

Forget *Flash Boys*—small investors actually get good stock prices from brokers like Fidelity and market makers like Citadel. Here's why.

The Little Guy Wins!

by Bill Alpert

In the furor surrounding last year's best-seller *Flash Boys*, by Michael Lewis, many retail investors were spooked by the book's claim that high-frequency traders use their technology edge to pick off the little guys, who, the author claims, were "easy kill" for the professionals. That part of the story was just wrong. While some institutional traders have fallen behind in the computer arms race, the evidence shows that retail traders enjoy some of Wall Street's best prices on their stock orders. Surprisingly, the little guy's advantage has grown in the past couple of years. • "The retail trader has never had it better," says Robert Battalio, a finance professor at the University of Notre Dame who wasn't afraid to criticize stockbrokers at Senate hearings amid the *Flash Boys* debate. "When you place a market order today, you pay a lower commission, you get an immediate confirm, and very rarely are you getting worse than the price you saw when you pushed the button," he says. • The competition for retail traders' orders actually yields a price that's better than the published quote, on average, when small investors go to buy or sell at the market price. The resulting savings can be trivial or as large as a discount broker's commission, but across the industry, these price improvements were worth almost \$600 million to individual investors last year,



according to financial-market analytics firm RegOne Solutions. That's much less than the billions paid out in commissions, but it's hardly chump change. As irony would have it, these savings mostly result from the computerization of market makers and retail brokers.

The public has never seen much information on which firms do the best job executing stock trades. So *Barron's* spent months analyzing trade-quality reports of the big "wholesale" market makers, where discount brokers send most buy orders to find a matching sell, and vice versa.

Retail investors most often tell their brokers to issue a "market order," to buy or sell the stock at the best price quickly obtainable. Trading venues quote bid and ask prices on a stock, with a spread that might show a \$10.01 bid and a \$10.03 ask, for example. Brokers send the order to a market maker that might offer a price better than the quoted \$10.03, allowing you to buy the stock at \$10.02. That is "price improvement" of a penny a share.

As the charts on page 26 show, we found that the biggest average price benefit was delivered by Citadel Securities, the market-making unit of Citadel, whose chief is hedge fund manager Ken Griffin. Citadel saved traders about five bucks on a 1,000-share trade in the December quarter, according to data required by the Securities and Exchange Commission. That's a little less than a discount broker's \$7.95 commission but still significant. Close behind, depending on the type of stock, were the market makers at UBS (ticker: UBS), Two Sigma Securities, and KCG Holdings (KCG).

The SEC mandates very little disclosure on execution quality by retail brokers, who need only report what fraction of orders they route to which exchange or market maker, plus some tidbits about payments they receive from market makers for that order flow.

To compare brokers, we composed a score that reflects how much of a broker's flow it sends to the best-performing market makers. The brokerage industry's scanty reporting makes any inferences tenuous, and brokers cautioned us that price improvement is but one consideration in their choice of market makers. So consider our broker comparison a kind of first-generation ultrasound image: fuzzy but as good as possible given the limited information available today.

By our scoring, Fidelity Brokerage Services finished No. 1, and Charles Schwab (SCHW) and E*Trade Financial (ETFC) tied for second among discount brokers. Our broker comparison didn't include firms like Interactive Brokers (IBKR), which route most of their orders to exchanges.

Good execution is just one criterion in choosing a broker. Commissions, product offerings, and service quality matter a lot, as you'll see next week in our 20th Annual Online Broker ranking.

Last year's heightened attention to Wall Street trading prompted an industry group to draw up a new menu of execution-quality statistics that some brokers will start voluntarily disclosing in the second quarter. This could provide us with a sharper picture of brokers' performance. For those who would like to test our work, we've posted computer scripts on GitHub, a popular Website for software collaboration, where you can download and reproduce our analysis with free, open-source software. For direct links to this and other Websites mentioned, as well as additional

charts, see Barrons.com.

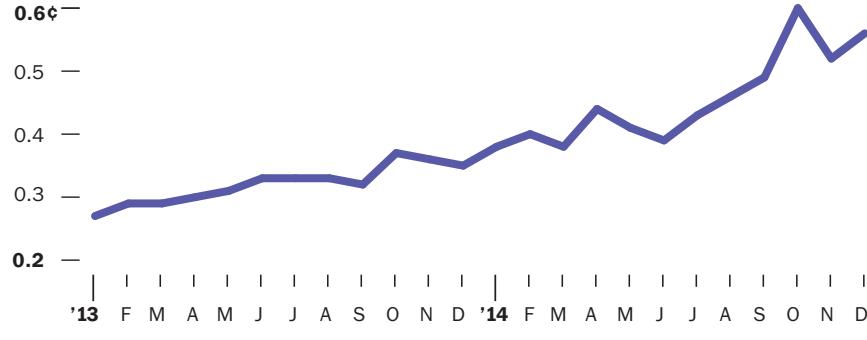
Almost 15 years ago, as the SEC was reducing stock-price increments to a penny, it began requiring disclosures on execution quality. Market makers and exchanges must report monthly statistics under what's now called Rule 605. Each quarter, under the companion Rule 606, retail brokers must show the trading venues where they send orders and disclose whether they got paid for that order flow. The reports are supposed to show how well brokers are fulfilling their legal obligation to get the best execution on their customers' trades. Best execution means getting the best price possible, but also involves factors like speed and the likelihood of getting the trade done.

Most investors know how to shop for cheap commissions, but not trade execution. That may change as new

More Bang for Your Buck

Price improvement, or the difference between the best price quote and what an investor ultimately gets for buying or selling shares, doubled over 2013 and 2014 as a result of market makers' battle for supremacy. On average, price improvement on a trade has risen to 0.56 of a cent per share from 0.27 in that time. Contrary to many news accounts, retail investors have actually done quite well in executing trades, saving more than \$1 billion in the past few years.

Average Price Improvement Per Share



Includes the eight largest wholesale market making firms according to rule 605 reported volume.

Source: RegOne Solutions

industry standards emerge in coming months. "Commissions are only one part of it," says Ram Subramanian, president of Fidelity's retail brokerage business. "Execution quality is another key part of the value equation, especially for people who are more active. The challenge is that execution quality is not easily visible."

The way most trades unfold has changed in the past decade. Like malls losing shoppers to nearby Costcos, exchanges lost out to market makers in the competition for retail market orders. *Flash Boys* ascribed insidious motives to this hunger for retail order flow, suggesting that the computerized wolves of Wall Street were carving up uninformed small fry. The book described the launch of IEX Group, a trading venue designed to protect large orders of institutional traders from getting front-run by high-speed predators. IEX, however, doesn't offer a retail product.

Our attempts to reach Lewis through his publisher went unanswered.

In any case, retail traders don't need IEX's protection, because techies can't reliably front-run small retail orders. "What high-frequency trader is going to try to front-run an order that my grandma places at 3 o'clock to buy GE?" asks Notre Dame's Battaglio.

Trading venues prize retail orders above those of institutions for obvious reasons, says Jamil Nazarali, who heads up execution services at Citadel Securities. For market

makers, rapid-fire orders from an institution can move a stock price, causing a loss. "Market makers are often willing to give a better price to a retail order because we know that a retail order for 5,000 shares is probably just an order for 5,000 shares, rather than a small part of a much larger order," he says. "In contrast, if a market maker fills a 5,000-share order that is part of a 100,000 share order, the market maker will likely get run over."

The order-flow market is a kind of economic paradox, therefore, where small orders can get better prices than large orders. At KCG, according to our analysis, most orders of fewer than 500 shares got price improvement of better than half-a-cent a share, while most orders of 5,000 or more shares got less than two-tenths of a cent a share.

A passive market maker like KCG takes the other side of small retail orders, hoping for small profits on many trades.

Those profits come out of the spread between the quoted bid and offer on any of the thousands of tickers the firm trades. Other large wholesale market makers are Citigroup's (C) Automated Trading Desk and the derivatives powerhouse Susquehanna International Group, which bought the market-making affiliate of E*Trade in 2013. One way wholesalers compete is by paying for brokers' order flow, which can add up to hundreds of millions of dollars a year for a broker like TD Ameritrade Holding (AMTD). Another way, which directly benefits consumers, is by giving up some of the spread and offering price improvement by executing at a better price than the current quote. That produces slightly less revenue per trade for market makers, but they hope to make it up on volume, if brokerages send more trades their way.

"Competition for retail order flow is intense and creates a very good deal for the retail investor," says Dave Weisberger, who ran the wholesale market-making group at Two Sigma Securities before taking charge of execution-quality analysis at RegOne Solutions.

With big players like Citadel and KCG battling for market share in the past two years, RegOne estimates that average price improvement per share at the top eight market makers has doubled from 0.27 of a cent per share to 0.56 of a cent, as the chart on this page shows. Those amounts look small, but so are spreads on most stocks. Across hundreds of billions of shares, it has resulted in a wealth transfer from Wall Street to Main Street worth more than a \$1 billion in recent years.

The SEC is aware of this benefit: When it announced a pilot test of a rule that could shift some order flow from market makers to exchanges, the agency exempted retail orders. So measures of execution quality have become crucial exhibits in debates about such regulatory proposals. The industry's best disclosure appears on the Website of exchange operator BATS Global Markets, which has daily updates of stock-by-stock measures. "The industry is headed to a world of more transparency and granular information about execution quality," says Chris Concannon, president of BATS.

While institutional traders have to sweat about front-running and the price impact of their big trades, a retail trader can focus on fewer quality factors. "The true online retail trader doesn't have to worry about how much price impact his trade had," says Greg Tusar, who runs KCG's U.S. wholesale market-making business, "but rather how

much of the spread he was able to capture."

In our comparisons of market maker and broker execution, we therefore focused on price-improvement measures. Rather than take any firm's word on what the data show, we ran each market maker's Rule 605 execution reports through statistical-analysis scripts that we wrote in the widely used open-source math software known as "R." In our own transparency effort, we invited market makers and brokers to review and critique our analysis. After months of error-checks, our software was able to produce execution quality measures comparable to what brokers and dealers get from their own commercial data vendors.

Rule 605 reports can get pretty complicated. Each market maker's monthly report is a digitized table that can run to more than 50,000 rows of data on dozens of measures of execution speed, order size, and pricing for thousands of stocks. Some broker Websites draw attention to the percentage of shares that are price improved. But customers don't benefit much if the amount of that price improvement is immaterial. An order of 1,000 shares that gets 0.01 of a cent price improvement only puts 10 cents more in the customer's pocket, for example, while a more material 0.50 of a cent improvement adds five bucks to the customer's gain.

That's why good brokers focus on a quality measure called net price improvement per share. It's the average dollar amount of price improvement across all shares executed, netting those orders that get better than the quote prices against those that got worse than the quote pricing. Net price improvement numbers are hard to game without giving away lots of price improvement dollars to customers.

In the fourth quarter of last year, our analysis shows that the market maker with the best overall net price improvement on market orders was the biggest firm, Citadel Securities, which averaged 0.48 of a cent improvement per share across the 7.6 billion shares it traded. UBS was next, with 0.46 of a cent, and KCG and Two Sigma Securities tied with 0.43 of a cent.

These differences may reflect the types of stocks in the order flow received by a market maker, so it's important to zoom in on execution performance for various kinds of stocks. The most important differences, says Ray Ming Yeh, who co-heads wholesale market making at Two Sigma, are market capitalization, spread size, and average daily traded volume.

Our chart ranking the market makers uses one of the more popular ways of segmenting the analysis into Standard & Poor's 500 stocks, versus non-S&P 500 stocks. Again, Citadel ranks first in both segments. In both cases, Citigroup's ATD ran last among the big market makers.

A market maker's execution in non-S&P 500 stocks can be particularly important to retail brokers, since these less-liquid names move less predictably and therefore make it harder for the market maker to maintain a neutral exposure. But since spreads are wider on these stocks, the price improvement is also larger. The flows of Citadel and KCG tilt toward non-S&P stocks, so their overall numbers benefited from the fact that net price improvement for these stocks was 0.5 a cent share, at Citadel, for example, versus 0.42 for S&P shares.

There's a distortion built into the price-improvement measure, however. Trades on a high-priced stock like **Price-line Group** (PCLN) can yield impressive-looking price-improvement numbers when the market maker actually gave up very little of the stock's wide spread. That's why the industry's acid-test quality measure is the ratio of effective spread over the quoted spread, or E/Q. The E/Q puts stocks

of all prices on the same footing, by measuring how close your trade price was to the bid-ask midpoint, compared with the quote: A smaller E/Q percentage number is better since you're getting closer to the midpoint price.

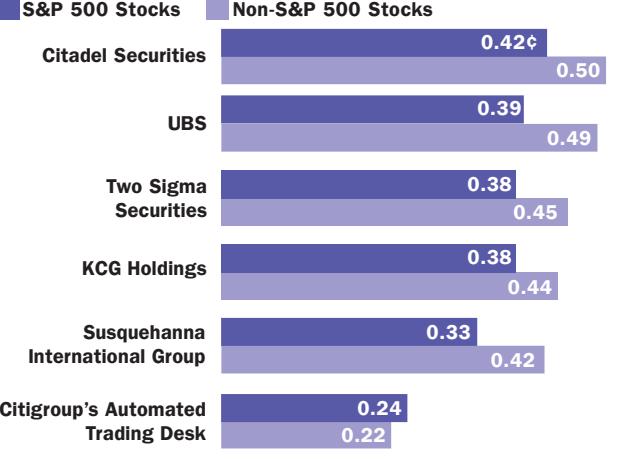
"Our dialogue with brokers about E/Q is a daily, intensely competitive discussion," says KCG's Tusan.

Citadel led for the December quarter, per our calculations, with the lowest E/Q, averaging 57% for S&P 500 stocks and 64% on the more challenging non-S&P stocks. KCG was

How Market Makers, Brokers Stack Up

Barron's exclusive ranking puts Citadel on top in price improvement for both S&P 500 stocks and non-S&P shares...

MARKET MAKERS



Volume-weighted mean for market orders of all reported sizes.

...While Fidelity tops the brokers on NYSE stocks and ties with Schwab and E*Trade for Nasdaq leadership. Broker scores are based on the overall execution quality of their market makers.

BROKERS

NYSE Stocks Nasdaq Stocks



Dec. quarter 2014 brokers' routing of market orders for NYSE stocks used with market makers' NYSE E/Q measure. Nasdaq routing used with Nasdaq E/Qs.

Source: Barron's analysis of Rule 605 and 606 reports

second in S&P stocks with 59%, but fifth in non-S&P stocks at 71%. Two Sigma was third for S&P shares with 61% and fourth for non-S&P shares with 70%. UBS was fourth in S&P shares with 62% and second in non-S&P shares at 68%.

While market makers are a key part of execution quality, most retail investors are more interested in the execution they're getting from their own brokers. And that's where required disclosures fall short. Brokers' routing reports, under the SEC's Rule 606, show only what portion of orders they send to particular market makers. The broker reports leave out many kinds of orders and give you none of the

execution-quality details found in the market makers' Rule 605 reports. The SEC should have long ago updated the Rule 605 and 606 mandates, say the analysts at KOR Group, an outspoken trading-quality consultancy run by industry insiders Chris Nagy, former head of routing strategy at TD Ameritrade, and Dave Lauer, a veteran of high-frequency trading. Their market reform ideas appear at healthymarkets.org.

Asked about the rules, the SEC declined to comment.

Investors or competitors who want to compare brokers' execution can do little more than see how much order flow goes to market makers with good-looking execution stats. A fundamental problem with any resulting inferences is that a market maker's average execution across all of its sending brokers may be better or worse than its performance on a particular broker's flow. Several brokers told us that their executions at a market maker were above average for that market maker. One brokerage exec scolded us for even trying to combine the information in his firm's routing report with the execution measures of his firm's market makers.

We think the most responsible, objective way to use the disclosures that our regulators have chosen to mandate is to score each broker with a weighted sum of their order flow fractions, with the weights derived from the E/Q measures of the relevant market makers. To arrive at a number where good values are higher, we first transform the execution measure by subtracting the market makers' E/Q fraction from one. The SEC's Rule 606 segments stocks into New York Stock Exchange or Nasdaq groups, so that's what we used in our analysis. As shown in the nearby chart of December-quarter results, these scores turn out to be closely clustered, but Fidelity slightly outranks its peers.

Caveats abound. Brokers that don't report 100% of their order routing get a lower score, perhaps deservedly. Fidelity gets a lot of the market-order-type trades we analyze in this story, while TD Ameritrade gets more trades known as limit orders, in which buyers or sellers demand a specific price. Some brokers voluntarily show actual execution-quality measures on their Websites. But each uses a different measure, making comparisons impossible.

E*Trade says its E/Q for the month of January 2015 was 59% on S&P 500 stocks. Scottrade reports a measure of price improvement per order (as opposed to per share), which it shows rising from \$2.49 in August 2014 to \$3.65 in January 2015 on S&P 500 stocks. Schwab shows that for smaller order sizes, it averaged 0.47 cent a share price improvement on S&P 500 stocks in the September-2014 quarter, with an E/Q on that group of 56%.

Fidelity provided us with numbers that show it outperformed its market makers' averages. In the December quarter, the broker got price improvement of 0.64 cent a share on S&P stocks and 0.81 cent on non-S&P stocks, compared with an average of its market makers of just 0.40 cent on S&P stocks and 0.45 cent on non-S&P shares. Fidelity's E/Q measures were similarly superior to its market makers' averages.

Our next report could make a sharper ranking of brokers if they all begin disclosing under execution-quality standards being developed by the Financial Information Forum, a Wall Street trade group. It's likely that some brokers will start talking up the FIF's new execution measures on their Websites and in ads—giving investors another factor to consider in selecting their brokers. But any such reports will be voluntary. Says Battaglio: "I'd rather have the SEC push the responsibility on brokers. What's the penalty for getting something wrong that's voluntary?" ■

A groundbreaking Barron's analysis in March showed that retail investors got a better-than-expected deal on trades. New figures support our findings and our broker rankings.

It's Official: Fidelity Top Broker for the "Little Guy"

by Bill Alpert

IT'S EASY TO SEE IF ONE BROKER'S COMMISSION is cheaper than another's. Before now, however, it was hard to know which brokers were saving you the most money through good trade execution—for example, by getting you a stock price that's better than the quote you saw when you pressed the "Place Order" button. For such "price improvement," discount brokers squeeze Wall Street market makers to give up some of the bid-ask spread to benefit the brokers' retail customers.

New numbers released recently by the industry indicate that a retail trader can get the best pricing from Fidelity's discount brokerage unit. This confirms the findings of *Barron's* computer-aided analysis earlier this year ("The Little Guy Wins!" March 2).

Industrywide, these savings add up to hundreds of millions of dollars a year, rebutting the claim by writers like Michael Lewis, author of *Flash Boys*, that retail investors are getting skinned in today's computerized markets.

Because the Securities and Exchange Commission requires scant disclosure, our analysis was forced to estimate the caliber of each broker's trade execution. But a few weeks ago some brokers and market makers released the first performance measures under a voluntary industry standard. The March-quarter 2015 numbers echo what we figured for the December 2014 quarter: Fidelity Brokerage Services averaged the best savings among the reporting brokers, while Citadel Securities gave the best pricing among the wholesale market makers, who handle most trades for discount brokers. TD Ameritrade (ticker: AMTD) and E*Trade (ETFC) didn't participate, instead reporting their own statistics on their Websites.

The industry's new reports—devised under the auspices of a trade group called the Financial Information Forum (fff.com)—also disclosed for the first time the price



Industry numbers released for the first time show that Fidelity offered the most "price improvement" to individual investors, ahead of Scottrade and Schwab.

improvement on orders of 99 or fewer shares, the so-called odd lot. In that commonest of order sizes, Fidelity's savings on trades of S&P 500-member stocks were five-times bigger than those averaged by Scottrade and 10-times bigger than Charles Schwab's (SCHW), as you can see in the nearby chart.

The striking gap in odd-lot price improvement proves the value of disclosure, says Chris Nagy, who launched the trading-quality consultancy KOR Group, after running TD Ameritrade's order-routing unit. "Next quarter, those numbers are going to be much, much better" as brokers respond, Nagy predicts. "Transparency can make a world of difference in trading behavior and quality."

The March numbers also suggest increased competition among wholesale market makers since we spotlighted them in December. In the latest tally, Citadel edged out other market makers in overall price improvement, but for the two important order-size categories of 100-to-499 shares and 500-to-1,999 shares, the biggest savings were at UBS Securities, a unit of UBS Group (UBS), where Schwab sends most of its order flow. Retail price improvement

price quote was only for 800 shares. The Financial Information Forum stats are being developed by a New York outfit called RegOne Solutions, under the direction of Dave Weisberger. He says that performance differences between retail brokers may reflect differing mixes of market orders and limit orders (where a trader specifies a price). But the big lesson from the statistics, Weisberger says, is that retail trades executed through the big wholesale market makers get the best pricing in the stock market. That's an inconvenient fact for the market makers' stock-exchange rivals, and brokers that patronize them, such as Interactive Brokers Group (IBKR).

Traders choose a broker for many reasons, not just price improvement. For now, the Financial Information Forum reports show execution-quality stats only for market orders for S&P 500 stocks and other stocks listed on the NYSE or the Nasdaq. The industry decided to report price improvement on a per-order level—which produces more-impressive-looking dollar amounts but makes it hard to compare between firms and order sizes. So our chart, and others you'll find at barrons.com, show you the savings on a per-share basis, namely, savings per 100 shares.

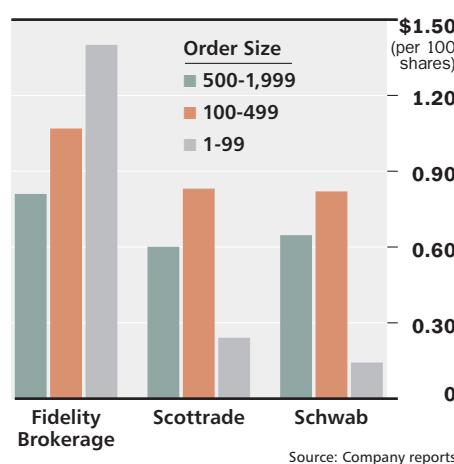
Brokers that extract the best price improvement for their customers necessarily forgo some hefty payments that other brokers get for sending their order flows to market makers. "The market makers are not both going to pay you a lot for order flow and then turn around and provide your customers with a high level of price improvement," says Gregg Murphy, Fidelity Brokerage's senior vice president for trading.

It is perhaps not an accident, therefore, that the brokers and market makers offering the most aggressive price improvement are privately held firms such as Fidelity, Scottrade, and Citadel. Publicly held brokers like TD Ameritrade might show a hit to the bottom line if they took fewer payments for order flow. "There's a lot of competition out there," says Matt Billings, Scottrade's senior vice president for trading services. "Our role is to foment competition among the wholesale market-making community." ■

The Bottom Line

Fidelity was best among brokers in price improvement for customers, while Citadel provided the biggest savings among the market makers who serve retail brokers.

Average Savings Per 100 Shares On S&P 500 Stocks



has increased steadily in the past few years, but several industry executives told *Barron's* that the brokers have turned up the heat since the practice was scrutinized here and in the new voluntary disclosures.

Later this year, the industry standard reports will also show how the firms supply you with enhanced liquidity, for example, by filling your 1,000-share order at the best quoted price, even though the