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D-Quote Update

Traders like flexibility but auction quality is little changed

Overshadowed in the hoopla of the "Trump bump," closing auction sizes have quietly but meaningfully grown over the past nine months, garnering a larger share of daily trading activity. Due to the rise of indexing in recent years, the close has received more attention on trading desks and among mainstream media. As auction sizes have increased amid a slow intraday trading environment, there has been a major uptick in interest in more innovative tools and methods of trading around the close. Anecdotally, we have seen an increase in interest among institutional trading desks in utilizing the discretionary quote (D-Quote) rather than submitting traditional market-on-close and limit-on-close orders (MOC and LOC). This uptick has included direct order flow as well as within our algorithmic offering.

ITG wrote previously that trading through the D-Quote causes more price impact than submitting orders to the auction in the customary way.[1] In this paper, we measure the change in use of the D-Quote over the past two years. We see empirical evidence for increased use of the D-Quote, and we explore the effects on market structure by comparing auction quality to Nasdaq, which has a similar process to NYSE but without a D-Quote–like facility.

D-QUOTE OVERVIEW

D-Quote orders can be used throughout the day, but for our purposes we are discussing them only in the context of the closing auction.[2]

From "The Cost of the D-Quote":

> D-Quotes can be entered manually by the floor trader or can be received electronically, though orders submitted electronically must still be manually accepted.[3] D-Quotes can participate exclusively in the closing auction, regardless of the existing imbalance—opposite or same side. D-Quotes can be submitted, modified or canceled at any time until 3:59:50 PM, which is nearly 15 minutes later than the cutoff for MOC/LOC orders at 3:45 PM. In addition, D-Quotes submitted to the closing auction are hidden from the public until 3:55 PM, at which time they are included in the NYSE closing imbalance message.
>
> The benefits of D-Quotes are that they are more flexible than MOC/LOC orders. This flexibility can be useful to traders who miss the 3:45 PM MOC cutoff, as well as for traders who aren't committed to trading in the closing auction and may want to cancel later. Also, a trader working a large order may use a D-Quote simply to delay when their trading interest is included in the imbalance feed.
>
> The downside of the D-Quote is that the market has only 5 minutes to offset any significant imbalance revealed in the imbalance feed at 3:55 PM. And unless an opposite-sided Regulatory Imbalance already exists, traders can only offset this imbalance using D-Quotes. The short time frame coupled with relatively limited means of offsetting any imbalances can make large D-Quotes more impactful than similarly sized MOC orders, which we investigate empirically in the next sections. The other potential downside is the manual nature of D-Quotes, which can lead to increased operational risk (e.g., a floor trader does not acknowledge the order in a timely manner and misses the close).

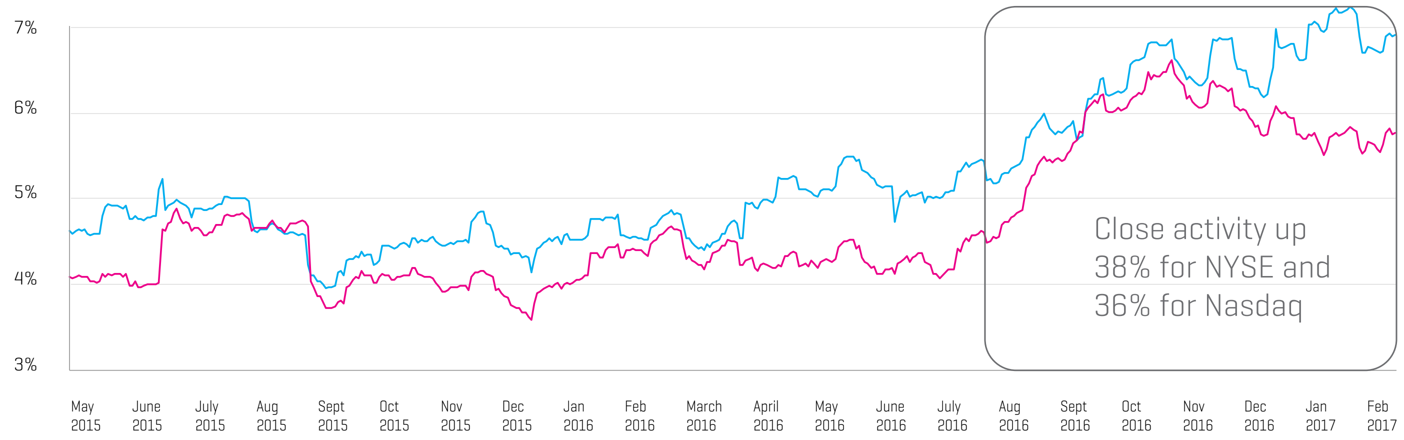
[1] https://www.itg.com/thinking-article/cost-of-d-quote/
[2] For more detail on D-Quotes, see NYSE Rule 70.25.
[3] Floor brokers can accept multiple orders at a time.

Our previous research showed an increase in price impact when trading to the close via the D-Quote compared with a regular MOC or LOC order. Placing an order in the auction via the traditional mechanism has lower cost than doing so via a floor trader, largely because there are 15 minutes to offset a sizable order rather than 5 or fewer. The added flexibility of using the D-Quote has created a risk-reward tradeoff. Additionally, as we have shown previously, the best time to trade outside the auction on a close-benchmarked order is before the closing cutoff (3:45 for NYSE and 3:50 for Nasdaq). Doing so allows traders to capture the impact of their own close orders, which is concentrated in the seconds immediately following the first post-cutoff imbalance announcement. [4]

USAGE OF THE CLOSE

In the past three quarters, close activity has surged—for both NYSE and Nasdaq listings.

CLOSE VOLUME AS % OF ADV



Source: ITG; 50-day moving average

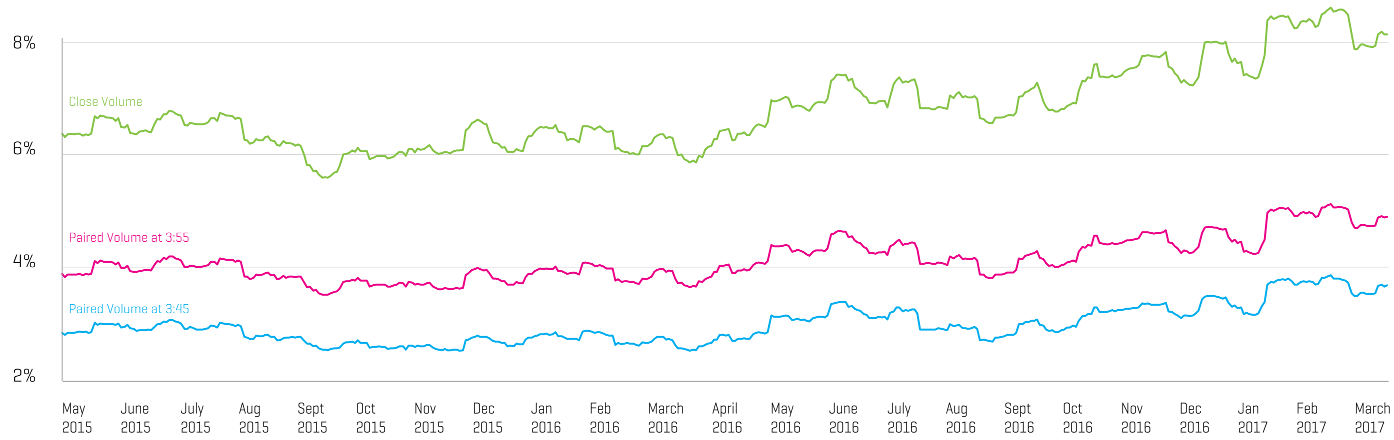
[4] For more on this, see “Trading Around the Close” – https://www.itg.com/thinking-article/trading-around-close/

To analyze this, we used an equal-weighted average for all NYSE stocks per trading day from March 2015 to March 2017.[5] The paired volume chart (below) shows the amount of paired volume in the first imbalance message after 3:45 (initial close cutoff) and the first imbalance message after 3:55 (including the D-Quote) compared with the total auction volume as a percentage of ADV.[6] The paired volume is included in every imbalance message and shows the number of shares that would be crossed if the auction were to occur at the current reference price.

This data shows that all levels of closing auction activity have grown incrementally over time. The gains in initial paired volume and between 3:45 and 3:55 (the gap between the blue and magenta line) remained fairly consistent. The more drastic increase occurred between the post-3:55 imbalance message and the actual closing auction size. This went from a 2.3 percentage point difference in 2015 to a 3.3 percentage point change for the first two months of 2017.

Over the past two years, the paired volume published at the first imbalance (3:45) for NYSE is about 45% of the total closing size. Comparatively, Nasdaq, without post-cutoff trading functionality, generally has much less movement in paired volume between the cutoff (3:50) and the actual auction. A recent study showed that the paired volume in the initial imbalance message on Nasdaq is approximately 95% of the final closing volume.[7]

PAIRED VOLUME VS. CLOSE VOLUME



Source: ITG; NYSE 50-day moving average

The discrepancy on NYSE between paired volume and final auction size results from several factors. Limit day orders, DMM prop flow, and crowd interest are all integral to the closing auction but are not accounted for in the imbalance messages. Price movements are also a component as the realized price diverges from the reference price. The other primary consideration is the D-Quote.

As the tide continues to shift with close activity, we thought it would be prudent to question how the D-Quote has affected this change, if at all. One of the main reasons the D-Quote exists is to allow floor traders the ability to offset closing imbalances to help smooth the closing process. The D-Quote theoretically would have an offsetting effect to help limit volatility. That is not what we are seeing.

[5] We excluded Russell rebalance day and all triple witching days from the sample as those days correspond with vastly outsized closing auctions.

[5] For the paired volume analysis, we removed all symbols that didn't have reliable imbalance information, largely illiquid stocks, but it creates a slightly different sample from the previous Close Volume chart.

[7] http://business.nasdaq.com/marketinsite/2017/Trading-the-Auctions-Greenwich-Associates-Report.html

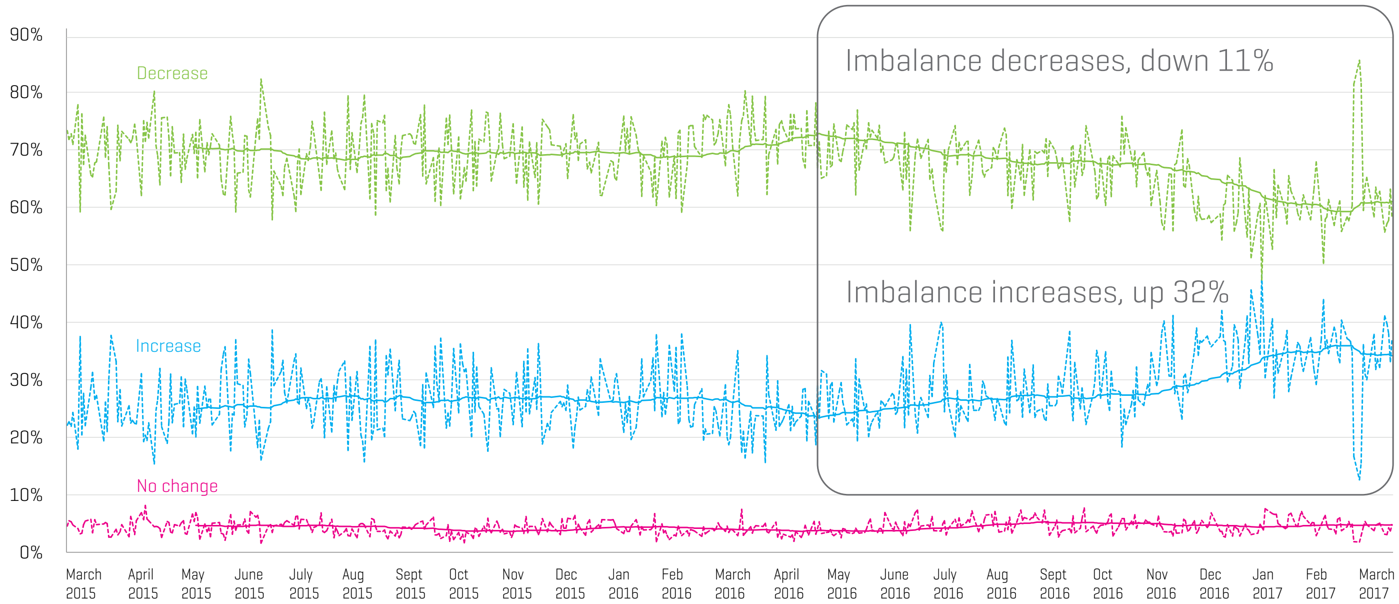
CHANGES IN IMBALANCES

To gauge the impact of the D-Quote, we compare the last imbalance message before 3:55 with the first one directly afterward. The 3:55 imbalance message is the first that contains information from the D-Quote orders. The options at this point are:

1. Imbalance size decreases partially, but remains same side
2. Imbalance completely decreases to 0
3. Imbalance is reduced and flips from buy to sell or vice versa
4. Imbalance size increases, on same side
5. No change in imbalance size

If the D-Quote is meeting its stated purpose, post-3:55 imbalances should be lower because the floor traders have had a chance to offset the imbalance. While this is still generally the case, recent trends are in the opposite direction. In the chart below, we have combined all decreases (including those with a flip in side) as they all show a reduction in imbalance size. When viewed this way, you can observe that the number of imbalance decreases (either partial or full) has reduced since Q2 2015 from about 70% of the time to about 62%. Concurrently, the number of times the imbalance actually increases after 3:55 has gone up from 25% to 33%.

IMBALANCE DIRECTIONAL MOVEMENT

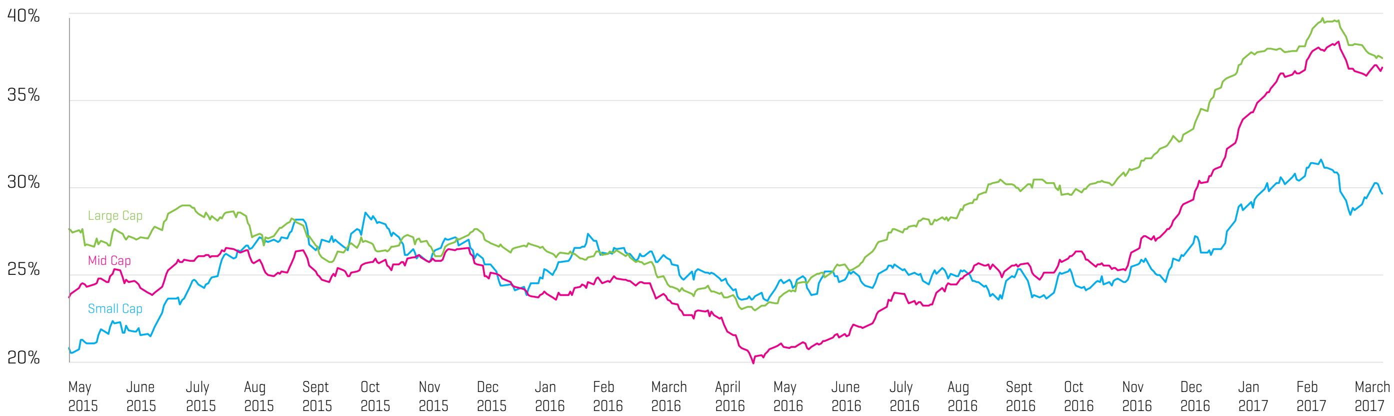


Source: ITG; NYSE 50-day moving average

Additionally, we can see the frequency of the imbalance increases at 3:55 by market capitalization. While mid cap and large cap experience more pronounced growth, the effect is present across all capitalization groups.

Initially, based strictly on the timing of this shift, we thought these changes might be coordinated with the start of the tick-size pilot program, but that does not appear to be the case. Control group stocks actually showed more imbalance size increases than tick pilot test groups.

% IMBALANCE INCREASE BY MARKET CAP

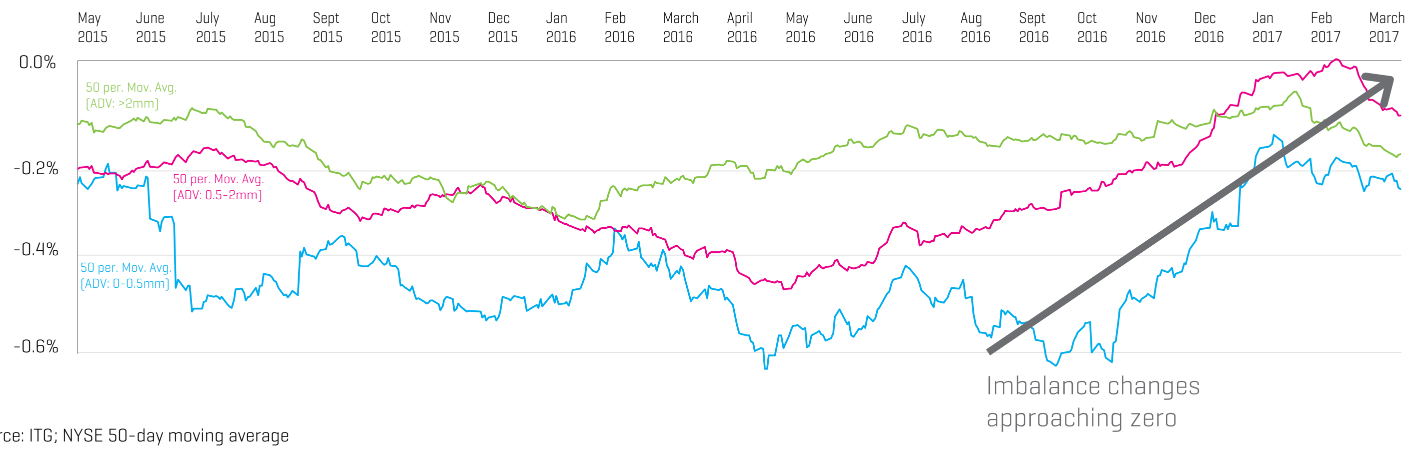


Source: ITG; NYSE 50-day moving average

The below chart shows total imbalance change equally weighted by stock within three ADV buckets. This shows actual level of imbalance change (rather than just the direction) immediately before and after 3:55.

There is a clear trend as the imbalance changes approach zero—indicating that on the whole, imbalances are barely being reduced at all. This implies that the helpful, and intended, effect of the D-Quote has decreased significantly.

IMBALANCE CHANGE LEVEL AT 3:55



Source: ITG; NYSE 50-day moving average

Because the amount of imbalance increases has risen, it's not easy to gauge the actual impact of the D-Quote by using paired volume. When imbalances are decreasing, likely the D-Quote volume will show up in paired stats (given that it has matched with existing orders), but in cases with a growing imbalance, more shares are not matching and thus are not reflected in paired volume, obfuscating the size.

D-QUOTE IMPACT

Despite the disparate closing auction systems, performance of close orders at both NYSE and Nasdaq appears to be quantitatively undifferentiated. We evaluated this in a number of ways—including arrival price on client MOC orders, drift after the auction cutoff, and close-to-open reversion for both exchanges—and found no statistically significant difference. We ran a series of regression analysis on arrival (3:45 for NYSE, 3:50 for Nasdaq) performance of large MOC orders using a stock's market cap, historical volatility, historical spread, order size and the primary exchange. As might be expected, orders in stocks with larger market caps had a lower cost. Similarly, stocks with lower historic volatility had a lower cost. There was no statistically significant relationship between primary exchange and quality of the auction relative to arrival.

Our research has shown that the closing auction has grown in importance in the current trading environment. Furthermore, empirical evidence suggests an increased use of the D-Quote as a method of trading the close. However, these orders have historically been more impactful and they are being used in a way that does not seem to be improving the quality of the auction process. An argument could be made that if the Nasdaq and NYSE closes are of similar quality, a fully automated close may be the better format.

However, traders seem to place a high value on the optionality the D-Quote offers. Even if it is outside the initial philosophy of the order type, being able to submit, correct or cancel orders until 3:59:50 gives traders flexibility to trade the last 15 minutes the way they see fit. The D-Quote is likely helpful in many circumstances, with the notable exception being when a large order needs to find liquidity. In these situations, the added time to offset the imbalance remains a paramount concern. While trading after 3:45 may be more expensive on the whole, there is no evidence of a detrimental impact on the quality of the auction itself. It will be interesting to see if this is a short-term trend or a persistent shift in market structure; we will continue to monitor the trading patterns and costs around the close.