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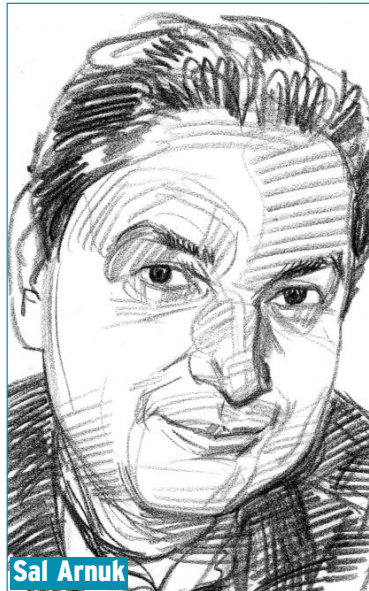
Playing Fair?

Themis Trading Picks Apart Market's Post-Reg NMS Structural Flaws

Sal Arnuk and Joe Saluzzi run a tiny institutional trading boutique, called **Themis Trading**, out of a small suite of offices in suburban Chatham, NJ., convenient mostly so that they can coach their kids' Little League games. So why are these industry veterans, who cut their trading teeth working at electronic trading pioneer **Instinet**, currently testifying at SEC market structure roundtables and locking horns with some of the biggest and most powerful brokers and high frequency traders in the Street? When I asked, Joe pointed to the root of the mythological name Sal chose to bestow on their firm: *Themis*, the goddess of fairness and trust. Structural and regulatory changes in the market, combined with rapid technological innovation, the pair say, are destroying the trust necessary for the market, and capitalism, to function. Listen in.
KMW

You guys are becoming quite the media stars by criticizing high frequency trading - especially since the flash crash.

Joe: It has taken us a long time to get news organizations interested, and educated, but now some are pressing the issues and doing a good



Sal Arnuk



Joe Saluzzi

job. We were in the *FT* today. Their reporter is pretty good. They actually link to our blog on their website now, which is pretty neat.

No one would have wished May 6 on anyone, but it has focused attention in a way that little else could on "market structure." Suddenly, it's not just "inside baseball."

Joe: Well, sometimes it takes a disaster to get a problem fixed. And it turns out it wasn't really a disaster because the market came right back - right?

So most folks would like to believe. But I suspect it was more likely a warning shot across the market's bow.

Sal: You bet, a wake-up call. Joe and I get so

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Victor Juhasz
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upset when we hear chatter in the media, for instance from talking heads on *CNBC*, suggesting that the flash crash was a non-event. “If you bought a stock at 48 and it fell to 31 during the day, but then climbed back up to 46 by the close – and the low print was an error – what does it matter to you, *as a long-term investor*?” In other words, they are suggesting that if you invest for the long-term, you should overlook any shenanigans that go on, intraday. But what about the cost to confidence of a day like the flash crash? Consider what it did to many people who had stop orders in the market. And then there were all of the people who caught the news on TV and said, “Oh my God, what’s going on? Get me out!” I mean, markets trade on sentiment. So for anyone to suggest that it doesn’t matter – or to take the opposite tack and suggest that, if you do care about what happens intraday, then you’re not a long-term investor, you’re a trader – and so you *deserve* what you get. No! No! Both suggestions are patently false.

Besides, all sorts of trades by all sorts of investors were executed amid that market upheaval. With real economic consequences.

Joe: And many were *not* broken later.

Sal: But the most troubling comment we’ve heard on TV since the flash crash came from **Tom Joyce**, the Chairman and CEO of **Knight Securities**, who was saying that the new circuit breakers the SEC is experimenting with are great. “Exactly what we needed. But I probably would have wanted them to be a little bit wider. I think 15% would have been better than 10%.”

What’s wrong with that, unless you really don’t like circuit breakers?

Sal: My point is that comment was a giant joke. “This solves the issue; let’s move on.”

Joe: “Don’t look here, guys. Don’t stare at the crime scene. Everything is fine, keep moving people. There’s nothing wrong here.”

Sal: The issues surrounding high frequency trading are not only about fairness, though we talk about the fairness issues a lot. The bigger problem, as **Senator Ted Kaufman**, who actually gets it, has pointed out, is that it poses systemic risks. Now we’ve seen HFT implicated in the flash crash. How levered up are these HFT guys? Is it 10 times? Are the hedge funds doing HFT levered two, two and a half times? The proprietary HFT guys can be levered up more, because they’re perceived to be riskless. They start the day flat and they end the day flat. If they’re levered up 10-15 times now – which is what we hear – what happens when one of them

decides, “Gee, we’ve got to get levered up more to get the same returns because there are many more of us now?”

Joe: And their margins *have* shrunk, just like the carry trade’s, because there are so many guys who have gotten into the business – and more are entering all of the time.

That’s a lot of leverage in this post-credit-crisis world.

Joe: Well, I have even heard of some HFT guys leveraged as high

as 30 times. But how much generally depends on the perceived risk level of the HFT strategy. If they’re running a simple rebate strategy, they’ll employ more leverage than if they’re doing some sort of long/short strategy. And if the HFT is a DMM providing a market making function, such as a **Goldman Sachs** or a **GETCO**, a very large firm, it will likely carry the most leverage. But, let me be clear. We have no inside knowledge of these firms. This is just what we hear in the market.

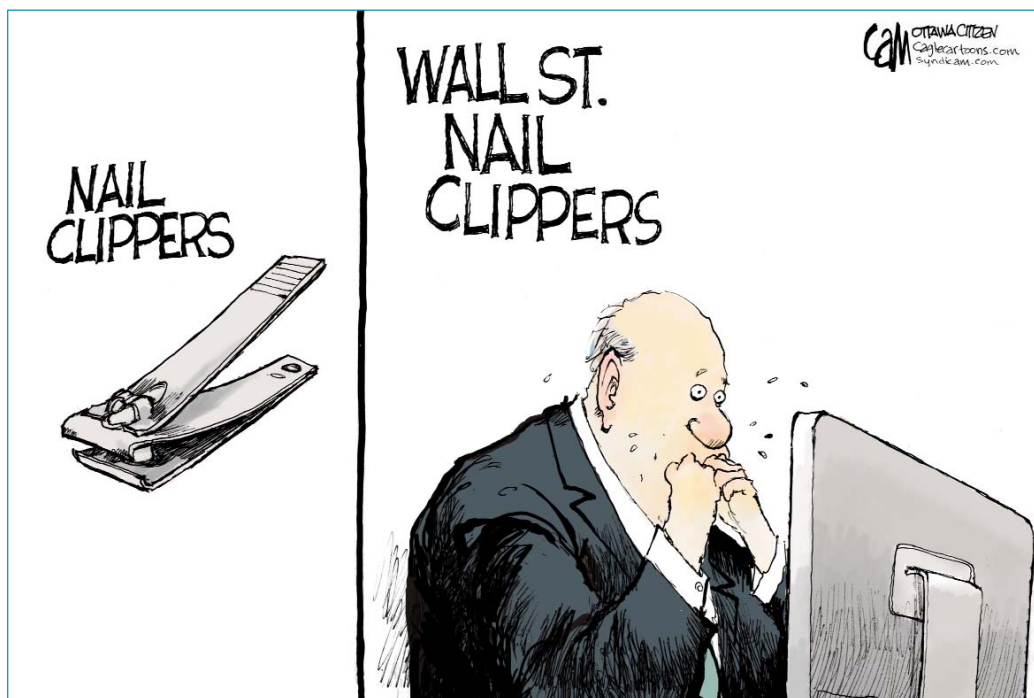
Sal: All we do is ask questions about the way high frequency trading works in today’s fragmented markets. Does the sheer volume of our questions mean that there is something sinister about HFT? Maybe, but probably not. Still, the questions have to be asked. The more people ask questions, the more likely it is that the regulators will be spurred to get some answers. Somehow, the traditional U.S. market model, in which we used to have a handful of exchanges with onsite

“Does the sheer volume of our questions mean that there is something sinister about HFT? Maybe, but probably not. Still, the questions have to be asked. The more people ask questions, the more likely it is that the regulators will be spurred to get some answers.”

regulators – who required them to balance profitability and investor protection – has morphed into 50-odd competing trading venues and destinations, dark and light, which are cross-owned up the wazoo. This brokerage firm owns a large stake in that high-frequency trader and they both own a large stake in this exchange. Is it any wonder that, if all this stuff is going on and if you're on the inside, life is real, real good? But if you're *not* on the inside – for the other 99.5% of us – it can be confidence shattering. They are basically arming very young math majors and Ph.D.s from every corner of the globe to design these incredible algorithms and these incredible strategies that are predatory on everyone else in the markets. What will happen to all of these intraday high-tech war games that are going on, when the true investors really lose confidence in the markets? You hear it already at cocktail parties: "I don't trust the markets. They're all crooks, look at Wall Street. Look at Goldman. Look at this one. Look at that one. Look at **Bernie Madoff.**" It is getting worse. The flash crash, no surprise, caused confidence to plunge further. Meanwhile, the more layers that get peeled away, the more malfeasance everyone seems to see. When the true investors take their marbles and go home; when the long-term owners in the market abdicate – all you will be left with in the market will be the renters. It will just be a big video game. It'll be like "*Call of Duty*," with burnt out, shelled out buildings and kids who are really well-armed just sniping at each other. In fact, we hope that's everyone's vision of an evolved market – because that's what we see coming, unless HFT gets reined in.

Wow. That's pretty apocalyptic –

Joe: It's not meant to be. We think the pendulum has swung way too far to the electronic side. At one point, it was way too far on the human side, when the specialists dominated



trading. But when people wake up and it swings back somewhere towards the middle, a technology-driven market will be just fine, as long as it includes the *people* needed to help out with capital formation. You just can't do that with computers.

Sal: Technology can be leveraged for efficiency, for improving speed and for improving productivity – we've done that our whole careers – but when it gets to the point where technology has taken over, where that is the end game and it has become an arms race, machine against machine, we end up with casino capitalism – and the market's capital raising function, which depends on trust and relationships, goes out the window.

Are you sure you aren't just fighting a rear-guard battle against progress – because you can't keep up?

Sal: I really can't stand it when I hear the "adapt or die" argument. My mom can't afford to co-locate or do all the other things that HFTs are doing. Neither can many institutional investors. That argument reveals a lack of understanding of the capital formation process. It requires broad participation. If all the regular folk take their money and go away, the game is up. Just in our relatively short careers – we're not the youngest guys in the world but we're not that old, either – I can't believe how the frame of reference and the moral compass in the

industry has become “Hey, to participate in the stock market you must compete with these HFT guys.” It’s crazy!

Joe: The evolution argument maybe works in the computer world, where Moore’s Law applies. But the capital formation process is entirely different. By damaging it, HFT is affecting the economy, the equities market, jobs – I hate to sound like I’m on a soapbox – but this is important for America. Sure, we’ve had a couple of new listings on the New York Stock Exchange this year – of Chinese companies. Great. But how does that help capital formation *here*?

But can you really expect to turn back the clock on a technological innovation like HFT? Especially since all those trades are widely believed to enhance market liquidity?

Joe: We have May 6 now to prove that HFT *doesn’t* increase market liquidity. We don’t need to say anything further.

Sal: But here is the best counter to the liquidity argument: Average trading volume today is about three times what it was just a few years back. Yet we have recently heard the head of electronic trading at a major bulge bracket firm claim that the culprit in the flash crash was the *market order*. I’m not kidding. He said it in an editorial in *Traders Magazine*.

If you can’t handle *market orders* in what’s supposedly a very liquid market, it goes to show you that volume is *not* the same thing as liquidity. If the HFT crowd is providing liquidity for investors and lowering costs, then why can’t we handle a simple 100-year-old order type in a market whose volume has increased 300%? What does it say when one of the guys who is playing the game is telling the world: “Do not trust our market because we can’t handle a *market order*”?

Joe: “We may print you at a penny a share.”

Sal: So there is a downside to HFTs providing “liquidity”. They provide it when they want to, *not* when the market needs them to. And only if their profit is virtually guaranteed.

Joe: They are also liquidity *demanders*. The same guys who provide liquidity when they want to also demand liquidity when *they* need to. On May 6, they demanded liquidity.

Sal: And they demanded it a lot more efficiently than anyone else could.

Joe: Because when you’re levered up 10 to 15 times or more and it all starts hitting, the first thing you do is get rid of your buy orders and sell everything else – making you a demander

of liquidity. But we never hear that they are demanders of liquidity, by the way, in any of the public statements from the HFT guys. We hear all the time that they shrink spreads, increase liquidity and help the price discovery process. Well, none of that happened on May 6th. The price discovery process was gone. You could have priced a sub-prime rated CDO better than you could have priced **GE** or **Procter & Gamble** that day. What happened to the price discovery process for those 20 minutes? I would have rather traded on the Baghdad Stock Exchange at that juncture, because at least they have a white board with the prices, so you’d know what the prices were at any given point. We had no idea during the flash crash, because prices were moving all over the place when the HFT guys disappeared. That’s not a healthy market.

Sal: Then the arbitrary cancellations of trades, post flash crash, was just outrageous. Where did that 60% threshold for busting trades come from? No one has answered that question. At bottom, it is a confidence issue. Do people have more confidence in the markets now? I doubt it.

Okay, how did a small agency trading firm in New Jersey end up in the forefront of critics of high frequency trading?

Joe: That *is* the question, right? It should be the title of a book one day, I suppose. Sal and I have been in the business since the early ’90s. We were both at Instinet for 10 years, where we got our background in electronic trading, so we know how the guts of the markets and of the machines work. We started this firm eight years ago for the sole purpose of serving institutional clients with our abilities to trade for best execution, because we knew what was going in the machines. We figured, look, if we know how the machines work, we can certainly trade better than the machines themselves – because they were pretty easy to spot – and we thought that we could add best execution. That was the model. The model wasn’t research or any of the stuff that it has become over the last couple of years. And, for the first six years, we pretty much went about our business, traded, and did our agency thing; everything was fine. But it was around the time that Reg NMS was put in place [2005] that things started to change. When Reg NMS came out, we noticed right away that things were starting to *feel* differently. Stocks were moving a heck of a lot more than they used to, volumes exploded. So we started to dig around, ask questions. Eventually, we found enough to write a research paper in December of

'08, called "Toxic Equity Trading," for the sole purpose of letting our clients know: "Hey guys, when we trade your order flow, this is what we're seeing." We sent it to clients and put it on our website. For the next six months, it pretty much just sat there, even though we had put a lot of work into digging up the information and vetting it. But then the flash order controversy started and interest in what Themis was saying went boom. All of a sudden, the press wanted to find out what was going on with flash trades. And they didn't have to dig long to stumble on our research paper. The next thing I knew, we were doing commentary on electronic trading strategies in the business press – and the only media we'd done before were just standard market views. Then we got a phone call, "CNBC wants to do a piece," and I found myself debating high frequency trading with **Irene Aldridge** [author of *High-Frequency Trading: A Practical Guide to Algorithmic Strategies and Trading Systems*, and managing partner of **ABLE Alpha Trading Ltd.**, a proprietary HFT vehicle]. Well, the debate got a little heated. She called me a turtle. I yelled back. It made for great television.

You didn't hide in your shell?

Joe: No way. She said that I was complaining about HFT, "Just because you trade like a turtle." Implying that the only problem with HFT was that I was slow and it is so fast. So I came back and said, "No, you're unethical." Obviously, it got heated then, making for a good TV debate. It caused a little bit of stink. But we kept pressing and pressing. We got involved in industry conference calls. We kept digging. And every time we'd turn a rock, we'd find something ugly. Like you said, we're a small shop in the middle of New Jersey, how did this start? It started by us wanting to do the best job for our clients and because we would sense something when we were trading. We'd be like, "Well, that doesn't seem right. Let me call this guy up and ask what's going on or call the exchange and ask a few questions, or call whoever. Then we started looking into smart routers. The more we looked, the more we didn't like what we found and the more questions we asked. Again, the main goal was to inform our clients about what we were seeing. That's how we got involved. I guess the answer to why we're in the forefront now is that we're almost the only critics in the industry who are talking in public.

What does that tell you?

Joe: There are a couple of consultants, like the **TABB Group** and **Rosenblatt Securities**, who do a lot of work in the industry, and who have been a little critical. But they seem to be mostly on the other side, as well. No one is going to come out, like we are doing, and say, "We don't think this is right and this is why." Almost everyone else seems to have a vested interest – either because they have clients doing HFT or they're doing it themselves. Then, if you talk to the regulators, they don't quite understand it. The politicians, other than Senator Kaufman, really have no idea what's going on. Anyway, once we found ourselves in the middle of the controversy, we felt we had no choice but to keep researching it.

That must be a burden for a firm as small as yours –

Joe: And it keeps growing. We're just two or three or maybe four guys doing all this work – in addition to our trading. So you can imagine it's tough. But we feel that it's extremely important – and we want answers, too. We know we don't have all the answers. But we do have a lot of questions.

How about being more specific about what made you start asking questions?

Sal: I guess we're introspective, for traders. We had noticed, when trading for our clients, for lack of a better word, an increasing amount of "wobble" in prices. Daily, we were hearing complaints from clients about how trading had become like a cage match. Daily, our clients would detail to us how they would have to explain to their portfolio managers why they were light on volume. Why they only got 2,400 shares bought, for instance, with the stock \$1.50 higher on only 16,000 shares. And because we care about what we do – and I think there's a whole mess of traders in the market who care about what they do, like we do – we started looking into it. We wanted to find out how we could improve outcomes for our clients. As we were looking into it, we started peeling away layers. When we peeled one layer, we discovered flash trading. The more layers we peeled away, the more questions we asked, the more we uncovered questionable actions.

Like what?

What we learned amazed us. HFT was accounting for as much as 70% of trading volume. Under every rock we turned, we found HFT engaged in: (1) what clearly looked like a ques-

tionable practices that cost institutional investors money, or (2) raised questions about whether HFT was enjoying an unfair advantage versus traditional institutional investors.

Such as?

Well, because we are not on the inside of these robots' algorithms and their trading strategies to see exactly what's going on, nor are we involved in the meetings in which we believe the exchanges are complicit in so much of what's going on, it's hard for us to come back with specifics when defenders of HFT say, "Oh, you don't have the data to back it up."

So you only have questions and are saying the exchanges and the high frequency traders themselves own the data that you – or the SEC – would need to answer your questions?

Joe: Exactly. But we can still ask them.

Sal: That's why we've been pretty big in pushing Washington to require trader tags and other ways to track what is happening in the markets in a very granular way. Also, let me stress that we are *not* here to say that all high frequency trading is horrible and wrong. There are *parts* of it that we don't like. We think the predatory aspect is sub-optimal for lack of a better word –

Joe: Also rebate trading.

Sal: Right. Rebate trading is a market-distorting model. But the parts that are patently unfair are the parts of high frequency trading where we really get passionate. They go against everything we've been brought up to believe in, within our families, within this industry, within the firms where we've worked.

Let's back up here and make it clear what you're talking about when you use the term "high frequency trading".

Sal: HFTs are computerized trading programs that come in many, many flavors. But they basically make money two ways, in general. They offer bids in such a way so as to make tiny amounts of money from per share liquidity rebates provided by the exchanges. Or they make tiny per share long or short profits. While this might sound like small change, HFTs collectively execute billions of shares a day, making it an extremely profitable business.

Don't they also add tons of lovely liquidity to the market, every day, as their proponents claim?

Sal: It depends on how you define liquidity.

Our view is that HFTs provide only low-quality liquidity. In the old days, when NYSE specialists or Nasdaq market makers added liquidity, they were required to maintain a fair and orderly market, and to post a quote that was part of the National Best Bid and Offer a minimum percentage of time. HFTs have no such requirements. They have no minimum shares to provide nor do they have a minimum quote time. They can turn off their liquidity at any time – as we saw quite clearly on May 6. What's more, HFT volume can generate false trading signals, causing other investors to buy at higher prices, or sell at lower ones, than they otherwise would.

How so?

Sal: A spike in HFT volume can cause an institutional algorithm order based on a percentage of volume to be too aggressive. A spike can attract momentum investors, further exaggerating price moves. Seeing such a spike, options traders can start to build positions, which, in turn, can attract risk arbitrage traders who believe there's potential news that could affect the stock. And because most HFT servers are co-located at exchanges, they are much faster than other trading systems, enabling them to beat out institutional or retail orders, causing them to pay more for a stock or to sell it for less than they should have. Which raises all sorts of fairness issues that have grown in importance as HFT has come to dominate trading in the last several years.

Doesn't the fact that HFT has become so dominant in such a short time – and its evident profitability – tell you that they must be doing something right? Isn't making money what Wall Street is all about?

Sal: What we're saying is that HFT's rise to dominance in the market has been so rapid and so overwhelming that it raises questions about what it's doing to the health of the market. Has it simply gotten too large to be good for the marketplace? We just think HFT deserves regulatory attention commensurate with its influence on the market.

Joe: We often hear that the trading environment was worse back when there were specialists. The proponents of high frequency trading always say, "Oh, this is better. It was wrong then."

No argument, the specialist system meant that you could be robbed slowly - but they were regulated and did have an obligation to make orderly markets.

Joe: Our point is that “It’s better now that you can do it a million times faster,” is not a good argument.

Sal: No. 1, if stealing is bad, then hyper-stealing is hyper-bad. No. 2, at least the specialist didn’t make money *every day*. That tells you something right there. You can’t really quite equate the two – specialists and high frequency traders – because the specialist did have a role, a function to fulfill. When there were periods of market stress, the specialists *did* slow the market down; for the most part they did the things they were supposed to do.

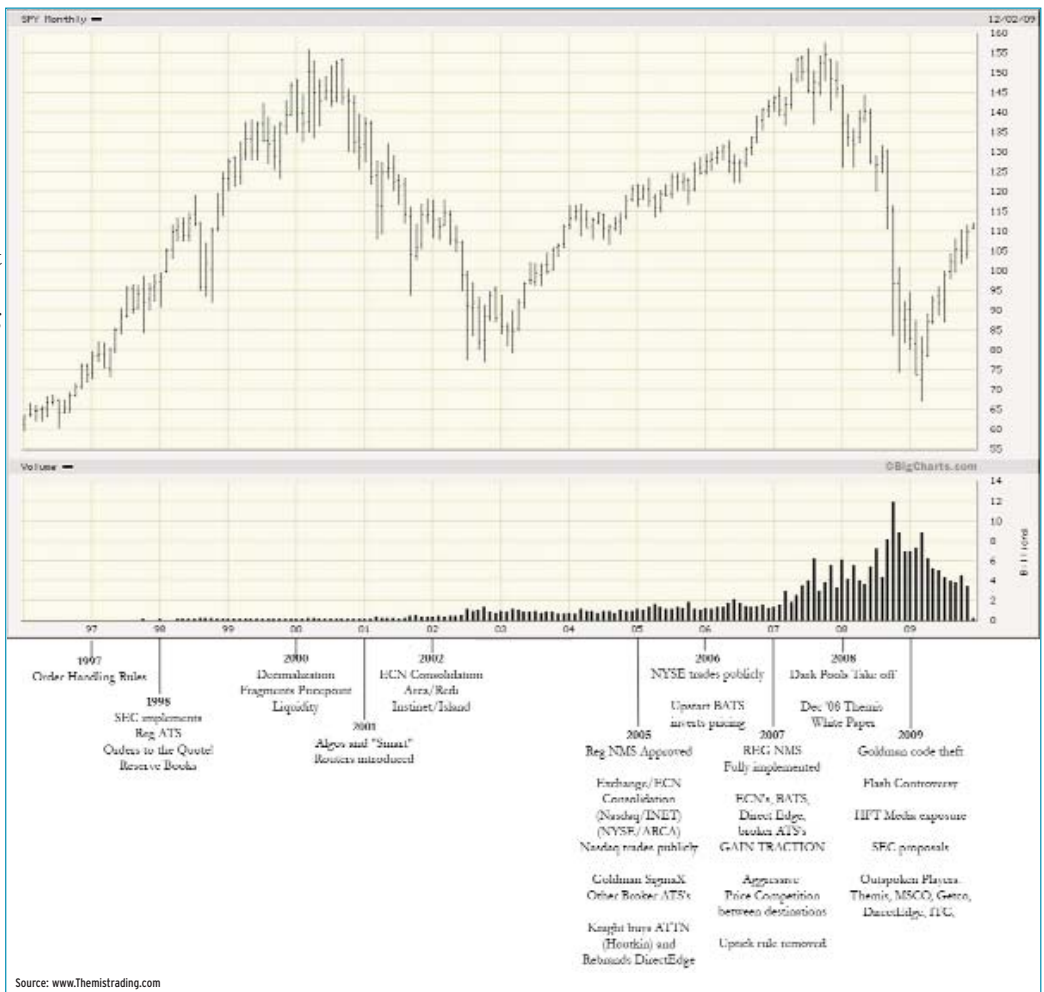
With greater or lesser enthusiasm and alacrity. But granted, the specialists did take hits at times, to protect their franchises.

Sal: There was an on-site regulator. There were governors on the floor and the governors were *not* Designated Market Makers. They weren’t the fox guarding the hen house. There wasn’t a GETCO as a governor on the floor of the New York, a situation which is frankly comical to most of the buy side. Some really horrible conflicts of interest have materialized in the past five or six years, without anyone publicly questioning it.

Joe: We’re the only ones.

You guys have blamed the SEC’s Regulation NMS for jumpstarting much of what you’re complaining about. That was the regulators’ last grand effort to improve the market’s structure. What went wrong?

Joe: It morphed over the years. The whole point of Reg NMS, or at least one of its main points, was to encourage the display of *more* liquidity. That was the thought: “Hey, let’s get more liquidity.”



Ironically, but predictably, that is the opposite of what they got.

Sal: The markets have gone darker than ever. Reg NMS has led to an enormous number of unintended consequences – surprise! The most notable are market fragmentation and the lack of transparency which, along with technological advances, have resulted in a proliferation of new generations of the very profitable, high-speed computerized trading firms and methods we’ve been talking about, which are inducing institutional and retail investors to chase artificial or ephemeral prices. The U.S. equity market is now a fragmented web of for-profit exchanges, ECNs, ATSs and dark pools connected by high-speed, low-latency lines. Visible liquidity in all but the top-volume stocks has essentially disappeared as many market participants elect to hide in dark pools and piece their orders out in small slices throughout the day.

Joe: Yet the SEC keeps approving more dark pools, allowing new ATSs. It’s almost like a

revolving door. Anybody can get in. The fragmentation of the market is staggering. But Reg NMS also tried to encourage a fast market and this is really where it *really* got sticky. The New York Stock Exchange had to convert from a slow exchange to a fast exchange, which immediately opened a whole new playground, 2,500 stocks, to the high frequency traders; stocks they had never touched before. High frequency trading had existed in the Nasdaq world as far back as when we were at Instinet in the early 1990s. They were the automated traders whose activity we saw in teenies back then. They were the “teenie jump” guys. Or the 32nds or the 64ths.

Sal: We would put in an order and the instant we would put it in, someone would jump up ahead of us in the system. So we’d cancel and they would cancel. Then we’d go in and they would go in. Then we’d cancel. There would be flickering all day long. Now, it’s much worse because it’s often predatory. The automated trading guys who are doing it essentially pay the exchanges to give them more information and more tools and more speed and co-location. In other words, they pay for every advantage so that high frequency trading has become a can’t-miss proposition.

Can’t miss? How can you say that?

Sal: Because now they can brag about making money for four years in a row, everyday, as **Tradebot** has done.

Okay, and all this, you lay at the feet of Reg NMS?

Sal: It – and a whole raft of other changes in regulation and technology. Look, the regulatory changes in the U.S. equities market over the last decade have been dramatic. The market has shifted from a slow paced auction market with 1/8-point spreads to a high speed, electronic market where penny-wide spreads are common. Consolidated average daily share volume and trades in NYSE-listed stocks have increased from just 2.1 billion shares and 2.9 million trades in January 2005, to 5.9 billion shares (an increase of 181%) and 22.1 million trades (an increase of 662%) in September 2009.

Sounds like everything is working swell.

Sal: Sure, on the surface, it might *appear* that these new regulations have been successful and that the market is healthy and liquid. But we think that’s an illusion. We think the new environment has spawned many inequalities. Fairness

and transparency in the market seem to have lost out to the never-ending quest for profit.

And the HFTs are exhibit No. 1?

Joe: Well, we think that HFTs have unfair advantages in the marketplace. But we do not believe that high frequency trading is at the root of the problem. It is just a symptom.

Sal: The basic problem, in our view, is the for-profit exchange model, which is filled with inherent conflicts of interest. In their quest to satisfy the bottom line demands of the for-profit model that has evolved since Reg NMS was introduced, the exchanges have basically sold out the institutional and retail investor. And left unchecked, the exchanges will continue to make choices that cater to the customer base that generates most of their revenue – the HFT community. Now, HFT is a very big bucket that catches many types of trading. For the most part – despite the claims my partner might make on TV to make his point – we don’t question HFTs’ morality or legality. HFT practitioners, even the predatory ones, are doing what our free market system encourages them to do: making money by all legal and acceptable means, collateral damage be damned. The problem is that our market structure has evolved to cater to them. And to date, our regulators have rubber-stamped every system and rule change placed in front of them by the exchanges.

And we *do* question a market structure that has allowed *predatory* HFT to flourish. Predatory high frequency trading, which picks off orders in dark pools using a plethora of tools (actionable IOIs, for example), and is amped up with co-located speed, *is* an issue, in our opinion. But make no mistake: it is a dwarf issue relative to the fact that for-profit exchanges, focused on next quarter’s profits, cater to HFT firms at the expense of other investors.

So you’re saying that the exchanges have “sold out” to the highest bidders?

Sal: Exactly. To understand what has happened, you have to understand a bit of history. Traditionally, the exchange business wasn’t really very competitive, almost utility-like, and the exchanges could source revenues from three different areas: listings, transaction fees and market data revenue. But, as detailed in a 2009 study by **Grant Thornton**, it has changed dramatically in the last decade. The accounting firm developed what it referred to as “The Great Delisting Machine Timeline,” [repro-

duced below] to show how a progression of regulatory changes destroyed economic incentives for traditional market making, investment banking and research. Grant Thornton's main conclusion was that that this robbed small companies of crucial capital-raising support. And the result was a drying up of a vital part of the U.S. economy, the IPO market – which, not incidentally, eliminated listing fees as a major source of revenue for the exchanges. So obviously, the exchanges have needed to look elsewhere for revenues.

Joe: And the exchanges now get most of their revenues from transactions and from the sale of market data and related services based on those transactions. This new exchange model is extremely competitive and filled with new entrants. There are now four major stock exchanges in the U.S.: **NYSE, Nasdaq, BATS** and **Direct Edge**, and a plethora of alternative venues. Two of these exchanges are publicly traded companies, the others, privately held, but all are very much for-profit enterprises. In fact, based on recent events, it is clear that the primary goal of all of these exchanges is to maximize profits. We grant you that they have every right – and even obligations – to do so. But the exchanges also have a dual mandate to protect all investors – and that's where recent events shows they have clear conflicts of interest.

How so?

Joe: The real issue is who drives change at the exchanges. Why do they make the changes they make in their systems? Is it because exchange executives have seen a better way? Or are they being driven by client demand? We obviously think, with all their cross-ownerships and evident conflicts of interest, that the changes in the way the exchanges operate have been driven by big clients, who say to them, "We want this. If you don't give it to us, we'll go down the block." So they do it, because it is a commoditized market; the exchange's thin spreads make that plain.

Sal: The conflicts of interest were most obvious in the flash trading controversy that boiled over last fall; that whole thing couldn't have made it clearer that the exchanges will do anything to stay competitive. Look what happened when Direct Edge instituted their flash trading program. What was it called?

Joe: ELP, which stands for Enhanced Liquidity Provider, and gives a small group of clients an advance look at orders before they're exposed to the rest of the market.

Sal: Both Nasdaq and BATS saw their market shares drop drastically once that came in. They said, "Wait a minute, this is not fair. That's an order type that could actually damage some investors." They actually wrote to the SEC and complained. But the SEC did nothing. So they said, "Okay, we're losing market share. Here's our application to do the same kind of orders."

Joe: Competitively, they felt they had to offer the same service.

Sal: What does this tell you about the exchanges? Remember, the head of Nasdaq actually stood in front of a Congressional panel and said, "We were shocked and did not think this was a proper order type. We only did it because..." What it tells you is that every time profitability runs up against fairness or transparency or the protection of all investors, profitability wins.

Every time? Or in that case?

Sal: They have a track record. This is not hypothetical. I don't need to ask them what they will do. I see what they have done, again and again.

Joe: The exchanges have lost the revenue streams that IPOs and listing fees used to generate. That business model is gone, like we said, so they need new sources of revenue. And what are they doing? The NYSE is building a 400,000 square foot computer facility in Mahwah, New Jersey, for \$250 million – to attract high frequency traders who want to collocate. These are the same guys who on May 6 said that the human model worked, which left

The Great Delisting Machine Timeline

The Root Cause

Two phenomena are the root cause of The Great Depression in Listings that began in 1997.

Online Brokerage – 1996

The advent of Online Brokerage which disintermediated the retail broker who bought and sold small cap stocks. Retail salesmen, once the mainstay storytelling engine driving small cap stocks, had been chased from the business by the introduction of unbundled trading. (Unbundled trades separated commissions into discrete payments for research and trade execution, and online brokerage.)

Order Handling Rules – 1997

The advent of new Order Handling Rules by which ECNs were required to link with a registered exchange or the NASD, allowing exchange or NASD members to execute their trades against ECN orders inside the public bid and offer, thus eroding the economics that enabled capital commitment, sales and research support.

Compounding Factors

A number of other factors compounded the IPO Crisis and listings market decline, but each came after 1997, and thus did not precipitate The Great Depression in Listings:

Decimalization – 2001

While the conversion of trading spreads from quarter and eighth fractions to pennies may not have triggered the decline, it certainly exacerbated it by ensuring that the U.S. listings market would not offer adequate trading spread to compensate firms to provide the market making, sales and research support.

Passage of Sarbanes-Oxley – 2002

Given its timing well after the onset of the listings decline, SOX clearly is not the precipitating factor in the Great Depression in Listings and the IPO Crisis. However, public companies have incurred significant incremental costs in establishing, testing and certifying internal controls due to its passage and implementation. These costs likely have fueled some delistings and served to dissuade some companies from going public. However, since its passage, SOX compliance costs have declined and should continue to decline.

Global Research Settlement – 2003

Given that small capitalization stock coverage became unprofitable, the separation of research from banking eliminated banking compensation for analysts that was the last revenue source used to offset the opportunity cost analysts incur by covering fewer large capitalization stocks. Large capitalization stocks are by definition held by many times more investors than small capitalization stocks. More investors per stock leads to greater demand and reputation for the analyst. Thus, the loss of investment banking-derived compensation for analysts contributed to declines in small capitalization stock coverage, IPOs and new listings.

us scratching our heads. Which way is it, guys?

Sal: What's more, if you looked at the quarterly earnings reports from the publicly traded exchanges, I think you'd be stunned by how dependent they have become on derivatives, options. The growth in their revenues derived from co-location in options has been dramatic. We've been concerned for some time about the effects of high frequency trading on leverage in the cash market. But now they're getting into second derivative instruments, where we don't even know where the tail is wagging the dog, and to what extent. Someone *has* to be looking at this in terms of the potential systemic risk.

Joe: See, what Reg NMS did was open up a whole new world to the high frequency traders. It opened up an entire set of stocks that were not practical for them to trade before, because they had only traded on a slow market. Before Reg NMS, you couldn't trade **IBM** as a high frequency trader, it just didn't work. So while overall market volume has soared since Reg NMS, Nasdaq volume hasn't really increased much. All the increased volume is in the New York -listed stocks. That's where the high frequency traders are now playing the most, in the **Citigroups**, the **Fords**, the **Bank of Americas**; that's where all the rebate trading is going back and forth. So they have created this whole new world, post Reg NMS. Another thing that changed, post Reg NMS, that has proved quite helpful to the HFT guys, is the way the exchanges calculate their shares of market data revenue. That whole pot of money, amounting to some \$500 million a year, which is generated by selling market data, gets split among the exchanges based on the market shares that they bring to the table. This is something we wrote about in our comment letter to the SEC, which hasn't really gotten much attention yet. Maybe we'll focus on it a little bit more. The exchanges used to get a share of the data revenue based on the number of trades they did. But under Reg NMS, that calculation is based not just on the number of trades, but also on their share of the quotes. So 50% of the revenue now gets allocated based on quotes, if the exchange is on the inside, and 50% is based on how many trades it puts onto the ticker.

Sal: And you have to ask yourself, why?

Joe: Right. Here's the thing: You can get a quote credit if you're up on the NBBO for *one second*. That's all it takes. And the high frequency guys know when they can stay up there. Now, you might say, "Wait a second, that doesn't make any sense, Joe." It is the exchange

that is going to get that market data money; it's not the HFT guy. If the HFT guy isn't getting that money, why would he be encouraged to quote? Well, there's a rebate, of course.

There's always a rebate in this business. If you are a certain percentage – and it's like three quarters of one percent of market share on that exchange for that stock – they will rebate to you a portion of the tape data revenue that they collect from the tape revenue pot, up to 100%.

One hundred percent?

Joe: They just pass it along to the HFT firms.

Sal: Amazingly enough, all this technology, all the leaps that we've made from millisecond to microsecond to nanosecond trading speeds, hasn't made things efficient enough for the data providers to actually cut the market data fees significantly for the institutional investors and others who are signing contracts to have those data feeds displayed on their **Bloomberg** or their **Reuters** terminals and everywhere else. Data fees keep going up and the revenue gets passed on from the exchanges to the HFT guys generating that volume. But all the rebate trading just distorts the market. Let me give you a real world example. For one customer of ours, we were buying a stock. We had to buy probably 30,000 or 40,000 shares, which is not a very big order, but it is a very big order when you consider that the stock trades 5,000-6,000 shares day. Well, as soon I displayed my first bit of liquidity, I started a chain of events. People stepped in front of me and then someone stepped in front of them. So I cancelled and walked away and said, "Okay, this is not the way to do it. We have to think about this." But while I adjusted the way we were going to play the stock, these two guys – without doing one single trade – and I say "two guys" but I mean the high frequency traders jockeying the quote – changed their quotes 1,600 times in a period of 20 minutes, alternating around the NBBO.

Joe: And how many shares traded?

Sal: Zero traded.

Zilch?

Sal: Yes, which goes to show you that there's a market data revenue element to what the high frequency guys are doing. Now, can I prove that? No. That would take the SEC going into the books of GETCO and Goldman Sachs and all of the rest. But I can easily imagine the HFT guys going to the NYSE Board of Governors, and claiming, "Look, we're on the inside 'providing liquidity' X percent of the time in our

350 stocks, and therefore we qualify, under your rules, for the higher rebates; we qualify for the non-locate ability for short sales; we qualify for the other perks that we get as DMMs on the floor, for trading at parity.” They can match people in the crowd and step ahead of the line. This is all because they supposedly are quoting, and “providing liquidity.” But going back to my example of the stock that traded zero shares, despite 1,600 quote changes in 20 minutes, what I want to know is whether those “quotes” are being averaged in with what they’re actually doing in stocks that probably do need their liquidity provision? Is that being averaged in so that they can show one nice graph to people who are unsophisticated (i.e., 99.9% of us) and say, “See what we’re doing, we’re being so beneficial to the market and we’re doing this out of the benevolence and goodness of our hearts.”

You clearly suspect it is –

Joe: Market data revenue is a \$500 million a year pot, like we said. There was a group back in 2006, called **The NetCoalition**, that was started by **Yahoo Finance** and a few other guys who were trying to find out why market data fees were so high. It turned into a huge legal fight that the exchanges won. But in the course of discovery, the NetCoalition came up with an estimate that the actual cost to the exchanges of generating their market data feeds was only \$100 or \$200 million. They were basically questioning why the exchanges should be reaping so much in profits on what is more of a utility function than anything else. The real question now, however, is where is all of this money going? Each time we’ve looked, we’ve found the exchanges rebating little slivers; most of which feed into what’s now the monster HFT industry.

Still, you’re only talking about a couple of hundred million of revenue, over the cost of generating the market data, which the exchanges could be rebating to HFT firms. Spread across all of them, that doesn’t sound like such a big deal.

Joe: Maybe not, but it *is* a big deal. Because if you start to peel away the HFT guys’ revenue sources, you degrade their profit incentives. The exchanges – to every question we ask – always come back with the same answer: Their giving the high frequency traders the ability to profit from data rebates is completely legal. There is nothing illegal going on. Nonetheless, the HFT firms are getting all sorts of extra services and incentives from the exchanges, like

co-location, like special data feeds, like market data revenue –and that built the industry.

And you clearly have problems with that –

Sal: It goes back, again, to how the economics of the exchange model have morphed. Since the early 1990s, when the **Island ECN** first introduced rebate trading, the equity market has used a maker/taker model. Liquidity makers get paid a rebate by the exchange/ECN and liquidity takers pay a fee to the exchange/ECN. Normally, the rebate is less than the take fee. This model has become the standard for all market centers. Almost nobody in the trading community even questions the maker/taker model anymore. It is assumed to be the only way stocks should trade. The buy side probably doesn’t care much since they pay a flat fee to their broker regardless if they are making or taking. And the brokers who sponsor algorithmic trading systems have figured out a way for this model to be very profitable. Meanwhile, the exchanges are happy to bolster their revenues with the spread between the make/take rate.

So what’s your problem with it?

Joe: It is not just ours. Earlier this year three big-time academics published a paper concluding that “make-or-take pricing has significantly distorted trading.” **James Angel** of **Georgetown**, **Lawrence Harris** of the **University of Southern California** and **Chester Spatt** of **Carnegie Mellon**. According to their paper, “*Equity Trading in the 21st Century*,” the maker/taker model has “...Distorted order routing decisions, aggravated agency problems among brokers and their clients, unlevelled the playing field among dealers and exchange trading systems, produced fraudulent trades, and produced quoted spreads that do not represent actual trading costs.”

That’s a whole lot of blame –

Sal: Well, as we see it, the maker/taker model is at the core of the equity market structure problem. It has influenced how most smart order routers access liquidity. Some orders are *not* routed to the destination where best execution would dictate, but to the cheapest destination first. Which is why we beg institutional clients to ask what order routing hierarchy their smart routers use. Most institutional algos use a smart router to route orders in small pieces throughout the day. The pecking order of these routers differs depending on which broker sponsors the algo. But a common goal is to

always route to the least expensive destination first. Most of the time this means routing to a dark pool before routing to a displayed liquidity venue. Some of these dark pools are filled with predatory traders that are “hiding out” electronically, watching for footprints that the algos leave. And it’s not just a few academics and us who see the conflicts of interest embedded in the maker/taker model leading to bad behavior in the markets.

What do you mean?

Sal: Would you believe **Morgan Stanley** sent a comment letter to the SEC, dated March 4, complaining – let me read parts of it: *“The real, underlying problem that needs to be addressed is the conduct of... diverse market participants...engaging in similar economically driven order handling/routing practices without being subjected to the same regulatory obligations merely by virtue of their respective defined roles in the marketplace.”* *“We believe that many of these issues...are symptoms of the larger underlying cause – aggressive order handling/routing practices that have emerged in recent years. These practices, including the aggressive use of actionable IOIs [Indications of Interest] and blind pinging, are driven by economic incentives to engage in such practices across many different venues and market participants, not just by dark pools. The economic incentives that exist in the market to reduce execution costs inevitably lead to a race for cheaper execution alternatives.”* *“The acceptance of the ‘free look for a free execution’ mantra has lead to many market participants, including broker-dealers and exchanges, routing their orders to various alternative liquidity providers in lieu of the traditional lit marketplace. Competition and advances in technology have not only permitted, but have encouraged participants to look for the most cost effective execution, many times in conflict with the underlying customer whose order information is being ‘leaked’ to sophisticated market participants and who is not the ultimate recipient of the resulting economic benefit.”*

Joe: In other words, Morgan Stanley agrees with us that brokers are using algorithms that route to the cheapest venue and not necessarily to the venue that provides best execution. And the cheapest can include venues where HFT predators hide out and take advantage of robotic order flow based on simple volume weighted average price (VWAP) algos. This has been proven by recent research from **Quantitative**

Services Group (QSG), a leading provider of equity research and trading analytics to institutional investors – and to us.

Proven?

Sal: Yes. There are not many people who can measure that sort of trading cost slippage, so we’re happy to plug QSG. They wrote a report not long ago called, *“Beware of the VWAP Trap,”* which used a powerful set of tick-based algorithm evaluation measures to prove that VWAP is being pushed around by the activities of the HFT guys, who can spot a VWAP over a mile away.

Joe: Exactly. And the dark pools etc. are assisting the HFTs in identifying institutional activity. Why doesn’t a dark pool charge to allow an institution to access it? Most of them are free. The answer is that the dark pools want the institutional order flow.

Sal: Because they’re making money off it; taking the other side. You would be shocked by how little is really understood about what we call market minutia on the typical institutional desk.

Why sweat the small stuff?

Joe: Market minutia is really driving everything nowadays. If you don’t understand what we call the minutia, then you’re not going to understand what’s going on. How your router is working, how your algo is working – you really need to know what is happening in the guts of the router. All too often, we think, people have gotten too reliant on their algorithms and their machines. At the end of the day, they get their average fill, their VWAP [volume weighted average price] execution. They get the volume they expected, so everybody is happy.

There certainly were lots of praises sung about market innovations lowering trading costs at the SEC’s market structure roundtable last week.

Sal: I wasn’t surprised. People tell us, “My explicit trading cost has come down dramatically over the last three years. I’m only paying half a penny a share; what’s your problem, guys? Everything is working out great, there is tons of liquidity and I’m getting these great prices. I may even be getting sub-penny price improvements.” Well, the problem is a lot of institutional traders don’t quite understand what is in the secret sauce. They don’t understand what’s going on in the middle, and that’s where all the money is being made.

So just what *is* going on in the middle?

Sal: The reality is that transaction costs are a moving target. The institutions' actual activity in participating in these electronic strategies – these algorithms and time-WAP and time-WAP with an alpha-bend to it and hyper on steroids, etc. – all the different twists they're doing – actually affect the costs they're targeting, but traditional trading cost analytics miss that kind of slippage.

Joe: Yes, that's the key.

Sal: Saying that you beat the target by "X" – when you've also moved that target – is an illusion. Somewhere along the line, I'd hope that someone in these firms would realize that he'd rather buy the stock at 40 cents than at 50 cents – instead of complaining that, at 40 cents, he was a penny worse than VWAP, and being satisfied that, at 50 cents, he was two cents better than the VWAP.

Joe: That is what CSG has proven, that the cost target is moved – but if you'll let us read one more quote, they state the ramifications a lot better than I can:

"...significantly higher impact costs and trading velocity are incurred for VWAP algorithms when compared to Arrival Price Algorithms... The results suggest that High Frequency Trading (HFT) strategies are materially contributing to these increased costs... The details of the study uncover an important artifact from today's trading environment: increased order parceling has three negative ramifications. First, more 'strikes,' or executions per order, increase a client's exposure to adverse ticks and this tick risk translates into higher impact costs. Second, more strikes increase the chances of leaving a statistical footprint that can be exploited by the 'tape reading' HFT algorithms. Third, should HFT strategies identify the order and begin to trade in anticipation of the order flow, this will begin a positive feedback loop that can significantly change an algorithm's behavior and invite even more predatory order flow."

Joe: That's why we beg institutional clients, "Call your provider of algorithms and ask them what is inside your smart router. What are your destinations? What would happen if you extracted one or two of the "toxic destinations"? Would your rate stay the same? We bet they would get very interesting answers.

Sal: Because the broker is incentivized – often paid by the dark pools and the various alternative trading destinations – to send their orders there. Just as an **Ameritrade** is paid to send their order flow to **Citadel** or whatever. It is the same

payment for order flow game, which is played on so many different levels, that is at the center of the maker/taker model.

But commission rates have been crushed, spreads have been crushed. Is there really enough money to be made in liquidity rebates to drive business like you're saying?

Sal: It's actually become more important, as those other revenue sources have been squeezed. In that same comment letter we quoted earlier, Morgan Stanley urged the SEC to carefully examine the way access and data fees are driving order routing and handling behavior, estimating that it could be amping broker revenues by \$63 million annually, based on 100 million shares of average daily trading volume, and turning what otherwise would be a \$10 million net loss at the exchanges into a \$76 million gain.

Joe: But that's only the tip of the iceberg. The real money is being made by HFT firms as they detect the footprints of the algorithms and interposition themselves with the help of their lightning fast technology and access to direct market feeds from the exchanges. HFT is estimated to be an \$8-20 billion a year industry. That money comes from somewhere – and we believe a good part of it is coming from the leakage of institutional algos because brokers and exchanges have economic incentives to route to the cheapest venue.

Sal: As we wrote in our own comment letter to the SEC, "Reevaluate the maker/taker model." How much liquidity in stocks like Citigroup, which trades a billion shares a day, needs to enticed into the market with rebates? From where we sit, it looks like the model, with assistance from some algos and exchanges, is being used by predatory high-speed traders to pilfer millions of dollars, daily, from long-term investors' pockets.

There you go again, HFTs "pilfer" millions from long-term investors? How?

Sal: First off, flash order types haven't gone away. The political hue and cry were too much for Nasdaq and BATS, which pulled their pre-route order strategies last September. But favored clients are still getting a sneak peek at order flow elsewhere because, while the SEC has *proposed* banning them, it hasn't yet *acted*. But an even more important factor is what's known as latency arbitrage, which has become one of the fastest-growing strategies on Wall Street. We wrote about a predatory HFT prac-

tice, which is based on information gleaned through latency arbitrage, in our latest white paper, comparing it to ID theft, on an institutional scale.

Joe: What we demonstrated in that paper is that both BATS and Nasdaq have been – all quite legally, we point out – providing sensitive trade data to HFTs in their high-speed data feeds to court order flow. This is a kind of information leakage that most institutional and retail investors haven't had a clue about.

Sal: It is part of the reason we have sort of mixed feelings about May 6th – the events of that day really have helped focus investors on what we've been saying. Soon after that, when we published the data theft white paper [W@W guest perspective, May 14], we actually were approached by some very large buy side firms who were not even customers of ours. They arranged a half-hour, after-the-close conference call, in which Joe and I had an opportunity to discuss our research with the heads of the desks of 10 of the largest firms in the country. It was a chance to say, see, as a firm, we position ourselves as allies of the institutions. We have no ax to grind. We don't do prop trading. We are a very small firm, but we are an extension of the institutions' desks, when they work with us. In that sense, we welcome anything that helps us get our message across, even the shock of a May 6th.

What did you tell them?

Joe: They wanted to know about the data theft paper. "Give us more details about your paper." That was the point.

So let's get into the nitty-gritty.

Joe: It's tough to follow; you have to dig into trading minutia pretty deeply to see what is happening. That's why some of the language Sal uses to write our white papers can sound a little hyperbolic. He makes analogies to things like ID theft to grab attention and make it comprehensible. You can't start out talking about things like subsection 4.62 of the Nasdaq TotalView-ITCH Feed protocol; no one would read it!

Understood. But you guys *have* read it. What did you find that raised your hackles so?

Joe: It is all about the leakage of information related to hidden or non-displayed order flow – it could be from a broker or from an institution – that, in one of these cases, goes through Nasdaq to the HFTs who take the exchange's

direct data feed. The exchanges argue that this information is public and available to all investors. Technically, this may be true, however, realistically, not many retail or institutional investors have the capital to invest in the type of computer systems needed to access and use this information and most are not even aware that it exists at all. Nasdaq also stresses that the ITCH data feed they're selling doesn't give up any *pre-order information*, and we don't dispute that.

But once you've been executed, if you think you're working a hidden order, well, think again. Every time a non-displayed (or hidden) order is executed, this direct data feed that Nasdaq sends to HFTs includes a message that not only identifies that a trade has occurred, but also identifies if the hidden order was a "buy" or "sell." In addition, the trade order ID associated with that trade is "cumulative." This means that every time a trade executes that is part of a hidden order, the *same ID number* is attached to that trade as to the original trade. By re-engineering that info, ITCH subscribers can figure out how much of the stock in question the hidden buyer or seller has accumulated. Which is valuable market intelligence.

Sal: Our first problem with that – even though it is perfectly legal under current rules – is that the vast majority of institutions are unaware that the private trade information they are entrusting to the market centers is being made public by the exchanges. They don't realize that they have signed away – in their exchange agreements – their rights to that data.

Joe: The exchanges are confident that they own it and can do what they want with it.

Sal: Very many investors think that there's a single consolidated tape for U.S. markets, on which is recorded the security, the price, quantity, time and location of every trade. Never in their wildest dreams have they imagined that the exchanges are going out and offering to provide a second raw data feed to anybody. Some of them provide it free, to attract volume, others sell it, using it to generate revenue. But either way, the second feed includes more data, and is compressed so that it's faster, and it also leaves in the order number ID.

Joe: It has got a heck of a lot of information in there.

Sal: This order number ID is a key. As soon as you come in with a tranche, the exchange is tagging executions with the same order ID as the parent order. So it's basically allowing a video camera to record your trading strategy.

The direct data feed doesn't actually reveal a trader's identity, does it?

Sal: No. The info doesn't go out pre-trade, and doesn't tell anyone that it's, say, **Fidelity** selling 168,000 shares of, for instance, **Abbott Labs**. But it does show that someone has accumulated 168,000 shares in 13 minutes. That's not valuable?

Joe: What the exchanges also claim is that we can't prove for sure that anyone is using their high speed data feeds to re-engineer market information. And, by the way, they also say that the fact those order numbers don't change is merely an artifact. They claim that they didn't even realize the ID numbers were in the feed until we started writing about it. But if you ask them to take them out, well, they can't. There are all sorts of complexities involved.

Sal: They say, "These Themis guys, they don't know what they're talking about." They're right, we don't have evidentiary proof that someone is re-engineering trade information. But if I were in a court of law and had circumstantial evidence - "If the glove fits, you must not acquit." We have enough information to ask lots of questions. Why don't they just eliminate those ID numbers from their feeds, if no one is using them? By the way, they did get rid of them awfully quick overseas after we called attention to them. They were able, technologically, to do it in a heartbeat over there when some institutions started to boycott their European dark pools. Though, frankly, we're a little skeptical that they took out everything we'd find objectionable if we had the regulatory power to comb through their records.

A "little" skeptical?

Joe: Okay, a lot. Basically, we're asking if this sort of thing is part of the reason why latency arbitrage has become so big, so fast.

Sal: Let's explain. The latency that is being arbitrated refers to computer communications speeds, which are, ultimately, limited to the speed of light. That is why everyone wants to "co-locate" their servers right next to the exchanges'. Communications latency has been steadily decreasing as hardware, software and networking have improved and through the isolation of inefficiencies in circuits and cabling. There is now an entire industry of consultants available to develop ways for corporations and trading firms to reduce latency from endpoint to endpoint. Staying on top of this rapidly evolving technology requires major expenditures for continuous upgrades of systems and

equipment. But HFTs evidently find it worth paying for. HFTs use this kind of cutting-edge technology and co-located servers at exchanges and ATSS, combined with purchases of raw data feeds from these market centers, to create their own inside National Best Bid and Offer (NBBO) quotes and depth of book substantially earlier than what is publicly available to the rest of the world, via the Security Information Processor, or SIP, quote. The SIP feed quotes are what are generally seen on professional terminals, on the algorithmic trading systems used by institutions for as much as 50% of their orders, and are the quotes seen by retail investors on internet sites.

HFTs also employ technologies such as "feed handlers" to further speed the receiving of data from the exchanges. Recently, a firm named **QuantHouse** announced that its feed handler technology, used to standardize exchange raw market data feeds, is able to decode more than 5.55 million messages per second. As a result, HFTs know with near certainty what the market will be microseconds ahead of everybody else - valuable knowledge that HFTs take advantage of when they trade thousands of stocks, thousands of times, every trading day. HFTs will then use techniques, such as Predatory Algos, Immediate or Cancel (or "cancel and replace") orders, and Dark Pool Pinging, to determine what kind of institutional algo orders are in the market, such as those driven by commonly used VWAP formulas, and how those orders will react if the bid /offer of a stock moves up or down. Valuable information, no?

Sure sounds like it. But how can the exchanges legally sell data feeds that are faster than the publicly available consolidated quote?

Joe: Through an enormous loophole in the regulations. As the SEC's own concept release on market structure explains: *"Exchanges, ATSS, and other broker-dealers are prohibited from providing their data directly to customers any sooner than they provide their data to the plan processors"* (who put together the consolidated tape). However, *"the fact that trading center data feeds do not need to go through the extra step of consolidation at a plan processor... means that such data feeds can reach end-users faster than the consolidated data feeds. The average latencies of the consolidation function at plan processors (from the time the processor receives information from the SROs to the time it distributes consolidated information to the pub-*

lic) are as follows: (1) Network A and Network B - less than 5 milliseconds for quotation data and less than 10 milliseconds for trade data; and (2) Network C - 5.892 milliseconds for quotation data and 6.680 milliseconds for trade data.”

That's not much time –

Sal: It may not sound like much time, but it's evidently plenty for the HFTs. Let me read you a little more from the SEC's concept release: *“Some proprietary firms' strategies may exploit structural vulnerabilities in the market or in certain market participants. For example, by obtaining the fastest delivery of market data through co-location arrangements and individual trading center data feeds, proprietary firms theoretically could profit by identifying market participants who are offering executions at stale prices.”*

“When it adopted Regulation NMS in 2005, the Commission did not require exchanges, ATSS, and other broker-dealers to delay their individual data feeds to synchronize with the distribution of consolidated data, but prohibited them from independently transmitting their own data any sooner than they transmitted the data to the plan processors. Given the extra step required for SROs to transmit market data to plan processors, and for plan processors to consolidate the information and distribute it to the public, the information in the individual data feeds of exchanges and ECNs generally reaches market participants faster than the same information in the consolidated data feeds. The extent of the latency depends, among other things, on the speed of the systems used by the plan processors to transmit and process consolidated data and on the distances between the trading centers, the plan processors, and the recipients....

So there you have it. The SEC just made our case for us. They acknowledge that HFTs are seeing information before everybody else because they are buying direct data feeds and paying for their servers to be co-located. They acknowledge that HFTs are profiting at the expense of the average investor. They acknowledge that there are currently two sets of data in the public domain: fast data, which is accessed by privileged firms that can afford all the technology and market data expenses, and slow data, which is what the rest of the investment

community receives.

Joe: It comes down to this: When a market center provides an HFT with the ability to out-manuever institutional orders, is not the exchange putting institutions and their brokers in breach of their fiduciary responsibilities, especially those institutions managing ERISA funds? It is one thing entirely for an HFT firm to use proprietary algorithms to try to predict how an institution's own algo will operate, so that the HFT can out-manuever the institution. It is the buy side trader's fiduciary responsibility to protect his/her firm's orders by adjusting execution methods and tactics regularly, in order to avoid predictability. But what if the entire playing field is rigged in favor of the HFTs?

I might have known you'd leave me with a question. Thanks, fellows.

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