Ripe for Innovation:

U.S. Retail Brokerage Industry

sonictrade

White Paper

Introduction

Just as the U.S. stock market has soared in the years following the Great Recession, so has the retail brokerage industry in the United States bounced back and continued to grow. Over the five years to 2018, brokerage industry revenue increased at an annualized rate of 2.5 percent to an estimated $158.4 billion. U.S. retail trading assets in 2013 stood at approximately $2.8 trillion, with some online brokerage firms having experienced a 500 percent increase in average annual trading revenues from 1995 to 2013. A survey conducted by asset manager BlackRock in 2013 found that American investors overall keep 48 percent of their investible assets in cash, 18 percent in equities, and 7 percent in bonds.

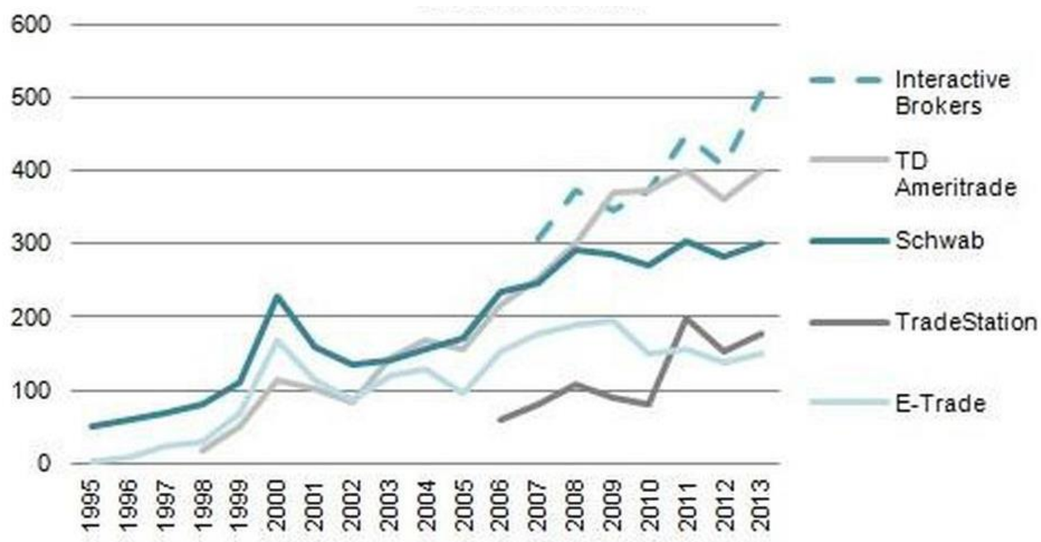
The 2018 maximum daily trading volume (to date) for the NASDAQ is 4.58 billion shares, recorded on September 21. As indicated by the table below, trading volumes for the cash equity and equity derivative asset classes have consistently increased on a year-over-year basis from 2017 to 2018.

Summary of NASDAQ Trading Volumes, 2017-18

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cash Equities (shares, millions)												
2017	23,208	22,759	28,773	23,015	26,859	29,473	21,675	24,849	22,592	23,701	25,276	23,744
2018	26,979	31,348	30,291	26,619	27,364	29,818	24,802	27,412	25,614			
YOY Change (%)	16.2%	37.7%	5.3%	15.7%	1.9%	1.2%	14.4%	10.3%	13.4%			
Equity Derivatives (contracts, millions)												
2017	129	120	136	113	137	137	114	134	116	133	144	122
2018	165	155	155	138	140	139	131	149	126			
YOY Change (%)	27.9%	29.2%	14.0%	22.1%	2.2%	1.5%	14.9%	11.2%	8.6%			
Fixed Income ($ traded, billions)												
2017	$1,686	$1,560	$1,794	$1,481	$1,654	$1,620	$1,297	$1,321	$1,356	$1,433	$1,397	$1,200
2018	$1,627	$1,932	$1,597	$1,242	$1,580	$1,312	$1,018	$1,130	$1,046			
YOY Change (%)	-3.5%	23.8%	-11.0%	-16.1%	-4.5%	-19.0%	-21.5%	-14.5%	-22.9%			

Looking back further, retail brokerage trading volumes have consistently increased since at least 1995, as evidenced by the chart below, which was prepared by Aite Group in 2013.

Historical Change in Daily Average Revenue Trades, Select Firms



Industry Landscape

The U.S. retail brokerage industry is currently dominated by four major players: Charles Schwab, E-Trade Financial, Fidelity Investments, and TD Ameritrade. There are substantial similarities among the major brokerage institutions, most notably their publication of high-quality research to inform clients' investment decisions. Additional common practices include:

- Utilizing Morningstar as a prime source of research on exchange-traded funds (ETFs) and mutual funds;
- Offering proprietary fixed-income research; and
- Offering a wide variety of features such as advanced charting, options tools, screeners, hotkeys, virtual trading, watch lists, ladders, Level II quotes, and back testing support.

The table below illustrates not only the market dominance of the four major players in absolute terms, but also impressive levels of annual growth, as evidenced by the "net new" numbers. Fidelity Investments is by far the largest of these four firms; however, it is privately held, and therefore limited information is publicly available.

“Big 4” Summary Statistics

(for year-end 2017)	Charles Schwab	E-Trade	Fidelity Investments	TD Ameritrade
Revenue	$8.6 billion	$2.4 billion	$18.2 billion	$3.7 billion
Total Client Accounts	10.8 million	3.6 million	69.2 million	11 million
Net New Client Accounts	1.4 million	171,906	unknown	4.1 million
Total Client Assets	$3.4 trillion	$383.3 billion	$2.5 trillion	$1.1 trillion
Net New Client Assets	$198.6 billion	$12.2 billion	unknown	$80.1 billion
Avg No. Client Trades/Day	608,800	214,284	unknown	511,000
Average Revenue per Trade	$8.20	$8.23	unknown	$8.33
Customer Margin Balances	$18.3 billion	$9.1 billion	unknown	$23.8 billion
Market Cap	$70.39 billion	$13.6 billion	n/a	$29.6 billion

The following is a summary of each of the most prominent or noteworthy retail brokerage firms operating in the United States.

Charles Schwab

Charles Schwab Corporation (NYSE: SCHW), founded in 1971, has the distinction of being the first discount brokerage firm in the United States. Schwab currently manages $3.4 trillion in client assets across 10.8 million accounts. Unlike many brokerage firms, Schwab enables customers to open checking accounts alongside brokerage accounts. Schwab offers registered investment advisor (RIA) accounts, and as of 2014, managed $143 million per RIA account. The firm publishes its own proprietary A – F ratings, called Schwab Equity Ratings, for over 3,000 U.S. stocks. Schwab maintains a full roster of in-house experts, who frequently publish research articles, known as Schwab Insights, on a variety of market topics. Schwab also creates video content in the form of market updates and Schwab LIVE events.

Schwab’s desktop platform is called the StreetSmart Edge. The Schwab mobile app, Schwab Mobile, enables clients to manage all their investment and bank accounts with a single app. Most Schwab brokerage accounts require a minimum deposit of $1,000 and every trade costs $4.95. Working with a financial adviser incurs additional fees (paid annually) of 0.5-1.5 percent of assets under management.

As of 2015, roughly half of Schwab’s client assets were connected to some form of ongoing advisor-client relationship – although those relationships were reportedly under pressure due to the advent of technology. Schwab Intelligent Portfolios, the firm’s online “robo-advisor”, amassed $4.1 billion in assets under management within six months of its launch in March 2015. Schwab reported in 2015 that 46 percent of its “new-to-firm” clients were under age 40.

E-Trade Financial

Founded in Palo Alto in 1982, E-Trade Financial (NASDAQ: ETFC) started as a holding company and later transformed into a leading U.S. discount brokerage. E-Trade features an electronic trading platform for the purchase and sale of financial securities including common stocks, preferred stocks, futures contracts, exchange-traded funds, options, mutual funds, and fixed income investments. It also provides margin lending, online banking, and cash management services. Smaller than its primary competitors, at year-end 2017 E-Trade held $383.3 billion in client assets across 3.6 million accounts.

E-Trade's rise coincided with the technology boom of the early 1980s. Today it is a leading financial firm in the realm of mobile accessibility, online trading tools, and customized user experiences. In 2017, in response to escalating downward price pressure, the company lowered its fee per trade from $9.99 to 6.95 (or lower, depending on trading volume). E-Trade's desktop platform, known as E*TRADE Pro, can be accessed by clients who execute at least 30 trades per quarter or maintain over $250,000 in assets. Its web-based platform, known as OptionsHouse by E*TRADE, enables trading of both options and stocks and features a $0 minimum account balance. E-Trade Mobile, the company's mobile app, enables trading of all types of financial products and requires an account minimum of $500.

Fidelity Investments

Fidelity Investments, a privately-held company founded in 1946, is the nation's largest keeper of 401(k) retirement savings plans and the largest provider of 403(b) plans for nonprofit organizations. With $2.5 trillion in client assets across 69.2 million accounts, Fidelity is not only a major retail brokerage firm but also a primary provider of mutual funds and other advisory services. As of 2015, approximately 30 percent of Fidelity's customer accounts were brokerage accounts.

Fidelity brokerage clients benefit from access to proprietary Fidelity ETFs and mutual funds, which number more than four hundred. In addition, the firm offers discounts and commission-free transactions for Fidelity products. Fidelity distributes high-quality market research and personal finance educational materials through its Fidelity Viewpoints weekly publication. Fidelity also physically maintains more than 140 investor centers across the U.S. where customers can manage their investments or seek in-person financial advice.

Fidelity charges $4.95 per trade. The firm's desktop platform, known as Active Trader Pro, is available to clients who execute at least 36 trades in a rolling 12-month period. Active Trader Pro is well-regarded for its ability to facilitate comprehensive stock comparisons, allowing customers to compare up to five stocks at once with 21 different metrics. Fidelity has a mobile app to facilitate cash management but does not offer browser-based or mobile trading.

TD Ameritrade

TD Ameritrade Holding Corporation (NYSE: AMTD), founded in 1975, provides financial services to both institutions and individuals. The company operates an electronic trading platform for the purchase and sale of a comprehensive range of financial securities. The firm also provides margin lending and cash management services. TD Ameritrade acquired Scottrade Financial Services in September 2017. At year-end 2017, TD Ameritrade held client assets totaling $1.1 trillion across 11 million client accounts.

TD Ameritrade charges $6.95 per trade (down from $9.99 as of February 2017). However, none of its platforms – desktop, web, or mobile – require a minimum level of trading activity or non-zero account balance.

TD Ameritrade is well-renowned for its high-quality trading platforms and innovative investor tools. The firm's desktop-based platform, known as "thinkorswim", is designed for experienced traders and packed with features. Its browser-based platform, known as Trade Architect, is designed more simply to appeal to beginner and intermediate investors. For mobile trading, TD Ameritrade offers multiple apps with varying degrees of sophistication. The most basic is the TD Ameritrade Mobile app, which is designed simply but still provides many of the features available through the thinkorswim desktop platform. The TD Ameritrade Mobile Trader app provides a more powerful trading experience, enabling clients to customize their dashboards and screens, access research and advice, transfer funds, receive market alerts, and watch educational videos.

Among the innovative tools offered by TD Ameritrade is an in-app messaging feature that allows a customer service representative to "take over" operation of the app at an investor's request. For example, if a customer needs help with executing a covered-call trade, the service representative can complete the trade on the client's behalf. TD Ameritrade also offers a tool that it calls Social Signals, which analyzes individual equities using proprietary algorithms based primarily on social media coverage. The Social Signals tool produces a "Sentiment Score" that indicates what percentage of tweets are positive and displays other relevant metrics. Also in the social realm, TD Ameritrade has created what it calls the Investor Movement Index, which generates "index" results based analysis of data from its six million retail customers. The purpose of the index is to characterize the collective "sentiment" of its retail investors' portfolios. The firm also operates TD Ameritrade U, a platform that introduces college students to simulated investing.

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Aside from these four largest firms, described above, the following firms are carving unique niches in the marketplace based on their individual strengths and capacities to innovate.

Robinhood

Robinhood, founded in 2013, is a mobile trading app that allows individuals to invest in U.S. publicly-traded companies and exchange-traded funds without paying a commission. While Robinhood does not provide access to a full range of investment products such as mutual funds, it does support cryptocurrency investing. It also recently added 250 ADRs for a select group of foreign companies. (Its decisions to add cryptocurrency trading and the selected ADRs were based on its analyses of user searches within the app.) In October 2018, the firm announced the addition of its own clearing system, built for the purpose of clearing and settling its own transactions and maintaining custody of its assets.

Robinhood does not charge a commission on trades; however, it does pass on to customers the nominal fees levied by the SEC and FINRA when shares are sold. The app generates revenue by offering a premium subscription service, known as Robinhood Gold, which allows users to trade on margin and during extended market hours. The subscription price, which ranges from $6-200 per month depending on account value, equates to an interest rate of approximately 6 percent. This is on par with rates charged by competitors, but innovative in its simplicity, as it does not require users to calculate interest rates for money invested on margin. In addition to subscription fees, Robinhood also generates income from "the float" – interest earned on the cash in users' accounts.

The Robinhood app is distinctive due to its simplicity. For individual stocks, the app displays just four components: the ticker symbol, the price, a chart showing price changes over time, and a "Buy" button. (Users may scroll down for news or more detailed statistics.) Investors can download the app and register a new account in about five minutes. The app's push notifications encourage frequent engagement, resulting in the most active users checking the app up to ten times per day.

Not surprisingly, Robinhood's demographic skews young, with a median age of 28. A full 78 percent of users are under age 35, with 25 percent identifying as first-time traders. Most Robinhood users are interested in both building their savings and developing relationships with the brands they value the most.

As of October 2018, Robinhood had 6 million users, up from 4 million in May. After its most recent funding round, in May 2018, the company was valued at $5.6 billion.

Interactive Brokers

Interactive Brokers, founded in 1978, is a leading electronic brokerage firm in the United States. The company brokers stocks, options, futures, EFPs, futures options, foreign exchange swaps, bonds, and CFDs.

In 2009, Interactive Brokers launched its mobile trading app, known as iTWS, based on the firm's desktop platform (known as Trader Workstation or TWS). In 2012, Interactive Brokers began offering money market accounts and opened the fully electronic Money Manager Marketplace. Interactive Brokers also released the TWS Mosaic trading interface, a comprehensive tool for order entry and order management, and the Tax Optimizer tool, which helps clients to manage capital gains and losses. In 2013, Interactive Brokers released Probability Lab, a statistical modeling tool, and Traders' Insight, a service that publishes daily commentary by both IB traders and third party contributors. Also in 2013, Interactive Brokers integrated a trading notification tool, known as IB FYI, into its Trader Workstation. IB FYI keeps customers informed of upcoming announcements that could impact their investments, and is capable of automatically acting to exercise options early if such action is projected to be beneficial to the customer. IB FYI can also act to automatically suspend customers' orders before announcements of major economic events that are projected to influence the market.

In 2014, Interactive Brokers became the first online broker to offer direct access to IEX, a private electronic communication network for trading securities, which was subsequently registered as an exchange. In 2015, Interactive Brokers created the service known as Investors' Marketplace, which allows customers to find investors and other service providers in the financial industry. In March 2016, Interactive Brokers released a companion app to its mobile app (iTWS) for the Apple Watch. From its founding days, the company has consistently focused on building innovative technology over generating sales, with the focus of technology development often on increasing automation for the purpose of providing more efficient customer service at a lower cost.

Mobile transactions account for only about 10 percent of the company's retail orders. Investors can open online accounts, which require a $10,000 minimum balance; individual retirement accounts require a $5,000 minimum balance. The minimum account balance for younger clients, those under age 26, is only $3,000. Monthly trading commissions for most accounts are $10 per month, with an activity fee charged if the minimum commission levels are not met. New-to-the-firm clients are encouraged to utilize Interactive Brokers' educational resource, known as Traders' University, which features a series of a webinars and videos on Interactive Brokers' products and trading tools.

Merrill Edge

Merrill Edge, launched in 2010, is an online discount brokerage service provided by Bank of America Merrill Lynch. Merrill Edge appeals to casual traders by offering a combination of excellent customer service and competitive pricing. The online brokerage integrates seamlessly with parent company Bank of America's existing banking platform, enabling clients to access all their accounts in the same place. Those who meet minimum account balance requirements qualify for a limited number of commission-free trades each month. Notably, all Merrill Edge brokerage clients have access to in-person investment advice at more than 2,100 Bank of America locations nationwide. Merrill Edge's Preferred Rewards program is very highly rated; in addition to $0 stock trades, customers enjoy other perks including bonus rewards on credit cards and discounted mortgage rates. The brokerage's desktop platform, Merrill Edge MarketPro, is available only to customers who maintain an account balance greater than $50,000 or make at least 15 trades per quarter. The Merrill Edge mobile trading app is available to all customers.

You Invest by JPMorgan Chase

JPMorgan Chase launched its digital investing platform, known as You Invest, in August of 2018. The platform offers all JPMorgan Chase customers, which number more than 47 million, one hundred commission-free trades in the first year, in addition to the opportunity to earn unlimited commission-free trading. The service is structured such that the institution's members can seamlessly access the new offering via the bank's existing websites and apps. With the launch of You Invest, JPMorgan Chase is specifically targeting millennials who have never invested and current clients who currently invest elsewhere. In addition to trading capability, You Invest provides access to the bank's stock research and portfolio-building tools. There is a $0 account minimum for JPMorgan Chase customers to open a You Invest account.

You Invest currently only supports trading in individual stocks and ETFs. Trading on margin, in options, and other financial products will become possible in 2019. Also beginning in 2019, a "robo-advice" service known as You Invest Portfolios will be incorporated into the platform.

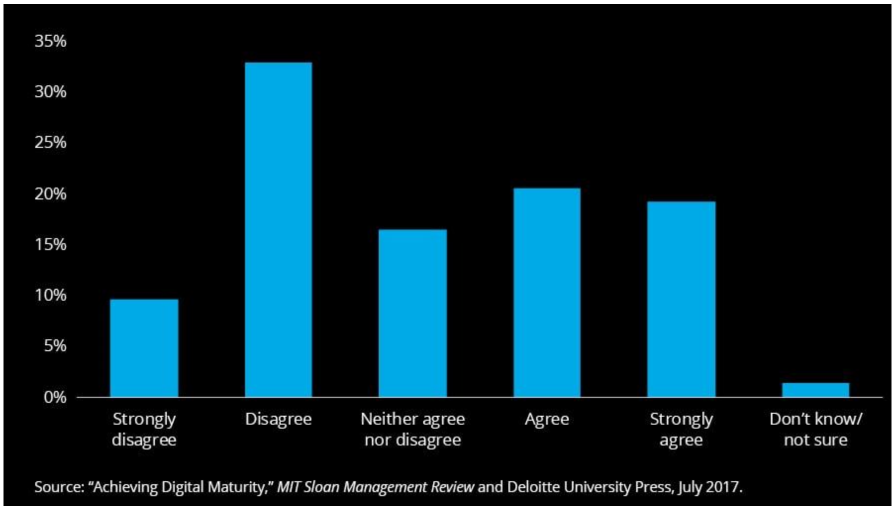
Industry Trends

The retail brokerage industry has long been migrating away from telephone-based trading. While desktop-based trading is still prevalent, the most substantial increase in activity is by younger investors engaging in mobile-only trading. Investment platforms are seeking to differentiate themselves by targeting more niche groups of investors, increasing their platforms' personalization, and focusing more on "customer journey management" to ensure positive user experiences. A study of financial services institutions in 2017 revealed that 55 percent planned to increase investment in personalization in the coming year.

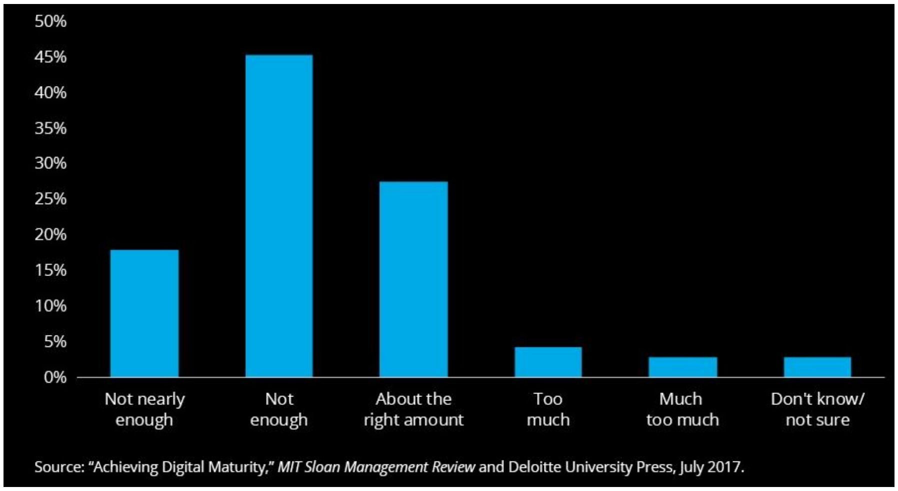
Looking ahead, the industry is trending toward increased automation and use of artificial intelligence. Robo-advisors are already competing with traditional wealth managers, causing established advisors to now offer more automated tools conducive to online investing. Chatbots are also becoming increasingly prevalent as the user experience becomes increasingly customized.

There is clearly still great need (and demand) for technological improvement, however, as evidenced by the responses to a 2017 survey conducted by MIT Sloan and Deloitte. Researchers posed the following two (among other) questions to investment managers: "To what extent do you agree with the following statement? 'Our organization has a clear and coherent digital business strategy'" and "How much time, energy, and resources does your organization spend implementing digital business initiatives?". The responses to these questions, presented graphically below, indicate that the need is clearly recognized but satisfactory solutions have yet to be fully pursued.

Agree/Disagree: "Our organization has a clear and coherent digital business strategy"



Time, Energy, & Resources Spent Implementing Digital Business Initiatives



The most prominent and emerging trends occurring in the retail brokerage industry – namely, self-directed investing, mobile-only investing, and voice-activated trading – are each described below.

Self-Directed Investing

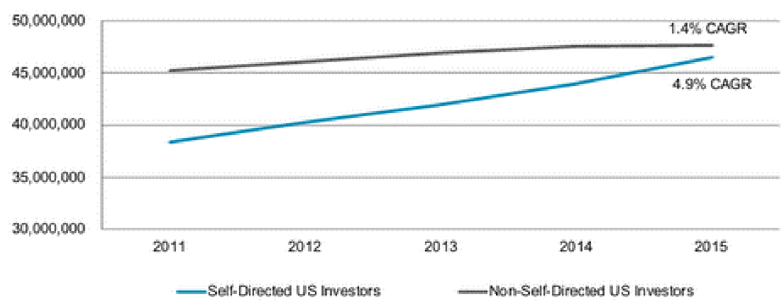
Self-directed investors comprise an increasingly significant portion of the global wealth management market. As investors gradually shift away from commitments to discretionary mandates, with decreasing focus on client-advisor relationships, wealth managers and brokers are expected to provide investors with satisfactory means to participate in, or fully control, their investments. These means typically take the form of digital investment platforms, advisory "lite" services, and other online tools. Many brokerage firms now offer hybrid investing services that support both self-directed investors and those seeking professional guidance. Also, brokerage firms are offering more educational information, without charge, to enable self-directed investors to make better-informed decisions.

Given the superior results achieved by many self-directed investors, this trend is very likely to continue. According to wealth management start-up SigFig, investors advised by financial professionals in 2013 experienced average overall returns of 14.1 percent, while self-directed investors achieved overall returns of 17.1 percent. Three full points higher! Moreover, the cost of financial advice amounted to an average expense ratio of 90 basis points, excluding asset management fees, for clients with less than $250,000 in investments.

Globally, execution-only mandates in 2017 constituted 19.1 percent of total HNW assets held with wealth managers. A 2014 report by research firm Cerulli Associates revealed that nearly 30 percent of U.S. HNW investors, defined as clientele with investable assets greater than $5 million, consider themselves to be self-directed. More than half of HNW investors maintain online brokerage accounts with balances between $500,000 and $1 million. Self-directed HNW investors are typically motivated by price sensitivity to seek alternatives to traditional advisory mandates, and many use self-directed accounts to test their own investment ideas, provide liquidity, and even to shelter assets from primary advisors. Younger HNW investors, those under 35 years old, and successful first-generation entrepreneurs are the most likely to self-direct their investments.

Although the majority of clients in developing economies tend to prefer unadvised services, the U.S., in absolute terms, represents the biggest market opportunity for brokerage firms catering to self-directed investors. According to a 2015 report by research & advisory firm Celent, the self-directed portion of U.S. investors is growing the fastest, at 4.9 percent annually, as compared with just 1.4 percent annually for U.S. investors who rely solely on professional guidance.

Annual Growth of Self-Directed vs. Traditionally Advised U.S. Investors

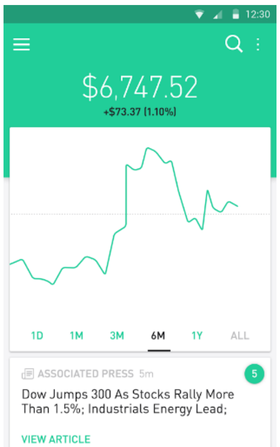


Mobile-Only Investing

The next generation of investors has embraced mobile technology, and many traders use only mobile devices to execute trading ideas and manage their accounts. While the more sophisticated platforms continue to be desktop-based, browser-based platforms and mobile trading apps tend to be simpler and more user-friendly. Many brokerage firms that offer advanced desktop-based platforms also feature mobile apps to facilitate on-the-go trading. As mobile-only investing increasingly contributes to daily average revenue trades, the contributions by web-based and desktop-based platforms are waning rapidly.

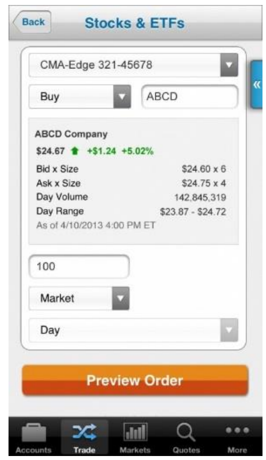
Mobile trading is attractive to many investors because it allows for increased control. Investors can receive alerts and respond in real time to changes in the market, regardless of their current location. In addition, the lack of a (potentially untrustworthy) intermediary is appealing to younger investors, who typically prefer to self-direct their investments. Mobile trading apps are unemotional, subservient, and agenda-less – the polar opposite of many traditional financial advisors, especially those with commission-based models.

Nearly all online brokerage firms offer mobile trading apps; however, not all apps are created equal. Features can vary dramatically. While popular apps like Robinhood pride themselves on being extremely uncluttered and easy to use, other mobile apps are packed with features. Below are screenshots of several of the most popular mobile apps used by traders today:

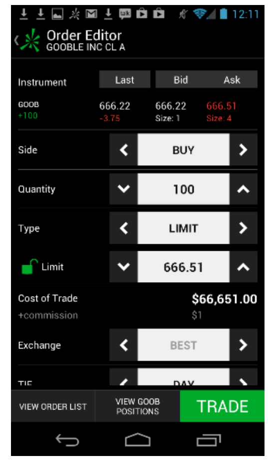


Robinhood

Interactive Brokers



Merrill Edge



TDAM Mobile Trader

Voice-Activated Trading

Voice-activated trading is a nascent trend that is still emerging. To date, Fidelity and Charles Schwab are the only retail brokerage firms that enable clients to conduct transactions using their voices; however, the process is not yet fully automated. Both firms use a so-called "voice print" to identify the person executing the transaction. Voice prints work similarly to fingerprints or biometric face recognition, two technologies currently in use to unlock cell phones. Investors wishing to use these firms' voice technology must first register their voice prints and speak with a customer services representative to confirm voice functionality for their accounts. Thereafter, investors are able to complete trades or withdraw funds using only voice commands.

Customer Demographics & Preferences

Of the $2.8 trillion of retail trading assets held in the U.S. in 2013, approximately $1.8 trillion was held by non-professional traders and the remainder was owned by professional traders utilizing personal retail accounts. A large percentage of professional traders report trading their own funds in retail accounts. Overall, about a quarter of all adults in the U.S. with internet access engage in retail trading, and an additional 6 percent of retail traders are professionals, for a total count of about 54 million retail traders in the United States. As of 2015, about 47 percent of investors, across asset classes, considered themselves to be self-directed.

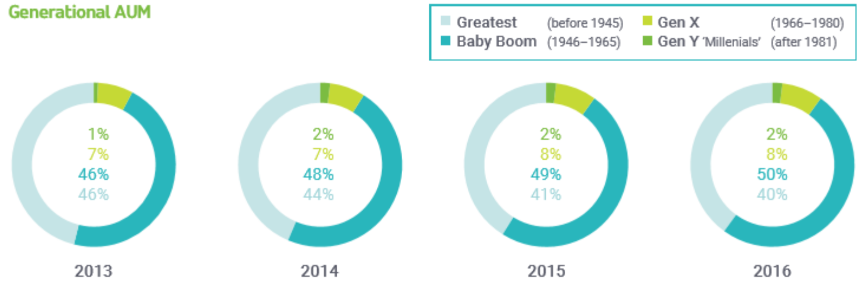
A strong majority of retail brokerage clients do not maintain any fee-based accounts. At year-end 2015, 65 percent of retail brokerage relationships were reported as transaction-only, while 13 percent were fee-only. The remaining 23 percent of client relationships encompassed both fee-based and transactional accounts.

Although the proportion of the U.S. population investing in mutual funds (approximately 95.8 million people in 2017, representing 44.4 percent of households and $18.8 trillion in assets), typically via wealth managers, still dwarfs the retail trading contingent, this demographic is in decline. Wealth managers report nearly a third (29 percent) of their clients to be older than 65, and 69 percent over age 50. However, just 7 percent of wealth managers report using technology to segment clients by age, and none do so by gender. Instead, the highest proportion of wealth managers (38 percent) continue to group their clients only by current assets – just as they've always done.

In 2015, women comprised, on average, 33 percent of wealth managers' clients. This number was expected by wealth managers to rise to 38 percent by 2017. However, for an online survey conducted by Investor's Business Daily in 2017, only 6 percent of millennial respondents were women. Older women are utilizing wealth managers, while younger women are mostly not participating in the investment market. This represents a significant market opportunity for those that can capture it.

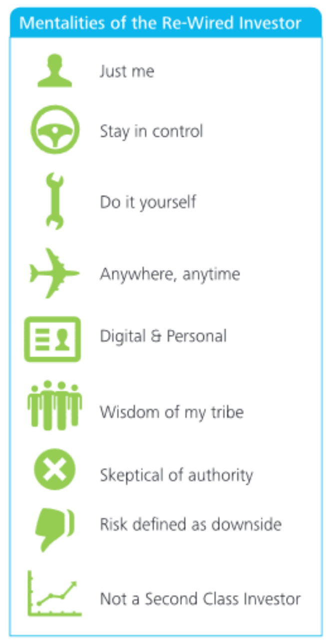
Generationally, Baby Boomers (those born 1946-65) in 2016 owned half of the AUM managed by North American financial advisors, up from 46 percent in 2013. The Greatest Generation (those born before 1946) in 2013 held an equal share of the AUM as Baby Boomers, but that share declined to 40 percent by 2016. Generation X (those born 1966-80) in 2016 owned 8 percent of advisor-managed assets. Millennials (those born 1981-95) in 2016 owned just 2 percent of advisor-managed assets.

Generational Ownership of Advisor-Managed Assets, 2013-16



The millennial demographic represents the most significant emerging opportunity for the retail brokerage industry, especially as wealth transfer from the Baby Boomer generation accelerates. Holding only 5 percent of U.S. mutual fund assets as of 2015, millennials continue to be ignored by professional financial advisors. Just 30 percent of financial advisors actively seek clients under age 40, according to the research firm Corporate Insight. However, it is estimated that millennials' wealth could top $15 trillion in the United States in the next 15-20 years.

In 2018, 13.5 percent of Americans aged 18 to 29 years reported using an online brokerage service to facilitate personal investment. The 2017 survey by Investor's Business Daily, which included responses from 415 millennials, revealed that half of millennial investors have been investing for less than three years. The survey also showed that millennial investors' median portfolio size is $35,900, which is far smaller than the national average for all age groups. Although millennial investors were more likely than the overall group surveyed to have some college education, they were less likely to hold advanced degrees, and their household incomes were overall less than average.



Forged in the fire of the Great Recession, millennials share key characteristics in their relationship to money. They're risk-averse; they distrust institutions; they want transparency regarding fees. A 2015 study by Fidelity indicated that one in four millennials "trusts no one" in regards to money. Despite this aversion, millennials who participate in the financial markets are trading in stocks, options, ETFs, foreign currencies, and futures almost as enthusiastically as older investors. The 2017 Investor's Business Daily survey found that 81 percent of millennial investors owned individual stocks and 33 percent owned exchange-traded funds — the top two investment types among this age group. Growth stocks were the most popular, owned by 70 percent of millennial investors, followed by "blue chip" stocks, owned by 38 percent. Defensive stocks were among the least popular, owned by just 9 percent of millennial investors. Trading in futures and foreign currencies by millennials jumped 12 twelve percent from 2015 to 2016. Additionally, in effort to grow their (typically) limited assets while putting fewer dollars at risk, millennials have demonstrated particular interest in innovative financial products such as E-Mini S&P 500 futures. A survey by LinkedIn and market research firm Ipsos in 2015 indicated that nearly 70 percent of millennials would be willing to purchase financial products and services from non-financial brands (such as Apple or Google), while only 47 percent of Gen Xers responded the same.

TD Ameritrade reports that millennial investors are voracious online consumers of research on stocks, ETFs, derivatives, and other financial instruments. Upon learning about more sophisticated investment strategies, millennial investors – more often than not – put them into practice. Half of millennial investors trade at least five times per month, roughly in line with the overall average for all age groups. Yet millennial investors are by far the most cost-conscious and the least satisfied with their broker experience among all age groups. As a result, millennial investors are far less likely to recommend a broker to colleagues or friends, and far more likely to switch brokers, citing cost as the main reason for switching.

According to the Investor's Business Daily survey, TD Ameritrade, Interactive Brokers, and E-Trade Financial are the most popular brokerage firms among millennial investors. Just over a third (34 percent) of millennial respondents indicated that one of these three firms is their primary broker, with TD Ameritrade alone accounting for 13 percent. However, a sizable 23 percent of millennial investors responding to the survey cited a small or obscure brokerage firm as their primary agency. Six percent of millennials polled indicated that Robinhood is their primary broker. By comparison, financial giant Fidelity was cited as the primary broker by 7 percent of millennial respondents and Charles Schwab was identified by 5 percent.

In addition to being far less concentrated in the major brokerage firms, millennial investors have demonstrated a noticeable proclivity for innovative investment technology. Among investors who indicated in the Investor's Business Daily survey that their primary brokerage firm offers automated investment advisory service (so-called "robo-advice"), 56 percent of millennial respondents revealed that they had placed some assets via the service. By contrast, only 29 percent of investors from all age groups had done the same.

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