**Online Brokers: A Comparison of Costs and Features**

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**Abstract**

Many online brokers offer investors the efficient execution of security trades. Each broker has a set of costs and a bundle of features from which traders make complicated comparisons to select a broker. A way to simplify broker choice is to examine the relationship between costs and features from online brokers. If online brokers operate in an efficient market, costs should vary directly with the size and quality of features offered. And if costs vary directly with features, then the costs are a signal for features in an efficient market for online brokers. This paper compares costs and features of online brokers and finds no relationship between them, which suggests that online traders need to find other ways to simplify their choice of an online broker.

**Introduction**

Over half of American adults own stocks, according to a Gallop poll described by McCarthy (2016). In addition, according to the U.S. Census Bureau (2015), seven percent of all securities and commodities contract revenue was from e-commerce [online trading]. Ody (2011) found that online traders want low costs. In addition, Balasubramanian, Konana, and Menon (2003) found that the perception of trading costs is an important factor influencing online trader satisfaction. Online traders have many different online brokers to choose from, and online brokers often use their stock trading fee as the primary advertising tool. Online traders could easily choose an online broker primarily due to the fee to trade stocks, since according to Ahmed, Schneible, and Stephens (2003), many online traders are naïve stock traders. This could result in a costly mistake, because with so much competition by online brokers for customer accounts, a lower trading fee might correspond to higher fees for other features or the lack of some features. Thus, tradeoffs might exist in the costs and features offered by online brokers. This paper describes a study that looked for tradeoffs in the costs and features from online brokers that could help online traders choose an online broker and offers insight into the efficiency of the market for online trading.

The literature describes a shift that took place from stock traders using full-service brokers to many now using online discount brokers. A substantial portion of trading is now done through these online discount brokers. While online brokers charge small fees in comparison to full-service brokers, online traders tend to trade more and earn lower returns, so their costs of trading are important considerations. However, lower trading costs might be available only at the price of higher fees for other services or a lack of other services. The hypothesis for this study is that online brokers set costs and offer features in a manner that results in tradeoffs – if the market for online brokers is efficient, higher costs from a broker should be associated with more features from that broker. On the other hand, lower costs from a broker should be associated with less features from that broker. These relationships are the focus of this study.

The methodology for this study is correlation and regression analyses. The data are from various online brokers analyzed by the staff of *Barron’s,* who awarded points for groups of costs and features offered by online brokers. The results show that costs are uncorrelated to features, but features are highly correlated with one another. The conclusion is that a highly efficient market for online brokers does not have support from this study. In addition, online traders can expect to need information on both costs and features when choosing an online broker.

This paper continues with the details of a study investigating online broker costs and feature tradeoffs. The paper has a review of the relevant literature, an explanation of the research methodology, a description of the empirical data, a presentation of the statistical results, and a conclusion with some suggestions regarding the usefulness of the findings and ideas for further research.

**Literature**

The forerunner of the online broker was the discount broker that came into existence shortly after the Securities and Exchange Commission ended fixed commission rates in 1975. Schaefer (1983) shows that by 1980, discount brokers became an established part of the securities industry. Brown (1996) discusses the declining need for stock brokers due to changes in technology. Indeed, Kim and Kim (2014) and Nguyen, Hai, Shirai, and Velcin (2015) argue that internet stock message boards, where individuals discuss product releases, company news and company stock predictions as sources of information for investors, have risen in popularity. Iancu, Ancuta, and Maier (2016) say smartphone usage as well as news alerts and notifications from most online trading platforms allow investors to be up to date and make more informed trades. With the development and widespread use of the internet and its information resources, discount brokers became known as online brokers.

De Campos Costa and Joia (2003) say online broker costs are an integral part of the critical success factors that influence overall investor success. El Fadl, Abbey, and Choi (2015) find that perceptions of the usefulness of an online trading platform significantly impact stock portfolio performance. Odean (1999) finds that investors using online brokers engage in excessive trading and herding behavior by buying stock after significant price appreciation, and selling after price stabilization, which results in buying stocks that underperform. Chan and Hussein (2017) suggest that as the cost of online trading goes down, investors may be more likely to engage in “over herd[ing] behavior, overconfidence, and excessive trading.” Khan, Tan, and Chong (2017) found support for the idea that investors using online stock trading platforms increase their trading activities and take more risks. Barber and Odean (2001) found that both men and women trade excessively using online stockbrokers, but that men trade more than women, and the excessive trading reduces returns for both men and women, although more so for men. Both Barber and Odean (2002) as well as Choi, Laibson, and Metrick (2002) found that online investors tend to increase turnover and decrease their returns after switching to online trading. Dorn, Dorn, and Sengmueller (2008) suggest that the trading activity of German online investors is primarily driven by an entertainment motive, since the costs of their trading do not justify their returns. Only Ivkovic and Weisbenner (2005) find that the average online investor generates an additional annual return from stock holdings of local companies due to an informational advantage. In addition, Lin, Chiu, and Kang (2010) find that when stock traders begin trading online they trade more often, but their returns are the same, based on trading data from Taiwan. Zhang and Zhang (2015) report that online brokers allow many inexperienced and uninformed traders to enter the financial markets. Most of these studies suggest that online stock trading returns could improve by knowing about tradeoffs between the fees and features offered by online brokers.

Odean (1999) also finds that online traders exhibit irrational herding behavior. Rubaltelli, Rubichi, Savadori, Tedeschi, and Ferretti (2005) find that not only are online traders more naïve investors, but they are also irrational in their decisions, especially about how presentation formats influence their decisions. Konana, Menon, and Balasubramanian (2000) say low observable costs of trading may overly influence many new entrants to the world of online individual investing, making those new entrants oblivious to potentially large unobservable costs. Looney, Valacich, Todd, and Morris (2006) describe and try to explain the paradox that consists of online investing giving traders a greater sense of competence, control, efficiency, and economy, while at the same time causing traders to become less competent, have less control, become less efficient, and to pay more for trading. The overconfidence of online traders has indirect support from findings in Uchida (2006) for Japanese online stock traders. The loyalty of online traders to their online broker was studied by Toufaily and Pons (2017), who find that traders are no more loyal to online brokers that also offer brick-and-mortar stores than to pure online brokers. Given the behavioral traits found in online traders, a search for tradeoffs between the highly observable online trading costs and the often less observable features should be useful to online traders.

**Methodology**

*Hypothesis*

The hypothesis for this study employs the theory of perfect competition. The market for online brokers may fit into this category of market activity for at least four reasons. First, many firms exist in the market, none of which has a substantially greater number of clients than another. Second, online brokers should be able to easily enter and exit the market. This should be the case for online brokers because technology, rather than brick-and-mortar, is the dominant capital input. Third, each online broker offers mostly homogenous features. Homogeneity has support from the data for this study. Fourth, all market participants have access to complete information about costs and features. This should be the case for online broker features since their costs and features are available on their respective websites. A business that operates in a market characterized by perfect competition cannot set costs, but rather must set costs consistent with those set by other market participants, unless the business compensates by changing a cost on another feature in the opposite direction, such that the overall cost for available features from each online broker is essentially the same. Since casual observation reveals that online trading costs are not identical, this paper uses data from an analysis of online brokers to see if tradeoffs exist between costs charged to customers, and features available to customers from online brokers, which should exist in an efficient market.

*Research*

The research design seeks to explain the online trading costs of different online brokers with the features offered by those online brokers. The costs are posted on the websites of online stockbrokers, as are the features offered by each broker. If the market for online brokers is efficient, there should be a strong positive relationship between costs and features. Evidence of a relationship should exist in the form of significant correlations and regression coefficients. Pearson correlations between each pair of variables, and ordinary least square regressions explaining costs with features, should show the extent and intensity of the relationships between online broker costs and features.

*Model*

The regression model attempts to explain the costs to trade stock and other securities online with level, quality, and availability of features. Two models are used, a full model and a potentially truncated model. The full model shows all the variables regardless of the significance of their regression coefficients. The potentially truncated models are formed by using stepwise regression to identify the variables with the most ability to explain the costs of using an online broker with features offered, while minimizing the impact of any multicollinearity. The full regression model is as follows:

Costs = *β0* + *β1* Trading + *β2* Usability + *β3* Mobile + *β4* Offerings

 + *β5* Research + *β6* Portfolio + *β7* Service + *ε*

A stepwise regression procedure uses the same variables starting with putting in the most influential variable in the first step, then putting in the next most influential variable in the second step, until variables are no longer significant at a selected alpha level. The procedure could show several models depending on how many variables are significant at an alpha level of 0.15 to enter or remove variables, and outliers that might need removal after using a Cook’s D test at a 0.80 threshold.

*Variables*

The variables are from the “*Barron’s* 2018 Best Online Brokers Ranking” table found in Carey (2018). Evaluations by staff at *Barron’s* of various features from 19 online brokers were used to award points for costs and other features. Points awarded ranged from zero (*worst*) to five (*best*). The variables used in this study are all eight features evaluated by Barron’s staff for each online broker, and include: Costs, to represent the sum of points awarded for stock and option commissions, and mutual fund and other transaction fees; Trading, to represent the sum of points awarded for easily placing an order and efficient order-routing; Usability, to represent the sum of points awarded for the design and ease of using the broker’s website and programs; Mobile, to represent the sum of points awarded for the availability and quality of mobile account data and mobile educational opportunities; Offerings, to represent the sum of points awarded for the diversity of investments available for trading online; Research, to represent the points awarded for the quality and accessibility of research, quotes, and charting; Portfolio, to represent the points awarded for clear reports updated in real time that show current balances, positions, and margin status; and Service, to represent the sum of points awarded for both online and offline help, education both online and live, and security measurement statistics. These variables are listed along with their descriptive statistics in Table 1.

Table 1 has summary statistics showing the mean, standard deviation, minimum, median, and maximum for each variable. All variables have means greater than their standard deviations, and means close to their medians, which suggests that all variables have normal distributions. In addition, the values in the table indicate that points were awarded to the costs and features based on a scale of from 0.0 to 5.0, with actual awards ranging from 0.0 to 4.9. Costs seem to have been awarded fewer points than any of the features.

**Results**

*Correlations*

Correlations between all the variables, along with p-values in parentheses immediately below the correlations are in Table 2. The correlations between the variable measuring the costs related to the trading accounts (Costs) and the variables measuring the features (Trading, Usability, Mobile, Offerings, Research, Portfolio, and Service) of the trading accounts are in the column labeled Costs. Correlations in the Costs column are all low with high p-values, suggesting the lack of any strong associations between costs and features. However, correlations between features are high with all p-values at eight percent or lower. The highest correlation is between Trading and Research, and the lowest correlation is between Mobile and Offerings. The correlations do not support an efficient market for online brokers based on the lack of strong correlations between costs and all the features, nor do they suggest that the regressions will be significant.

*Regressions*

 The results from regressions explaining the costs charged to traders with the features offered to traders by online brokers appear in Table 3. Results from four different regressions are reported.

 The first column of results, labeled All Data OLS, are from using data from all 19 online brokers. That column shows that the overall regression is insignificant, based on the F-test. However, to see if any subset of features could explain Costs by minimizing multicollinearity effects, a stepwise regression was done using the same 19 observations, yet not a single feature was able to explain any significant part of the Costs variable. This is reported in the second column, labeled All Data Stepwise. However, since two outlier observations were found using a Cook’s D test, additional regression results are reported that excluded the outliers.

 The third column of results, labeled Without Outliers OLS, are from excluding two outliers from the full data set, thus using only 17 observations. The F-test shows that the regression without the outliers is also insignificant. In addition, when the 17 observations were put into a stepwise regression to see if any subset of features could explain Costs by minimizing the influence of multicollinearity, the results show that not a single feature variable was able to explain a significant source of variation in the Costs variable. The fourth column of regression results, labeled Without Outliers Stepwise, reports the findings from the stepwise regression on the truncated data.

**Conclusion**

This study explores the relationship between trading costs and trading features offered by online brokers. The results were expected to support an efficient market for online brokers and show that seeing costs is an easy way for online traders to select an online broker; however, the results do not support an efficient market, leaving online traders without costs as a signal of the level, quality, and availability of features. The results of this study show that it is just as likely to find an online broker with high costs and low-quality features as it is to find one with low costs and high-quality features. Traders who wish to open an account with an online broker should carefully explore both costs and features by looking at online broker rankings such as the one from *Barron’s* used for this study. In fact, our study suggests such rankings should be a valuable use of time for online traders who wish to prudently search for the online broker best suited for them. In addition, results from this study suggest that inefficiencies in the market for online brokers offer opportunities for new online brokers to enter the market.

More research is necessary to explore the robustness of results from this study over time and use different measures of online broker costs and features. For example, using a different assessment date and different data, such as a compilation of costs and features from a different source, could produce different results. Additional research will also be necessary since costs and features of online brokers are likely to change over time. And if new online brokers enter the market for online trading, or if consolidations occur, different sets of observations should become available. Finally, as the market for online brokers matures, a comparison of cost and features might eventually discover an efficient market for online brokers.

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**Tables**

Table 1

Descriptive Statistics for Costs and other Features of Online Brokers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Mean | Standard Deviation | Minimum | Median | Maximum |
| Costs | 2.6 | 1.0 | 1.0 | 2.5 | 4.6 |
| Trading | 3.3 | 1.2 | 1.4 | 3.5 | 4.8 |
| Usability | 3.5 | 0.9 | 2.0 | 3.9 | 4.7 |
| Mobile | 3.8 | 1.1 | 0.0 | 4.0 | 4.9 |
| Offerings | 3.0 | 1.0 | 1.7 | 3.0 | 4.8 |
| Research | 3.4 | 1.4 | 0.7 | 3.4 | 4.9 |
| Portfolio | 3.3 | 1.3 | 1.4 | 3.6 | 4.9 |
| Service | 3.7 | 0.8 | 2.4 | 3.8 | 4.9 |

N = 19 for each variable. Means, standard deviations, minimum values, medians, and maximum values are shown for each variable. Variables are sums of points earned for some feature of an online broker. Total points available for a feature range from five (best) to zero (worst). Costsis points for stock and option commissions, and mutual fund and other transaction fees. Tradingis points for easily placing an order and efficient order-routing. Usability is points for the design and ease of using the broker’s website and programs. Mobileis points for the availability and quality of mobile account data and mobile educational opportunities. Offeringsis points for the diversity of investments available for trading online. Researchis points for the quality and accessibility of research, quotes, and charting. Portfoliois points for clear reports updated in real time that show current balances, positions, and margin status. Serviceis points for online and offline help; education online and live; and security measurement statistics. Detailed descriptions of how points were earned are available at <https://www.barrons.com/articles/how-we-ranked-the-brokers-2018-1521854005?tesla=y>.

Table 2

Pearson Correlations for Costs and other Features of Online Brokers

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Costs | Trading | Usability | Mobile | Offerings | Research | Portfolio |
| Trading | 0.23 |  |  |  |  |  |  |
|  | (0.35) |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Usability | 0.16 | 0.90 |  |  |  |  |  |
|  | (0.50) | (0.00) |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Mobile | 0.09 | 0.586 | 0.70 |  |  |  |  |
|  | (0.72) | (0.01) | (0.00) |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Offerings | -0.01 | 0.80 | 0.79 | 0.41 |  |  |  |
|  | (0.99) | (0.00) | (0.00) | (0.08) |  |  |  |
|  |  |  |  |  |  |  |  |
| Research | 0.10 | 0.92 | 0.88 | 0.58 | 0.82 |  |  |
|  | (0.69) | (0.00) | (0.00) | (0.01) | (0.00) |  |  |
|  |  |  |  |  |  |  |  |
| Portfolio | -0.04 | 0.75 | 0.84 | 0.64 | 0.74 | 0.83 |  |
|  | (0.86) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |  |
|  |  |  |  |  |  |  |  |
| Service | 0.24 | 0.87 | 0.91 | 0.57 | 0.61 | 0.83 | 0.75 |
|  | (0.32) | (0.00) | (0.00) | (0.01) | (0.01) | (0.00) | (0.00) |

N = 19 for each variable. Pearson correlations and p-values in parentheses appear for each pair of variables. Variables are sums of points earned for some feature of an online broker. Total points available for a feature range from five (best) to zero (worst). Costs is points for stock and option commissions, and mutual fund and other transaction fees. Tradingis points for easily placing an order and efficient order-routing. Usability is points for the design and ease of using the broker’s website and programs. Mobileis points for the availability and quality of mobile account data and mobile educational opportunities. Offeringsis points for the diversity of investments available for trading online. Researchis points for the quality and accessibility of research, quotes, and charting. Portfoliois points for clear reports updated in real time that show current balances, positions, and margin status. Serviceis points for online and offline help; education online and live; and security measurement statistics. Detailed descriptions of how points were earned are available at https://www.barrons.com/articles/how-we-ranked-the-brokers-2018-1521854005?tesla=y.

Table 3

Regression Results Explaining Online Trading Costs with other Trading Features

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | All Data OLS | All Data Stepwise | Without Outliers OLS | Without Outliers Stepwise |
| Constant | 2.03 | (no terms | 4.13 | (no terms |
|  | (0.36) | entered) | (0.22) | entered) |
| Trading | 0.66 |  | 0.67 |  |
|  | (0.42) |  | (0.37) |  |
| Usability | 0.40 |  | -1.97 |  |
|  | (0.76) |  | (0.39) |  |
| Mobile | -0.06 |  | -0.95 |  |
|  | (0.88) |  | (0.42) |  |
| Offerings | -0.38 |  | 0.37 |  |
|  | (0.62) |  | (0.64) |  |
| Research | -0.24 |  | -1.70 |  |
|  | (0.70) |  | (0.10) |  |
| Portfolio | -0.29 |  | 1.58 |  |
|  | (0.54) |  | (0.16) |  |
| Service | 0.04 |  | 1.84 |  |
|  | (0.98) |  | (0.28) |  |
| *F*-value | 0.48 |  | 0.90 |  |
|  | (0.83) |  | (0.54) |  |
| Adjusted R2 | 0.0% |  | 0.0% |  |
| N | 19 |  | 17 |  |

Variables are sums of points awarded in *Barron’s* 2018 Best Online Brokers Rankingfor a feature of an online broker, from five points (*best*) to zero (*worst*). The dependent variable, Cost,is for stock and option commissions, and mutual fund and other transaction fees. Independent variables are: Trading, points for easily placing an order and efficient order-routing; Usability, points for the design and ease of using the broker’s website and programs; Mobile, points for the availability and quality of mobile account data and mobile educational opportunities; Offerings, points for the diversity of investments available for trading online; Research, points for the quality and accessibility of research, quotes, and charting; Portfolio, points for clear reports updated in real time that show current balances, positions, and margin status; and Service, points for online and offline help, education online and live, and security measurement statistics. Cook’s D test identified two outliers from the All Data OLS regression, which were removed for the Without Outliers OLS regression.