Written Testimony to the

United States Senate

Committee on Banking, Housing, and Urban Affairs

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Contents

Question One:

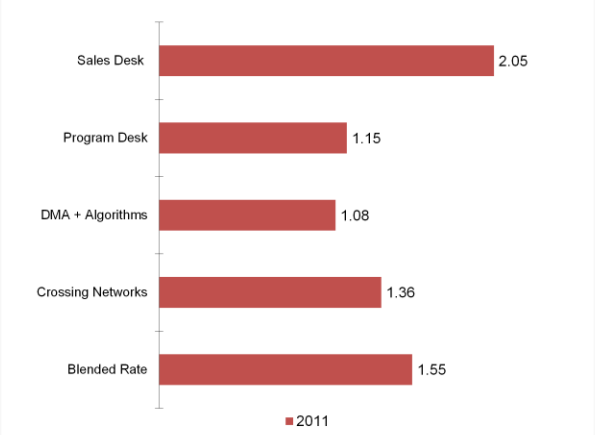
What are the benefits of automated trading of securities in our marketplace? Are there any disadvantages?

First, virtually all equity trading in the US is automated. From the 100-share order entered via the online broker to the million-share order executed by the largest global asset managers, each and every order goes through a very sophisticated electronic execution process that encompasses: (1) a complex market data aggregation process; (2) the routing of the order from the investor to a broker: (3) the possible electronic internalization of that order at the broker; and (4) a sophisticated smart-order-routing process to send unexecuted orders to Automated Trading Systems (ATSs) and/or exchanges for execution. In addition, there is a very sophisticated and electronic market-making process that allows investors, traders, and market makers to interact with incoming orders so they are executed efficiently and smoothly.

Advantages

The benefit of this electronic execution framework is the efficiency and the cost. Institutional investors pay in the area of 1.08 cents per share for more self-directed orders and 2.05 cents for orders that need more assistance (see Exhibit 1). Retail online investors are paying $8 to $10 a trade, regardless of the number of shares traded. The timeliness of execution is currently measured in milliseconds (thousandths of a second) and increasingly in microseconds (millionths of a second). Prior to the implementation of Reg NMS in 2007, the execution speed of the NYSE was greater than 5 seconds. While the difference between milliseconds and microseconds may not seem significant, the difference between milliseconds and seconds can be huge. Many things can happen in 5 seconds, and most of them are good for investors. Today, even online retail investors can obtain real-time market data, and can execute orders within a small fraction of a second. Unless the order is very large, it can receive sub-second execution at or better than the best bid/offer (NBBO) displayed in the market and all for under $10 a trade. This could not happen without significant automation.

Exhibit 1
Institutional Equity Trading Commissions "Execution Only" 2011
(Traditional Asset Managers – cents per share)



Source: TABB Group "2011/12 US Equity Trading"

In addition, the electronic marketplace has made the marketplace overall more efficient, measured by volume traded. High-speed computers are continuously analyzing millions of quotes a second and looking for incorrectly priced assets, buying the theoretically cheaper ones, and selling the more expensive ones to bring prices in line. This is done on a millisecond basis between index futures and ETFs, equity options, and their underlying equities.

This process, when markets are not in turmoil, efficiently absorbs both news and supply-and-demand information and effectively prices assets according to market conditions. Automation is the lubricant that makes this process efficient and seamless.

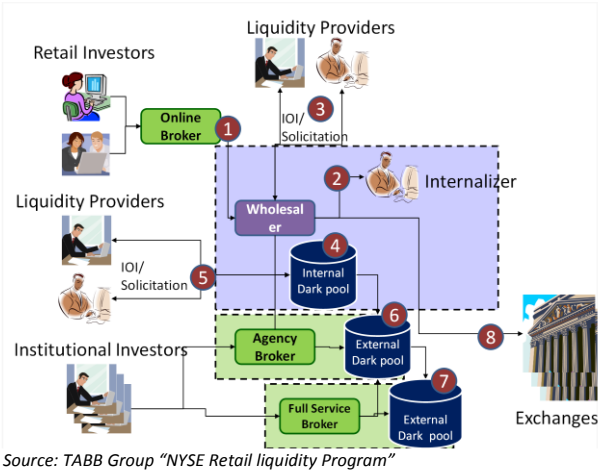
Disadvantages

Complexity

Our fully automated markets are overly complex. There are 13 registered stock exchanges and 30 or more major ATSs, as well as four major wholesalers (brokers that buy orders from retail brokers) and a number of internalizing brokers. Getting buyers and sellers to effectively meet (trade) becomes a very complex and sophisticated task, when there are dozens of venues that could house the buyer to your seller, or vice versa. Brokers need sophisticated smart-order-routing technologies to find the other side of the trade.

This execution process typically includes: (1) determining if the broker wants to trade against the order (which is legal, as long as the execution price is at or better than the NBBO); (2) matching the order in the broker's ATS (dark pool); (3) soliciting other clients to trade against the client order; (4) routing the order to other brokers' ATSs; and (5) having other brokers solicit possible contra orders. If all else fails and the broker cannot find the other side of the trade, they then send that order to an exchange. If the exchange can't match the order at the best price, the exchange is mandated to route that order to the exchange displaying the best price (see Exhibit 2).

Exhibit 2
Equity Retail Order Flow Schematic



Source: TABB Group "NYSE Retail liquidity Program"

While this process is overly complex, the time scale of this activity typically happens sub-second. While complex this process is efficient, cheap, and fairly effective.

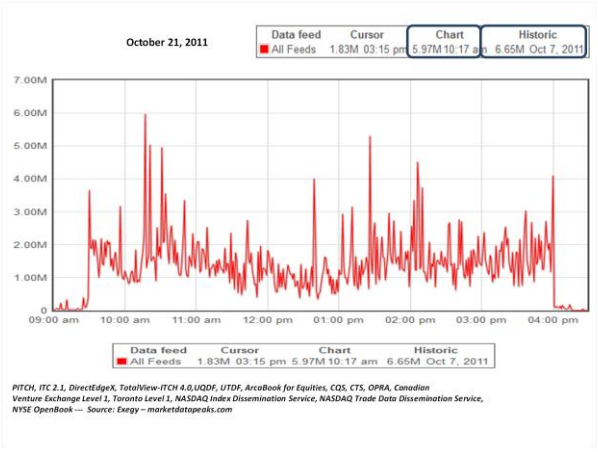
The downside to this electronic messaging is threefold:

1) Information leakage. Because orders are pinged around various brokers, ATSs, clients, and subsequently exchanges, at each place that a message stops, it disseminates a little information. If you are listening to this information, you can discern trends very quickly. When you can spot a large buyer, it becomes easier to aggressively buy ahead of the investor, pushing the price away from that investor, and then subsequently sell it to the investor at a higher price. The same process works for sellers as well. Now this process does not generally impact retail investors, as their orders are generally not large enough to push

the market; however, it is very impactful to larger investors (which actually invest the bulk of individuals' assets through mutual funds, pension funds, and professionally managed accounts).

2) Market data distribution and management. The amount of market data that is processed on any given day is voluminous. Currently, on an average day the US exchanges can produce a peak level of 4 million to 5 million messages per second (over a minute). The peak messages-per-second level was hit on 10/7/11 at approximately 6.6 million messages (see Exhibit 3). This data must be managed, analyzed, and stored. In addition, if one of the exchanges has market data problems (the feed can go down, incorrect time stamps, etc.), it can create catastrophic problems, as people are no longer analyzing data and submitting orders; machines are spitting out orders automatically depending upon the market data. If the market data is wrong, unless the data is really wrong, the trading engines assume it is right and trade accordingly. This was a contributing factor to the May 6th 2012 Flash Crash[1].

Exhibit 3
Consolidated US Exchange Market Data Transmission Rates



Source: Marketdatapeaks.com, FIF

3) Market data arbitrage. Because the markets are fully electronic, small time increments, irrelevant to humans, become trading opportunities. These opportunities are hard, if not impossible to eliminate. It takes light (data through fiber optics) approximately 1 millisecond to go 100 miles, or 1 microsecond to go about 0.1 mile. Given that the NYSE and NASDAQ data centers are about 41 miles apart, it takes about 0.4 microseconds for data to get from one venue to the other. For humans, this gap would be infinitesimal; however, for machines, it becomes an opportunity, and for some investors this gap can be a significant challenge. Firms that are co-located (have their trading technology at or very close to the exchange) and obtain data directly from that exchange, will have at least a 0.4 microsecond advantage over a firm that uses the aggregated market data feed provided by the Consolidated Tape Association/Securities Information Processor (CTA/SIP). The aggregated feed will always be slower than a direct feed, because the aggregated feed receives data from ***all*** the exchanges, aggregates and normalizes that data and distributes it. The aggregated feed must wait to obtain data from all sites before it distributes it, while a

[1] Findings Regarding The Markets Events of May 6th 2010, REPORT OF THE STAFFS OF THE CFTC AND SEC TO THE JOINT ADVISORY COMMITTEE ON EMERGING REGULATORY ISSUES - http://www.sec.gov/news/studies/2010/marketevents-report.pdf

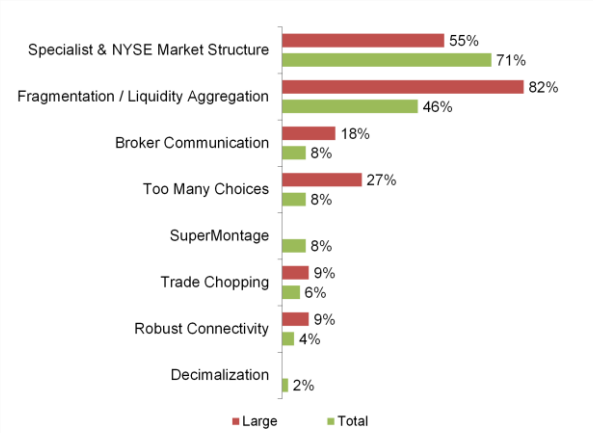
direct feed just pumps data out of the exchange directly from the matching engine (where it is created). Even if direct feeds were banned, firms that were closer to the dissemination point (because of the speed of light issue) would be able read and act on this data faster than a firm with a data center a mile away, 6 miles away, or 3,000 miles away in California.

In addition, given the message pinging that occurs, once a trend is spotted, there is ample time for very quick trading machines to react to this information.

Fragmentation and Time Priority

The fragmentation of the markets has been both good and bad. Historically, when the NYSE had the dominant share of NYSE-listed market activity, the NYSE acted like a monopoly. Execution times were long, costs were high, and institutional investors were not happy with their execution quality. In 2004, TABB Group did our first study of institutional investors, and 71% of the institutional investors' traders we interviewed responded that the NYSE specialist and market structure was their most significant challenge in trading the US markets (see Exhibit 4). Monopolies do not have any incentive to be efficient.

Exhibit 4
Largest Institutional Equity Trading Challenges 2004

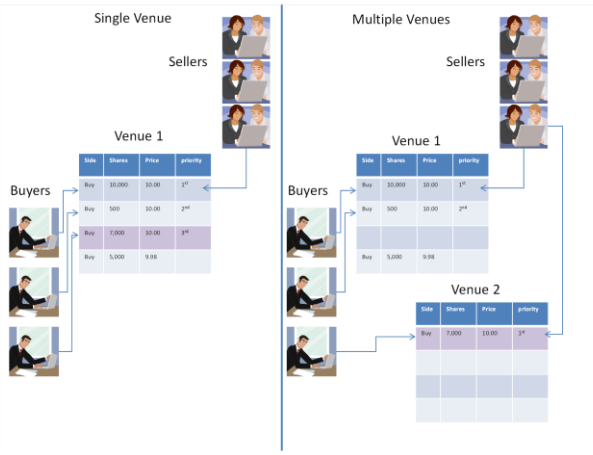


Source: TABB Group "2004 Institutional Equity Trading"

The implementation of Reg NMS changed this. It forced the NYSE to compete against other exchanges for market share. This caused the NYSE to lower cost, streamline their technologies, and expedite their average execution time from approximately 11 seconds, circa 2005, to under a millisecond today. This is a good thing.

The problem, however, is that once there are multiple places to trade, liquidity gets spread out among exchanges, the time arbitrage play becomes more significant, trade size declines, and time priority becomes meaningless.

Exhibit 5
Market Fragmentation and Price Time Priority



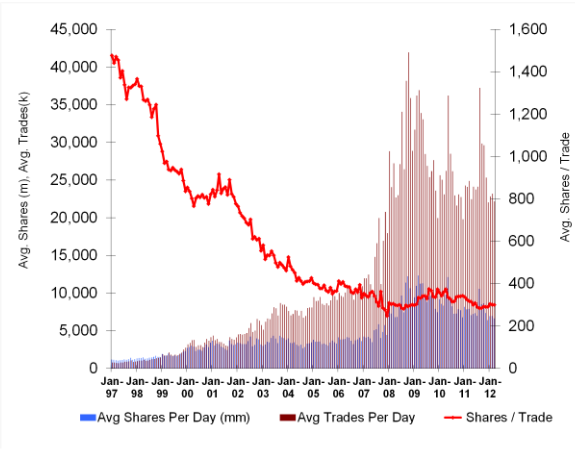
Source: TABB Group

If there is only one order book, the trade at the top of the book needs to be cleared (fully executed) before the next trade can be started. This incentivizes larger orders, because the only way to go around the large order is to pay more or sell for less. Once there are two places to trade, the large order can be easily bypassed (see Exhibit 5). This changes the incentive structures. Once there are two places to trade and an order no longer has primacy, then size is no longer an incentive, speed is. If an order can be traded around, then orders will become smaller, so it is harder for others to guess my intention. Orders will also need to be more nimble; execution infrastructures will need to analyze the different venues to determine where it is easier to be on the top of the book, and which orders also have a higher probably of being executed.

With the creation of multiple trading venues comes a need for market synchronization or arbitrage. This process ensures that the price of an asset trading over multiple venues is consistent. In this day of computers and high-speed connectivity, a fragmented market means that high-speed, low-latency machines are needed to trade between the markets in order to keep prices aligned.

This market structure also forces trade size to decline and message speed and rates to increase. This is exactly what we have seen in the US markets. The average trade size currently is approximately 300 shares, down from about 1,500 shares per trade in 1997 (see Exhibit 6). This trend also highlights the perverse issue that the large orders we see in the market are most typically retail individual investor orders, instead of orders from large investment managers who typically slice and dice their hundred-thousand and million-share orders into 100-share and 200-share lots.

Exhibit 6
US Equities Trades, Shares, and Average Trade Size



Source: TABB Group & Exchanges

The challenge is, what level of fragmentation is appropriate? Do we want a monopoly that has no incentive to lower price and increase efficiency? Or do we want a single venue to promote a more fair and egalitarian market? These are very challenging questions without a right or wrong answer.

The real question becomes, if we do remain fragmented, how do we promote innovation, without creating an unfair playing field?

Averages Cover a Multitude of Issues

Market makers and many traders with short time horizons are typically profiting by capturing a spread. They try to buy at the bid and sell at the offer. Traders using this strategy are more interested in the volume of shares traded than the actual price of the stock. A stock that trades 10 million shares is better than a stock that only trades 1,000 shares, even if the spread of the less-liquid stock is $0.25 or even a full $1.00, while the spread of the more-liquid stock may only be $0.01. That is because 10 million x $0.01 ($100,000) is a lot more than 1,000 x $0.25 ($250) or 1,000 x $1.00 ($1,000). So market makers tend to be more active in higher volume (more-liquid) stocks.

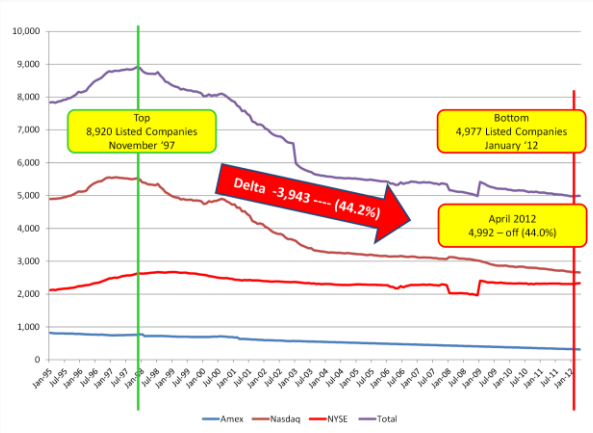
Historically, when the exchanges had more control of which firms had the best trading economics, the exchanges forced these firms (which were market makers) to cover both more- and less-liquid stocks. They tended to make money on the more-liquid stocks, break even on stocks with a moderate amount of liquidity, and they lost money on less-liquid stocks (no matter how wide the spread).

As the economics of trading has changed, and exchanges have moved from industry utilities to for-profit exchanges, new non-market-maker electronic traders have been able to trade as efficiently, and in many cases more efficiently than traditional market makers.

This creates problems for less-liquid stocks. Because the economics are better for highly-liquid names, non-market-maker electronic trading firms quickly moved into the more-liquid names and ignored the less-liquid names. This undercut the profitability of formal market makers by hurting their profitability in their most profitable names (stocks). If market makers can't make money in their most profitable names, then they surely can't make money in their least-liquid stocks. This makes it difficult for traditional market makers to survive, making it harder to provide liquidity for less-liquid/small-cap names.

This creates a market structure where the most liquid names are traded very efficiently, with tight spreads and low costs. This is good. Because these are the most liquid names it also makes the overall market statistics look very good. However, the less-liquid names become very hard to trade. The least bit of activity causes significant price volatility, and makes it harder for investors to either get into or out of these stocks.

Exhibit 7
Number of US Corporations Traded on the NYSE, NASDAQ, and AMEX Exchanges



Source: World Federation of Exchanges & TABB Group

The more difficult to get into or get out of these stocks, the harder it is for larger institutions to take positions in these stocks, and hence they shy away from buying them altogether.

While this should create buying opportunities for undervalued stocks, unfortunately, for whatever reason, it has caused a consolidation of the number of publicly traded companies. The number of publicly traded companies has declined from approximately 10,000 in 1997 to under 5,000 today (see Exhibit 7). Now there are many other reasons why companies are not going public besides market structure issues; however, there have been a number of papers written on this impact and the recently passed JOBS Act tasked the SEC to investigate widening the spread for less-liquid stocks to better understand this challenge[2].

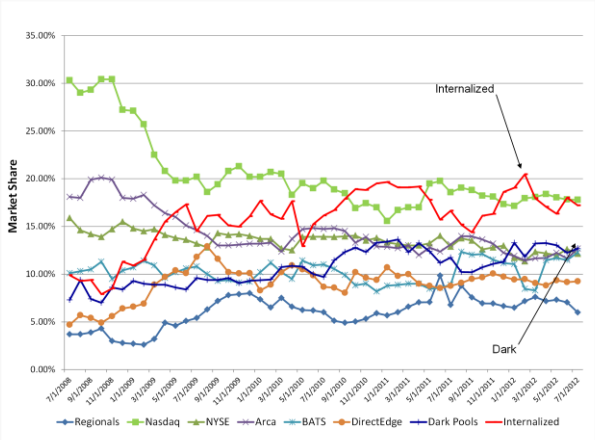
Exchange Rebates and Sub-Pennies

Part of the market structure debate is the exchange rebate strategy. But to understand rebates, one needs to understand limit orders. Limit orders are like advertisements reinforced by regulatory edict. The customer looking to execute in the market is obliged by regulation (Reg NMS) to go to the exchange displaying the best advertised price. Even if the customer goes into the wrong store looking to buy the product at a higher price, the store is not only obliged to direct that customer to the store with the cheapest price, but they are mandated to actually take them to the competing store with the best price (or at least a store matching the best price). This was the key Trade-Through mandate implemented as part of Reg NMS.

Having the best price is a critical aspect of exchange competition and can significantly swing exchange market share.

Exchange competition is so fierce (see Exhibit 8), that many exchanges pay their merchandisers a small fee to advertise at their store. The equities market is so efficient (especially in highly liquid names) that this small fee can tip market makers' and High Frequency Traders' (HFT) profitability. In addition, the fee/rebate structure also creates incentives to brokers to route their orders to various exchanges.

Exhibit 8
Exchange Market Share



Source: TABB Group & Exchanges

[2] "A wake-up call for America," By David Weild and Edward Kim, November 2009, Grant Thornton, http://www.gt.com/staticfiles/GTCom/Public%20companies%20and%20capital%20markets/gt_wakeup_call_.pdf
"Market Structure Issues and Impact On Initial Public Offerings", SEC Advisory Committee on Small and Emerging Companies, June 8, 2012 - http://www.sec.gov/news/otherwebcasts/2012/weild_060812.pdf

Many people fault the rebate structure and align it with the increase in high-frequency trading. Personally, I look at the rebate structure as a way to populate exchanges' order books and promote exchange competition. If exchanges didn't offer rebates, the traders would just widen their spreads to capture the same amount of profit.

Another way to look at exchange rebates is through the lens of sub-penny pricing.

Under Reg NMS the SEC banned the listing of limit orders in sub-penny increments (e.g., $ 10.00***2***). Depending upon the aggressiveness of the market makers, quoting the fee/rebate dictates the net spread capture the market maker can achieve. So by having a 28-mil (28 cents per 100 shares) take fee and a 25-mil rebate means that the actual spread is no longer 1 cent and that the realized liquidity provisioning spread is 1 cent plus $0.25 x 2 or 1.5 cents (1 penny spread plus two 25-mil rebates) and the realized take spread is 1.56 cents (1 penny spread plus two 28-mil take fees) with the exchange pocketing the $0.06 cents.

These rebates allow the market makers, liquidity providers or HFTs to quote more aggressively. So even if they both buy and sell at the same price, if they provide liquidity on both the buy and the sell, they can still make 5 cents per 100 shares. Most institutional and individual investors, however, do not pay this fee. This fee generally goes to the broker who routes that order.

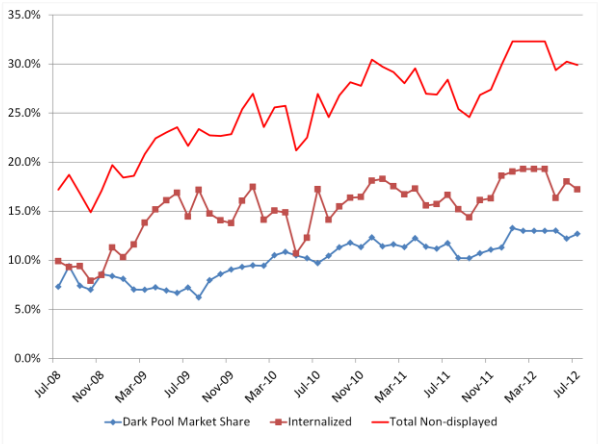
Does this rebate promote more trading? Yes it does. But it promotes the posting of limit orders, which is like inventory and advertising to a store. A store without anything on its shelves or no way to advertise will have a harder time attracting customers. And it is the customers who benefit from the tight pricing and the full shelves.

Dark and Internalized Order Flow

Approximately 30% of US Equity order flow is executed off exchange. This is up from approximately 18% in July 2008. This flow is either being internalized by brokers or being matched in ATSs/dark pools (see Exhibit 9).

A significant amount of retail order flow is internalized by wholesalers, meaning that the broker responsible for executing these orders can buy (or sell) the retail order as it comes from the investor, at or better than the prevailing price (see Exhibit 2). Over the past year or two, the amount of flow that brokers internalize

Exhibit 9
Percentage of US Equity Order Flow That is Either Internalized or Matched in Dark Pools/ATSs



Source: TABB Group, ATSs & Exchanges

has hovered in between 15% and 20% of total US equity volume. In addition, approximately 13% of order flow is matched in ATSs or dark pools. ATSs are automated matching systems that allow a broker's customer's order flow to interact, meaning two customer orders (buy and sell) can match directly within the ATS. While many ATSs cater to the matching of illiquid stocks, the largest ATSs have become so significant that as much at 50% of the volume of some of the most liquid equities are traded in the dark.

Many institutional investors prefer that their order flow be matched in the dark (which mostly happens outside of exchanges – even though exchanges can match), because it disseminates less information. In addition, since brokers (and hence ATSs) see orders before they reach the exchange, brokers and hence investors who trade in dark pools have access to order flow in advance of the exchange. This is all perfectly legal under SEC rules.

ATSs and dark pools were initially created to help institutions match larger orders, however the average order size in many ATSs is approximately the same size as orders in traditional exchanges. In addition, many of the largest ATSs do not let their competitors into each other's ATSs directly, they do let many non-competitive liquidity providers in and they do let competitors in via third-party independent brokers so increasingly, ATSs and exchanges look very similar, except that exchanges have a much higher regulatory obligation than ATS and internalizing brokers.

While exchanges cannot quote in increments smaller than 1cent, ATSs have a much easier time matching at sub-penny increments. In addition, ATSs do not need to publish their matching rules, order types, or even their volumes, in fact, ATS anonymity is protected by SEC under Reg ATS, so there isn't a single consolidated list of ATSs and the SEC will only provide the information under a Freedom of Information Act filing.

For-Profit Exchanges

For-profit exchanges are another aspect of our markets. In the era of member-owned exchanges, the members owned the exchange. While exchanges could make rules that benefited the owners (and many times they did), they were not profit-oriented. They made rules that benefited the members, which had diversified business models: some were specialists, some were brokers, some were agency traders, and some traded for their own accounts. They had a collective interest in a diversified book of business which represented their true businesses (retail and institutional brokerage as well as investment banking), not just their trading businesses. This pushed the exchanges to care about trading across the large, medium and small-capitalized stocks, as well as promoting the development of new companies within the markets and growing smaller companies into larger ones.

Now exchanges are public for-profit entities. They don't have members; they have shareholders, to whom the exchanges are responsible to maximize returns. In this era of fewer IPOs, it means that exchanges make money from trading, market data, and selling technology. Since the bulk of the trading is generated by the high-frequency

traders in the most highly-liquid stocks, the exchange has the incentive to ignore less-active traders and less-liquid stocks.

Now, I would virtually guarantee that no exchange will say that they are ignoring vast market segments; however, when they change pricing strategies, create new markets, or add new order types, they are not discussing these issues as thoroughly with investors (who are not exchange customers) as they are with their largest "liquidity providers" (who are more likely direct exchange customers) and provide the majority of their quotes.

Order Types

An order type is an electronic message that tells the exchange how to handle a specific order. The simplest orders are limit orders and market orders. A market order tells the exchange to buy a product at the current price. A limit order tells the exchange to only trade this order at a specific price and to display that price out to the market. While market orders and limit orders are the simplest order types, there are dozens of order types that range from hidden (non-displayed), floating (move with the market), midpoint (trade between the best bid and offer), and others. Some order types are very straightforward and easy to understand. Some are not.

Some of these message types are very arcane, and while the exchanges are obliged to post these order types, many are not thoroughly described and may not behave like you would think they would. Depending upon the exchange and order type, there may be clear advantages and/or disadvantages to using them and unfortunately, learning the intricacies of some of the more arcane order types is not easy and anything but straightforward.

Dark Pool Order Types and Matching Priorities

While order types and price/time priority in exchanges may be complex, arcane and not thoroughly described, the matching methodologies in ATSs are not even posted. ATSs are not required to post or even describe to their clients their matching or routing methodologies. TABB Group has been following many of the dark pools in the US markets for years many of whom report their volumes to us on a monthly basis, and never has a single ATS or dark pool been 100% transparent (to our level of confidence) as to how their ATS precisely operates. Many of the ATS/dark pool operators believe that their matching methodologies are proprietary and hence confidential, so that they don't let us know exactly how they operate. Most firms, however, do have discussions with their largest clients about routing and matching methodologies. However, if you are not in that small cadre of highly prized clients, it is very difficult to follow how orders are matched within ATSs and where orders are routed if they are not matched.

Question Two:

Does the current market structure allow all investors to participate in the market meaningfully and fairly? Why or why not? Are additional measures needed and appropriate to improve the integrity of our market structure?

Fairness of the Current Market Structure

The current market structure benefits smaller investors. It also benefits technologically sophisticated institutional investors, and investors that choose/partner with more technologically sophisticated brokers.

Smaller individual investors (those placing their own orders into the marketplace via online brokers) have never had a more efficient and inexpensive marketplace. Many studies have stated that not only are equity commission rates very low (under $10) but spreads in the US markets (up until this year), are historically low. Individual investors, as long as they are not buying sizable positions receive quick and inexpensive executions.

Day traders are completely disadvantaged. Any individual (without very sophisticated infrastructure) looking to trade the market with a relatively short time horizon (minutes, hours, and maybe even a few days) is completely out-gunned. Day traders are competing with a large number of sophisticated traders and investors armed with the fastest computers, and very sophisticated analytics. The chances of a day trader consistently profiting off the market, is very small. They would have better luck doing fundamental analysis and making more intermediate and longer-term investments.

Larger investors (who are managing the bulk of individual investors' assets through mutual funds, pensions, and professionally managed accounts) do not have it so easy. As mentioned above, because of the fragmentation of the markets, it becomes easier to spot larger investors, and to disadvantage their execution.

However, increasingly, there are tools that help larger investors better manage their executions. There are ATSs to help institutional investors hide from more aggressive traders; there are also sophisticated trading algorithmic technologies which can outfox pernicious trading machines. But understanding these tools takes time, patience, careful transaction cost measurement, and technology.

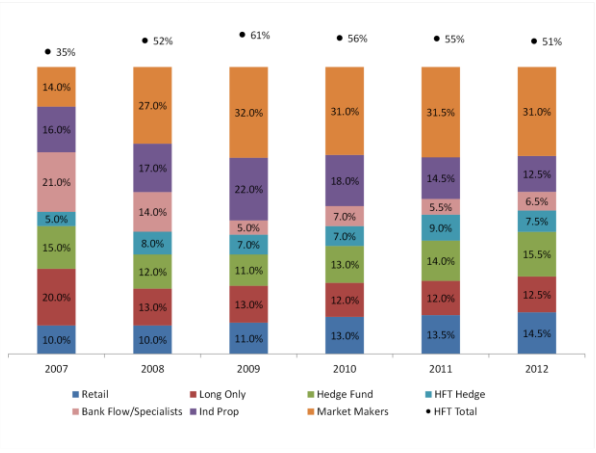
In some ways this is how a market should work. Initially a trader creates a profitable trading strategy which may disadvantage an unsophisticated investor. Eventually, that investor (or their broker) realizes that they are being disadvantaged and complains to their broker. If enough people complain, the broker fixes the problem. If they don't, the investor switches accounts and the broker suffers. If the broker fixes the problem, they keep the customer.

Regulatory Change Creates Trading Opportunities

Most profitable trading strategies are generated out of major market structure change typically created by a regulatory shift. Regulators change the rules, the sophisticated traders figure out how to profit from these changes, investors are disadvantaged, complain, and brokers respond and take away that opportunity.

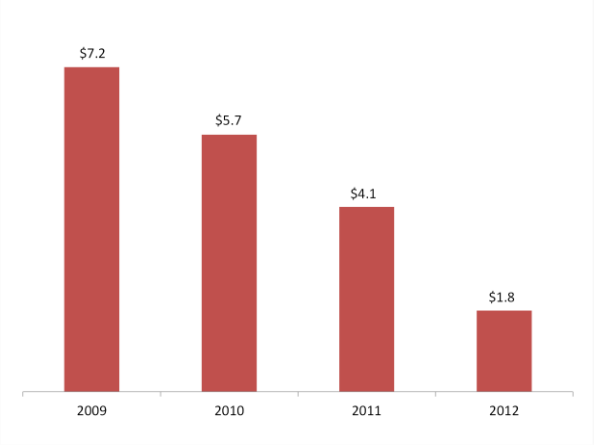
The TABB Group has estimated the amount of spread capture that sophisticated traders (high-frequency traders) have captured. The high water level of high-frequency trading profit in the US equity markets was in 2009, when HFT players generated approximately $7.2 billion and accounted for approximately 61% of US equity volumes (see Exhibits 9 and 10). Since that time, HFT profitability has declined to $1.8 billion and comprises approximately 51% of share volumes (see Exhibits 10 and 11). While $1.8 billion seems like a lot, it is only about 0.3 basis points of US equity dollar volume traded, or accounts for only 0.3 cents ($0.003) per $100 traded. This is down from approximately 1.3 basis points in 2009 or 1.3 cents per $100 traded.

Exhibit 10
Percentage of Trading by Market Constituent



Source: TABB Group

Exhibit 11
Profitability of High Frequency Traders ($US Billions)

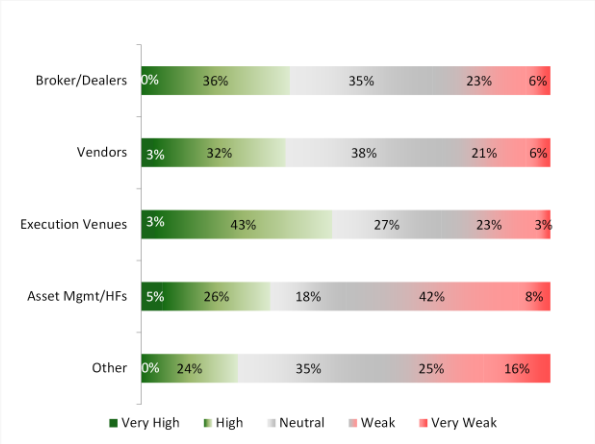


Source: TABB Group

Question Three:
Have the high-profile computer trading failures over the past year, such as the recent trading problem at one firm that sent stocks sharply higher and then lower over a period of minutes, discouraged ordinary investors from participating in the stock market? Have these failures and recent volatility with initial public offerings discouraged companies from taking advantage of the capital markets?

Yes, these high profile trading glitches have reduced confidence in the market. TABB Group has surveyed the market and has tracked market confidence post-Flash Crash, Facebook, and Knight fiascos. We sampled 260 market professionals, or vendors that serve market professionals, and the confidence is not good (see Exhibit 12). Overall market confidence of these professionals has dropped from 15% of the sample rating confidence either poor or very poor post Flash Crash (May 2010) to a whopping 34% two weeks after the Knight debacle (see Exhibit 13).

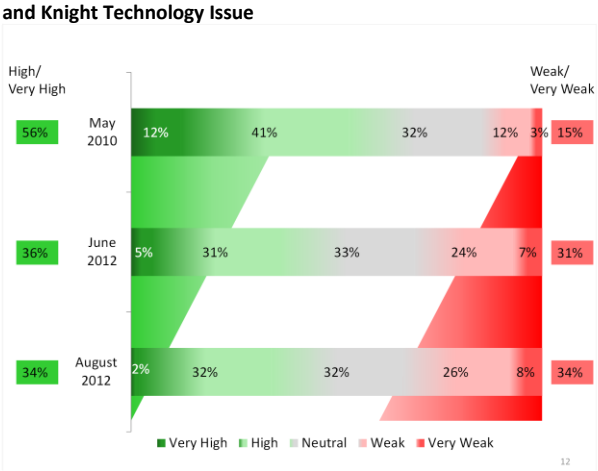
Exhibit 12
Confidence of Market Constituents Post-Knight Capital Technology Issue (Sample – 260 Industry Professionals)



Source: TABB Group

While the confidence of market professionals has dropped, and I wouldn't doubt the same is true of individual investors, I am not sure that there is a direct correlation between this drop in confidence and the long-term trend of decreasing equity ownership, a reduction in IPOs and lack of trading volume across virtually all financial products. There are just too many other factors that would influence investor and corporate behavior besides equity market structure including:

Exhibit 13
Confidence of Market Constituents After Flash Crash, Facebook, and Knight Technology Issue



Source: TABB Group

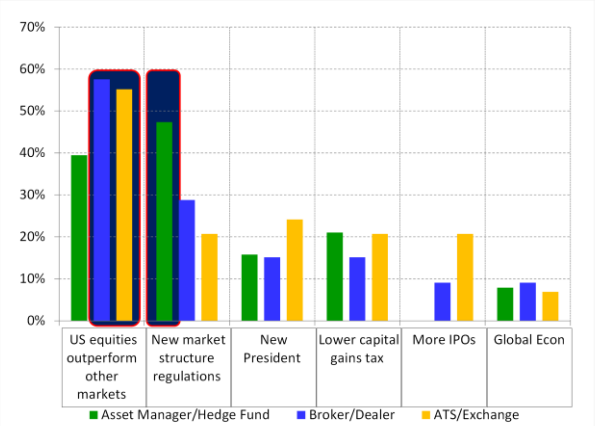
- The election – going back over previous election cycles from 1950, third-quarter equity trading volume during election years is down an average of 17% compared to the first half of the year. In non-election years, it is down only 4%. Volume in the fourth quarter during election years is down 5% from the first 3 quarters, while fourth-quarter volume during non-election years is only down 3%.

- Washington unease – the debt ceiling, the fiscal cliff, tax rates, and credit rating downgrades have investors uncertain about how to plan for the future.
- Regulations – with Dodd Frank and many European regulatory initiatives in the works, it is hard for financial institutions to know how to plan.
- Sarbanes-Oxley – raises the cost of becoming a public company. This was addressed in the JOBS Act for smaller organizations.
- Research settlement/research business model – Because of the Spitzer Research Settlement, it becomes harder to fund equity research, and without equity research (even biased research), it becomes harder to discover opportunities in smaller companies.
- Basle III – new capital requirements increase the cost of capital, and with interest rates so low it is hard for banks to generate an adequate return. This makes it harder for banks to provide capital to the market.
- Europe – with the Euro zone threatening to break up, investors do not know how to react or invest.
- Risk on-Risk off/high correlations – with all of the macro risk in the market, investors are not investing in companies, they are investing in sectors and geographies via ETFs. So investors are not worried about Coke or Pepsi or Ford or GM, they are worried about US or China, technology or health care. They are then using ETFs to express those strategies. Because ETFs are generally index-driven, they don't buy undervalued assets and sell overvalued assets – they buy all the assets in an index in relation to the weighting of stocks in the index. Those trading strategies then drive the correlation of assets within the index toward 1.00. I Instead of one stock appreciating and the other depreciating, both begin to move in the same direction. This hurts single-stock investors who then switch their investing strategy away from single names to trading sectors, or global macro themes.
- Low interest rates – with interest rates so low, and declining over the past 30 years, at some level it becomes more beneficial to borrow money instead of issuing stock and diluting owners' capital.
- Demographics – baby boomers are retiring and want to secure their retirement by moving assets out of equities into fixed income or into savings accounts
- Bank consolidation – with bank/broker/investment bank consolidation, the fees generated on smaller IPOs become immaterial. As banks get bigger, they need bigger transactions to move the dial.
- Private equity – is tapping institutional money to invest in private companies because the return on public companies is so low and interest rates are so low. Tax treatment of PE firms may also play into this.

What Will Bring Back Confidence?

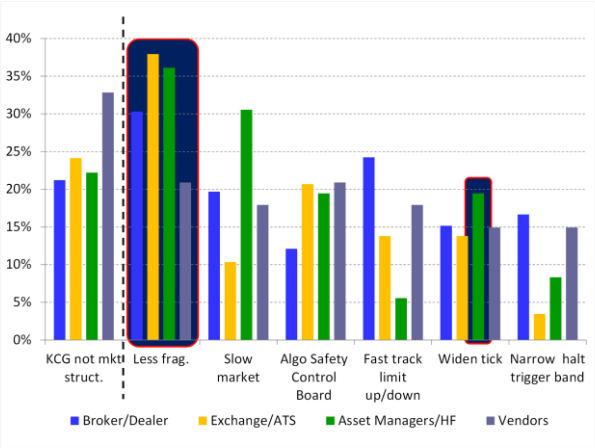
Industry professionals believe that two major things will bring back confidence in our markets: US equity market performance, and new market structure regulations (see Exhibit 14). When asked to pick among a number of changes that would enhance confidence in the market, besides many of our respondents saying that Knight was not a market structure issue, the preponderance of professionals believed that reduced market fragmentation would be their first choice. In addition, 30% of asset managers and hedge funds thought that slowing down the market would benefit confidence and approximately 20% of this same demographic thought widening the tick size would help (see Exhibit 15). This is a surprising response given that it is a money manager's job to reduce trading cost, and tick size is a major component of trading cost.

Exhibit 14
What Will Bring Back Market Confidence?



Source: TABB Group

Exhibit 15
What Will Bring Back Market Confidence?



Source: TABB Group

Question Four:

What changes need to be made to help fortify our markets, especially during times of market stress? In particular, is it possible to minimize the systemic effects of a flawed algorithm or a computer strategy gone awry?

The best insulation from a rogue algorithm or trading model run amok are:

1) Circuit breakers (limit up/limit down). These rules need to be implemented as robustly as possible, covering as much of the trading day as possible, as soon as possible. Trading halts will stop a cascading market as long as they are operative. They also need to be harmonized across markets and to some extent across asset classes, especially between index futures and options and their underlying stocks.
2) Ban trade breaks. Breaking trades reduces the incentive to ensure properly implemented and monitored trading strategies. They provide less incentive for investors to trade during turbulent times. If a traders/investor takes the other side of a trade during a period of stress, then hedges it or sells it only to find out that one of the trades is broken and hence unhedged/exposed, the market is clearly penalizing the trader/investor for jumping into the breach. We want a market that incentivzes providing liquidity in turbulent times, otherwise when volatility roils the markets, fewer traders/investors step in and volatility is exacerbated and not absorbed. Make firms responsible for their trading errors. If they blow up, then the firm goes out of business, or their investors become diluted.
3) Capital and liability – hand in hand with no do-overs means that firms need to have an adequate capital base not only compared with their overnight trading exposure but with their intraday exposure and possibly their trading capabilities. Because if someone blows up, there needs to be enough capital behind the firm, their clearing firm, and the central clearing house to make all other participants whole. In addition, there need to be ways of protecting individuals. Currently, individual investors using stop losses can be taken advantage of during whipsaw markets. Individual investors need to be able to get satisfaction through their broker. Or maybe stop loss orders should be turned into stop losses with collars so that a stop loss may trigger in a falling market at the stop loss price, but if the market is plummeting it doesn't trigger at $0.01, and if it does they can go back to the broker for satisfaction.
4) Stop buttons – every trading machine needs a stop button. Why the stop button was not triggered during the last fiasco, I don't know. But there is no excuse. An electronic trading problem is only an electronic trading problem for at most a minute – after that it is a human problem. Why didn't the human stop it? What happened to the monitoring process?
5) Direct access rules – The SEC issued direct access risk gateway rules. Those rules, I would assume, should have stopped this. I am not sure why they didn't. One reason the direct access rules didn't stop this problem was they were never implemented as specified, because implementing them as specified is next to impossible. But that said, the SEC should first ensure that their rules will solve the problems that they

are targeting, and once they have specified and drafted the proper rules they should test and enforce them.

Again – we need to be careful not to over-regulate our markets. The unintended consequences may be tremendous. That said, liability and responsibility are important to the marketplace and should not be vacated.

Question Five:

Do regulators have adequate tools to identify and limit manipulative or abusive strategies?

No they don't. This is a key aspect of investor confidence, and the challenge of better understanding the impact of high-frequency trading. The regulators need two major tools: first, an accurate and technically robust audit trail that captures all of the market information (bids, offers, cancellations, modifications, orders, and executions). Second, they need the appropriate tools and sophistication to understand what is going on, and who is trading what. They need to understand spot manipulators (actually, first they need to define manipulative trading strategies), piece together sliced and diced orders, and place this information in context with not only news and events but with trading activity happening in other markets.

If the regulators had these capabilities, and we could be assured that the regulators understood market structure, analyzed the markets, and caught the misbehavers, much of this discussion of high-frequency trading would be moot. However, the regulators do not have the tools. When they create rules, they specify them incorrectly (like Large Trader), or create rules that are impossible to implement (e.g., Direct Access), or don't have the sophistication to understand how to put large orders that get sliced into thousands of little pieces back together, or the complexity of how proprietary trading engines work.

Question Six:

What, if any, policy changes should be considered by regulators or Congress in order to better protect investors; maintain fair, orderly, and efficient markets; and facilitate capital formation?

First, Do No Harm

My first statement is to do no wrong. As you can see, the markets are very complex and interrelated. Small changes here can cause a huge impact there. For example, the implementation of penny spreads killed market maker profitability; forced markets to automate; enabled (created) the fragmented trading environment, which filled HFT coffers; forced firms to invest millions in infrastructure; and has been blamed for the destruction of equity research, the IPO, investor confidence, and the downfall of corporate America including the inability of US companies to create jobs. Of course, that is a bit hyperbolic, but from the research, blogs, and talking with many market participants, I know that these sentiments are in the market and have heard many of these stories in discussions with industry professionals.

So first do no harm, and that means do nothing radical. A radical re-shifting of the market will actually hurt investors and not help them. Radical changes will provide incentives to traders to thoroughly read the rules and learn how to profit off of less-astute investors or traders. This opportunity will only close once investors pressure their brokers and the brokers to develop counter-measures.

What I Would Do

1) Start defragmenting the market. Stop granting new exchange and ATS licenses immediately. Also create a new license or structure which limits the number of internalizing brokers. Maybe grant every internalizing broker a license but grant no others.
    a. Determine the optimal number of exchanges, ATSs, and internalizing brokers. As these entities go bankrupt, merge, or consolidate, reduce the number of licenses.
    b. Maybe grant a maximum number, and say anything over that number can't even be transferred and must be retired.
    c. We need to be careful; we don't want to limit competition too much, but 13 equities exchanges, 50 or so ATS licenses, and who knows how many internalizing brokers is too many.
2) Manage broker/ATS solicitations. Currently it is very difficult to understand what happens to your order and where it goes. Larger orders are being executed in smaller pieces. A 50,000-share order can be executed in more than 200 trades. While this information is provided to many institutional money managers, it is much more difficult to tell them where their order was routed but not executed. This information may actually be more important than where it was actually executed. An order may be seen by 50 to 100 firms before it is routed to an exchange for execution. Between brokers soliciting the other

side, ATSs routing to each other, and exchanges routing to ATSs – virtually everyone that may have wanted to trade against an order will have seen it before it is executed.

3) Better manage Minimum Price Variations (MPVs or spreads). Currently, we have a minimum of 1 cent MPV for stocks over $1. We should follow the direction of the JOBS Act and try to widen the spreads for less liquid stocks (small caps). This may also extend to high-priced stocks, too, as why should Apple priced at almost $700 a share trade at the same MPV as BankAmerica trading at $10. A penny spread in BankAmerica is 10 basis points, while the same spread in Apple is only 0.143 basis points. We need to think about appropriate spreads for appropriate pricing bands, liquidity characteristics, and capitalization levels.
4) Provide greater transparency of order types and routing mechanisms. Currently, most exchanges post their order types; however, the descriptions of what they do and how they work are not tremendously intuitive. Exchanges, and for that matter ATSs, ECNs, internalizers and even brokers need to begin to provide greater transparency, descriptions, and concrete examples of how each order type works, how fees/rebates are generated, where they show up in the book queue, how and when they route out, and how these order types change under the various market conditions. If these entities are not willing to be more transparent, then maybe that is one way to limit the number of matching licenses.
5) Quickly develop a marketwide consolidated audit trail for equities, options and futures markets. Develop incentives that will facilitate the cooperation of the SEC, CFTC and various SROs to ensure harmonious oversight. Develop clear rules on what is manipulative behavior in an electronic marketplace and have it updated frequently. Provide regulators with the tools and people who can develop ways to understand the market and find people and/or machines that are driving manipulative behavior. These people and organizations should be stopped, fined, or imprisoned. If we had confidence that our regulators had the tools and capabilities to surveil our markets, it would give the public more confidence that pernicious behavior was being flagged, challenged, and resolved. It would provide investors with the assurance that our markets are safe again for trading, investing, and raising capital.

About TABB Group and Larry Tabb

TABB Group

TABB Group is a financial markets research and strategic advisory firm focused exclusively on capital markets. Founded in 2003 and based on the methodology of "first-person knowledge," TABB Group analyzes and quantifies the investing value chain from the fiduciary, investment manager, broker, exchange and custodian. Our goal is to help senior business leaders gain a truer understanding of financial markets issues and trends so they can grow their businesses. TABB Group members are regularly cited in the press and speak at industry conferences. For more information about TABB Group, go to www.tabbgroup.com.

Larry Tabb

Larry Tabb is the founder and CEO of TABB Group, the global financial markets strategic advisory and research firm focused exclusively on capital markets. TABB Group helps senior leaders throughout the industry make critical decisions about their business.

Larry is a member of the CFTC High-Frequency Trading Sub-Committee of the CFTC Technology Advisory Committee.

Larry has published industry research analyzing both US and European market structure; central clearing; fixed income, equity and foreign exchange trading; financial markets trading and processing systems; analytical trading tools; grid and cloud computing; financial markets infrastructure; and trading technologies.

Quoted extensively and in virtually all industry and general news publications, he has been cited in The Wall Street Journal, Financial Times, The New York Times, Associated Press, CNN, Bloomberg, CNBC, Reuters, Dow Jones News, Barron's, Forbes, Financial News, Wall Street & Technology, Securities Industry Monitor, and Waters. He continues to be a featured speaker at major industry and business conferences throughout the US, Europe, Asia and Canada.

Before founding TABB Group, he was vice president and founder of TowerGroup's Securities & Investments practice where he managed research across the capital markets, investment management, retail brokerage and wealth management segments. Prior to joining TowerGroup, he managed business analysis for Lehman Brothers' Trading Services Division and was in charge of capital markets technology planning.

He began his career managing various operations for the North American Investment Bank of Citibank, where he managed front office trading and finance operations, various back-office money market operations and, for US Treasury debt, proprietary trading clearance and settlement operations.