.spdji.com)

Source: S&P Dow Jones Indices. Data as of May 22, 2017

# Some of What We Look For In Pricing Providers:

- Depth of buy-side use (is there a good feedback loop?)
  - Pricing & analytical personnel:
    - Location U.S.? Other? (if other, why?, what are they doing?)
    - Depth of experience
  - Use of and investment in technology to leverage large data sets
    - Measurable quality assurance metrics
    - Potential real-time or intraday pricing
  - Pricing analytics & risk measures
  - New issue coverage (timeliness)
  - What base curve is used & why?
  - Coverage: Investment grade, high yield
  - Challenge process: Clear / effective / timely
  - Consistent & timely delivery
  - SOC 1/SSAE 18 Audit (They do what they say the do)
  - IOSCO: Data submitters code
- 
- Additional value add? i.e. Liquidity metrics & data sets

# If Pricing Provider is Also Bond Data Provider:

In addition to the previous questions:

- Par amount: at issuance & current outstanding par amount (has to be right)
- New Issue set-up (timeliness)
- Sectoring schema (is it a fit?)
- If using a third party for terms & conditions data:
  - Which service is used?
  - Validation steps to correct or modify the data? If so, when/how?

# Thank you

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# Observation Based Pricing

Tom Metzold  
Senior Managing Director  
Best Credit Data





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DATA

# Best Credit Data

## Tom Metzold

### Senior Managing Director



# Tom Metzold – Introduction

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## 30+ Years in Muni Industry

- Eaton Vance (1987 to 2015)
  - Co-Head of Municipal Bond Group
  - Portfolio Manager
  - Analyst
  - Trader
- National Public Finance Guarantee (2015/2016)
  - Head of Capital Markets



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# Why I joined BCD

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## Excited about

- Quality / Coverage / Cost
- Business model
- Cloud-based computing
- Ability to pass cost savings to customers
- Automation
- Leverage of key employees



# Best Credit Data (BCD) is a Data Company

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- Laser-focused on Evaluated Pricing (US Muni and Corporate)
- 100% Coverage of Muni Market
- Highest Quality Pricing - Independent studies from Fund Admin companies and prospective clients
- Fully Automated - State-of-the-art cloud-based technology that is fast *and* accurate
- Lower Cost - Company of the future

# Product Consolidation– Muni Industry-wide Problem

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## IDC / S&P Pricing Merger - both purchased by the ICE

- 97+% of the market had IDC/S&P as Primary/Secondary Source
  - Most mutual funds need / want two “independent” sources
- Products will merge in 2017 based on best estimates
  - Clients (the entire market really) will need a new secondary source
  - No competitor prior to announcement, could answer the following question: “Name 10 clients that use you for secondary pricing source?”
  - Options include: Best Credit Data / Markit / Thomson Reuters / Bloomberg



# BCD - Leading the Evaluated Pricing Evolution

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**Evaluated Prices** are independent valuations of investments in low liquidity (trading) markets, such as fixed income markets. Some securities can go days, weeks or months without a single trade. For example, roughly 13,000 securities (less than 1%) of the approximately 1.3 million US Municipal Bond Market will trade today. 99% will rely on evaluated pricing.

## The old way



- Hundreds of expensive analysts
- Expensive locally hosted Technology
- People are error-prone
- Bucketing securities limits accuracy
- Accuracy tied to liquidity of securities
- Slower to respond to market movements
- Pass through costs to customers

## The BCD way



- Millions of inexpensive processors / CPUs
- Hosted in the Google Cloud / Bigquery
- Algorithms are not error-prone
- Every security computed independently
- Accuracy is not dependent on liquidity
- Valuations reflect all market movements
- Pass through savings to customers

# BCD – Pricing Methodology

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## Observation-based Pricing

We collect data from thousands of different sources, and through a rigorous and proprietary process, we calculate the best possible price for every security in our universe. We layer transactional pricing data, bid-offer pricing data, positions data from open and closed end mutual funds, ETFs, insurance companies and governmental pension plans. Then we run a weighted regression analysis to reconcile all of these observations into a single meaningful price. Through this effort, we believe that our price is more accurate to the true value of the security than simple matrix pricing or bid-offer pricing data.

## Full Transparency

Our detailed reporting includes the number of pricing points used for input, details on the type of pricing points – transactional or institutional, curve analysis and correlation analysis used. Reports also contain a BCD Confidence Quotient, which clearly distinguish the quality of each BCD pricing point and in turn helps you build a stronger analysis.

# Coverage and Quality are Critically Important

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Coverage X Quality = Total Quality

Best Coverage X Highest Quality = Best Possible Solution

## The Coverage Impact

- Product 1 with 100% Coverage
  - Grade A quality product X 100% coverage = Grade A Product
- Product 2 with 70% Coverage =
  - Grade A quality product X 70% coverage = Grade C-/D+ Product



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# Quality Study Results by SS&C

Market Coverage (by Sub Asset Class)							
Sub Asset Class	Security Count	Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Best Credit
Municipal Bond	1,870	65%	100%	70%	74%	99%	100%
Contemporaneous Market Alignment (by Sub Asset Class)							
Sub Asset Class	Transaction Count	Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Best Credit
Municipal Bond	838	38bps (+/-6)	29bps (+/-3.4)	45bps (+/-4.7)	35bps (+/-5)	82bps (+/-13)	46bps (+/-8)
Prospective Market Alignment (by Sub Asset Class)							
Sub Asset Class		Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Best Credit
Municipal Bond		76bps (+/-9)	52bps (+/-6)	56bps (+/-6)	76bps (+/-9)	117bps (+/-17)	113bps (+/-20)
Retrospective Market Alignment (by Sub Asset Class)							
Sub Asset Class		Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Best Credit
Municipal Bond		47bps (+/-4.6)	47bps (+/-4.0)	59bps (+/-5.0)	46bps (+/-4.7)	65bps (+/-6)	65bps (+/-8)
Outliers (5% or more variance from trade price)							
Sub Asset Class		Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Best Credit
Municipal Bond		4%	1%	1%	2%	5%	2%





# Clients / Prospective Clients

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- 60+ Firms Currently Using / Evaluating BCD Muni Pricing
  - Most still in evaluation stage
  - Confirmed two new clients in last 30 days
- Clients / Prospects / Partners Include:
  - Mutual Funds / Hedge Funds / Accounting Firms
  - Index Firms / Exchanges / Attribution Tools / Analytics Firms
  - Investment Banks / Wealth Management / Commercial Bank
  - Asset Pricing Services

# Current Partners

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For client testing or partnering, please contact:

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**Jimmy Suppelsa, COO & Co-Founder,**

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# Credit Research & High Yield Bonds

Dan DiBono

Manager of High Yield  
Evaluations

Thomson Reuters





2500	0.00	2.6100	0.041	TRM	2500	0.00	2.6100	0.041	TRM
2500	0.00	3.1220	0.037						
2500	0.25	3.2240	0.040	ESM	2500	0.00	3.2240	0.040	ESM
2500	0.00	3.2420	0.041	ALLM	2500	0.00	3.2420	0.041	ALLM
SEC	Chg	IRS Bdy	Bid	Chg	SEC	Chg	IRS Bdy	Bid	Chg
2510	-0.00	2510	29.20	-2.70	2510	-0.00	2510	29.20	-2.70
2530	-0.00	2530	-32.20	-2.00	2530	-0.00	2530	-32.20	-2.00
2540	-0.00	2540	126.40	2.40	2540	-0.00	2540	126.40	2.40



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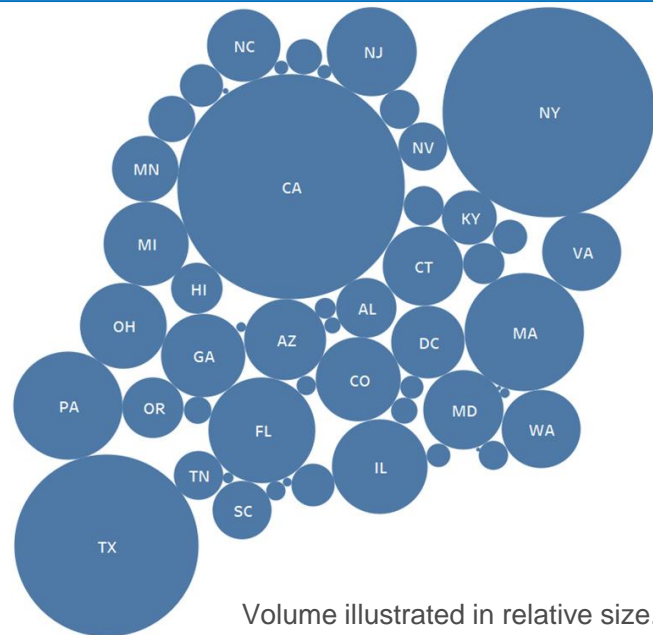
Latest Developments in Municipal Bond Pricing & Benchmarks

May 25, 2017

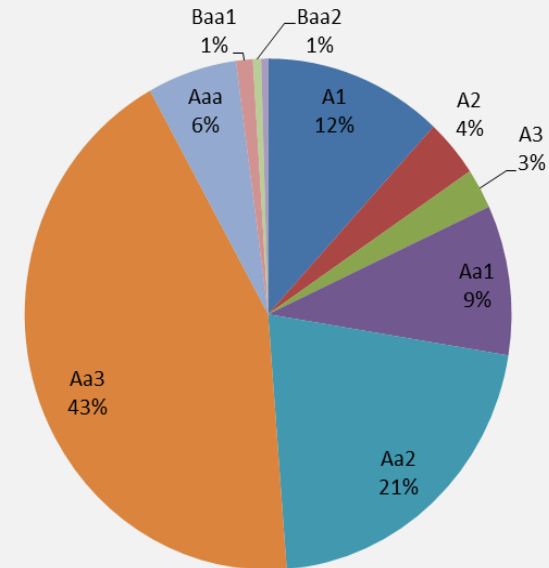
# TRPS MSRB Database Captures Trade Data

Trades are used for calibrating adjustments and constructing curves

Institutional MSRB Trades by State



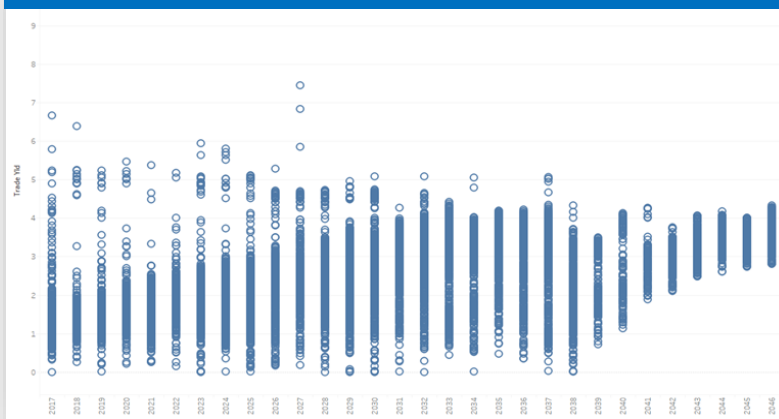
Rating categories for California bonds



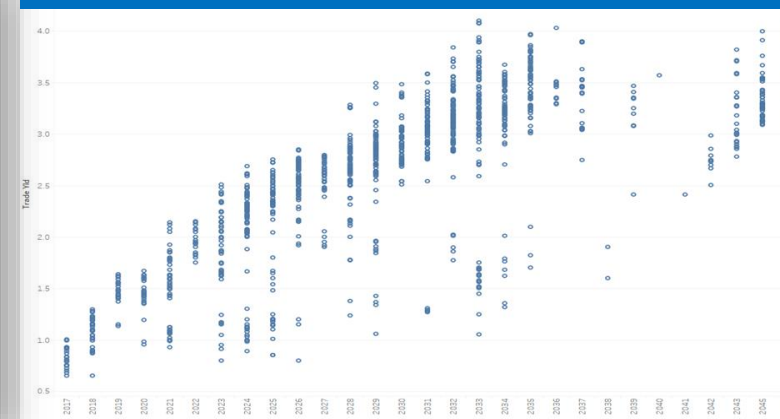
# Using Trade Data to Construct Curves: CA GO

Raw MSRB trade data is adjusted for market movement and structural characteristics

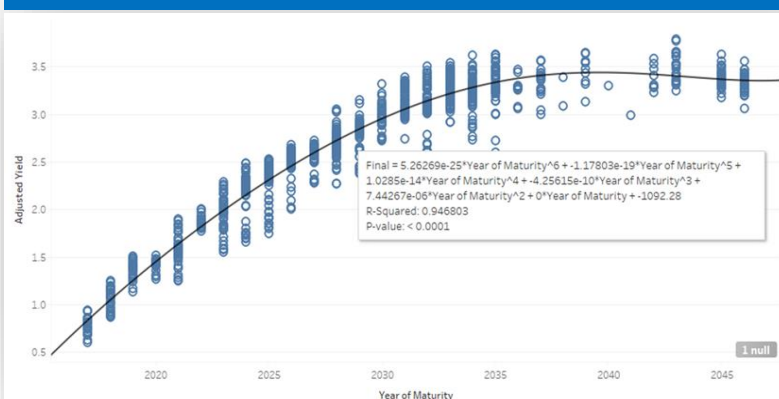
(1) Raw Trade Data: two-month time horizon



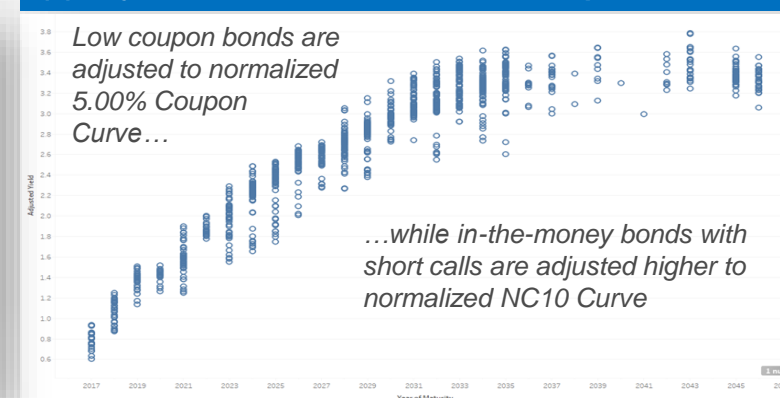
(2) Filtered for Institutional Trades > \$750K



(4) Empirical Data Constructs Polynomial Trend Line



(3) Adjusted for Market Movement, Coupon and Calls



# Trade Data is a Limited Source of Market Information

## Waterfall of observable trade and market color data for pricing bonds

1. Institutional trades on target security
2. Institutional trades on comparable securities
  - Same issuer
  - Same rating and sector category
3. Institutional market color
4. Odd lot trades
  - Less valuable for IG bonds
  - More valuable for HY and less liquid bonds
5. Fundamental credit research is required
  - HY bonds
  - Less liquid bonds

### Daily Market Stats

Bonds Traded:  
3%  
of total market

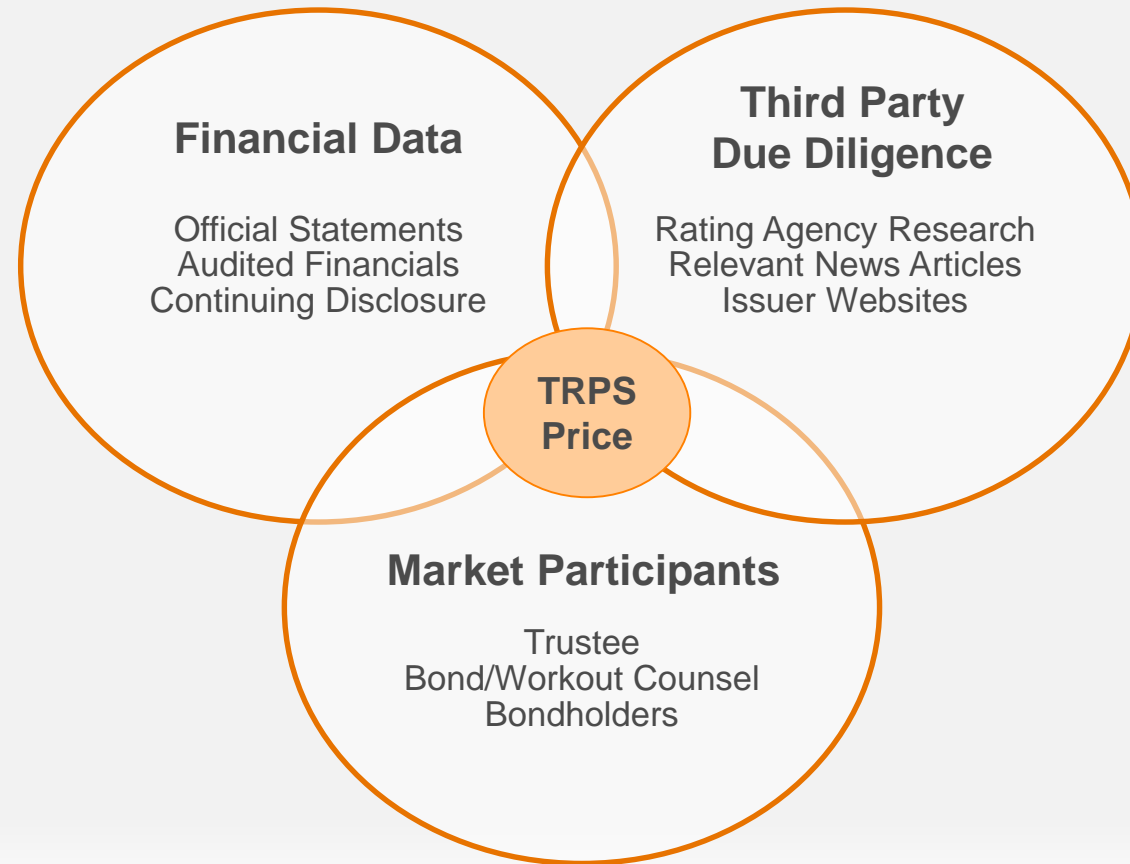
Market Quotes:  
5%  
of total market

Investment Grade:  
95%  
of all trades



# TRPS Approach to Pricing HY Bonds

Analysts gather information from a variety of sources to produce detailed credit reviews



# Sample Credit Research: Higher Education

## Harrisburg University: High Yield Credit Analysis Factors *other than ratios*

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#### MUNICIPAL EVALUATIONS CREDIT REVIEW

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#### Harrisburg University of Science & Technology

Sector	Private University	Maturity	9/1/2036
CUSIP	41473XAB5	Original Issue Par	\$60.225 million
Dated Date	1/8/2007	Evaluation: 2/24/2017	\$93.773 / 6.571%

#### SUMMARY

Harrisburg University of Science and Technology issued debt in 2007 to build out an urban campus in Harrisburg, PA offering STEM education to traditionally underrepresented groups in this discipline. After an Event of Default in 2014 when it found it could not meet its debt service obligations and its accreditation placed on probation by The Middle States Commission on Higher Education, HUST enacted a turnaround plan. Expanding its graduate programs, increasing undergraduate enrollment and seeking students from overseas, the school successfully reversed its financial decline. Moreover, the University was removed from probation, its accreditation reaffirmed through 2021.

HUST reported thirty-eight percent of its students are ethnic minority, 51 percent are women and half of the undergraduate students are the first in their families to attend college. All Harrisburg University undergraduate students have received some form of institutional financial aid. Total enrollment going into 2016 was nearly 2,600 students. A record incoming freshman class of 175 brought total undergraduate enrollment up to 434 students. Graduate students comprised the balance of the class, with nearly 1,700 coming from overseas, particularly India and China.

HUST is seeking new full-time faculty: it doubled the size of its full-time faculty in 12 months and broke the 100-employee mark for the Fall 2016 semester. It is finishing construction on the 13-story education tower to accommodate current and projected growth.

#### RATIONALE & OUTLOOK

Audited FY 2016 (FYE 6/30) show the school's revenues at \$40.8 mm, a 67% increase over FY 2015 results of \$24.4 mm. While government and private grants of \$4.3 mm (nearly \$1 mm of which came from Dauphin Co. as debt forgiveness under the Guarantee agreement which was accounted for and disclosed as a Grant) comprised 10% of revenues, the 90% balance was Tuition, even after a 10% discounting.

This increase generated a 42% operating margin, covering debt service on the outstanding long term debt of \$58.3 million by 2.88 times. Debt burden was 14.5%. The increase in cash flow moved Days Cash on Hand to 268 days, compared to 2015's 65 DCOH. With a positive fund balance for the first time in years, Debt to Cap stood at 89%.

### Evaluation criteria:

- Public purpose of the entity
- Target mission and demographic
- Committed and astute Senior Management
- Review of turnaround plan
- Buy in and execution from all stakeholders



# Sample Credit Research: Florida ‘Dirt’ Bonds

## Tolomato CDD: Tracking security and payment priority following multiple restructurings

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#### MUNICIPAL EVALUATIONS CREDIT REVIEW

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#### Tolomato Community Development District (“Tolomato CDD”)

Sector	TIF/CDD	Issue Date(s)	2006/2007/2012/2015
Location	St. Johns County, FL	Last Review	03/06/2017
Base CUSIP (6-digit)	889560	Evaluation	See page 3

#### SUMMARY

Tolomato CDD consists of approximately 13,370 acres of land located partially within Duval County and St. Johns County, Florida. The District was created in in 2004 and merged with Split Pine CDD in 2010.

In 2012, as a result of the Developer's failure to pay the Delinquent Assessments, the Developer negotiated a restructuring of the Series 2007 and 2007A Bonds in order to avoid foreclosure and to accommodate the slower than anticipated development and sale of the lands in the Development. In September of 2012, a two year Forbearance agreement was completed on approximately 1,300 developable acres.

The Forbearance agreement expired on September 5, 2014. On March 10, 2015 the Series 2007-2 bonds previously represented by the Forbearance Agreement were restructured and exchanged for Series 2015 1-3 bonds. The effective date of the exchange was September 5, 2014, the date of the expiration of the Forbearance agreement.

The result of the various restructurings can be found in the *Debt Profile* section below.

A notice of non-payment of the 11/01/2016 debt service for 889560BG2 has been posted on EMMA. Non-payment is not an event of default under the Fifth Supplemental indenture. Series 2015-3 is subordinate in payment to Series 2015-1 and 2015-2.

#### RATIONALE & OUTLOOK

A large degree of development continues in the district, most notably Nocatee, a master-planned community comprised of 26 neighborhoods on 13,223 acres. At full build out, Nocatee is expected to have 12,000 homes, 1 million sq feet of retail and 4 million sq feet of office and commercial space. Two-thirds of the land will be preserved and protected. In 2015, 1,105 new homes were sold.

TRPS prices of the senior current interest and convertible capital appreciation bonds have been updated to reflect this credit review. The price of the subordinate bonds that have missed principal and interest payments continue to reflect the uncertainty as to when, and if principal and interest payments will be made on those obligations.

### Evaluation criteria:

- Forbearance history and debt exchange
- Restructuring with new cusips issued in 2012 and again in 2015
- Restructured securities include senior and subordinate coupon bonds and convertible CABs



# Sample Credit Research: Charter Schools

## American Charter Schools Foundation: Evaluating relative performance

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#### MUNICIPAL EVALUATIONS CREDIT REVIEW

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#### American Charter Schools Foundation (Pima Co. AZ)

Sector	Charter Schools	Maturity	07/01/2038
CUSIP	72177MJP3	Original Issue Par	\$50,690,000
Dated Date	10/25/2007	Evaluation: 3/14/2017	\$86.47 / 6.84%

#### SUMMARY

Issued in 2007 to finance the acquisition, construction and renovation of several charter schools in the Phoenix, AZ area, this bond issue was initially rated NR/NR/BBB but had that sole rating, which had migrated to BB in 2013, withdrawn earlier this year. Total enrollment across the 10 high schools was 3,621 students for 6-mo. of FY 2017 (FYE 6/30). In comparison, for FY 2010, enrollment was 4,539. While two schools in the portfolio received "A" ratings by the AZ Department of Education in 2016, overall the academic performance of the schools is a "C+", with 3 schools under PreIntervention plans due to the downward trend in performance. Serving a 'nontraditional student' (i.e., economically disadvantaged, English as a second language, additional support, special needs), the schools get additional funding from state and Federal sources as well as flexibility on performance metrics. The weak financial and academic performance of the schools, which would otherwise be cause for concern for either closure, loss of accreditation or funding cuts, is balanced against the essential public policy initiative served by the schools as codified in the State of Arizona's Department of Education guidelines on charter schools. Arizona's commitment to charters schools and an open-enrollment, school choice policy was established in 1995.

#### RATIONALE & OUTLOOK

The schools' generated \$30.8 mm in revenues in FY 2016 for an operating margin of 24% which covered debt service on the \$69.7 mm of outstanding debt 1.26 times reflecting the 19% debt burden. Day's cash on hand of 41 days is misleading since the schools draw extensively from short-term cash borrowing sources, but do pay them down annually. Debt was 96% of capitalization. State funding comprised 90% of revenues; Federal grants comprised 10% of revenues.

The schools are paid an annually reset per diem per student by attendance. Through a month end e-filing system, the schools are effectively paid in real time, a benefit to managing cash flow, effective budgeting and budget projections. The unknown is attendance, which even a 2% fluctuation can cause variances. Attendance in the schools is consistently above 85%, well within benchmarks. Note that 8 of the 10 schools have charters running through 2036. The two schools with charter renewals in 2018 are the "A" rated schools.

### Evaluation criteria:

- Charter renewal risk
- Cash flow management
- Local competition
- Essentiality to the community demographic
- School performance relative to state and local medians
- Bonds were defeased on 5/9/2017



# Summary: Evaluating High Yield Bonds

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- Prices based on a hierarchy of inputs:
  - Institutional trades on the target security
  - Institutional trades on comparable securities
  - Institutional market color
  - Odd lot trade data
  - Fundamental credit research
- Credit research is a key input for pricing high yield and other less liquid securities
- Engaging with bondholders and other market participants to exchange information is an important part of the analytical process
- Ongoing surveillance and monitoring to update credit reviews and prices as events occur

# Contact Information

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## Specialist Vendors & New Data Sources

Matthew Fiordaliso  
Head of Municipal  
Evaluations  
IHS Markit





IHS Markit™

# Voltaire Webinar

New Data Sources

May 2017



## Agenda

- Current process and how it is changing
- Need for additional data sources
- Granularity and bifurcation of municipalities
- Ways to leverage this

## Need for more

### Market Data

- MSRB
- Dealer runs
- Word of mouth
- Press sources

### Issuer Data

- Directly from issuer and municipality financials
- After the news has come out
- Manual process in general

### Transaction

- Dealer to Dealer
- Bloomberg messaging
- Phone calls

# Current Data Process

## Market Data

- MBIS
- Electronic Trading Platforms

## Liquidity Metrics

- SEC requirements
- Support for auditors
- Information to meet internal control
- Moving past leveling

# Information Processing and Leverage

## Issuer

- Parsing of financials
- Rise of alternative platforms
  - > Integration of data
  - > Access
  - > Speed
  - > Partnerships
  - > Impact on pricing services
- Benefits bond holders
  - > More detailed explanations
  - > Aids in the audit process

**Q INVESTING**

**NOTE:** Returns include only those companies that have been analyzed. Average returns for a different weighting scheme are available upon request. Source for all stocks is the Standard & Poor's 500 Index. Returns are calculated by Standard & Poor's.

**COMPANY NAME** **MAJOR CAP** **MARKET CAP** **PERF. 1YR** **PERF. 3YR** **PERF. 5YR** **PERF. 10YR** **PERF. 15YR** **PERF. 20YR** **PERF. 25YR** **PERF. 30YR** **PERF. 35YR** **PERF. 40YR** **PERF. 45YR** **PERF. 50YR** **PERF. 55YR** **PERF. 60YR** **PERF. 65YR** **PERF. 70YR** **PERF. 75YR** **PERF. 80YR** **PERF. 85YR** **PERF. 90YR** **PERF. 95YR** **PERF. 100YR** **PERF. 105YR** **PERF. 110YR** **PERF. 115YR** **PERF. 120YR** **PERF. 125YR** **PERF. 130YR** **PERF. 135YR** **PERF. 140YR** **PERF. 145YR** **PERF. 150YR** **PERF. 155YR** **PERF. 160YR** **PERF. 165YR** **PERF. 170YR** **PERF. 175YR** **PERF. 180YR** **PERF. 185YR** **PERF. 190YR** **PERF. 195YR** **PERF. 200YR** **PERF. 205YR** **PERF. 210YR** **PERF. 215YR** **PERF. 220YR** **PERF. 225YR** **PERF. 230YR** **PERF. 235YR** **PERF. 240YR** **PERF. 245YR** **PERF. 250YR** **PERF. 255YR** **PERF. 260YR** **PERF. 265YR** **PERF. 270YR** **PERF. 275YR** **PERF. 280YR** **PERF. 285YR** **PERF. 290YR** **PERF. 295YR** **PERF. 300YR** **PERF. 305YR** **PERF. 310YR** **PERF. 315YR** **PERF. 320YR** **PERF. 325YR** **PERF. 330YR** **PERF. 335YR** **PERF. 340YR** **PERF. 345YR** **PERF. 350YR** **PERF. 355YR** **PERF. 360YR** **PERF. 365YR** **PERF. 370YR** **PERF. 375YR** **PERF. 380YR** **PERF. 385YR** **PERF. 390YR** **PERF. 395YR** **PERF. 400YR** **PERF. 405YR** **PERF. 410YR** **PERF. 415YR** **PERF. 420YR** **PERF. 425YR** **PERF. 430YR** **PERF. 435YR** **PERF. 440YR** **PERF. 445YR** **PERF. 450YR** **PERF. 455YR** **PERF. 460YR** **PERF. 465YR** **PERF. 470YR** **PERF. 475YR** **PERF. 480YR** **PERF. 485YR** **PERF. 490YR** **PERF. 495YR** **PERF. 500YR** **PERF. 505YR** **PERF. 510YR** **PERF. 515YR** **PERF. 520YR** **PERF. 525YR** **PERF. 530YR** **PERF. 535YR** **PERF. 540YR** **PERF. 545YR** **PERF. 550YR** **PERF. 555YR** **PERF. 560YR** **PERF. 565YR** **PERF. 570YR** **PERF. 575YR** **PERF. 580YR** **PERF. 585YR** **PERF. 590YR** **PERF. 595YR** **PERF. 600YR** **PERF. 605YR** **PERF. 610YR** **PERF. 615YR** **PERF. 620YR** **PERF. 625YR** **PERF. 630YR** **PERF. 635YR** **PERF. 640YR** **PERF. 645YR** **PERF. 650YR** **PERF. 655YR** **PERF. 660YR** **PERF. 665YR** **PERF. 670YR** **PERF. 675YR** **PERF. 680YR** **PERF. 685YR** **PERF. 690YR** **PERF. 695YR** **PERF. 700YR** **PERF. 705YR** **PERF. 710YR** **PERF. 715YR** **PERF. 720YR** **PERF. 725YR** **PERF. 730YR** **PERF. 735YR** **PERF. 740YR** **PERF. 745YR** **PERF. 750YR** **PERF. 755YR** **PERF. 760YR** **PERF. 765YR** **PERF. 770YR** **PERF. 775YR** **PERF. 780YR** **PERF. 785YR** **PERF. 790YR** **PERF. 795YR** **PERF. 800YR** **PERF. 805YR** **PERF. 810YR** **PERF. 815YR** **PERF. 820YR** **PERF. 825YR** **PERF. 830YR** **PERF. 835YR** **PERF. 840YR** **PERF. 845YR** **PERF. 850YR** **PERF. 855YR** **PERF. 860YR** **PERF. 865YR** **PERF. 870YR** **PERF. 875YR** **PERF. 880YR** **PERF. 885YR** **PERF. 890YR** **PERF. 895YR** **PERF. 900YR** **PERF. 905YR** **PERF. 910YR** **PERF. 915YR** **PERF. 920YR** **PERF. 925YR** **PERF. 930YR** **PERF. 935YR** **PERF. 940YR** **PERF. 945YR** **PERF. 950YR** **PERF. 955YR** **PERF. 960YR** **PERF. 965YR** **PERF. 970YR** **PERF. 975YR** **PERF. 980YR** **PERF. 985YR** **PERF. 990YR** **PERF. 995YR** **PERF. 1000YR** **PERF. 1005YR** **PERF. 1010YR** **PERF. 1015YR** **PERF. 1020YR** **PERF. 1025YR** **PERF. 1030YR** **PERF. 1035YR** **PERF. 1040YR** **PERF. 1045YR** **PERF. 1050YR** **PERF. 1055YR** **PERF. 1060YR** **PERF. 1065YR** **PERF. 1070YR** **PERF. 1075YR** **PERF. 1080YR** **PERF. 1085YR** **PERF. 1090YR** **PERF. 1095YR** **PERF. 1100YR** **PERF. 1105YR** **PERF. 1110YR** **PERF. 1115YR** **PERF. 1120YR** **PERF. 1125YR** **PERF. 1130YR** **PERF. 1135YR** **PERF. 1140YR** **PERF. 1145YR** **PERF. 1150YR** **PERF. 1155YR** **PERF. 1160YR** **PERF. 1165YR** **PERF. 1170YR** **PERF. 1175YR** **PERF. 1180YR** **PERF. 1185YR** **PERF. 1190YR** **PERF. 1195YR** **PERF. 1200YR** **PERF. 1205YR** **PERF. 1210YR** **PERF. 1215YR** **PERF. 1220YR** **PERF. 1225YR** **PERF. 1230YR** **PERF. 1235YR** **PERF. 1240YR** **PERF. 1245YR** **PERF. 1250YR** **PERF. 1255YR** **PERF. 1260YR** **PERF. 1265YR** **PERF. 1270YR** **PERF. 1275YR** **PERF. 1280YR** **PERF. 1285YR** **PERF. 1290YR** **PERF. 1295YR** **PERF. 1300YR** **PERF. 1305YR** **PERF. 1310Y**

# Thank You!

- ◆ Participants will receive a copy of the slide deck and a recording of the Webinar tomorrow.
- ◆ This Webinar is part of our VIVA program of fund valuation initiatives throughout 2017 – more details can be found here:

<http://www.voltaireadvisors.com/viva.html>

- ◆ The next event is our Webinar on Loan Valuations on June 1<sup>st</sup>



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