Empirasign Strategies LLC was founded in 2009 by former ARMs trader Adam Murphy to provide trading models and risk analytics to institutional clients and active traders. In 2010, we launched our market data product with the threefold objective of making market data standardized and easier to access while increasing transaction velocity in the secondary markets. Beginning with MBS trade data captured from emails received through our network of dealers via proprietary NLP techniques, our product has since been extended to include a variety of metadata reports, portfolio monitoring, sales & marketing tools, and custom enterprise solutions. Our clients consist of both front and middle office professionals for both the sell side and buy side. We are headquartered in Midtown Manhattan and maintain a Data Quality Assurance and Customer Service facility in central London.

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# Product Overview

2. **Live Market Data**
   View BWICs, Price Talk, Trade Color, & Dealer Bid/Offer/Market Runs collected and indexed in real time.

3. **Extensive Price History**
   Search through over a decade’s worth of indexed secondary market activity.

5. **Market Intel**
   Observe market reactions to market activity with our proprietary and third-party metadata, as well as an inside look at aggregated Empirasign user activity.

7. **Watchlists**
   Easily keep track of the bonds you and your clients care about.

8. **Automatic Market Activity Alerts**
   Let Empirasign monitor the market for you with our real-time alert system.

9. **Data Parsing & Integration**
   Transform your unstructured data files into usable information.

11. **Sales & Marketing Tools**
    Utilize simple messaging tools for more efficient transactions.

12. **Contact Us**
Live Market Data

The BWIC homepage automatically refreshes throughout the day, displaying the most recent additions to the database across all sectors. Select a start and end date to filter your view by a specific date range, or narrow your view by sector under the BWICs tab in the top navigation bar. Sector-specific Current & Recent BWIC tables additionally feature a Bond-Level View option.

The News Feed at the top of every BWIC page displays new trade data as it is added to the database, as well as alerts for activity in your Watchlists (See Watchlists, pg. 7). This scrolling feed has pause, fast-forward, and rewind options, and can be customized to only feature certain sectors. To save on screen real estate, the News Feed can be launched as a table in a smaller, separate window and will continue to update in real time.
Extensive Price History

Click on any BWIC to view its price talk, trade color, and market history, including Federal Interest Rates on past trade dates and recent SEC filings that contain at least one CUSIP on the list. From the individual BWIC table view, you can choose to perform the following actions:

- Email yourself current BWIC price talk and trade color
- BWIC Watcher (off) (See Automatic Market Activity Alerts, pg. 8)
- Launch DES function on BBG Terminal
- Add notes to a bond or BWIC
- View similar bonds (matched across core characteristics by our proprietary algorithm)
- Add bond to Watchlist (see pg. 7)
- See ICE Evaluated Pricing Data
- See Refinitiv Evaluated Pricing Data
- See Bloomberg Valuation Score

When price talk is available from more than one dealer, the average is displayed and linked to detailed pricing information.

Dynamic Price Talk Dot and Box plots can be generated for any bond or BWIC with price talk from at least five dealers. Just look for these icons on the BWIC page and/or Price Talk table.
Extensive Price History

Bonds can be searched by CUSIP, ISIN, or Bloomberg Ticker. Our advanced search features help you find the information you need quickly and easily: our Predictive Search mechanism populates the most popular trades as you type, and Wildcard Character functionality allows you to match single (?) or multiple (*) characters.

Any bond search will return all BWICs, Dealer Runs, SEC filings and NAIC transactions featuring the bond, as well as a list of registered representatives who work for advisers who have purchased the bond. BWIC history will show all price talk and trade color collected. Dealer Runs will show bids, offers, and two-way markets. All available pricing data is plotted on Price History charts on Bond Profile pages, including BWIC data, runs data, TRACE pricing data, N-PORT filings and NAIC filings.

Access More With API

Seamlessly embed the entire Empirasign Structured Products Trade Database into in-house systems via simple HTTP requests. Data is returned in CSV or JSON format for easy implementation and debugging on the client side.

API requests are CUSIP, ISIN, or Bloomberg ticker-based. Price talk, trade color, and dealer runs (bids, offers, and two-way markets) are returned for each request.

Code samples are available in Python, Java, and VBA. Custom install services are also available.
Empirasign User Base Aggregated Insights

› Trending Bonds
  Observe which bonds are being searched by the market most often.

› Popular BWICs
  Observe which BWICs are being viewed by the market most often.

› Evaluated Pricing Requests
  Get a sense of which securities the market currently considers difficult to evaluate with our real-time report of the most popular evaluated pricing requests, based on data from commercial evaluated pricing companies with whom we have marketing relationships.

› Collaborative Search Suggestions
  Receive bond suggestions based on our item-based recommendation system that determines bonds you may be interested in based on BWIC contents, proprietary aggregate search history, and web app usage patterns from our worldwide user base. Suggested searches will appear in search results and BWIC Watcher/Runs alerts for eligible bonds, as well as in Watchlists (see pg. 7).

Market Overview Reports

› Dealer Metrics
  View which dealers are most active in reporting price talk and direct on the most BWICs.

› Offer Spread Changes
  View spread changes by dealer in CMBS Last Cash Flow Inventories.

› Popular EU Issuers
  View the top 50 quoted/auctioned issuers in the EU.

› Most Actives
  View the bonds currently appearing across the most BWICs in our database.

› Widely Held Offerings
  View the top 10 most widely held Residential ABS bonds, Consumer ABS bonds, Non-Agency and Alt-A bonds, Agency CMO bonds, CMBS bonds, and Agency ARM bonds.

› Trade Volume
  Visualize where market activity is concentrated each day, broken out by sector.

› Email Message Volume
  Observe message volume fluctuations over the last 90 days.

› DNT Percentage
  See the portion of bonds on BWICs not hitting sellers’ reserve levels.
Market Intel

Third-Party Data

› FINRA
  Visualize TRACE aggregate and Buy/Sell volume data, broken out by sector.
  View TRACE pricing data on eligible bond profile pages.
  View a list of registered representatives matched on CRD data for the advisers/sub-advisers of funds searched on our Fund Holdings search page.

› NAIC
  View detailed insight into the market activity of insurance companies.

› IHS Markit
  View a list of all the BWICs for which the seller has been probabilistically deduced using publicly available holdings data filed by mutual funds and insurance companies from IHS Markit (formerly Ipreo).

› SEC EDGAR
  View every fund with current or previous positions in any bond, or search by fund name to view complete portfolio holdings according to the latest available Form N-PORT P filings. This information is observable at both the bond and BWIC level. We also aggregate and rank the market value of each fund’s portfolio holdings in our Largest Sector Holders feature, and provide a High Variance Mark report displaying the bonds with the greatest variance in price across holders.

  View the registered representatives for the adviser/subadviser(s) of funds according to the latest available Form N-CEN filings and CRD data from FINRA. RIA information is made available on bond history pages according to each fund’s latest available N-PORT P filings, as well as in Fund Holdings Search results.

  View a list of relevant ABS-15Ga1/Ga2 filings for bonds traded or quoted on a specific date, or run a custom query against our SQLite database table to correlate CUSIPs, ISINs, tickers, or FIGI IDs with their issuer and depositor CIKs.
Watchlists

Seamlessly integrate Empirasign data into your workflow with Watchlists. Create a Watchlist by adding individual bonds directly from BWIC or bond history pages, or by copy & pasting CUSIPs into the provided online form. Bonds added to your Watchlist will display number of trades, last trade date, and links to recent BWIC and offering activity. Watchlists have unlimited position storage, and each bond can be assigned to any number of tags.

Watchlists are fully integrated with our Automatic Market Activity Alerts (see pg. 8).

Find trade opportunities among your client base by cross-linking Watchlists with our Cross Finder Tool.

Generate a visual representation of all suggested bond searches and how they relate to one another for all bonds stored in your Watchlists with sufficient search history. (See Collaborative Search Suggestions, pg. 6)
Automatic Market Activity Alerts

› Watchlist BWIC/Offer Alerts
Receive alerts any time a Watchlist bond appears on a BWIC or Dealer Run. Watchlist alerts display recent trade color, price talk, and dealer offering data. Alerts for bonds appearing on an upcoming BWIC with price talk from at least five dealers will also include a dot plot with the most updated price talk available from our real-time database. Available via email, Bloomberg message, browser notifications, SMS, and Slack.

› Deal Tracker
Automatically monitor live market activity across all tranches in a deal. Receive a real-time alert any time a bond in a deal Watchlist appears on a BWIC, Dealer Run, or Axe posting.

› Recap Emails & Excel Reports
Market activity summaries for all your Watchlist bonds are sent out via email at every close of business, every Friday, and every month end. Such reports are invaluable for fair value calculations.

› BWIC Watcher Alerts
Receive alerts whenever new price talk or trade color is added to any BWIC you choose to watch. Every time you open any BWIC Watcher alert, the data automatically refreshes to reflect the latest price talk and trade color data available. A timestamp in the Trade Color/Price Talk table or dot plot will indicate when the data was last refreshed. Available via email, Bloomberg message, browser notifications, SMS, and Slack.
Data Parsing & Integration

› Email Search
Parse emails on our web app via our Email Search tool. Simply copy & paste an email or Bloomberg message into the Raw Email Message box and hit “Parse Email Msg.” Our parser will recognize all bond identifiers and link them to their respective search results pages on our web app, giving you access to the most recent market activity (including MyData Excel Uploads, see pg. 10) for all bonds mentioned in the message text.

Let us handle all your data integration so you can work with one, unified view of your organization’s data. Our system will grab all relevant data and link it to any bond query you run on the Empirasign web app. We have custom installation options available for everything ranging from internal databases, CRM systems, or even simple Excel worksheets for auto-parsing your organization’s spreadsheets.

Parser As A Service
Easily convert all your emails, spreadsheets, and Bloomberg messages into accessible market data via Empirasign’s Parser as a Service. Our parser accepts Outlook, Bloomberg, or any other RFC-compliant email formats. Your semi-structured email message will return a fully-parsed and normalized JSON document ready to load into your own on-site data repositories, transforming the challenging Extract, Transform, and Load process into Load-only. If two out of three is not enough, you can Load your parsed data onto our cloud with our Parse & Store add-on. Parse & Store runs can be accessed at any time via our web app or API, and will display alongside search results for any bond query.
Data Parsing & Integration

- **MyData Excel Uploads**
  Access all of your data in the context of our comprehensive trade database via our easy-to-use front-end. When you upload an Excel spreadsheet via the MyData page, the Empirasign parser will automatically grab all relevant information and display it alongside search results for any bond query you run on the Empirasign web app. *No more getting stuck debugging VLOOKUP functions!*

**An Example from Valuation Work**

The example below shows some data being maintained about a specific bond: valuation date, some benchmark rates, quotes from pricing vendors, and an internal mark. After uploading this spreadsheet via the MyData page, every time the user searches for a bond on Empirasign their search results will encompass both Empirasign data and any matching data from their spreadsheets.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Date</td>
<td>CUSIP</td>
<td>Ticker</td>
<td>5Y</td>
<td>10Y</td>
<td>Reuters</td>
<td>BVAL</td>
<td>IDC</td>
<td>Internal</td>
</tr>
<tr>
<td>5/20/2019</td>
<td>94858SWDN8</td>
<td>WMFBM2007-11 A85</td>
<td>3.09</td>
<td>3.24</td>
<td>97.64</td>
<td>100.00</td>
<td>100.80</td>
<td>99.99</td>
</tr>
<tr>
<td>6/20/2019</td>
<td>94858SWDN8</td>
<td>WMFBM2007-11 A85</td>
<td>3.11</td>
<td>3.42</td>
<td>96.55</td>
<td>98.31</td>
<td>99.01</td>
<td>99.03</td>
</tr>
<tr>
<td>7/19/2019</td>
<td>94858SWDN8</td>
<td>WMFBM2007-11 A85</td>
<td>3.05</td>
<td>3.18</td>
<td>98.00</td>
<td>100.00</td>
<td>100.96</td>
<td>99.71</td>
</tr>
</tbody>
</table>

Sample search results (MyData section circled in red):

Uploading spreadsheets via MyData is essentially like API access in reverse. Instead of downloading Empirasign market data into Excel for a unified view of the market, you upload your data into Empirasign to see everything you need on one web-accessible page.

*All data that you or your colleagues upload via Empirasign MyData can be shared within your organization at the user level. Read permissions are set and controlled by the user uploading the data.*
<table>
<thead>
<tr>
<th>Sales &amp; Marketing Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anonymous Axe System</strong></td>
</tr>
<tr>
<td>Access our anonymous platform accessible exclusively to Empirasign subscribers, where participants have the ability post indications of buy or sell interest and chat about posted bonds. User identities are withheld on all interactions, allowing users to automate the axe communication process without sacrificing anonymity.</td>
</tr>
<tr>
<td><strong>Bid Collector</strong></td>
</tr>
<tr>
<td>Request a bid from your counterparty contacts or record one on their behalf – even if they are not Empirasign clients. All data collected via the Bid Collector feature will populate alongside our BWIC and Dealer Runs, and can be shared with colleagues at your discretion.</td>
</tr>
<tr>
<td><strong>“I Am Direct” Button</strong></td>
</tr>
<tr>
<td>A list of dealers who have announced they are direct on a BWIC is displayed on every BWIC page. With a click of the mouse you can alert your clients and prospects that you are directly participating on any BWIC. For price talk distributors, this option is selected by default. Sell-side clients benefit from smoother and more seamless communication with their customers; buy-side clients benefit from easily finding alternative avenues to participate on a BWIC if their regular dealers are not direct.</td>
</tr>
<tr>
<td><strong>Quote Builder</strong></td>
</tr>
<tr>
<td>Automatically compile the most recent market observations for a bond, including BWIC activity (price talk and trade color), Dealer Bids, Dealer Offerings, and Dealer Two-Way Markets into a Bloomberg-compatible email message, ready to share with clients.</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
</tr>
<tr>
<td>Add notes to any bid list. Notes can be made private, viewable to colleagues, or public.</td>
</tr>
</tbody>
</table>
Contact Us

For all questions regarding the Empirasign Database, reach out to us at:

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