High Frequency Trading

RIVER ROAD
ASSET MANAGEMENT®

Following the release of Michael Lewis' new book, *Flash Boys*, we would like to take a moment to provide River Road's perspective on high frequency trading (HFT) and respond to some questions asked by our clients and their advisors about the HFT debate.

EXECUTIVE SUMMARY

River Road views the discussion about high frequency trading sparked by Mr. Lewis' new book, *Flash Boys*, as positive for investors as it will broaden the discourse on this controversial practice. That being said, most of the facts and insights reported in Mr. Lewis' book are not news, but rather well-documented practices thoroughly understood by institutional investors who actively pursue best execution for their clients.

Perhaps the most controversial, and widely reported, statement made by Lewis was that the existence of HFT implies that markets are "rigged" or "broken." From our perspective, this is simply not true. There are certain types of HFT strategies, referred to as predatory, that seek to manipulate trading and disadvantage investors. We believe these deserve closer scrutiny from regulators. However, there are also HFT strategies which provide important benefits to investors including increased liquidity, tighter spreads, pricing efficiency, additional depth of market, and reduced price dislocation.

The U.S. equity markets have become more complex, highly fragmented, and extremely fast-moving over the past 10 years. This is why institutional investors like River Road have invested significant resources in people, processes, and technology that will allow us to both respond to these changes and reap their potential benefits.

River Road has implemented many processes that we use, as appropriate, to control our interactions with HFT, including:

- Active trading in crossing networks that exclude HFT participants
- Setting a minimum execution size requirement, which greatly deters HFT from trading against us as their model operates on small share execution basis
- Use of stock price limits which controls volatility of stock movement
- Setting minimum size requirements on off-exchange venues
- Not posting on certain exchanges due to the presence of "toxic" order types where the potential for information leakage is deemed to be egregious

While these changes have been effective, we believe further beneficial improvements to the market should be made, including:

- Increased government regulation of all exchanges to level the playing field and standardize market participation
- Regulated speed at which market data is delivered thus eliminating the timing gap
- Restructured exchange access fees to eliminate broker conflict of best execution and internal cost reduction
- Minimum market share requirements to maintain exchange status
- Order to trade limitations and ratios

High frequency trading strategies have become interwoven in the equity markets. Distinguishing trading approaches that employ HFT from those that do not has become difficult, if not impossible. As exposure to various forms of HFT is nearly unavoidable, we advocate that market participants and regulators come together to make focused changes to simplify and improve the structure and stability of the market.

Below are our responses to some frequently asked questions as they apply to River Road's trading philosophy:

Q: What is High Frequency Trading (HFT)?

A: High Frequency Trading (HFT) refers to automated proprietary trading strategies that are dependent on low-latency technology to execute rapid short-duration orders. HFT strategies typically make execution and routing "decisions" and derive profits based on latency-sensitive information, including low-latency data feeds, executions, and structural inefficiencies in the market. Strategies include short-term risk horizons and short holding periods, and many do not entail carrying overnight positions.

Q: What are the different HFT strategies?

A: There is a wide variety of HFT strategies, not all of which are purely HFT. Some of the strategies commonly known as HFT include both predatory elements and those that are constructive and beneficial to the investment community. Examples of HFT strategies include:

- Market making – a role previously filled by specialist firms, now conducted by a wide variety of participants due to use of direct market access
- Statistical and cross market arbitrage – used to exploit temporary deviations in statistical relationships in securities
- Event and news arbitrage – automated systems which trade on electronic text format used to identify keywords or phrases
- Latency arbitrage – automated systems that use market data speed to gain microsecond advantages in price discrepancies across different exchanges and markets

Q: What are the possible benefits of trading with HFT strategies?

A: There are a number of benefits associated with HFT strategies that bring tangible advantages to the investment community, including:

- Increased liquidity
- Tighter spreads
- Pricing efficiency
- Increased depth of market
- Reduced price dislocation

Q: Can trading with HFTs be avoided?

A: It would be very difficult to avoid trading with HFTs altogether, and there is no way, on most trading venues (exchanges and non-exchange), to "opt out" of trading with HFTs. Participants can control how they interact with HFTs, such as using minimum fill sizes on orders, trading with trusted broker partners, and using trading strategies that minimize information leakage.

Q: Do the issues raised in the book impact other markets (other regions or other asset classes)?

A. Yes. HFT is prevalent in other countries and asset classes, including FX and options. Markets that have automated trading as well as fragmented markets (more than one venue to trade on) are ideal for HFT strategies.

Q: What is a dark pool?

A: Dark pools match buy and sell orders, just like an exchange. Unlike an exchange, dark pools do not display any orders, so there is no "pre-trade transparency" on whether or not there are buyers or sellers in the pool, what prices they are willing to trade at, or how large their orders are.

Q: Are dark pools regulated?

A: Yes. Dark pools must file forms with the SEC detailing how they operate (Form ATS) and they must re-file this form any time they make a material change to how they operate. Dark pools must also register as broker-dealers with the SEC (as any bank broker-dealer would do). Additionally, dark pools are required to become members of FINRA, which is a self-regulatory agency that oversees broker-dealers.

Q: Are dark pool trades included in volume reports? Are there records of dark pool trades?

A: Yes. Dark pool trades are included in market volume and all stock trading in the U.S. is required to be reported to the "consolidated tape" and included in volume records.

Q: Do institutional investors trade in dark pools? Why?

A: Yes. Most, if not all, institutional investors in the U.S. trade in dark pools, both directly and through brokers. Institutional investors use dark pools because of the size of their orders – dark pools allow them to rest large portions of their orders in the market, without "exposing their hand" and risking other market participants trading ahead of them. In addition to protecting order information while trading, dark pools represent a significant and important source of liquidity for institutional investors.

Q: What is IEX?

A: IEX is an Alternative Trading System (ATS) in the U.S. which opened in October 2013. Similar to a stock exchange, IEX matches buyers and sellers. IEX is owned exclusively by a consortium of buy-side investors, including mutual funds, hedge funds, and family offices. IEX has been focused on creating a market model where participants cannot take advantage of structural inefficiencies in the market to disadvantage other participants. Orders are submitted to IEX by broker-dealers on behalf of institutional clients and other firms.

Q: Is IEX an exchange or a dark pool?

A: Currently, IEX is a dark pool. It is registered with the SEC as an ATS. IEX has announced plans to expand to include "lit", or displayed, orders in the near future, in addition to "dark" orders. IEX has indicated that they would like to become a registered exchange in the future.

Q: Do River Road's brokers route trades to IEX?

A: Yes. Many of our brokers currently route to IEX.

Q: What is River Road's trading philosophy and are there concerns about how HFT might affect trades on behalf of the firm? How does River Road protect clients' trades from HFT firms?

A: Our primary focus is achieving best execution for our clients as we seek to maximize our access to liquidity while minimizing our execution costs through the use of a variety of trading strategies and venues. While it is difficult (if not impossible) to avoid HFT altogether, we believe we have taken significant measures to minimize the negative impact that may occur. To protect clients' trades we review that our brokers use one or more the following guidelines, as appropriate:

- Do not give preference to any venues to hit special execution cost "tiers" or rebates
- Do not prioritize internal venues before routing client orders to external venues
- Use anti-gaming logic (i.e. algorithms that examine a stock or venue's trading patterns and adapt market interactions to minimize information leakage)
- Monitor participant order flow and quality
- Provide trade cost analysis (TCA) of all transactions upon request including venue, fix tag, and other relevant execution data
- Monitor toxicity, as evidenced by unusual price movement, price reversion, or unwarranted impact in both trade flow and execution venue
- Do not post on certain exchanges due to the presence of negative HFT execution activity

Q: Does River Road conduct best execution testing for algorithms, dark pools, etc.?

A: Yes. We use both internal and external best execution testing in regards to transactions. For example, River Road:

- Conducts internal TCA analysis of brokers
- Uses third-party analysis to aid in identifying possible exchanges and venues that have predatory HFT firm participation

Q: Does River Road believe HFT negatively affects the firm's executions?

A: HFT is too broad a term to allow an all-encompassing opinion as there are many HFT strategies in the marketplace. While some HFT strategies provide liquidity and stability, other strategies – such as latency arbitrage and other predatory strategies – cause us concern and have the possibility of affecting our executions. In instances where these strategies may be used, we engage our brokers in developing methods to minimize this interaction.

Q: Does River Road use trading strategies to minimize information leakage and the negative effects of HFT?

A: Yes. River Road uses strategies that have components which minimize leakage and the possible negative effects of HFT that are enforced by the brokers, which may include, and are not limited to:

- Randomized display sizes to lit venues
- Anti-gaming logic preventing intra-order gaming and combating latency arbitrage (an HFT strategy)
- Randomized use of time-based triggers
- Regular toxicity studies to measure performance in dark pools
    - Utilization of this data when making order-routing decisions
    - May remove destinations from certain classes of orders or from our router altogether
- Required minimum quantities on dark orders to block pinging
- Prohibited aggregation of orders to meet minimum quantities, if available
- Randomized order of venues accessed when checking for liquidity

Q: Does River Road use dark pools, and do you believe their use affects execution costs?

A: Yes. We trade through many dark pools. One type of dark pool we transact through only allows natural buy-side to buy-side flow, has led to an increase in liquidity and price improvement, and does not allow HFT interaction. For those pools that are not designated buy-side to buy-side only, we employ the trading strategies listed in the previous question to minimize information leakage while still accessing off-exchange liquidity.