



## LIKELIHOOD TO TRADE SCORE - LTS

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**KNOW WHEN TO TRADE**

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TRUMID LABS

This report introduces the Trumid Likelihood to Trade Score (LTS), a bond-level, real-time measure of liquidity. The LTS guides traders to the bonds most likely to trade, which means traders can get more trades done while improving execution.

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## 1 Waiting for Liquidity

Unlike the liquid equities and FX markets, credit markets are notorious for having limited liquidity. For a busy trader looking to do a trade, waiting for a counterparty to arrive can feel as fruitless as waiting for Godot. Even when there's some interest in the market, many are merely passing distractions just making noise.

With new issues, usually there is enough critical mass to ensure trades get done, but for older vintages there isn't as much interest. Instead of waiting around for liquidity to appear, it can be advantageous to go to where liquidity is. The problem is that by the time you get there, it may have already dried up. In these markets, there is no value in arriving late to the party. Instead, imagine arriving just before a market is forming. Now you're positioned to not only make the trade, but to get better execution, as well. Trumid's state-of-the-art Likelihood to Trade Score (LTS) was developed to accomplish this goal.

## 2 A Definition For LTS

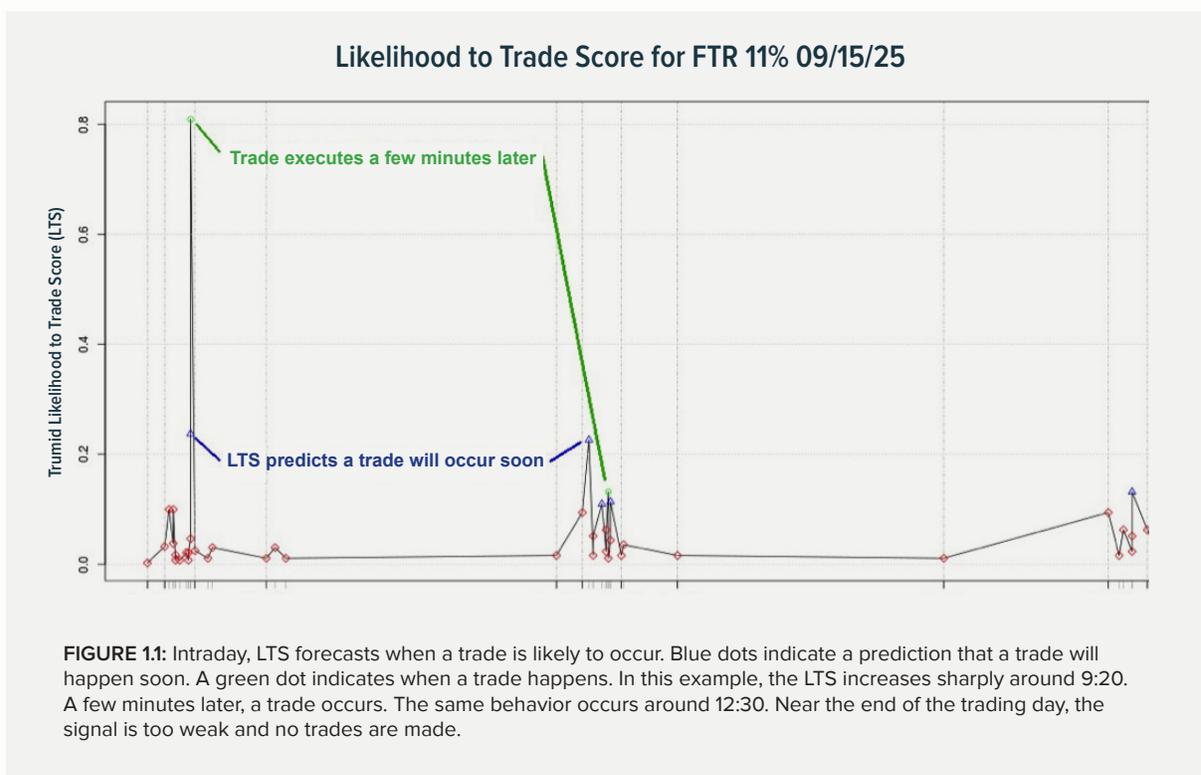
When you are involved in many different bonds, how do you know which ones to look at? Ideally, you want to focus on the ones that have a high chance of trading in the near future. With this in mind, Trumid has created a proprietary Likelihood to Trade Score (LTS), or the (point-in-time) probability that a bond will trade based on current market conditions. With this in mind, Trumid has created a proprietary Likelihood to Trade Score (LTS)—or the (point-in-time) probability that a bond will traded based on current market conditions—so you know which bonds have the greatest chance of trading on Trumid right now. The LTS is computed for each bond as the platform state changes, giving traders a real-time view into which bonds have liquidity and are likely to trade.

An example of the LTS for FTR 11% 09/15/25 is depicted in Figure 1.1. The LTS reacts to each market event giving the current probability of whether FTR will trade. On September 29, 2016, there were three such opportunities, and two of them led to realized trades.

LTS is powered by a machine learning model that incorporates real-time state information of the Trumid dark pool. Behind the mathematical model is natural intuition of how supply and demand drive liquidity. On Trumid, in addition to placing firm orders, users can post non-binding indications of interest (IOIs). These IOIs are only visible by the ATS to facilitate trading. Direction is required for all IOIs, while price and size is optional. Traders can also add bonds to their personal watchlist. In aggregate, this information represents how much traders are interested and willing to trade in different bond issues. These inputs feed our machine learning model, which produces coefficients that fit the market behavior on Trumid. The Likelihood to Trade Score is defined

$$LTS = \sum_s (\alpha_{o_s} o_s + \alpha_{j_s} i_s) + \beta w,$$

where  $s$  represents the two sides (bid and ask) for orders  $o$  and IOIs  $i$ . Users can also add bonds to their watchlist, and  $w$  captures the number of watchlists on which the given bond appears. A LTS of 0 implies nearly zero chance of trading, while an LTS of 1 indicates that a trade will almost surely occur. This simple model identifies the highest-quality trading opportunities, which translates to better execution for traders. If everyone knows when a trade is most likely to occur, liquidity is concentrated in time, narrowing the bid-ask spread when it matters most. This increased opportunity to trade is only possible in an electronic trading network and market intelligence platform like Trumid.



## 2.1 Using Watchlists to concentrate liquidity

Concentrating liquidity isn't just a theoretical idea. Trumid incorporates the LTS into its platform interface to make increased liquidity a reality. The watchlist is a tool used to track bonds important to you. This list can grow indefinitely, and, in practice, some traders have hundreds of bonds on their watchlist. Knowing which ones to monitor can become a job in its own right, which is why Trumid sorts every user's watchlist by the LTS. As a proper probability measure, the LTS can be used to sort bonds based on likelihood to trade. The effect is that bonds most likely to trade will rise to the top of the watchlist, increasing the chance of being seen by a trader. This forms a virtuous feedback loop that further increases the likelihood to trade.

| MY WATCH LIST          |  |                        |                          |
|------------------------|--|------------------------|--------------------------|
| Sectors, Tickers, Tags |  |                        | Remove All               |
| #COCOS   X             | #NEW ISSUES - HY   X                                     | #NEW ISSUES - IG   X   | #PREFERRED   X           |
| #TRENDING - HY   X     | #TRENDING - IG   X                                       | > CABLE HY   X         | FTR   X > TELECOM IG   X |
| Filter                 | Instruments  | Sort By                | Import   Remove All      |
| T>                     | FTR 11.00 09/15/25<br>35906AAZ1                          | Add IOI or Add Order   | Interest X               |
| T>                     | RBS 8.625 12/29/49<br>780097BB6                          | Add IOI or Add Order   | Interest X               |
| T>                     | FCX 3.55 03/01/22<br>35671DAU9                           | Edit IOIs or Add Order | 70 X                     |
| S>                     | CHK 4.875 04/15/22<br>165167CN5                          | Edit IOIs or Add Order | Interest X               |
| S>                     | RBS 5.125 05/28/24<br>780099CH8 UST 10Y                  | Add IOI or Add Order   | 61 X                     |
|                        | CHTR 6.484 10/23/45<br>161175AV6 144A UST OLB            | Add IOI or Add Order   | Interest X               |
|                        | ZIGGO 5.50 01/15/27<br>98954NAA7 144A                    | Add IOI or Add Order   | Interest X               |
|                        | EPENEG 8.00 11/29/24<br>268787AE8 144A<br>MARK-UP : FREE | Add IOI or Add Order   | 53 X                     |
|                        | NFLX 4.375 11/15/26<br>64110LAM8 144A                    | Add IOI or Add Order   | 48 X                     |

FIGURE 1.2: Each section of the watchlist is sorted based on LTS. This ensures that bonds most likely to trade are the ones most likely to be seen, further improving the likelihood that a trade will occur.

## 2.2 Midday forecast

As the trading day progresses, bonds are continuously updated based on platform activity. To keep traders informed, Trumid publishes a midday look-ahead report. Crucially, this report factors in the current state of Trumid and predicts which bonds and sectors will have more trading activity for the current day. Table 1.1 shows the midday forecast from September 29, 2016, at the bond level. Given the platform state, FTR, RBS, and CHK have the greatest chance of trading that day.

The midday LTS is designed to help guide trades over the finish line. For traders who missed an earlier trading opportunity, the LTS helps identify additional opportunities, and make informed decisions about whether to express interest or place a firm order. Since all traders can see the midday predictions, liquidity will naturally concentrate in the bonds with higher LTSs.

| Bond                               | LTS  | Sector  | Credit Quality   |
|------------------------------------|------|---------|------------------|
| FTR 11.00 09/15/25                 | 0.84 | TELECOM | HIGH_YIELD       |
| RBS 8.625 12/29/49                 | 0.58 | BANKS   | INVESTMENT_GRADE |
| CHK 4.875 04/15/22                 | 0.46 | ENERGY  | HIGH_YIELD       |
| RBS 5.125 05/28/24   UST 10Y       | 0.41 | BANKS   | INVESTMENT_GRADE |
| CHTR 6.484 10/23/45   144A UST OLB | 0.28 | CABLE   | HIGH_YIELD       |
| ZIGGO 5.50 01/15/27   144A         | 0.15 | CABLE   | HIGH_YIELD       |

**TABLE 1.1:** The midday forecast helps traders anticipate where liquidity will be for the remainder of the day.

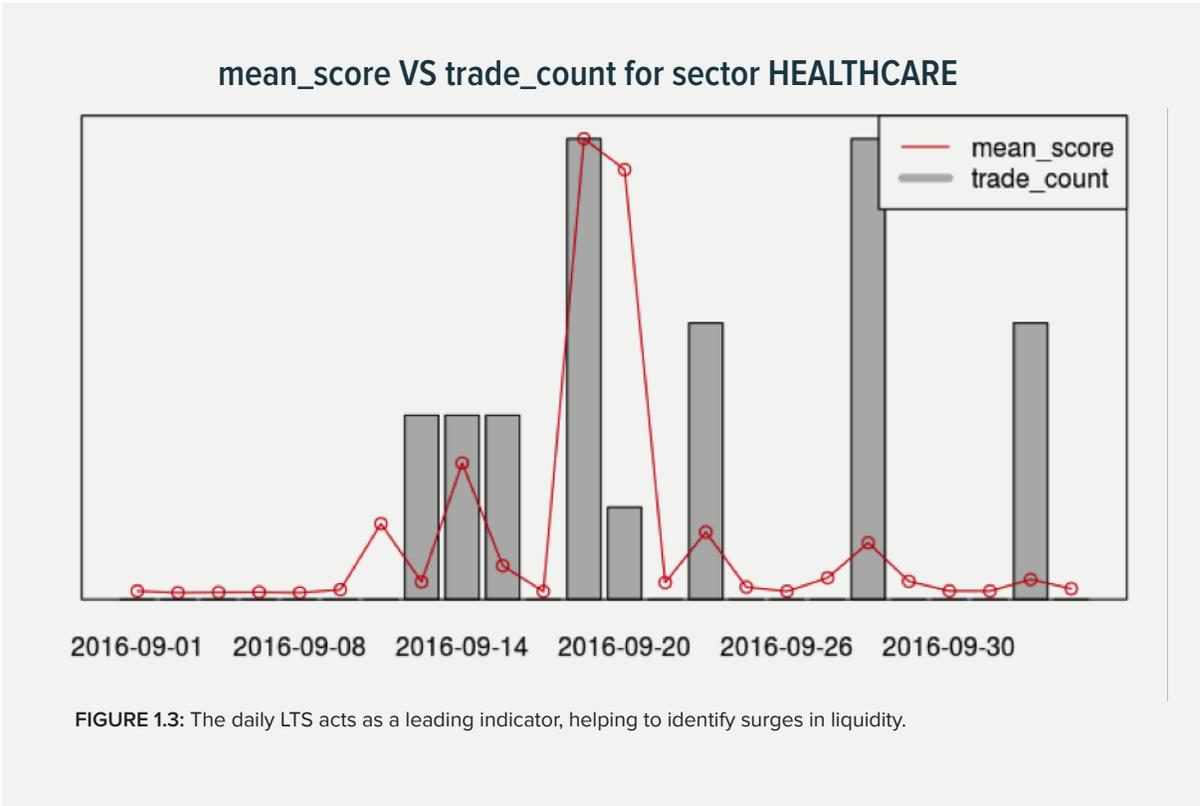
### 3 Market insight: market sentiment

The LTS differs from other liquidity measures because it is computed in real-time. This gives traders an unprecedented view into when trading opportunities arise. Most other liquidity forecasts are end-of-day, which is less useful for getting trades done. In contrast, the LTS not only provides real-time insights, but can also be used at a daily level to forecast liquidity in specific sectors as well as overall market sentiment. At the sector level, the LTS captures changes in interest over time. Shown in Figure 1.3, the daily LTS can predict whether there will be trades during the next trading day. We can see that for healthcare, there was no interest until September 12, 2016. This uptick in the LTS is followed by actual trades the next day.

Aggregating all sector LTSs can signal a shift in market sentiment. The coefficients to the LTS are stable but change over time. The ratio of the bid and ask coefficients indicates whether there is more demand to buy or sell. Slow changes in these coefficients point to structural shifts in the market. In contrast, sharp changes coupled with elevated LTS levels hint at macroeconomic shocks disrupting the current equilibrium.

#### 3.1 Predicting the bid-ask spread

Most liquidity models use the bid-ask spread as an input. This implies that liquidity is a function of the bid-ask spread. In plain language, this is equivalent to saying that when the bid-ask spread is wide, liquidity is thin. This runs counter to how we think about liquidity as a driver of bid-ask spreads. The Trumid model flips this causal relationship around so that the bid-ask spread is a function of liquidity. In other words, if there is a lack of liquidity, bid-ask spreads are wide. Not only does this make more intuitive sense, it also means that we can now predict the bid-ask spread based on the LTS. Indeed, when the LTS predicts that a bond will trade, on average, the bid-ask spread of price bonds is 59% tighter. For spread bonds, the bid-ask spread is 42% tighter. Traders can expect to get better execution when the LTS is high.



## 4 Conclusion

Traders don't need to wait endlessly for liquidity. With the guidance of the Trumid Likelihood to Trade Score (LTS), traders can focus on the bonds highlighted at the top of their watch list. Dynamic filtering of bonds on the platform will lead to higher execution rates and improved execution by concentrating users' attention on the bonds with the highest LTS. The LTS is unique in that it uses data directly from the dark pool to compute the real-time liquidity of each bond. At the sector level, the LTS points to sector activity and also to general market sentiment. LTS is only available in the Trumid Market Center platform. 📊