

# Guide to U.S. Options Electronic Trading Services

For Broker-Dealer and Institutional Investor Use Only. Not for Retail.

## Execution quality

- BofA Securities (BofAS) maintains an Execution Quality Working Group (EQWG) that was created to review the performance and evaluation of the U.S. options order flow executed through the firm's algorithms and our smart order router(s). The EQWG's mandate includes, but is not limited to, identifying and addressing conflicts of interest that might affect the delivery of best execution; development and review of routing logic, new prospective venues and monitoring of existing venues' execution quality; and assessing and responding when appropriate to market changes and market structure developments that may have a bearing on execution quality. The EQWG meets on a quarterly and ad hoc basis as needed.
- In addition to the EQWG, BofAS maintains a Retail Best Execution Working Group. The Best Execution Working Group is responsible for, but not limited to, the review of the execution quality for transactions at the venues where relevant client flow is routed, primarily in the context of retail flow. The review may include the systems' routing behavior and the rules associated with routing. In addition, the Working Group monitors overall performance and change implementation.

## Safeguarding of client information

- BofAS maintains policies and procedures designed to safeguard the confidential information of clients, including information relating to orders and trading activities. We appreciate the sensitivities around client trading strategies and we exercise care in our dealings and communications to preserve client anonymity and avoid adverse dissemination. In addition, we have in place information barriers to prevent improper sharing or disclosure of confidential information among trading desks. These information barriers consist of physical separation, policies and procedures, and system access controls.
- Any potential material changes to the handling of clients' order flow will be communicated to the relevant clients in a timely manner.

## Proprietary trading

- The Volcker Rule was finalized on December 10, 2013 and generally prohibits entities, such as BofAS, from stand-alone proprietary trading. As of June 30, 2011, in anticipation of the Volcker Rule, BofAS exited its stand-alone proprietary trading business. Permissible activities under the finalized Volcker Rule generally include trading with and for customers.

## Order routing disclosure

- Rule 606 of SEC Regulation NMS requires broker-dealers to make publicly available quarterly reports that identify the primary market centers to which they route non-directed customer orders in exchange-listed stocks and equity options. Our Rule 606 reports also disclose the material aspects of our relationships with market centers to which we direct orders. Rule 606 reports for BofAS are available via the public website ([https://www.bofaml.com/en-us/content/best\\_execution.html](https://www.bofaml.com/en-us/content/best_execution.html)), and upon your request we will provide additional details concerning the routing and execution of your order, including the market center(s) that executed your order.
- The U.S. option exchanges have rules which require member firms to identify certain orders as being entered on behalf of a "Professional Customer." The account of a non-broker-dealer is considered a "Professional Customer" if that person or entity enters on average more than 390 orders per day in a calendar month within a calendar quarter for the same beneficial owner(s). When BofAS is acting as a routing broker for a registered broker-dealer, BofAS does not know the beneficial owner(s) related to the routed orders. Therefore, it is incumbent on the registered broker-dealer, for whom BofAS is acting as agent, to monitor its own orders to ensure applicable accounts who meet the above criteria are marked as a "Professional Customer."

## Infrastructure and data centers

- BofAS has electronic trading infrastructure in Savvis NJ2X Data Center in Weehawken, NJ and Equinix NY4 Data Center in Secaucus, NJ.

## Ownership of execution venues

- BofA Securities, Inc. ("BofAS") or an affiliate currently owns a minority equity investment stake in the following market centers and therefore stands to participate as a shareholder/investor in the profits that each market center realizes in part from the execution of securities transactions, including transactions that may involve orders for the accounts of BofAS customers: (i) Block Interest Discovery Services LP (BIDS ATS) and (ii) EBX LCC ("eBX/Level ATS").

# Algorithms

## Pre-trade and intra-order checks

- Orders received by BofAS's algorithmic engines are assessed for a number of factors to determine specific settings that will be enforced on orders as they work in the market. Parameters assessed include, but are not limited to, the order quantity, strategy selected and order type.
- Based on this assessment, price thresholds are placed on qualifying orders. Evaluations are performed on the orders' price participation in the market and take into account adverse price moves. If the adverse price move thresholds are breached then the order may be canceled back to the upstream order management system with an alert generated indicating that the order is no longer active in the market.

## Market data

- BofAS utilizes a combination of direct market data feeds and the OPRA market data feed for all U.S. options exchanges. The OPRA market data feed may be used should there be an issue identified with any of the direct market data feeds.
- Servers are co-located at major data centers where the information is transmitted over BofAS's 40GB network.

## Order types

- BofAS will accept and utilize Limit, Market, MOO, MOC, LOO, LOC, Stop and Stop Limit order types.

## Change control & monitoring

- Algorithm execution is typically monitored on a daily, intraday basis by the BofAS electronic trading desk. Additional performance monitoring by the product and execution consulting teams focuses on changes in performance trends in order to assess the benefits of product enhancements.
- The release of new algorithms or algorithm enhancements follows a controlled, disciplined software release process that gradually deploys new software to the algorithm instances. A typical release process takes approximately one week and starts with software deployment to a single algorithm server which receives limited order flow. Validation of the changes provides a checkpoint for continued progression of the release.
- BofAS reserves the right to reject or cancel any client order, at any time, in its sole and absolute discretion. BofAS shall have no further responsibility or obligations after BofAS rejects or cancels an order.

# BofAS Smart Order Router Frequently Asked Questions (FAQs)

## Overview of the BofAS Single-Leg Smart Order Router

- The BofAS Smart Order Router (SOR) is available between the hours of 7:45 a.m. – 4:15 p.m. EST for core trading sessions in U.S. exchange-listed options.
- The BofAS SOR offers five strategies: CLEANSWEEP for taking and posting orders on exchanges, FASTSWEEP for more urgently taking top-of-book displayed liquidity using Intermarket sweep (ISO) orders, DELTA-ADJUSTED for dynamically adjusting an order's limit price based on the underlying security price and user-defined parameters, TWAP for executing orders in similar-sized slices over a specified time interval, and BofA CAPTURE™ for seeking liquidity within the quoted spread and taking or posting liquidity on exchanges.
- BofAS has in place connectivity to all U.S. options exchanges and is connected to a select group of third-party routing brokers to seek potential price improvement opportunities.
- BofAS may send eligible orders for clients who are enabled for price improvement functionality to third-party liquidity providers in an attempt to achieve price improvement.
- BofAS is equipped to stop routing specific orders to any venue upon a client's request except when legal, regulatory or Firm policy requirements prevent such action.
- Our default routing strategy is generally cost-sensitive and will post/take liquidity based on economics. Upon client request, we offer an option that is cost-agnostic.
- The BofAS SOR provides liquidity-seeking tactics that adapt to a variety of real-time factors including order attributes, market conditions and venue-specific trading patterns.
- The BofAS SOR exhausts displayed liquidity at each price level across all exchanges up to the limit price of the order. If an order becomes unmarketable, the Firm will passively post any residual quantity across one or more exchanges.
- BofAS may preference orders to certain market-makers on exchanges that support preferencing programs. If an order is marketable and the preferenced market-maker is quoting on NBBO then the market-maker could receive an enhanced allocation. BofAS may also receive an additional exchange credit as published in the exchange fee schedule.

## Exchange taking logic

- Generally accesses destinations based on available displayed liquidity.
- Utilizes Immediate or Cancel (IOC), IOC ISOs and/or Day orders to seek liquidity. Oversize logic applies when order quantity exceeds displayed quantity in an attempt to capture reserve liquidity.
- Cost-sensitive by default; however, cost-agnostic is available as an option per client request.

## Exchange posting logic

- Controls for display quantity; certain strategies may utilize native exchange reserve order functionality.
- Generally cost-sensitive by default; however, cost-agnostic is available as an option per client request.
- Orders will post to one or more exchanges depending on order quantity.
- Posting to a particular destination may change based on regular reviews.
- Clients may opt out of trading with any venue except when legal, regulatory or policy requirements prevent such action.
- All clients remain anonymous to external execution venues.
- Clients may request a venue analysis for their order flow.

## Overview of the BofAS Complex Smart Order Router

- The BofAS Complex SOR is available between the hours of 7:45 a.m. – 4:15 p.m. EST, handling orders for core trading sessions in U.S. exchange listed options.
- BofAS SOR offers one complex routing strategy: SMART SPREADS, which depending on order size will slice complex orders across multiple exchange complex order books simultaneously. Once liquidity is sourced, orders will be re-evaluated and re-routed based on where executions occur.
- BofAS has in place connectivity to all exchanges that maintain complex order books. There is no regulatory requirement to connect to every exchange complex order book. Given this, if an exchange adds a new complex order book we will evaluate the feasibility of connecting the BofAS complex order router.
- BofAS is equipped to stop routing specific orders to any venue upon a client's request except when legal, regulatory or policy requirements prevent such action.
- Our default routing strategy is generally cost-agnostic and will not post/take liquidity based on economics, but upon client request, we offer an option that is cost-sensitive.
- Controls for display quantity.
- Orders will post to one or more exchanges depending on order quantity.
- Posting to a particular destination may change based on regular reviews.

**BofA Securities (BofAS) Routing and Order Handling** – In the absence of instructions to the contrary, or depending upon your expressed preferences, the particular BofAS routing strategy or algorithm that you may elect to employ, or that is employed on your behalf, and as part of BofAS's services seeking the most efficient and effective experience for Client orders, your orders may be given an opportunity to interact with any resident non-displayed orders in one of BofAS's own ATs, which may include BofAS principal trading interest, prior to being exposed to external venues. External venues may include, but not be limited to, public exchange markets, multi-lateral trading facilities, other ATs, or broker-dealers, (such routing appropriate to each BofAS region) consistent with your instructions or BofAS's routing logic as applicable. While BofAS maintains relationships and connectivity to a variety of such venues as part of its routing processes, BofAS does not represent that it has access to all such venues that potentially may be available at any given point in time. To the extent that this document references performance times, such information is indicative and attempts to illustrate the performance speed and latency generally associated with certain systems, order/message paths and linkages. Actual performance may be different and, in some cases, materially slower than indicated.

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